# Power Distribution & Control SCHRACK TECHNICA

# Part 4/5 Contactors & Circuit Breakers





















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INCL. AVAILABILITY INFORMATION



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- More than 15,000 items are stored ready for shipping
- Professional warehouse management by our top-trained staff



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#### GENERAL INFORMATION

- All **dimensioned drawings** are displayed within the confines of available space on the page and are only intended as a guide.
- All circuit diagrams are schematic wiring diagrams which are intended to allow better understanding of the function, and will need to be edited/added to during the course of project planning.
- All **images** represent samples of the product and are intended for information purposes only.

Unless otherwise stipulated, the current version of the General Terms of Delivery issued by The Association of the Austrian Electrical and Electronics Industries "FEEI" shall apply. You can find a copy of these at the end of this catalogue.

No liability for errors in text, type or images; we reserve the right to make changes to technical specifications of the product range.

The user information contained in this catalogue reflect the opinion of the company at the time of writing. The information contained in it was assembled on the basis of published norms, specialist industry presentations, specialist literature and in-house expertise. The content is for informational purposes only and has no validity in law.



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# Plug-in Relays



# Print Relays



# ■ Modular Relays



# Relay Sockets & Sets



# ■ Force-guided Contacts Relays



PLC Series EASY



# Relays

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# Relay Package Schrack, Series SNR

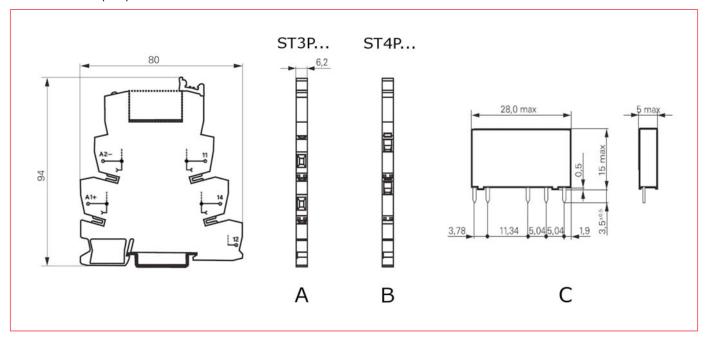


ST3P3LC4

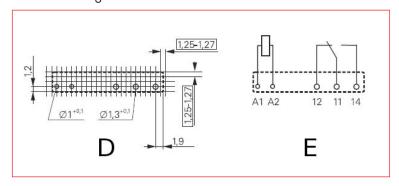
#### Schrack-Info

- Relay package consisting of a relay and a DIN rail socket
- 1 CO 6 A rated current
- Safe disconnection compliant with VDE 0160 in combination with socket YRT78626
- Module width only 6.2 mm
- Narrow component width allows high component density and tight-packed functionality on the DIN
  rail
- Complies with the 2011/65/EU RoHS Directive
- Protection diode

#### Dimensions (mm)



# Circuit Diagram



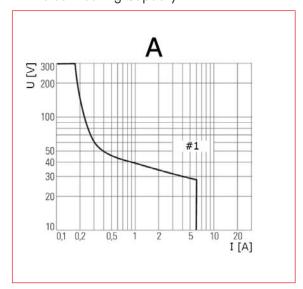
#### Dimensions & Circuit Diagram

A	Screw terminals
В	Spring clamp terminals
С	Dimensions SNR relay
D	Bottom view on solder pins
E	1 CO



# Relay Package Schrack, Series SNR

# Rated Breaking Capacity



# Rated Breaking Capacity

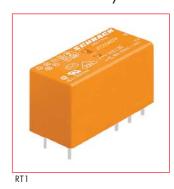
Α	Max. DC rated breaking capacity				
#1 Resistive load					
U	DC voltage in [V]				
I	DC current in [A]				

# Technical Data

CONTACT DATA		6 A		
Number of contact and type		1 CO		
Contact style		Single contact		
Type of disconnection		Micro-switch		
Rated current		6 A		
Rated voltage/ max. switchin	g voltage AC	240 / 400 V~		
Max. rated breaking capacity	/ AC	1500 VA		
Limiting making capacity, max	x 4 s, duty factor 10 %	10 A		
Contact material		AgSnO₂, AgSnO₂ hard gold plated		
INPUT DATA				
Rated voltage		12, 24 V DC, 115, 230 V AC / V DC (type 115, 230 V AC / V DC mit 60 V DC relay)		
Rated power	DC coil	12 V DC 184 mW, 24 V DC 220 mW, 115 V AC 402 mVA, 230 V AC 736 mVA		
Operation range according to IEC 61810		2		
GENERAL DATA				
Ambient temperature		-40+55 °C		
Degree of protection DIN 400	050	IP20		
Terminals		Screw terminals/ spring clamp terminals		
Terminal screw torque accord	ing to IEC 61984	0.5 Nm		
	Max.	0.6 Nm		
Wire cross section	Solid wire	0.14 2.5 mm <sup>2</sup>		
	Stranded wire	0.14 2.5 mm <sup>2</sup>		
	With ferrule (DIN 46228/1)	0.14 2.5 mm <sup>2</sup>		

DESCRIPTION	AVAILABLE	ORDER NO.
Relay Package - Screw Terminal		
12V-DC, 1 CO, 6A with socket	000 0-0	ST3P3LB2
24V-DC, 1 CO, 6A with socket	000	ST3P3LC4
24V-DC, 1 CO, 6A with socket	000	ST3P2LC4
230V-AC/DC, 1 CO, 6A with socket	000	<b>ST3P3TP0</b>
Relay Package - Spring Clamp Terminal		
24V-DC, 1 CO, 6A with socket	000	ST4P3LC4
230V-AC/DC, 1 CO, 6A with socket	000	ST4P3TP0
Accessories		
DIN rail mounted plug-in socket for SNR relays, 24V-DC, 6A, incl. protection diode, with screw terminals	000	ST3FLC4
SNR jumper bar, red, 500mm	000	ST37001
SNR jumper bar, blue, 500mm	000 0-0	ST37002
SNR jumper bar, grey, 500mm	999 0-0	ST37003
Marking plate 1 plate=100pcs		ST37040











#### Schrack-Info

#### RT1

- 1 pole 12/16 A, AC or DC coil
- 1 CO or 1 NO
- Sensitive coil 400 mW/0.75 VA
- 5 kV, 10 mm coil/contact
- Appliance class II (VDE 0700)
- Safe disconnection compliant with VDE 0160 in combination with socket YRT78626
- Ambient temperature 85°C (DC coil)
- Low component height 15.7 mm
- Gold plated contacts available
- Print and screw type sockets
- · For boiler controls, timer relays, garage door controls, vending machines, interface modules

#### RT1 Inrush and High Inrush

- 1 pole 16 A, for high peak inrush current
- 1 NO
- RTS3T024 (= High Inrush) with Tungsten early-make contact
- Sensitive coil 400 mW
- 5 kV, 10 mm coil/contact
- Appliance class II (VDE 0700)
- Ambient temperature 85°C
- Low component height 15.7 mm
- Print and screw type sockets
- For household appliances, heating controls, light controls, building automation

#### RT2

- 2 poles 8 A, AC or DC coil
- 2 CO
- Sensitive coil 400 mW
- 5 kV, 10 mm coil/contact
- Appliance class II (VDE 0700)
- Safe disconnection compliant with VDE 0160 in combination with socket YRT78626
- Low component height 15.7 mm
- Print and screw type sockets
- · For household appliances, heating controls, emergency lighting, modems

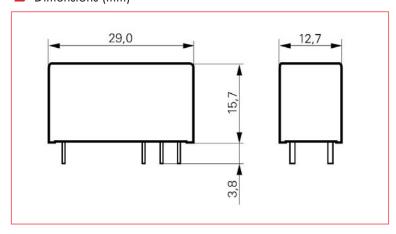
# RT Overview

Relays	Number of contacts and type	Rated current [A]	c	oil	Pinning [mm]	Contact material	RT1	RT1 Inrush	RT1 High Inrush	RT2
RT114012	1 CO	12	DC	12 V	3.5	AgNi90/10	Х			
RT114024	1 CO	12	DC	24 V	3.5	AgNi90/10	Х			
RT114524	1 CO	12	AC	24 V	3.5	AgNi90/10	Х			
RT214012	1 CO	12	DC	12 V	5	AgNi90/10	Х			
RT214024	1 CO	12	DC	24 V	5	AgNi90/10	Х			
RT214730	1 CO	12	AC	230 V	5	AgNi90/10	Х			
RT314005	1 CO	16	DC	5 V	5	AgNi90/10	Х			
RT314012	1 CO	16	DC	12 V	5	AgNi90/10	Х			
RT314024	1 CO	16	DC	24 V	5	AgNi90/10	Х			
RT334024	1 NO	16	DC	24 V	5	AgNi90/10	Х			
RT314110	1 CO	16	DC	110 V	5	AgNi90/10	Х			
RT314524	1 CO	16	AC	24 V	5	AgNi90/10	Х			
RT314730	1 CO	16	AC	230 V	5	AgNi90/10	Х	İ		
RT315730	1 CO	16	AC	230 V	5	AgNi90/10 hgp*	Х			
RT33K012	1 NO	16	DC	12 V	5	AgNi90/10	İ	Х		
RT33K024	1 NO	16	DC	24 V	5	AgNi90/10		Х		
RT31L024	1 CO	16	DC	24 V	5	AgSnO <sub>2</sub>		Х		
RTS3T024	1 NO	16	DC	24 V	5	T* * + AgSnO <sub>2</sub>	İ		Х	
RT424006	2 CO	8	DC	6 V	5	AgNi90/10	ĺ			Х
RT424012	2 CO	8	DC	12 V	5	AgNi90/10				Х
RT424024	2 CO	8	DC	24 V	5	AgNi90/10				Х
RT425024	2 CO	8	DC	24 V	5	AgNi90/10 hgp*	İ			Х
RTE24024	2 CO	8	DC	24 V	5	AgNi90/10				Х
RT424048	2 CO	8	DC	48 V	5	AgNi90/10				Х
RT424060	2 CO	8	DC	60 V	5	AgNi90/10				Х
RT424110	2 CO	8	DC	110 V	5	AgNi90/10				Х
RT424524	2 CO	8	AC	24 V	5	AgNi90/10				Х
RT424548	2 CO	8	AC	48 V	5	AgNi90/10				Х
RT424615	2 CO	8	AC	115 V	5	AgNi90/10				Х
RT425615	2 CO	8	AC	115 V	5	AgNi90/10 hgp*	İ			Х
RT424730	2 CO	8	AC	230 V	5	AgNi90/10				Х
RT425730	2 CO	8	AC	230 V	5	AgNi90/10 hgp*				Х

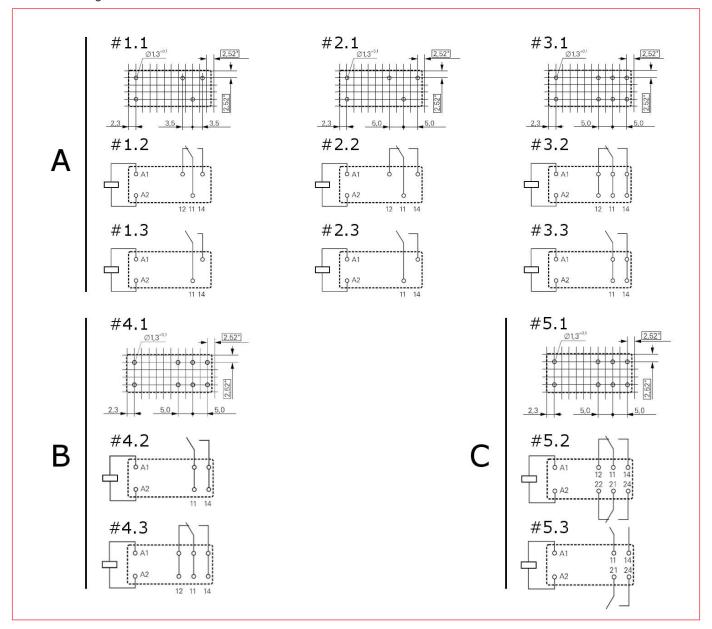
<sup>\*</sup>hgp = hard gold-plated

\*\*Tungsten pre-contact

# Dimensions (mm)



## Circuit Diagrams



#### Circuit Diagrams, Contacts & Pinning

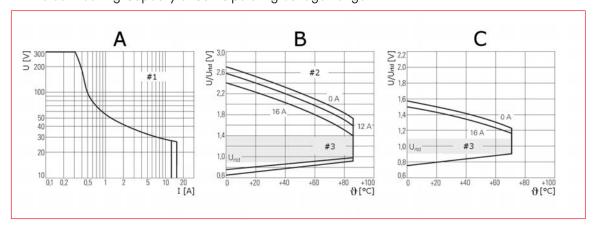
	A	RT1			
	В	RT1 Inrush and High Inrush			
	С	RT2			
	<b>#1.1</b> 12 A, pinning 3.5 mm				
	<b>#1.2</b> 1 CO				
	#1.3 1 NO #2.1 12 A, pinning 5 mm				
	#2.2	1 CO			
	<b>#2.3</b> 1 NO				

#3.1	16 A, pinning 5 mm
#3.2	1 CO
#3.3	1 NO
#4.1	16 A, pinning 5 mm
#4.2	1 NO
#4.3	1 CO
#5.1	8 A, pinning 5 mm
#5.2	2 CO
#5.3	2 NO

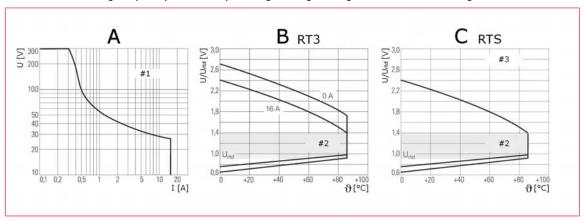
#### General Info

View of the terminals, dimensions in mm. Equipping with indicated hole diameter also possible in 2.5 mm or 2.54 mm contact spacing.

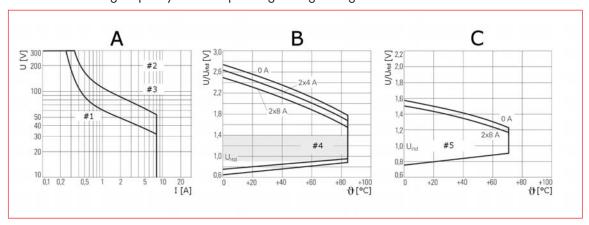
# Rated Breaking Capacity & Coil Operating Voltage Range RT1



## Rated Breaking Capacity & Coil Operating Voltage Range RT1 Inrush And High Inrush



## Rated Breaking Capacity & Coil Operating Voltage Range RT2



## Rated Breaking Capacity & Coil Operating Voltage Ranges

RT1				
Α	Max. DC rated breaking capacity			
В	Coil operating range DC			
С	Coil operating range AC			
#1	Resistive load			
#2	16 A version			
#3	Recommended voltage range in [V]			
U	DC voltage in [V]			
U/U <sup>rtd</sup>	Coil voltage in [V]			
I	DC current in [A]			
Ů	Ambient temperature in [°C]			

KI I Inrush and High Inrush					
Α	Max. DC rated breaking capacity				
В	Coil operating range DC (RT3)				
С	Coil operating range DC (RTS)				
#1	Resistive load				
#2	Recommended voltage range in [V]				
#3	Monostable version				
U	DC voltage in [V]				
U/U <sup>rtd</sup>	Coil voltage in [V]				
I	DC current in [A]				
Ů	Ambient temperature in [°C]				

K12				
Α	Max. DC rated breaking capacity			
В	Coil operating range DC			
С	Coil operating range AC			
#1	1 contact			
#2	2 pole resistive load			
#3	2 contacts in series			
#4	Recommended voltage range in [V]			
#5	Rated coil voltage in [V]			
U	DC voltage in [V]			
U/U <sup>rtd</sup>	Coil voltage in [V]			
ı	DC current in [A]			
Ů	Ambient temperature in [°C]			



# ■ Technical Data

CONTACT DATA		12 A	16 A
Number of contacts and type		1 CO or 1 NO contact	
Contact style		Single	e contact
Rated current		12 A	16 A
Rated voltage/ max. switching voltage AC		250 / 400 V~	
Limiting continuous current		12 A	16 A, UL: 20 A
Max. rated breaking capacity AC		3000 VA	4000 VA
Limiting making current (max. 4 s at 10 % DF)		25 A	30 A
Contact material		AgNi 90/10, AgNi 90/10 hard gold plated	
COIL DATA			
Rated voltage	DC coil	5110 V	
	AC coil	24230 V~	
Rated power	DC coil	400	O mW
	AC coil	0.74 VA	
Operative range, IEC 61810			2
Coil insulation system according to UL1446		Cl	ass F
Operation-/ release voltage/ coil resistance	24 V DC coil	16.8 V / 2.4 V / 1440 Ω ± 10%	
at ambient temperature 23 °C 230 V AC coil		172.5 V / 34.5 V	/ / 32500 Ω ± 10%

RT1 Inrush and High Inrush

CONTACT DATA		RT3	RTS	
Number of contacts and type		1 CO or 1 NO	1 NO	
Contact style		Sing	le contact	
Rated current			16 A	
Rated voltage / max. switching voltage AC		250	/ 400 V~	
Limiting continuous current			16 A	
Max. rated breaking capacity AC		4	000 VA	
Limiting making current		30 A (max. 4 s at 10 % DF)	165 A (max. 20 ms incandescent lamps) 800 A (max. 200 µs fluorescent lamps)	
Contact material		AgNi 90/10, AgSnO <sub>2</sub>	W (lead contact) + AgSnO <sub>2</sub>	
COIL DATA				
Rated voltage		5110 V DC		
Rated power		400 mW		
Operative range, IEC 61810		2		
Coil insulation system according to UL1446		Class F		
Operation-/ release voltage/ coil resistance	24 V DC coil	16.8 V / 2.4 V / 1440 Ω ± 10%		
at ambient temperature 23 °C	230 V AC coil	- $172.5 \text{ V} / 34.5 \text{ V} / 32500 \Omega \pm 10$		

#### RT2

CONTACT DATA		8 A
Number of contacts and type		2 CO
Contact style		Single contact
Rated current		8 A
Rated voltage/ max. switching voltage AC		250 V / 400 V~
Limiting continuous current		8 A, UL: 10 A
Max. rated breaking capacity AC		2000 VA
Limiting making current (max. 4 s at 10 % DF)		15 A
Contact material		AgNi 90/10, AgNi 90/10 hard gold plated
COIL DATA		
Rated voltage	DC coil	5110 V
	AC coil	24230 V~
Rated power	DC coil	400 mW
	AC coil	0.74 VA
Operative range, IEC 61810		2
Coil insulation system according to UL1446		Class F
Operation-/ release voltage/ coil resistance	24 V DC coil	16.8 V / 2.4 V / 1440 Ω ± 10%
at ambient temperature 23 °C	230 V AC coil	$172.5 \text{ V} / 34.5 \text{ V} / 32500 \Omega \pm 10\%$



2V-DC, 1 CO, 12A 4V-DC, 1 CO, 12A 4V-AC, 1 CO, 12A 2V-DC, 1 CO, 12A	000 0-60	RT114012
4V-DC, 1 CO, 12A 4V-AC, 1 CO, 12A 2V-DC, 1 CO, 12A		RT114012
4V-AC, 1 CO, 12A 2V-DC, 1 CO, 12A		
V-DC, 1 CO, 12A	000 000	RT114024
	000 0-0	RT114524
	333 0-8	RT214012
4V-DC, 1 CO, 12A	000 0-0	RT214024
80V-AC, 1 CO, 12A	333 0-0	RT214730
ower Relays RT1, 16A		
/-DC, 1 CO, 16A	999 0-9	RT314005
V-DC, 1 CO, 16A	000 0-0	RT314012
4V-DC, 1 CO, 16A	388 0-8	RT314024
4V-DC, 1 NO, 16A	000 0-0	RT334024
4V-AC, 1 CO, 16A	355 0- 0	RT314524
30V-AC, 1 CO, 16A	000 0-0	RT314730
30V-AC, 1 CO, 16A, gold plated		RT315730
ower Relays RT1 Inrush and High Inrush	333 <del>0- 8</del>	K1013700
2V-DC, 1 NO, 16A	080 0-0	RT33K012
4V-DC, 1 NO, 16A	000 0-0	RT33K024
4V-DC, 1 CO, 16A	988 0- 8-	RT31L024
ower Relays RT1 High Inrush	Description (France)	
4V-DC, 1 NO, 16A	000 0-0	RTS3T024
ower Relays RT2		
/-DC, 2 CO, 8A	000 0-0	RT424006
2V-DC, 2 CO, 8A	000 0-0	RT424012
4V-DC, 2 CO, 8A	555 0-8	RT424024
4V-DC, 2 CO, 8A, gold plated	000 0-0	RT425024
4V-DC, 2 CO, 8A	333 0-0	RTE24024
3V-DC, 2 CO, 8A	000 0-0	RT424048
DV-DC, 2 CO, 8A	000	RT424060
0V-DC, 2 CO, 8A	000 0-0	RT424110
4V-AC, 2 CO, 8A	000 0-0	RT424524
3V-AC, 2 CO, 8A	000 0-0	RT424548
5V-AC, 2 CO, 8A	333 0-0	RT424615
5V-AC, 2 CO, 8A, gold plated	000 0-0	RT425615
30V-AC, 2 CO, 8A	000 0-0	RT424730
30V-AC, 2 CO, 8A, gold plated	000	RT425730
oring Clamp Terminal Plug-in Socket for Power Relays RT		
N rail mounted plug-in socket for RT2x, RT3x, RT4x, XT, RP4x relays, pinning 5mm, max. 16A, with spring clamp terminals	000 0-0	RT7872P
mper link for connection of RT7872P	355 0-8	RT170P1
ug-in Socket for Power Relays RT		
N rail mounted plug-in socket for RT1x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals	988 6-8	YRT78624
N rail mounted plug-in socket for XT, RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw		
minals	000 0-0	YRT78626
N rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 16A, conventional arrangement, with screw minals	999	RT78725
etaining clip for RT relays with ejection function	000 0-0	RT17017
mper bar for connection of up to 8 RT-sockets	000 0-0	RT170R8
arking tag (for YRT sockets YRT78624 and YRT78626)	000 0-0	YRT16040
odules Matching Plug-in Socket for Power Relays RT		
D module, red, 6-24V AC/DC, EM07	000 O- 0	YMLRA024
,,		YMLRD024-A
D module, red, 6-24V DC, A1+, EM18	555 0-6	ENDULT'S

DESCRIPTION	AVAILABLE	ORDER NO.
Modules Matching Plug-in Socket for Power Relays RT		
LED module, red, 110-230V AC, EM06	555 0-6	YMLRW230
LED module, green, 6-24V AC/DC, EM11	333 0-0	YMLGA024
LED module, green 6-24V DC with protection diode, A1+, EM12	300	YMLGD024
LED module, green, 110-230V AC, EM 10	333	YMLGW230
Protection diode module 6-230V DC, A1+, EM09	300 0-0	YMFDG230
RC Network module 6-60V AC, EM02	355 0-6	YMRCW024
RC Network module 110-230V AC, EM03	388 0-6	YMRCW230
Varistor module, 24V-AC, EM04	333 0-6	YMVAW024
Varistor module 230V-AC, EM05	300 0-0	YMVAW230

# Pluggable Interface Relay Schrack, Series XT





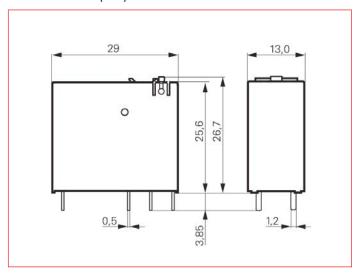




#### Schrack-Info

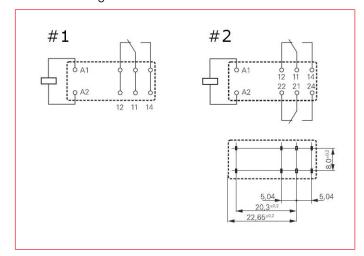
- 1 pole 16 A, 2 poles 8 A, 1 or 2 CO
- AC or DC coil, sensitive coil 400 mW
- Reinforced insulation, appliance class II (VDE 0700)
- Safe disconnection complaint with VDE 0160 in combination with socket YRT78626
- 4 kV, 8 mm coil/contact
- Lockable manual testing system (see drawing "How To Use")
- Optional model with mechanical and/or electrical indication
- Suitable for standard RT sockets
- Recyclable packaging
- Complies with the 2011/65/EU RoHS Directive
- For control panels, machine building

# Dimensions (mm)

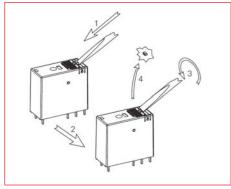


# Pluggable Interface Relay Schrack, Series XT

# Circuit Diagrams



#### How To Use



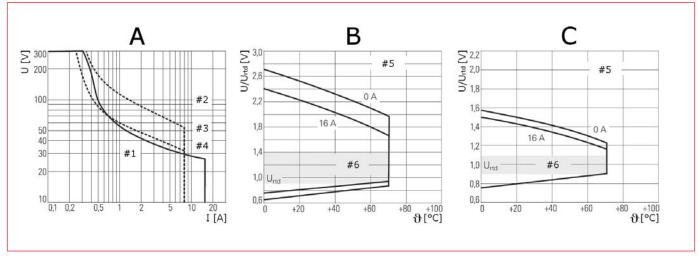
#### How To Use

Description of the locking function: If the test button is pulled out to forcibly, it may skip the test position and move directly to the locking position. To go to the locking position, please remove the plastic locking cam (see drawing).

# Circuit Diagrams

#1	16 A, 1 CO
#2	8 A, 2 CO
General info	View of the terminals, dimensions in mm

## Rated Breaking Capacity & Coil Operating Voltage Range



## Rated Breaking Capacity & Coil Operating Voltage Range

A	Max. DC rated breaking capacity	
В	Coil operating range DC	
С	Coil operating range AC	
U	DC voltage in [V]	
U/U <sup>rtd</sup>	Coil voltage in [V]	
1	DC current in [A]	
Ů	Ambient temperature in [°C]	

#1	1 pole 12 / 16 A resistive load
#2	2 pole 8 A resistive load
#3	2 contacts in series
#4	1 contact
#5	Versions without LED
#6	Recommended voltage range in [V]

# Pluggable Interface Relay Schrack, Series XT

# ■ Technical Data

CONTACT DATA		1-POLE	2-POLE
Number of contacts and type		1 CO	2 CO
Contact style		Single conto	ıct
Rated current		16 A	8 A
Rated voltage/ max. switching voltage AC		240 / 400	V~
Limiting short-time current, 30 ms		300 A	
Max. rated breaking capacity AC		4000 VA	2000 VA
Inrush current (max. 4 s at 10 % DF)		30 A	15 A
Contact material		AgNi 90/10	
Minimal contact load		12 V / 10 mA	
COIL DATA			
Rated voltage	DC coil	6110 V	
	AC coil	24230 V	~
Rated power	DC coil	typ. 400 m\	W
	AC coil	typ. 0.75 VA	
Operative range, IEC 61810		2	
Coil insulation system according to UL1446		Class F	
Operation-/ release voltage/ coil resistance	24 V DC coil	16.8 V / 2.4 V / 1440 Ω ± 10 %	
at ambient temperature 23 °C	24 V AC coil	18 V / 3.6 V / 350	Ω ± 10 %
	230 V AC coil	172.5 V / 34.5 V / 325	500 Ω ± 10 %

24V-DC, 1 CO, 16A, with LED and protection diode  24V-DC, 2 CO, 8A, with LED and protection diode  24V-DC, 2 CO, 8A, with LED  230V-AC, 2 CO, 8A, with LED  230V-AC, 2 CO, 8A, with LED  230V-AC, 2 CO, 8A, with LED  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  230V-BC, 2 CO, 8A, EMO  23	DESCRIPTION	AVAILABLE	ORDER NO.
24V-DC, 2 CO, 8A, with LED and protection dioide  24V-AC, 2 CO, 8A, with LED  23OV-AC, 2 CO, 8A, with LED  25Pring Clamp Terminal Plug-in Socket for Relays, Series XT  28training clip for RT relays with ejection function  28TR7872P  28training clip for RT relays with ejection function  28TR7017  28training clip for RT relays with ejection function  28TR7017  28training clip for RT and RP relays with ejection function  28TR7017  28training clip for RT and RP relays with ejection function  28TR7017  28TR7017  28TR7017  28TR7017  28TR7018  29TR78624  20TN rail mounted plug-in socket for RT1x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals  29TR78624  20TN rail mounted plug-in socket for RT1x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  20TN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  20TN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  20TN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  20TN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  20TN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  20TN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  20TN rail relationship for rail relationship for rail relationship for rail relationship for rail relationship for rail relationship for rail relationship for rail relationship for rail relationship for rail relationship for rail relationship for rail relationship for rail relationship	Pluggable Interface Relay XT		
24V-AC, 2 CO, 8A, with LED  XT484R24 230V-AC, 2 CO, 8A, with LED  XT484T30  Spring Clamp Terminal Plug-in Socket for Relays, Series XT  DIN rail mounted plug-in socket for RT2x, RT3x, RT4x, XT, RP4x relays, pinning 5mm, max. 16A, with spring clamp terminals  RT7872P Retaining clip for RT relays with ejection function  RT17017  RT17017  RT17017  RT17019  Plug-in Socket for Relays, Series XT  DIN rail mounted plug-in socket for RT1 x relays, pinning 3.5mm, max. 12A, I/O- logical arrangement, with screw terminals  VRT78624  DIN rail mounted plug-in socket for RT1 x relays, pinning 3.5mm, max. 12A, I/O- logical arrangement, with screw terminals  VRT78626  DIN rail mounted plug-in socket for RT1x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O- logical arrangement, with screw terminals  VRT78626  DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O- logical arrangement, with screw terminals  RT78725  RRT78725  RRT78725  RRT78726  RRT78725  RRT78726  RRT78726  RRT78727  RRT78727  RRT78727  RRT78728  RRT78728  RRT78729  RRT7872P  RRT	24V-DC, 1 CO, 16A, with LED and protection diode	000 0-0	XT374LC4
XT484T30 Spring Clamp Terminal Plug-in Socket for Relays, Series XT    Spring Clamp Terminal Plug-in Socket for Relays, Series XT   Spring Clamp Terminal Plug-in Socket for RT2x, RT3x, RT4x, XT, RP4x relays, pinning 5mm, max. 16A, with spring clamp terminals   RT7872P   RT17017   RT170	24V-DC, 2 CO, 8A, with LED and protection diode	888	XT484LC4
Spring Clamp Terminal Plug-in Socket for Relays, Series XT  DIN rail mounted plug-in socket for RT2x, RT3x, RT4x, XT, RP4x relays, pinning 5mm, max. 16A, with spring clamp terminals  RT7872P Retaining clip for RT relays with ejection function  RT17017  Retaining clip for RT relays with ejection function  RT17017  Were limited plug-in socket for RT2x, RT3x, RT4x, RT3x, RT4x relays, pinning 5mm, max. 16A, with spring clamp terminals  RT17017  Plug-in Socket for Relays, Series XT  DIN rail mounted plug-in socket for RT1x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals  DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 16A, conventional arrangement, with screw terminals  RT178626  DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 16A, conventional arrangement, with screw terminals  RT178725  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for XT and RP relays with ejection function  RT17017  Retaining clip for XT and RP relays with ejection function  RT17017  Retaining clip for XT and RP relays with ejection function  RT17017  Retaining clip for XT and RP relays with ejection function  RT17017  R	24V-AC, 2 CO, 8A, with LED	000	XT484R24
R17872P Retaining clip for RT relays with ejection function Retaining clip for RT relays with ejection function Retaining clip for RT relays with ejection function R17872P Retaining clip for XT and RP relays with ejection function R17872P R17017 Retaining clip for XT and RP relays with ejection function R17872P R17017 Retaining clip for XT and RP relays with ejection function R17872P R170017 R2 was a compared to the connection of R17872P R170017 R2 was a compared to the connection of R17872P R170017 R2 was a compared to the connection of R17872P R170017 R2 was a compared to the connection of R17872P R170017 R2 was a compared to the connection of R17872P R170017 R2 was a compared to the connection of R17872P R170017 R2 was a compared to the connection of R17872P R170017 R2 was a compared to the connection of R17872P R170017 R2 was a compared to the connection of R17872P R170017 R2 was a compared to the connection of Up to R17 relays with ejection function R178725 R2 was a compared to the connection of Up to R17 relays with ejection function R170017 R2 was a compared to the connection of Up to R17 relays with ejection function R170017 R2 was a compared to the connection of Up to R17 relays with ejection function R170017 R2 was a compared to the connection of Up to R17 relays with ejection function R170017 R2 was a compared to the connection of Up to R17 relays with ejection function R170017 R2 was a compared to the connection of Up to R17 relays with ejection function R170017 R2 was a compared to the connection of Up to R17 relays with ejection function R170017 R2 was a compared to the connection of Up to R17 relays with ejection function R170017 R2 was a connection of Up to R17 relays with ejection function R170017 R2 was a connection of Up to R17 relays with ejection function R170017 R2 was a connection of Up to R17 relays with ejection function R170017 R2 was a connection of Up to R17 relays with ejection function R170017 R2 was a connection of Up to R17 relays with ejection function R170017 R2 was a connectio	230V-AC, 2 CO, 8A, with LED	888 0-0	XT484T30
Retaining clip for RT relays with ejection function  Retaining clip for XT and RP relays with ejection function  Retaining clip for XT and RP relays with ejection function  RT17017  Rumper link for connection of RT7872P  RT170P1  Pully In Socket for Relays, Series XT  DIN rail mounted plug-in socket for RT1x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals  PRT78624  DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  PRT78725  RT17017  Retaining clip for RT relays with ejection function  RT78725  Retaining clip for RT relays with ejection function  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT17017  RT	Spring Clamp Terminal Plug-in Socket for Relays, Series XT		
Retaining clip for XT and RP relays with ejection function  Programment in the for connection of RT7872P  RT170P1  RT170P2  RT170P2  RT170P3  RT170	DIN rail mounted plug-in socket for RT2x, RT3x, RT4x, XT, RP4x relays, pinning 5mm, max. 16A, with spring clamp terminals	555	RT7872P
rumper link for connection of RT7872P  Plug-in Socket for Relays, Series XT  DIN rail mounted plug-in socket for RT1x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals  DIN rail mounted plug-in socket for RT1x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw erminals  PRT78626  DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw erminals  RT78725  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for XT and RP relays with ejection function  RT17018  Marking tag (for YRT sockets YRT78624 and YRT78626)  RT17018  Accessories for Plug-in Sockets, Series XT  LED module, red, 6-24V AC/DC, EM07  DIN module, red, 6-24V DC, A1+, EM08  LED module, red, 110-230V AC, EM06  LED module, green, 6-24V DC with protection diode, A1+, EM12  LED module, green, 6-24V DC with protection diode, A1+, EM12  LED module, green, 6-24V DC, A1-, EM09  RT MRCW230  VMICW230   EM04	Retaining clip for RT relays with ejection function	000 0-0	RT17017
Plug-in Socket for Relays, Series XT  DIN rail mounted plug-in socket for RT1 x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals  DIN rail mounted plug-in socket for XT, RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  RT78725  Relating alip for RT relays with ejection function  RT17017  Retaining alip for XT and RP relays with ejection function  Warking tag (for YRT sockets YRT78624 and YRT78626)  Accessories for Plug-in Sockets, Series XT  ED module, red, 6-24V AC/DC, EM07  ED module, red, 6-24V AC/DC, EM06  ED module, red, 6-24V AC/DC, EM11  ED module, green, 6-24V AC/DC, EM10  Portion and the protection diode, A1+, EM12  ED module, green, 6-24V AC/DC, EM10  Portion and the protection diode module 6-230V DC, A1+, EM09  RC Network module 6-60V AC, EM02  Vankeward module, 24V-AC, EM04  Vankeward Marking to gene, 6-230V AC, EM02  Vankeward module, 24V-AC, EM04  Vankeward Marking to gene, 6-230V AC, EM06  Vankeward Marking to gene, 6-230V AC, EM06  Vankeward Marking to gene, 6-24V AC/DC, EM10  Vankeward Marking to gene, 6-24V AC/DC, EM10  Vankeward Marking to gene, 6-24V AC, EM02  Vankeward Marking to gene, 6-24V AC, EM02  Vankeward Marking to gene, 6-24V AC, EM03  Vankeward Marking to gene, 6-24V AC, EM03  Vankeward Marking to gene, 6-24V AC, EM03  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward Marking to gene, 6-24V AC, EM04  Vankeward	Retaining clip for XT and RP relays with ejection function	000	XT17017
DIN rail mounted plug-in socket for RT1x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals  DIN rail mounted plug-in socket for XT, RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals  PRT78626  DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 16A, conventional arrangement, with screw terminals  RT78725  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for XT and RP relays with ejection function  PRT17018  Marking tag (for YRT sockets YRT78624 and YRT78626)  Accessories for Plug-in Sockets, Series XT  RED module, red, 6-24V AC/DC, EM07  RED module, red, 6-24V AC/DC, EM08  RED module, red, 6-24V AC, AL+, EM18  RED module, green, 6-24V AC, EM06  RED module, green, 6-24V AC/DC, EM11  RED module, green, 6-24V AC/DC, EM11  RED module, green, 6-24V AC/DC, EM10  POPULATION AL+, EM109  RC Network module 6-60V AC, EM02  VAMRW230  Varistor module, 24V-AC, EM04  VAMRW230	Jumper link for connection of RT7872P	000 0-0	RT170P1
Olin rail mounted plug-in socket for XT, RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw erminals    XT78626	Plug-in Socket for Relays, Series XT		
reminals  TRT78725  RT178725  Retaining clip for RT relays with ejection function  RT178725  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for RT relays with ejection function  RT17017  Retaining clip for RT relays with ejection function  RT17017  REtaining clip for RT relays with ejection function  RT17017  RT17017  RT17017  RT17018  RT17017  RT17017	DIN rail mounted plug-in socket for RT1x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals	000 0-0	YRT78624
Retaining clip for RT relays with ejection function  Retaining clip for XT and RP relays with ejection function  Retaining clip for XT and RP relays with ejection function  Retaining clip for XT and RP relays with ejection function  Retaining clip for XT and RP relays with ejection function  RETATOLY  Retaining clip for XT and RP relays with ejection function  RETATOLY  RET	DIN rail mounted plug-in socket for XT, RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals	000 0-0	YRT78626
Retaining clip for XT and RP relays with ejection function    TT17017	DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 16A, conventional arrangement, with screw terminals	000 0-0	RT78725
Imper bar for connection of up to 8 RT-sockets  Marking tag (for YRT sockets YRT78624 and YRT78626)  Accessories for Plug-in Sockets, Series XT  ED module, red, 6-24V AC/DC, EM07  ED module, red, 6-24V DC, A1+, EM18  ED module, red, 6-24V DC, A1-, EM08  ED module, red, 110-230V AC, EM06  ED module, green, 6-24V AC/DC, EM11  ED module, green, 6-24V AC/DC, EM11  ED module, green, 6-24V AC/DC, EM11  ED module, green, 6-24V DC, A1+, EM18  ED module, green, 6-24V AC/DC, EM11  ED module, green, 6-24V AC/DC, EM11  ED module, green, 6-24V AC/DC, EM10  Protection diode module 6-230V DC, A1+, EM09  RC Network module 6-60V AC, EM02  Arristor module, 24V-AC, EM04  Arristor module, 24V-AC, EM04	Retaining clip for RT relays with ejection function	000 0-0	RT17017
Marking tag (for YRT sockets YRT78624 and YRT78626)  Accessories for Plug-in Sockets, Series XT  ED module, red, 6-24V AC/DC, EM07  ED module, red, 6-24V DC, A1+, EM18  ED module, red, 6-24V DC, A1-, EM08  ED module, red, 110-230V AC, EM06  ED module, red, 110-230V AC, EM06  ED module, green, 6-24V AC/DC, EM11  ED module, green, 6-24V DC with protection diode, A1+, EM12  ED module, green, 6-24V DC with protection diode, A1+, EM12  ED module, green, 110-230V AC, EM10  Protection diode module 6-230V DC, A1+, EM09  RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04	Retaining clip for XT and RP relays with ejection function	555 0-0	XT17017
Accessories for Plug-in Sockets, Series XT  LED module, red, 6-24V AC/DC, EM07  LED module, red, 6-24V DC, A1+, EM18  LED module, red, 6-24V DC, A1-, EM08  LED module, red, 110-230V AC, EM06  LED module, green, 6-24V AC/DC, EM11  LED module, green, 6-24V DC with protection diode, A1+, EM12  LED module, green, 110-230V AC, EM10  Protection diode module 6-230V DC, A1+, EM09  RC Network module 6-60V AC, EM02  Acristor module, 24V-AC, EM04  Acristor module, 24V-AC, EM04  TMLRA024  TMLRA024  TMLRW230  TMLGW230  TMLGW230  TMFDG230  TMRCW230  TMRCW230  TMRCW230  TMRCW230  TMRCW230  TMRCW230  TMRCW230  TMRCW230	Jumper bar for connection of up to 8 RT-sockets	388 0-8	RT170R8
ED module, red, 6-24V AC/DC, EM07  ED module, red, 6-24V DC, A1+, EM18  ED module, red, 6-24V DC, A1-, EM08  ED module, red, 110-230V AC, EM06  ED module, green, 6-24V AC/DC, EM11  ED module, green, 6-24V AC/DC, EM11  ED module, green, 6-24V DC with protection diode, A1+, EM12  ED module, green, 110-230V AC, EM10  Protection diode module 6-230V DC, A1+, EM09  RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04  VMLRA024  YMLRA024  YMLRA024  YMLRD024  YMLGA024  YMLGA024  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230  YMLGW230	Marking tag (for YRT sockets YRT78624 and YRT78626)	000 0-0	YRT16040
ED module, red, 6-24V DC, A1+, EM18  ED module, red, 6-24V DC, A1-, EM08  ED module, red, 110-230V AC, EM06  ED module, green, 6-24V AC/DC, EM11  ED module, green, 6-24V DC with protection diode, A1+, EM12  ED module, green, 110-230V AC, EM10  Protection diode module 6-230V DC, A1+, EM09  Protection diode module 6-60V AC, EM02  RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04  YMLRD024-  YMLRD024  YMLGD024	Accessories for Plug-in Sockets, Series XT		
ED module, red, 6-24V DC, A1-, EM08  ED module, red, 110-230V AC, EM06  ED module, green, 6-24V AC/DC, EM11  ED module, green 6-24V DC with protection diode, A1+, EM12  ED module, green, 110-230V AC, EM10  Protection diode module 6-230V DC, A1+, EM09  RC Network module 30V AC, EM02  Acristor module, 24V-AC, EM04  YMLGA024  YMLGA024  YMLGD024	LED module, red, 6-24V AC/DC, EM07	000 0-0	YMLRA024
ED module, red, 110-230V AC, EM06  ED module, green, 6-24V AC/DC, EM11  ED module, green 6-24V DC with protection diode, A1+, EM12  ED module, green, 110-230V AC, EM10  Protection diode module 6-230V DC, A1+, EM09  RC Network module 6-60V AC, EM02  RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04	LED module, red, 6-24V DC, A1+, EM18	000 0-0	YMLRD024-A
LED module, green, 6-24V AC/DC, EM11  LED module, green 6-24V DC with protection diode, A1+, EM12  LED module, green, 110-230V AC, EM10  Protection diode module 6-230V DC, A1+, EM09  RC Network module 6-60V AC, EM02  RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04	LED module, red, 6-24V DC, A1-, EM08	000 0-0	YMLRD024
ED module, green 6-24V DC with protection diode, A1+, EM12  ED module, green, 110-230V AC, EM10  Protection diode module 6-230V DC, A1+, EM09  RC Network module 6-60V AC, EM02  RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04  YMLGD024  YMLGW230  YMFDG230  YMFDG230  YMRCW230  YMRCW230	LED module, red, 110-230V AC, EM06	388 0-8	YMLRW230
ED module, green, 110-230V AC, EM10  Protection diode module 6-230V DC, A1+, EM09  RC Network module 6-60V AC, EM02  RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04  YMLGW230  YMFDG230  YMRCW244  YMRCW230  YMRCW230	LED module, green, 6-24V AC/DC, EM11	000 0-0	YMLGA024
Protection diode module 6-230V DC, A1+, EM09  RC Network module 6-60V AC, EM02  RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04  YMFDG230  YMRCW230  YMRCW230  YMVAW024	LED module, green 6-24V DC with protection diode, A1+, EM12	000 0-0	YMLGD024
RC Network module 6-60V AC, EM02  RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04  YMRCW230  YMVAW024	LED module, green, 110-230V AC, EM10	000 0-0	YMLGW230
RC Network module 110-230V AC, EM03  Varistor module, 24V-AC, EM04  YMRCW230  YMVAW024	Protection diode module 6-230V DC, A1+, EM09	000 0-0	YMFDG230
Varistor module, 24V-AC, EM04  YMVAW024	RC Network module 6-60V AC, EM02	000 0-0	YMRCW024
	RC Network module 110-230V AC, EM03	000	YMRCW230
Varistor module 230V-AC, EM05 YMVAW230	Varistor module, 24V-AC, EM04	000 0-0	YMVAW024
	Varistor module 230V-AC, EM05	000	YMVAW230











#### Schrack-Info

#### **S-RELAY**

- Miniature industry-grade relay for multi-purpose application
- AC and DC coil
- Suitable for DIN rail mounted plug-in sockets, for use in control panel building or on PCBs (PCB and soldering connectors)
- Mechanical indicator and lockable test button
- Integrated insulated contact chambers for increased flash-over resistance
- Cadmium-free contact material
- Certificate: VDE

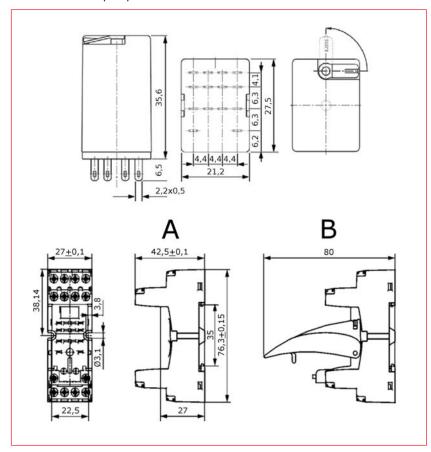
#### Socket YRS78704

- Socket for S-RELAY Series 4
- Suitable for mounting in electrical enclosures or for DIN rail mounting
- High-grade terminals preventing incorrect insertion
- Captive terminal screws

#### LED and protection modules

- Compatible with socket YRS78704
- LED DC modules with integrated protection diode
- Retrofittable

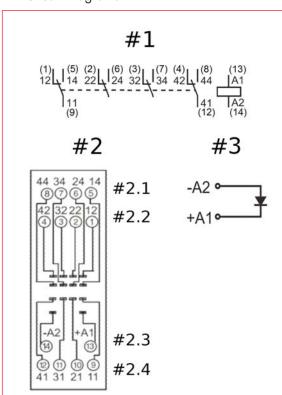
# Dimensions (mm)



#### Dimensions

Α	Standard socket	
В	Socket with retainer/ retractor clip	

## Circuit Diagrams

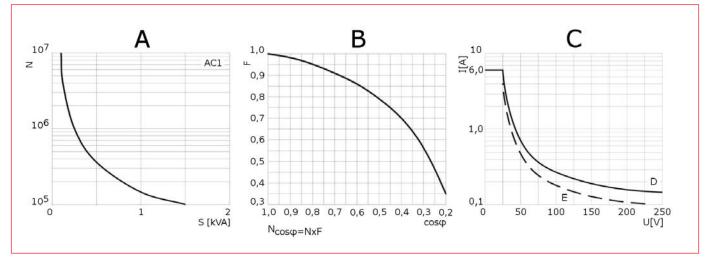


# Circuit Diagrams

#1	Circuit diagram	S-RELAY
#2	Terminals	
#2.1	NO contacts	
#2.2	NC contacts	Socket
#2.3	Coil	
#2.4	Com	
#3	Circuit diagram	Protection diode module



# Rated Breaking Capacity, Reduction Factor & Coil Operating Voltage Range



## Rated Breaking Capacity, Reduction Factor & Coil Operating Voltage Range

Α	Electrical service life at AC resistive load, switching frequency: 1.200 cycles/hour
В	Electrical service life reduction factor at AC inductive load
С	Max. DC rated breaking capacity
N	Number of cycles/ electrical service life at AC1
S	Rated breaking capacity in [kVA]
F	Reduction factor
cos φ	Power factor
D	Resistive load DC1
E	Inductive load L/R = 40 ms
I	DC current in [A]
U	DC current in [A]

#### Coil Types

#### COIL DATA - DC voltage version

Coil code	Rated voltage V DC	Coil resistance Ω at 20 °C	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 55 °C)
006	6	40	+10%	4,8	6,6
012	12	160	+10%	9,6	13,2
024 / LC4	24	640	+10%	19,2	26,4
048	48	2600	+10%	38,4	52,8
060	60	4000	+10%	48	66
110	110	13600	+10%	88	121
220 / N20	220	54000	+10%	165 / 176	242

#### COIL DATA - AC 50/60Hz voltage version

Coil code	Rated voltage V AC	Coil resistance Ω at 20 °C	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
506	6	9,8	+10%	4.8	6.6
512	12	39,5	+10%	9.6	13.2
524 / R24	24	158	+10%	19.2	26.4
548	48	640	+10%	38.4	52.8
615 / \$15	115	3610	+10%	92	127
730 / T30	230	16100	+10%	184	253

#### TECHNICAL DATA, Protection diode module

Terminent Britis, Froncesion aloue moude		
Voltage	6230 V DC	
Wiring	A1 +	
	A2 -	

# ■ Technical Data

CONTACT DATA			
Number and type of contacts			4 CO
Contact material			AgNi
Rated/ max. switching voltage AC			250 / 250 V~
Min. switching load			10 V (AgNi)
Rated load (capacity)		AC1	6 A/ 250 V~
. , ,,		AC15	1.5 A / 120 V~; 0.75 A / 240 V (C300)
		AC3	125 W (single-phase motor)
		DC1	6 A / 24V DC
		DC 13	0.22 A / 120 V DC; 0.1 A / 250 V DC (R300)
Ain. switching current			5 mA
Max. inrush current			12 A
ated current			6 A
Nax. rated breaking capacity		AC1	1500 VA
Ain. rated breaking capacity		7.61	0.3 W (AgNi)
Contact resistance			≤ 100 mΩ
	Ar	A.C.1	
Max. operating capacity	At rated load	AC1	1200 cycles/hour
COIL DATA	No load		18000 cycles/hour
COIL DATA		AC 50 / 40 H	4 0401/
Rated voltage 50 / 60Hz		AC 50 / 60 Hz	6240 V~
4 . 1		DC	5220 V
Nust release voltage		AC	≥ 0.2 U <sub>N</sub>
		DC	≥ 0.1 U <sub>N</sub>
Operating range of supply voltage			See table "Coil types"
Rated power consumption		AC	1.6 VA
		DC	0.9 W
nsulation			According to PN-EN 60664-1
nsulation class			B250
nsulation rated voltage			250 V~
Rated surge voltage			2500 V; 1.2 / 50 μs
Overvoltage category			II
nsulation pollution degree			2
Dielectric strength		Between coil and contacts	2500 V~ (basic insulation)
Ü		Contact clearance	1500 V~ (micro-disconnection clearance)
		Pole-pole	2000 V~ (basic insulation)
Contact - coil distance			
Clearance			≥ 1.6 mm
Creepage			≥ 3.2 mm
GENERAL DATA			
Operating/ release time (typical value)		AC	10 / 8 ms
3, 11111 17,		DC	13 / 3 ms
Electrical service life		Resistive AC1	> 10 <sup>5</sup> , 6 A / 250 V~
		cos Φ	See diagram
Mechanical service life (cycles)		σου φ	> 2 x 10 <sup>7</sup>
Dimensions (LxWxH)			27.5 x 21.2 x 35.6 mm
Weight			35g
<del>-</del>	C+		-40+85 °C
Ambient temperature	Storage	16	
	Operating	AC DC	-40+55 °C -40+70 °C
Samuel de mare affirmations of			
Cover degree of protection			IP40
nvironmental protection		(1.0.4)	RTI
Shock resistance		(NO/NC)	10 / 5 g
/ibration resistance			5g; 10150 Hz
Solder bath temperature			max. 270 °C
Soldering time			max. 5 sec.



DESCRIPTION	AVAILABLE	ORDER NO.
S-Relay 4 Poles, Series 4		
6V-DC, 4 CO, 6A		RS410006
12V-DC, 4 CO, 6A		RS410012
24V-DC, 4 CO, 6A	000 0-0	RS410024
24V-DC, 4 CO, 6A, with LED and protection diode	000 0-0	RS410LC4
48V-DC, 4 CO, 6A		RS410048
60V-DC, 4 CO, 6A		RS410060
110V-DC, 4 CO, 6A		RS410110
110V-DC, 4 CO, 6A, with LED and protection diode		RS410MB0
220V-DC, 4 CO, 6A		RS410220
20V-DC, 4 CO, 6A, with LED		RS410N20
6V-AC, 4 CO, 6A		RS410506
12V-AC, 4 CO, 6A		RS410512
24V-AC, 4 CO, 6A	000 000	RS410524
24V-AC, 4 CO, 6A, with LED	000 000	RS410R24
48V-AC, 4 CO, 6A		RS410548
115V-AC, 4 CO, 6A		RS410615
115V-AC, 4 CO, 6A, with LED		RS410S15
230V-AC, 4 CO, 6A	000 000	RS410730
230V-AC, 4 CO, 6A, with LED		RS410T30
Plug-in Socket for S-Relay 4 Poles, Series 4		
Socket with screw terminals 14 pole, mounting on DIN-rail for 4 pole relays 6A	000 000	YRS78704
Retaining clip	333 0-6	YRS16016
Fixing clip, metal		YRS16009
Marking tag	333 000	YRS16040
Modules Matching Plug-in Socket for S-Relays, Series 4		
Protection diode module 6-230V DC, A1+	388 0-0	YRSFL230
LED+PD module, red, 6-24V DC, A1+		YRSLR024
LED+PD module, green, 6-24V DC, A1+	333 0-0	YRSLG024
LED module, red, 110-230V AC	000	YRSLR230
LED module, green, 110-230V AC	555	YRSLG230







PT570LC4

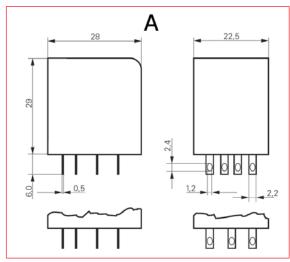
YPT78704

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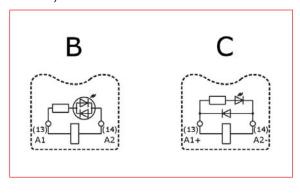
- 2 poles 12 A, 3 poles 10 A or 4 poles 6 A
- AC or DC coil
- 2, 3 or 4 CO
- Up to 3000 VA switching capacity
- Component height 29 mm

- Cadmium-free contact material
- Mechanical and electrical status indicator
- Touch protection test switch, choice of locking method
- White labelling field
- Multi-purpose use for control and machine building

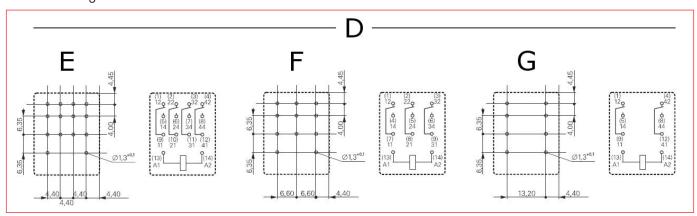
#### Dimensions (mm)



#### LED/Protection Diode & LED



#### Circuit Diagrams

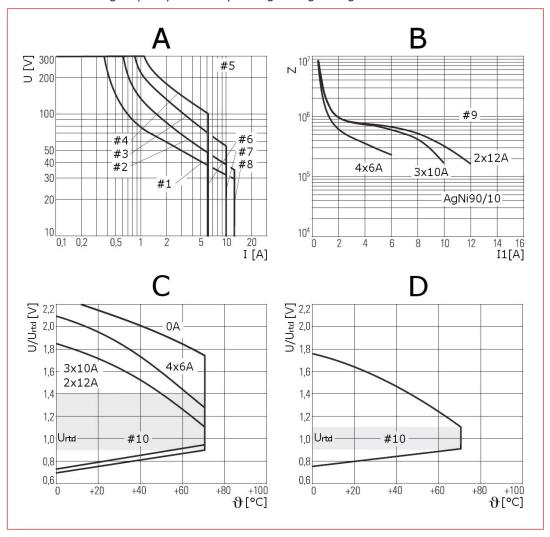


## Dimensions & Circuit Diagrams

Α	Soldering and plug-in terminals (standard version)		
В	LED		
С	Protection diode and LED		
D	Bottom view on pins		
E	4 pole		
F	3 pole		
G	2 pole		



# Rated Breaking Capacity & Coil Operating Voltage Range



# Rated Breaking Capacity & Coil Operating Voltage Range

Α	Max. DC rated breaking capacity	
В	Electrical endurance	
С	Coil operating range DC	
D	Coil operating range AC	
#1	1 contact	
#2	2 contacts in series	
#3	3 contacts	
#4	4 contacts	
#5	Resistive load	
#6	4 pole	

#/	3 pole	
#8	2 pole	
#9	250 V AC resistive load	
#10	Recommended voltage range in [V]	
U	DC voltage in [V]	
U/U <sup>rtd</sup>	Coil voltage in [V]	
1	DC current in [A]	
11	Switching current in [A]	
Z	Cycles	
Ů	Ambient temperature in [°C]	

CONTACT DATA		PT2	PT3	PT5
Number of contacts and type		2 CO	3 CO	4 CO
Contact style			Single contact	
Type of disconnection			Micro-switch	
Rated current		12 A	10 A	6 A
Rated voltage/ max. switching voltage AC		240 /	240 / 400 V~ 240 / 240	
Limiting continuous current		12 A	10 A	6 A
Limiting short time current 30 ms			300 A	
Max. rated breaking capacity AC		3000 VA	2500 VA	1500 VA
Limiting making current, max. 20 ms		24 A	20 A	12 A
Contact material		AgN	li 90/10, AgNi 90/10 hard gold plated	
Minimal contact load		12 V	/ 10 mA, 20 mV $/$ 1 mA hard gold plated	
COIL DATA				
Rated voltage	DC coil		6220 V	
	AC coil		6230 V~	
Rated power	DC coil	750 mW		
	AC coil		1.0 VA	
Operative range, IEC 61810		2		
Coil insulation system according to UL1446			Class F	
Operation-/ release voltage/ coil resistance	6 V DC coil	$4.5 \mathrm{V}/0.6 \mathrm{V}/48 \Omega \pm 10 \%$		
at ambient temperature 23 °C	12 V DC coil	$9 \text{ V} / 1.2 \text{ V} / 192 \Omega \pm 10 \%$		
	24 V DC coil	18 V $/$ 2.4 V $/$ 777 $\Omega$ ± 10 %		
	48 V DC coil	$36 \text{ V} / 4.8 \text{ V} / 3072 \Omega \pm 10 \%$		
	60 V DC coil		$45 \text{ V} / 6 \text{ V} / 4845 \Omega \pm 12 \%$	
	110 V DC coil		82.5 V / 11 V / 16133 Ω ± 15 %	
	220 V DC coil	165 V $/$ 22 V $/$ 64533 $\Omega$ ± 10 %		
	6 V AC coil*	4.8 V / 1.8 V / 11 Ω ± 10 %		
	12 V AC coil*	$9.6  \text{V} / 3.6  \text{V} / 48  \Omega \pm 10  \%$		
	24 V AC coil*		$19.2 \text{ V} / 7.2 \text{ V} / 192 \Omega \pm 10 \%$	
	48 V AC coil*		$38.4 \text{ V} / 14.4 \text{ V} / 777 \Omega \pm 10 \%$	
	115 V AC coil*		92 V $/$ 34.5 V $/$ 4845 $\Omega$ ± 12 %	
	230 V AC coil*		184 V / 69 V / 19465 Ω ± 15 %	
*50 Hz				
DESCRIPTION			AVAILABLE	ORDER NO
PT Relays 2 Poles				
24V-DC, 2 CO, 12A			000 0-0	PT270024
48V-DC, 2 CO, 12A			000	PT270048

DESCRIPTION	AVAILABLE	ORDER NO.
PT Relays 2 Poles		
24V-DC, 2 CO, 12A	555	PT270024
48V-DC, 2 CO, 12A	333	PT270048
24V-AC, 2 CO, 12A	338	PT270524
230V-AC, 2 CO, 12A	333	PT270730
Plug-in Socket for PT Relays 2 Poles		
DIN rail mounted plug-in socket for PT2 relays, 8 pole, 12A (2 CO)		YPT78702
Retaining clip metal	000	PT28800
PT Relays 3 Poles		
24V-DC, 3 CO, 10A	000	PT370024
110V-DC, 3 CO, 10A	999	PT370110
24V-AC, 3 CO, 10A	333	PT370524
230V-AC, 3 CO, 10A		PT370730
Plug-in Socket for PT Relays 3 Poles		
DIN rail mounted plug-in socket for PT3 relays, 11 pole, 10A (3 CO)	000	YPT78703
PT Relays 4 Poles		
6V-DC, 4 CO, 6A		PT570006
12V-DC, 4 CO, 6A	000	PT570012
24V-DC, 4 CO, 6A	990	PT570024
48V-DC, 4 CO, 6A	750	PT570048
110V-DC, 4 CO, 6A with LED and protection diode		PT <i>57</i> 0MB0
60V-DC, 4 CO, 6A	550	PT570060
110V-DC, 4 CO, 6A	990	PT570110
125V-DC, 4 CO, 6A	000	PT570125
220V-DC, 4 CO, 6A	998	PT570220
6V-AC, 4 CO, 6A	338 0-6	PT570506
12V-AC, 4 CO, 6A	998 0-6	PT570512

- Trog in Relays definder, defices the		
DESCRIPTION	AVAILABLE	ORDER NO.
PT Relays 4 Poles		
24V-AC, 4 CO, 6A	388 0-8	PT570524
48V-AC, 4 CO, 6A	388 6-8	PT570548
115V-AC, 4 CO, 6A	000 0-0	PT570615
230V-AC, 4 CO, 6A	000 0-0	PT570730
24V-DC, 4 CO, 6A with LED and protection diode	000 0=0	PT570LC4
24V-DC, 4 CO, 6A with LED	000 0-0	PT570L24
20V-DC, 4 CO, 6A with LED	000 0-0	PT570N20
24V-DC, 4 CO, 6A with LED	000 0-0	PT570R24
115V-AC, 4 CO, 6A with LED		PT <i>57</i> 0S15
230V-AC, 4 CO, 6A with LED	999 0- 0	PT570T30
24V-DC, 4 CO, 6A, gold plated	000 0-0	PT580024
110V-DC, 4 CO, 6A, gold plated		PT580110
220V-DC, 4 CO, 6A, gold plated	000 0-0	PT580220
24V-AC, 4 CO, 6A, gold plated	383 0- 6	PT580524
115V-AC, 4 CO, 6A, gold plated		PT580615
230V-AC, 4 CO, 6A, gold plated	555 0- 0	PT580730
24V-DC, 4 CO, 6A, gold plated with LED	000	PT580L24
230V-AC, 4 CO, 6A, gold plated with LED	000 0-0	PT580T30
Plug-in Socket for PT Relays 4 Poles		
DIN rail mounted plug-in socket for PT5 relays, 14 pole, 6A (4 CO), with spring clamp terminals	000 0-0	PT7874P
Retaining clip for PT socket PT7874P	000 0=0	PT17021
lumper link, 12A, for PT socket PT7874P	000 0-0	PT170P1
Marking tag	000 0-0	YPT16040
Plug-in Socket for PT Relays, I/O - Logical Arrangement 4 Poles		
DIN rail mounted plug-in socket for PT5 relays, 14-pole, 6A (4 CO) with screw terminals	900 0-0	PT78742
Retaining clip for PT socket PT7874P	388 0- 8	PT17021
lumper bar, 12A, for connection of up to 6 PT sockets YPT78	000 0-0	PT170R6
Marking tag	388 0- 8	YPT16040
Plug-in Socket for PT Relays 4 Poles, Conventional Model		
DIN rail mounted plug-in socket for PT2 relays, 8 pole, 12A (2 CO)	988 0- 8	YPT78702
DIN rail mounted plug-in socket for PT3 relays, 11 pole, 10A (3 CO)	000 0-0	YPT78703
DIN rail mounted plug-in socket for PT5 relays, 14 pole, 6A (4 CO)	388 0-8	YPT78704
DIN rail mounted plug-in socket for PT5 relays, 14 pole, 6A (4 CO) with protection diode	000 0-0	YPT78110
Retaining clip	000	YPT16016
Retaining clip for PT socket PT78xx	000 0-0	PT17024
Jumper bar, 12A, for connection of up to 6 PT sockets YPT78	000 0-0	PT170R6
Marking tag	000 0-0	YPT16040
Modules Matching Plug-in Socket for PT Relays		
LED module, red, 6-24V AC/DC, EM07	000	YMLRA024
LED module, red, 6-24V DC, A1+, EM18	388	YMLRD024-A
LED module, red, 6-24V DC, A1-, EM08	388	YMLRD024
LED module, red, 110-230V AC, EM06	388 0-1	YMLRW230
LED module, green, 6-24V AC/DC, EM 11	333 0-0	YMLGA024
LED module, green 6-24V DC with protection diode, A1+, EM12	300	YMLGD024
LED module, green, 110-230V AC, EM10		YMLGW230
Protection diode module 6-230V DC, A1+, EM09		YMFDG230
RC Network module 6-60V AC, EM02		YMRCW024
RC Network module 110-230V AC, EM03		YMRCW230
Varistor module, 24V-AC, EM04	555 6-1	
	588	YMVAW220
Varistor module 230V-AC, EM05	000	YMVAW230



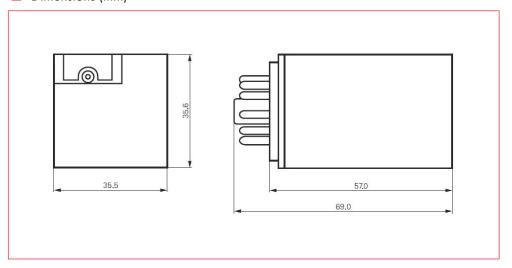




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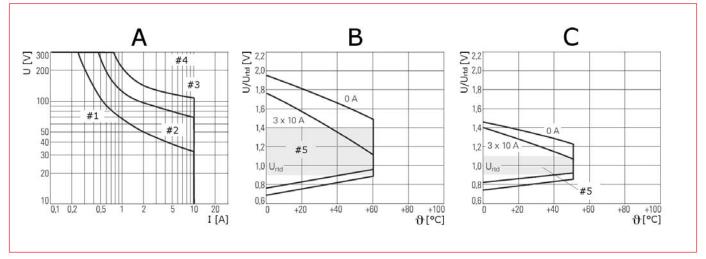
- 2/3 poles 10 A, AC or DC coil
- 2 or 3 CO
- Cadmium-free contact material
- Standard model with mechanical status indicator
- Optional electrical status indicator
- Test switch system: touch protection, lockable with lever integrated in the cap, front access test switch
- Multi-purpose use for industrial system and machine building

#### Dimensions (mm)





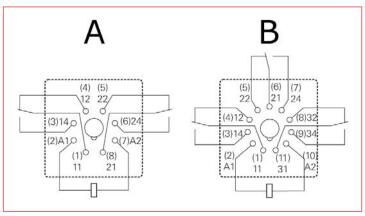
## Rated Breaking Capacity & Coil Operating Voltage Range



#### Rated Breaking Capacity & Coil Operating Voltage Range

Α	Max. DC rated breaking capacity
В	Coil operating range DC
С	Coil operating range AC
#1	1 contact
#2	2 contacts in series
#3	3 contacts in series
#4	Resistive load
#5	Recommended voltage range in [V]
U	DC voltage in [V]
U/U <sup>rtd</sup>	Coil voltage in [V]
I	DC current in [A]
Ů	Ambient temperature in [°C]

# Circuit Diagrams



#### Circuit diagrams

Α	2 CO
В	3 CO

10 A

Class 130 (B)

18 V / 2.4 V / 475 Ω ± 10 %

19.2 V / 7.2 V / 86  $\Omega$  ± 10 %

184 V / 69 V / 8300  $\Omega$  ± 10 %

## Technical Data

**CONTACT DATA** 

Number of contacts and type	er of contacts and type 2 CO or 3 CO contacts		
Contact style Single contact		Single contact	
Rated current		10 A	
Rated voltage/ max. switching voltage AC		240 / 400 V~	
Limiting continuous current		10 A	
Max. rated breaking capacity AC		2500 VA	
Limiting making current, max. 20 ms		20 A	
Contact material		AgNi 90/10, AgNi 90/10 hard gold plated	
Minimal contact load		12 V / 10 mA, 20 mV / 1 mA hard gold plated	
COIL DATA			
Rated voltage	DC coil	6220 V	
	AC coil	6230 V~	
Rated power	DC coil	1.2 W	
	AC coil	2.3 VA	
Operative range, IEC 61810		2	

24 V DC coil

24 V AC coil

230 V AC coil



Coil insulation system according to UL1446

Operation-/ release voltage/ coil resistance

at ambient temperature 23  $^{\circ}\text{C}$ 

DESCRIPTION	AVAILABLE	ORDER NO.
MT Relays 2 Poles		
12V-DC, 2 CO, 10A	555 0- 0	MT221012
24V-DC, 2 CO, 10A	388 0- 0	MT221024
12V-AC, 2 CO, 10A	000 0-0	MT226012
24V-AC, 2 CO, 10A	555 0- 0	MT226024
115V-AC, 2 CO, 10A	000 0-0	MT226115
230V-AC, 2 CO, 10A	388 0- 0	MT226230
230V-AC, 2 CO, 10A with LED		MT228230
Plug-in Socket for MT Relays 2 Poles		
DIN rail mounted plug-in socket for MT2 relays, 8 pole, 10A (2 CO) with screw terminals, not compatible with function modules	000 0-0	YMR78701
MT Relays 3 Poles		
12V-DC, 3 CO, 10A	000 0-0	MT321012
24V-DC, 3 CO, 10A	000 0-0	MT321024
48V-DC, 3 CO, 10A	000 0-0	MT321048
60V-DC, 3 CO, 10A	388 0- 6	MT321060
24V-DC, 3 CO, 10A with protection diode	000 0=0	MT3210C4
110V-DC, 3 CO, 10A	988 0- 0	MT321110
220V-DC, 3 CO, 10A	000 0=0	MT321220
24V-DC, 3 CO, 10A with LED	000 0-0	MT323024
48V-DC, 3 CO, 10A with LED	000 0-0	MT323048
60V-DC, 3 CO, 10A	000 0-0	MT323060
24V-DC, 3 CO, 10A with LED and protection diode	000 0-0	MT3230C4
110V-DC, 3 CO, 10A with LED	000 0-0	MT323110
220V-DC, 3 CO, 10A with LED	000 0=0	MT323220
12V-AC, 3 CO, 10A	000	MT326012
24V-AC, 3 CO, 10A	900 0-0	MT326024
48V-AC, 3 CO, 10A	000 0-0	MT326048
60V-AC, 3 CO, 10A	000 0-0	MT326060
115V-AC, 3 CO, 10A	000	MT326115
230V-AC, 3 CO, 10A		MT326230
24V-AC, 3 CO, 10A with LED	555 0-8	MT328024
115V-AC, 3 CO, 10A with LED	000 0-0	MT328115
230V-AC, 3 CO, 10A with LED	000 0-0	MT328230
24V-DC, 3 CO, 10A, gold plated	000 0=0	MT331024
110V-DC, 3 CO, 10A, gold plated		MT331110
220V-DC, 3 CO, 10A, gold plated		MT331220
24V-DC, 3 CO, 10A, gold plated		MT333024
24V-DC, 3 CO, 10A, gold plated		MT3330C4
230V-AC, 3 CO, 10A, gold plated		MT336230
Plug-in Socket for MT Relays 3 Poles	000 0-0	
DIN rail mounted plug-in socket for MT3 relays and timer relays series ZR4, 11 pole, 10A (3 CO), with screw terminals, not		
compatible with function modules	000 0-0	YMR78700
Modules and Plug-in Socket for MT Relays, 3 Poles	and the same	
DIN rail mounted plug-in socket for MT3 relays, 11 pole, 10A (3 CO), with screw terminals, compatible with function modules	555 0-6	MT78740
LED module red 24V AC/DC for socket MT78740	000 0-0	MTML0024
Protection diode module 1N4007 for socket MT78740	388 0- 8	МТМТООАО
RC-Network module 110-240V AC for socket MT78740	555 0-6	MTMU0730
Single function module Delay ON for socket MT78740	000 0-0	MTMZ0W00
Multifunction module for socket MT78740	000 0-0	MTMF0W00











Series RM

#### Schrack-Info

#### RM2/3/7

- 2/3 poles 10/16 A, AC or DC coil
- Switching capacity up to 6000 VA
- Mechanical status indicator
- Test switch
- Plug-in or print versions, strap mounting or DIN rail mounting
- For elevator controls, mains adaptors

#### RM5/6

- 2/3 poles 10/16 A, AC or DC coil
- 2 NO or 3 NO
- 3 mm contact gap
- Test switch
- Plug-in or print versions, strap mounting or DIN rail mounting
- For mains adaptors, power supply units, pump control systems

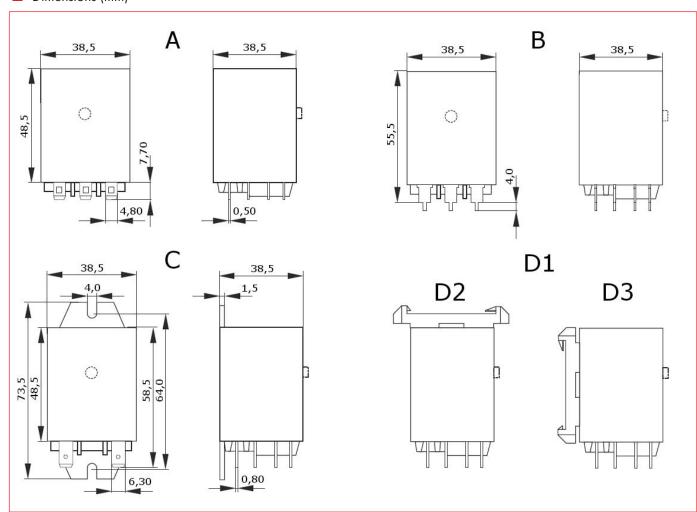
#### RM8

- 2 poles 25 A, AC or DC coil
- Mechanical status indicator
- Test switch
- Strap mounting or DIN rail mounting
- For cleaning machines, heating/cooling equipment

#### **RMD**

- 1 pole 30 A, AC or DC coil
- 1 NO or 1 NO & 1 NC
- Switching capacity up to 7500 VA
- Test switch
- Strap mounting
- For battery chargers, heating controls

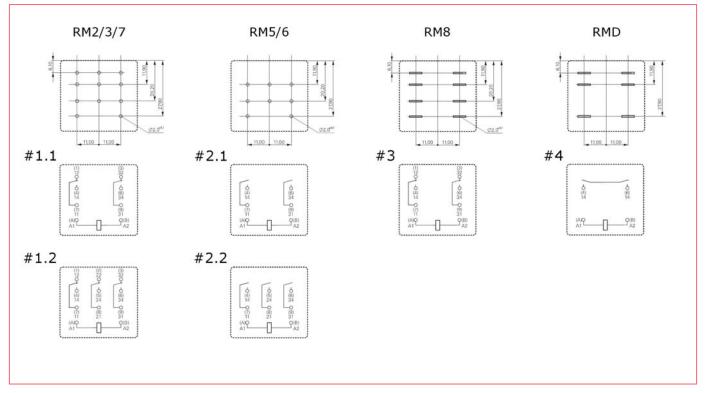
# Dimensions (mm)



#### Dimensions

Α	Cover without lug, plug-in connectors for plug-in socket
В	PCB version
С	Cap with mounting bracket, Faston 250 (187 possible)
DI	Cap with DIN snap mechanism (only Faston 250)
D2	Lying
D3	Standing

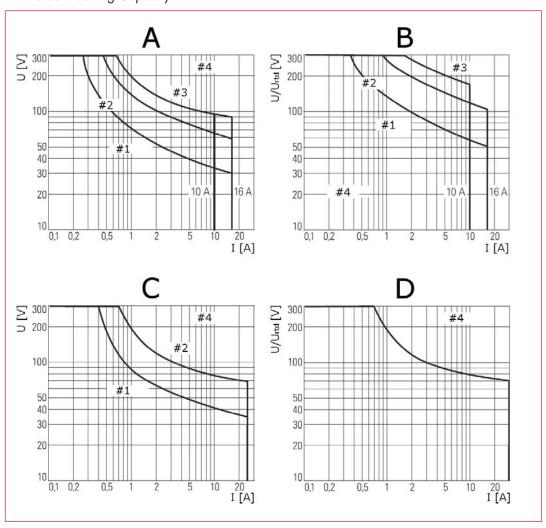
# Circuit Diagrams



# Circuit Diagrams

#1.1	2 CO
#1.2	3 CO
#2.1	2 NO
#2.2	3 NO
#3	2 CO
#4	1 NO RMD

# Rated Breaking Capacity



# Rated Breaking Capacity

Α	RM2/3/7 Max. DC rated breaking capacity
В	RM5/6 Max. DC rated breaking capacity
С	RM8 Max. DC rated breaking capacity
D	RMD Max. DC rated breaking capacity
#1	1 contact
#2	2 contacts in series
#3	3 contacts in series
#4	Resistive load
U	DC voltage in [V]
I	DC current in [A]

# ■ Technical Data RM2/3/7

CONTACT DATA		RM2	RM3	RM7
Number of contacts and type	2 CO 3 CO		3 CO	
Contact style			Single contact	
Rated current		16 A	10 A	16 A
Rated voltage/ max. switching voltage AC			400 / 440 V	
Max. rated breaking capacity AC		6000 VA	3800 VA	6000 VA
Limiting making current, max. 20 ms			40 A	·
Contact material		AgCdO, AgNi90/10		AgCdO
Minimal contact load		24 V DC/ 100 mA		A
COIL DATA				
Rated voltage	DC coil		6220 V	
	AC coil		6400 V	
Rated power	DC coil	1.2 \	V	1.6 W
	AC coil	2.3 \	'A	2.7 VA
Operative range, IEC 61810		2		
Coil insulation system according to UL1446		Class 130 (B)		
Operation-/ release voltage/ coil resistance	24 V DC coil	18 V / 2.4 V / 4	175 Ω ± 10 %	18 V / 2.4 V / 345 Ω ± 10 %
at ambient temperature 23 °C	230 V AC coil	184 V / 69 V / 8	300 Ω ± 12 %	184 V / 69 V / 7500 Ω ± 10 %

# ■ Technical Data RM5/6/8

CONTACT DATA		RM5	RM6	RM8
Number of contacts and type		2 NO	3 NO	2 CO
Contact style			Single contact	·
Contact gap		3 mm		-
Rated current		16 A	10 A	25 A
Rated voltage/ max. switching voltage AC		400 / 440 V	230 / 400 V	400 / 400 V
Max. rated breaking capacity AC		6000 VA	3800 VA	6000 VA
Limiting making current, max. 20 ms		30 A	25 A	60 A
Contact material		AgCdO AgCdO, A		AgCdO, AgNi90/10
Minimal contact load 24 V DC / 100 m.		24 V DC / 100 mA	·	
COIL DATA				
Rated voltage	DC coil		6220 V	
	AC coil		6400 V	
Rated power	DC coil	1.7 W 1.2		1.2 W
	AC coil	2.7	7 VA	2.7 VA
Operative range, IEC 61810		2		•
Coil insulation system according to UL1446		Class 130 (B)		
Operation-/ release voltage/ coil resistance	24 V DC coil	18 V / 2.4 V /	′ 345 Ω ± 10 %	18 V / 2.4 V / 475 Ω ± 10 %
at ambient temperature 23 °C	230 V AC coil	184 V / 69 V / 7500 Ω ± 10 %		

#### ■ Technical Data RMD

CONTACT DATA		RMD
Number of contacts and type		1 NO
Contact style		Single bridging contact
Rated current		30 A
Rated voltage/ max. switching voltage AC		400 / 440 V
Max. rated breaking capacity AC		7500 VA
Limiting making current, max. 20 ms		60 A
Contact material		AgCdO, AgNi90/10
Minimal contact load		24 V DC / 100 mA
COIL DATA		
Rated voltage	DC coil	6220 V
	AC coil	6400 V
Rated power	DC coil	1.2 W
	AC coil	2.7 VA
Operative range, IEC 61810		2
Coil insulation system according to UL1446		Class 130 (B)
Operation-/ release voltage/ coil resistance	24 V DC coil	18 V / 2.4 V / 475 Ω ± 10 %
at ambient temperature 23 °C	230 V AC coil	184 V / 69 V / 7500 Ω ± 10 %



DESCRIPTION	AVAILABLE	ORDER NO.
RM Relays 2 Poles		
24V-DC, 2 CO, 25A	000 0=0	RM835024
24V-DC, 2 CO, 25A	000 0-0	RM838024
24V-DC, 2 CO, 25A	000 0-0	RM839024
24V-DC, 1 NO, 30A	000 0-0	RMD05024
230V-AC, 2 CO, 25A	000 0-0	RM805730
230V-AC, 2 CO, 25A	000 0-0	RM8357305E
230V-AC, 2 CO, 25A	000 0-0	RM809730
230V-AC, 2 CO, 25A	000 0-0	RM839730
RM Relays 3 Poles		
24V-DC, 3 CO, 10A	555 0-6	RM332024-D
230V-AC, 3 CO, 10A	000 0-0	RM3327305E
24V-DC, 3 NO, 10A	000 0-0	RM632024-A
24V-DC, 3 CO, 16A	000 0-0	RM702024-C
12V-DC, 3 CO, 16A	000 0-0	RM732012-C
24V-DC, 3 CO, 16A	000 0-0	RM732024-C
60V-DC, 3 CO, 16A	555 0- 6	RM732060
24V-AC, 3 CO, 16A	000 0-0	RM732524-C
230V-AC, 3 CO, 16A	000 0-0	RM732730
400V-AC, 3 CO, 16A	000 0-0	RM732900
230V-AC, 3 CO, 16A	000 0-0	RM7357305E
24V-DC, 3 CO, 16A	000 0-0	RM738024-C
230V-AC, 3 CO, 16A	000	RM738730-C
230V-AC, 3 CO, 16A	000	RM7397305E
Plug-in Socket for RM Relays, up to 16 A, for RMxx2xxx		
DIN rail mounted plug-in socket, 11 pole, up to 16A, for Faston 187	999 0- 6	RM78705

# Relay Sockets and Sets Schrack, Series SNR

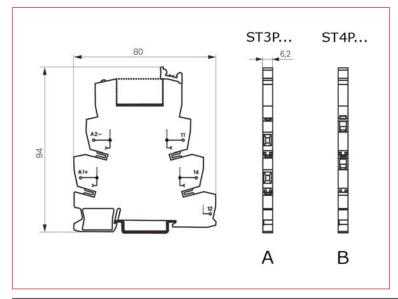


ST3FLC4

#### Schrack-Info

- Relay package consisting of a relay and a DIN rail socket
- 1 CO 6 A rated current
- Safe disconnection compliant with VDE 0160 in combination with socket YRT78626
- Module width only 6.2 mm
- Narrow component width allows high component density and tight-packed functionality on the DIN
- Complies with the 2011/65/EU RoHS Directive
- Protection diode

#### Dimensions (mm)



# Dimensioned drawing

Α	Screw terminals	
В	Spring clamp terminals	

DESCRIPTION	AVAILABLE	ORDER NO.
12V-DC, 1 CO, 6A with socket	000	ST3P3LB2
24V-DC, 1 CO, 6A with socket	355 0-6	ST3P3LC4
24V-DC, 1 CO, 6A with socket	355 0-6	ST3P2LC4
230V-AC/DC, 1 CO, 6A with socket	000 0-6	<b>ST3P3TP0</b>
24V-DC, 1 CO, 6A with socket	388 0-6	ST4P3LC4
24V-DC, 1 CO, 6A with socket, htv		ST4P2LC4
230V-AC/DC, 1 CO, 6A with socket	355 0-6	ST4P3TP0
DIN rail mounted plug-in socket for SNR relays, 24V-DC, 6A, incl. protection diode, with screw terminals		ST3FLC4
SNR jumper bar, red, 500mm	388 0- 6	ST37001
SNR jumper bar, blue, 500mm		ST37002
SNR jumper bar, grey, 500mm	303 0-6	ST37003
Marking plate, 1 plate= 100pcs.	333 0-6	ST37040
Separator plate	355 0-6	ST36040
Connection bridge 20 pole for YSN90020	333 0-0	YSN90020









Schrack-Info

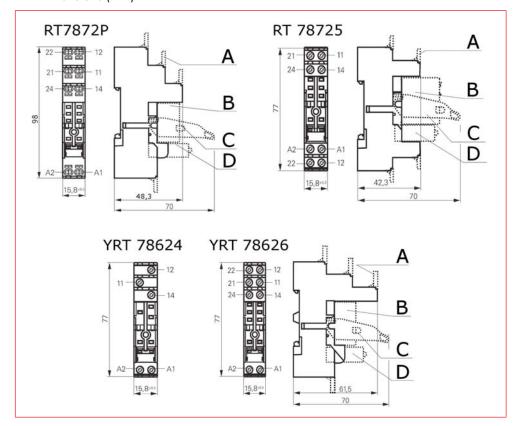
#### RT7872P

- Screwless terminals
- Solid wire for toolless mounting
- Twin terminals for each connection
- Cross-connector bridges to establish a connection
- Open coil circuit for active modules
- Inputs and outputs separated

#### RT78725, YRT78624, YRT78626

- Easy changing of the relay even if tightly packed
- High-grade terminals preventing incorrect insertion
- Captive terminal screws

#### Dimensions (mm)



#### Dimensions

Α	Label
В	Relay
С	Bracket
D	Module

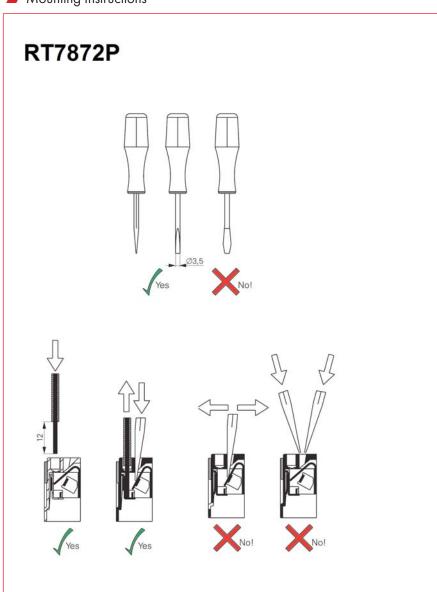


## Technical Data

		RT 7872P	YRT 78624	YRT 78626	RT 78725
Rated current		2 x 8 A, 16 A*)	12 A	2 x 8 A, 16 A*)	2 x 8 A, 16 A*)
Rated voltage AC		240 / 400V~	250 V~		
Terminals		Cage-clamp terminals	Screw terminals		
Terminal torque according to IEC 61984		-	0.5 Nm		
	Max.	-		0.7 Nm	
Terminal capacity	Copper wire	1 x 0.75 / 1 / 1.5 mm <sup>2</sup> , 2 x 0.75 / 1 mm <sup>2</sup>		$2 \times 2.5 \text{ mm}^2$	
	Stranded wire	1 x 0.75 / 1 / 1.5 mm <sup>2</sup> , 2 x 0.75 / 1 mm <sup>2</sup>		$2 \times 2.5 \text{ mm}^2$	
	With ferrule (DIN 46228/1)	1 x 0.75 / 1 mm <sup>2</sup> , 2 x 0.75 mm <sup>2</sup>		$2 \times 1.5 \text{ mm}^2$	
	With ferrule, without insulation or insulation at least 18mm long	1 x 1.5 mm <sup>2</sup>		-	
	Without ferrule, with standard insulation	2 x 1.5 mm <sup>2</sup>		-	

For stranded conductors with single wires of 0.05 mm or less, the used of ferrules is recommended. When using stranded conductors without ferrules, the terminal must be opened to insert the conductor.

## Mounting Instructions





<sup>\*</sup>For 1 pole relays (16 A) the relay terminals 11-21, 12-22 and 14-24 have to be bridged!

DESCRIPTION	AVAILABLE	ORDER NO.
Jumper link for connection of RT7872P	000 0-0	RT170P1
DIN rail mounted plug-in socket for RT2x, RT3x, RT4x, XT, RP4x relays, pinning 5mm, max. 16A, with spring clamp terminals	000 0=0	RT7872P
DIN rail mounted plug-in socket for RT1x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals	388 0- 6	YRT78624
DIN rail mounted plug-in socket for XT, RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals	000 0-0	YRT78626
DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 16A, conventional arrangement, with screw terminals	000	RT78725
Jumper bar for connection of up to 8 RT-sockets	000 0-0	RT170R8
Retaining clip for RT relays with ejection function	388 0- 6	RT17017
Marking tag (for YRT sockets YRT78624 and YRT78626)	000 0-0	YRT16040
LED module, red, 6-24V AC/DC, EM07	388 0-8	YMLRA024
LED module, red, 6-24V DC, A1+, EM18	000	YMLRD024-A
LED module, red, 6-24V DC, A1-, EM08	000	YMLRD024
LED module, red, 110-230V AC, EM06	000 0-0	YMLRW230
LED module, green, 6-24V AC/DC, EM11	000	YMLGA024
LED module, green 6-24V DC with protection diode, A1+, EM12	388 0-8	YMLGD024
LED module, green, 110-230V AC, EM10	888 0-8	YMLGW230
Protection diode module 6-230V DC, A1+, EM09	000 0-0	YMFDG230
RC Network module 6-60V AC, EM02	500 0-0	YMRCW024
RC Network module 110-230V AC, EM03	000 0=0	YMRCW230
Varistor module, 24V-AC, EM04	888 0-8	YMVAW024
Varistor module 230V-AC, EM05	000 0=0	YMVAW230









Schrack-Info

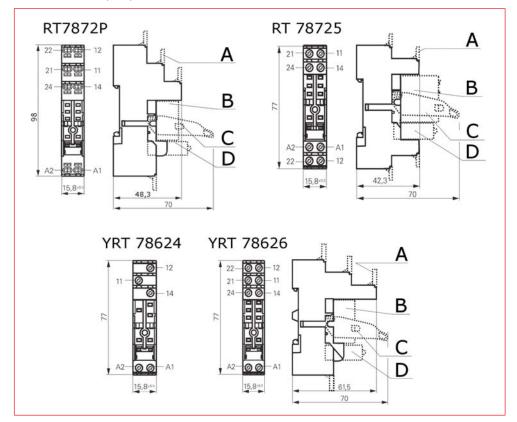
#### RT7872P

- Screwless terminals
- Solid wire for toolless mounting
- Twin terminals for each connection
- Cross-connector bridges to establish a connection
- Open coil circuit for active modules
- Inputs and outputs separated

#### RT78725, YRT78624, YRT78626

- Easy changing of the relay even if tightly packed
- High-grade terminals preventing incorrect insertion
- Captive terminal screws

#### Dimensions (mm)



#### Dimensions

A	Label	
В	Relay	
С	Bracket	
D	Module	

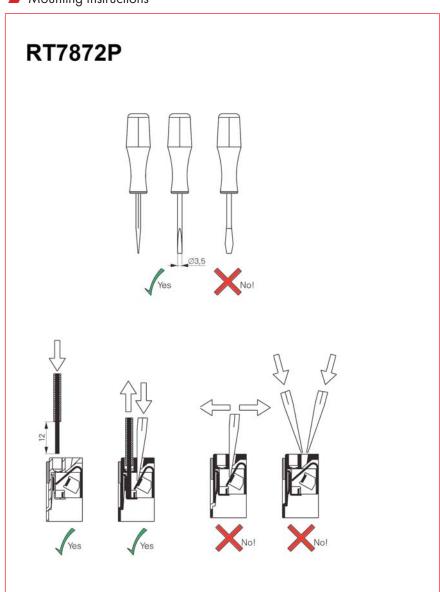


## Technical Data

		RT 7872P	YRT 78624	YRT 78626	RT 78725
Rated current		2 x 8 A, 16 A*)	12 A	2 x 8 A, 16 A*)	2 x 8 A, 16 A*)
Rated voltage AC		240 / 400 V~	250 V~		
Terminals		Cage-clamp terminals	Screw terminals		
Terminal torque according to IEC 6	1984	-	0.5 Nm		
	Max.	-		0.7 Nm	
Terminal capacity	Copper wire	1 x 0.75 / 1 / 1.5 mm <sup>2</sup> , 2 x 0.75 / 1 mm <sup>2</sup>		$2 \times 2.5 \text{ mm}^2$	
	Stranded wire	1 x 0.75 / 1 / 1.5 mm <sup>2</sup> , 2 x 0.75 / 1 mm <sup>2</sup>		$2 \times 2.5 \text{ mm}^2$	
	With ferrule (DIN 46228/1)	1 x 0.75 / 1 mm <sup>2</sup> , 2 x 0.75 mm <sup>2</sup>		$2 \times 1.5 \text{ mm}^2$	
	With ferrule, without insulation or insulation at least 18mm long	1 x 1.5 mm <sup>2</sup>		-	
	Without ferrule, with standard insulation	2 x 1.5 mm <sup>2</sup>		-	

For stranded conductors with single wires of 0.05 mm or less, the used of ferrules is recommended. When using stranded conductors without ferrules, the terminal must be opened to insert the conductor.

## Mounting Instructions





<sup>\*</sup>For 1 pole relays (16 A) the relay terminals 11-21, 12-22 and 14-24 have to be bridged!

DESCRIPTION	AVAILABLE	ORDER NO.
DIN rail mounted plug-in socket for RT2x, RT3x, RT4x, XT, RP4x relays, pinning 5mm, max. 16A, with spring clamp terminals	355 0-6	RT7872P
Jumper link for connection of RT7872P	388 0-6	RT170P1
DIN rail mounted plug-in socket for RT1x relays, pinning 3.5mm, max. 12A, I/O - logical arrangement, with screw terminals	333 0- 6	YRT78624
DIN rail mounted plug-in socket for XT, RT2x, RT3x, RT4x relays, pinning 5mm, max. 12A, I/O - logical arrangement, with screw terminals	000	YRT78626
DIN rail mounted plug-in socket for RT2x, RT3x, RT4x relays, pinning 5mm, max. 16A, conventional arrangement, with screw terminals	000	RT78725
Jumper bar for connection of up to 8 RT-sockets	000 0-0	RT170R8
Retaining clip for XT and RP relays with ejection function	388 0- 6	XT17017
Marking tag (for YRT sockets YRT78624 and YRT78626)	555 0= 6	YRT16040
LED module, red, 6-24V AC/DC, EM07	688 6- 6	YMLRA024
LED module, red, 6-24V DC, A1+, EM18	000 0=0	YMLRD024-A
LED module, red, 6-24V DC, A1-, EM08	688 64 6	YMLRD024
LED module, red, 110-230V AC, EM06	000 0=0	YMLRW230
LED module, green, 6-24V AC/DC, EM 11	000 0-0	YMLGA024
LED module, green 6-24V DC with protection diode, A1+, EM12	000 0=0	YMLGD024
LED module, green, 110-230V AC, EM10	688 6-6	YMLGW230
Protection diode module 6-230V DC, A1+, EM09	000 0-0	YMFDG230
RC Network module 6-60V AC, EM02	388 0-6	YMRCW024
RC Network module 110-230V AC, EM03	300 0= 0	YMRCW230
Varistor module, 24V-AC, EM04	000 0=0	YMVAW024
Varistor module 230V-AC, EM05	000 0-0	YMVAW230
·		

# Relay Sockets for S-Relay, Series RS4



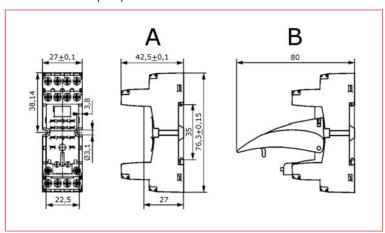




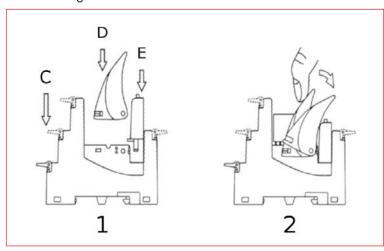
## Schrack-Info

- Socket for S-RELAY Series 4
- Suitable for mounting in electrical enclosures or for DIN rail mounting
- High-grade terminals preventing incorrect insertion
- Captive terminal screws

## Dimensions (mm)



## Mounting of Accessories



## Dimensions & Mounting of Accessories

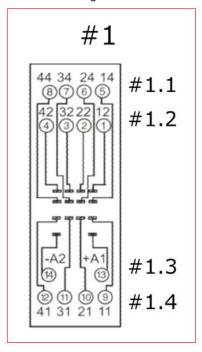
Α	Standard socket	
В	Socket with retainer/ retractor clip	
1	Installation of retainer/ retractor clip, module and description plate	
2	Retainer/ retractor clip usage	
С	Description plate	
D	Retainer/ retractor clip	
E	Module	



## Relay Sockets for S-Relay, Series RS4

## Circuit Diagram

## Circuit Diagram



#1	Terminals	
#1.1	NO contacts	
#1.2	NC contacts	
#1.3	Coil	
#1.4	COM	

## ■ Technical Data

TECHNICAL DATA			
Туре		14-pole for 4-pole plug-in relays	
Rated current		6 A	
Rated voltage/ max. switching voltage AC		300 V	
Dielectric strength	Coil/ contact set Contacts	3000 V (50/60 Hz 1 min.)	
Connections		Screw terminals	
Terminal torque according to IEC 61984		0.7 Nm	
Force for single connector		> 0.8 N	
Connection material		Copper or stranded wire	
Terminal capacity	Max. cable connectivity Rated connectivity	$2 \times 2.5 \text{ mm}^2$ $2 \times 1.5 \text{ mm}^2$	
Ambient temperature	Storage Operating	-40+85 °C -40+70 °C	
Degree of protection		IP20	
Mounting/rail		DIN-rail mounting	

DESCRIPTION	AVAILABLE	ORDER NO.
Socket with screw terminals 14 pole, mounting on DIN-rail for 4 pole relays 6A	355 0- 6	YRS78704
Retaining clip	000 0-0	YRS16016
Fixing clip, metal		YRS16009
Marking tag	000 0-0	YRS16040







YPT78702

YPT78704





EM 06 YMLRW230

Schrack-Info

#### PT7874P

YPT78110

- PT socket, 4 poles, 6 A
- Screwless terminals
- Solid wire for toolless mounting
- Twin terminals for each connection
- Cross-connector bridges to establish a connection
- Open coil circuit for active modules
- Inputs and outputs separated

#### PT78742

- Socket with separated control and load connectors
- High-grade terminals preventing incorrect insertion
- Captive terminal screws
- Double A2 for easy through-wiring

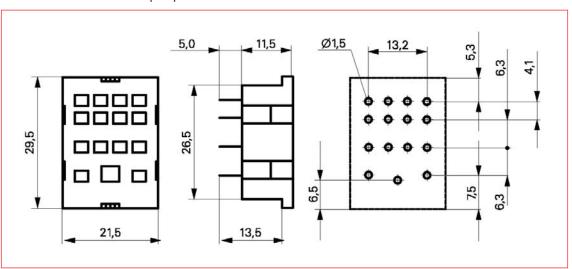
#### YPT78702, YPT78703, YPT78704, YPT78110

- High-grade terminals preventing incorrect insertion
- Captive terminal screws

#### PT78604

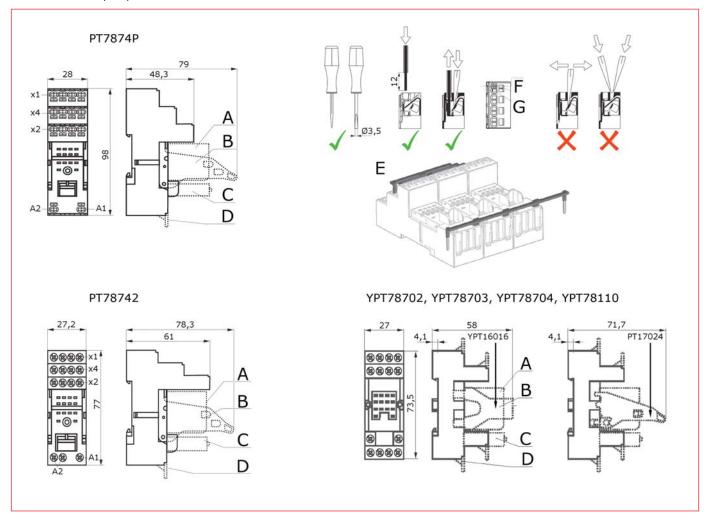
• Print socket, 4 poles, 6 A

#### Dimensions PT78604 (mm)





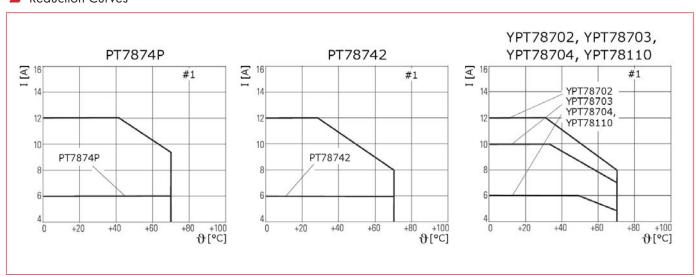
## Dimensions (mm)



### Dimensions

Α	Relay	
В	Bracket	
С	Module	
D	Label	
E	Jumper bar	
F	Opening access	
G	Conductor opening	

## Reduction Curves



#### Reduction Curves

#1	Tight package	
I	Load current in [A]	
Ů	Ambient temperature in [°C]	

## ■ Technical Data

#### PT 7874P

		4 POLE
Rated current		6 A
Rated voltage/ max. switching	voltage	240 V~
Limiting continuous current		See reduction curve
Dielectric strength	Coil-contact set	2500 V <sub>rms</sub>
	Open contact	1200 V <sub>rms</sub>
	Adjacent contacts	2000 V <sub>rms</sub>
Clearance/ creepage	Coil-contact circuit	≥ 4 / 4 mm
	Adjacent contact circuits	≥ 1.8 / 3.5 mm
Insulation to IEC 60664-1		
Type of insulation	Coil-contact set	Basic
	Open contact	Functional
	Adjacent contact	Basic
Rated insulation voltage		250 V
Pollution degree		2*
Overvoltage category		III
Ambient temperature	For mounting/handling	-25+70 °C
	In operation	-40+70 °C
Terminals		Screw less terminal
Wire stripping length		12 mm
Terminal capacity	Solid wire	1 x 0.75 / 1 / 1.5 mm <sup>2</sup> , 2 x 0.75 / 1 mm <sup>2</sup>
	With standard insulation (no reinforced insulation)	2 x 1.5 mm <sup>2</sup>
	Stranded wire without ferrule	1 x 0.75 / 1 / 1.5 mm <sup>2</sup> , 2 x 0.75 / 1 mm <sup>2</sup>
	Without ferrule, with standard insulation	2 x 1.5 mm <sup>2</sup>
	With ferrule	$1 \times 0.75 / 1 \text{ mm}^2$ , $2 \times 0.75 \text{ mm}^2$
	With ferrule, without insulation or insulation at least 18 mm long	1 x 1.5 mm <sup>2</sup>

<sup>\*</sup>With inserted relay pollution degree 1 in region of contact pins/ socket inlets.

### PT 78742

		4 POLE
Rated current		6 A
Rated voltage/ max. switching	voltage	240 V~
Limiting continuous current		See reduction curve
Dielectric strength	Coil-contact set	2500 V <sub>rms</sub>
	Open contact	1200 V <sub>rms</sub>
	Adjacent contacts	2000 V <sub>rms</sub>
Clearance/ creepage	Coil-contact circuit	≥ 4 / 4 mm
	Adjacent contact circuits	≥ 1.8 / 3.5 mm
Insulation to IEC 60664-1		
Type of insulation	Coil-contact set	Basic
	Open contact	Functional
	Adjacent contact	Basic
Rated insulation voltage		250 V
Pollution degree		2*
Overvoltage category		III
Ambient temperature		-40+70 °C
Terminals		Screw terminal
Terminal torque according to IE 61984	С	0.5 Nm
	Max.	0.7 Nm
Terminal capacity	Copper wire	2 x 2.5 mm <sup>2</sup>
	Stranded wire	$2 \times 2.5 \text{ mm}^2$
	With ferrule (DIN 46228/1)	$2 \times 1.5 \text{ mm}^2$

<sup>\*</sup>With inserted relay pollution degree 1 in region of contact pins/ socket inlets.



## ■ Technical Data

# YPT 78702, YPT 78703, YPT 78704, YPT 78110

		2 POLE	3 POLE	4 POLE		
Rated current		12 A	10 A	6 A		
Rated voltage/ max. switching AC	voltage		250 V~			
Limiting continuous current			See reduction curve			
Dielectric strength	Coil-contact set		2500 V <sub>rms</sub>			
	Open contact		1200 V <sub>rms</sub>			
	Adjacent contacts		2500 V <sub>rms</sub>			
Clearance/ creepage	Coil-contact circuit		≥ 4 / 4 mm			
	Adjacent contact circuits	≥ 3.5 / 9.5 mm	≥ 2.6 / 3.5 mm	≥ 1.8 / 3.5 mm		
Insulation to IEC 60664-1						
Type of insulation	Coil-contact set		Basic			
	Open contact	Functional				
	Adjacent contact	Ва	isic	Functional		
Rated insulation voltage			250 V			
Pollution degree			2			
Overvoltage category			III			
Ambient temperature			-40+70 °C			
Terminals			Screw terminals			
Terminal torque according to IEG	C 61984		0.5 Nm			
	Max.		0.7 Nm			
Terminal capacity	Copper wire		2 x 2.5 mm <sup>2</sup>			
	Stranded wire		$2 \times 2.5 \text{ mm}^2$			
	With ferrule (DIN 46228/1)		$2 \times 1.5 \text{ mm}^2$			

## PT 78604

		4 POLE
Rated current		6 A
Rated voltage/ max. switching v AC	voltage	250 V~
Limiting continuous current		See reduction curve
Dielectric strength	Coil-contact set	2500 V <sub>rms</sub>
	Open contact	1200 V <sub>rms</sub>
	Adjacent contacts	2000 V <sub>rms</sub>
Clearance/creepage	Coil-contact circuit	≥ 4 / 4 mm
	Adjacent contact circuits	≥ 1.8 / 3.5 mm
Insulation to IEC 60664-1		
Type of insulation	Coil-contact set	Basic
	Open contact	Functional
	Adjacent contact	Functional
Rated insulation voltage		250 V
Pollution degree		2
Overvoltage category		III
Ambient temperature		-40+80 °C
Terminals		Screw terminals
Terminal torque according to IEC	61984	0.5 Nm
	Max.	0.7 Nm
Terminal capacity	Copper wire	2 x 2.5 mm <sup>2</sup>
	Stranded wire	2 x 2.5 mm <sup>2</sup>
	With ferrule (DIN 46228/1)	2 x 1.5 mm <sup>2</sup>



DESCRIPTION	AVAILABLE	ORDER NO.
DIN rail mounted plug-in socket for PT5 relays, 14 pole, 6A (4 CO), with spring clamp terminals	000	PT7874P
Jumper link, 12A, for PT socket PT7874P	000	PT170P1
DIN rail mounted plug-in socket for PT5 relays, 14-pole, 6A (4 CO) with screw terminals	000	PT78742
Retaining clip for PT socket PT7874P	080	PT17021
Marking tag	000	YPT16040
DIN rail mounted plug-in socket for PT2 relays, 8 pole, 12A (2 CO)	000	YPT78702
DIN rail mounted plug-in socket for PT3 relays, 11 pole, 10A (3 CO)	000	YPT78703
DIN rail mounted plug-in socket for PT5 relays, 14 pole, 6A (4 CO)	000	YPT78704
DIN rail mounted plug-in socket for PT5 relays, 14 pole, 6A (4 CO) with protection diode	383	YPT78110
Retaining clip	000	YPT16016
Retaining clip for PT socket PT78xx	000	PT17024
Jumper bar, 12A, for connection of up to 6 PT sockets YPT78	000 0-0	PT170R6
PCB socket for PT5 relays, 4 pole, 6A	000	PT78604
Retaining clip metal	000	PT28800
Retaining clip metal for PCB socket	000	PT28802
Marking tag for socket PT787	000	PT17040
LED module, red, 6-24V AC/DC, EM07	000	YMLRA024
LED module, red, 6-24V DC, A1+, EM18	000	YMLRD024-A
LED module, red, 6-24V DC, A1-, EM08	000	YMLRD024
LED module, red, 110-230V AC, EM06	000	YMLRW230
LED module, green, 6-24V AC/DC, EM11	300	YMLGA024
LED module, green 6-24V DC with protection diode, A1+, EM12	000 0-0	YMLGD024
LED module, green, 110-230V AC, EM10	333	YMLGW230
Protection diode module 6-230V DC, A1+, EM09	000	YMFDG230
RC Network module 6-60V AC, EM02	333	YMRCW024
RC Network module 110-230V AC, EM03	500	YMRCW230
Varistor module, 24V-AC, EM04	333	YMVAW024
Varistor module 230V-AC, EM05	555	YMVAW230





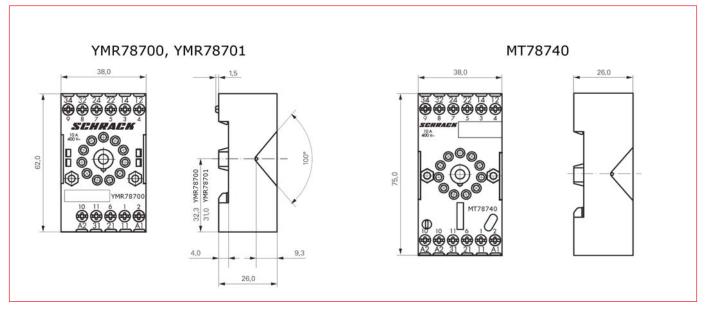




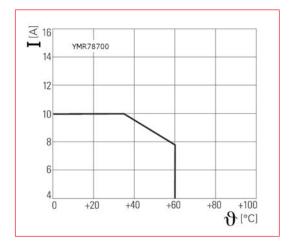
## Schrack-Info

- DIN rail snap mounting
- Screw mounting with centering screw
- Pozidrive screws with lift terminals
- Logical arrangement of I/O terminals
- White labelling field

## Dimensions (mm)



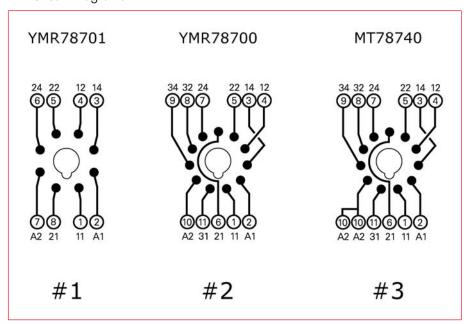
## Reduction Curve



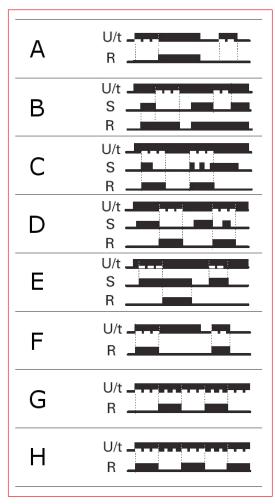
#### Reduction Curve

1	DC current in [A]
Ů	Ambient temperature in [°C]

## Circuit Diagrams



## ■ Time Module Functionalities



## ■ Circuit Diagrams & Time Module Functionalities

#1	2 CO
#2	3 CO
#3	3-pole
Δ	Response delayed
	MTMZ0W00, MTMF0W00
В	Reset delayed
В	MTMF0W00
С	Single shot leading edge with pulse control
C	MTMF0W00
	Single shot trailing edge
D	MTMF0W00
E	Response delayed with control contact
-	MTMF0W00
	Single shot leading edge
F	MTMF0W00
	Flashing pause starting
G	MTMF0W00
	Flashing pulse starting
Н	MTMF0W00

## Technical Data

## YMR78700, YMR78701, MT78740

Rated current		10 A
Rated voltage/ max. switching voltage		240 / 400 V
Dielectric strength	Coil-contact set	2500 V <sub>rms</sub>
	Open contact	1500 V <sub>rms</sub>
	Adjacent contacts	2500 V <sub>rms</sub>
Clearance/ creepage	Coil contact circuit	≥ 2.8 / 4 mm
Insulation to IEC 60664-1		
Type of insulation	Coil-contact set	Basic
	Open contact	Functional
	Adjacent contact	Basic
Rated insulation voltage		250 V
Pollution degree		2
Overvoltage category		III
Ambient temperature		-20+80 °C
Degree of protection		IP20
Mounting distance		>0 dense packing
Mounting/ rail		DIN50024/22
Terminal capacity		2 x 2.5 mm <sup>2</sup>
Terminal torque in according to IEC 61984	·	0.5 Nm
	Max.	0.7 Nm

#### **Function Modules For Socket MT78740**

Rated voltage	24240 V DC / AC
Mains frequency	4863 Hz
Repeat accuracy	± 0.5 %
Repeatability	≤ 0.5 % or 5 ms
Temperature influence	≤ 0.1 % pro °C
Time ranges switchable	0.05 s240 h in 8 ranges
Ambient temperature	-25+55 °C

DESCRIPTION	AVAILABLE	ORDER NO.
DIN rail mounted plug-in socket for MT2 relays, 8 pole, 10A (2 CO) with screw terminals, not compatible with function modules	355 0- 5	YMR78701
DIN rail mounted plug-in socket for MT3 relays and timer relays series ZR4, 11 pole, 10A (3 CO), with screw terminals, not compatible with function modules	300 0-6	YMR78700
DIN rail mounted plug-in socket for MT3 relays, 11 pole, 10A (3 CO), with screw terminals, compatible with function modules	000 0-0	MT78740
LED module red 24V AC/DC for socket MT78740	000 0-0	MTML0024
Protection diode module 1N4007 for socket MT78740	333 0-0	MTMTOOAO
RC-Network module 110-240V AC for socket MT78740	000 0-0	MTMU0730
Single function module Delay ON for socket MT78740	588 0-8	MTMZ0W00
Multifunction module for socket MT78740	000 0-0	MTMF0W00
Metal retaining clip	000 0-0	MT28800

## Relay Sockets for Schrack, Serie RM (RMxx2xxx)

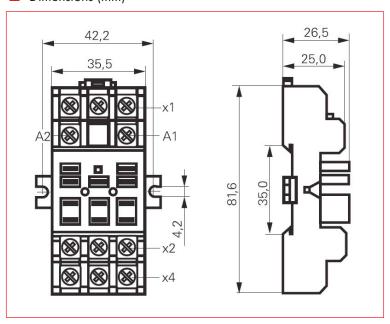




#### Schrack-Info

- 2/3 poles 10/16 A
- RM socket for RMxx2x types (Faston 187): RM332, RM632, RM732

## Dimensions (mm)



## Technical data

Rated current		16 A
Rated voltage		250 V
Dielectric strength	Coil-contact set	2500 V <sub>rms</sub>
	Open contact	1500 V <sub>rms</sub>
	Adjacent contact	2500 V <sub>rms</sub>
Clearance/ creepage coil-contact circuit		≥ 4.0 / 14.9 mm
Insulation to IEC 60664-1		
Type of insulation	Coil-contact set	Basic
	Open contact	Functional
	Adjacent contact	Basic
Rated insulation voltage		250 V
Pollution degree		2
Overvoltage category		III
Ambient temperature		-40+40 °C
Terminals		Screw terminals
Terminal torque according to IEC 61984		0.8 Nm
	Max.	1.2 Nm
Terminal capacity	Copper wire	2 x 2.5 mm <sup>2</sup>
	Stranded wire	$2 \times 2.5 \text{ mm}^2$
	With ferrule (DIN 46228/1)	$2 \times 1.5 \text{ mm}^2$

DESCRIPTION	AVAILABLE	ORDER NO.
DIN rail mounted plug-in socket, 11 pole, up to 16A, for Faston 187	333 0-6	RM78705
Retaining Clip	000 0-0	RM28802



## Print Relay Sockets for Schrack, Series RP5

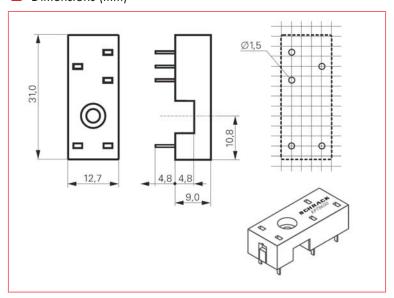




## Schrack-Info

- Print socket for 2.5 mm Pinning
- Matches Relay Series RP5

## Dimensions (mm)



## Technical Data

Rated current		12 A
Rated voltage/ max. switching voltage AC		240 / 400 V~
Dielectric strength	Coil-contact set	4000 V <sub>rms</sub>
Clearance/ creepage	Coil-contact circuit	≥ 4 / 4 mm
Insulation to IEC 60664-1		
Type of insulation	Coil-contact set	Basic
	Open contact	Functional
Rated insulation voltage		250 V
Pollution degree		2
Overvoltage category		III
Ambient temperature		-40+80 °C
Degree of protection DIN 40050		IP20
Terminals		РСВ
Insertion cycles		A (10)
Max. insertion force total		100 N
Mounting distance		Tight package
Resistance to soldering heat		270 °C / 10 s

DESCRIPTION	AVAILABLE	ORDER NO.
PCB socket for RP5 relays with 2.5mm pinning		RP78600
Bracket for PCB socket series RP5		RP16100

# Print Relay Sockets for Schrack, Series RT





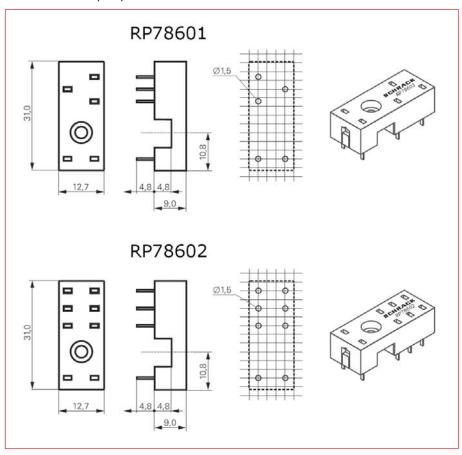




## Schrack-Info

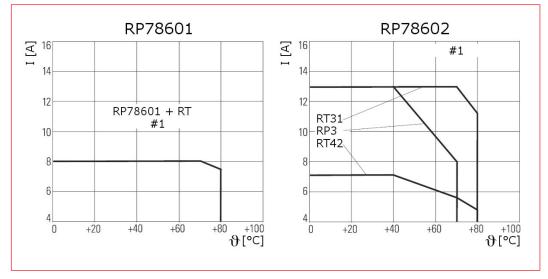
- Print socket for 3.5 and 5 mm Pinning
- Matches Relay Series RT

## Dimensions (mm)



## Print Relay Sockets for Schrack, Series RT

## Reduction Curves



## Reduction Curves

#1	Tight package
1	DC current in [A]
Ů	Ambient temperature in [°C]

## Technical Data

## RP 78601, RP 78602

Rated current		12 A*	
Rated voltage/ max. switching AC	voltage	See reduction curves	
Limiting continuous current		240 / 400 V~	
Dielectric strength	Coil-contact set	4000 V <sub>rms</sub>	
	Open contact	1000 V <sub>rms</sub>	
	Adjacent contacts	2500 V <sub>rms</sub>	
Clearance/ creepage	Coil-contact circuit RT	> 10 / 10 mm	
	Coil-contact circuit RP	> 8 / 8 mm	
Insulation to IEC 60664-1			
Type of insulation	Coil-contact set	Reinforced	
	Open contact	Functional	
	Adjacent contact	Functional	
Rated insulation voltage		250 V	
Pollution degree		2	
Overvoltage category		III	
Ambient temperature		-40+80 °C	
Degree of protection DIN 400	50	IP20	
Terminals		PCB	
Mounting distance		Tight package	

<sup>\*</sup>For 1-pole relays (16A) the relay terminals 11-21, 12-22 and 14-24 have to be bridged on the PCB!

DESCRIPTION	AVAILABLE	ORDER NO.
PCB socket for RT relays, 3.5mm pinning	355 0- 5	RP78601
PCB socket for RT relays, 5.0mm pinning	000 0-0	RP78602
Retaining clip for PCB socket RT, metal	388 0- 6	RT28516
Retaining clip for PCB sockets RT, plastic	000 0-0	RT16041

## Print Relay Sockets for PT Relays





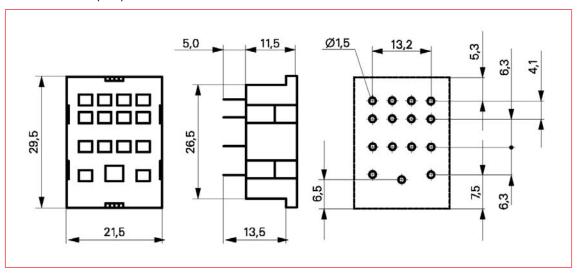


PT78604

## Schrack-Info

• Print socket, 4 poles, 6 A

## Dimensions (mm)



## Technical Data

		4 POLE
Rated current		6 A
Rated voltage/ max. switching voltage	ge AC	250 V~
Limiting continuous current		See reduction curve
Dielectric strength	Coil/contact set	2500 V <sub>rms</sub>
	Open contact	1200 V <sub>rms</sub>
	Adjacent contacts	2000 V <sub>rms</sub>
Clearance/ creepage	Coil contact circuit	≥ 4 / 4 mm
	Adjacent contact circuits	≥ 1.8 / 3.5 mm
Insulation to IEC 60664-1		
Type of insulation	Coil-contact set	Basic
	Open contact	Functional
	Adjacent contact	Functional
Rated insulation voltage		250 V
Pollution degree		2
Overvoltage category		III
Ambient temperature		-40+80 °C
Terminals		Screw terminals
Terminal torque accrding to IEC 6198	34	0.5 Nm
•	Max.	0.7 Nm
Terminal capacity	Copper wire	2 x 2.5 mm <sup>2</sup>
	Stranded wire	2 x 2.5 mm <sup>2</sup>
	With ferrule (DIN 46228/1)	2 x 1.5 mm <sup>2</sup>

DESCRIPTION	AVAILABLE	ORDER NO.
PCB socket for PT5 relays, 4 pole, 6A	999 0-9	PT78604
Retaining clip metal for PCB socket	300 0-0	PT28802

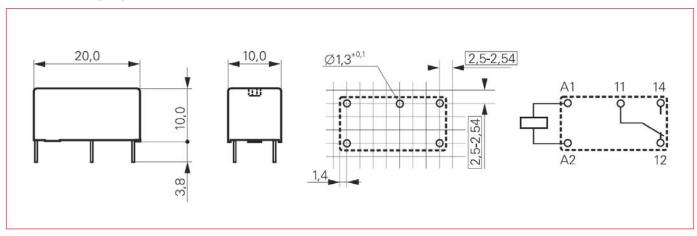
## Print Relays Schrack, Series PE



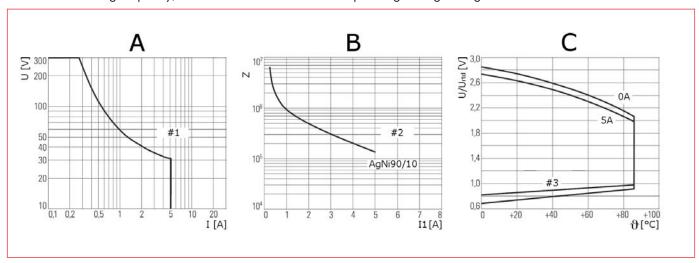
#### Schrack-Info

- 1 CO, 5 A
- Coil 5 up to 24 V DC
- 2.5 mm Pinning
- Low component height of 10 mm
- Coil power rating: 200 mW
- Cadmium-free contact material
- Ambient temperature 85°C
- For industrial equipment electronics, whiteware, battery powered devices

## Dimensions (mm)



## Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range



## Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range

Α	Max. DC rated breaking capacity
В	Electrical endurance
С	Coil operating range DC
#1	Resistive load
#2	250 V AC resistive load
#3	U <sub>rtd</sub> Rated coil voltage
I	DC current in [A]
11	Switching current [A]
U	DC voltage in [V]
$U/U_{rtd}$	Coil voltage in [V]
Z	Cycles
Ů	Ambient temperature in [°C]



# ■ Print Relays Schrack, Series PE

## ■ Technical Data

	DAT

Number of contacts and type		1 CO contact	
Rated current		5 A	
Rated voltage/ max. switching voltage AC		250 / 400 V	
Max. rated breaking capacity AC		1250 V	
Contact material		AgNi 90/1	
Frequency of operation	With Load	360 ops/h	
	Without Load	72000 ops/h	
Operate release time		typ. 8 / 8 m	
Bounce time		typ. 4 / 6 m	
COIL DATA			
Operative range, IEC 61810		2	
INSULATION DATA			
Initial dielectric strength	Open contacts	1000 V <sub>rms</sub>	
	Conatct and coil	4000 V <sub>rms</sub>	
Initial insulation resistance	Open contact set	> 10 x 10° Ω	
	Coil contact set	> 10 X 10 Ω	
Clearance/ creepage	Contact and coil	≥ 3.2 / 4 mm	
Ambient temperature		-40+85 °C	

DESCRIPTION	AVAILABLE	ORDER NO.
5V-DC, 1 CO, 5A	300 0-8	PE014005
12V-DC, 1 CO, 5A	000 0-0	PE014012
24V-DC, 1 CO, 5A	000 0-0	PE014024
<u> </u>		

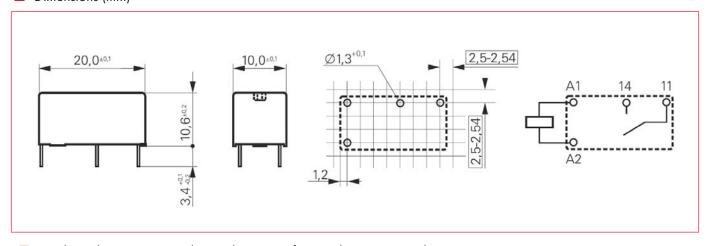
## Print Relays Schrack, Series RE



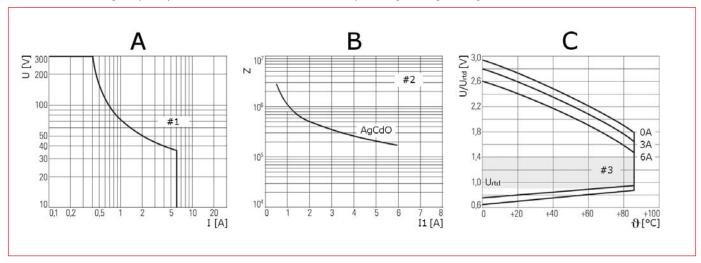
#### Schrack-Info

- 1 NO, 6 A
- Coil 5 up to 24 V DC
- PCB area 200 mm<sup>2</sup>
- Optimised height of 10.6 mm
- Coil power rating: 200 mW
- Wash proof
- For programmable controls, timer relays, temperature controllers, interface boards, whiteware

## Dimensions (mm)



## Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range



## Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range

A	Max. DC rated breaking capacity	
В	Electrical endurance	
С	Coil operating range DC	
#1	Resistive load	
#2	250 V AC resistive load	
#3	Recommended voltage range	
I	DC current in [A]	
11	Switching current [A]	
U	DC voltage in [V]	
U/U <sub>rtd</sub>	Coil voltage in [V]	
Z	Cycles	
Ů	Ambient temperature in [°C]	



# ■ Print Relays Schrack, Series RE

## ■ Technical Data

NTA		

	1 NO contact			
	6 A			
Rated voltage/ max. switching voltage AC 250 / 400 V				
	15 A			
	1500 V			
	AgCd			
With Load	360 ops/h			
Without Load	72000 ops/h			
	10 / 5 m			
	4 m			
	2			
	F			
Open contacts	1000 V <sub>rms</sub>			
Conatct and coil	4000 V <sub>rms</sub>			
Open contact set	> 10 ·· 10 <sup>9</sup> O			
Coil contact set	> 10 x 01 x			
Contact and coil	≥ 4 / 4 mm			
	-40+70 °C			
	AVAILABLE	ORDER NO.		
		RE030005		
	338 0-1	RE030012		
	300	RE030024		
	Open contacts Conatct and coil Open contact set Coil contact set	6 A 250 / 400 V 15 A 1500 V AgCd With Load 360 ops/h 72000 ops/h 10 / 5 m 4 m  2 F  Open contacts Conatct and coil Open contact set Coil contact set Coil contact set Contact and coil  2 4 / 4 mm -40+70 °C  AVAILABLE		





## Print Relays Schrack, Series RP









Horizontal

## Schrack-Info

#### RPII/1

- 1 pole 8/16 A
- 1 CO
- Pinning 3.5 mm (8 A) or 5 mm (16 A)
- For mains adaptors, household appliances, heating controls, cabling and wiring installations

#### RPII/2

- 2 poles 8 A
- 1 CO
- Pinning 5 mm
- For UPS, household appliances

## RP Power PCB Relay Cards E

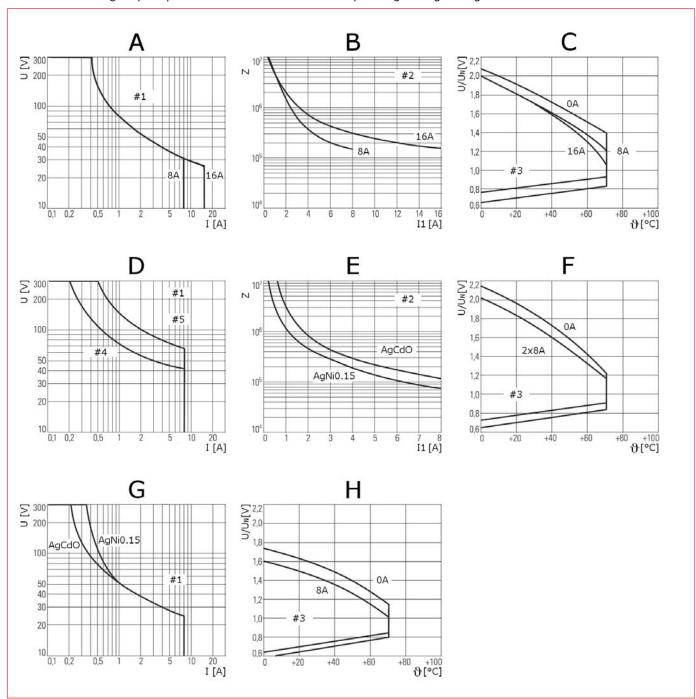
- Horizontal or vertical design
- 1 pole 8 A
- 1 CO
- Wash proof
- For I/O modules, heating controls, time switches

#### **RP** Overview

Relais	Number of CO	Rated current	c	oil	Pinning [mm]	Contact material	RPII/1	RPII/2	RP Relay Cards E Vertical	RP Relay Cards E Horizontal
DD010010 A	toniacis		D.C.	10.1/		4.610			Vernicui	Horizoniai
RP310012-A	1	16	DC	12 V	5	AgCdO	Х			
RP310024-A	1	16	DC	24 V	5	AgCdO	Х			
RP418024-A	1	8	DC	24 V	3.5	AgCdO	Х			
RP710024-A	1	16	DC	24 V	5	AgCdO	Х			
RP420012-B	2	8	DC	12 V	5	AgCdO		Х		
RP420024-B	2	8	DC	24 V	5	AgCdO		Х		
RP420524-B	2	8	AC	24 V	5	AgCdO		Х		
RP420730-B	2	8	AC	230 V	5	AgCdO		Х		
RP421024-B	2	8	DC	24 V	5	AgNi0.15		Х		
RP421048-B	2	8	DC	48 V	5	AgNi0.15		Х		
RP421730-B	2	8	AC	230 V	5	AgNi0.15		Х		
RP820024-A	2	8	DC	24 V	5	AgCdO		Х		
RP510012-E	1	8	DC	12 V	2.5	AgCdO			Х	
RP510024-E	1	8	DC	24 V	2.5	AgCdO			Х	
RP610012-E	1	8	DC	12 V	2.5	AgCdO				X
RP611024-E	1	8	DC	24 V	2.5	AgNi0.15				Х

## Print Relays Schrack, Series RP

## Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range



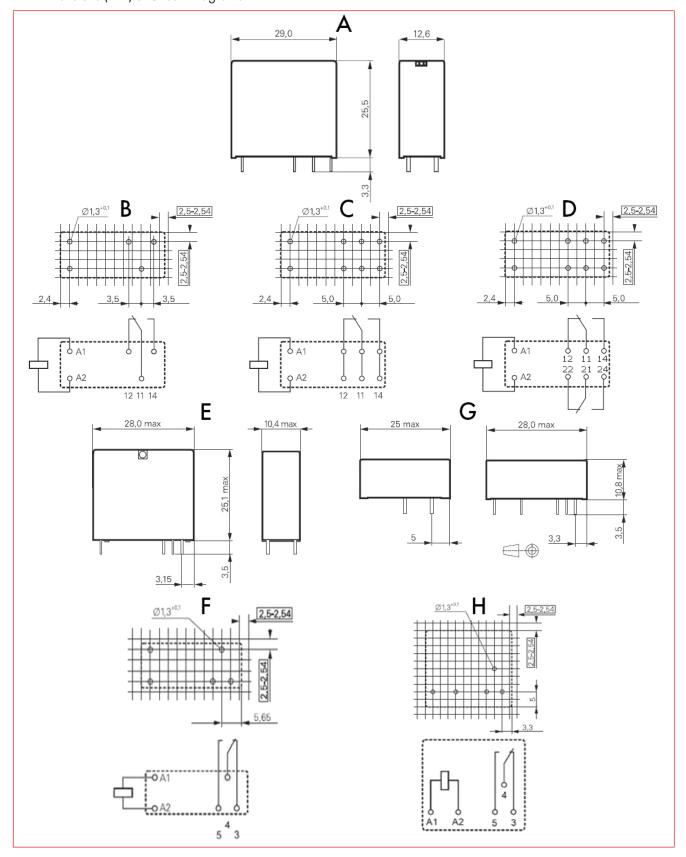
## Dimensions & Circuit Diagrams

Α	RPII/1 + 2
В	RPII/1, 8 A, 3.5 mm Pinning, 1 CO
С	RPII/1, 16 A, 5 mm Pinning, 1 CO
D	RPII/2, 8 A, 5 mm Pinning, 2 CO

E	RP PCB Vertical		
F	8 A, 2.5 mm Pinning, 1 CO, vertical		
G	RP PCB Horizontal		
Н	8 A, 2.5 mm Pinning, 1 CO, horizontal		



- Print Relays Schrack, Series RP
- Dimensions (mm) & Circuit Diagrams



## Print Relays Schrack, Series RP

## Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range

Α	RPII/1 Max. DC rated breaking capacity			
В	RPII/1 Electrical endurance			
С	RPII/1 Coil operating range DC			
D	RPII/2 Max. DC rated breaking capacity			
E	RPII/2 Electrical endurance			
F	RPII/2 Coil operating range DC			
G	RP Power PCB relay card E (horizontal/ vertikal) Max. DC rated breaking capacity			
н	RP Power PCB relay card E (horizontal/ vertikal) Coil operating range DC			
#1	Resistive load			

#2	250 V AC Resistive load		
#3	U <sub>N</sub> Nominal coil voltage		
#4	1 contact		
#5	2 contacts in series		
I	DC current in [A]		
11	Switching current in [A]		
U	DC voltage in [V]		
U/U <sub>N</sub>	Coil voltage in [V]		
Z	Cycles		
Ů	Ambient temperature in [°C]		



# ■ Print Relays Schrack, Series RP

## ■ Technical Data

RPII	/1

CONTACT DATA		8 A	16 A	
Number of contacts and type		1 C	0	
Rated current		8 A	16 A	
Rated voltage/ max. switching voltage AC		250 / 4	400 V	
Limiting making current		16 A	25 A	
Max. rated breaking capacity AC		2000 VA	4000 VA	
Contact material		AgNi0.15	AgCdO	
Frequency of operation	With Load	600 h <sup>-1</sup>		
	Without Load	72000 h <sup>-1</sup>		
Operate/ release time max.		8 / :	2 m	
Bounce time		2 / 4 m		
COIL DATA				
Operative range, IEC 61810		2		
INSULATION DATA				
Initial dielectric strength	Open contacts	1000	V <sub>rms</sub>	
	Conatct and coil	4000	$V_{rms}$	
Clearance/ creepage	Contact and coil	≥8/8	3 mm	
Ambient temperature		-40+	70 °C	

## RPII/2

		Ki ii/ Z
CONTACT DATA		8 A
Number of contacts and type		2 CO contacts
Rated current		8 A (UL: 10 A)
Rated voltage/ max. switching voltage AC		250 / 400V
Limiting making current, max. 4 s, duty factor	10 %	14 A
Max. rated breaking capacity AC		2000 V
Contact material		AgCdO, AgNi0.1
Frequency of operation	With Load	600 h <sup>-1</sup>
, , ,	Without Load	72000 h <sup>-1</sup>
Operate/ release time max.		9 / 3 m
Bounce time		2 / 3 m
COIL DATA		
Operative range, IEC 61810		2
INSULATION DATA		
Initial dielectric strength	Open contacts	1000 V <sub>rms</sub>
	Conatct and coil	4000 V <sub>rms</sub>
	Adjacent contacts	2500 V <sub>rms</sub>
Clearance/ creepage	Contact and coil	≥ 8 / 8 mm
Ambient temperature		-40+70 °C

## RP Power PCB relay card E

CONTACT DATA		8 A, wash tight	
Number of contacts and type		1 CO	
Rated current		8 A	
Rated voltage/ max. switching voltage AC		250 / 400 V	
Limiting making current, max. 4 s, duty factor	10 %	15 A	
Max. rated breaking capacity AC		2000 V	_
Contact material		AgCdO, AgNi0.1	_
Frequency of operation	With Load	360 h <sup>-1</sup>	
	Without Load	72000 h <sup>-1</sup>	
Operate/ release time max.		7 / 3 m	
Bounce time		0.5 / 3 m	
INSULATION DATA			_
Initial dielectric strength	Open contacts	1000 V <sub>rms</sub>	_
	Conatct and coil	4000 V <sub>rms</sub>	
Clearance/ creepage	Contact and coil	≥ 4 / 4 mm	
Ambient temperature		-40+70 °C	

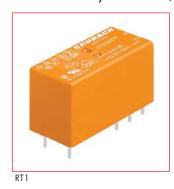


# ■ Print Relays Schrack, Series RP

DESCRIPTION	AVAILABLE	ORDER NO.
	AVAILABLE	ORDER NO.
RPII/1		
12V-DC, 1 CO, 16A	700 000	RP310012-A
24V-DC, 1 CO, 16A	333 0-0	RP310024-A
24V-DC, 1 CO, 12A	333 0-0	RP418024-A
RPII/2		
12V-DC, 2 CO, 8A	333 0-0	RP420012-B
24V-DC, 2 CO, 8A	555 0-6	RP420024-B
24V-AC, 2 CO, 8A	333 0-0	RP420524-B
230V-AC, 2 CO, 8A	333 0-0	RP420730-B
24V-DC, 2 CO, 8A		RP421024-B
230V-AC, 2 CO, 8A	335 0-0	RP421730-B
24V-DC, 2 CO, 8A		RP820024-A
RP Power PCB Relay Cards E Vertical		
12V-DC, 1 CO, 8A	333 0-0	RP510012-E
24V-DC, 1 CO, 8A	333	RP510024-E
RP Power PCB Relay Cards E Horizontal		
12V-DC, 1 CO, 8A		RP610012-E
24V-DC, 1 CO, 8A		RP611024-E

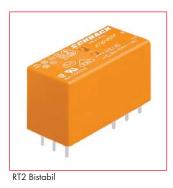


## Print Relays Schrack, Series RT









#### Schrack-Info

#### RT1

- 1 pole 12/16 A, AC or DC coil
- 1 CO or 1 NO
- Sensitive coil 400 mW/0.75 VA
- 5 kV, 10 mm coil/contact
- Appliance class II (VDE 0700)
- Safe disconnection compliant with VDE 0160 in combination with socket YRT78626
- Ambient temperature 85°C (DC coil)
- Low component height 15.7 mm
- Gold plated contacts available
- Print and screw type sockets
- · For boiler controls, timer relays, garage door controls, vending machines, interface modules

#### **RT1 Inrush and High Inrush**

- 1 pole 16 A, for high peak inrush current
- 1 NO
- RTS3T024 (= High Inrush) with Tungsten early-make contact
- Sensitive coil 400 mW
- 5 kV, 10 mm coil/contact
- Appliance class II (VDE 0700)
- Ambient temperature 85°C
- Low component height 15.7 mm
- Print and screw type sockets
- · For household appliances, heating controls, light controls, building automation

#### RT2

- 2 poles 8 A, AC or DC coil
- 2 CO
- Sensitive coil 400 mW
- 5 kV, 10 mm coil/contact
- Appliance class II (VDE 0700)
- Safe disconnection compliant with VDE 0160 in combination with socket YRT78626
- Low component height 15.7 mm
- Print and screw type sockets
- For household appliances, heating controls, emergency lighting, modems

#### **RT2** Bistable

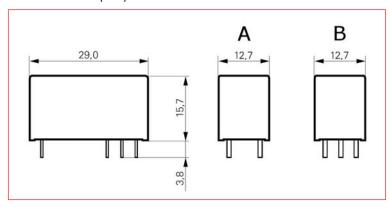
- 2 poles 8 A
- 2 CO
- Bistable version with one (= RT424A24) or two coils (RT424F12 or RT424F24)
- Reinforced insulation
- For battery powered devices or memory storage applications

# Print Relays Schrack, Series RT

## RT Overview

Relais	Number of contacts	Rated current [A]	c	oil	Pinning [mm]	Contact material	RT1	RT1 Inrush	RT1 High Inrush	RT2	RT2 Bistable
RT114012	1 CO	12	DC	12 V	3.5	AgNi90/10	Х				
RT114024	1 CO	12	DC	24 V	3.5	AgNi90/10	Х				
RT114524	1 CO	12	AC	24 V	3.5	AgNi90/10	Х				
RT214012	1 CO	12	DC	12 V	5	AgNi90/10	Х				
RT214024	1 CO	12	DC	24 V	5	AgNi90/10	Х				
RT214730	1 CO	12	AC	230 V	5	AgNi90/10	Х				
RT314005	1 CO	16	DC	5 V	5	AgNi90/10	Х				
RT314012	1 CO	16	DC	12 V	5	AgNi90/10	Х				
RT314024	1 CO	16	DC	24 V	5	AgNi90/10	Х				
RT334024	1 NO	16	DC	24 V	5	AgNi90/10	Х				
RT314110	1 CO	16	DC	110 V	5	AgNi90/10	Х				
RT314524	1 CO	16	AC	24 V	5	AgNi90/10	Х				
RT314730	1 CO	16	AC	230 V	5	AgNi90/10	Х				
RT315730	1 CO	16	AC	230 V	5	AgNi90/10 hgp*	Х				
RT33K012	1 NO	16	DC	12 V	5	AgNi90/10		Х			
RT33K024	1 NO	16	DC	24 V	5	AgNi90/10		Х			
RT31L024	1 CO	16	DC	24 V	5	AgSnO <sub>2</sub>		Х			
RTS3T024	1 NO	16	DC	24 V	5	T* * + AgSnO <sub>2</sub>			Х		
RT424006	2 CO	8	DC	6 V	5	AgNi90/10				Х	
RT424012	2 CO	8	DC	12 V	5	AgNi90/10				Х	
RT424024	2 CO	8	DC	24 V	5	AgNi90/10				Х	
RT425024	2 CO	8	DC	24 V	5	AgNi90/10 hgp*				Х	
RTE24024	2 CO	8	DC	24 V	5	AgNi90/10				Х	
RT424048	2 CO	8	DC	48 V	5	AgNi90/10				Х	
RT424060	2 CO	8	DC	60 V	5	AgNi90/10				Х	
RT424110	2 CO	8	DC	110 V	5	AgNi90/10				Х	
RT424524	2 CO	8	AC	24 V	5	AgNi90/10				Х	
RT424548	2 CO	8	AC	48 V	5	AgNi90/10				Х	
RT424615	2 CO	8	AC	115V	5	AgNi90/10				Х	
RT425615	2 CO	8	AC	115 V	5	AgNi90/10 hgp*				Х	
RT424730	2 CO	8	AC	230 V	5	AgNi90/10				Х	
RT425730	2 CO	8	AC	230 V	5	AgNi90/10 hgp*				Х	
RT424A24	2 CO	8	DC	24 V	5	AgNi90/10					Х
RT424F12	2 CO	8	DC	12V	5	AgNi90/10					Х
RT424F24	2 CO	8	DC	24V	5	AgNi90/10					Х

## Dimensions (mm)



## Dimensions

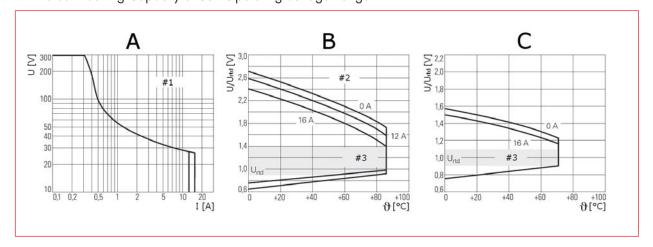
Α	RT1, RT1 Inrush, RT1 High Inrush, RT2 und RT2 Bistable 1 coil (RT424A24)

RT2 Bistable 2 coils (RT424F12 bzw. RT424F24)

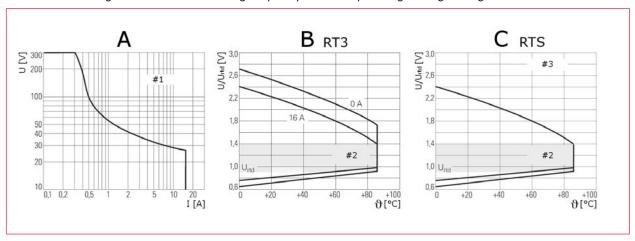


<sup>\*</sup>hgp = hard gold-plated
\*\*Tungsten pre-contact

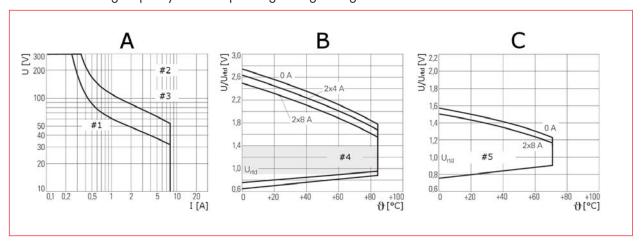
- Print Relays Schrack, Series RT
- Rated Breaking Capacity & Coil Operating Voltage Range RT1



✓ Inrush and High Inrush Rated Breaking Capacity & Coil Operating Voltage Range RT1



Rated Breaking Capacity & Coil Operating Voltage Range RT2



# Print Relays Schrack, Series RT

## Rated Breaking Capacity & Coil Operating Voltage Ranges

RT1		
Α	Max. DC rated breaking capacity	
В	Coil operating range DC	
С	Coil operating range AC	
#1	Resistive load	
#2	16 A version	
#3	Recommended voltage range in [V]	
U	DC voltage in [V]	
U/U <sub>rtd</sub>	Coil voltage in [V]	
I	DC current in [A]	
Ů	Ambient temperature in [°C]	

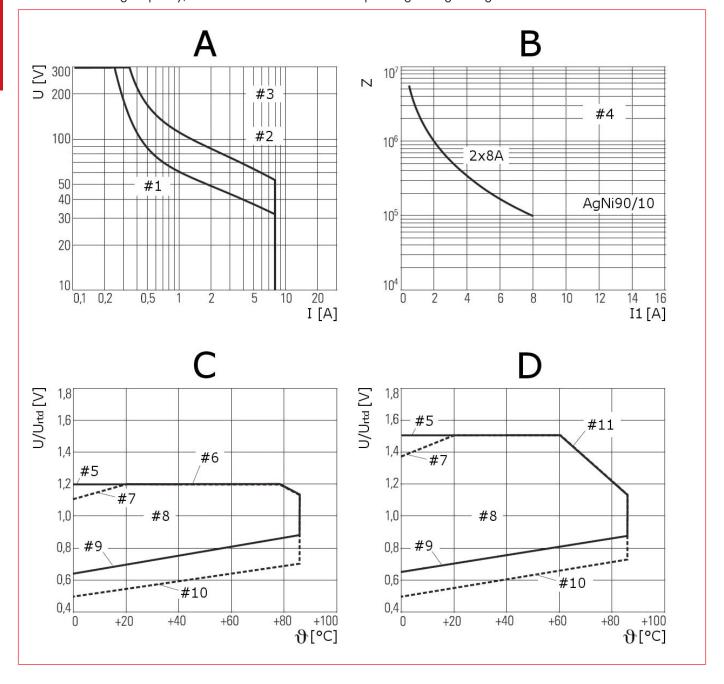
RT1 Inrush und High Inrush		
Α	Max. DC rated breaking capacity	
В	Coil operating range DC (RT3)	
С	Coil operating range DC (RTS)	
#1	Resistive load	
#2	Recommended voltage range in [V]	
#3	Monostable version	
U	DC voltage in [V]	
U/U <sub>rtd</sub>	Coil voltage in [V]	
I	DC current in [A]	
Ů	Ambient temperature in [°C]	

	RT2
Α	Max. DC rated breaking capacity
В	Coil operating range DC
С	Coil operating range AC
#1	1 contact
#2	2-pole resistive load
#3	2 contacts in series
#4	Recommended voltage range in [V]
#5	Rated coil voltage in [V]
U	DC voltage in [V]
U/U <sub>rtd</sub>	Coil voltage in [V]
1	DC current in [A]
Ů	Ambient temperature in [°C]

Α	Max. DC rated breaking capacity
В	Electrical endurance
С	Coil operating range, 1 coil
D	Coil operating range, 2 coils
#1	1 contact
#2	2 contacts in series
#3	2-pole resistive load
#4	250 V AC resistive load
#5	Max. SET
#6	Max. SET and RESET 16 A, 2 x 8 A
#7	Max. RESET
#8	U <sub>rld</sub> Rated coil voltage
#9	SET
#10	RESET
#11	Max. SET and RESET
U	DC voltage in [V]
$U/U_{rtd}$	Coil voltage in [V]
I	DC current in [A]
11	Switching current in [A]
Z	Cycles
Ů	Ambient temperature in [°C]



- Print Relays Schrack, Series RT
- Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range RT2 Bistable



# Print Relays Schrack, Series RT

# Rated Breaking Capacity & Coil Operating Voltage Ranges

RT1				
Α	Max. DC rated breaking capacity			
В	Coil operating range DC			
С	Coil operating range AC			
#1	Resistive load			
#2	16 A version			
#3	Recommended voltage range in [V]			
U	DC voltage in [V]			
U/U <sub>rtd</sub>	Coil voltage in [V]			
I	DC current in [A]			
Ů	Ambient temperature in [°C]			

RT1 Inrush und High Inrush				
Max. DC rated breaking capacity				
В	Coil operating range DC (RT3)			
С	Coil operating range DC (RTS)			
#1	Resistive load			
#2	Recommended voltage range in [V]			
#3	Monostable version			
U	DC voltage in [V]			
U/U <sub>rtd</sub>	Coil voltage in [V]			
I	DC current in [A]			
Ů	Ambient temperature in [°C]			

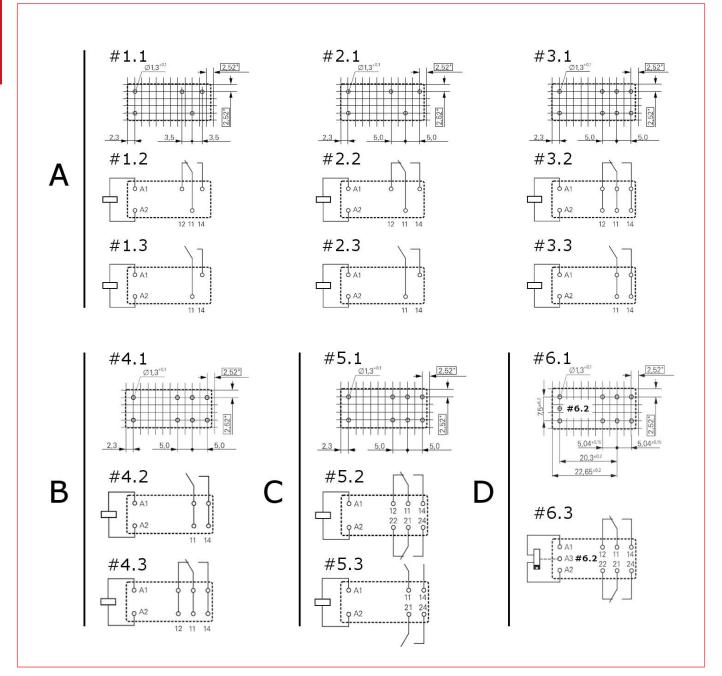
RT2				
A Max. DC rated breaking capacity				
В	Coil operating range DC			
С	Coil operating range AC			
#1	1 contact			
#2	2-pole resistive load			
#3	2 contacts in series			
#4	Recommended voltage range in [V]			
#5	Rated coil voltage in [V]			
U	DC voltage in [V]			
U/U <sub>rtd</sub>	Coil voltage in [V]			
I	DC current in [A]			
Ů	Ambient temperature in [°C]			

A Max. DC rated breaking capace B Electrical endurance C Coil operating range, 1 coil D Coil operating range, 2 coils #1 1 contact #2 2 contacts in series #3 2-pole resistive load #4 250 V AC resistive load #5 Max. SET	
C         Coil operating range, 1 coil           D         Coil operating range, 2 coils           #1         1 contact           #2         2 contacts in series           #3         2-pole resistive load           #4         250 V AC resistive load           #5         Max. SET	ity
D   Coil operating range, 2 coils   #1   1 contact   #2   2 contacts in series   #3   2-pole resistive load   #4   250 V AC resistive load   #5   Max. SET	
#1 1 contact #2 2 contacts in series #3 2-pole resistive load #4 250 V AC resistive load #5 Max. SET	
#2 2 contacts in series #3 2-pole resistive load #4 250 V AC resistive load #5 Max. SET	
#3 2-pole resistive load #4 250 V AC resistive load #5 Max. SET	
#4 250 V AC resistive load #5 Max. SET	
#5 Max. SET	
## CET IDECET 1/ A O	
#6 Max. SET and RESET 16 A, 2 x 8	3 A
#7 Max. RESET	
#8 U <sub>rtd</sub> Rated coil voltage	
<b>#9</b> SET	
#10 RESET	
#11 Max. SET and RESET	
U DC voltage in [V]	
U/U <sub>rtd</sub> Coil voltage in [V]	
I DC current in [A]	
Switching current in [A]	
<b>Z</b> Cycles	
d Ambient temperature in [°C]	



### Print Relays Schrack, Series RT

### Wiring Diagrams



### Circuit Diagrams

Α	RT1
В	RT1 Inrush and High Inrush
С	RT2
D	RT2 Bistable
#1.1	12 A, pinning 3.5 mm
#1.2	1 CO
#1.3	1 NO
#2.1	12 A, pinning 5 mm
#2.2	1 CO
#2.3	1 NO
#3.1	16 A, pinning 5 mm

#3.2	1 CO
#3.3	1 NO
#4.1	16 A, pinning 5 mm
#4.2	1 NO
#4.3	1 CO
#5.1	8 A, pinning 5 mm
#5.2	2 CO
#5.3	2 NO
#6.1	8 A, pinning 5 mm
#6.2	For 2 coil version only
#6.3	2 CO

#### General Info

View of the terminals, dimensions in mm Equipping with indicated hole diameter also possible in 2.5 mm or 2.54 mm contact spacing

# ■ Print Relays Schrack, Series RT

### ■ Technical Data (Part 1)

CONTACT DATA		12 A	16 A
Number of contacts and type		1 CO or 1 NO contact	
Contact style		Single cor	ntact
Rated current		12 A	16 A
Rated voltage/ max. switching voltage AC		250 / 40	0 V~
Limiting continious current		12 A	16 A, UL: 20 A
Max. rated breaking capacity AC		3000 VA	4000 VA
Limiting making current (max. 4 s at 10 % DF)		25 A	30 A
Contact material		AgNi 90/10, AgNi 90/10 hard gold plated	
COIL DATA			
Rated voltage	DC coil	5110	V
	AC coil	24230	V~
Rated power	DC coil	400 m\	V
	AC coil	0.74 VA	
Operative range, IEC 61810		2	
Coil insulation system according to UL1446		Class I	=
Operation-/ release voltage/ coil resistance	24 V DC coil	16.8 V / 2.4 V / 1440 Ω ± 10 %	
at ambient temperature 23 °C	230 V AC coil	172.5 V / 34.5 V / 3	2500 Ω ± 10 %

#### RT1 Inrush and High Inrush

	1111111100	aag 0 5		
CONTACT DATA		RT3	RTS	
Number of contacts and type		1 CO oder 1 NO	1 NO	
Contact style		Single contact		
Rated current		16 A		
Rated voltage / max. switching voltage AC		250 / 400 V~		
Limiting continuous current			16 A	
Max. rated breaking capacity AC		4000 VA		
Limiting and the second		30 A (max. 4 s at 10 % DF)	165 A (max. 20 ms incandescent lamps)	
Limiting making current		30 A (max. 4 s dr 10 % DF)	800 A (max. 200 µs fluorescent lamps)	
Contact material		AgNi 90/10, AgSnO <sub>2</sub>	W (lead contact) + AgSnO <sub>2</sub>	
COIL DATA				
Rated voltage		5 110 V DC		
Rated power		400 mW		
Operative range, IEC 61810		2		
Coil insulation system according to UL1446		Class F		
Operation-/ release voltage/ coil resistance	24 V DC coil	coil 16.8V / 2.4V / 1440 Ω ± 10 %		
at ambient temperature 23 °C 230 V AC coil		-	172.5 V / 34.5V / 32500 Ω ± 10 %	



# Print Relays Schrack, Series RT

# ■ Technical Data (Part 2)

v	

		RI2
CONTACT DATA		8 A
Number of contacts and type		2 CO
Contact style		Single contact
Rated current		8 A
Rated voltage/ max. switching voltage AC		250 V / 400 V~
Limiting continuous current		8 A, UL: 10 A
Max. rated breaking capacity AC		2000 VA
Limiting making current (max. 4 s at 10 % DF)		15 A
Contact material		AgNi 90/10, AgNi 90/10 hard gold plated
COIL DATA		
Rated voltage	DC coil	5110 V
	A.C. :1	04.0007
D. I.	AC coil	24230 V~
Rated power	DC coil	400 mW
0 " " " " " " " " " " " " " " " " " " "	AC coil	0.74 VA 2
Operative range, IEC 61810		
Coil insulation system according to UL1446	041400 d	Class F
Operation-/ release voltage/ coil resistance	24 V DC coil	$16.8 \text{ V} / 2.4 \text{ V} / 1440 \Omega \pm 10 \%$
at ambient temperature 23 °C	230 V AC coil	172.5 V / 34.5 V / 32500 Ω ± 10 %
		RT2 Bistable
CONTACT DATA		8 A
Number of contacts and type		2 CO
Rated current		8 A, UL: 10 A
Rated voltage/ max. switching voltage AC		250 / 400 V~
Limiting continuous current		8 A, UL: 10 A
Max. rated breaking capacity AC		2000 VA
Limiting making current (max. 4 s at 10 % DF)		15 A
Contact material		AgNi 90/10
Frequency of operation	With Load	900 h <sup>-1</sup>
. , .	Without Load	72000 h <sup>-1</sup>
Operate/ release time max.		10 / 5 ms
Bounce time		4 / 9 ms
COIL DATA		1 COIL
Magnetic system		Bistable
Operative range, IEC 61810		2
Coil voltage range DC		24 V
Limiting voltage, % of rating voltage		120 %
Energization duration at < 10 % duty factor	Min.	30 ms
	Max.	1 min.
Coil insulation system according to UL1446		Class F
BISTABLE COIL - OPERATION*		1 COIL
Coil terminals		A1 A2
Operate		+
Reset		- +
COIL DATA		2 COILS
Magnetic system		Bistable
Operative range, IEC 61810		2
Coil voltage range DC		12 / 24 V
Limiting voltage, % of rating voltage		150 %
Energization duration at < 10 % duty factor	Min.	30 ms
	Max.	1 min.
Coil insulation system according to UL1446		Class F
BISTABLE COILS - OPERATION*		2 COILS
Coil terminals		A1 A3 A2
Operate		+ -
Reset		- +
INSULATION DATA		
Initial dielectric strength	Open contacts	1000 V <sub>rms</sub>
minar arefective sitetigin	Conatct and coil	5000 V <sub>rms</sub>
	Adjacent contacts	2500 V <sub>rms</sub>
Clearance/ creepage	Conatct and coil	> 10 / 10 mm
Cicarance/ creepage	Adjacent contacts	> 10 / 10 mm
Ambient temperature	Bistable 1 coil	-10+85 °C
Ambieni lelliherdiore	Bistable 2 coils	-10+85 °C
	DISTABLE Z COIIS	1

<sup>\*</sup>Contact position not defined at delivery



# Print Relays Schrack, Series RT

DESCRIPTION	AVAILABLE	ORDER NO.
Print Relays RT1, 12A		
12V-DC, 1 CO, 12A	300 0-0	RT114012
24V-DC, 1 CO, 12A	355	RT114024
24V-AC, 1 CO, 12A	300 0-6	RT114524
12V-DC, 1 CO, 12A	355	RT214012
24V-DC, 1 CO, 12A	000 0-0	RT214024
230V-AC, 1 CO, 12A	333	RT214730
Print Relays RT1, 16A		
5V-DC, 1 CO, 16A	333	RT314005
12V-DC, 1 CO, 16A	000 0-0	RT314012
24V-DC, 1 CO, 16A	999 0-0	RT314024
24V-DC, 1 NO, 16A	988 0~ 0	RT334024
24V-AC, 1 CO, 16A	050 0-5	RT314524
230V-AC, 1 CO, 16A	050 0=0	RT314730
230V-AC, 1 CO, 16A, gold plated	353 c= 5	RT315730
Print Relays RT1 Inrush		
12V-DC, 1 NO, 16A	999	RT33K012
24V-DC, 1 NO, 16A	000 0-0	RT33K024
24V-DC, 1 CO, 16A	988	RT31L024
Print Relays RT1 High Inrush		
24V-DC, 1 NO, 16A	355 0-0	RTS3T024
Print Relays RT2		
6V-DC, 2 CO, 8A	353 0-	RT424006
12V-DC, 2 CO, 8A	000 0-9	RT424012
24V-DC, 2 CO, 8A	333 -	RT424024
24V-DC, 2 CO, 8A, gold plated	333 0-0	RT425024
24V-DC, 2 CO, 8A	938	RTE24024
48V-DC, 2 CO, 8A	000 0-	RT424048
60V-DC, 2 CO, 8A	000	RT424060
110V-DC, 2 CO, 8A	000 0-	RT424110
24V-AC, 2 CO, 8A	333	RT424524
48V-AC, 2 CO, 8A	7000 0-0	RT424548
115V-AC, 2 CO, 8A	000	RT424615
115V-AC, 2 CO, 8A, gold plated	333 0-	RT425615
230V-AC, 2 CO, 8A	933	RT424730
230V-AC, 2 CO, 8A, gold plated	799 0-0	RT425730
Print Relays RT2 Bistable		
24V-DC, 2 CO, 8A	333 0	RT424A24
12V-DC, 2 CO, 8A	333	RT424F12
24V-DC, 2 CO, 8A	000 0-	RT424F24

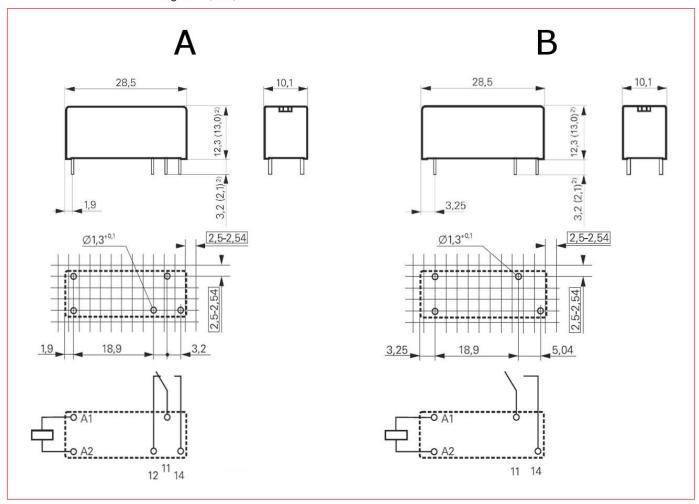
### Print Relays Schrack, Series RY



#### Schrack-Info

- 1 pole 8 A
- 1 CO or 1 NO
- Coil 12 or 24 V DC
- Pinning 3.2 (CO) or 5 mm (NO)
- Low component height of 12.3 mm
- Reinforced insulation (appliance class II)
- RY530012 (NO version) especially suitable for ohmic or inductive loads
- For heating controls, interface technology, household appliances, timers, thermostats

### Dimensions & Circuit Diagrams (mm)

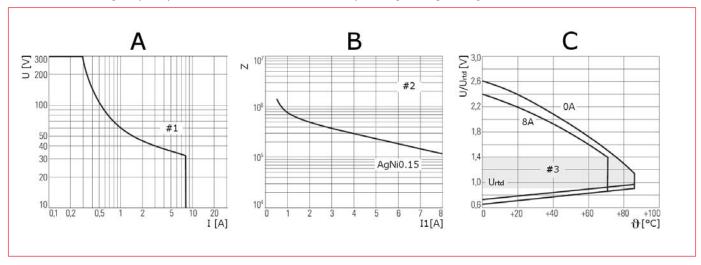


### Dimensions & Circuit Diagrams

Α	1 CO, Pinning 3.2 mm
В	1 NO, Pinning 5 mm

### Print Relays Schrack, Series RY

### Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range



### Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range

Α	Max. DC rated breaking capacity	
В	Electrical endurance	
С	Coil operating range DC	
#1	Resistive load	
#2	250 V AC Resistive load	
#3	Recommended voltage range	
I	DC current in [A]	
11	Switching current in [A]	
U	DC voltage in [V]	
U/U <sub>rtd</sub>	Coil voltage in [V]	
Z	Cycles	
Ů	Ambient temperature in [°C]	

### Technical Data

#### CONTACT DATA

Number of contacts and type		1 CO oder 1 NO
Rated current		8 A
Rated voltage/ max. switching voltage AC		250 / 400 V
Max. rated breaking capacity AC		2000 VA
Contact material		AgCdO, AgNi0.15 or AgNi0.15 hgp*
Frequency of operation	With Load	6 min <sup>-1</sup>
	Without Load	1200 min <sup>-1</sup>
Operate/ release time max.		9 / 5 ms
Bounce time		6 / 10 ms
COIL DATA		
Operative range, IEC 61810		2
INSULATION DATA		
Initial dielectric strength	Open contacts	1000 V <sub>rms</sub>
	Conatct and coil	5000 V <sub>rms</sub>
Clearance/ creepage	Contact and coil	≥ 8 / 8 mm
Ambient temperature		-40+70 °C
*hard gold-plated	•	

DESCRIPTION	AVAILABLE	ORDER NO.
12V-DC, 1 CO, 16A	333 0-5	RY210012
24V-DC, 1 CO, 16A	000 0-0	RY210024
24V-DC, 1 CO, 16A	000 0-0	RY211024
24V-DC, 1 CO, 8A	000 0-0	RY612024
12V-DC. 1 CO. 8A		RY530012

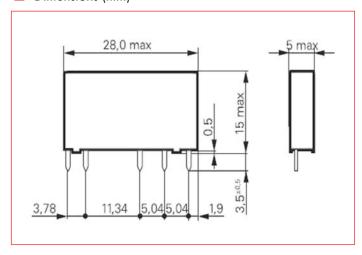
### Print Relays Schrack, Series SNR



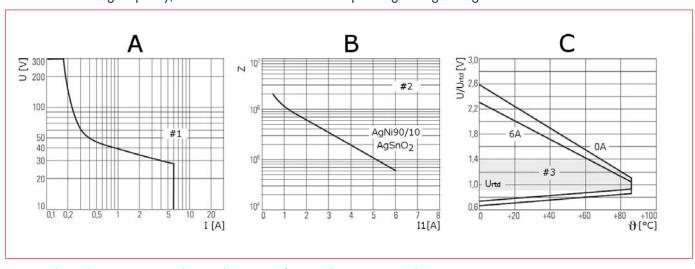
#### Schrack-Info

- 1 pole 6 A
- 1 CO or 1 NO
- Coil 12 or 24 V DC
- Sensitive coil 170 mW
- Only 5 mm component width
- High component density and tight-packed functionality
- Reinforced insulation (appliance class II)
- Cadmium-free contact material AgSnO<sub>2</sub>
- For interface technology, SPS, timers, centralised and decentralised heating controls

#### Dimensions (mm)



### Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range



### Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range

A	Max. DC rated breaking capacity	
В	Electrical endurance	
С	Coil operating range DC	
#1	Resistive load	
#2	250 V AC Resistive load	
#3	Recommended voltage range	

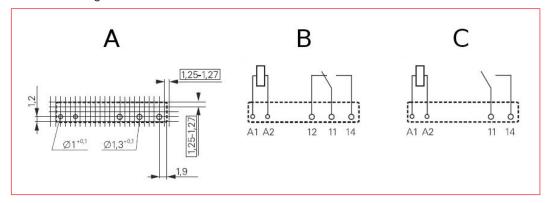
Switching current in [A]		
U	DC voltage in [V]	
U/U <sub>rtd</sub>	Coil voltage in [V]	
Z	Cycles	
Ů	Ambient temperature in [°C]	

DC current in [A]



# ■ Print Relays Schrack, Series SNR

### Circuit Diagrams



### Circuit Diagrams

Α	Bottom view on solder pins
В	1 CO
С	1 NO

### Technical Data

#### CONTACT DATA

CONTACT DATA			
Number of contacts and type		1 CO or 1NO contact	
Rated current		6 A	
Rated voltage/ max. switching voltage AC		250 / 400 V	
Limiting making current, max. 4 s, duty factor	10 %	10 A	
Max. rated breaking capacity AC		1500 V	
Contact material		$AgSnO_2$	
Min. recommended contact load		100 mA, 12 V	
Frequency of operation	With Load	6 min <sup>-1</sup>	
	Without Load	1200 min <sup>-1</sup>	
Operate/ release time max.		12 / 5 ms	
Bounce time		3 / 8 ms	
COIL DATA			
Operative range, IEC 61810		2	
INSULATION DATA			
Initial dielectric strength	Open contacts	1000 V <sub>rms</sub>	
	Conatct and coil	$4000  V_{rms}$	
Clearance/ creepage	Contact and coil	≥ 6 / 8 mm	
Ambient temperature		-40+85 °C	

DESCRIPTION	AVAILABLE	ORDER NO.
12V-DC, 1 CO, 6A	000 0-0	SNR03012
24V-DC, 1 CO, 6A	000 0-0	SNR03024
24V-DC, 1 NO, 6A	585 0-6	SNR13024

# Print Relays Schrack, Series PT



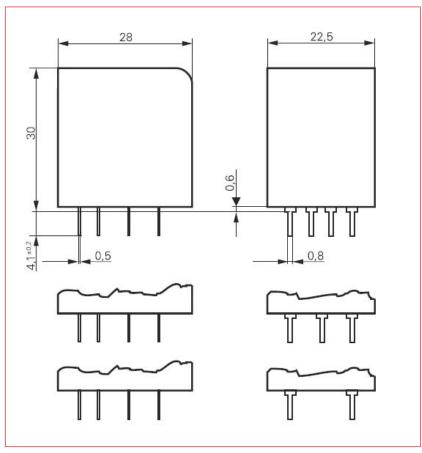


PT581024

### Schrack-Info

- 4 poles 6 A
- AC or DC coil (PT581024 or PT571730)
- 4 CO
- Up to 1500 VA switching capacity (PT5 relays)
- Component height 29 mm
- Cadmium-free contact material
- Mechanical and electrical status indicator, PT581024 with LED
- Touch protection test switch, choice of locking method
- White labelling field
- Multi-purpose use for control and machine building

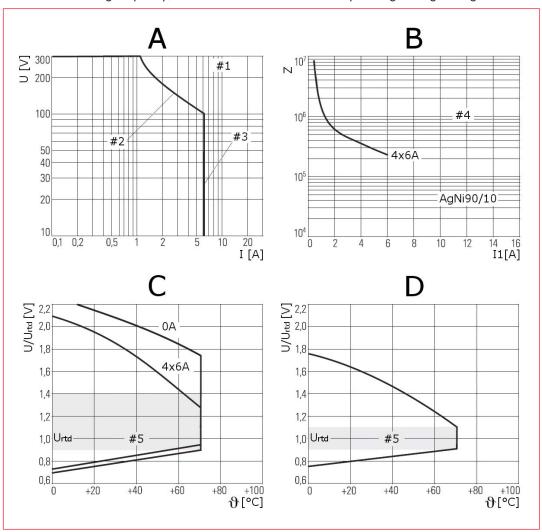
### Dimensions (mm)





### Print Relays Schrack, Series PT

### Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Ranges

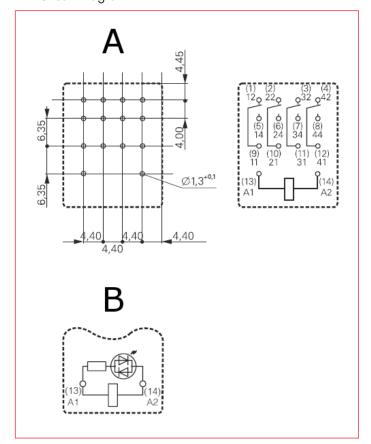


### Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Ranges

Α	Max. DC rated breaking capacity		
В	Electrical endurance		
С	Coil operating range DC		
D	Coil operating range AC		
#1	Resistive load		
#2	4 contacts		
#3	4-pole		
#4	250 V AC resistive load		
#5	Recommended voltage range in [V]		
U	DC voltage in [V]		
U/U <sub>rtd</sub>	Coil voltage in [V]		
I	DC current in [A]		
11	Switching current in [A]		
Z	Cycles		
Ů	Ambient temperature in [°C]		

# Print Relays Schrack, Series PT

### Circuit Diagram



### Circuit Diagram

Α	PCB layout 4-pole, 4 CO
В	LED (for PT581024)

### Technical Data

CONTACT DATA		PT5
Number of contacts and type		4 CO
Contact style		Single contact
Type of disconnection		Micro-switch
Rated current		6 A
Rated voltage/ max. switching voltage AC		240 / 240 V~
Limiting continuous current		6 A
Limiting short time current 30 ms		300 A
Max. rated breaking capacity AC		1500 VA
Limiting making current, max. 20 ms		12 A
Contact material		AgNi 90/10 (PT571730), AgNi 90/10 hard gold-plated (PT581024)
Minimal contact load		12 V / 10 mA, 20 mV/ 1 mA hard gold-plated
COIL DATA		
Rated voltage	DC coil	24 V
	AC coil	230 V~
Rated power	DC coil (Coil + LED)	<i>7</i> 59 mW
	AC coil	1.0 VA
Operative range, IEC 61810		2
Coil insulation system according to UL1446		Class F
Operation-/ release voltage/ coil resistance	24 V DC coil	18 V / 2.4 V / 777 Ω ± 10 %
at ambient temperature 23 °C	230 V AC coil	184 V $/$ 69 V $/$ 19465 $\Omega$ ± 10 %

DESCRIPTION	AVAILABLE	ORDER NO.
230V-AC, 4 CO, 6A with PCB terminals		PT571730
24V-DC, 4 CO, 6A, gold plated, with PCB terminals		PT581024

### Force-guided Contacts Relays Schrack, Series SR, Print Version







SR6B4024

SR6B4024

#### Schrack-Info

#### SR2

- 2 poles with force-guided contacts 6 A
- 2 CO
- Coil 24 V DC
- Contact material AgNi
- Reinforced insulation between the poles
- Complies with EN 50205

#### SR4

- 4 poles with force-guided contacts 8 A
- 2 NO, 2 NC (SR4D4024) or 3 NO, 1 NC (SR4M4024)
- Coil 24 V DC
- Contact material AgSnO<sub>2</sub>
- Compact, slim-line design
- Complies with EN 50205

#### SR6

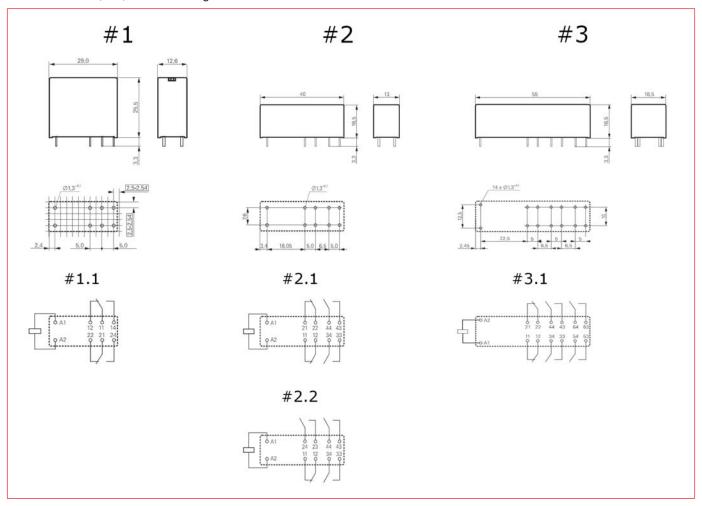
- 6 poles with force-guided contacts 8 A
- 4 NO, 2 NC
- Coil 24 V DC
- Contact material AgSnO<sub>2</sub>
- Reinforced insulation between all contacts
- Complies with EN 50205

Multi-purpose application of SR2, SR4 & SR6

• For emergency stops, machine and press controls, elevators and escalators, safety switches

### Force-guided Contacts Relays Schrack, Series SR, Print Version

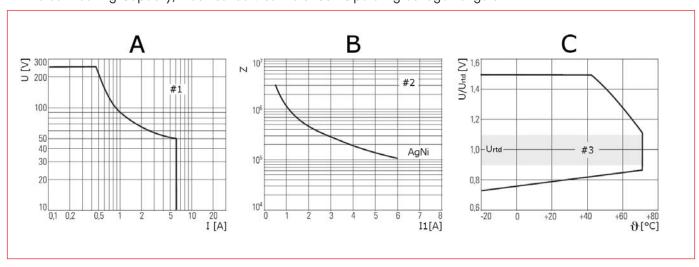
### Dimensions (mm) & Circuit Diagrams



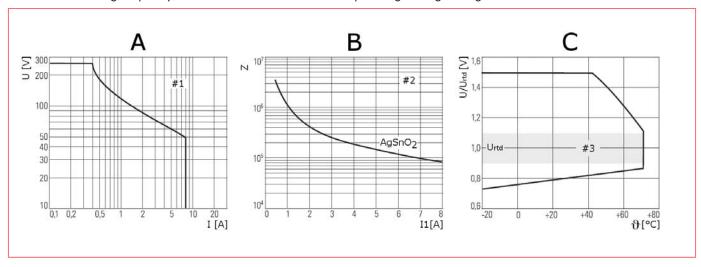
### Dimensions & Circuit Diagrams

#1	SR2
#1.1	2 CO, 6 A
#2	SR4
#2.1	2 NO und 2 NC, 8 A
#2.2	3 NO und 1 NC, 8 A
#3	SR6
#3.1	4 NO und 2 NC, 8 A

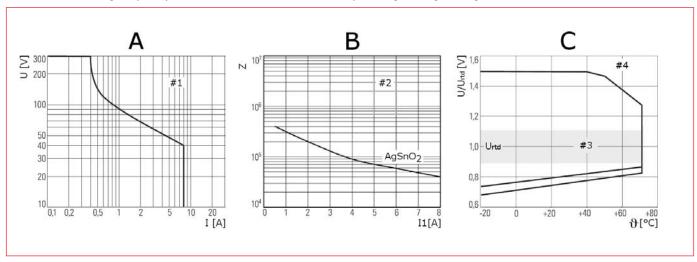
### Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range SR2



- Force-guided Contacts Relays Schrack, Series SR, Print Version
- Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range SR4



### Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Range SR6



### Rated Breaking Capacity, Electrical Service Life & Coil Operating Voltage Ranges

SR2		
Α	Max. DC rated breaking capacity	
В	Electrical service life	
С	Coil operating range DC	
#1	Resistive load	
#2	250 V AC resistive load	
#3	Recommended voltage range in [V]	
U	DC voltage in [V]	
$U/U_{rtd}$	Coil voltage in [V]	
ı	DC current in [A]	
11	Switching current in [A]	
Z	Cycles	
Ů	Ambient temperature in [°C]	

SR4			
Α	Max. DC rated breaking capacity		
В	Electrical service life		
С	Coil operating range DC		
#1	Resistive load		
#2	250 V AC resistive load on 1 NO contact		
#3	Recommended voltage range in [V]		
U	DC voltage in [V]		
U/U <sub>rtd</sub>	Coil voltage in [V]		
ı	DC current in [A]		
11	Switching current in [A]		
Z	Cycles		
Ů	Ambient temperature in [°C]		

SR6		
Α	Max. DC rated breaking capacity	
В	Electrical service life	
С	Coil operating range DC	
#1	Resistive load	
#2	250 V AC resistive load on 1 NO contact	
#3	Recommended voltage range in [V]	
#4	1200mW coil	
U	DC voltage in [V]	
U/U <sub>rtd</sub>	Coil voltage in [V]	
I	DC current in [A]	
11	Switching current in [A]	
Z	Cycles	
Ů	Ambient temperature in [°C]	



# ■ Force-guided Contacts Relays Schrack, Series SR, Print Version

### ■ Technical Data

CONTACT DATA		SR2	SR4	SR6
Number of contacts and type		2 CO	2 NO und 2 NC or 3 NO und 1 NC	4 NO und 2 NC
Contact style	EN 50205		Single contact, force guided	
Rated current		6 A	8	A
Rated voltage/ max. switching voltage AC			250 / 400 V~	
Min. recommended contact load			5 V / 10 mA	
Initial contact resistance			$<$ 100 m $\Omega$ at 1 A, 24 V DC	
Contact material		AgNi	AgS	$nO_2$
Frequency of operation	With load Without load	300 min <sup>-1</sup>	6 min <sup>-1</sup>	min <sup>-1</sup>
Contact ratings according to IEC60947-5-1	AC15 DC13		3 A (1 NO)	5 A (2 NO) 6 A (2 NO)
Mechanical service life			10 x 10 <sup>6</sup> Operations	
INSULATION DATA				
Dielectric strength	Open contacts Contact and coil	2000.1/	1500 V <sub>rms</sub> 4000 V <sub>rms</sub>	2000 V
	Adjacent contacts	3000 V <sub>rms</sub>	2500 V <sub>rms</sub>	3000 V <sub>rms</sub>
Clearance/ creepage	Open contacts  Contact and coil	≥ 8 / 8 mm	≥ 10 / 10 mm	≥ 5.5 / 5.5 mm
Insulation to EN 50178	Adjacent contacts	≥ 5.5 / 5.5 mm	≥ 3 / 3.5 mm	
Type of insulation	Contact and coil Adjacent contacts	Reinforced	Reinforced Basic	Reinforced
Ambient temperature			-25+70 °C	
DESCRIPTION			AVAILABL	E ORDER NO.
24V-DC, 2 CO, 6A			35-00	₽ SR2Y5024
24V-DC, 2 NO, 2 NC, 8A				\$R4D4024
24V-DC, 3 NO, 1 NC, 8A				SR4M4024
24V-DC, 4 NO, 2 NC, 8A			000 0-	₽ SR6B4024



# ■ Force-guided Contacts Relays Schrack, Series SR, in DIN Rail Module





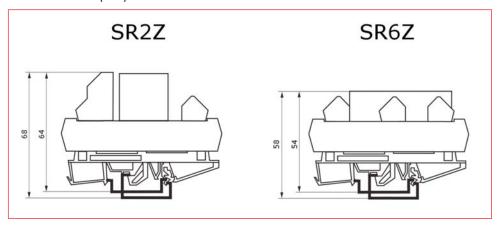


SR2ZY024

Schrack-Info

- 2 poles 6 A
- 2 CO, 6 A
- Coil 24 V DC
- SR2 on DIN rail module
- Spring clamp terminals

### Dimensions (mm)



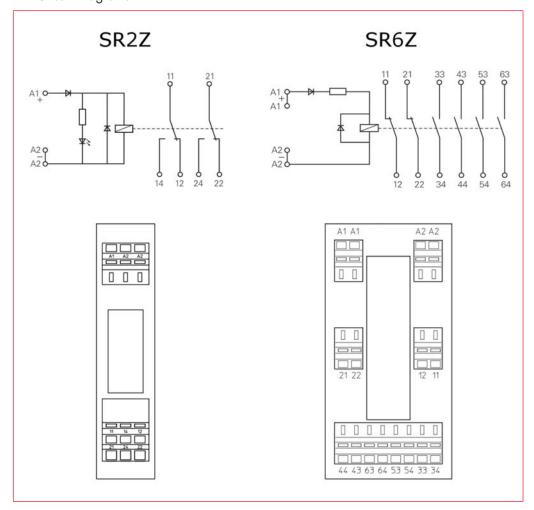
#### Dimensions

SR2Z	Module length: 87 mm Module width: 20 mm	
SR6Z	Module length: 87 mm Module width: 46 mm	

#### General Info

Fit onto mounting rails according DIN EN 60175

- Force-guided Contacts Relays Schrack, Series SR, in DIN Rail Module
- Circuit Diagrams



# ■ Force-guided Contacts Relays Schrack, Series SR, in DIN Rail Module

### Technical Data

	SR2Z	SR6Z
	2 CO	4 NO und 2 NC
EN 50205	Single conta	ict, force guided
	6 A	8 A
	250 /	/ 250 V~
	5 V ,	/ 10 mA
	≤ 100 mΩ c	at 1 A, 24 V DC
	AgNi	AgSnO <sub>2</sub>
With load	6	min <sup>-1</sup>
Without load	300 min <sup>-1</sup>	150 min <sup>-1</sup>
AC15	-	5 A (1 NO)
DC 13	-	6 A (1 NO)
	10 x 10 <sup>6</sup>	Operations
% of rated coil voltage	90 to 11	10 % of Urtd
Release voltage (+23 °C)	10 %	6 of Urtd
% of rated coil voltage	110 %	-
Max. coil power	700 mW	1200 mW
	LED	-
Open contacts	1500 V <sub>rms</sub>	1000 V <sub>rms</sub>
Contact and coil	4000 V <sub>rms</sub>	3000 V <sub>rms</sub>
Adjacent contacts	20	00 V <sub>rms</sub>
Open contacts	Micro di	isconnection
Contact and coil	≥ 8 / 8 mm	≥ 5.5 / 5.5 mm
Adjacent contacts	≥ 1 /1 mm	≥ 2.8 / 2.8 mm
Contact and coil	Reir	nforced
Adjacent contacts	В	Basic
		5 mm <sup>2</sup>
Stranded wire		5 mm <sup>2</sup>
Stranded wire with ferrule		5 mm <sup>2</sup>
	Spring clo	amp terminals
		Any
F /1 III	0	.40 °C
For mounting/ handling		50 °C
	With load Without load AC15 DC13  % of rated coil voltage Release voltage (+23 °C) % of rated coil voltage Max. coil power  Open contacts Contact and coil Adjacent contacts Contact and coil Adjacent contacts Contact and coil Adjacent contacts  Contact and coil Adjacent contacts  Solid wire Stranded wire	2 CO   EN 50205   Single contact

DESCRIPTION	AVAILABLE	ORDER NO.
24V-DC, 2 CO, 6A		SR2ZY024
24V-DC, 4 NO, 2 NC, 8A		SR6ZB024



# Modular Relays



### Schrack-Info

- Coupling relay
- Installation design

# ■ Modular Relays





### Schrack-Info

- 1 or 2 CO, 8A
- Supply voltage 12 or 24 up to 240V-AC/DC
- Width 17.5 or 35 mm

	CD Set THEAD		

	SCHOOLACK East-1000
	©
BZ651000	

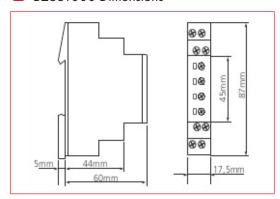
BZ652000

tracts Indiards: Indiards: Icators Ica	1CO, 8A  EN 55011, EN61000  Position of o  Terminals to 240V AC/DC -15% to +10% 4VA (1.5W)	output relay	
icators  ow LED ON/OFF  of circuit:  ply voltage  minal voltage 24  rance ed consumption  minal frequency y cycle	Position of a  Terminals to 240V AC/DC  -15% to +10%  4VA (1.5W)	Dutput relay A1 - A2 12 to 240V AC/DC	
ow LED ON/OFF  It circuit:  ply voltage  minal voltage 24  rance ed consumption  minal frequency y cycle	Terminals to 240V AC/DC -15% to +10% 4VA (1.5W)	A1 - A2 12 to 240V AC/DC	
at circuit:  ply voltage  minal voltage 24  rance ed consumption  minal frequency y cycle	Terminals to 240V AC/DC -15% to +10% 4VA (1.5W)	A1 - A2 12 to 240V AC/DC	
ply voltage minal voltage 24 rance ed consumption minal frequency y cycle	to 240V AC/DC -15% to +10% 4VA (1.5W)	12 to 240V AC/DC	
minal voltage 24 rance ed consumption minal frequency y cycle	to 240V AC/DC -15% to +10% 4VA (1.5W)	12 to 240V AC/DC	
rance ed consumption minal frequency y cycle	-15% to +10% 4VA (1.5W)	•	
ed consumption minal frequency y cycle	4VA (1.5W)	10% to ±10%	
minal frequency y cycle		-10/010 +10/0	
y cycle	. =	6VA (2W)	
	48 up to	63 Hz	
at time	1		
n line	after 10	00 ms	
p-out voltage	>30%		
ervoltage category	III (according to	IEC 60664-1)	
ed surge voltage 4 kV	4k	·V	
tput			
ormally open contact Terminals	15 - 16, 18	15 - 12, 14 and 21 - 22, 24	
ed voltage	250V	/-AC	
tching capacity	2000VA (8A / 24V-DC	C, 24V-AC, 250V-AC)	
chanical life	20 x 10 <sup>6</sup> o	pperations	
trical life	Resistive load: 2 x 10 <sup>5</sup> c	operations at 1000VA	
bient conditions			
pient temperature	-25 to + 55 °C (com	plies with IEC 68-1)	
age temperature	-25 to +70°C		
ative humidity	15% to 85% (according to	IEC 60721-3-3 class 3K3)	
ution degree	2, when built-in 3 (acco	ording to IEC 60664-1)	
chanical Design			
using	Made of self-extinguishir	ng plastic, IP rating IP40	
unting	on DIN rail TS 35 acc	cording to EN 60715	
ckproof terminal connection according to VBG 4 (PZ1 pired)	IP rating IP20		
minals			
ninal capacity	1 x 0.5 to 2.5 mm <sup>2</sup> with/w	rithout multicore cable end	
	$2 \times 0.5$ to $1.5 \text{ mm}^2$ with/w	rithout multicore cable end	
	1 x 4 mm <sup>2</sup> without m	nulticore cable end	
	2 x 2 5 mm <sup>2</sup> flexible with	nout multicore cable end	
tening torque	Z X Z.J IIIII IIEXIDIE WIIII		

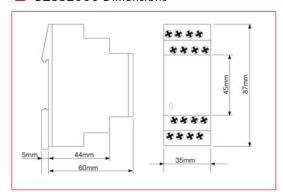


### ■ Modular Relays

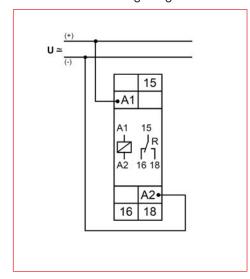
### BZ651000 Dimensions



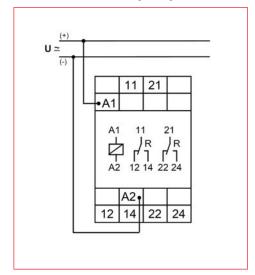
#### BZ652000 Dimensions



### BZ651000 Wiring Diagram



### BZ652000 Wiring Diagram



DESCRIPTION	AVAILABLE	ORDER NO.
1 CO 8A/250V-AC, Coil 24-240V AC/DC	333 0- 0	BZ651000
2 CO 8A/250V-AC, Coil 12-240V AC/DC	355 0-0	BZ652000

### PLC Series EASY



### Schrack-Info

For easy switching of complex requirements. It is very easy with the EASY control relay to realize the requirements only with a keystroke or with the comfortable EASY-Soft on the PC. The easy menu navigation simplifies the entering. Saving of installation and wiring costs.

EA274108

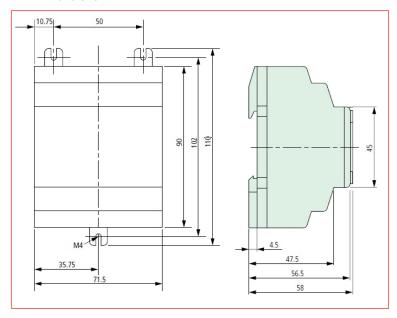
	EA274103	EA274104	EA274108	EA274109	EA274115	EA274121		
Nominal supply power	100 - 240 V AC	V AC 100 - 240 V AC 24 V DC		24 V DC	100 - 240 V AC	24 V DC		
Power losses	5 VA	5 VA	2 W	2 W	10 VA	3,5 W		
Input, digital	8	8	8	8	12	12		
Input analogue 0-10 V (option)	-	-	2	2	-	4		
Output, digital (R=relay, T=transistor)	4R	4R	4R	4R	6R	8T		
Output analogue 0-10 V (option)	-	-	-	-	-	-		
LC-display/keypad	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes		
Week-/year timer	-/-	yes/yes	-/-	yes/yes	yes/yes	yes/yes		
Continues output	8A	8A	8A	8A	8A	0,5 A		
Short-circuit proof at cos φ=1			MCB B16 = 600 A			-		
Short-circuit proof at cos φ=0,50,7			MCB B16 = 900 A			-		
Terminal connection			0,2-4,0mm <sup>2</sup> (AV 0,2-2,5mm <sup>2</sup> (AW	VG 22, 12), rigid G 22, 12), flexible				
Degree of protection			IP	20				
Radio frequency interference		EN 55	5011, EN 55022 cla	ss B, IEC 61000-6-1	1,2,3,4			
Working ambient temperature			-25°C .	+55°C				
Transport and stock temperature			-40°C.	+70°C				
Approvals		EN50178, IEC/EN 60947, UL, CSA						
Mounting		rail mounting acc. DIN 50022, 35 mm or for screw mounting use adapter ZB4-101-GF1						
Measurement (W x H x D)mm		71,5 x 90	) x 58 mm		107,5 x 90	x 58 mm		

	EA212314	EA232112	EA256267	EA274110	EA274113	EA274119			
Supply power	100 - 240 V AC	24 V DC	100 - 240 V AC	24 V DC	24 V DC	24 V DC			
Power losses	10 VA	4 W	10 VA	2 W	7 VA	3,5 W			
Input, digital	12	12	12	8	12	12			
Input analogue 0-10 V (option)	-	-	-	2	4	4			
Output, digital (R=relay, T=transistor	6R	6R	6R	4R	6R	6R			
Output analogue 0-10 V (option)	-	-	-	-	-	-			
LC-display/keypad	-/-	-/-	yes/yes	-/-	yes/yes	yes/yes			
Week-/year timer	-/-	-/-	yes/yes	yes/yes	yes/yes	yes/yes			
Continues output	A8	8A	8A	8A	8A	8A			
Short-circuit proof at cos φ=1			MCB B16 = 600 A						
Short-circuit proof at cos φ=0,50,7		MCB B16 = 900 A							
Terminal connection			0,2-4,0mm <sup>2</sup> (AV 0,2-2,5mm <sup>2</sup> (AW						
Degree of protection			IP 2	20					
Radio frequency interference		EN 3	55011, EN 55022 clas	s B, IEC 61000-6-1	,2,3,4				
Working ambient temperature			-25°C	. +55°C					
Transport and stock temperature			-40°C	. +70°C					
Approvals			EN50178, IEC/EN	1 60947, UL, CSA					
Mounting		rail mounting acc. DIN 50022, 35 mm or for screw mounting use adapter ZB4-101-GF1							
Measurement (W x H x D)mm	107,5 x 90	x 58 mm	107,5 x 90 x 72 mm	71,5 x 90 x 58 mm	0 x 58 mm				

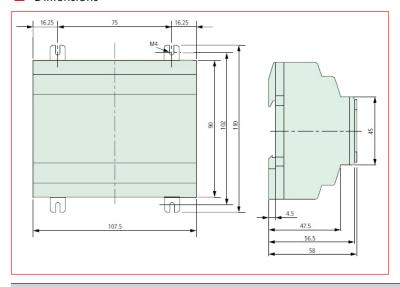


### PLC Series EASY

#### Dimensions



### Dimensions



DESCRIPTION	AVAILABLE	ORDER NO.
EASY512ACRC-100-240VAC, control relay, 81N-digital, 4OUT-relays, clock	333 0-0	EA274104
EASY512ACR-100-240VAC, control relay, 8IN-digital, 4OUT-relays	000 0-0	EA274103
EASY512DCR-24VDC, controlrelay, 8IN-digital, 4OUT-relays	355 0-0	EA274108
EASY512DCRC-24VDC, control relay, 8IN-digital, 4OUT-relays, clock	000 0-0	EA274109
EASY512DCRCX-24VDC, control relays without display, 2IN-Analog, 2IN-digital, 4OUT-relays		EA274110
EASY719ABRC-24VAC, control relay, 41N-Analog, 81N-digital, 4OUT-relays; clock		EA274113
EASY719ACRC-100-240VAC, control relay, 12IN-digital, 6OUT-relays, clock	355 0-0	EA274115
EASY719DCRC-24VDC,control relay, 12IN-digital, 6OUT-relays, clock	555 0-0	EA274119
EASY721 DCTC-24VDC, control relay, 12IN-digital, 8OUT-Transistor, clock	355 0-0	EA274121
EASY618ACRE-240VAC, control relay expansion, 12IN-dig, 6OUT-relays	000 0-0	EA212314
EASY618DCRC-24VDC ,control relay expansion, 12IN-digital, 6OUT-relays		EA232112
EASY819ACRC-100-240VAC, control relay, 12IN-digital, 6OUT-relays, clock	000 0-0	EA256267
Windows programing software for easy400-700	300 0-0	EA284545
EASY500/700 -Memory module, extern		EA270884
EASY-PC-Programming cable RS232; control relay easy	555 0-6	EA202409
EASY400-Switched power supply 100-240VAC/24VDC, 1,25A, 1 phase		EA212319
EASY800PC cable for programming	555 0-6	EA256277
EASY-PC-Programming cable USB; easy 500 + 700	000 0-0	EA107926





Timer Relays Series ZR4



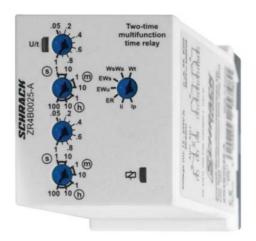
■ Timer Relays Series AMPARO



Timer Relays Series ZR5



■ Timer Relays Series ZR4



■ Timer Relays Series ZR6



# Timer Relays

✓ Index		
Timer Relays Series ZR5	Page	98
Timer Relays Series ZR4	Page	107
Timer Relays Series AMPARO	Page	112
Timer Relays Series ZR6	Page	116















### Schrack-Info

#### ZR5E0011

- 1 CO
- Mode: "E"
- Multi-voltage 24-240 V AC/DC
- In-line design
- 17.5 mm component width

#### ZR5R0011

- 1 CO
- Mode: "R"
- Multi-voltage 24-240 V AC/DC
- In-line design
- 17.5 mm component width

### ZR5ER011

- 1 CO
- Modes: "E" & "R"
- Multi-voltage 24-240 V AC/DC
- In-line design
- 17.5 mm component width

#### ZR5MF011

- Multi-function timer relay
- 1 CO
- Modes: "E", "R", "Ws", "Wa", "Es", "Wu"
   & "Bp"
- Multi-voltage 12-240 V AC/DC
- In-line design
- 17.5 mm component width

#### ZR5MF025

- Multi-function timer relay
- 2 CO
- Modes: "E", "R", "Ws", "Wa", "Es", "Wu"
   & "Bp"
- Multi-voltage 12-240 V AC/DC
- In-line design
- 35 mm component width

#### ZR5B0011

- 1 CO
- Modes: " lp" & "li"
- Multi-voltage 12-240 V AC/DC
- In-line design
- 17.5 mm component width

#### ZR5B0025

- Multi-function dual time flasher relay with internal clock
- 2 CO
- Wide input voltage range
- Modes: "lp", "li", "ER", "EWu", "EWs", WsWa" & "Wt"
- Multi-voltage 12-240 V AC/DC
- In-line design
- 35 mm component width

#### **ZR5SD025**

- 2 CO
- Wide input voltage range
- Mode: "S"
- Multi-voltage 12-240 V AC/DC
- In-line design
- 35 mm component width

#### ZR5RT011

- Timer function for emergency lighting tests
- 1 CO
- Integrated test switch
- Mode: "Ws"
- 230 V AC
- In-line design
- 17.5 mm component width

#### NOTE:

 The timer function must be selected in a de-energised state!

# Overview Timer Relays ZR5

Article	Number of contacts and type	Voltage range	Number of time ranges	Number of functions	E	R	Ws	Wa	Es	Wu	Вр	lр	li	ER	EWυ	EWs	WsWa	Wt	s	WsTest
ZR5E0011	1 CO	24-240 V AC / DC	7	1	Х															
ZR5R0011	1 CO	24-240 V AC / DC	7	1		Х														
ZR5ER011	1 CO	24-240 V AC / DC	7	2	Χ	Х														
ZR5MF011	1 CO	12-240 V AC / DC	7	7	Х	X	X	X	Х	Х	Х									
ZR5MF025	2 CO	12-240 V AC / DC	7	7	Х	X	Х	Х	Х	Х	Х									
ZR5B0011	1 CO	12-240 V AC / DC	7	2								Х	Χ							
ZR5B0025	2 CO	12-240 V AC / DC	7	7								Х	Χ	Х	Χ	Х	Х	Х		
ZR5SD025	2 CO	12-240 V AC / DC	4	1		Π													Χ	
ZR5RT011	1 CO	230 V AC	6	1																Х

### Overview Modes

Article	
ZR5E0011	Time relay ON delay
ZR5R0011	Time relay OFF delay
ZR5ER011	Time relay ON-OFF delay
ZR5MF011	AA lef e
ZR5MF025	Multifunction time relays
ZR5B0011	Dulan dinan nalawa
ZR5B0025	Pulse time relay
ZR5SD025	Star-Delta relay
ZR5RT011	Emergency light test relay

#### Functions

E	ON delay	
R	OFF delay	(with control contact)
Ws	Single shot leading edge	(with control contact)
Wa	Single shot trailing edge	(with control contact)
Es	ON delay	(with control contact)
Wu	Single shot leading edge voltage controlled	
Вр	Flasher pause first	
ER	ON and OFF delay	(with control contact)
EWυ	ON delay and single shot leading edge voltage controlled	
EWs	ON delay and single shot leading edge	(with control contact)
WsWa	Single shot leading- and single shot trailing edge	(with control contact)
Wt	Pulse sequence monitoring	
S	Star-Delta start-up	
WsTest	Single shot leading edge	(with control contact)

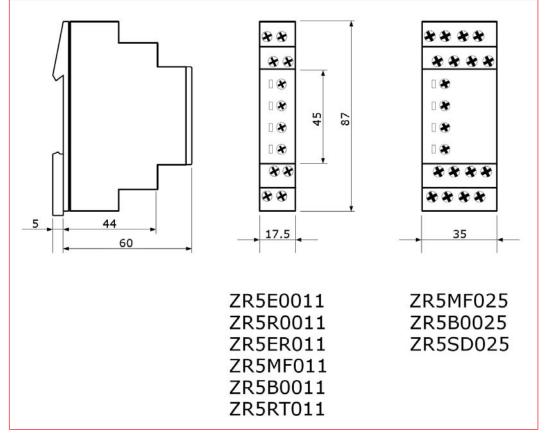
### ZR5B0011

lp	Asymmetric flasher pause first (flashing)
li	Asymmetric flasher pulse first (flashing)

### ZR5B0025

lp	Asymmetric flasher pause first (pulsing)
li	Asymmetric flasher pulse first (pulsing)

### Dimensions (mm)



### Configuration & Functionalities

# 1 2 2 34 5

### ■ Configuration & Functions

#### Example ZR5MF011

1	Operation display
2	Adjustable time range 50 ms to 100 h
3	Adjustable function area (E, R, Ws, Wa, Es, Wu and Bp)
4	45 mm cap dimension
5	Multi-voltage 12 or 24 V to 240 V AC / DC

### ■ Time Ranges

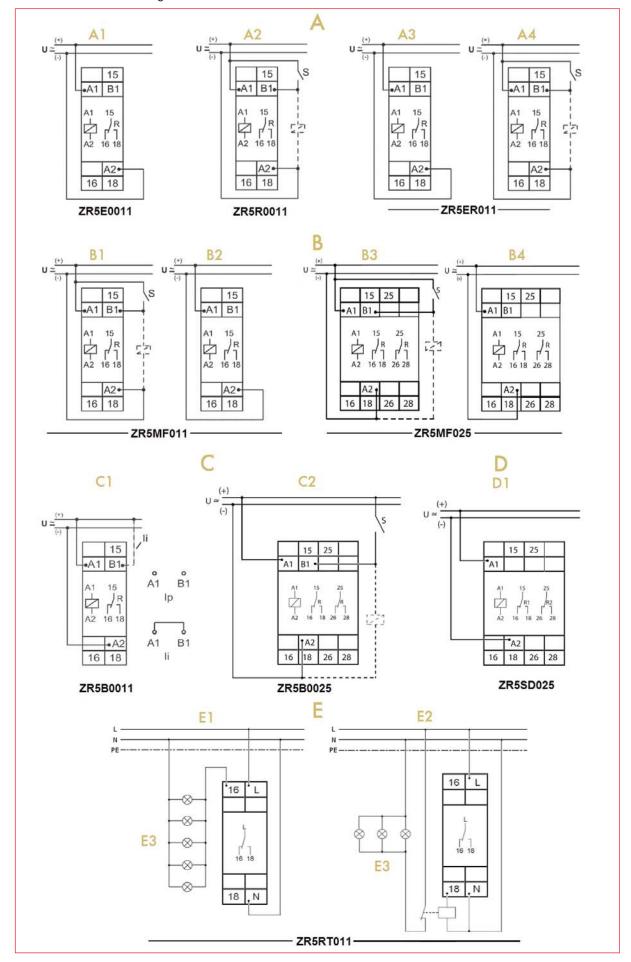
ZR5E0011, ZR5R0011, ZR5ER011, ZR5MF011, ZR5MF025, ZR5B0011, ZR5B0025					
Time range	Adjustment range				
1 s	50 ms - 1 s				
10 s	500 ms - 10 s				
1 min	3 s - 1 min				
10 min	30 s - 10 min				
1 h	3 min - 1 h				
10 h	30 min - 10 h				
100 h	5 h - 100 h				

ZR5SD025						
Time range	Adjustment range					
10 s	500 ms - 10 s					
30 s	1500 ms - 30 s					
1 min	3 s - 1 min					
3 min	9 s - 3 min					

ZR5RT011
Time range reversible
10min, 30 min, 60 min,
90 min, 2 h und 3 h



### Overview Circuit Diagrams

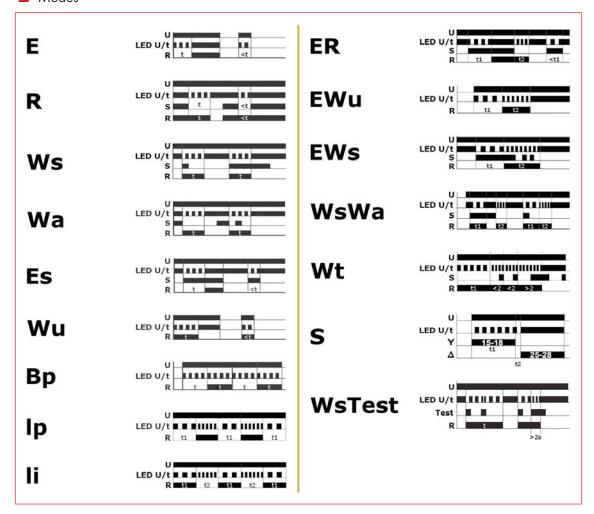


# Overview Circuit Diagrams

Α	ON/OFF-DELAY RELAYS	
A1	ON delay (E)	without control contact
A2	OFF delay (R)	with control contact "S"
А3	ON delay (E)	without control contact
A4	OFF delay (R)	with control contact "S"
В	MULTIFUNCTION RELAYS	
В1	OFF delay (R), Single shot leading edge (Ws), Single shot trailing edge (Wa) and ON delay with control input (Es)	with control contact "S"
B2	ON delay (E), Single shot leading edge voltage controlled (Wu) and Flasher pause first (Bp)	without control contact
В3	OFF delay (R), Single shot leading edge (Ws), Single shot trailing edge (Wa) and ON delay with control input (Es)	with control contact "S"
В4	ON delay (E), Single shot leading edge voltage controlled (Wu) and Flasher pause first (Bp)	without control contact
С	FLASHING RELAYS	
C1	Asymmetric flasher pause first (lp) and Asymmetric flasher pulse first (li)	without control contact
C2	Asymmetric flasher pause first (lp), Asymmetric flasher pulse first (li), ON delay and single shot leading edge voltage controlled (EWu), Pulse sequence monitoring (Wt), ON delay and OFF delay with control contact (ER), ON delay and single shot leading edge (EWs) as well as Single shot leading and single shot trailing edge (WsWa)	with control contact "S"
D	TIMER STAR-DELTA	
D1	Star-delta start up (S)	without control contact
E	EMERGENCY LIGHT TEST RELAY	
	Single shot leading edge (Ws)	with control contact "S"
E1	Direct connection of emergency lights (I < 16 A)	
E2	Switching emergency lights with contactor (I > 16 A)	
E3	Emergency lights with integrated rechargeable power cells	



#### Modes



### Overview Modes

lр

li

Article	E	R	Ws	Wa	Es	Wυ	Вр	lр	li	ER	EWυ	EWs	WsWa	Wt	S	WsTest
ZR5E0011	Χ															
ZR5R0011		Х														
ZR5ER011	Χ	Х														
ZR5MF011	Χ	Х	Х	Х	Х	Х	Х									
ZR5MF025	Χ	Х	Х	Х	Х	Х	Х									
ZR5B0011								Х	Х							
ZR5B0025								Х	Х	Х	Х	Х	Х	Χ		
ZR5SD025															Х	
ZR5RT011																X

lр

li

#### Detailed Description of Modes (Part 1)

	ZK2B00
-	

#### Asymmetric flasher pause first (flashing)

When the supply voltage **U** is applied, the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired, the output relay switches into off-position (yellow LED not illuminated). The output relay is triggered at the ratio of **t1:t2** until the supply voltage is interrupted.

#### Asymmetric flasher pulse first (flashing)

When the supply voltage  ${\bf U}$  is applied, the output relay  ${\bf R}$  switches into on-position (yellow LED illuminated) and the set interval  ${\bf t1}$  begins (green LED  ${\bf U}/{\bf t}$  flashes slowly). After the interval  ${\bf t1}$  has expired, the output relay switches into off-position (yellow LED not illuminated) and the set interval  ${\bf t2}$  begins (green LED  ${\bf U}/{\bf t}$  flashes fast). After the interval  ${\bf t2}$  has expired, the output relay switches into on-position (yellow LED illuminated). The output relay is triggered at the ratio of  ${\bf t1}$ : ${\bf t2}$  until the supply voltage is interrupted.

#### ZR5B0025

#### Asymmetric flasher pause first (pulsing)

When the supply voltage **U** is applied, the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired, the output relay switches into off-position (yellow LED not illuminated). The output relay is triggered at the ratio of **t1:t2** until the supply voltage is interrupted.

#### Asymmetric flasher pulse first (pulsing)

When the supply voltage **U** is applied, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay switches into off-position (yellow LED not illuminated) and the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired, the output relay switches into on-position (yellow LED illuminated). The output relay is triggered at the ratio of **t1:t2** until the supply voltage is interrupted.



#### Detailed Description of Modes (Part 2)

#### ON delay

E

When the supply voltage  $\mathbf{U}$  is applied, the set interval  $\mathbf{t}$  begins (green LED  $\mathbf{U}/\mathbf{t}$  flashes). After the interval  $\mathbf{t}$  has expired (green LED  $\mathbf{U}/\mathbf{t}$  illuminated) the output relay  $\mathbf{R}$  switches into on-position (yellow LED illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the interval  $\mathbf{t}$ , the interval already expired is erased and is restarted when the supply voltage is next applied.

#### OFF delay with control contact "S"

R

The supply voltage **U** must be constantly applied to the device (green LED **U/t** illuminated). When the control contact **S** is closed, the output relay **R** switches into on-position (yellow LED illuminated). If the control contact is opened, the set interval **t** begins (green LED **U/t** flashes). After the interval **t** has expired (green LED **U/t** illuminated) the output relay switches into off-position (yellow LED not illuminated). If the control contact is closed again before the interval **t** has expired, the interval already expired is erased and is restarted.

#### Single shot leading edge with control contact "S"

Ws

The supply voltage **U** must be constantly applied to the device (green LED **U/t** illuminated). When the control contact **S** is closed, the output relay **R** switches into on-position (green LED **U/t** illuminated) and the set interval **t** begins (green LED **U/t** flashes). After the interval **t** has expired (green LED **U/t** illuminated) the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

#### Single shot trailing edge with control contact "S"

Wa

The supply voltage  $\mathbf{U}$  must be constantly applied to the device (green LED  $\mathbf{U}/\mathbf{t}$  illuminated). Closing the control contact  $\mathbf{S}$  has no influence on the condition of the output  $\mathbf{R}$ . When the control contact is opened, the output relay switches into on-position (yellow LED illuminated) and the set interval  $\mathbf{t}$  begins (green LED  $\mathbf{U}/\mathbf{t}$  flashes). After the interval  $\mathbf{t}$  has expired (green LED  $\mathbf{U}/\mathbf{t}$  illuminated), the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

#### ON delay with control contact "S"

Es

The supply voltage  $\mathbf{U}$  must be constantly applied to the device (green LED  $\mathbf{U}/\mathbf{t}$  illuminated). When the control contact  $\mathbf{S}$  is closed, the set interval  $\mathbf{t}$  begins (green LED  $\mathbf{U}/\mathbf{t}$  flashes). After the interval  $\mathbf{t}$  has expired (green LED  $\mathbf{U}/\mathbf{t}$  illuminated) the output relay  $\mathbf{R}$  switches into on-position (yellow LED illuminated). This status remains until the control contact is opened again. If the control contact is opened before the interval  $\mathbf{t}$  has expired, the interval already expired is erased and is restarted with the next cycle.

### Single shot leading edge, voltage controlled

Wu

When the supply voltage  $\mathbf{U}$  is applied, the output relay  $\mathbf{R}$  switches into on-position (yellow LED illuminated) and the set interval  $\mathbf{t}$  begins (green LED  $\mathbf{U}/\mathbf{t}$  flashes). After the interval  $\mathbf{t}$  has expired (green LED  $\mathbf{U}/\mathbf{t}$  illuminated) the output relay switches into off-position (yellow LED not illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval  $\mathbf{t}$  has expired, the output relay switches into off-position. The interval already is erased and is restarted when the supply voltage is next applied.

#### Flasher pause first

Вр

When the supply voltage  ${\bf U}$  is applied, the set interval  ${\bf t}$  begins (green LED  ${\bf U}/{\bf t}$  flashes). After the interval  ${\bf t}$  has expired, the output relay  ${\bf R}$  switches into on-position (yellow LED illuminated) and the set interval  ${\bf t}$  begins again. After the interval  ${\bf t}$  has expired, the output relay switches into off-position (yellow LED not illuminated). The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted.

#### ON delay and OFF delay with control contact "S"

ER

The supply voltage **U** must be constantly applied to the device (green LED **U/t** illuminated). When the control contact **S** is closed, the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into on-position (yellow LED illuminated). If the control contact is opened, the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired, the output relay switches into off-position (yellow LED not illuminated). If the control contact is opened before the interval **t1** has expired, the interval already expired is erased and is restarted with the next cycle.

#### ON delay and single shot leading edge, voltage controlled

EWυ

When the supply voltage **U** is applied, the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired, the output relay switches into off-position (yellow LED not illuminated). If the supply voltage is interrupted before the interval **t1+t2** has expired, the interval already expired is erased and is restarted when the supply voltage is next applied.

#### ON delay and single shot leading edge with control contact "S"

EWs

The supply voltage **U** must be constantly applied to the device (green LED **U/t** illuminated). When the control contact **S** is closed, the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired, the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

## Single shot leading and single shot trailing edge with control contact "S"

WsWa

The supply voltage **U** must be constantly applied to the device (green LED **U/t** illuminated). When the control contact **S** is closed, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into off-position (yellow LED not illuminated). If the control contact is opened, the output relay again switches into on-position (yellow LED illuminated) and the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times.

#### Pulse sequence monitoring

Wt

When the supply voltage **U** is applied, the set interval **t1** begins (green LED **U/t** flashes slowly) and the output relay **R** switches into on-position (yellow LED illuminated) After the interval **t1** has expired, the set interval **t2** begins (green LED **U/t** flashes fast). So that the output relay **R** remains into on-position, the control contact **S** must be closed and opened again within the set interval **t2**. If this does not happen, the output relay **R** switches into off-position (yellow LED not illuminated) and all further pulses at the control contact are ignored. To restart the function the supply voltage must be interrupted and reapplied.

#### Star-delta start up

S

When the supply voltage **U** is applied, the star-contact switches into onposition (yellow LED illuminated) and the set star-time **t1** begins (green LED **U/t** flashes). After the interval **t1** has expired (green LED **U/t** illuminated), the star-contact switches into off-position (yellow LED not illuminated) and the set transit-time **t2** begins. After the interval **t2** has expired, the contact for the delta-contactor switches into on-position. To restart the function, the supply voltage must be interrupted and reapplied.

#### Single shot leading edge with control contact "S"

WsTest

The supply voltage  $\mathbf{U}$  must be constantly to the device (green LED  $\mathbf{U/t}$  illuminated). Pressing the integrated test key forces the output relay  $\mathbf{R}$  to switch into on-position (yellow LED illuminated), so the emergency lights are disconnected from the mains and the set interval  $\mathbf{t}$  begins (green LED  $\mathbf{U/t}$  flashes). After the interval  $\mathbf{t}$  has expired (green LED  $\mathbf{U/t}$  illuminated), the output relay  $\mathbf{R}$  switches into off-position (yellow LED not illuminated) and the emergency lights are reconnected to the mains. During the interval, the test key can be operated any number of times. Prolonged pressure on the test key (>2s) aborts the running test interval (green LED  $\mathbf{U/t}$  flashes fast) and a further cycle can be started.



# ■ Technical Data

			ZR5E0011	ZR5R0011 ZR5ER01	1 ZR5MF011	ZR5MF025				
INDICATORS	Green LED U/t ON			Indication of supp	y voltage					
Green LED U/t flashes			Indication of time period							
	Yellow LED R ON/OFF		Indication of relay outputs							
MECHANICAL DESIGN	Housing			Self-extinguishing plastic housing						
	IP rating housing			IP40						
	Mounting	(EN 50022)		DIN-rail TS	35					
	Terminal	(VBG 4, PZ1 required)		Shockproof terminal	connection					
	IP rating terminal			IP20						
	Mounting position			Any						
	Tightening torque			Max. 1 N	m					
	Terminal capacity		1 >	0.5 to 2.5 mm <sup>2</sup> with/witho	ut multicore cable	end				
			1 x 4 mm <sup>2</sup> without multicore cable end							
			2 x 0.5 to 1.5 mm <sup>2</sup> with/without multicore cable end							
			2 x 2.5 mm² flexible without multicore cable end							
INPUT CIRCUIT	Input			Terminals A1(						
	Supply voltage		24	- 240 V AC / DC	12 - 240	V AC/DC				
	Tolerance		24 V	I5 % to 240 V+10 %	12 V10 %	to 240 V+10%				
	Rated consumption			4 VA (1.5 W)		6 VA (2W)				
	Rated frequency			48 to 63 h	lz					
	Duty cycle			100 %						
	Reset time			100 ms						
	Residual ripple for DC			10 %						
	Drop-out voltage		> 30 % of minimum rated supply voltage							
	Overvoltage category	(IEC 60664-1)	III							
	Rated surge voltage		4 kV							
OUTPUT CIRCUIT	Number of contacts and type		1 CO 2 potential free							
	Rated voltage			250 V AC						
	Switching capacity		2000 VA (8 A / 250 V)							
	Fusing		8 A fast acting							
	Mechanical service life		20 x 10 <sup>6</sup> operations							
	Electrical service life		2 x 10 <sup>5</sup> operations at 1000 VA resistive load							
	Switching frequency			Max. 60/min at 100 V						
	gq,	(IEC 947-5-1)	max. 6/min at 1000 VA resistive load							
	Overvoltage category	(IEC 60664-1)	III III III III III III III III III II							
	Rated surge voltage	(12000000)	1	4 kV						
CONTROL INPUT	Input not potential free		Terminals A1-B1							
	Loadable		NO	10111	Yes					
	Max. line length		CONTROL		10 m					
	Trigger level (sensitivity)		CONTACT	Automatic ada	ption to supply vol	rane				
	Min. control pulse length				ms. AC 100 ms	ago				
ACCURACY	Base accuracy			±1 % of maximum s	-,					
ACCORACT	Adjustment accuracy			< 5 % of maximum						
	Repetition accuracy			< 0.5 % or ±						
	Voltage influence			- 0.5 70 61 =	5 1115					
	Temperature influence		+	≤ 0.01 % /	°C					
AMBIENT CONDITIONS	Ambient temperature	(IEC 68-1)	-25 °C to +55 °C							
AMBIENT CONDITIONS	Storage temperature	(120 00-1)	+	-25 °C to +7						
	Transport temperature		+	-25 °C to +7						
	Relative humidity	(IEC 721-3-3 class 3K3)	+	15 % to 85						
	Pollution degree	(IEC 721-3-3 class 3K3)	+	2, if built in						
	Vibration resistance	(IEC 684-1)	+	· · · · · · · · · · · · · · · · · · ·						
	Amminiminesistance	(ILC 00-Z-0)	10 to 55 Hz, 0.35 mm 15 g, 11 ms							



DESCRIPTION	AVAILABLE	ORDER NO.
Tripping and Release Delay		
Timer single function ON-delay 24-240V AC/DC, 1CO, 8A/250V	700 0-0	ZR5E0011
Timer single function OFF-delay 24-240V AC/DC, 1CO, 8A/250V	000 0-0	ZR5R0011
Timer duo function ON/OFF-delay 24-240V AC/DC, 1CO, 8A/250V	000 0-0	ZR5ER011
Multi-function Relays		
Timer multifunction 12-240V AC/DC, 1CO, 8A/250V	000 0-0	ZR5MF011
Timer multifunction 12-240V AC/DC, 2CO, 8A/250V	000	ZR5MF025
Flasher Relays		
Timer flashing 12-240V AC/DC, 1CO, 8A/250V	000	ZR5B0011
Two-time multifunction 12-240V AC/DC, 2CO, 8A/250V	000 0-0	ZR5B0025
Star-Delta Relays		
Timer Star-Delta 12-240V AC, 2CO, 8A	000 0-0	ZR5SD025
Emergency Lighting Testers		
Emergency-light-test-relay 230V, modular version	000 0-0	ZR5RT011

### ■ Timer Relays Series ZR4, for Round 11 Pole Plug-in Socket







ZR4MF025-A

ZR4B0025-A YMR

#### Schrack-Info

#### ZR4MF025-A

- Multi-function relay
- 2 CO
- Modes: "E", "R", "Ws", "Wa", "Es", "Wu" & "Bp"
- For 11 pole plug-in MT socket
- Multi-voltage 12-240 V AC/DC
- 38 mm component width
- Standard front dimension 45 mm

#### ZR4B0025-A

- Flasher relay
- 2 CO
- Internal clock
- Dual time multi-function
- Zoom voltage
- Modes: "lp", "li", "ER", "EWu", "EWs", WsWa" & "Wt"
- For 11 pole plug-in MT socket
- Multi-voltage 12-240 V AC/DC
- 38 mm component width
- Standard front dimension 45 mm

#### YMR78700

• MT socket compatible with pluggable Series ZR4 timer relays

### Overview ZR4 Timer Relays

Article	Number of contacts and type	Voltage range	Number of time ranges	Number of functions	E	R	Ws	Wa	Es	Wυ	Вр	lp	li	ER	EWυ	EWs	WsWa	Wt
ZR4MF025-A	2 CO	12 - 240 V AC / DC	7	7	Χ	Χ	Х	Х	Х	Х	Х							
ZR4B0025-A	2 CO	12 - 240 V AC / DC	7	7								Х	Х	Х	Χ	Х	Х	Х

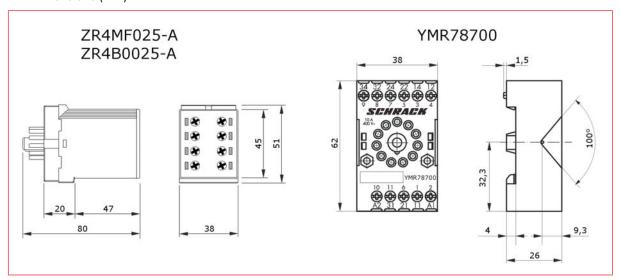
### ■ Timer Relays Series ZR4, for Round 11 Pole Plug-in Socket

### Overview Modes

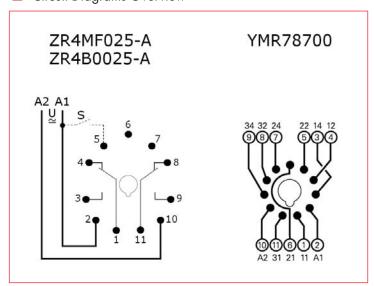
Article	
ZR4MF025-A	Pluggable multifunction relay
ZR4B0025-A	Pluggable pulse time relay

E	ON delay	
R	OFF delay	(with control contact)
Ws	Single shot leading edge	(with control contact)
Wa	Single shot trailing edge	(with control contact)
Es	ON delay	(with control contact)
Wυ	Single shot leading edge voltage controlled	
Вр	Flasher pause first	
ER	ON and OFF delay	(with control contact)
EWυ	ON delay and single shot leading edge voltage controlled	
EWs	ON delay and single shot leading edge	(with control contact)
WsWa	Single shot leading- and single shot trailing edge	(with control contact)
Wt	Pulse sequence monitoring	
lp	Asymmetric flasher pause first	
li	Asymmetric flasher pulse first	

### Dimensions (mm)



### Circuit Diagrams Overview



### Time Ranges

ZR4MF025-A, ZR4B0025-A						
Time range	Adjustment range					
1 s	50 ms - 1 s					
10 s	500 ms - 10 s					
1 min	3 s - 1 min					
10 min	30 s - 10 min					
1 h	3 min - 1 h					
10 h	30 min - 10 h					
100 h	5 h - 100 h					

### ■ Timer Relays Series ZR4, for Round 11 Pole Plug-in Socket

### Modes



### Overview Modes

Article	E	R	Ws	Wa	Es	Wυ	Вр	lр	li	ER	EWυ	EWs	WsWa	Wt
ZR4MF025-A	Х	Х	Х	Х	Х	Х	Х							
ZR4B0025-A								Х	Х	Χ	Х	Х	Х	Х

### Detailed Description of Modes (Part 1)

### ON delay

E

R

Ws

When the supply voltage  ${\bf U}$  is applied, the set interval  ${\bf t}$  begins (green LED  ${\bf U/t}$  flashes). After the interval  ${\bf t}$  has expired (green LED  ${\bf U/t}$  illuminated) the output relay  ${\bf R}$  switches into on-position (yellow LED illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the interval  ${\bf t}$ , the interval already expired is erased and is restarted when the supply voltage is next applied.

### OFF delay with conrol contact "S"

The supply voltage  ${\bf U}$  must be constantly applied to the device (green LED  ${\bf U}/t$  illuminated). When the control contact  ${\bf S}$  is closed, the output relay  ${\bf R}$  switches into on-position (yellow LED illuminated). If the control contact is opened, the set interval  ${\bf t}$  begins (green LED  ${\bf U}/t$  flashes). After the interval  ${\bf t}$  has expired (green LED  ${\bf U}/t$  illuminated) the output relay switches into off-position (yellow LED not illuminated). If the control contact is closed again before the interval  ${\bf t}$  has expired, the interval already expired is erased and is restarted.

### Single shot leading edge with control contact "S"

The supply voltage  $\mathbf{U}$  must be constantly applied to the device (green LED  $\mathbf{U/t}$  illuminated). When the control contact  $\mathbf{S}$  is closed, the output relay  $\mathbf{R}$  switches into on-position (green LED  $\mathbf{U/t}$  illuminated) and the set interval  $\mathbf{t}$  begins (green LED  $\mathbf{U/t}$  flashes). After the interval  $\mathbf{t}$  has expired (green LED  $\mathbf{U/t}$  illuminated) the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

### Asymmetric flasher pause first

lр

li

ER

When the supply voltage **U** is applied, the set interval **†1** begins (green LED **U/†** flashes slowly). After the interval **†1** has expired, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **†2** begins (green LED **U/†** flashes fast). After the interval **†2** has expired, the output relay switches into off-position (yellow LED not illuminated). The output relay is triggered at the ratio of **†1:†2** until the supply voltage is interrupted.

### Asymmetric flasher pulse first

When the supply voltage  ${\bf U}$  is applied, the output relay  ${\bf R}$  switches into on-position (yellow LED illuminated) and the set interval  ${\bf t1}$  begins (green LED  ${\bf U}/{\bf t}$  flashes slowly). After the interval  ${\bf t1}$  has expired, the output relay switches into off-position (yellow LED not illuminated) and the set interval  ${\bf t2}$  begins (green LED  ${\bf U}/{\bf t}$  flashes fast). After the interval  ${\bf t2}$  has expired, the output relay switches into on-position (yellow LED illuminated). The output relay is triggered at the ratio of  ${\bf t1}$ : ${\bf t2}$  until the supply voltage is interrupted.

### ON delay and OFF delay with control contact "S"

The supply voltage **U** must be constantly applied to the device (green LED **U/t** illuminated). When the control contact **S** is closed, the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into on-position (yellow LED illuminated). If the control contact is opened, the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired, the output relay switches into off-position (yellow LED not illuminated). If the control contact is opened before the interval **t1** has expired, the interval already expired is erased and is restarted with the next cycle.



Wa

Es

Wu

# Timer Relays Series ZR4, for Round 11 Pole Plug-in Socket

### Detailed Description of Modes (Part 2)

### Single shot trailling edge with control contact "S"

The supply voltage  $\mathbf{U}$  must be constantly applied to the device (green LED  $\mathbf{U/t}$  illuminated). Closing the control contact  $\mathbf{S}$  has no influence on the condition of the output  $\mathbf{R}$ . When the control contact is opened, the output relay switches into on-position (yellow LED illuminated) and the set interval  $\mathbf{t}$  begins (green LED  $\mathbf{U/t}$  flashes). After the interval  $\mathbf{t}$  has expired (green LED  $\mathbf{U/t}$  illuminated), the ouput relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

### ON delay with control contact "S"

The supply voltage **U** must be constantly applied to the device (green LED **U/t** illuminated). When the control contact **S** is closed, the set interval **t** begins (green LED **U/t** flashes). After the interval **t** has expired (green LED **U/t** illuminated) the output relay **R** switches into on-position (yellow LED illuminated). This status remains until the control contact is opened again. If the control contact is opened before the interval **t** has expired, the interval already expired is erased and is restarted with the next cycle.

### Single shot leading edge, voltage controlled

When the supply voltage  $\mathbf{U}$  is applied, the output relay  $\mathbf{R}$  switches into on-position (yellow LED illuminated) and the set interval  $\mathbf{t}$  begins (green LED  $\mathbf{U}/\mathbf{t}$  flashes). After the interval  $\mathbf{t}$  has expired (green LED  $\mathbf{U}/\mathbf{t}$  illuminated) the output relay switches into off-position (yellow LED not illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval  $\mathbf{t}$  has expired, the output relay switches into off-position. The interval already is erased and is restarted when the supply voltage is next applied.

### Flasher pause first

Вр

When the supply voltage  $\mathbf{U}$  is applied, the set interval  $\mathbf{t}$  begins (green LED  $\mathbf{U}/\mathbf{t}$  flashes). After the interval  $\mathbf{t}$  has expired, the output relay  $\mathbf{R}$  switches into on-position (yellow LED illuminated) and the set interval  $\mathbf{t}$  begins again After the interval  $\mathbf{t}$  has expired, the output relay switches into off-position (yellow LED not illuminated). The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted.

### ON delay and single shot leading edge, voltage controlled

When the supply voltage **U** is applied, the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired, the output relay switches into off-position (yellow LED not illuminated). If the supply voltage is interrupted before the interval **t1+t2** has expired, the interval already expired is erased and is restarted when the supply voltage is next applied.

### ON delay and single shot leading edge with control contact "S"

The supply voltage **U** must be constantly applied to the device (green LED **U/t** illuminated). When the control contact **S** is closed, the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired, the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

# Single shot leading and single shot trailing edge with control contact "S"

WsWa

EWυ

**EWs** 

The supply voltage **U** must be constantly applied to the device (green LED **U/t** illuminated). When the control contact **S** is closed, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t1** begins (green LED **U/t** flashes slowly). After the interval **t1** has expired, the output relay **R** switches into off-position (yellow LED not illuminated). If the control contact is opened, the output relay again switches into on-position (yellow LED illuminated) and the set interval **t2** begins (green LED **U/t** flashes fast). After the interval **t2** has expired the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times.

### Pulse sequence monitoring

Wt

When the supply voltage **U** is applied, the set interval **†1** begins (green LED **U/t** flashes slowly) and the output relay **R** switches into on-position (yellow LED illuminated) After the interval **†1** has expired, the set interval **†2** begins (green LED **U/t** flashes fast). So that the output relay **R** remains into on-position, the control contact **S** must be closed and opened again within the set interval **†2**. If this does not happen, the output relay **R** switches into off-position (yellow LED not illuminated) and all further pulses at the control contact are ignored. To restart the function the supply voltage must be interrupted and reapplied.



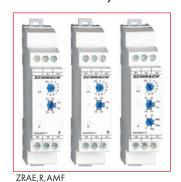
# ■ Timer Relays Series ZR4, for Round 11 Pole Plug-in Socket

# ■ Technical Data

	0 150 11 / 0 11	ZR4MF025-A ZR4B0025-A
NDICATORS	Green LED U/t ON	Indication of supply voltage
	Green LED U/t flashes	Indication of time period Indication of time period
	Green LED U/t flashes fast	- Indication of time period
	Yellow LED R ON/OFF	Indication of relay output
NECHANICAL DESIGN	Housing	Self-extinguishing plastic housing
	IP rating housing	IP40
	Mounting (IEC 60067-1-18 <sub>a</sub> )	11-pole socket YMR78700
	Terminal (VBG 4, PZ1	Shockproof terminal connection
	required)	'
	IP rating terminal	IP20
	Mounting position	Any
	Tightening torque	Max. 1 Nm
	Terminal capacity	$1 \times 0.5$ to $2.5 \text{ mm}^2$ with/without multicore cable end
		1 x 4 mm <sup>2</sup> without multicore cable end
		$2 \times 0.5$ to $1.5 \text{ mm}^2$ with/without multicore cable end
		2 x 2.5 mm² flexible without multicore cable end
NPUT CIRCUIT	Pins	S2(+)-S10 / A1(+)-A2
	Supply voltage	12 - 240 V AC / DC
	Tolerance	-10 % to +10 %
	Rated consumption	6 VA (2 W)
	Reated frequency	48 to 63 Hz
	Duty cycle	100 %
	Reset time	100 ms
	Residual ripple for DC	10 %
		> 30 % of the supply voltage
	Drop-out voltage	
	Overvoltage category (IEC 60664-1)	 
	Rated surge voltage	4 kV
OUTPUT CIRCUIT	Number of contacts	2 potential free CO contacts
	and type	<u> </u>
	Rated voltage	250 V AC
	Switching capacity	2000 VA (8A / 250 V)
	Fusing	8 A fast acting
	Mechanical service life	20 x 10 <sup>6</sup> operations
	Electrical service life	2 x 10 <sup>5</sup> operations at 1000 VA resistive load
	Switching frequency (IEC 60947-5-1)	Max. 6 / min at 1000 VA resistive load
	Overvoltage category (IEC 60664-1)	III
	Rated surge voltage	4 kV
ONTROL CIRCUIT	Input not potential free	Pins S2-S5
	Loadable	Yes
	Max. line length	10 m
	Trigger level (sensitivity)	Automatic adaption to supply voltage
	Min. control pulse length	DC 50 ms, AC 100 ms
CCURACY	Base accuracy	± 1 % of maximum scale value
CCORACI		< 5 % of maximum scale value
	Adjusting accuracy	
	Repition accuracy	< 0.5 % or ± 5ms
	Temperature influence	≤ 0.01 % / °C
MBIENT CONDITIONS	Ambient temperature	-25 °C to +55 °C
	Storage temperature	-25 °C to +70 °C
	Transport temperature	-25 °C to +70 °C
	Relative humidity (IEC 60721-3-3 class 3K3)	15 % to 85 %
	Pollution degree (IEC 60664-1)	2, if built in 3
ESCRIPTION		AVAILABLE ORDER NO.
		, , , , , , , , , , , , , , , , , , ,
Nulti-function Relays mer multifunction 12-240V AC/DC, 2CC	2.8 A plug version	ZR4MF025
, ,	on, plug-version	ZR4MF025
lasher Relays	CO 9A 250V plus varian	7040000E
vo-time multifunction 12-240VAC/DC, 2	CO, 6A, 230V, piug-version	<u>✓ ▼ ▼ ▼ ZR4B0025-</u>
ockets		
	lays and timer relays series ZR4, 11 pole, 10A (3 CO), with screw	













Schrack-Info

### ZRAE0011

- Tripping delayed timer relay
- Mode: "E"
- 1 CO, 5 A
- 24-48 V DC / 24-240 V AC
- Time range 0.05 seconds 10 hours
- Component width 17.5 mm

### ZRAR0011

- Release delayed timer relay
- Mode: "R"
- 1 CO, 5 A
- 24-48 V DC / 24-240 V AC
- Time range 0.05 seconds 10 hours
- Component width 17.5 mm

### ZRAMF011

- Multi-function timer relay
- Modes: "E", "R", "Ws", "Wu", "Wa", "Bp" & "F"
- 1 CO, 5 A
- 24-48 V DC / 24-240 V AC
- Time range 0.05 seconds 10 hours
- Component width 17.5 mm

### Overview AMPARO Timer Relays

Article	Number of contacts and type	Voltage range	Number of time ranges	Number of functions	E	R	Ws	Wu	Wa	Вр	F
ZRAE0011	1 CO	24 - 240 V AC / DC	6	1	Х						
ZRAR0011	1 CO	24 - 240 V AC / DC	6	1		Х					
ZRAMF011	1 CO	24 - 240 V AC / DC	6	7	Х	Х	Х	Х	Χ	Χ	Χ

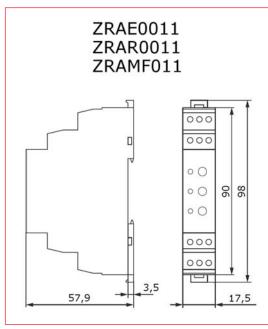
### Overview Modes

Article	
ZRAE0011	Time relay ON delay
ZRAR0011	Time relay OFF delay
ZRAMF011	Multifunction time relays

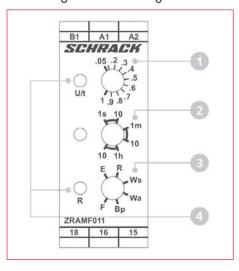
### **Functions**

E	ON delay	
R	OFF delay	(with control contact)
Ws	Single shot leading edge	(with control contact)
Wu	Single shot leading edge voltage controlled	
Wa	Single shot trailing edge	(with control contact)
Вр	Flasher pause first	
F	T-FlipFlop (Togale)	

### Dimensions (mm)



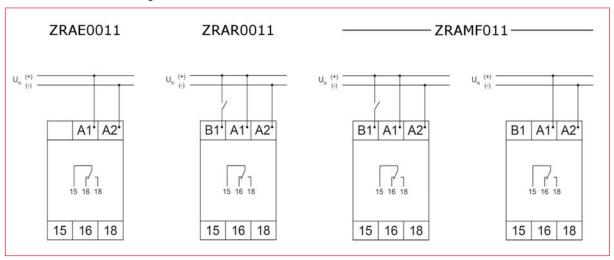
### ■ Configuration & Settings



### Configuration & Functionalities

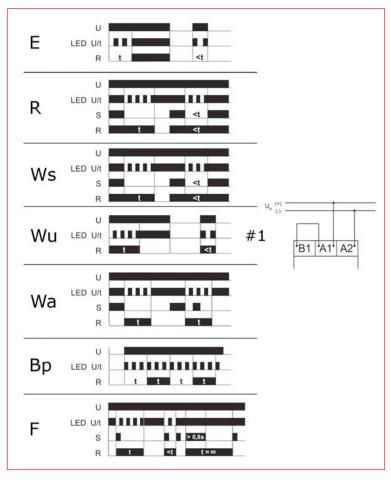
1	Fine adjustment			
2	Setting of time range			
3	Selection of the desired function			
Status indication				
4	<b>U/t</b> : LED greenSupply voltage applied			
	R: LED yellowRelay is active			

### Overview Circuit Diagrams





# Modes



### Overview Modes

Article	E	R	Ws	Wυ	Wa	Вр	F
ZRAE0011	Х						
ZRAR0011		Х					
ZRAMF011	Х	Х	Х	Х	Х	Х	Х

# Description of Modes

E	ON delay	
R	OFF delay	with control contact
Ws	Single shot leading edge	with control contact
Wυ	Single shot leading edge voltage controlled (function selector must be set on <b>Ws</b> and fixed jumper A1 - B1)	
#1	Function <b>Ws</b> with fixed jumper A1 - B1	
Wa	Single shot trailing edge	with control contact
Вр	Flasher pause first	
F	T-FlipFlop (Toggle)	

# ■ Technical Data

			ZRAE0011	ZRAR0011	ZRAMF01			
INDICATORS	Green LED U/t ON		Indic	ation of supply	voltage			
	Green LED U/t flashes	Ind	Indication of time period					
	Yellow LED R ON/OFF	Yellow LED R ON/OFF						
INPUT CIRCUIT	Terminals			A1 - A2 48 V DC / 24 -				
	Supply voltage	Supply voltage						
	Duty cycle	11.7						
	Bridging time			< 30 ms				
	Reset time			100 ms				
	Drop-out voltage			> 30 %				
	Power loss			1 W				
OUTPUT CIRCUIT	Number of contacts and type			1 CO				
	Terminals			15 - 16 - 18				
	Туре			Relay				
	Contact material			AgNi				
	Rated voltage			250 V				
	Max. switching voltage			250 V				
	Max. switching current			5 A				
	Rated current			5 A / 250 V	/			
	Service life	Mechanical		1 x 10 <sup>6</sup> operati	ons			
		Electrical		1 x 10 <sup>5</sup> operati	ons			
	Switching frequency	With load		6 / min				
		Without load	1200 / min					
	Fusing	Fusing			5 A fast acting			
DATAS OF INSULATION	Pollution degree (IEC 61812-1)			2				
	Overvoltage category (IEC 61812-1)			II				
	Rated insulation voltage (IEC 61812-1)	Rated insulation voltage (IEC 61812-1) Input circuit/ output circuit						
	Rated surge voltage (IEC 61812-1)	Input circuit/ output circuit		2500 V				
	Insulation-test-voltage (IEC 61812-1)	Insulation-test-voltage (IEC 61812-1) Input circuit/ output circuit			1600 V			
	Insulation	Input circuit/ output circuit		Basic insulation	on			
LECTRICAL CONNECTION	Terminal			Screw-termina	al			
	Terminal capacity	Rated terminal capacity		$2.5 \text{ mm}^2$				
	Max. terminal capacity	Flexible with /without ferrule	1 x 0.252	2.5 mm <sup>2</sup> (23 AV	VG14AWG)			
		Flexible without sleeve	2 x 0.251	1.5 mm <sup>2</sup> (23 AV	VG14AWG)			
		Flexible with twin-sleeve		1.5 mm <sup>2</sup> (23 AV				
		Stranded without sleeve	1 x 0.252	2.5 mm <sup>2</sup> (23 AV	VG14AWG)			
	Length without insulation			7 mm				
	Tightening torque	Tightening torque			Max. 0.5 Nm			
GENERAL DATA	Ambient temperature	Operation		-25+50 °C	<u> </u>			
	Dimensions (DIN 43880)	LxHxD	1	7.5 × 97 × 57.9	mm			
	Mounting	(EN 60715)		DIN-rail				
	Mounting position			Any				
	IP rating	Housing	IP40					
		Terminals						
DESCRIPTION			AVAIL	ABLE C	ORDER NO.			
Tripping and Release Delay								
•	O, 24V AC/DC or 230V AC, 1 CO, 5A/230V		900	Z	RAE0011			
	O, 24V AC/DC or 230V AC, 1 CO, 5A/230V		999	$\overline{}$	RAR0011			
Multi-function Relays								
Timer multifunction AMPARO, 24V AC/I	DC or 230V AC. 1 CO. 5A/230V			Z	RAMF011			
			( 000					



# ■ Timer Relays Series ZR6





### Schrack-Info

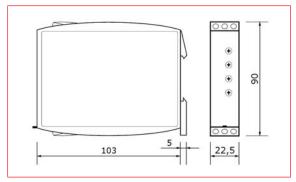
- 16 different modes
- 16 time ranges
- 2 CO
- Zoom voltage 24 to 240 V AC/DC
- Remote potentiometer connection
- Component width 22.5 mm
- Industrial type design

### Overview Modes

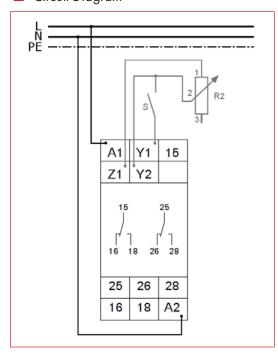
	with control contact "S"
Es11 ON delay	
,	with control contact "S"
Wull Single shot leading edge voltage controlled	
Ws11 Single shot leading edge	with control contact "S"
Wall Single shot trailing edge	with control contact "S"
Bill Flasher pulse first	
Bp11 Flasher pause first	

2 delayed contacts					
E20	ON delay				
R20	OFF delay	with control contact "S"			
Es20	ON delay	with control contact "S"			
Wu20	Single shot leading edge voltage controlled				
Ws20	Single shot leading edge	with control contact "S"			
Wa20	Single shot trailing edge	with control contact "S"			
Bi20	Flasher pulse first				
Bp20	Flasher pause first				

# Dimensions (mm)



### Circuit Diagram

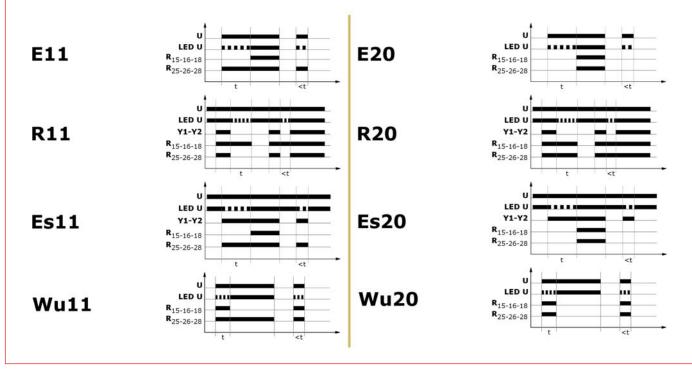


### Time Ranges

Time range	Adjustment range
1 s	50 ms - 1 s
3 s	150 ms - 10 s
10 s	500 ms - 10 s
30 s	1500 ms - 30 s
1 min	3 s - 1 min
3 min	9 s - 3 min
10 min	30 s - 10 min
30 min	90 s - 30 min
1 h	3 min - 1 h
3 h	9 min - 3 h
10 h	30 min - 10 h
30 h	90 min - 30 h
1 d	72 min - 1 d
3 d	216 min - 3 d
10 d	12 h - 10 d
30 d	36 h - 30 d

### Timer Relays Series ZR6

### Modes (Part 1)



### Detailed Description of Modes (Part 1)

The internal potentiometer is deactivated when a remote potentiometer is connected! The function has to be set before connecting the relay to the supply voltage.

E20

R20

Es20

Wu20

### ON delay

R11

Es11

Wu11

When the supply voltage **U** is applied, the instantaneous contact switches into on-position and the set interval **t** begins (green LED flashes). After the interval **t** has expired (green LED illuminated) the delayed contact switches into on-position (yellow LED illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the interval **t**, the interval clready expired is erased and is restarted when the supply voltage is next applied.

### OFF delay with control contact "S"

The supply voltage **U** must be constantly applied to the device (green LED illuminated). When the control contact **Y1-Y2** is closed, both contacts switch into on-position (yellow LED illuminated). If the control contact is opened, the instantaneous contact switches into off-position and the set interval **†** begins (green LED flashes). After the interval **†** has expired (green LED illuminated) the delayed contact switches into off-position (yellow LED not illuminated). If the control contact is closed again before the interval **†** has expired, the interval already expired is erased and is restarted with the next cycle.

### ON delay with control contact "S"

The supply voltage **U** must be constantly applied to the device (green LED illuminated). When the control contact **Y1-Y2** is closed, the instantaneous contact switches into on-position and the set interval **t** begins (green LED flashes). After the interval **t** has expired (green LED illuminated) the delayed contact switches into on-position (yellow LED illuminated). This status remains until the control contact is opened again. If the control contact is opened before the interval **t** has expired, the interval already expired is erased and is restarted with the next cycle.

### Single shot leading edge voltage controlled (Wu11)

When the supply voltage **U** is applied, both contacts switch into on-position (yellow LED illuminated) and the set interval **t** begins (green LED flashes). After the interval **t** has expired (green LED illuminated) the delayed contact switches into off-position (yellow LED not illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval **t** has expired, the both contacts switch into off-position. The interval already expired is erased and is restarted when the supply voltage is next applied.

### ON delay

When the supply voltage  $\mathbf{U}$  is applied, the set interval  $\mathbf{t}$  begins (green LED flashes). After the interval  $\mathbf{t}$  has expired (green LED illuminated) the output relay  $\mathbf{R}$  switches into on-position (yellow LED illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the interval  $\mathbf{t}$ , the interval already expired is erased and is restarted when the supply voltage is next applied.

### OFF delay with control contact "S"

The supply voltage **U** must be constantly applied to the device (green LED illuminated). When the control contact **Y1-Y2** is closed, the output relay **R** switches into on-position (yellow LED illuminated). If the control contact is opened, the set interval **t** begins (green LED flashes). After the interval **t** has expired (green LED illuminated) the output relay switches into off-position (yellow LED not illuminated). If the control contact is closed again before the interval **t** has expired, the interval already expired is erased and is restarted with the next cycle.

### ON delay with control contact "S"

The supply voltage **U** must be constantly applied to the device (green LED illuminated). When the control contact **Y1-Y2** is closed, the set interval **t** begins (green LED flashes). After the interval **t** has expired (green LED illuminated) the output relay **R** switches into on-position (yellow LED illuminated). This status remains until the control contact is opened again. If the control contact is opened before the interval **t** has expired, the interval already expired is erased and is restarted with the next cycle.

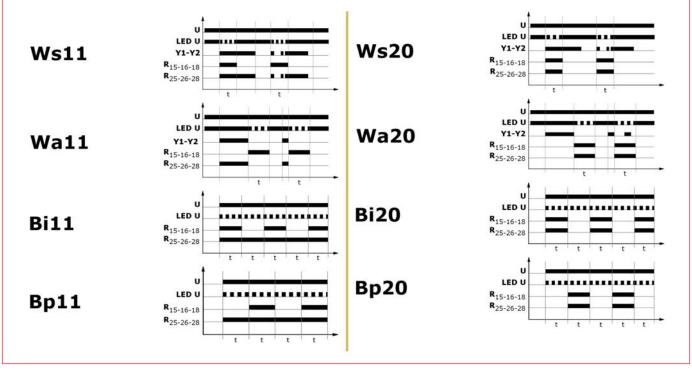
### Single shot leading edge voltage controlled

When the supply voltage **U** is applied, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval **t** begins (green LED flashes). After the interval **t** has expired (green LED illuminated) the output relay switches into off-position (yellow LED not illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval **t** has expired, the output relay switches into off-position. The interval already expired is erased and is restarted when the supply voltage is next applied.



# Timer Relays Series ZR6

### Modes (Part 2)



### Detailed Description of Modes (Part 2)

The internal potentiometer is deactivated when a remote potentiometer is connected! The function has to be set before connecting the relay to the supply voltage.

### Single shot leading edge with control contact "S"

Ws 11

The supply voltage  $oldsymbol{\mathsf{U}}$  must be constantly applied to the device (green LED illuminated). When the control contact Y1-Y2 is closed, both contacts switch into on-position (yellow LED illuminated) and the set interval t begins (green LED flashes). After the interval # has expired (green LED illuminat the delayed contact switches into off-position (yellow LED not illuminated). The instantaneous contact remains in on-position, until the control contact is opened again. During the interval, the control contact (and the instantaneous contact) can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

### Single shot trailing edge with control contact "S"

Wa 11

The supply voltage **U** must be constantly applied to the device (green LED illuminated). When the control contact **Y1-Y2** is closed the instantaneous contact switches into on-position. When the control contact is opened, the instantaneous contact switches into off-position, the delayed contact switches into on-position (yellow LED illuminated) and the set interval t begins (green LED flashes). After the interval t has expired (green LED illuminated), the delayed contact switches into off-position (yellow LED not illuminated). During the interval, the control contact (and the instantaneous contact) can be operated any number of times. A further cycle can only be started when the cycle run has been completed

### Flasher pulse first

Bi11

When the supply voltage  $oldsymbol{\mathsf{U}}$  is applied, the instantaneous contact and the delayed contact switch into on-position (yellow LED illuminated) and the set interval t begins (green LED flashes). After the interval t has expired, the delayed contact switches into off-position (yellow LED not illuminated) and the set interval t begins again. The delayed contact is triggered at a ratio of 1:1 until the supply voltage is interrupted.

### Flasher pause first

Bp11

When the supply voltage  $oldsymbol{\mathsf{U}}$  is applied, the instantaneous contact switches into on-position and the set interval t begins (green LED flashes). After the interval t has expired, the delayed contact switches into on-position (yellow LED illuminated) and the set interval  ${f t}$  begins again. After the interval  ${f t}$ has expired, the delayed contact switches into off-position (yellow LED not illuminated). The delayed contact is triggered at a ratio of 1:1 until the supply voltage is interrupted.

### Single shot leading edge with control contact "S"

The supply voltage  ${\bf U}$  must be constantly applied to the device (green LED illuminated). When the control contact Y1-Y2 is closed, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval t begins (green LED flashes). After the interval t has expired (green LED illuminated) the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has

### Single shot trailing edge with control contact "S"

Wa20

Ws20

The supply voltage  ${\bf U}$  must be constantly applied to the device (green LED illuminated). Closing the control contact Y1-Y2 has no influence on the condition of the output relay  $\mathbf{R}$ . When the control contact is opened, the output relay switches into on-position (yellow LED illuminated) and the set nterval t begins (green LED flashes). After the interval t has expired (green LED illuminated), the output relay switches into off-position (yellow LED not lluminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

### Flasher pulse first

been completed.

Bi20

When the supply voltage **U** is applied, the output relay **R** switches into on-position (yellow LED illuminated) and the set interval t begins (green LED flashes). After the interval **t** has expired, the output relay switches into off-position (yellow LED not illuminated) and the set interval t begins again. The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted

### Flasher pause first

Bp20

When the supply voltage  $oldsymbol{\mathsf{U}}$  is applied, the set interval  $oldsymbol{\mathsf{t}}$  begins (green LED flashes). After the interval  ${f t}$  has expired, the output relay  ${f R}$  switches into onposition (yellow LED illuminated) and the set interval t begins again. After the interval t has expired, the output relay switches into off-position (yellow LED not illuminated). The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted.



# Timer Relays Series ZR6

### Technical Data

lechnical Data			ZR6MF052
NDICATORS	Green LED U/t ON		Indication of supply voltage
	Green LED U/t flashes		Indication of time period
	Yellow LED R ON/OFF		Indication of relay output
MECHANICAL DESIGN	Housing		Self-extinguishing plastic housing
	IP rating housing		IP40
	Mounting	(EN 60715)	DIN-rail TS 35
	Terminal	(VBG 4, PZ1 required)	Shockproof terminal connection
	IP rating terminal	4	IP20
	Mounting position		Any
	Tightening torque		Max. 1 Nm
	_ 0		1 x 0.5 to 2.5 mm <sup>2</sup> with/without multicore cable end
	Terminal capacity		'
			1 x 4 mm <sup>2</sup> without multicore cable end
			2 x 0.5 to 1.5 mm² with/without multicore cable end
			2 x 2.5 mm² flexible without multicore cable end
NPUT CIRCUIT	Input		Terminals A1-A2 (galvanically separated)
	Supply voltage	AC/DC	24 V to 240 V~
	Tolerance	24 to 240 V DC	-20 % to +25 %
		24 to 240 V AC	-15 % to +10 %
	Rated frequency	48 to 400 Hz	24 to 240 V~
	. ,	16 to 48 Hz	48 to 240 V~
	Rated consumption		2.5 VA (1 W)
	Duration of operation		100 %
	Reset time		500 ms
	Wave form	For AC	Sinus
	Residual ripple	For DC	10 %
	Drop-out voltage		> 15% of the supply voltage
	Overvoltage category	(IEC 60664-1)	III
	Rated surge voltage		4 kV
UTPUT CIRCUIT	Number of contacts and type		2 potential free CO contacts
	Rated voltage		250 V AC
	Switching capacity	(distance < 5 mm)	750 VA (3 A / 250 V~)
	Switching capacity	(distance > 5 mm)	1250 VA (5 A / 250 V~)
	<del>-</del>	(disidlice > 5 IIIII)	
	Fusing		5 A fast acting
	Mechanical service life		20 x 10 <sup>6</sup> operations
	Electrical service life		2 x 10 <sup>5</sup> operations at 1000VA resistive load
	Switching capacity	(150 400 47 5 1)	Max. 60 / min at 100 VA resistive load,
		(IEC 60947-5-1)	Max. 6 / min at 1000 VA resistive load
	Overvoltage category	(IEC 60664-1)	III
	Rated surge voltage	,	4 kV
ONTROL CONTACT	Activation		Bridge Y1-Y2
SITIROE CONTACT			· ·
	Potential free		Yes, basic isolation against input and output circuit
	Loadable		No
	Control voltage	Max.	5 V
	Short circuit current	Max.	1 mA
	Line length	Max.	10 m
	Control pulse length	Min.	50 ms
	· · ·		The internal potentiometer is de-activated when a remo
EMOTE POTENTIOMETER	(not included)		potentiometer is connected!
	Connections		1 MΩ potentiometer, terminals Z1-Y2
	Line type		Twisted pair
	Control voltage	Max.	5 V
	Short circuit current	Мах.	μA range
	Line length	Max.	5 m
CCURACY	Base accuracy		± 1 % (of maximum scale value) using 1 MΩ remote potentiometer
	Frequency response		-
	Adjustment accuracy		< 5 % (of maximum scale value) using 1 MΩ remote potentiometer
	Repetition accuracy		< 0.5 % or ± 5 ms
	Temperature influence		≤ 0,01 % / °C
MBIENT CONDITIONS	Ambient temperature	(IEC 60068-1)	-25 °C to +55 °C
AMBIENI CONDIIIONS	1	(UL 508)	-25 °C to +40 °C
		1 21	
	Storage temperature		
	Storage temperature		-25 °C to +70 °C
	Transport temperature	UEC (AZA) A A L. AYA)	-25 °C to +70 °C
	Transport temperature Relative humidity	(IEC 60721-3-3 class 3K3)	-25 °C to +70 °C 15 % to 85 %
	Transport temperature Relative humidity Pollution degree	(IEC 60664-1)	-25 °C to +70 °C 15 % to 85 % 3
	Transport temperature Relative humidity	·	-25 °C to +70 °C 15 % to 85 %

<sup>\*</sup>The potentiometer is used for remote setting of the time. Here, the internal potentiometer (knob for fine adjustment of the time) is automatically disabled. The nominal value of the potentiometer is 1 M $\Omega$ . At a value approximately > 1.6 M $\Omega$  at this input the time fine-tuning is again determined by the internal potentiometer.

DESCRIPTION AVAILABLE ORDER NO.

**Multi-function Relays** 

Timer multifunction 12-240V AC/DC, 2CO, 8A/250V



ZR6MF052



Measuring and Monitoring Relays Series UR5
Measuring and Monitoring Relays



Series AMPARO



Measuring and Monitoring Relays Series UR6
Relay Module





Summary Alarm Indicators



Diode Combination DBS



# Measuring and Monitoring Relays

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UR5R1021

Schrack-Info

### UR5U1011

- Voltage monitoring for AC and DC in 1-phase networks
- Undervoltage monitoring
- 1 CO
- Component width 17.5 mm
- In-line design

### **UR5U3011**

- 3-phase voltage monitoring
- Undervoltage monitoring
- Supply voltage = measured voltage
- 1 CO
- Component width 17.5 mm
- In-line design

### **UR5U3N11**

- 3-phase undervoltage monitoring
- Fixed switching threshold US and fixed hysteresis
- Component width 17.5 mm
- In-line design

### UR511011

- AC monitoring in 1-phase networks
- Component width 17.5 mm
- In-line design

### UR5P3011

- Phase sequence, phase failure and phase imbalance monitoring
- 1 floating CO (output relay)
- Component width 17.5 mm
- In-line design

### **UR5R1021**

- Tripping unit for motor winding temperature monitoring with or without short-circuit monitoring of the thermistor circuit (selectable with terminal bridges)
- Optional reading of a temperature sensor
- Test functionality with integrated Reset switch
- Max. rated insulation voltage sensor circuit up to 690 V
- Component width 35 mm
- In-line design

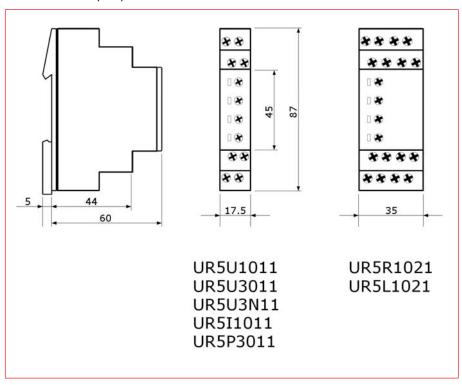
### **UR5L1021**

- Filling level monitoring of conductive liquids
- Multiple modes
- Safe disconnection of measuring circuits
- 1 CO
- Component width 35 mm
- In-line design

### Overview Modes

Article number	Functions
UR5U1011	AC/DC under voltage monitoring in 1-phase mains with adjustable threshold and hysteresis.  UNDER = Under voltage monitoring
UR5U3011	Undervoltage monitoring in 3-phase mains (each phase against the neutral wire) with fixed or adjustable threshold voltage US and fixed hysteresis.
UR5U3N11	Undervoltage monitoring in 3-phase mains (each phase against the neutral wire) with fixed threshold voltage US and fixed hysteresis.
UR511011	AC current monitoring in 1-phase mains with adjustable threshold and fixed hysteresis.
UR5P3011	Monitoring of phase sequence, phase failure and asymmetry with adjustable asymmetry, connection of neutral wire optional.
UR5R1021	Temperature monitoring of the motor winding (max. 6 PTC) with fault latch for temperature sensors in accordance with DIN 44081, short circuit monitoring of the thermistor line (selectable by means of terminals), integrated test/reset key.
UR5L1021	Level monitoring of conductive liquid, timing for tripping delay and turn-off delay separately adjustable and the following functions (selectable by means of rotary switch):  Pump up = Pump up or minimum monitoring  Pump down = Pump down or maximum monitoring

### Dimensions (mm)

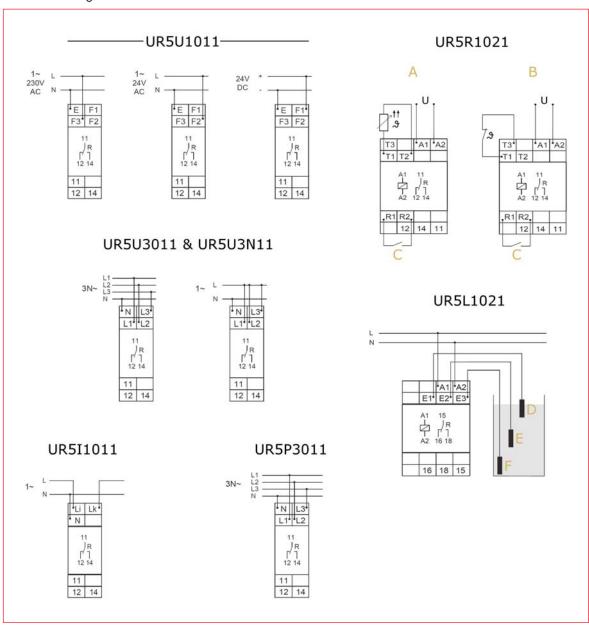




### Time Ranges

Article number			Adjustment range
UR5U1011	Tripping delay (delay):		-
UR5U3011	Tripping delay:		fixed approx. 200 ms
LIDELIONITI	Tripping delay:		fixed approx. 200 ms
UR5U3N11	Threshold Us:	(L - N)	fixed, 195.5 V (L - N)
UR511011	Tripping delay (delay):		-
UR5P3011	Tripping delay:		fixed approx. 100 ms
UR5R1021	Start-up suppression time (start):		-
UK5K1U21	Tripping delay (delay):		-
UR5L1021	Tripping delay (delay ON):		0.5 to 10 s
UK3L1UZ1	Turn-off delay (delay OFF):		0.5 to 10 s

### Circuit Diagrams

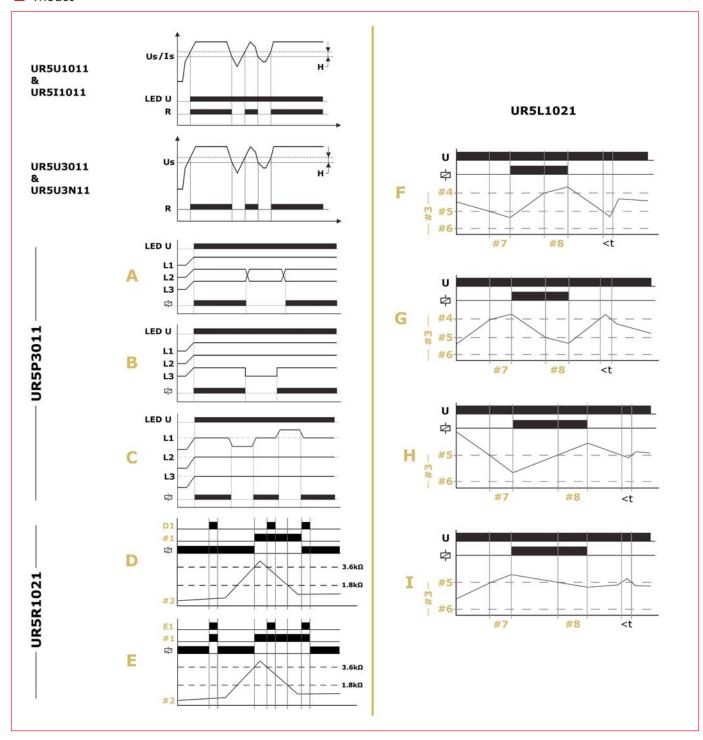


### Circuit Diagrams

Α	Monitoring temperature sensors
В	Monitoring thermal contact
С	Reset
D	Probe max.
E	Probe min.
F	Mass probe



- Measuring and Monitoring Relays Series UR5
- Modes



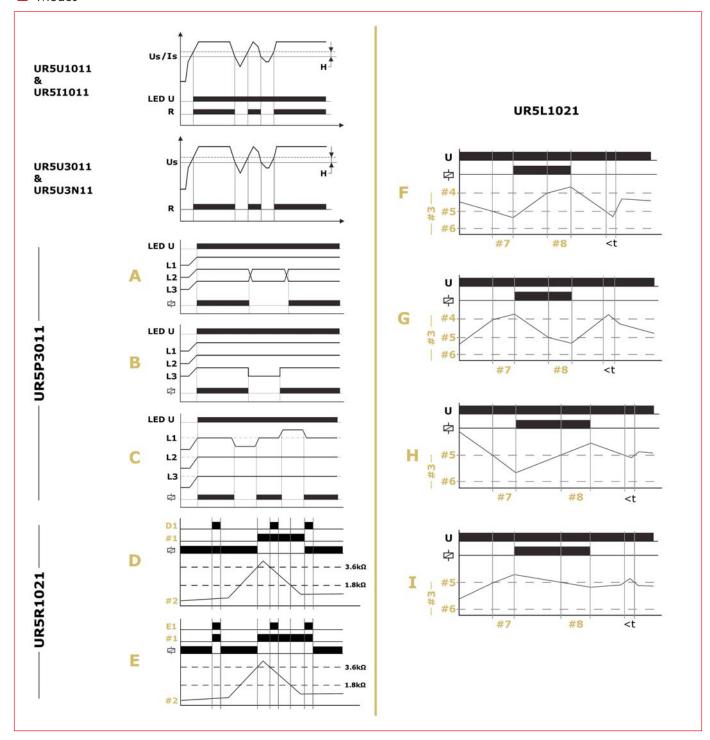
Detailed Desc	cription of Modes (Part 1)
UR5U1011	The supply voltage <b>U</b> must be constantly applied to the device (green LED illuminated). The output relay <b>R</b> switches into on-position (yellow LED illuminated) when the measured voltage <b>U</b> exceeds the value adjusted at the Us regulator. The output relay <b>R</b> switches into off-position (yellow LED not
	illuminated) when the measured value for the voltage falls below the set value by more than the fixed hysteresis.
	Under voltage monitoring for 3-phase AC mains with variable threshold voltage <b>Us</b> and fixed hysteresis. All measuring inputs (L1, L2 and L3) must be connected to phase voltage. If single or 2-phase monitoring is required, unused input terminals (L) must be connected to mains voltage to have proper <b>L-N</b> voltage on the terminals <b>L1</b> , <b>L2</b> and <b>L3</b> . A phase failure can not be detected, if the reverse voltage coming from the load exceeds the threshold US relay.  Test function (optional)
UR5U3011	The test function enables a manually disconnection of the output relay.
	Under voltage monitoring
	The output relay <b>R</b> switches into on-position (yellow LED illuminated), when the measuring voltage of all connected phases exceeds the fixed threshold US by more than the fixed hysteresis <b>H</b> . When the voltage of one of the connected phases (L1, L2 or L3) falls below the fixed threshold, the output relay switches into off-position again (yellow LED not illuminated).
UR5U3N11	Under voltage monitoring for 3-phase AC mains with fixed threshold voltage US and fixed hysteresis. All measuring inputs (L1, L2 and L3) must be connected to phase voltage. If single or 2-phase monitoringis required, unused input terminals (L) must be connected to mains voltage to have proper L-voltage on the terminals L1, L2 and L3. A phase failure can not be detected, if the reverse voltage coming from the load exceeds the threshold US relay Test function (optional)  The test function enables a manually disconnection of the output relay.
	Under voltage monitoring The output relay <b>R</b> switches into on-position (yellow LED illuminated), when the measuring voltage of all connected phases exceeds the fixed threshold US by more than the fixed hysteresis <b>H</b> . When the voltage of one of the connected phases (L1, L2 or L3) falls below the fixed threshold, the output relay switches into off-position again (yellow LED not illuminated).
UR511011	The supply voltage <b>U</b> must be constantly applied to the device (green LED illuminated). The output relay <b>R</b> switches into on-position (yellow LED illuminated) when measured current exceeds the value adjusted at the ls regulator. The output relay <b>R</b> switches into off-position (yellow LED not illuminated) when the measured value for the current falls below the set value by more than the fixed hysteresis.
	A  Phase sequence monitoring  When all the phases are connected in the correct sequence and the measured asymmetry is less than the fixed value, the output relay switche into on-position (yellow LED illuminated). When the phase sequence changes, the output relay switches into off-position (yellow LED not illuminated).
UR5P3011	B Phase failure monitoring The output relay R switches into off-position (yellow LED not illuminated), when one of the three phases fails.
	Asymmetry monitoring  C The output relay <b>R</b> switches into off-position (yellow LED not illuminated), when the asymmetry exceeds the value set at the ASYM-regulator. Reverse voltages of a consumer (e.g. a motor which continues to run on two phases only) do not effect the disconnection.
	Temperature monitoring of the motor winding with fault latch  If the supply voltage $\mathbf{U}$ is applied (green LED illuminated) and the cumulative resistance of the PTC-circuit is less than 3.6k $\Omega$ (standard temperature of the motor), the output relay switches into on-position.
	Pressing the test/reset key under this conditions, forces the output relay to switch into off-position. It remains in state as long as the test/reset key is press and thus the switching function can be checked in case of fault. The test function is not effective by using an external reset key.
UR5R1021	When the cumulative resistance of the PTC-circuit exceeds $3.6$ k $\Omega$ (at least one of the PTCs has reached the cut-off temperature), the output relay switched into off-position (red LED illuminated).

The output relay  ${\bf R}$  switches into on-position again (red LED not illuminated), if the cumulative resistance drops below 1.65k $\Omega$  by cooling down of the PTC and either a reset key (internal or external) was pressed or the supply voltage was disconnected and reapplied.

D	Application of an external reset
D1	External reset
E	Application of internal test/reset key
E1	Test/Reset
#1	LED Failure
#2	PTC (Positive Temperature Coefficient)



- Measuring and Monitoring Relays Series UR5
- Modes



Detailed Description of Modes (Part 2)

	N.
	Note
	Use cables with low capacity for wiring the probes especially with extended wiring length!
	Following processes are suggested for the adjustment:
	The existent time delay should be to minimum (0.5s).
	The function selector switch must be in position pump down.  The function selector switch must be in position pump down.
	Turn the sensitivity controller slowly clockwise from "min." to "max." until the relays switches into on-position (probes must be in dipped state).  The moistened probes should be taken out of the liquid to control if the relays switches into off-position. If the relays doesn't switch into off-position, turn the
	The moistened probes should be taken out of the liquid to control if the relays switches into off-position. If the relays doesn't switch into off-position, turn the sensitivity controller slightly back to "min." (counter clockwise).
	Set the existent time delay to desired value to fade out a short term moisten the probes by waves in the liquid.
	Set the function selector switch to desired position (either pump up or pump down).
	Set the folicitor selector switch to desired position (either point) up of points down).
	Pump up
	Connection of the probe rods <b>E1</b> , <b>E2</b> and <b>E3</b> . Alternatively the electrically conducting container can be connected in lieu of the test probe <b>E3</b> . When the
	F air-fluid level falls below the minimum probe <b>E2</b> the set interval of tripping delay (Delay ON) begins. After the expiration of the interval, the output relays
	R switches into on-position (yellow LED illuminated). When the air-fluid level again rises above the maximum probe E1, the set interval of turn-off delay
	(Delay OFF) begins. After the expiration of the interval the output relays <b>R</b> switches into off-position (yellow LED not illuminated).
	Pump down
	Connection of the probe rods E1, E2 and E3. Alternatively the electrically conducting container can be connected in lieu of the test probe E3. When the
UR5L1021	G maximum probe E1 gets moistened the set interval of tripping delay (Delay ON) begins. After the expiration of the interval the output relays R switches
	into on-position (yellow LED illuminated). When the air-fluid level falls below the minimum probe <b>E2</b> , the set interval of turn-off delay (Delay OFF) begins.
	After the expiration of the interval, the output relays <b>R</b> switches into off-position (yellow LED not illuminated).
	Minimum monitoring (Pump up)
	Connection the probe rods E2 and E3 (bridge E1-E3). Alternatively the electrically conducting container can be connected in lieu of the test probe E3.
	When the air-fluid level falls below the probe <b>E2</b> the set interval of tripping delay (Delay ON) begins. After the expiration of the interval, the output relays
	<b>R</b> switches into on-position (yellow LED illuminated). When the air-fluid level again rises above the probe <b>E2</b> , the set interval of turn-off delay (Delay OFF) begins. After the expiration of the interval the output relays <b>R</b> switches into off-position (yellow LED not illuminated).
	Maximum monitoring (Pump down)
	Connection of probe rods <b>E2</b> and <b>E3</b> (bridge E1-E3). Alternatively the electrically conducting container can be connected in lieu of the test probe <b>E3</b> .  When the probe <b>E2</b> gets moistened the set interval of tripping delay (Delay ON) begins. After the expiration of the interval the output relays <b>R</b> switches
	into on-position (yellow LED illuminated). When the air-fluid level sinks below the probe <b>E2</b> , the set interval of turn-off delay (Delay OFF) begins. After the
	expiration of the interval the output relays R switches into off-position (yellow LED not illuminated).
	#3 Level
	#4 Probe E1
	#5 Probe E2
	#6 Probe E3
	#7 Delay ON
	#8 Delay OFF
	10 200, 011



# ■ Technical Data (Part 1)

			UR5U1011	UR5U3011	UR5U3N11	UR511011
INDICATORS	Green LED ON/OFF		Indication of supply voltage	-	-	Indication of supply voltage
	Green LED <b>L1</b> ON/OFF		-	Indication of supply voltage L1 - N	-	-
	Green LED <b>L2</b> ON/OFF		-	Indication of supply voltage	-	-
	Green LED <b>L3</b> ON/OFF		-	Indication of supply voltage	-	-
	Yellow LED ON/OFF				f relay output	
MECHANICAL DESIGN	Housing			Self-extinguishir	ng plastic housing	
	Degree of protection housing	(5) (07) 5)			240	
	Mounting	(EN 60715) (VBG 4, PZ1			il TS 35	
	Terminal	required)		Shockproof teri	minal connection	
	Degree of protection terminal	-			20	
	Mounting position				iny	
	Tightening torque Terminal capacity		1 v C		1 Nm without multicore cabl	o and
	тегтінаі сарасіту		l xc		multicore cable end	e end
			2 x 0		without multicore cabl	e end
			2 >		thout multicore cable	end
INPUT CIRCUIT	Supply voltage			Measuring voltage		2221
	Rated voltage $U_{\text{N}}$		24 V AC / DC, 230 V~	3(N) 230	) / 400 V~	230 V~
	Terminals		230 V~ E - F3 E - F2	N - L1	- L2 - L3	Li - N
			24 V~ (distance			
			> 5 mm)			
			24 V DC E - F1(+) -25 % to +20 %	20.9/ 1. 110.9/	20.9/ 1. 15.9/	15 9/ 1 15 9/
	Tolerance		-25 % to +20 % of U <sub>N</sub>	-30 % to +10 % of U <sub>N</sub>	-30 % to +15 % of U <sub>N</sub>	-15 % to +15 % of U <sub>N</sub>
	Rated consumption		230 V~ 10 VA (0.6 W)	5 VA (0.6 W)	5 VA (0.6 W)	5 VA (0.8 W)
			24 V~ 1.3 VA (0.8 W) 24 V DC 0.6 W	8 VA (0.8 W)		
	Rated frequency		24 7 50 0.5 77	AC 48	to 63 Hz	
	Duration of operation				0 %	
	Reset time			50	0 ms	_
	Wave form		AC / DC Sinus -		Sinus	
	Hold-up time		> 60 % of	1	-	> 20% of
	Drop-out voltage		supply voltage	y Determined by undervoltage detection sup (see measured circuit)		supply voltage
	Overvoltage category	(IEC 60664-1)			III	
OUTPUT CIRCUIT	Rated surge voltage Number of contacts and type				al free CO	
OUIPOI CIRCUII	Rated voltage				0 V~	
	Switching capacity				A / 250 V~)	
	Fusing				st acting	
	Mechanical service life				operations	
	Electrical service life	(150 (00 (7 5 1)			1000VA resistive loa	d
	Switching capacity	(IEC 60947-5-1)			000 VA resistive load	
	Overvoltage category  Rated surge voltage	(IEC 00004-1)			kV	
MEASURING VOLTAGE	Measuring variable		AC or DC Sinus,		AC Sinus, 48 to 63H:	7
			48 to 63 Hz Supply voltage	160 - 240 V~	,	5A AC
	Measuring input Terminals		230 V~ E - F3		Supply voltage - L2 - L3	Li, Lk
	Tommus		24 V~ E - F2* 24 V DC E - F1(+)		12 10	Li, Li
	Overload capacity		120 % of U <sub>N</sub>	Determined by tol	erance specified for	7 A (ex 5 A: distance
			.20 /0 01 0 <sub>N</sub>	supply	voltage	> 5 mm!)
	Starting current			-		1 s 40 A 3 s 20 A
	Input resistance					10 mΩ
	Switching threshold Us		80 - 120 %	160 - 240 V	fix, 195.5 V (L - N)	10 - 100 % of I <sub>N</sub>
	Hysteresis H	UEC (0// 4.1)	Fixed, 5 %		ox. 5 %	Fixed, 10 %
	Overvoltage category	(IEC 60664-1)				
	Rated surge voltage			4	kV	



# ■ Technical Data (Part 2)

			UR5U1011	UR5U3011	UR5U3N11	UR511011
ACCURACY	Base accuracy		< 5 % of rated value			•
	Adjustment accuracy		± 5 % of rated value		-	± 5 % of rated value
	Repetition accuracy		< 2 % of rated value			
	Voltage influence		-			
	Temperature influence		≤ 0.05 % / °C			
AMBIENT CONDITIONS	Ambient temperature	(IEC 60068-1)	-25 °C to +55 °C			
	Storage temperature		-25 °C to +70 °C			
	Transport temperature		-25 °C to +70 °C			
	Relative humidity	(IEC 60721-3-3 class 3K3)	15 % to 85 %			
	Pollution degree	(IEC 60664-1)	2 2, if built			2, if built in 3
	Vibration resistance	(IEC 68-2-6)	10 to 55 Hz, 0.35			10 to 55 Hz, 0.35
	vibration resistance	vibration resistance (IEC 08-2-0)	mm		-	mm
	Shock resistance	(IEC 68-2-27)	15 g, 11 ms		-	15 g, 11 ms

<sup>\*</sup>The distance between the devices must be **greater than 5 mm!** 

### ■ Technical Data (Part 3)

			UR5P3011	UR5R1021	UR5L1021	
INDICATORS	Green LED ON/OFF		Indication	Indication of supply voltage		
	Yellow LED ON/OFF		Indication of relay output	-	Indication of relay output	
	Red LED ON/OFF		-	Indication of failure	·	
MECHANICAL DESIGN	Housing Degree of protection housing		Self-exting	uishing plastic housin IP40	9	
	Mounting	(EN 60715)	D	IN-rail TS 35		
	Terminal	(VBG 4, PZ1 required)	Shockpro	of terminal connection	า	
	Degree of protection terminal		IP20			
	Mounting position			Any		
	Tightening torque			Max. 1 Nm		
	Terminal capacity		1 x 0.5 to 2.5 mm <sup>2</sup> v	vith/without multicore	e cable end	
				thout multicore cable		
				vith/without multicore		
			2 x 2.5 mm <sup>2</sup> flexib	le without multicore c	able end	
INPUT CIRCUIT	Supply voltage		Measured voltage	230	) V~	
	Rated voltage U <sub>N</sub>		3(N) 230 / 400 V~	230 V~		
	Terminals		N-L1-L2-L3	A1 - A2		
	Tolerance		-30 % to +30 % of U <sub>N</sub>	-15 % to +10 % of U <sub>N</sub>		
	Rated consumption		8 VA (0.8 W)	1.3 VA (1 W)	2 VA (1 W)	
	Rated frequency		A	C 48 to 63 Hz		
	Duty cycle		100 %			
	Reset time		500 ms	250 ms	500 ms	
	Residual ripple for DC		-	50 ms	-	
	Drop out voltage		> 20 % of the supply voltage	> 30 % of the	supply voltage	
	Overvoltage category	(IEC 60664-1)		III		
	Rated surge voltage		4 kV	6	kV	
OUTPUT CIRCUIT	Number of contacts and type		1 p	otential free CO		
	Rated voltage			250 V~		
	Terminals		-	11 - 12 - 14	-	
	Switching capacity		1250 VA AC1 B300 60947-5-1), therm. cc 5 A		m. constant current	
	Fusing		5	A fast acting		
	Mechanical service life		15 x 10 <sup>6</sup> operations 20 x 10 <sup>6</sup> operations		operations	
	Electrical service life		100 x 10 <sup>3</sup> operations at 1000 VA resistive load	2 x 10 <sup>5</sup> operations at 1000 VA resistive		
	Switching frequency	(IEC 60947-5-1)	Max. 6 / min	at 1000 VA resistive	load	
	Overvoltage category	(IEC 60664-1)	III			
	Rated surge voltage	. ,	4 kV	6	kV	



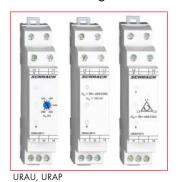
# ■ Technical Data (Part 4)

			UR5P3011	UR5R1021	UR5L1021
MEASURING CIRCUIT	Measuring variable		3 (N)~, sinus, 48 to 63 Hz		
	Measuring input		Supply voltage		Conductive probes
	Terminals		(N) - L1 - L2 - L3	T1 - T2 or T1 - T3	E1 - E2 - E3
	Overload capacity		Determined by tolerance specified for supply voltage		
	Internal resistance			< 1.5 kΩ	
	Response value	(relay in off-position)		≥ 3.6 kΩ	
	Release value	(relay in on-position)		≤ 1.65 kΩ	
	Disconnection (short circuit thermistor)	Yes		At T1 - T2	
		No		At T1 - T3	İ
	Measuring voltage T1-T2	(EN 60947-8)		$\leq$ 7.5 V at R $\leq$ 4 k $\Omega$	
	Asymmetry		5 % to 25 % adjustable or disengageable		
	Sensitivity				0.25 to 100 kΩ (4 mS to 10 S)
	Sensor voltage				12 V~
	Sensor current				Max. 7 mA
	Wiring distance	Set value < 50 %			Max. 1000 m
	(capacity of cable 100 nF / km)	Set value 100 %			Max. 100 m
	Overvoltage category (IEC 60664-1)			III	
	Rated surge voltage		4 kV		
ACCURACY	Base accuracy		±5 % of maximum scale value	±5 %	-
	Adjustment accuracy		< 5 %		-
	Repetition accuracy		< 2 %	< 1 %	-
	Voltage influence			-	
	Temperature influence		≤ 0.05 % / °C	≤ 0.15 % / °C	-
CONTROL CONTACT R*	Function			Connection of an external reset key	
	Loadable			No	
	Line length R1 - R2			Max. 10 m (twisted pair)	
	Control pulse length			Min. 50 ms	
	Reset			Potential free NO contact,	
A MADIENT CONIDITIONIC	A ashionttons and a	/IEC 40040 11		-25 °C to +55 °C	L
AMBIENT CONDITIONS	Ambient temperature	(IEC 60068-1)		-25 °C to +55 °C	
	Storage temperature			-25 °C to +70 °C	
	Transport temperature Relative humidity	(IEC 60721-3-3 class 3K3)		15 % to 85 %	
	Pollution degree	(IEC 60664-1)	2	2, if built in 3	2
*Note: The terminals <b>R2 - T2</b> are	<u>~</u>	(ILC 00004-1)		Z, II DUIII IN S	

DESCRIPTION	AVAILABLE	ORDER NO.
Voltage Monitoring Relays		
Voltage monitoring relay, 1 phase, 1CO	300 O- 0	UR5U1011
Voltage monitoring relay with adjustable voltage range 160-240V, 3-phase, 1CO	333 0-0	UR5U3011
Voltage monitoring relay, 3 phase against N, fixed Us=195.5V, 1CO	000 0-0	UR5U3N11
Current Monitoring Relays		
Current monitoring relay 1 phase, input 230V, 1CO	999 000	UR511011
Phase Monitoring Relays		
Phase monitoring relay, 3 phase, 1CO	333 0-0	UR5P3011
Thermistor Monitoring Relays		
Thermistor monitoring relay, 1 phase, 1CO	000 0-0	UR5R1021
Level Monitoring Relays		
Level monitoring relay, 1 phase, 1CO	350 0-6	UR5L1021













Schrack-Info

### **URAU3011**

- 1- and 3-phase undervoltage monitoring with settable switching threshold
- 1 CO, 5 A
- Supply voltage 230/400 V
- Supply circuit = measuring circuit
- Neutral conductor is required
- Component width 17.5 mm

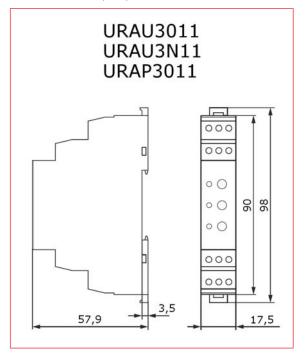
### **URAU3N11**

- 1- and 3-phase undervoltage monitoring with fixed switching threshold
- 1 CO, 5 A
- Supply voltage 230/400 V
- Supply circuit = measuring circuit
- Neutral conductor is required
- Component width 17.5 mm

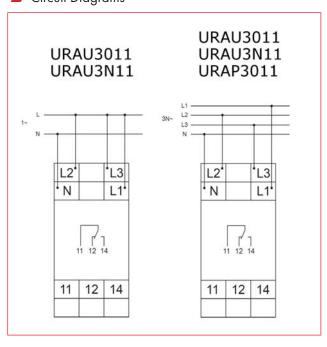
### **URAP3011**

- Phase sequence and phase failure monitoring
- Fixed phase imbalance monitoring
- Supply voltage 230/400 V
- Neutral conductor is required
- Component width 17.5 mm

### Dimensions (mm)

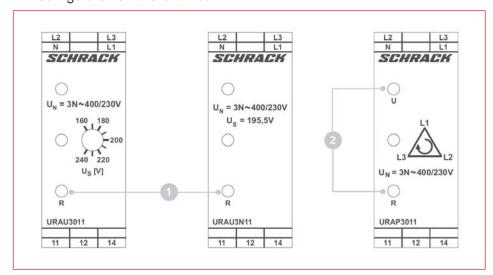


### Circuit Diagrams





# ■ Configuration & Functionalities



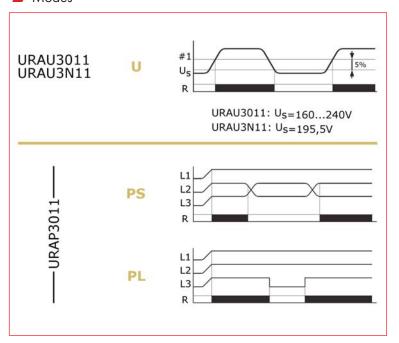
### ■ Configuration & Settings

1		URAU3011 and URAU3N11
		Status indication
'		LED yellow
	K	= Relay is active

	URAP3011				
		Status indication			
		LED green			
	"	= Supply voltage is applied			
		LED yellow			
	R	= Relay is active			

Electrical connection				
L1-L2-L3-N	Supply and measuring voltage			
	3 N~ 230 / 400 V, 50 / 60 Hz			
11-12-14	Output relay			
	AC1 5 A / 250 V			

# Modes



### Modes

	URAU3011								
	Undervoltage monitoring for 3-phase AC mains with <b>variable threshold voltage Us</b> and fixed hysteresis.  All measuring inputs (L1, L2 and L3) must be connected to phase voltage. If single-phase monitoring is required, unused input terminals (L) must be connected to mains voltage to have proper <b>L-N</b> voltage on the terminals <b>L1</b> , <b>L2</b> and <b>L3</b> . A phase failure can not be detected, if the reverse voltage coming from the load exceeds the threshold <b>Us</b> relay.								
U	Undervoltage monitoring  The output relay <b>R</b> switches into on-position (yellow LED illuminated), when the measuring voltage of all connected phases exceeds the fixed threshold <b>Us</b> by more than the fixed hysteresis <b>H</b> . When the voltage of one of the connected phases (L1, L2 or L3) falls below the fixed threshold, the output relay <b>R</b> switches into off-position again (yellow LED not illuminated).								
	#1 Hysteresis								

	URAU3N11							
	Undervoltage monitoring for 3-phase AC mains with <b>fixed threshold voltage Us</b> (=195.5 V) and fixed hysteresis.  All measuring inputs (L1, L2 and L3) must be connected to phase voltage. If single-phase monitoring is required, unused input terminals (L) must be connected to mains voltage to have proper <b>L-N</b> voltage on the terminals <b>L1</b> , <b>L2</b> and <b>L3</b> . A phase failure can not be detected, if the reverse voltage coming from the load exceeds the threshold <b>Us</b> relay.							
U	Undervoltage monitoring							
	The output relay <b>R</b> switches into on-position (yellow LED illuminated), when the measuring voltage of all connected phases exceeds the fixed threshold <b>Us</b> by more than the fixed hysteresis <b>H</b> . When the voltage of one of the connected phases (L1, L2 or L3) falls below the fixed threshold, the output relay <b>R</b> switches into off-position again (yellow LED not illuminated).							
	#1 Hysteresis							

	URAP3011						
	Monitoring of phase sequence						
PS	When all the phases are connected in the correct sequence and the measured asymmetry is less than the fixed value, the output relay <b>R</b> switches into on-position.						
	When the phase sequence changes, the output relay ${f R}$ switches into off-position.						
PL	Phase failure monitoring						
PL	The output relay <b>R</b> switches into off-position, when one of the three phases fails.						

# ■ Technical Data

			URAU3011	URAU3N11	URAP3011		
INPUT CIRCUIT	Terminals			L1 - L2 - L3 - N			
	Supply voltage			230 / 400 V~			
	Tolerance			-30 % to +15 % of L	J <sub>N</sub>		
	Rated frequency			50 / 60 Hz			
	Duty cycle			100 %			
	Bridging time			10 ms			
	Reset time			500 ms	T		
	Drop-out voltage		< 30 %	According to switching threshold 0.85 of U <sub>N</sub>	< 30 %		
	Power loss			0.8 W			
MEASURING CIRCUIT	Terminals		L1 - L2 - L3 - N				
	Measure			Voltage 3-phase			
	Measurement methods			Rectified value			
	Monitoring functions		Undervoltage	Undervoltage	Phase sequence phase failure, asymmetry		
	Measuring range			U <sub>N</sub> =230 / 400 V~			
	Overload		See tol	erances of the supply			
	Thresholds	Max.	-	-	-		
	mesheras	Min.	85 % of U <sub>N</sub>	85 % of U <sub>N</sub>	_		
		Adjustable	Yes	No No	No		
		Asymmetry	-	-	Fixed, 30 %		
	Hysteresis		5	%	-		
TIME CIRCLES	ON delay	Fixed		Approx. 400 ms	1		
	OFF delay			< 250 ms			
INDICATION	Supply voltage	Green LED U ON		Indication supply vo			
	Relay status	Yellow LED R ON		Relay is energized			
OUTPUT CIRCUIT	Number of contacts and type			1 CO			
	Terminals			11 - 12 - 14			
	Туре		Relay				
	Contact material			AgNi			
	Rated voltage			250 V			
	Max. switching voltage			250 V			
	Max. switching current			5 A			
	Rated current			5 A / 250 V			
	Lifetime Mechanical			1 x 10 <sup>6</sup> operations			
		Electrical (AC - 1)	1 x 10 <sup>5</sup> operations				
	Switching frequency	With load	6 / min				
		Without load	300 / min				
	Fusing		5 A fast acting				
ACCURACY	Basic accuracy			< 5 %			
	Setting accuracy		-				
	Repeatability		< 2 %				
	Influence of temperature		< 0.05 % / °C				
STANDARDS	Product standards		EN 61010-2-201:2013				
	Immunity	EN 61326-1	Basic electromagnetic environment				
	Emission	EN 61326-1		Class B			
DATAS OF INSULATION accord. to	Pollution degree			2			
IEC 61010-2-201	Overvoltage category			II			
	Rated insulation voltage	Input circuit/ output circuit		300 V			
	Rated surge voltage	Input circuit/ output circuit		2500 V			
	Insulation test voltage	Input circuit/ output circuit		1500 V			
	Insulation	Input circuit/ output circuit		Basic insulation			
ELECTRICAL CONNECTION	Terminal			Screw-terminal			
	Rated terminal capacity			2.5 mm <sup>2</sup>			
	Max. terminal capacity	Flexible with/without ferrule	1 x 0.25.	2.5 mm <sup>2</sup> (23 AWG	14AWG)		
		Flexible without sleeve	2 x 0.25.	1.5 mm <sup>2</sup> (23 AWG	14AWG)		
		Flexible with twin-sleeve	2 x 0.25.	1.5 mm² (23 AWG	14AWG)		
		Stranded without sleeve	1 x 0.25.	2.5 mm² (23 AWG	14AWG)		
	Length without insulation		7 mm				
	Tightening torque		Max. 0.5 Nm				
GENERAL DATA	Ambient temperature	Operation		-25+50 °C			
	Dimensions (DIN 43880)	LxHxD		17.5 x 97 x 57.9 mr	n		
	Mounting (EN 60715)			DIN-rail			
	Mounting position						
			IP40				
	Degree of protection	Housing Terminals		IP40 IP20			



# Measuring and Monitoring Relays

# Measuring and Monitoring Relays Series AMPARO

DESCRIPTION	AVAILABLE	ORDER NO.
Voltage Monitoring Relays		
Voltage monitoring relay AMPARO with adjustable voltage range 160-240V, 230V-AC, 3 phase, 1CO , 5A/230V	000 0-0	URAU3011
Voltage monitoring relay AMPARO, 230V-AC, with fixed switching threshold Us=195.5V, 3 phase against N, 1 CO, 5A/230V	333 0- 6	URAU3N11
Phase Monitoring Relays		
Phase monitoring relay AMPARO, 230V-AC, 3 phase, 1CO, 5A/230V	000 0-0	URAP3011











UR6P3052



### Schrack-Info

### UR6U1052

- Multi-function monitoring relay
- Voltage monitoring for AC and DC in 1-phase networks
- Error memory
- 16.6 to 400 Hz
- 2 CO
- Zoom voltage 24 to 240 V AC/DC
- Component width 22.5 mm
- Industrial type design

### UR6U3052

- Multi-function monitoring relay
- Voltage monitoring in 3-phase networks
- Phase sequence and phase failure monitoring
- Phase imbalance monitoring can be activated/deactivated
- Neutral conductor connection optional
- Loss of neutral wire detection
- Zoom voltage 24 to 240 V AC/DC
- Component width 22.5 mm
- Industrial type design

### UR611052

- Multi-function monitoring relay
- Current monitoring for AC and DC in 1-phase networks
- Error memory
- 16.6 to 400 Hz
- Zoom voltage 24 to 240 V AC/DC
- Component width 22.5 mm
- Industrial type design

### UR6P3052

- Voltage monitoring in 3-phase networks
- Phase sequence and phase failure monitoring
- Supply voltage = measured voltage
- Reverse voltage detection
- Neutral conductor connection optional
- 2 CO
- Component width 22.5 mm
- Industrial type design

### UR6R1052

- Motor winding temperature monitoring
- Supply voltage 230 V AC
- Connection of external Reset switch possible
- Component width 22.5 mm
- Industrial type design

### UR6L1052

- Multi-function monitoring relay
- Filling level monitoring of conductive liquids
- Safe disconnection of measuring circuits
- 2 CO
- Component width 22.5 mm
- Industrial type design

■ Technical Data (Part 1)

			UR6U1052	UR6U3052	UR611052		
INDICATORS	Green LED ON		Indication of supply voltage	-	Indication of supply voltage		
	Green LED flashes		Indication of start-up suppression time	-	Indication of start-up suppression time		
	Yellow LED ON/OFF	Yellow LED ON/OFF			out		
	Red LED ON/OFF		Indication of	failure of the correspor	nding threshold		
	Red LED flashes		Indication of tripp	oing delay of the corre	sponding threshold		
MECHANICAL DESIGN	Housing		Self-	extinguishing plastic h	ousing		
	Degree of protection housi	ng		IP40			
	Mounting	(EN 60715)		DIN-rail TS 35			
	Terminal	(VBG 4, PZ1 required)	Sho	ckproof terminal conne	ection		
	Degree of protection termin	nal		IP20			
	Mounting position			Any			
	Tightening torque			Max. 1 Nm			
	Terminal capacity		1 x 0.5 to 2.5	mm <sup>2</sup> with/without mul	ticore cable end		
			1 x 4 mm² without multicore cable end				
			2 x 0.5 to 1.5 mm² with/without multicore cable en				
				flexible without multic			
INPUT CIRCUIT	Terminals		A1 - A2 (galvanically separated)				
	Supply voltage		24 - 240V AC / DC				
	Tolerance	24 to 240 V DC	-20 % to +25 %				
		24 to 240 V AC	-15 % to +10 %				
	Rated consumption		4.5 VA (1 W)				
	Rated frequency	24 to 240 V AC 48 to 240 V AC	48 to 400 Hz				
	<del></del>	16 to 48 Hz					
	Duration of operation			100 %			
	Reset time			500 ms			
	Wave form for AC			Sinus			
	Residual ripple for DC			10 %			
	Drop-out voltage		>15% of the supply voltage				
	Overvoltage category	(IEC 60664-1)		III			
	Rated surge voltage		4 kV				
OUTPUT CIRCUIT	Number of contacts and ty		2 potential free CO contacts				
	Rated voltage	AC		250 V~			
	Switching capacity	Distance between the devices is < 5 mm		750 VA (3 A / 250 V	~)		
		Distance between the devices is > 5 mm		1250 VA (5 A / 250 V	·~)		
	Fusing			5 A fast acting			
	Mechanical service life		20 x 10 <sup>6</sup> operations				
	Electrical service life	2 x 10 <sup>5</sup> operations at 1000VA resistive load					
	Switching frequency	(IEC 60947-5-1)	max. 60 / min at 100 VA resistive load				
			max. 6	/ min at 1000 VA resi	stive load		
	Overvoltage category	(IEC 60664-1)		III			
	Rated surge voltage			4 kV			



■ Technical Data (Part 2)

			UR6U	11052	UR6U3052		UR611052		
MEASURING CIRCUIT	Fusing	(UL 508)			20 A				
	Measured variable			(C Sinus 400 Hz)		s (48 to 63		AC Sinus 400 Hz)	
			30 V	Terminals		Hz)	2 mA	Terminals	
	Input		AC/DC	E - F1 (+)		<b>-</b>	AC/DC	K - I1 (+)	
			60 V	Terminals	3 (N)~	Terminals (N) L1 - L2	1 A	Terminals	
			AC/DC	E - F2 (+)	0 (. 1)	- L3	AC/DC	K - I2 (+)	
			300 V AC/DC	Terminals E - F3 (+)			5 A AC/DC	Terminals K - I3 (+)	
	Overload capacity		30 V AC/DC	100 V <sub>rms</sub>			20 mA AC/DC	250 mA	
			60 V AC/DC	$150 \; V_{rms}$	3 (N)~	3 (N)~	1 A AC/DC	3 A	
			300 V AC/DC	440 V <sub>rms</sub>			5 A AC/DC	10 A	
	Input resistance		30 V AC/DC 60 V	47 Ω			20 mA AC/DC 1 A	2.7 Ω	
			AC/DC	100 Ω	3 (N)~	1 ΜΩ	AC/DC	47 mΩ	
			300 V AC/DC	470 Ω			5 A AC/DC	10 mΩ	
	Switching threshold	Max.	10 % to 10	00 % of U <sub>N</sub>	-20 % to +30 % of U <sub>N</sub>		10 % to 100 % of I <sub>N</sub>		
		Min.	5 % to 95 % of U <sub>N</sub>		-30 % to +20 % of U <sub>N</sub>		5 % to 95 % of I <sub>N</sub>		
	Asymmetry		-		5 % 1	5 % to 25 %		-	
	Overvoltage category	III							
	Rated surge voltage		4 kV						
ACCURACY	Base accuracy		≤ 3 % (of maximum scale value)						
	Frequency response			-10 % to 5 % (16.6 to 400 Hz)			5 % (16.6 to ) Hz)		
	Adjustment accuracy	Adjustment accuracy			% (of maxi	mum scale va	lue)		
	Repetition accuracy				≤	2 %			
	Voltage influence	Voltage influence			-				
	Temperature influence		≤ 0.05 % / °C						
AMBIENT CONDITIONS	Ambient temperature	(IEC 60068-1)				to +55 °C			
	<u></u>	(UL 508)	-25 °C to +40 °C						
		Storage temperature			-25 °C to +70 °C				
	Transport temperature	(IEC 701 2 2 .l 2K2)	-25 °C to +70 °C 15 % to 85 %						
	Relative humidity	(IEC 721 - 3-3 class 3K3)			15 %	3			
	Pollution degree	(IEC 60664-1)			10 to 55				
	Vibration resistance	(IEC 60068-2-6)			Hz	0.35 mm			
	Shock resistance	(IEC 60068-2-27)			15 g	11 ms			



# ■ Technical Data (Part 3)

			UR6P3052	UR6R1052	UR6L1052		
INDICATORS	Green LED ON		Indication	on of supply voltage			
	Yellow LED ON/OFF		Indication of relay output	-	Indication of relay output		
	Red LED ON/OFF		-	Indication of failure			
MECHANICAL DESIGN	Housing		Self-exting	uishing plastic housir	ng		
	Degree of protection ha	using	, and a second s	IP40			
	Mounting	(EN 60715)	D	IN-rail TS 35			
	Terminal	(VBG 4, PZ1 required)	Shockpro	of terminal connectio	n		
	Degree of protection ter		55	IP20			
	Mounting position			Any			
	Tightening torque			Max. 1 Nm			
	Terminal capacity		1 x 0.5 to 2.5 mm <sup>2</sup> y		e cable end		
	reminar capacity			thout multicore cable			
			2 x 0.5 to 1.5 mm <sup>2</sup> v				
				le without multicore			
				A1 - A2			
INPUT CIRCUIT	Terminals		(N) L1 - L2 - L3 [= measuring	(galvanically	A1 - A2		
			voltage]	separated)			
	Supply voltage		3 (N)~ 230 / 400 V AC	2	30 V AC		
	Tolerance	230 V AC	=		% to +15 %		
		3 (N)~ 230 / 400 V AC	3 (N)~ 342 to 457 V		-		
	Rated consumption		9 VA	2 VA (1.5 W)			
	Rated frequency		50 / 60 Hz				
	Duration of operation		100 %				
	Reset time		500 ms				
	Wave form for AC						
	Residual ripple for DC		_				
				> 15 % of the	> 30 % of the supply		
	Drop-out voltage		> 20 % of the supply voltage	supply voltage	voltage		
	Overvoltage category	(IEC 60664-1)		III	191		
	Rated surge voltage	(120000011)		4 kV			
	Number of contacts						
OUTPUT CIRCUIT	and type		2 potent	tial free CO contacts			
	Rated voltage	AC		250 V~			
	Switching capacity	Distance between the devices is	750 V	'A (3 A / 250 V~)			
		Distance between the devices is	1250 VA (5 A / 250 V~)				
		> 5 mm	· ' ' ·				
	Fusing		5 A fast acting				
	Mechanical service life		20 x 10 <sup>6</sup> operations				
	Electrical service life		<u>_</u>	ons at 1000 VA resist			
	Switching frequency	(IEC 60947-5-1)	Max. 60 / min at 100 VA resistive load				
	<del></del>		Max. 6 / min at 1000 VA resistive load				
	Overvoltage category	(IEC 60664-1)	III				
	Rated surge voltage			4 kV			



# ■ Technical Data (Part 4)

		UR6P3052		UR6R1052	UR6L1052				
MEASURING CIRCUIT	Measured variable		AC Sinus (48	3 to 63 Hz)	-		-		
	Input		3 (N)~ 230 / 400 V	(N) L1 - L2 - L3	Terminals T1 - T2	Conductive probes	Terminals E1 - E2 - E		
	Overlord capacity		3 (N)~ 230 / 400 V	3(N)~ 264 / 457 V					
	Input resistance		3 (N)~ 230 / 400 V	15 kΩ					
	Asymmetry		Fixed, typ	э. 30 %					
	Initial resistance				< 1.5 kΩ				
	Response value	(Relay in off-position)			> 3.6 kΩ				
	Release value	(Relay in on-position)			< 1.8 kΩ				
	Disconnection	(Short circuit thermistor)			No				
	Measuring voltage T1-T2	(DIN VDE 0660 part 302)			< 2.5 V DC at R < 4 kΩ				
	Sensitivity					0.25 to 10 to 10	0 kΩ (4 mS 0 μS)		
	Sensor voltage					12	V~		
	Sensor current						7 mA		
	Wiring distance	(Capacity of cable 100 nF / km)				Max. 1000 m Max. 100	50 % Set value		
	Overveltage estegery	(IEC 60664-1)			l III	m	100 %		
	Overvoltage category  Rated surge voltage	(IEC 80884-1)		4 kV	III		kV		
CONTROL CONTACT R	Function			4 KV	External reset key		K Y		
CONTROL CONTACT R	Loadable				No No				
	-				Max. 10 m				
	Line length R-T2				(twisted pair)				
	Control pulse length				-				
	Reset				Potential free NO contact, terminals R - T2				
					+10 % of				
ACCURACY	Base accuracy				maximum scale				
					value				
	Frequency response				-				
	Adjustment accuracy				-				
	Repetition accuracy				< 1 %				
	Voltage influence				< 2.2 %				
	Temperature influence				≤0.1 % / °C				
AMBIENT TEMPERATURE	Ambient temperature	(IEC 60068-1) (UL 508)		-25	°C to +55 °C °C to +40 °C				
	Storage temperature	Storage temperature			-25 °C to +70 °C				
	Transport temperature		-25 °C to +70 °C						
	Relative humidity	(IEC 721-3-3 class 3K3)		1	5 % to 85 %				
	Pollution degree	(IEC 60664-1)			3				
	Vibration resistance	(IEC 60068-2-6)			10 to 55 Hz 0.35 mm				
	Shock resistance	(IEC 60068-2-27)			15 g 11 ms				



# Overview Modes

		ring in 1-phase mains with adjustable thresholds, timing for start-up suppression and tripping delay separately adjustable as well as the following functions (selectable by means of rotary switch):
	OVER	Overvoltage monitoring
UR6U1052	OVER + LATCH	Overvoltage monitoring with fault latch
	UNDER	Undervoltage monitoring
	UNDER + LATCH	Undervoltage monitoring with fault latch
	WIN	Monitoring the window between "Min." with "Max."
	WIN + LATCH	Monitoring the window between "Min." with "Max." with fault latch

	Voltage monitoring in	3-phase mains with adjustable thresholds, adjustable tripping delay, <b>monitoring of phase sequence and</b>
	phase failure, monitoring of asymmetry with adjustable threshold as well as the following functions (selectable by means of rotary	
	switch):	
UR6U3052 UNDER Undervoltage monitoring		Undervoltage monitoring
	UNDER + SEQ	Undervoltage monitoring and monitoring of phase sequence
WIN Monitoring the window between "Min." and "Max."  WIN + SEQ Monitoring the window between "Min." and "Max." and monitoring of phase seque		Monitoring the window between "Min." and "Max."
		Monitoring the window between "Min." and "Max." and monitoring of phase sequence

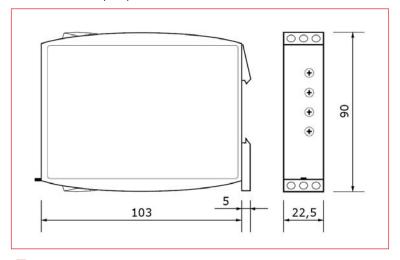
		ing in 1-phase mains with adjustable thresholds, timing for start-up suppression and tripping delay separately adjustable as well as the following functions (selectable by means of rotary switch):
	OVER	Overcurrent monitoring
110/11050	OVER + LATCH	Overcurrent monitoring with fault latch
UR611052	UNDER	Undercurrent monitoring
	UNDER + LATCH	Undercurrent monitoring with fault latch
	WIN	Monitoring the window between "Min." and "Max."
	WIN + LATCH	Monitoring the window between "Min." and "Max." with fault latch

UR6P3052	Monitoring of phase sequence, phase failure and detection of return voltage (by means of evaluating the asymmetry)
0.1.0. 0002	The initial of prices to desired, prices take a continuous of the

UR6R1052	lemperature monitoring of the motor winding (max. 6 PIC) with tault latch for temperature probes in accordance with DIN 44081 and
	test function with integrated test/reset key

	<b>Level monitoring</b> of conductive liquid, timing for tripping delay and turnoff delay separately adjustable as well as the following functions (selectable by means of rotary switch):		
UR6L1052	PUMP UP	Pump up or minimum monitoring	
	PUMP DOWN	Pump down or maximum monitoring	

### Dimensions (mm)

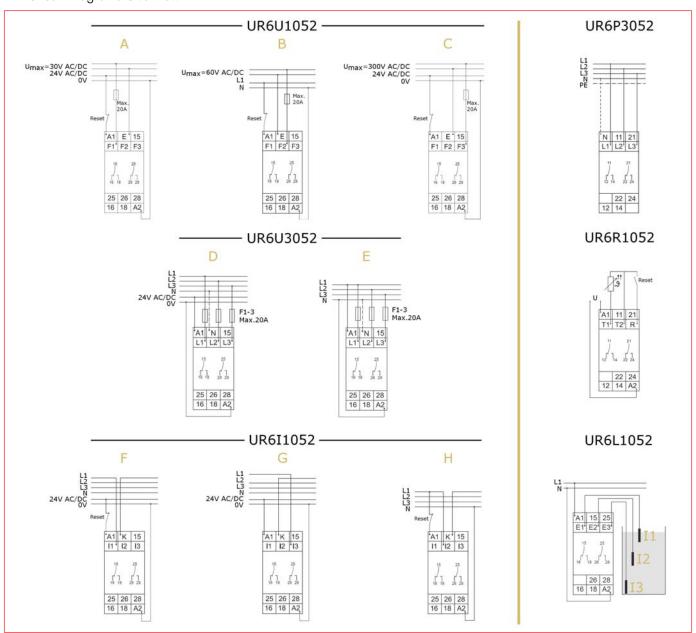


# ■ Time Ranges

Article number		Adjustment range	
UR6U1052	Start-up suppression time	0 s	10 s
UK601052	Tripping delay	0.1 s	10 s
UR6U3052	Start-up suppression time		-
UK0U3U32	Tripping delay	0.1 s	10 s
110/11050	Start-up suppression time	0 s	10 s
UR611052	Tripping delay	0.1 s	10 s
110402050	Start-up suppression time	Fixed, max. 500 ms	
UR6P3052	Tripping delay	Fixed, max. 350 ms	
110/01050	Start-up suppression time	-	
UR6R1052	Tripping delay	-	
110/11050	Tripping delay (DELAY ON)	0.5 s	10 s
UR6L1052	Turn-off delay (DELAY OFF)	0.5 s	10 s



### Circuit Diagrams Overview



### Overview Circuit Diagrams

UR6U1052			
Α	Supply voltage 24 V AC / DC		
A	Range 30 V and fault latch		
В	Supply voltage 230 V AC / DC		
	Range 60 V and fault latch		
	Supply voltage 24 V AC / DC		
,	Range 300 V and fault latch		

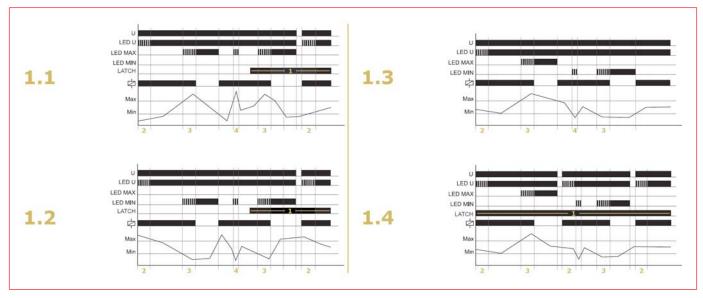
UR6U3052			
D Supply voltage 24 V AC / DC			
E	Supply voltage 230 V AC		

UR611052			
F	Supply voltage 24 V AC / DC		
	Range 20 mA and fault latch		
G	Supply voltage 24 V AC / DC		
G	Range 5 A without fault latch		
н	Supply voltage 230 V AC		
	Range 1 A and fault latch		

UR6L1052		
11	Probe max.	
12	Probe min.	
13	Mass probe	



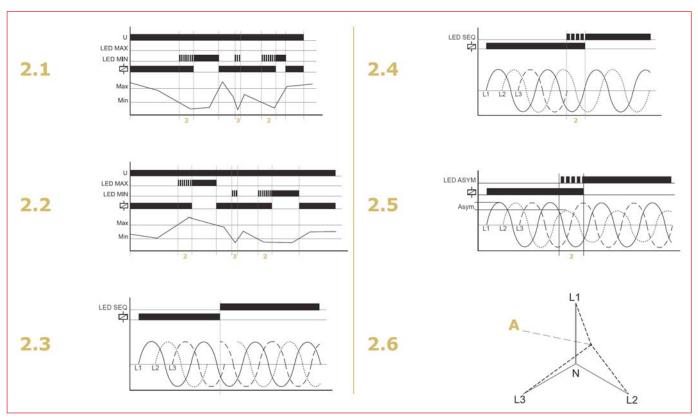
# UR6U1052 Modes



### ■ Detailed Description of UR6U1052 Modes

	When the supply voltage <b>U</b> is applied, the output relays switch into on-position (yellow LED illuminated) and the set interval of the start-up suppression ( <b>START</b> ) begins (green LED <b>U</b> flashes). Changes of the measured voltage during this period do not affect the state of the output relay. After the interval has expired the green LED is illumi-nated steadily. For all the functions the LEDs "MIN" and "MAX" are flashing alternating, when the minimum value for the measured voltage was chosen to be greater than the maximum value.		
	medacied venage was enese		Overvoltage monitoring
	OVER, OVER + LATCH	1.1	When the measured voltage exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay ( <b>DELAY</b> ) begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relays switch into off-position (yellow LED not illuminated). The output relays again switch into on-position (yellow LED illuminated), when the measured voltage falls below the value adjusted at the MIN-regulator (red LED MAX not illuminated). If the fault latch is activated ( <b>OVER+LATCH</b> ) and the measured voltage remains above the MAX-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured voltage falls below the value adjusted at the MIN-regulator. After resetting the failure (interrupting and reapplying the supply voltage), the output relays switch into on-position and a new measuring cycle begins with the set interval of the start-up suppression ( <b>START</b> ).
			Undervoltage monitoring
UR6U1052	UNDER, UNDER + LATCH	1.2	When the measured voltage falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay ( <b>DELAY</b> ) begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relays switch into off-position (yellow LED not illuminated). The output relays again switch into on-position (yellow LED illuminated), when the measured voltage exceeds the value adjusted at the MAX-regulator. If the fault latch is activated ( <b>UNDER+LATCH</b> ) and the measured volt-age remains below the MIN-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured voltage exceeds the value adjusted at the MAX-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relays switch into on-position and a new measuring cycle begins with the set interval of the start-up suppression ( <b>START</b> ).
			Window function
	WIN, WIN+LATCH	1.3	The output relays switch into on-position (yellow LED illuminated) when the measured voltage exceeds the value adjusted at the MIN-regulator. When the measured voltage exceeds the valueadjusted at the MAX-regulator, the set interval of the tripping delay (DELAY) begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relays switch into off-position (yellow LED not illuminated). The output relays again switch into on-position (yellow LED illuminated) when the measured voltage falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). When the measured voltage falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay (DELAY) begins again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relays switch into off-position (yellow LED not illuminated).
		If the fault latch is activated (WIN+LATCH) and the measured voltage remains below the MIN-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured voltage exceeds the value adjusted at the MIN-regulator. If the measured voltage remains above the MAX-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured voltage falls below the value adjusted at the MAX-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relays switch into on-position and a new measuring cycle begins with the set interval of the start-up suppression (START).	
		1	Latch activated (Y1-Y2 bridged)
	Diagram 2 3		Start
		3	Delay
		4	>Delay

# UR6U3052 Modes

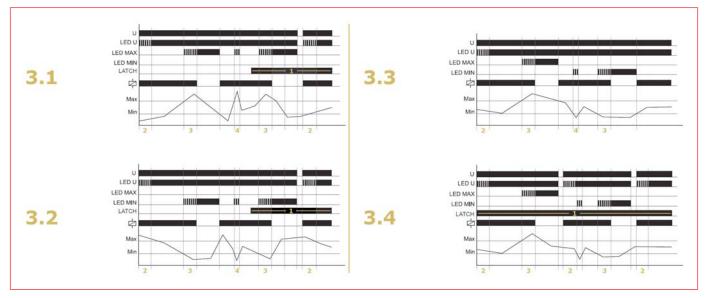


# Detailed Description of UR6U3052 Modes

	For all the functions the LEDs MIN and MAX are flashing alternating, when the minimum value for the measured voltage was chosen to be greater than the maximum value. If a failure already exists when the device is activated, the output relays remain in off-position and the LED for the corresponding threshold is illuminated.						
	UNDER, UNDER + SEQ	2.1	Undervoltage monitoring  When the measured voltage (mean value of phase-to-phase voltages) falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay (DELAY) begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relays switch into off-position (yellow LED not illuminated). The output relays again switch into on-position (yellow LED illuminated), when the measured voltage exceeds the value adjusted at the MAX-regulator.				
		Window function					
	The output relays switch into on-position (yellow LED illuminated) when the measured voltage phase-to-phase voltages) exceeds the value adjusted at the MIN-regulator. When themeasu the value adjusted at the MAX-regulator, the set interval of the tripping delay (DELAY) begin flashes). After the interval has expired (red LED MAX illuminated), the output relays switch int (yellow LED into illuminated). The output relays again switch into on-position (yellow LED illum measured voltage falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). The output relays again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated).						
			Phase sequence monitoring				
UR6U3052	SEQ	2.3	Phase sequence monitoring is selectable for all functions. If a change in phase sequence is detected (red LED <b>SEQ</b> illuminated), the output relays switch into off-position immediately (yellow LED not illuminated).				
OK003032	Phase failure monitoring						
	SEQ	2.4	If one of the phase voltages fails, the set interval of the tripping delay ( <b>DELAY</b> ) begins (red LED <b>SEQ</b> flashes).  After the interval has expired (red LED <b>SEQ</b> illuminated), the output relays switch into off-position (yellow LED illuminated). Reverse voltages of a consumer (e.g. a motor which continues to run on two phases only) do not effect the disconnection but can be monitored by using a proper value for the asymmetry.				
			Asymmetry monitoring				
		2.5	If the asymmetry of the phase-to-phase voltages exceeds the value set at the ASYM-regulator, the set interval of the tripping delay ( <b>DELAY</b> ) begins (red LED <b>ASYM</b> flashes). After the interval has expired (red LED ASYM illuminated), the output relays switch into off-position (yellow LED not illuminated). If the neutral wire is connec to the device, the asymmetry of the phase voltages referred to the neutral wire (Y-voltage) is monitored also. It that case both values of the asymmetry are evaluated and if one of the values exceeds the value set at the ASY regulator, the set interval of the tripping delay ( <b>DELAY</b> ) begins (red LED <b>ASYM</b> flashes). After the interval has expired (red LED <b>ASYM</b> illuminated), the output relays switch into off-position (yellow LED not illuminated).				
			Loss of neutral wire by means of evaluation of asymmetry				
		2.6	A break of the neutral wire between power line and machinery is detected as soon as asymmetry between phase-to-phase voltage and neutral wire occurs. If the asymmetry exceeds the value set atthe ASYM-regulato the set interval of the tripping delay ( <b>DELAY</b> ) begins (red LED <b>ASYM</b> flashes). After the interval has expired (red LED <b>ASYM</b> illuminated), the output relays switch into off-position(yellow LED not illuminated). A break of the neutral wire between our device and the machinery can not be detected.				
		Α	Shift of neutral point (asymmetry) caused by asymmetrical phase loads and missing neutral wire.				
	Diagram	2	Start				
		3	Delay				



# UR611052 Modes

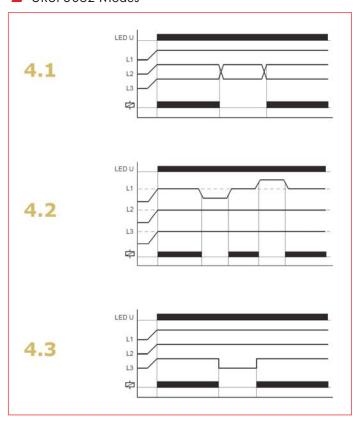


### Detailed Description of UR611052 Modes

	When the supply voltage <b>U</b> is applied, the output relays switch into on-position (yellow LED illuminated) and the set interval of the startup suppression ( <b>START</b> ) begins (green LED <b>U</b> flashes). Changes of the measured current during this period do not affect the state of the output relay. After the interval has expired the green LED is illuminated steadily. For all the functions the LEDs "MIN" and "MAX" are flashing alternating, when the minimum value for the			
	measured current was chosen	n to be gre	eater than the maximum value.	
	OVER, OVER, OVER + LATCH  OVER			
			Undercurrent monitoring	
UR611052	UNDER, UNDER + LATCH	3.2	When the measured current falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay ( <b>DELAY</b> ) begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relays switch into off-position (yellow LED not illuminated). The output relays again switch into on-position (yellow LED illuminated), when the measured current exceeds the value adjusted at the MAX-regulator. If the fault latch is activated ( <b>UNDER+LATCH</b> ) and the measured current remains below the MIN-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured current exceeds the value adjusted at the MAX-regulator. After resetting the failure (interrupting and reapplying the supply voltage), the output relays switch into on-position and a new measuring cycle begins with the set interval of the start-up suppression ( <b>START</b> ).	
			Window function	
	WIN, WIN + LATCH	3.3	The output relays switch into on-position (yellow LED illuminated) when the measured current exceeds the value adjusted at the MIN-regulator. When the measured current exceeds the valueadjusted at the MAX-regulator, the set interval of the tripping delay ( <b>DELAY</b> ) begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relays switch into off-position (yellow LED not illuminated). The output relays again switch into on-position (yellow LED illuminated) when the measured current falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). When the measured current falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay ( <b>DELAY</b> ) begins again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relays switch into off-position (yellow LED not illuminated).	
	WINTLAICH			
		3.4	If the fault latch is activated (WIN+LATCH) and the measured current remains below the MIN-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured current exceeds the value adjusted at the MIN-regulator. If the measured current remains above the MAX-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured current falls below the value adjusted at the MAX-regulator. After resetting the failure (interrupting and reapplying the supply voltage), the output relays switch into on-position and a new measuring cycle begins with the set interval of the start-up suppression (START).	
		1	Latch activated	
	Diagram	2 3 4	Start Delay >Delay	



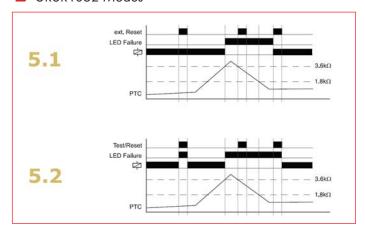
### UR6P3052 Modes



### ■ Detailed Description of UR6P3052 Modes

	4.1	Phase sequence monitoring  When all the phases are connected in the correct sequence and the measured asymmetry is less than the fixed value, the output relays switch into on-position (yellow LED illuminated). When the phase sequence changes, the output relays switch into off-position (yellow LED not illuminated).				
UR6P3052	Phase failure monitoring					
UKOP3U32	4.2	When one of the three phases fails, the output relays switch into off-position (yellow LED not illuminated).				
	Detection of reverse voltage (by means of evaluation of asymmetry)					
		The output relays switch into off-position (yellow LED not illuminated) when the asymmetry between the phase voltages exceeds the fixed value				
	4.3	of the asymmetry. An asymmetry caused by the reverse voltage of a consumer (e.g. a motor which continues to run on two phases only) does not effect the disconnection.				

#### UR6R1052 Modes

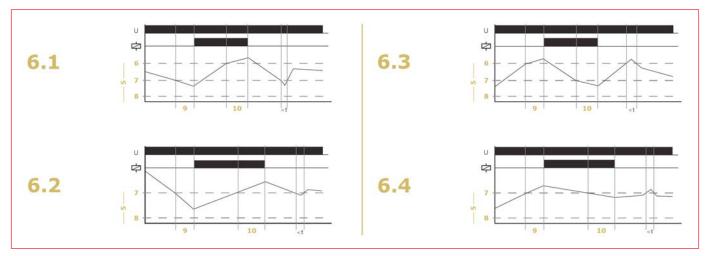


### ■ Detailed Description of UR6R1052 Modes

		If the supply voltage $\mathbf{U}$ is applied (green LED illuminated) and the cumulative resistance of the PTC-circuit* is less than $\mathbf{3.6k\Omega}$ (standard
	5.1	temperature of the motor), the output relays switch into on-position. Pressing the test/reset key under this conditions forces the output relays to
		switch into off-position. They remain in this state as long as the test/reset key is pressed and thus the switching function can be checked in case
UR6R1052		- of fault. The test function is not effective using an external reset key. When the cumulative resistance of the PTC-circuit exceeds <b>3.6kΩ</b> (at least
		one of the PTCs has reached the cut-off temperature), the output relays switch into off-position (red LED illuminated). The output relays again
	5.2	switch into on-position (red LED not illuminated), if the cumulative resistance drops below $1.8k\Omega$ by cooling down of the PTC and either a reset
		key (internal or external) was pressed or the supply voltage was disconnected and reapplied.
*DTC D ::: T : C		

<sup>\*</sup>PTC = Positive Temperature Coefficient

# UR6L1052 Modes



# ■ Detailed Description of UR6L1052 Modes

			Pump up			
	PUMP UP	6.1	Connection of the probe rods E1, E2 and E3. Alternatively the electrically conducting container can be connected in lieu of the test probe E3. When the air-fluid level falls below the minimum probe E2 the set interval of tripping delay (Delay ON) begins. After the expiration of the interval, the output relays R switches into on-position (yellow LED illuminated). When the air-fluid level again rises above the maximum probe E1, the set interval of turn-off delay (Delay OFF) begins. After the expiration of the interval the output relays R switches into off-position (yellow LED not illuminated).			
			Minimum monitoring (Pump up)			
	Connection the probe rods E2 and E3 (bridge E1-E3). Alternatively the electrically conducting container or connected in lieu of the test probe E3. When the air-fluid level falls below the probe E2 the set interval of tri  PUMP UP  6.2 (Delay ON) begins. After the expiration of the interval, the output relays R switches into on-position (yellow illuminated). When the air-fluid level again rises above the probe E2, the set interval of turn-off delay (Delay ON) begins. After the expiration of the interval the output relays R switches into off-position (yellow LED not illum					
	Pump down					
UR6L1052	PUMP DOWN	6.3	Connection of the probe rods <b>E1</b> , <b>E2</b> and <b>E3</b> . Alternatively the electrically conducting container can be connected in lieu of the test probe <b>E3</b> . When the maximum probe <b>E1</b> gets moistened the set interval of tripping delay ( <b>Delay ON</b> ) begins. After the expiration of the interval the output relays <b>R</b> switches into on-position (yellow LED illuminated). When the airfluid level falls below the minimum probe <b>E2</b> , the set interval of turn-off delay ( <b>Delay OFF</b> ) begins. After the expiration of the interval, the output relays <b>R</b> switches into off-position (yellow LED not illuminated).			
	Maximum monitoring (Pump down)					
	PUMP DOWN	6.4	Connection of probe rods <b>E2</b> and <b>E3</b> (bridge E1-E3). Alternatively the electrically conducting container can be connected in lieu of the test probe <b>E3</b> . When the probe <b>E2</b> gets moistened the set interval of tripping delay ( <b>Delay ON</b> ) begins. After the expiration of the interval the output relays <b>R</b> switches into on-position (yellow LED illuminated). When the air-fluid level sinks below the probe <b>E2</b> , the set interval of turn-off delay ( <b>Delay OFF</b> ) begins. After the expiration of the interval the output relays <b>R</b> switches into off-position (yellow LED not illuminated).			
		5	Level			
		6	Probe <b>E1</b>			
	Diagram	7	Probe <b>E2</b>			
	Diagram	8	Probe <b>E3</b>			
		9	Delay ON			
		10	Delay OFF			

DESCRIPTION	AVAILABLE	ORDER NO.
Voltage Monitoring Relays		
Voltage monitoring relay, 1 phase, AC/DC, 2 CO	000 0-0	UR6U1052
Voltage monitoring relay, 3 phase, AC/DC, 2 CO	383 0- 6	UR6U3052
Current Monitoring Relays		
Current monitoring relay, 1 phase, input 24-240V-AC/DC, 1CO	000 0-0	UR611052
Phase Monitoring Relays		
Phase monitoring relay, 3 phase, 2 CO	000 0-0	UR6P3052
Thermistor Monitoring Relays		
Thermistor monitoring relay, 1 phase, 230V-AC, 2 CO	000 0-0	UR6R1052
Level Monitoring Relays		
Level monitoring relay, 1 phase, input 230V-AC/5A, 2 CO	555 0-0	UR6L1052





# Accessories, Probes for Level Monitoring Relays







Schrack-Info

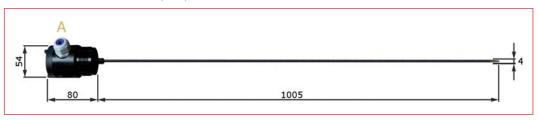
#### URL90010, URL90020, URL90030

- Maximum pressure range 1000 kPa
- Operating temperature up to 70°C
- Coated with Nylon 66
- · For use in all application, except for certain fields of the food processing industry where Nylon 66 is prohibited as insulating material

#### **URL91010**

• Probe element can be connected to cable

#### Dimensions URL90010 (mm)



#### Dimensions URL90010

Thread				
Α	(inch)	1.5		

#### Technical Data URL90010, URL90020 & URL90030

Holder / Conductive probe	Material		Nylon	
	Thread Inch		1,5 British standard	
	Degree of protection		IP65 +70 °C	
	Max. temperature			
Conductor / Electrode rods	Material Stainless s		AISI 316	
	Coating		Black powder epoxy	
	Length		1 m	
	Number of conductors	URL90010	1 x 1 metre rod	
		URL90020	2 x 1 metre rod	
		URL90030	3 x 1 metre rod	

**Note:** Coating of rods improves resistance to false switching caused by frothing of condensation.

DESCRIPTION	AVAILABLE	ORDER NO.
Level monitoring immersion probe	988	URL91010
Level monitoring 1 probe, 1x1 meter	000 0-0	URL90010
Level monitoring 2 probes, 2x1 meter	383	URL90020
Level monitoring 3 probes, 3x1 meter	000 000	URL90030

# Relay PCB

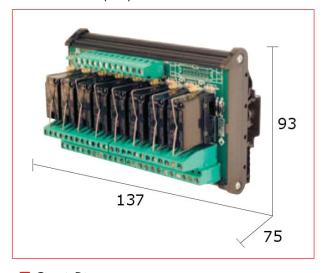


IK022176

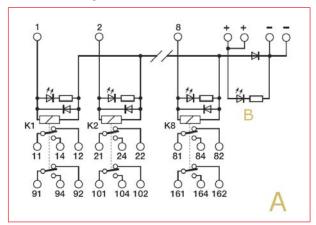
#### Schrack-Info

- 8 pcs. relay module (24 V DC/8 A)
- Version with plug-in relay
- 2 CO per relay
- DC control voltage
- Negative control voltage
- LED operating lights
- Fast and easy DIN rail mounting

### Dimensions (mm)



### Circuit Diagram



### Circuit Diagram

Α	8 piece relay module		
<b>B</b> Power on			
General data	The height dimension includes 35 mm DIN rail		



# Relay PCB

# ■ Technical Data

8 relay module				
Number of contacts and type		8 channels each with 2 CO		
Rated current		8 A		
Supply voltage	AC	250 V~		
Coil voltage	DC	24 V + 10%		
Coil current	(1 channel)	22 mA + 10%		
Turn ON time		15 ms		
Turn OFF time		10 ms		
Protection circuit		Damping- and protection diode		
LED colors		Yellow and green		
Contact material		AgNi		
Housing material		UL94V-0 plastic material		
Connection terminal	Screw terminal	2.5 mm <sup>2</sup>		
Degree of protection	IEC 529, EN 60529	IPOO		
Coil-/ contact isolation		2.5 kVA / 60 s		
Isolation between output terminals	(open contacts)	1 kVA / 60 s		
Overvoltage category		III		
Pollution degree		2		
Ambient temperature	Operation	-10 °C to +50 °C		
Approx. weight		ca. 419 g		
Reference standard		IEC 664-1, DIN VDE 0110.1		
Mounting		Vertical on DIN-rail		

DESCRIPTION	AVAILABLE	ORDER NO.
Relay module, 8 pcs. plug-in relays, 24V DC/8A, each with 2CO, for DIN-rail	300 0-0	IK022176

# Summary Alarm Indicators SSM 11-24V-DC









Schrack-Info

#### YY494006

The type SSM11 summary alarm indicator is a safe low-cost solution for many purposes, combining several functionalities in one unit:

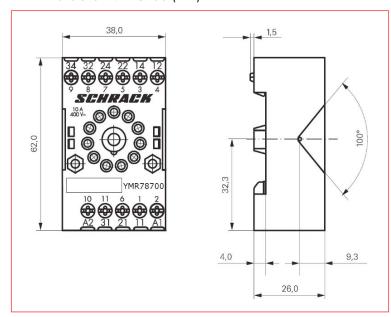
- Motor monitoring
- Contact monitoring with change over contact
- High reliability lighting
- Acoustic signalling
- Optical collective signalling
- Compatible with 11 pole plug-in socket YMR78700

#### Dimensions SSM 11 (mm)



# Summary Alarm Indicators SSM 11-24V-DC

#### Dimensions YMR78700 (mm)



#### Functionalities SSM 11

#### **Motor Monitoring**

If the motor is not running, the light (H1) will be off, if the motor is running, the light will be on. In the event of faulty operation of the motor (F1), the light will flash on-off.

#### Contact monitoring with Change Over Contact

During regular operation the light will be on  $(\mathbf{H2})$ ; in the event of an interruption, the light will flash on-off (**H3**).

#### **High Reliability Lighting**

To maintain the functionality of acoustic and optical collective signalling, connecting a parallel resistor is recommended (at 24 V, 2K2 Ω / ½ W).

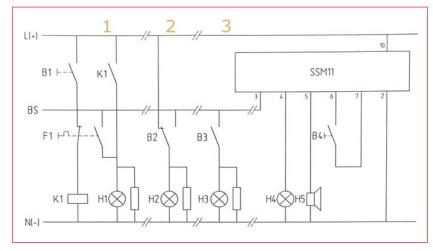
#### Acoustic Signalling

In the event of an interruption, the horn will signal approx. 15 sec. afterwards (H5). It can be reset by pressing the Acknowledge (B4)

#### **Optical Collective Signalling**

The Fault light  $(\mathbf{H4})$  will be on as long as there is one (or several) interruptions-regardless of whether the Acknowledge key has been pressed or not.

#### Circuit Diagram SSM 11



#### Circuit Diagram SSM 11

1	Option 1
2	Option 2
3	Option 3
B1	On-switch
B2	Operating- and fault signal contact (contactor)
В3	Fault message contact (contactor or control system)
B4	Acknowledge button
BS	Flashing bar
F1	Overcurrent relay
H1	Motor operation lamp
H2	Operation lamp
Н3	Failure lamp
H4	Failure lamp
H5	Horn
K1	Motor contactor

#### Technical Data

Rated voltage		24 V DC +20 %
Contacts	Max.	250 V~
	Max.	8A
Power consumption	Idle	ca. 1 VA
	In operation	ca. 4 VA
Assembly		11-pole socket <b>YMR78700</b>

DESCRIPTION	AVAILABLE	ORDER NO.
Indicator for Summary-alarm SSM 11-24V	999 0-0	YY494006
DIN rail mounted plug-in socket for MT3 relays and timer relays Series ZR4, 11 pole, 10A (3 CO), with screw terminals, not compatible with function modules	500 0-0	YMR78700



### Diode Combination DBS















#### Schrack-Info

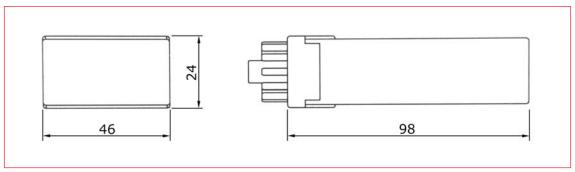
YY494107

• Despite their compact size the diode combinations DBS10 (YY494007) and DBS01 (YY494107) are suitable for up to 10 indicators. If there are light bulbs/glow lamps or LEDs for signalling operating states, integrating the diode combination can be a simple way to retrofit an alarm verification.

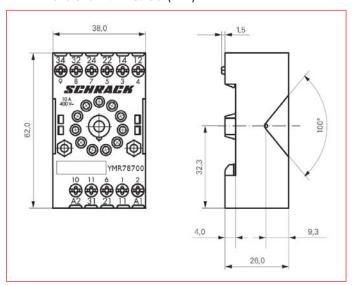
By connecting multiple combinations it is possible to scan any number of alarms. Every diode combinations contains a protective diode, which limits the impact of a defective individual diode on other components of the system (e.g. contactors). Both diode combinations DBS10 and DBS01 can be used as protection diodes for relays and contactors.

- The DBS10 and DBS01 have different polarities, which are explained in detail in the circuit diagrams
- Both types are compatible with the 11 pole plug-in socket YMR78700

#### Dimensions DBS10 & DBS01 (mm)

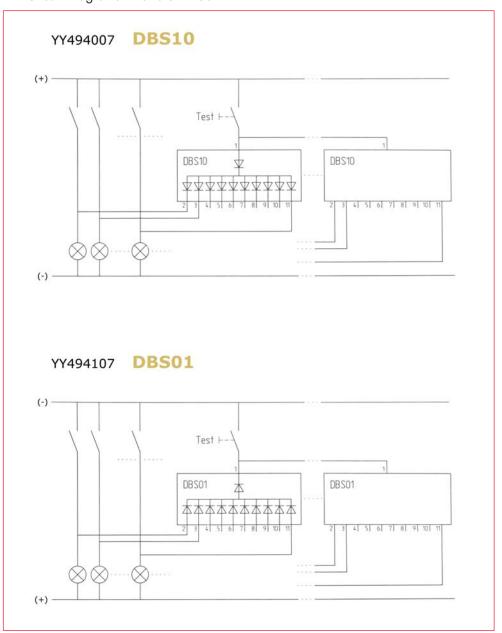


#### Dimensions YMR78700 (mm)



# Diode Combination DBS

# ■ Circuit Diagrams DBS10 & DBS01



#### Technical Data

Rated voltage Peak voltage	Max.	250 V~ 1000 V~
Current	Max.	1 A per single message
Peak current	Max.	20 A / 10 ms
Input	Diode	1N4007 (Pin 1)
Output	Diode	1 N4007 (Pin2-11)
Insulation class		VDE 0110
	Group C	250 V~
Assembly		11-pole socket YMR78700

DESCRIPTION	AVAILABLE	ORDER NO.
Diode-combination DBS10	585 0-5	YY494007
Diode-combination DBS01	000 0-0	YY494107
DIN rail mounted plug-in socket for MT3 relays and timer relays Series ZR4, 11 pole, 10A (3 CO), with screw terminals, not compatible with function modules	355 0-8	YMR78700







Modular Contactors "R" AC-1, AC Coil





■ Modular Contactors "R" AC-1, ACDC Coil
■ Modular Contactors "R" AC-1, ACDC Coil



# Modular Contactors

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Technical Specification	Page	165







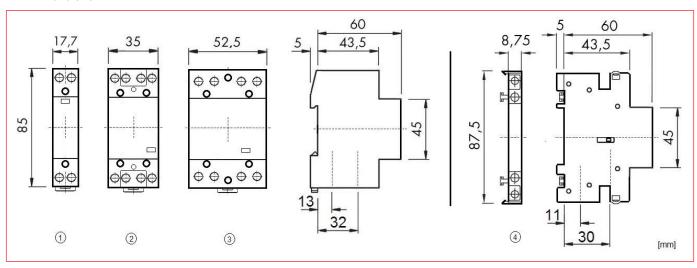
BZ326470

#### Schrack-Info

- Modular Contactors 1-, 2- or 4-pole
- AC-coil 24VAC 50/60Hz, 230VAC 50Hz
- Rated current 20, 25, 40 or 63A
- Breadth 1, 2 or 3MW, starting with 2MW one auxiliary contact RH11 (0.5MW) retrofit
- Less hum
- 1MW = 17.5mm

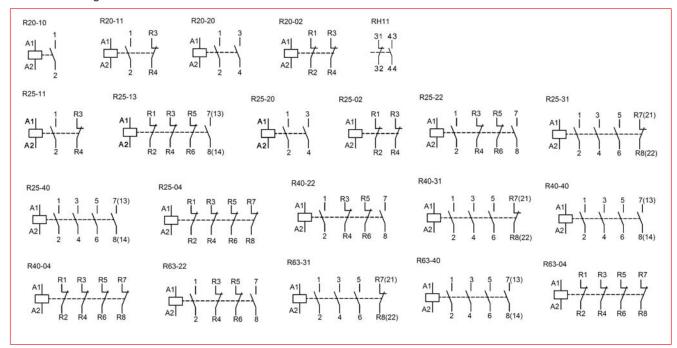
		1-pole	/ 2-pole		4-pole		Burn
		R20	R25	R25	R40	R63	RH11
Rated insulation voltage U <sub>i</sub>	(VAC)	4	40		440		440
Utilization category AC-1 cos φ = 1							
Rated operational power (heating power) at 230VAC	(kW)	4,6	5,5	5,7	9	14,3	-
Rated operational power (heating power) at 400VAC	(kW)	-	-	17	27,5	43	-
							AC-15 230V 3A
Rated operational current $I_e = I_{th}$ at $60^{\circ}$ C and $440$ VAC	(A)	20	25	25	40	63	DC-13 60V 2A
							DC-13 220V 0, 1 A
Utilization category AC-3 and AC-7b							
Rated operational power at 230VAC (single phase motors)	(kW)	1,1	1,3	-	-	-	-
Rated operational power at 400VAC (3-pole motors)	(kW)	-	-	4	12,5	15	-
Rated operational current I <sub>e</sub> at 380-400VAC	(A)	-	-	9	27	30	-
Ambient temperature (operation)	(°C)			-:	25 +60		
Permissible mounting position						30.	
Modules			1	2		3	0,5
Rules and regulations				IEC 947-4	-1/ EN60947-	-4-1	

#### Dimensions

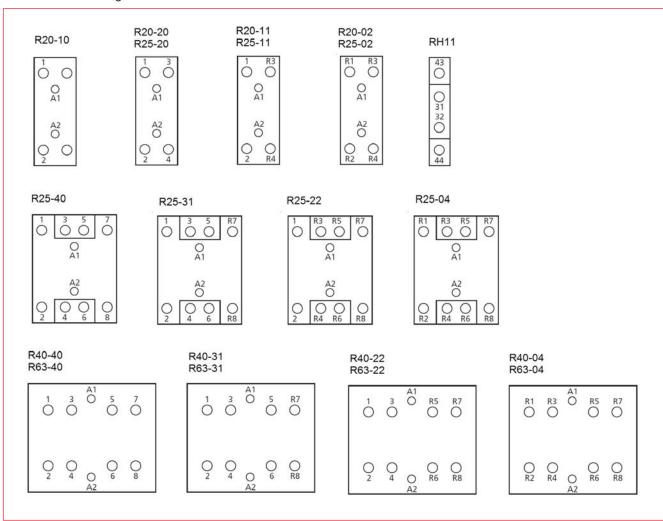


- 1) 1 Module
- 2) 2 Modules
- 3) 3 Modules
- 4) 0,5 Module

#### Circuit Diagrams



#### Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
24VAC coil voltage			
20A, 1NO / 24VAC 1 MW	R20-10		BZ326486
20A, 1NO+1 NC / 24VAC 1 MW	R20-11	000 0-0	BZ326421
20A, 2NO / 24VAC 1 MW	R20-20	000 0-0	BZ326453
20A, 1NO / 24VAC 1 MW	R20-02	000 0-0	BZ326490
25A, 1NO+1NC / 24VAC 1 MW	R25-11		BZ326476
25A, 1NO+3NC / 24VAC 2 MW	R25-13	000 0-0	BZ326464
25A, 2NO / 24VAC 1 MW	R25-20	000 0-0	BZ326474
25A, 2NC / 24VAC 1 MW	R25-02	2000 01 69	BZ326480
25A, 2NO+2NC / 24VAC 2 MW	R25-22	000 0-0	BZ326482
25A, 3NO+1NC / 24VAC 2 MW	R25-31	555 0- 0	BZ326462
25A, 4NO / 24VAC 2 MW	R25-40	000 0-0	BZ326460
25A, 4NC / 24VAC 2 MW	R25-04	388 0-0	BZ326483
40A, 2NO+2NC / 24VAC 3 MW	R40-22	000 0 0 0 0	BZ326488
40A, 3NO+1NC / 24VAC 3 MW	R40-31		BZ326487
40A, 4NO / 24VAC 3 MW	R40-40	500 0-0	BZ326443
40A, 4NC / 24VAC 3 MW	R40-04		BZ326489
63A, 2NO+2NC / 24VAC 3 MW	R63-22		BZ326456
63A, 3NO+1NC / 24VAC 3 MW	R63-31		BZ326455
63A, 4NO / 24VAC 3 MW	R63-40	000 0-0	BZ326445
63A, 4NC / 24VAC 3 MW	R63-04	000 O- 0-	BZ326458
230VAC coil voltage	K03-04		BZ320436
20A, 1NO / 230VAC 1 MW	R20-10	555 6-6	BZ326471
20A, 1NO+1 NC / 230VAC 1 MW			BZ326438
20A, 2NO / 230VAC 1 MW	R20-11	500 0-0	BZ326437
	R20-20	555 0-0	
20A, 2 NC / 230VAC 1 MW	R20-02	500 0-0	BZ326439
25A, 1NO / 230VAC 1 MW	R25-10	555 0-0	BZ326473
25A, 1NO+1NC / 230VAC 1 MW	R25-11	000 0-0	BZ326479
25A, 1NO+3NC / 230VAC 2 MW	R25-13	555 6-6	BZ326465
25A, 2NO / 230VAC 1 MW	R25-20	000 0-0	BZ326475
25A, 2NC / 230VAC 1 MW	R25-02	900	BZ326481
25A, 2NO+2NC / 230VAC 2 MW	R25-22	000 0-0	BZ326472
25A, 3NO+1NC / 230VAC 2 MW	R25-31	088 0-0	BZ326463
25A, 4NO / 230VAC 2 MW	R25-40	000 0-0	BZ326461
25A, 4NC / 230VAC 2 MW	R25-04	000	BZ326467
40A, 2NO+2NC / 230VAC 3 MW	R40-22	000 0-0	BZ326466
40A, 3NO / 230VAC 3 MW	R40-30	555 0-6	BZ326468
40A, 3NO+1NC / 230VAC 3 MW	R40-31	000 0-0	BZ326454
40A, 4NO / 230VAC 3 MW	R40-40	000 0-0	BZ326442
40A, 4NC / 230VAC 3 MW	R40-04		BZ326459
63A, 2NO+2NC / 230VAC 3 MW	R63-22	555 0- 5	BZ326457
63A, 3NO+1NC / 230VAC 3 MW	R63-31	000 0-0	BZ326452
63A, 4NO / 230VAC 3 MW	R63-40	555 6-6	BZ326444
63A, 4NC / 230VAC 3 MW	R63-04	000 0-0	BZ326469
Accessories			
Auxiliary contact 1NO+1NC 3A 0.5 MW	RH11	988 O- 6	BZ326470





BZ326482VM

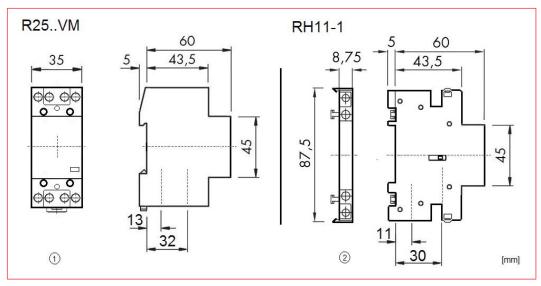
BZ326470VM

#### Schrack-Info

- Modular Contactors, 4-pole
- AC/DC-coil 24VACDC or 230VACDC
- Operational current 25A
- Width of contactor 2MW
- Auxiliary contact block RH11-1 (0.5MW) retrofit to each contactor
- Hum free
- 1MW = 17.5mm

		R25	RH11-1	
Rated insulation voltage U <sub>i</sub>	(VAC)	440	440	
Utilization category AC-1 cos φ= 1				
Rated operational power (heating power) at 230VAC	(kW)	5,7	-	
Rated operational power (heating power) at 400VAC	(k₩)	17	-	
			AC-15 230V 3A	
Rated operational current $I_e = I_{th}$ at 60°C and 440VAC	(A)	25	DC-13 60V 2A	
			DC-13 220V 0,1A	
Utilization category AC-3 and AC-7b			•	
Rated operational power at 230VAC (single phase motors)	(kW)	-	-	
Rated operational power at 400VAC (3-pole motors)	(kW)	4	-	
Rated operational current I <sub>e</sub> at 380-400VAC	(A)	9	-	
Ambient temperature (operation)	(°C)	-25	+60	
Permissible mounting position		00 00 00 00 00 00 00 00 00 00	30-	
Modules		2	0,5	
Rules and regulations	IEC 947-4-1 / EN60947-4-1			

#### Dimensions

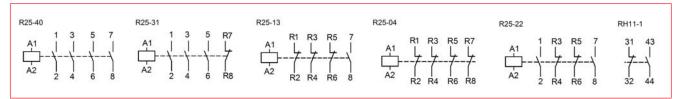


1) 2 Modules

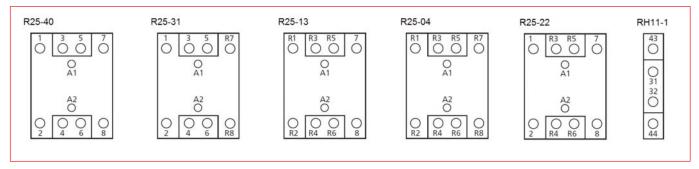
2) 0,5 Module



### Circuit Diagrams



#### Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
24VACDC coil voltage			
25A, 1NO+3NC / 24VACDC 2 MW	R25-13VM		BZ326464VM
25A, 2NO+2NC / 24VACDC 2 MW	R25-22VM	355 0-0	BZ326482VM
25A, 3NO+1NC / 24VACDC 2 MW	R25-31VM		BZ326462VM
25A, 4NO / 24VACDC 2 MW	R25-40VM	000 0-0	BZ326460VM
25A, 4NC / 24VACDC 2 MW	R25-04VM		BZ326483VM
230VACDC coil voltage			
25A, 1NO+3NC / 230VACDC 2 MW	R25-13VM		BZ326465VM
25A, 2NO+2NC / 230VACDC 2 MW	R25-22VM		BZ326472VM
25A, 3NO+1NC / 230VACDC 2 MW	R25-31VM		BZ326463VM
25A, 4NO / 230VACDC 2 MW	R25-40VM	000 0-0	BZ326461VM
25A, 4NC / 230VACDC 2 MW	R25-04VM		BZ326467VM
Accessories			
Auxiliary contact 1NO+1NC 3A for VM-types 0.5 MW	RH11-1		BZ326470VM

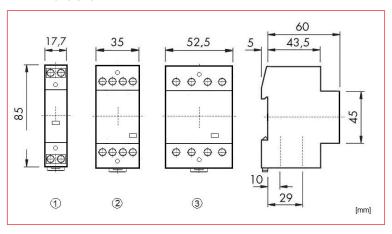


#### Schrack-Info

- Modular Contactors, 2- or 4-pole
- AC-coil 24VAC 50/60Hz, 230VAC 50Hz
- Operational current 20, 25, 40 and 63A
- Width of contactor 1, 2 or 3MW
- Less hum
- 1MW = approximately 17.5mm

		2-pole		4-pole	
	Γ	R20	R25	R40	R63
Rated insulation voltage U <sub>i</sub>	(VAC)	440		440	
Utilization category AC-1 cos φ = 1					
Rated operational power (heating power) at 230VAC	(kW)	4,6	5,7	9	14,3
Rated operational power (heating power) at 400VAC	(kW)	-	17	27,5	43
rated operational current $I_e = I_{th}$ at 60°C und 440VAC	(A)	20	25	40	63
Utilization category AC-3 and AC-7b					
Rated operational power at 230VAC (1-phase motor, 2-pole)	(kW)	1,1	-	-	-
Rated operational power at 400VAC (3-phase motor)	(kW)	-	4	12,5	15
Rated operational current le at 380-400VAC	(A)	-	9	27	30
Ambient temperature (operation)	(°C)		-25	. +60	
Permissible mounting position				300	
Modules		1	2	3	
Rules and regulations			IEC 947-4-1/	EN60947-4-1	

#### Dimensions



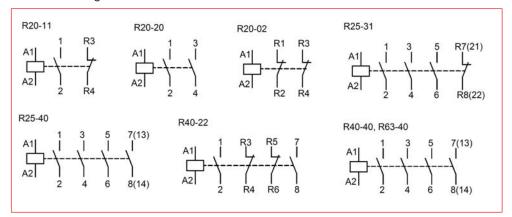
1) 1 Module

2) 2 Modules

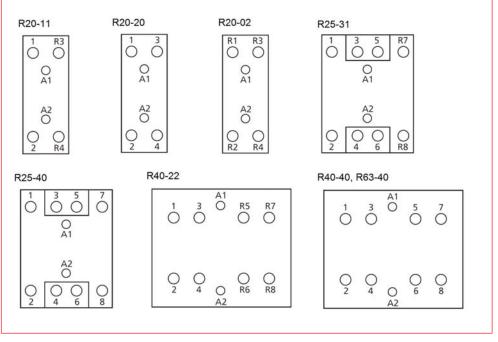
3) 3 Modules



#### Circuit Diagrams



#### ■ Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
24VAC coil voltage			
20A, 1NO+1 NC / 24VAC 1 MW	R20-11	000 0-0	BZ326421 ME
20A, 2NO / 24VAC 1 MW	R20-20	000 0-0	BZ326453ME
25A, 4NO / 24VAC 2 MW	R25-40	000 0=0	BZ326460ME
230VAC coil voltage			
20A, 2NO / 230VAC 1 MW	R20-20	000 0-0	BZ326437ME
20A, 1NO+1 NC / 230VAC 1 MW	R20-11	000 0-0	BZ326438ME
20A, 2 NC / 230VAC 1 MW	R20-02	000 0-0	BZ326439ME
40A, 4NO / 230VAC 3 MW	R40-40	555 0- 6	BZ326442ME
63A, 4NO / 230VAC 3 MW	R63-40	000 0-0	BZ326444ME
25A, 4NO / 230VAC 2 MW	R25-40	999 0- 8	BZ326461 ME
25A, 3NO+1NC / 230VAC 2 MW	R25-31	000 0-0	BZ326463ME
40A, 2NO+2NC / 230VAC 3 MW	R40-22	000 0-0	BZ326466ME

Lamp Type	Power	Current	Capacitors			30V 50Hz and max	1
	W	A	μF	R20	R25	R40	R63
Incandescent lamps	60	0,27	-	36	50	92	129
	100	0,45	-	21	30	55	77
	200	0,91	-	10	15	27	38
	300	1,36	-	7	10	19	26
	500	2,27	-	4	6	11	16
	1000	4,5	-	2	3	6	8
Fluorescent lamps	11	0,16	1,3	60	75	210	310
uncompensated or	18	0,37	2,7	25	30	90	140
serial compensated	24	0,35	2,5	25	30	90	140
·	36	0,43	3,4	20	25	70	140
	58	0,67	5,3	14	17	45	70
	65	0,67	5,3	13	16	40	65
	85	0,8	5,3	11	14	35	60
Fluorescent lamps	11	0,07	-	2 x 100	2 x 110	2 x 220	2 x 250
dual-connection	18	0, 11	_	2 x 50	2 x 55	2 x 130	2 x 200
	24	0,14	_	2 x 40	2 x 44	2 x 110	2 x 160
	36	0,22	_	2 x 30	2 x 33	2 x 70	2 x 100
	58	0,35	-	2 x 20	2 x 22	2 x 45	2 x 70
	65	0,35	_	2 x 15	2 x 16	2 x 40	2 x 60
	85	0,47	_	2 x 10	2 x 11	2 x 30	2 x 40
Fluorescent lamps	11	0,09	2	33	43	67	107
parallel compensated	18	0,13	2	25	32	50	80
buraner compensarea	24	0,16	3	25	32	50	80
	36	0,10	4	22	32	50	80
	58	0,45	7	14	18	36	46
	65	0,43	7	14	18	36	46
	85	0,6	8	12	16	33	44
Fluorescent lamps	18	0,09		40	40	100	150
with electronic fluorescent	36	0,16	-	20	20	50	75
	58			15	15	30	55
lamp ballast	80	0,25	-	7	10		30
	80	0,4	-	/	10	20	30
	2 x 18	0,17		20	20	50	60
			-				
	2 x 28	0,25	-	15	15	37	45
	2 x 36	0,32	-	10	10	25	30
	2 x 58	0,49	-	7	7	15	20
	2 x 80	0,7	-	4	4	8	10
Transformers	20	0,09	-	40	52	110	174
for metal halid	50	0,22	-	20	24	50	80
low voltage lamps	75	0,33	-	13	16	35	54
	100	0,43	-	10	12	27	43
	150	0,65	-	7	9	19	29
	200	0,87	-	5	5	14	23
	300	1,3	-	3	4	9	14
Mercury-vapour lamps	50	0,61	-	16	21	38	55
(high-pressure lamps)	80	0,8	-	12	16	28	40
uncompensated	125	1,15	-	8	11	20	28
e. g. HQL, HPL							
	250	2,15	-	4	6	11	15
	400	3,25	-	3	4	7	10
	700	5,4	-	1	2	4	6
	1000	7,5	-	1	1	3	4
Mercury-vapour lamps	50	0,28	7	7	18	36	50
high-pressure lamps),	80	0,41	8	5	16	31	44
compensated	125	0,65	10	3	13	25	35
e. g. HQL, HPL							
-	250	1,22	18	2	7	14	19
	400	1,95	25	1	5	10	14
	700	3,45	45	1	3	6	8
	1000	4,8	60	_	2	4	6
	1	.,,,		1		· · ·	



International Programme   International Pr		Power	Current	Capacitors	Max.	lamps per pole at 2	30V 50Hz and max	k. 60°C
Seed helidick lemps	Lamp Type	W	A	μF	R20	R25	R40	R63
Secondaries   70	Metal halide lamps	35	0,53		22	24	57	65
18	ncompensated	70		-	12	14	30	35
A00	. g. HQI, HPI, CDM	150	1,8	-		8	17	18
A00		250	3	_	4	5	10	12
1000				_			1	1
2000								1
18				-	-	1		
18								
Second Compose   Seco	00V per Pole					-		1
Section   Sect	Astal halido lamns							
250   1,5   33   1   4   9   11								
250	·			1		1		1
A00	. g. HQI, HPI, CDM	150	0,75	20	2	/	13	18
1000		250	1,5	33	1	4		11
2000   11,5   148   -		400	2,1	35	1	4	9	10
DOV per Pole		1000	5,8	95	-	1	3	4
Seal   11.6   10.0   -   -   2   3   3   20   11.6   10.0   -   -   2   3   3   20   11.6   10.0   -   -   -   2   3   3   3   3   1.5   10.0   12   3   3   3   3   3   3   3   3   3		2000	11,5	148	-	-	2	2
Seal   11.6   10.0   -   -   2   3   3   20   11.6   10.0   -   -   2   3   3   20   11.6   10.0   -   -   -   2   3   3   3   3   1.5   10.0   12   3   3   3   3   3   3   3   3   3	00V per Pole	2000	6.6	5.8	_	_	3	1
this electronic fluorescent   28	out her role				-		1	1
this electronic fluorescent   28	Netal halide lamps			integrated	9	9	18	20
tith elactronic fluorescent mith particular (e.g.; PCI) 70 0,36 integrated 5 5 5 10 12 12 0-125 x In lamp for 0,6ms 150 0,7 integrated 4 4 4 8 10 0-125 x In lamp for 0,6ms 150 0,7 integrated 4 4 4 8 10 0-125 x In lamp for 0,6ms 150 0,7 integrated 4 4 4 8 10 0-125 x In lamp for 0,6ms 150 0,7 integrated 4 4 4 8 10 0-125 x In lamp for 0,6ms 150 0,7 integrated 4 4 4 8 10 0-125 x In lamp for 0,6ms 150 0,7 integrated 4 4 6 13 19 19 19 19 19 19 19 19 19 19 19 19 19		28	0,15	1	-	_	_	18
Imp bollast (e.g.; PCI)				1	6	6	11	
0-125 x ln lomp for 0,6ms  150  0.77  integrated  4  4  4  8  10  odium-vapour lamps  35  1,5  -  7  9  22  30  ncompensated  90  2,4  -  135  3,3  -  3  4  10  14  150  3,3  -  3  4  10  14  180  3,3  -  3  4  10  14  180  3,3  -  3  4  10  14  180  3,3  -  3  4  10  11  10  11  10  10		1		1	!	1	!	!
35	, , , , , , , , , , , , , , , , , , , ,			-	!		1	1
cow pressure lamps), necessare lamps), necessare lamps), necessare lamps), necessare lamps), necessare lamps, necessare			-					
135   3,3   -   3   4   10   14				-	!	1	!	!
135   3,3   -   3   4   10   14     180   3,3   -   3   4   10   14     180   3,3   -   3   4   10   14     200   3,3   -   3   4   10   14     200   3,3   -   3   4   10   14     200   3,3   -   3   4   10   14     200   3,3   -   3   4   10   14     200   3,3   -   3   4   10   14     200   3,3   -   3   4   10   14     200   5   6   15   18     200   5   6   15   18     200   5   6   15   18     200   5   6   15   18     200   1,35   0,94   45   2   3   7   8     200   1,35   10   2   3   8   9     200   1,32   25   -     10   12     200   1,32   25   -     10   12     200   1,32   25   -     10   12     200   1,32   25   -     10   12     200   1,32   25   -     10   12     200   1,32   25   -     10   12     200   1,32   25   -     10   12     200   1,30   2   25   -     10   13     200   1,30   2   25   3   4   8   10     200   1,30   2   1   1   1   3   4     200   1,30   -   1   1   1   3     200   4,7   -   2   3   6   8     200   10,3   -   1   1   3   4     200   10,3   -   1   1   3   4     200   10,3   -   1   1   3   4     200   25   3   20   5   7   20   25     25   3   3   3   4   12   15     200   25   3   106   1   1   4   6     200   200   200   33   35   0,2   integrated   9   9   18   20     200   201   20   201   integrated   9   9   18   20     200   201   201   201   201   201     201   201   201   201   201   201     201   201   201   201   201   201     201   201   201   201   201   201     201   201   201   201   201   201     201   201   201   201   201   201     201   201   201   201   201   201   201     201   201   201   201   201   201     201   201   201   201   201   201   201     201   201   201   201   201   201   201     201   201   201   201   201   201   201     201   201   201   201   201   201   201   201     201   201   201   201   201   201   201   201     201   201   201   201   201   201   201   201     201   201   201   201   201   201   201   201     201   201   201   201   201   201   201   201     201   201   201   201   201   201   201     201   201   201   20				-	!		!	!
150   3,3   -   3   4   10   14   180   3,3   -   3   4   10   14   180   3,3   -   3   4   10   14   180   3,3   -   3   4   10   14   14   16   14   16   15   18   16   16   15   18   18   16   16   15   18   18   10   19   10   10   12   15   18   10   19   10   10   12   15   18   10   10   10   12   15   18   10   10   10   12   15   16   16   16   16   16   16   16	ncompensated	90	2,4	-	4	6	13	19
180   3,3   -   3   4   10   14		135	3,3	-	3	4	10	14
180   3,3   -   3   4   10   14		150		_	3	4	10	14
200   3,3   -   3   4   10   14				_				14
Section								1
Sempensated   Sempensated	odium-vapour lamps			20				
Propensited   Propensited					l .			1
135								1
150	ompensated	90	0,63	30	3	4	10	12
180		135	0,94	45				
200   1,32   25   -   -   10   12		150	1	40	2	3	8	9
150   1,8   -     5   8   17   22		180	1,16	40	2	3	8	9
150   1,8   -     5   8   17   22		200	1,32	25	-	-	10	12
250   3   -   4   5   10   13	odium-vapour lamps	150		-	5	8	17	
330   3,7   -   3   4   8   10				_				1
A00		1		_	l		1	1
1000   10,3   -   1   1   3   4				_		1	1	1
150   0,83   20   5   7   20   25		1						1
15   15   15   15   15   15   15   15	odium-vapour lamps							
330   2   40   2   3   10   13								1
400   2,4   48   2   2   8   12				1		1		1
1000   6,3   106   1   1   4   6	ompensarea	1		1		1		1
odium-vapour lamps         20         0,1         integrated         9         9         18         20           nigh pressure lamps)         35         0,2         integrated         6         6         11         13           ith serial electronic (e. g.: PCI)         70         0,36         integrated         5         5         10         12           0-125 x In lamp for 0,6ms         150         0,7         integrated         4         4         8         10           ED-Lamps         max. inrush current of contactor [A]         195         233         424         565           onsider the inrush current of contactor         inrush current of contactor         = max. lamps per pole at 230V 50Hz and max. 60°C		1			l .		1	1
aigh pressure lamps)       35       0,2       integrated       6       6       11       13         ith serial electronic (e. g.: PCI)       70       0,36       integrated       5       5       10       12         0-125 x In lamp for 0,6ms       150       0,7       integrated       4       4       8       10         ED-Lamps       max. inrush current of contactor [A]       195       233       424       565         onsider the inrush current of the lamp ballast and       inrush current of contactor [A]       = max. lamps, per pole at 230V 50Hz and max. 60°C	- 42			+				
70     0,36     integrated     5     5     10     12       0-125 x ln lamp for 0,6ms     150     0,7     integrated     4     4     8     10       ED-Lamps     max. inrush current of contactor [A]     195     233     424     565       consider the inrush current of the lamp ballast and     inrush current of contactor		l l		1 -	l			1
0-125 x In lamp for 0,6ms  150  0,7  integrated  4  4  8  10  ED-Lamps  max. inrush current of contactor [A]  195  233  424  565  consider the inrush current  f the lamp ballast and  inrush current of contactor  = max. lamps per pole at 230V 50Hz and max. 60°C		1		1	i e	1		1
ED-Lamps max. inrush current of contactor [A] 195 233 424 565 onsider the inrush current of contactor inrush current of contactor = max. Inrush current of c		70	0,36	integrated	5	5	10	12
onsider the inrush current  f the lamp ballast and  inrush current of contactor  = max lamps per pole at 230V 50Hz and max 60°C	0-125 x In lamp for 0,6ms				4		8	
f the lamp ballast and inrush current of contactor = max lamps per pole at 230V 50Hz and max 60°C	ED-Lamps	max. in	rush current of cont	actor [A]	195	233	424	565
	onsider the inrush current							
	the lamp ballast and		inrush curre	nt of contactor	= I.			
	e cos φ of the lamp				= max. lamps per	pole at 230V 50Hz	and max. 60°C	



				2-p	oole			4-	pole	
Туре			R20	R25	R40	R63	R25	R40	R63	RH11
Main Contacts 5) 6) 7)										
Rated insulation voltage Ui		V~	440 <sup>2)</sup>	441 <sup>2)</sup>	442 <sup>2)</sup>	443 <sup>2)</sup>	444 <sup>2)</sup>	445 <sup>2)</sup>	446 <sup>2)</sup>	447 <sup>2)</sup>
Rated operation voltage U <sub>e</sub>		V~	440	440	440	440	440	440	440	440
Frequency of operations z	AC1, AC3	1/h	300	300	600	600	300	600	600	600
Mechanical life		S x 10 <sup>6</sup>	1	1	1	1	1	1	1	1
Utilization category AC1 / AC7	r a									
Switching of resistive load										
Rated operational current I <sub>e</sub> (=I <sub>th</sub> )										
open	at 60°C	Α	20	25	40	63	25	40	63	-
Contact life		S x 10 <sup>6</sup>	0,1	0,1	0,1	0,1	0,1	0,1	0,1	-
Minimum Switch Voltage		V/mA	24/100	24/100	24/100	24/100	24/100	24/100	24/100	17/5
Short time current	10s-current	Α	72	72	216	240	72	216	240	-
Power loss per pole at le/AC1		W	2	3	3	7	2	3	7	0,5
Utilization category AC2 and A	C3 / AC7b									
Switching of three-phase motor	rs									
Rated operational current I <sub>e</sub>		Α	-	-	-	-	9	27	30	-
Rated operational power										
of three-phase motors	220V	kW	-	-	-	-	2.2	7.5	8	-
50-60Hz	230-240V	kW	-	-	-	-	2.5	8	8,5	-
	380-415V	kW	-	-	-	-	4	12,5	15	-
2-pole motors	230V	kW	1.1	1.3	2,6	5	-	-	-	-
Contact life		S x 10 <sup>6</sup>	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-
Power consumption of coils										
AC operated	inrush	VA	7 - 9	7 - 9			20 - 25	33 - 45	33 - 45	-
	sealed	VA	2.2 - 4.2	2.2 - 4.2	5 - 7	5 - 7	4 - 6	6 - 8	6 - 8	-
		W	0.8 - 1.6	0.8 - 1.6	3 - /	3 - /	1.5 - 2.5	2.6	2.6	-
AC and DC-operated		W	-	-			3 - 4	-	-	-
Operation range of coils										
in multiples of control voltage U <sub>s</sub> (-40	)° – +40°C)		0.85 - 1.1	0.85 - 1.1	0.85 - 1.1	0.85 - 1.1	0.85 - 1.1	0.85 - 1.1	0.85 - 1.1	-

<sup>2)</sup> Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 4kV.

<sup>5)</sup> Rated frequency 50/60Hz

<sup>6)</sup> Max. occ. switching overvoltage <4kV

<sup>7)</sup> Duty cycle: 100%

Data according to IEC60 947-4-1, IEC60 947-5-1, VDE 0660

Туре			R20	R25 (2p.)	R25 (4p.)	R25VM	R40	R63	RH11
Short circuit protection									
max. fuse Coordination-type "1"	gL (gG)	Α	35	35	35	35	63	80	-
Rated short circuit current	"r"	kA	3	3	3	3	3	3	-
	"lq"	kA	3	3	10	10	10	10	-
Switching time at control voltage U ±10%									
	make time	ms	7 - 16	7 - 16	9 - 15	17 - 24	11 - 15	11 - 15	-
	release time	ms	6 - 12	6 - 12	4 - 8	17 - 23	6 - 13	6 - 13	-
	arc duration	ms	10 - 15	10 - 15	10 - 15	10 - 15	10 - 15	10 - 15	-
Cable cross-sections									
Main connector	solid or stranded	$mm^2$	1.5 - 10	1.5 - 10	1.5 - 10	1.5 - 10	2.5 - 25	2.5 - 25	$0.5 - 2.5^{3)}$
	flexible	$mm^2$	1.5 - 6	1.5 - 6	1.5 - 6	1.5 - 6	2.5 - 16	2.5 - 16	$0.5 - 2.5^{3)}$
	flexible with multicore cable end	mm <sup>2</sup>	1.5 - 6	1.5 - 6	1.5 - 6	1.5 - 6	2.5 - 16	2.5 - 16	0.5 - 1.5
Cl	end		1	1	1	1	1	1	2
Clamps per pole Magnetic coil	solid or stranded	mm <sup>2</sup>	0.75 - 2.5	0. <i>7</i> 5 - 2.5	0.75 - 2.5	0.75 - 2.5	0.75 - 2.5	0.75 - 2.5	2
Magnetic coll	flexible	mm²	0.73 - 2.5	0.73 - 2.5	0.73 - 2.5	0.73 - 2.5	0.73 - 2.5	0.73 - 2.5	-
	flexible with multicore cable	mm²	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	-
	end	$\mathrm{mm}^2$	0.5 - 1.5	0.5 - 2.5	0.5 - 1.5	0.5 - 1.5	0.5 - 1.5	0.5 - 1.5	-
Clamps per pole			1	1	1	1	1	1	-
Auxiliary Contacts 5) 6) 7)									
Rated insulation voltage U <sub>i</sub> 1)		V AC	-	-	-	-	-	-	440 <sup>2)</sup>
Thermal rated current I <sub>th</sub>	40°C	Α	-	-	-	-	-	-	10
Ambient temperature	60°C	Α	-	-	-	-	-	-	6
Utilization category AC15									
Rated operational	220-240V	Α	-	-	-	-	-	-	3
current I <sub>e</sub>	380-415V	Α	-	-	-	-	-	-	2
	440V	Α	-	-	-	-	-	-	1,6
Utilization category DC13									
Rated operational	24-60V	Α	-	-	-	-	-	-	2
current I <sub>e</sub>	110V	Α	-	-	-	-	-	-	0.4
per pole	220V	Α	-	-	-	-	-	-	0.1
Short circuit protection									
short-circuit current 1kA,									
contact welding not accepted									
max. fuse size	gL (gG)	Α	-	-	-	-	-	-	10

<sup>2)</sup> Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 4kV.

<sup>3)</sup> Maximum cable cross-section with prepared conductor

<sup>4)</sup> AC7b motor 2-pole 230V 1,1kW

<sup>5)</sup> Rated frequency 50/60Hz

<sup>6)</sup> Max. occ. switching overvoltage <4kV

<sup>7)</sup> Duty cycle: 100%

-			4-pole	BU11 1
Type 5) 6) 7)			R25VM	RH11-1
Main contacts 5) 6) 7)			21	2)
Rated insulation voltage U <sub>i</sub>		V~	440 <sup>2)</sup>	440 <sup>2)</sup>
Rated operational voltage U <sub>e</sub>		V~	440	440
Switching frequency	AC1, AC3	1/h	300	600
Mechanical endurance		S x 10 <sup>6</sup>	1	1
Utilization category AC1				
Rated operational current I <sub>e</sub> (=I <sub>th</sub> )				
open at	60°C	Α	25	-
Endurance of main contacts		S x 10 <sup>6</sup>	0.1	-
Minimum switching voltage		V/mA	24/100	17/5
Short time current	10s-current	A	72	- -
Power loss per polel <sub>e</sub> /AC1		W	2	0.5
Utilization category AC3 / AC7	'b			
Switching of slipring or squirre	-cage motors			
Rated operational current le		Α	9	-
Rated power of motor	220V	kW	2.2	-
50-60Hz	230-240V	kW	2.5	-
	380-415V	kW	4	-
2-pole motors	230V	kW	-	-
Endurance of main contacts		S x 10 <sup>6</sup>	0.15	-
Power consumption of coil				
AC-operated	closing	VA	20 - 25	-
•	closed	VA	4-6	-
		W	3 - 3.5	
DC-operated		W	3-4	-
Operating range of coil				
in multiples of control voltage U <sub>s</sub> (-	40°C to +40°C)		0.85 - 1.1	-

- 2) Valid for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U<sub>imp</sub> = 4kV
- 5) Rated frequency 50/60Hz
- 6) Max. occ. switching overvoltage < 4kV
- 7) Duty cycle: 100%

# ■ Modular Contactors "Amparo" AC-1, AC Coil

		R20	R25	R40	R63			
Data according:		IEC/EN 60947-4-1						
			IEC/EI	V 61095				
Rated current I <sub>th:</sub>		20A	25A	40A	63A			
Rated voltage	1-phase U <sub>e</sub> :	230V	230V	230V	230V			
	3-phase Ue:	-	400V	400V	400V			
Rated current I <sub>e:</sub>	at AC1 / AC7 <sub>a</sub>	20A	25A	40A	63A			
Rated power	AC1 at U <sub>e</sub> = 230VAC Pmax:	4kW	16kW	-	-			
	AC1 at U <sub>e</sub> = 400VAC Pmax:	-	-	28kW	40kW			
	AC3 at U <sub>e</sub> = 400VAC Pmax:	-	4kW	12kW	15kW			
Rated insulation voltage Ui	:	500V	500V	500V	500V			
Rated impulse withstand vo	oltage U <sub>imp</sub> :	4kV						
Nominal frequency:	·	50/60Hz						
Maximum short circuit prote	ection	25A gL/gG	35A gL/gG	63A gL/gG	80A gL/gG			
Mechanical endurance		3000000	3000000	3000000	3000000			
Electrical endurance	at AC1 / AC7 <sub>a</sub>	150000	150000	150000	150000			
	at AC3 / AC7b	-	150000	150000	150000			
Breadth (1MW = 17.8mm)		1 MW	2 MW	3 MW	3 MW			
Maximum surrounding tem	perature	-5°C+55°C						
Protection degree			IP	20				

# ■ Terminal Screws

Devices	Kind of conn	ection						
	Screw with	Screw with		Screw		Screw driver	Tighteni	ng torque
	washer	clamp box		w.nut			Nm	lb. inch
Туре								
Modular Contactors								
Main and auxiliary conductors								
R20, R25	-	M3,5	-	-	(XX)	Pz1	0.8-1.4	<i>7</i> -12
R40, R63	-	M5	-	-	0.00	Pz2	2.5-3	22-26
Coil conductor								
R20, R25	-	M3,5	-	-		Pz1	0.6-1.2	5-11
R40, R63	-	M3,5	-	-		Pz 1	0.6-1.2	5-11



■ Electromechanical Contactors Series LA



Reversing Contactor Combinations Series ALEA LSW



Contactors Series CUBICO Mini, 3-pole



■ Electromechanical Contactors Series ALEA LS



Star-Delta Contactor Combinations Series ALEA LSY



■ Contactors Series CUBICO Classic, 3-pole



# **Electromechanical Contactors**

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# Micro Contactors LA, Size M



LAMD0510

#### Schrack-Info

- Contactors up to 2.2kW, 3- or 4-pole
- Worldwide smallest power contactor
- Suitable for safety applications according IEC 60335-1
- 3-pole contactors with one integrated auxiliary contact (1 NO or 1 NC)
- All auxiliary contactors are suitable for electronic circuits according to IEC 60947-5-4
- 4-pole contactors without auxiliary contact
- Contactors can not be fitted with additional auxiliary contacts
- No Thermal overload relais for contactors LAM are available
- Mountable on mounting rail TS 15 or with adaptor on DIN rail -TS 35
- Further accessories find attached

		K0-05D
Rated insulation voltage U <sub>i</sub>	(VAC)	440
Utilization category AC-1 cos φ = 1		
Rated operational power at 400VAC	(kW)	8.3
Rated operational current $I_e = I_{th}$ at 40°C and 480VAC	(A)	12
Utilization category AC-2 and AC-3		
Rated operational power at 400VAC	(k₩)	2.2
Rated operational current I <sub>e</sub> at 380-440VAC	(A)	5
Ambient temperature (operation)	(°C)	-40 +60
Permissible mounting position		30.
Rules and regulations according		IEC 60947-4-1, EN 60947-4-1

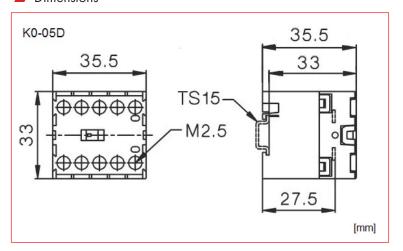
		Auxiliary contacts	
Rated insulation voltage U <sub>i</sub>	(VAC)	440	
Thermal rated current I <sub>th</sub>	(A)	5	
at 40°C and 440VAC	(A)	J	
Utilization category AC-15			
Rated operational current I <sub>e</sub>	(A)	2 /1	
at 40°C and 230/440VAC	(A)	3/1	
Utilization category DC13 1)			
Rated operational current le	(4)	0.5	
at 40°C up to 60VDC	(A)	0.5	
Ambient temperature (operation)	(°C)	-40 +60	
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1	
1) A - dr	:		

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 5mA) Positively guided contacts

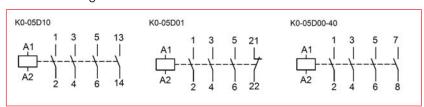


# Micro Contactors LA, Size M

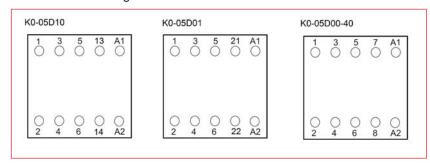
#### Dimensions



#### Circuit Diagrams



#### Connection Diagrams



DESCRIPTION	TYPE NO	A \ / A     A D   E	ORDER NO.
DESCRIPTION	TYPE NC	D. AVAILABLE	ORDER NO.
2.2kW - 3-pole			
AC-3/5A, 3NO+1NO, 24VAC	K0-05D1	0 000 0-0	LAMD0510
AC-3/5A, 3NO+1NO, 230VAC	K0-05D1	0	LAMD0513
AC-3/5A, 3NO+1NO, 400VAC	K0-05D1	0	LAMD0514
AC-3/5A, 3NO+1NO, 24VDC	K0-05D1	0	LAMD0515
AC-3/5A, 3NO+1NC, 24VAC	K0-05D0	1 000 0-0	LAMD0520
AC-3/5A, 3NO+1NC, 230VAC	K0-05D0	388 0-6	LAMD0523
AC-3/5A, 3NO+1NC, 400VAC	K0-05D0	1 000 0-0	LAMD0524
AC-3/5A, 3NO+1NC, 24VDC	K0-05D0	388	LAMD0525
2.2kW - 4-pole			
AC-3/5A, 4NO, 24VAC	K0-05D0	0-40	LAMD0540
AC-3/5A, 4NO, 230VAC	K0-05D0	0-40	LAMD0543
AC-3/5A, 4NO, 400VAC	K0-05D0	0-40	LAMD0544
AC-3/5A, 4NO, 24VDC	K0-05D0	0-40	LAMD0545
Accessories for contactors size M			
DIN-rail slotted, 1000x15x5mm	TS15	000 0-0	LAMZTS15
DIN-rail adaptor TS35	TS35	555 0- 5-	LAMZTS35





### Mini Contactors LA, Size 1



LA 100910

#### Schrack-Info

- Contactors up to 4kW, 3- or 4-pole
- 3-pole contactors with integrated auxiliary contacts (1NO or 1NC), 4-pole contactors without integrated auxiliary contact
- 3-pole contactors with one integrated auxiliary contact NO, auxiliary contact HKM can be snapped on
- 3-pole contactors with one integrated auxiliary contact NC, auxiliary contact HKM can be snapped on
- 4-pole contactors, auxiliary contacts HKM can be snapped on
- 3-pole contactors for direct mounting of Thermal overload relais of type U12/16E..K1 suitable
- 4-pole contactors are not suitable for Thermal overload relais
- Mountable on DIN-rail TS35 or mounting plate
- Further accessories find attached

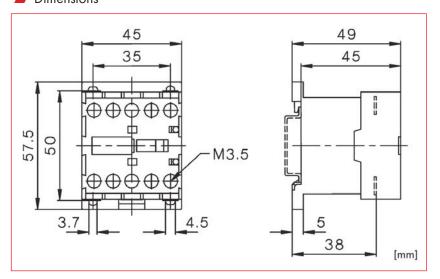
		K1-09
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Utilization category AC-1 cos φ = 1		
Rated operational power at 400VAC	(kW)	13,8
Rated operational current $I_e = I_{th}$ at 40°C and 690VAC	(A)	20
Utilization category AC-2 and AC-3		
Rated operational power at 400VAC	(kW)	4
Rated operational current I <sub>e</sub> at 380-440VAC	(A)	9
Ambient temperature (operation)	(°C)	-40 +60
Permissible mounting position		30. 00000
Rules and regulations according		IEC 60947-4-1, EN60947-4-1
		included auxiliary contacts
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Thermal rated current I <sub>th</sub> at 40°C and 440VAC	(A)	10
Utilization category AC-15		
Rated operational current le at 40°C and 230/440VAC	(A)	3 / 1.6
Utilization category DC13 <sup>1)</sup>		
Rated operational current le at 40°C up to 60/110/220VDC	(A)	2/0.4/0.1
Ambient temperature (operation)	(°C)	-40 +60
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 5mA), positively guided contacts

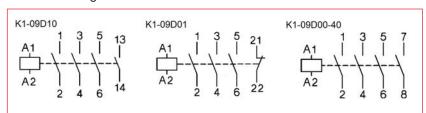


# Mini Contactors LA, Size 1

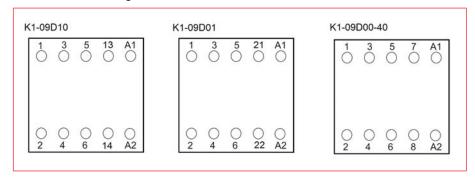
### Dimensions



### Circuit Diagrams



### ■ Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
4kW - 3-pole			
3NO+1NC, 20A, 24VAC	K1-09D10	000 0-0	LA100910
3NO+1NC, 20A, 24VDC	K1-09D10	000 0-0	LA100915
3NO main + 1NC auxiliary contact, 20A, 24VDC+supressor	K1-09D10	000 0-0	LA10091B
3NO+1NC, 20A, 230VAC	K1-09D10	555 0- 6	LA100913
3NO main + 1NC auxiliary contact, 20A, 230VAC+supressor	K1-09D10	000 0-0	LA10091C
3NO + 1NC, 20A, 24 VAC	K1-09D01	000 0-0	LA100920
3NO + 1NC, 20A, 24 VDC	K1-09D01	000 0-0	LA100925
3NO + 1NC, 20A, 230 VAC	K1-09D01	000 0-0	LA100923
4kW - 4-pole			
4 NO 230V AC, 20A	K1-09D00-40	000 0-0	LA100943
4NO, 20A, 24 VDC+ suppressor	K1-09D00-40	000 0-0	LA10094B
Auxiliary contacts			
Auxiliary contact block for mini Contactors K1, 2NO	HKM20		LA 190143
Auxiliary contact block for mini Contactors K1, 1NO+1NC	HKM 11	000 0-0	LA190151
Auxiliary contact block for mini Contactors K1, 2NO+2NC	HKM22	000 0-0	LA190150
Auxiliary contact block for mini Contactors K1, 2NC, HKM02	HKM02		LA 190152





# Power Contactors LA, Size 2



#### Schrack-Info

- Contactors up to 30kW, 4-pole
- K2-23 up to K2-37, in maximum 4 frontside auxiliary contacts HN or HA can be snapped on
- K2-45 up to K2-60, in maximum 6 frontside auxiliary contacts HN or HA can be snapped on

IEC 947-4-1/ EN60947-4-1

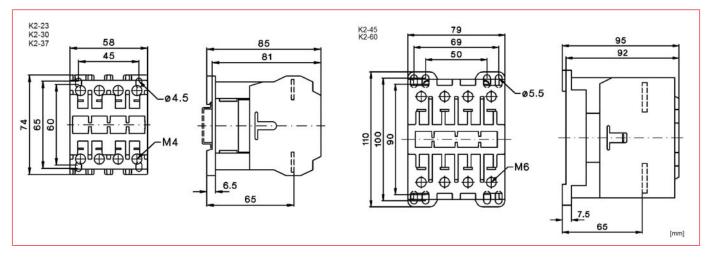
- No Thermal overload relais retrofit
- Mountable on DIN-rail TS35 or mounting plate
- Further accessories find attached

LA203742

		K2-23	K2-30	K2-37	K2-45	K2-60
Rated insulation voltage U <sub>i</sub>	(VAC)	690				
Utilization category AC-1 cos φ=1						
Rated operational power at 400VAC	(k₩)	31	34,5	34,5	55	69
Rated operational current $I_e = I_{th}$ at 40°C and 690VAC	(A)	45	50	50	80	100
Utilization category AC-2 and AC-3						
Rated operational power at 400VAC	(k₩)	11	15	18,5	22	30
Rated operational current I <sub>e</sub> at 380-400VAC	(A)	23	30	37	45	60
Ambient temperature (operation)	(°C)			-40 +60		
Permissible mounting position		300 O O O O O O O O O O O O O O O O O O				

#### Dimensions

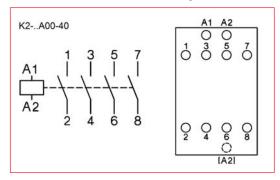
Rules and regulations according





# Power Contactors LA, Size 2

# Circuit and Connection Diagram



DESCRIPTION	TYPE NO. AVAILAE	BLE ORDER NO.
4-pole		
K2-23A00-40 230VAC/11kW	K2-23A00-40	LA202343
K2-30A00-40 230VAC/15kW	K2-30A00-40	LA203043
K2-37A00-40 110VAC/18.5kW	K2-37A00-40	LA203742
K2-37A00-40 230VAC/18kW	K2-37A00-40	LA203743
K2-45A00-40 230VAC/22kW	K2-45A00-40	LA204543
K2-60A00-40 230VAC/30kW	K2-60A00-40	LA206043
Auxiliary contacts		
front 1NO, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4	HN10	LA 190100
front 1 NC, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4	HN01	LA 190101
front 1 NC, 6A (230V, AC-15) for K2, K3-07 to K3-115, K4	HA01	LA 190135
front 1 NO, 6A (230V, AC-15) for K2, K3-07 to K3-115, K4	HA10	LA 190137
front 1 early make NO, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4		LA 190138
front 1 delayed NC, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4		LA190139

# Power Contactors LA, Size 3, 4 - 18.5kW



LA301010N

#### Schrack-Info

- Contactors from 4kW up to 18.5kW, 3- or 4-pole
- K3-10 up to K3-22, in maximum 4 frontside auxiliary contacts HN or HA can be snapped on
- K3-24 up to K3-40, in maximum 4 frontside auxiliary contacts HN or HA as well as 2 "side mounted" auxiliary contacts HB can be snapped on
- 3-pole contactors K3-10 up to K3-22 suitable for Thermal overload relais of type U12/16E..K3
- 3-pole contactors K3-10 up to K3-40 suitable for Thermal overload relais of type U3/32
- 3-pole contactors K3-24 up to K3-40 suitable for Thermal overload relais of type U3/42
- 4-pole contactors are not suitable for Thermal overload relais
- Mountable on DIN-rail TS35 or mounting plate
- Further accessories find attached

	1	K3-10	K3-14	K3-18	K3-22	K3-24	K3-32	K3-40
Rated insulation voltage U <sub>i</sub>	(VAC)			'	690	'		
Utilization category AC-1 cos φ = 1								
Rated power at 400VAC	(kW)	17,3	17,3	22,1	22,1	34,6	45	55,4
Rated operational current $I_e = I_{th}$ at 40°C and 690VAC	(A)	25	25	32	32	50	65	80
Utilization category AC-2 and AC-3								
Rated power at 400VAC	(kW)	4	5,5	7,5	11	11	15	18,5
Rated operational current I <sub>e</sub> at 380-400VAC	(A)	10	14	18	22	24	32	40
Ambient temperature (operation)	(°C)				-40 +60			
Permissible mounting position								
Rules and regulations according		IEC 60947-4-1, EN60947-4-1						

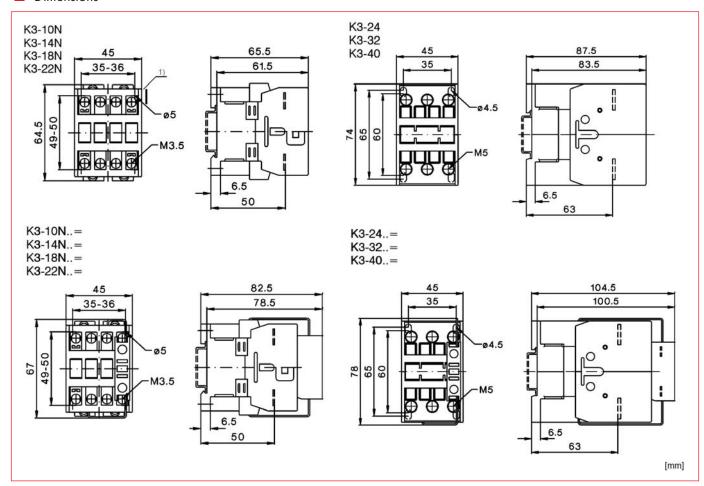
		Included auxiliary contacts
Rated insulation voltage U;	(VAC)	690
Thermal rated current I <sub>th</sub> at 40°C and 690VAC	(A)	10
Utilization category AC-15		
Rated operational current I <sub>e</sub> at 40°C and 230/440VAC	(A)	3 / 1,6
Utilization category DC13 <sup>1)</sup>		
Rated operational current I <sub>e</sub> at 40°C up to 60/110/220VDC	(A)	3,5 / 0,5 / 0,1
Ambient temperature (operation)	(°C)	-40 +60
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 5mA), positively guided contacts



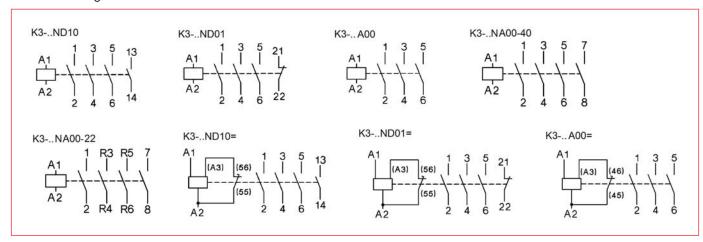
# Power Contactors LA, Size 3, 4 - 18.5kW

#### Dimensions



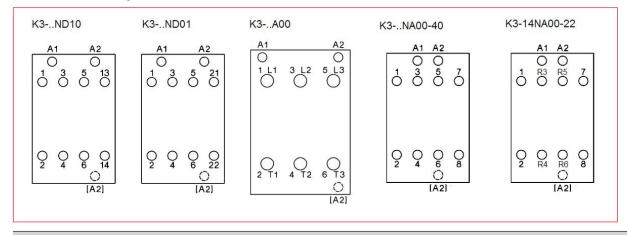
1) Minimum side distances to conductive parts at coil voltages: 500V U<sub>imp</sub>=6kV 2mm 660-690V U<sub>imp</sub>=8kV 4,5mm

#### Circuit Diagrams



# Power Contactors LA, Size 3, 4 - 18.5kW

### ■ Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
4kW / 10A AC3, 25A AC-1, 3-pole			
4kW, AC3, 10A, 24VAC + 1NO built in	K3-10ND10	000 0-0	LA301010N
4kW, AC3, 10A, 24VDC + 1NO built in	K3-10ND10=	999 0- 0	LA301015N
4kW, AC3, 10A, 24VAC + 1NC built in	K3-10ND01	300 O- 8	LA301020N
4kW, AC3, 10A, 48VAC + 1NO built in	K3-10ND10	000 0-0	LA301011N
4kW, AC3, 10A, 110VAC + 1NO built in	K3-10ND10		LA301012N
4kW, AC3, 10A, 230VAC + 1NO built in	K3-10ND10	555 0- 8	LA301013N
4kW, AC3, 10A, 400VAC + 1NO built in	K3-10ND10 /	300 O- 0	LA301014N
4kW, AC3, 10A, 230VAC + 1NC built in	K3-10ND01	300 0-8	LA301023N
4kW, AC3, 10A, 400VAC + 1NC built in	K3-10ND01	000 0-0	LA301024N
4kW, AC3, 10A, 230VAC + 1NC built in	K3-10ND01=	333 0-0	LA301025N
4kW / 10A AC3, 25A AC-1, 4-pole			
4kW, AC3, 10A, 230VAC, 4 main contacts	K3-10NA00-40	355 0- 8	LA301043N
5.5kW / 14A AC-3, 25A AC-1, 3-pole			
Contactor 3pole, 5.5kW, AC3, 14A, 24VAC + 1NO built in	K3-14ND10	000 0-0	LA301410N
Contactor 3pole, 5.5kW, AC3, 14A, 48VAC + 1NO built in	K3-14ND10		LA301411N
Contactor 3-pole, 5.5kW, AC3, 14A, 24VAC + 1NC built in	K3-14ND01 /	999 0-0	LA301420N
Contactor 3-pole, 5.5kW/14A AC3, 25A AC1, 1NC, 110VAC	K3-14ND01		LA301422N
Contactor 3pole, 5.5kW, AC3, 14A, 24VDC + 1NO built in	K3-14ND10=	000 0-0	LA301415N
Contactor 3-pole, 5.5kW/14A AC3, 25A AC1, 1NO, 220VDC	K3-14ND10=		LA301418N
Contactor 3-pole, 5.5kW, AC3, 14A, 24VDC + 1NC built in	K3-14ND01=	000 0-0	LA301425N
Contactor 3pole, 5.5kW, AC3, 14A, 110VAC + 1NO built in	K3-14ND10		LA301412N
Contactor 3pole, 5.5kW, AC3, 14A, 230VAC + 1NO built in	K3-14ND10	555 0- 5	LA301413N
Contactor 3-pole, 5.5kW, AC3, 14A, 230VAC + 1NC built in	K3-14ND01	000 0-0	LA301423N
Contactor 3pole, 5.5kW, AC3, 14A, 400VAC + 1NO built in	K3-14ND10	000 0-0	LA301414N
Contactor 3-pole, 5.5kW/14A AC3, 25A AC1, 1NC, 400VAC	K3-14ND01		LA301424N
5.5kW / 14A AC-3, 25A AC-1, 4-pole			
Contactor 4-pole, 5.5kW, AC3, 14A, 230VAC, 4 main contacts	K3-14NA00-40		LA301443N
Contactor 4-pole, 5.5kW/14A AC3, 25A AC1, 2NO+2NC, 230VAC	K3-14NA00-22		LA3014C3N
7.5kW / 18A AC-3, 32A AC-1, 3-pole			
Contactor 3-pole, 7.5kW, 1NO, 24VAC, 18A AC3, 32A AC1	K3-18ND10	355 0-0	LA301810N
Contactor, 3-pole, 7.5kW/18A AC3, 32A AC1, 1NO, 24VDC	K3-18ND10=	000 0-0	LA301815N
Contactor 3-pole, 7.5kW/18A AC3, 32A AC1, 1NO, 48VDC	K3-18ND10=		LA301816N
Contactor, 3-pole, 7.5kW/18A AC3, 32A AC1, 1NC, 24VAC	K3-18ND01	000 0-0	LA301820N
Contactor, 3-pole, 7.5kW/18A AC3, 32A AC1, 1NC, 24VDC	K3-18ND01=	000 0-0	LA301825N
Contactor 3-pole, 7.5kW/18A AC3, 32A AC1, 1NO, 48VAC	K3-18ND10		LA301811N
Contactor 3-pole, 7.5kW/18A AC3, 32A AC1, 1NO, 110VAC	K3-18ND10		LA301812N
Contactor 3-pole, 7.5kW, 1NO, 230VAC, 18A AC3,32A AC1	K3-18ND10 <u>/</u>	000 0-0	LA301813N





# Power Contactors LA, Size 3, 4 - 18.5kW

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
7.5kW / 18A AC-3, 32A AC-1, 3-pole			
Contactor, 3-pole, 7.5kW/18A AC3, 32A AC1, 1NC, 230VAC	K3-18ND01	000 0-0	LA301823N
Contactor 3-pole, 7.5kW/18A AC3, 32A AC1, 1NO, 415VAC	K3-18ND10	000 0-0	LA301814N
7.5kW / 18A AC-3, 32A AC-1, 4-pole			
Contactor, 4-pole, 7.5kW, 4 main contacts., 230VAC, 18A AC3,32A AC1	K3-18NA00-40	000 0-0	LA301843N
11kW / 22A AC-3, 32A AC-1, 3-pole			
Contactor, 3-pole, 11kW, 1NO, 24VAC, 22A AC3, 32A AC1	K3-22ND10	988 0-8	LA302210N
Contactor, 3-pole, 11kW/22A AC3, 32A AC1, 1NO, 24VDC	K3-22ND10=	000 0-0	LA302215N
Contactor 3-pole, 11kW/22A AC3, 32A AC1, 1NO, 48VDC	K3-22ND10=		LA302216N
Contactor, 3-pole, 11kW/22A AC3, 32A AC1, 1NC, 24VDC	K3-22ND01=	000 0-0	LA302225N
Contactor 3-pole, 11kW/22A AC3, 32A AC1, 1NO, 48VAC	K3-22ND10		LA302211 N
Contactor 3-pole, 11kW/22A AC3, 32A AC1, 1NO, 110VAC	K3-22ND10		LA302212N
Contactor, 3-pole, 11kW, 1NO, 230VAC, 22A AC3, 32A AC1	K3-22ND10	000 0-0	LA302213N
Contactor, 3-pole, 11kW/22A AC3, 32A AC1, 1NC, 230VAC	K3-22ND01	000 0-0	LA302223N
Contactor, 3-pole 11kW/22A AC3, 32A AC1, 1NO, 400VAC	K3-22ND10	000 0-0	LA302214N
Contactor 3-pole, 11kW/22A AC3, 32A AC1, 1NC, 400VAC	K3-22ND01		LA302224N
11kW / 22A AC-3, 32A AC-1, 4-pole			
Contactor, 4-pole, 11kW/22A AC3, 32A AC1, 4 main contact, 230VAC	K3-22NA00-40		LA302243N
11kW / 24A AC-3, 50A AC-1, 3-pole			
Contactor, 3-pole, 11kW/24A AC3, 50A AC1, 24VAC	K3-24A00		LA302430
Contactor, 3-pole, 11kW/24A AC3, 50A AC1, 48VDC	K3-24A00=		LA302436
Contactor, 3-pole, 11kW/24A AC3, 50A AC1, 24VDC	K3-24A00=	000 0-0	LA302435
Contactor, 3-pole, 11kW/24A AC3, 50A AC1, 48VAC	K3-24A00		LA302431
Contactor, 3-pole, 11kW/24A AC3, 50A AC1, 110VAC	K3-24A00		LA302432
Contactor, 3-pole, 11kW/24A AC3, 50A AC1, 230VAC	K3-24A00	000 0-0	LA302433
15kW / 32A AC-3, 65A AC-1, 3-pole			
Contactor, 3-pole, 15kW/32A AC3, 65A AC1, 24VAC	K3-32A00	988 0-8	LA303230
Contactor, 3-pole, 15kW/32A AC3, 65A AC1, 24VDC	K3-32A00=	000 0-0	LA303235
Contactor, 3-pole, 15kW/32A AC3, 65A AC1, 48VAC	K3-32A00		LA303231
Contactor, 3-pole, 15kW/32A AC3, 65A AC1, 110VAC	K3-32A00		LA303232
Contactor, 3-pole, 15kW/32A AC3, 65A AC1, 230VAC	K3-32A00	988 0-8	LA303233
Contactor, 3-pole, 15kW/32A AC3, 65A AC1, 400VAC	K3-32A00	988 0-8	LA303234
Contactor, 3-pole, 15kW/32A AC3, 65A AC1, 48VDC	K3-32A00=	999 0- 8	LA303236
18.5kW / 40A AC-3, 80A AC-1, 3-pole			
Contactor, 3-pole, 18,5kW/40A AC3, 80A AC1, 24VAC	K3-40A00		LA304030
Contactor, 3-pole, 18,5kW/40A AC3, 80A AC1, 48VAC	K3-40A00	000 0-0	LA304031
Contactor, 3-pole, 18,5kW/40A AC3, 80A AC1, 110VAC	K3-40A00		LA304032
Contactor, 3-pole, 18,5kW/40A AC3, 80A AC1, 230VAC	K3-40A00	000 0-0	LA304033
Contactor, 3-pole, 18,5kW/40A AC3, 80A AC1, 400VAC	K3-40A00		LA304034
Contactor, 3-pole, 18,5kW/40A AC3, 80A AC1, 24VDC	K3-40A00=	000 0=0	LA304035
Auxiliary contacts			
front 1NO, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4	HN10	000 0-0	LA190100
front 1NC, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4	HN01	988 0-8	LA190101
front 1NC, 6A (230V, AC-15) for K2, K3-07 to K3-115, K4	HA01	000 0-0	LA190135
front 1 NO, 6A (230V, AC-15) for K2, K3-07 to K3-115, K4	HA10	000 0-0	LA190137
front 1 early make NO, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4	HN10U	988 0-8	LA190138
front 1 delayed NC, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4	HN01U	999 0- 8	LA190139





# Power Contactors LA, Size 3, 22 - 90kW



LA305030

#### Schrack-Info

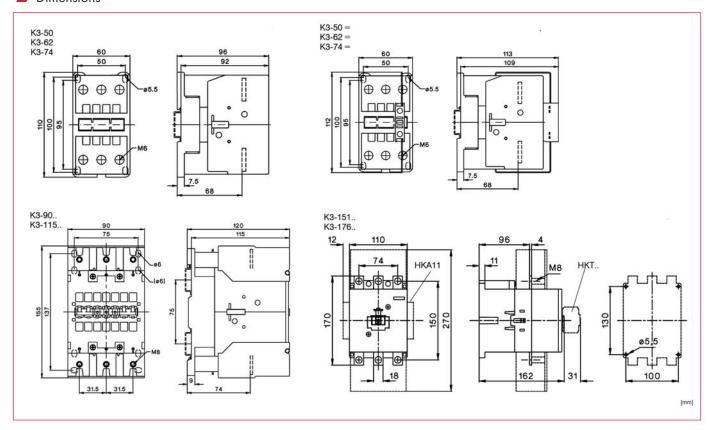
- Contactors from 22kW up to 90kW, 3- or 4-pole
- K3-50 up to K3-74, in maximum 4 frontside auxiliary contacts HN or HA as well as 2 "side mounted" auxiliary contacts HB can be snapped on
- K3-50 up to K3-74 with DC-coil, in maximum 3 frontside auxiliary contacts HN or HA as well as 2 "side mounted" auxiliary contacts HB can be snapped on
- K3-90 and K3-115, in maximum 7 frontside auxiliary contacts HN or HA as well as 2 "side mounted" auxiliary contacts HB can be snapped on
- K3-151 and K3-176, in maximum 1 frontside auxiliary contact HKT as well as 2 "side mounted" auxiliary contacts HKA11 can be snapped on
- 3-pole Contactors K3-50 up to K3-74 suitable for Thermal overload relais of type U3/74
- 3-pole Contactors K3-90 and K3-115 suitable for Thermal overload relais of type U85
- 3-pole Contactors K3-151 and K3-176 suitable for Thermal overload relais of type U180
- 4-pole Contactors are not suitable for Thermal overload relais
- Mouting of K3-50 up to K3-74 on DIN-rail TS35 or mounting plate
- Mouting of K3-90 up to K3-115 on 2 DIN-rails TS35 or mounting plate
- Mouting of K3-151 and K3-176 on mounting plate
- Further accessories find attached

		K3-50	K3-62	K3-74	K3-90	K3-115	K3-116	K3-151	K3-176
Rated insulation voltage U <sub>i</sub>	(VAC)		690	•		•	1000	•	•
Utilization category AC-1 cos φ = 1					•				
Rated operational power at 400VAC	(kW)	76.1	83	90	110	138	138	159	173
Rated operational current $I_e = I_{th}$ at 40°C and 690VAC	(A)	110	120	130	160	200	200	230	250
Utilization category AC-2 and AC-3									
Rated operational power at 400VAC	(kW)	22	30	37	45	55	55	<i>7</i> 5	90
Rated operational current I <sub>e</sub> at 380-400VAC	(A)	50	62	74	90	115	115	150	175
Ambient temperature (operation)	(°C)			-40 +60				-25 +55	
Permissible mounting position		3000						25. 25.	
Rules and regulations according					IFC 947-4-1	EN60947-4-1	1		

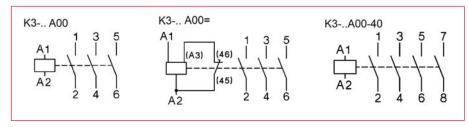


## Power Contactors LA, Size 3, 22 - 90kW

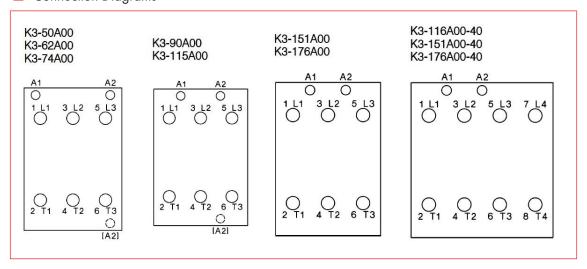
#### Dimensions



#### Circuit Diagrams



#### Connection Diagrams



# Power Contactors LA, Size 3, 22 - 90kW

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
22kW / 50A AC-3, 110A AC-1, 3-pole			
Contactor, 3-pole, 22kW/50A AC3, 110A AC1, 24VAC	K3-50A00	355 0-6	LA305030
Contactor, 3-pole, 22kW/50A AC3, 110A AC1, 110VAC	K3-50A00		LA305032
Contactor, 3-pole, 22kW/50A AC3, 110A AC1, 230VAC	K3-50A00	000 0=0	LA305033
Contactor, 3-pole, 22kW/50A AC3, 110A AC1, 24VDC	K3-50A00=	555 0- 0-	LA305035
30kW / 62A AC-3, 120A AC-1, 3-pole			
Contactor, 3-pole, 30kW/62A AC3, 120A AC1, 24VAC	K3-62A00	555 0-0	LA306230
Contactor, 3-pole, 30kW/62A AC3, 120A AC1, 48VAC	K3-62A00		LA306231
Contactor, 3-pole, 30kW/62A AC3, 120A AC1, 110VAC	K3-62A00		LA306232
Contactor, 3-pole, 30kW/62A AC3, 120A AC1, 230VAC	K3-62A00	000 0-0	LA306233
Contactor, 3-pole, 30kW/62A AC3, 120A AC1, 400VAC	K3-62A00		LA306234
Contactor, 3-pole, 30kW/62A AC3, 120A AC1, 24VDC	K3-62A00=	000 0-0	LA306235
37 -55kW / 74-115A AC-3, 130-200A AC-1, 3-pole			
Contactor, 3-pole, 37kW/74A AC3, 130A AC1, 110VAC	K3-74A00		LA307432
Contactor, 3-pole, 37kW/74A AC3, 130A AC1, 230VAC	K3-74A00	000 0-0	LA307433
Contactor, 3-pole, 37kW/74A AC3, 130A AC1, 400VAC	K3-74A00		LA307434
45kW/85A AC3, 150A AC1, 3-pole, 230VAC/DC	K3-90A00	555 0- 8	LA309033
45kW/85A AC3, 150A AC1, 3-pole, 48VAC	K3-90A00		LA30903E
55kW/115A AC3, 200A AC1, 3-pole, 230VAC/DC	K3-115A00	300 0-0	LA311533
75-90kW / 150-175A AC-3, 230-250A AC-1, 3-pole			
75kW/150A AC3, 230A AC1, 3-pole, 230VAC/DC	K3-151A00	555 0-0	LA31500H
90kW/175A AC3, 250A AC1, 3-pole, 230VAC/DC	K3-176A00		LA31750H
55-90kW / 115-175A AC-3, 200-250A AC-1, 4-pole			
55kW/115A AC3, 200A AC1, 4-pole, 230VAC/DC	K3-116A00-40		LA311643
75kW/150A AC3, 230A AC1, 4-pole, 230VAC/DC	K3-151A00-40		LA315043
90kW/175A AC3, 250A AC1, 4-pole, 230VAC/DC	K3-176A00-40		LA317543
Auxiliary contacts			
front 1 NO, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4	HN10	000 0-0	LA190100
front 1NC, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4	HN01	000 0-0	LA190101
lateral 1NO+1NC, 3A (230V AC-15) for K3-24 to K3-115	HB11	000 0-0	LA190134
front 1NC, 6A (230V, AC-15) for K2, K3-07 to K3-115, K4	HA01	555 0- 8	LA190135
front 1 NO, 6A (230V, AC-15) for K2, K3-07 to K3-115, K4	HA10	000 0-0	LA190137
front 1 early make NO, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4	HN10U	000 0-0	LA190138
front 1 delayed NC, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4	HN01U	000 0-0	LA190139
front 2NO+2NC, 3A (230V, AC-15) for K3-116 to K3-316	HKT22	000 0-0	LA190144
lateral 1NO+1NC, 3A (230V, AC-15) for K3-116 to K3-316	HKA11	000 0= 0	LA190145
front 1NO+1NC, 3A (230V, AC-15) for K3-116 to K3-316	HKT11		LA 190146



### Power Contactors LA, Size 3, 110 - 300kW

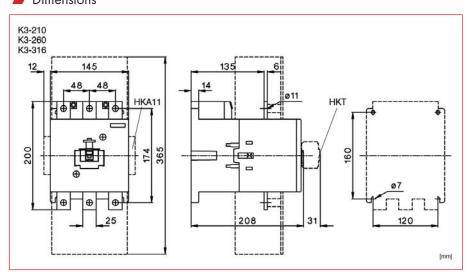


LA32103H

#### Schrack-Info

- Contactors from 110kW up to 300kW, 3-pole
- K3-210 up to K3-316, in maximum 1 frontside auxiliary contact HKT as well as 2 "side mounted" auxiliary contacts HKA11 can be snapped on
- K3-450A22 and K3-550A22, 1 additional frontside auxiliary contact HKF22 can be snapped on
- K3-210 up to K3-316 suitable forThermal overload relais of type U320 (on request)
- K3-450 and K3-550 suitable for Thermal overload relais of type U800 (on request)
- K3-450 up to K3-550 retrofit with a 4th pole "NP" (neutral conductor)
- Mountable on mounting plate
- Further accessories find attached

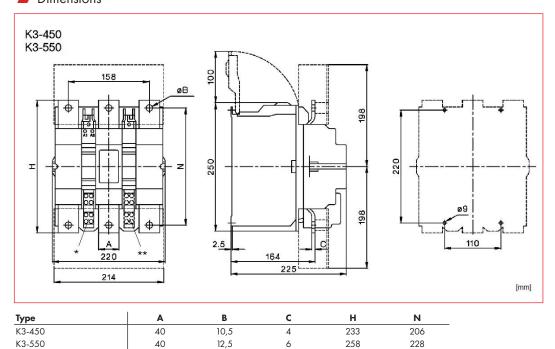
		K3-210	K3-260	K3-316	K3-450	K3-550
Rated insulation voltage U <sub>i</sub>	(VAC)			1000	•	
Utilization category AC-1 cos φ= 1						
Rated operational power at 400VAC	(kW)	242	311	346	485	526
Rated operational current $I_e = I_{th}$ at 40°C and 690VAC	(A)	350	450	500	700	760
Utilization category AC-2 and AC-3						
Rated operational power at 400VAC	(kW)	110	132	160	250	300
Rated operational current I <sub>e</sub> at 380-400VAC	(A)	210	260	316	450	550
Ambient temperature (operation)	(°C)			-25 +55		
Permissible mounting position			25, 25,	255-25	· /	
Rules and regulations according			IEC 9	47-4-1, EN6094	7-4-1	



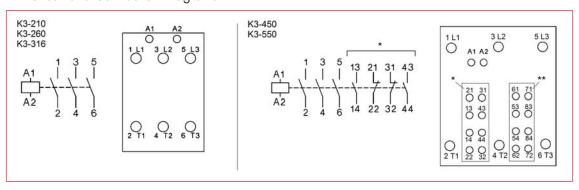


# Power Contactors LA, Size 3, 110 - 300kW

#### Dimensions



# Circuit and Connection Diagrams



<sup>\*</sup> HKF22 - standard mounted

<sup>\*\*</sup> HKF22 - additional

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
110-300kW / 210-550A AC-3, 230-250A AC-1, 3-pole			
Contactor, 3pole, 110kW/210A AC3, 350A AC1, 230V AC/DC	K3-210A00		LA32103H
Contactor, 3pole, 132kW/260A AC3, 230V AC/DC	K3-260A00		LA32603H
Contactor, 3pole, 160kW/315A AC3, 450A AC1, 230V AC/DC	K3-316A00		LA33163H
Contactor, 3pole,250kW/450A AC3 600A AC1, 2NO+2NC, 230VACDC	K3-450A22		LA34500H
Contactor, 3pole,300kW/550A AC3 760A AC1, 2NO+2NC, 230VACDC	K3-550A22		LA35500H
Auxiliary contacts			
front 1NO+1NC, 3A (230V, AC-15) for K3-116 to K3-316	HKT11		LA 190146
front 2NO+2NC, 3A (230V, AC-15) for K3-116 to K3-316	HKT22	388 0-0	LA190144
front 2NO+2NC, 3A (230V, AC-15) for K3-450 to K3-550	HKF22		LA 190147
lateral 1NO+1NC, 3A (230V, AC-15) for K3-116 to K3-316	HKA11	555 0-0	LA190145

# ■ Contactors for Photovoltaic Plants, 1000V DC



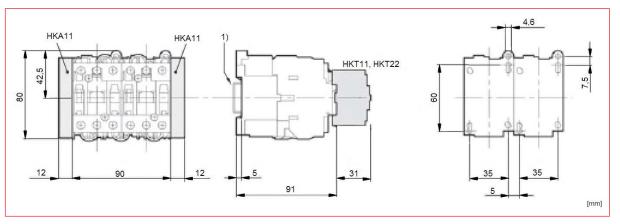
#### Schrack-Info

- Contactor 30A, 1000VDC DC-1
- For use as a string-switch in closed-circuit principle (in connection with Fire brigade Emergency OFF
   switch)
- In maximum 2 frontside auxiliary contacts HKT as well as 2 "side mounted" auxiliary contacts HKA11
  can be snapped on

LA3030D3PV

			K3PV-30
Rated insulation voltage U <sub>i</sub>		(VDC)	1000
Utilization category DC-1			
Rated operational current $I_e = I_{th}$	at 40°C and 600VDC	(A)	301)
	at 40°C and 1000VDC	(A)	301)
Poles in series			6
Ambient temperature (operation)		(°C)	-25 +40
Permissible mounting position			25° 25° 25° 25° 25° 25° 25° 25° 25° 25°
Rules and regulations according			IEC 60947-4-1, EN60947-4-1

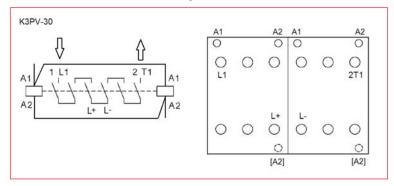
<sup>1) &</sup>gt;40°C ... 1%/°C reduction (e.g.: at 60°C 20% reduction = 24A)



1) DIN rail TS 35



- Contactors for Photovoltaic Plants, 1000V DC
- Circuit and Connection Diagram



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Contactors for Photovoltaic plants, 1000V DC			
Contactor, 6-pole, 30A DC-1, 1000VDC, 230VAC	K3PV-30	000 0=0	LA3030D3PV
Auxiliary contacts			
front 2NO+2NC, 3A (230V, AC-15) for K3-116 to K3-316	HKT22	000 0-0	LA190144
front 1NO+1NC, 3A (230V, AC-15) for K3-116 to K3-316	HKT11		LA 190146
lateral 1NO+1NC, 3A (230V, AC-15) for K3-116 to K3-316	HKA11	000 0-0	LA190145

## Micro Auxiliary Contactors, Size M



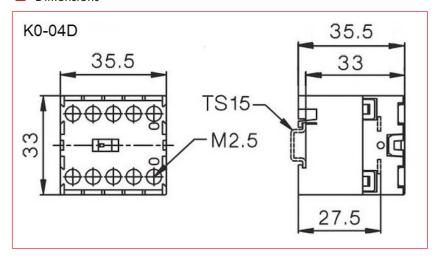
#### Schrack-Info

- Auxiliary contactors 4-pole, 3A AC-15
- Worldwide smallest auxiliary contactor
- Auxiliary contactors not retrofit with additional auxiliary contacts
- Contacts suitable for electronic circuits according to IEC 60947-5-4
- Suitable for safety applications according IEC 60335-1
- Mountable to DIN-rail TS15 or with adaptor to TS35

LAMH0370

	K0-04D
(VAC)	440
(A)	5
(A)	3/1
(A)	0,5
(°C)	-40 +60
	30. 00000
	IEC60947-5-1, EN 60947-5-1
	(A) (A) (A)

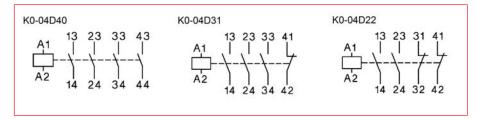
<sup>1)</sup> Contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 5mA) Positively guided contacts



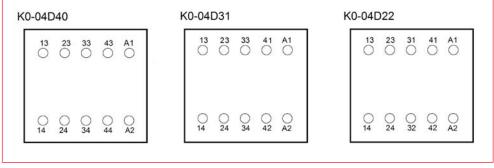


## Micro Auxiliary Contactors, Size M

## Circuit Diagrams



### Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
3A, 4-pole			
AC-15/3A, 4NO, 24VAC	K0-04D40	000 0-0	LAMH0370
AC-15/3A, 4NO, 230VAC	K0-04D40	355 0-0	LAMH0373
AC-15/3A, 4NO, 24VDC	K0-04D40	000 0-0	LAMH0375
AC-15/3A, 3NO+1NC, 24VAC	K0-04D31	000 0-0	LAMH0380
AC-15/3A, 3NO+1NC, 230VAC	K0-04D31	000 0-0	LAMH0383
AC-15/3A, 3NO+1NC, 24VDC	K0-04D31	000 0-0	LAMH0385
AC-15/3A, 2NO+2NC, 24VAC	K0-04D22	000 0-0	LAMH0390
AC-15/3A, 2NO+2NC, 230VAC	K0-04D22	388 0- 8	LAMH0393
AC-15/3A, 2NO+2NC, 24VDC	K0-04D22	000 0-0	LAMH0395
Accessories			
DIN-rail slotted, 1000x15x5mm	TS15	000 0= 0	LAMZTS15
DIN-rail adaptor TS35	TS35	388 0- 8	LAMZTS35

# Mini Auxiliary Contactors, Size 1



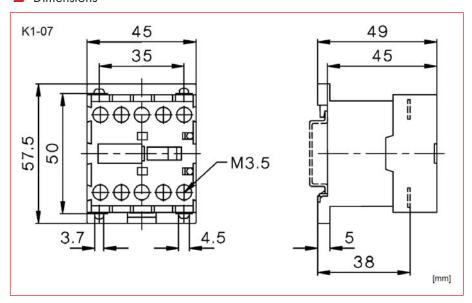
#### Schrack-Info

- Auxiliary contactors 4-pole, 3A AC-15
- Auxiliary contactors with additional auxiliary contact HK retrofit
- Contacts suitable for electronic circuits according to IEC 60947-5-4
- Mountable on DIN-rail TS35

LA100783

		K1-07
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Thermal rated current Ith at 40°C and 440VAC	(A)	10
Utilization category AC-15		
Rated operational current le at 40°C and 230/440VAC	(A)	3 / 1.6
Utilization category DC13¹¹		
Rated operational current le at 40°C up to 60/110/220VDC	(A)	2/0.4/0.1
Ambient temperature (operation)	(°C)	-40 +60
Permissible mounting position		30. 00000
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1

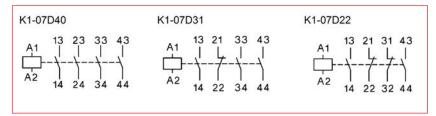
<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 5mA), positively guided contacts



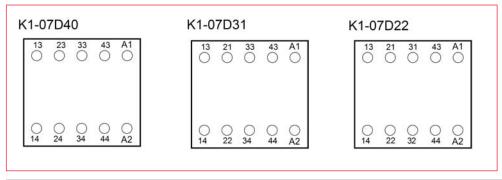


# Mini Auxiliary Contactors, Size 1

## Circuit Diagrams



### ■ Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
10A, 4-pole			
4NO, 3A, 24VAC	K1-07D40	000 0-0	LA100770
4NO, 3A, 230VAC	K1-07D40	988 0-0	LA100773
4NO, 3A, 24VDC	K1-07D40		LA100775
4NO, 3A, 48VDC	K1-07D40		LA100776
4NO, 3A, 400VAC	K1-07D40		LA100774
3NO+1NC, 3A, 24VAC	K1-07D31	000 0-0	LA100780
3NO+1NC, 3A, 48VDC	K1-07D31		LA100786
3NO+1NC, 3A, 230VAC	K1-07D31	555 0- 6	LA100783
3NO+1NC, 3A, 400VAC	K1-07D31		LA100784
3NO+1NC, 3A, 24VDC	K1-07D31	000 0-0	LA100785
2NO+2NC, 3A, 24VAC	K1-07D22	000 0-0	LA100790
2NO+2NC, 3A, 24VDC	K1-07D22	000 0-0	LA100795
2NO+2NC, 3A, 48VDC	K1-07D22		LA100796
2NO+2NC, 3A, 230VAC	K1-07D22	000 0-0	LA100793
Auxiliary contact blocks			
Auxiliary contact block for mini Contactors K1, 1NO+1NC	HK 11	000 0-0	LA190154
Auxiliary contact block for mini Contactors K1, 2NC, HK02	HK02		LA 190155
Auxiliary contact block for mini Contactors K1, 4NO, HK40	HK40	000 0-0	LA190156
Auxiliary contact block for mini Contactors K1, 2NO+2NC	HK22	000 0-0	LA190153

# Auxiliary Contactors, Size 3, DC Coil



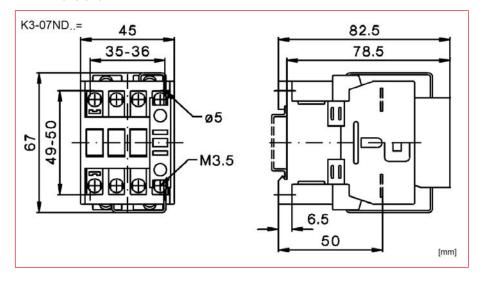
#### Schrack-Info

- Auxiliary contactors DC operated, 4-pole, 4A AC-15, for electronic circuits
- Coil in energy saving wiring with reduced power consumption of 2W (at closed)
- Auxiliary contactors with in maximum 3 additional auxiliary contacts HN retrofit
- Contacts suitable for electronic circuits according to IEC 60947-5-4
- Mountable to DIN-rail TS35

LA300475N

		K3-07ND
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Thermal rated current Ith at 40°C and 440VAC	(A)	10
Utilization category AC-15		
Rated operational current le at 40°C and 230/440VAC	(A)	4 / 1.6
Utilization category DC13 <sup>1)</sup>		
Rated operational current le at 40°C up to 60/110/220VDC	(A)	3.5 / 0.5 / 0.1
Ambient temperature (operation)	(°C)	-40 +60
Permissible mounting position		300 S S S S S S S S S S S S S S S S S S
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1

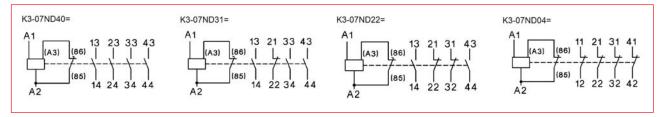
<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 5mA) Positively guided contacts



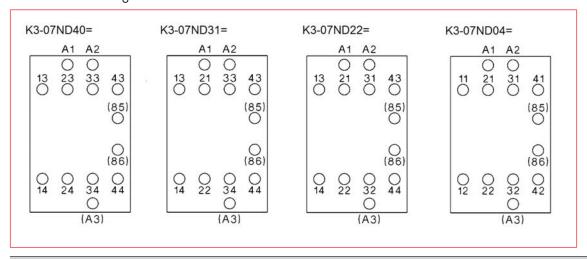


## Auxiliary Contactors, Size 3, DC Coil

#### Circuit Diagrams



#### Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
4A, 4-pole			
for electronic circuits 4A, 24VDC, 4NO	K3-07ND40=	000 0-0	LA300475N
for electronic circuits 4A, 24VDC, 3NO+1NC	K3-07ND31=		LA300485N
for electronic circuits 4A, 24VDC, 2NO+2NC	K3-07ND22=	000 0-0	LA300495N
for electronic circuits 4A, 24VDC, 4NC	K3-07ND04=	333 0- 8	LA3004A5N
Auxiliary contacts			
front 1NO, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4	HN10	000	LA190100
front 1NC, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4	HN01	000 0-0	LA190101
front 1 early make NO, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4	HN10U	355 0- 5	LA190138
front 1 delayed NC, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4	HN01U	000	LA190139

## Capacitor Switching Contactors LA, Size 3



LA3K7433

#### Schrack-Info

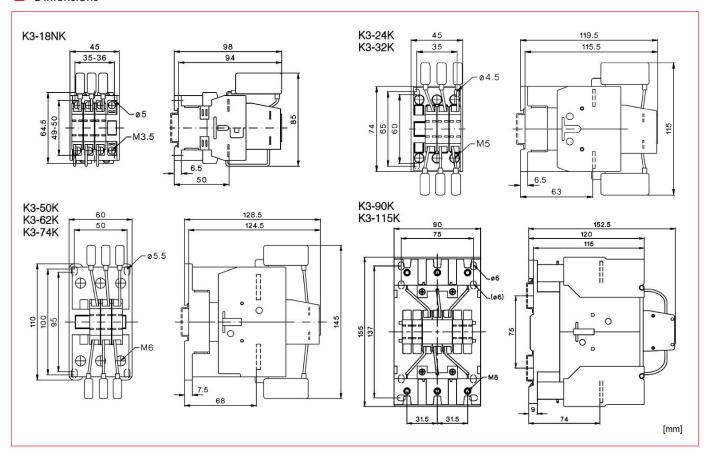
- Contactors for switching of capacitors from 12.5kVAr up to 100kVAr
- With included, magnetic uncoupled, Capacitor pre-loading resistors
- K3-18NK.. with one included auxiliary contact, in maximum 1 additional frontside auxiliary contact HN or HA can be snapped on
- K3-24K up to K3-74K, in maximum 1 frontside auxiliary contact HN or HA as well as 2 "side mounted" auxiliary contacts HB can be snapped on
- K3-90K and K3-115K, in maximum 4 frontside auxiliary contacts HN or HA as well as 2 "side mounted" auxiliary contacts HB can be snapped on
- Mountable on DIN-rail TS35 or mounting plate, mouting of K3-90K and K3-115K on 2 DIN-rails TS35 or mounting plate

		K3-18NK	K3-24K	K3-32K	K3-50K	K3-62K	K3-74K	K3-90K	K3-115K
Rated insulation voltage U <sub>i</sub>	(VAC)				6'	90			
Utilization category AC-1									
Rated operational current $I_{th}$ at 50°C and 690VAC	(A)	32	45	60	100	110	120	155	190
Utilization category AC-6b									
Rated operational power at 400VAC	(kVAr)	0 12.5	10 20	10 25	20 33.3	20 50	2075	33 80	33 100
Rated operational current I <sub>e</sub> at 50° and 380-400VAC	(A)	0 18	14 28	14 36	30 48	30 <i>7</i> 2	30 108	50 115	50 144
Ambient temperature (operation)	(°C)				-40 .	+60			
Permissible mounting position		0000 00 00 00 00 00 00 00 00 00 00 00 0							
Rules and regulations according		IEC 60947-4-1 / EN60947-4-1							

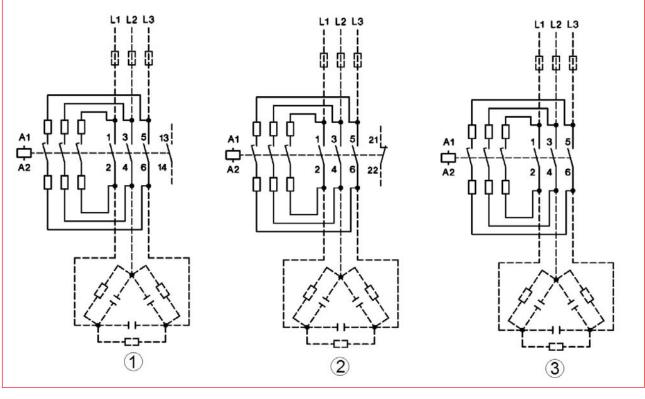


# Capacitor Switching Contactors LA, Size 3

#### Dimensions



### Schematic Diagram



Auxiliary contacts installed:

1) 1 NO

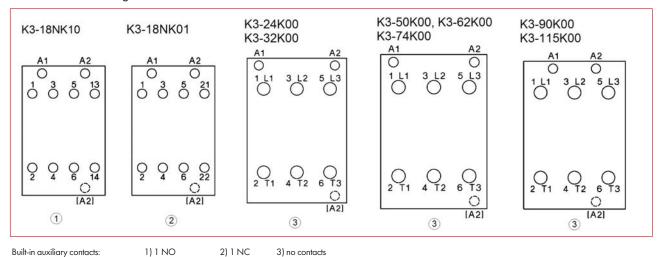
2) 1 NC

3) no contacts



## Capacitor Switching Contactors LA, Size 3

#### Connection Diagrams



DESCRIPTION TYPE NO. **AVAILABLE** ORDER NO. 12.5kVAr 12.5kVAr 230VAC / 1 NO K3-18NK10 **LA3K1813N** ----12.5kVAr 230VAC / 1 NC K3-18NK01 555 0- 6 LA3K1823N 20kVAr 20kVAr 230VAC K3-24K00 000 0-0 LA3K2433 25kVAr 25kVAr 230VAC 355 0- 6 LA3K3233 K3-32K00 33.3kVAr 33.3kVAr 230VAC K3-50K00 333 0-0 LA3K5033 50kVAr 50kVAr 230VAC K3-62K00 000 0-0 LA3K6233 75kVAr 75kVAr 230VAC LA3K7433 K3-74K00 950 0-0 80kVAr 80kVAr 230VAC 999 0-0 LA3K9033 K3-90K00 100kVAr 100kVAr 230VAC LA3K1A33 K3-115K00 **Auxiliary contacts** front 1NO, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4 LA190100 HN10 333 0- 6 front 1NC, 3A (230V AC-15) for LA2, LA3004-LA3115, LA4 HN01 300 0-0 LA190101 lateral 1NO+1NC, 3A (230V AC-15) for K3-24 to K3-115 HB11 999 0-0-LA190134 front 1 NC, 6A (230V, AC-15) for K2, K3-07 to K3-115, K4 HA01 LA190135 000 front 1 NO, 6A (230V, AC-15) for K2, K3-07 to K3-115, K4 LA190137 HA10 front 1 early make NO, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4  $\,$ LA190138 HN10U front 1 delayed NC, 3A (230V, AC-15) for K2, K3-07 to K3-115, K4 HN01U 0-6 LA190139

# ■ Sidemounted Auxiliary Contacts for Contactors K3-24 to K3-115

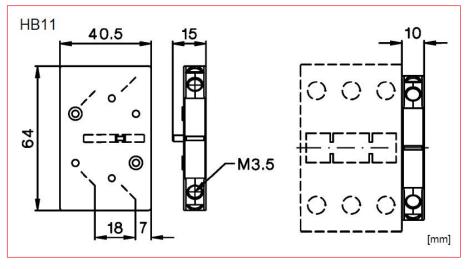


#### Schrack-Info

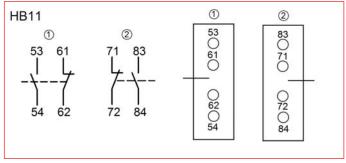
- Auxiliary contacts "side mounted" HB ...
- Mounting possible at left and right side of contactor
- Correct terminal designation of the auxiliary contacts depends on the mounting-side at contactor
- Auxiliary contact HB are suitable for electronic circuits according to IEC 60947-5-4

**Auxiliary contact** Rated insulation voltage Ui (VAC) 690 Thermal rated current  $I_{th}$  at  $40^{\circ}C$  and 690VAC(A) 10 **Utilization category AC-15** Rated operational current I<sub>e</sub> at 40°C and 230/440VAC (A) 3 / 1,6 Utilization category DC131) Rated operational current I<sub>e</sub> at 40°C up to 60/110/220VDC 2/0,4/0,1 (A) Ambient temperature (operation) (°C) -40 ... +62 IEC 60947-5-1, EN 60947-5-3 Rules and regulations according

#### Dimensions



#### Circuit and Connection Diagram



1) mounted right 2) mounted left

DESCRIPTION TYPE NO. AVAILABLE ORDER NO. 3A, AC-15 lateral 1NO+1NC, 3A (230V AC-15) for K3-24 to K3-115 LA190134 HB11





<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 5mA), positively guided contacts

# Front- and Sidemounted Auxiliary Contacts for Contactors K3-116 to K3-316





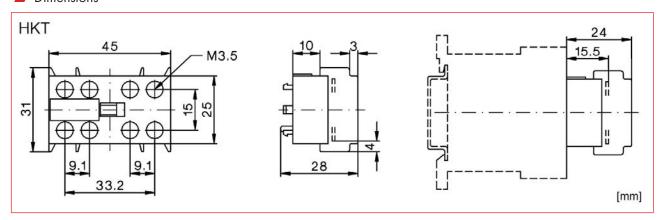
#### Schrack-Info

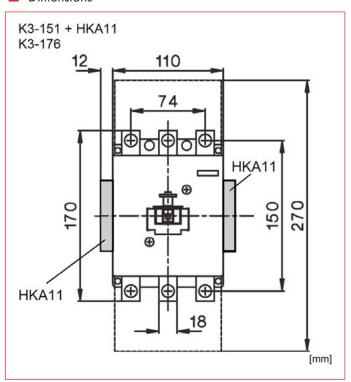
- Auxiliary contacts "frontside" HKT and "side mounted" HKA can be snapped on
- Correct terminal designation of the auxiliary contacts "side mounted" depends on the mounting-side at contactor

		Auxiliary contacts (front)	Auxiliary contacts (side)			
		HKT	HKA			
Rated insulation voltage U <sub>i</sub>	(VAC)	69	20			
Thermal rated current $I_{th}$ at 40°C and 690VAC	(A)	10	10			
Utilization category AC-15						
Rated operational current $l_{\scriptscriptstyle e}$ at 40°C and 230 $/$ 440VAC	(A)	3 / 1.5	3 / 1.6			
Utilization category DC13 <sup>1)</sup>						
Rated operational current $I_e$ at 40°C up to 60 $/$ 110 $/$ 220VDC	(A)	-/0,5/0.2	-/0.5/0.3			
Ambient temperature (operation)	(°C)	-40 +60				
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1				

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 5mA), positively guided contacts

#### Dimensions



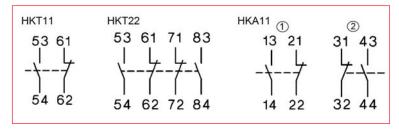




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# Front- and Sidemounted Auxiliary Contacts for Contactors K3-116 to K3-316

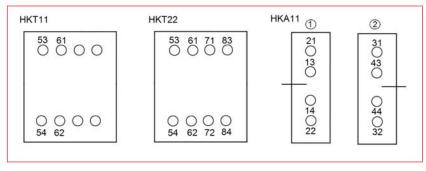
### Circuit Diagrams



1) right mounted

2) left mounted

### ■ Connection Diagrams



1) right mounted

2) left mounted

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
3A, AC-15			
front 1NO+1NC, 3A (230V, AC-15) for K3-116 to K3-316	HKT11		LA 190146
front 2NO+2NC, 3A (230V, AC-15) for K3-116 to K3-316	HKT22	383 0- 6	LA190144
lateral 1NO+1NC, 3A (230V, AC-15) for K3-116 to K3-316	HKA11	300 0-0	LA190145

# Frontmounted Auxiliary Contacts for Contactors K3-450 to K3-550



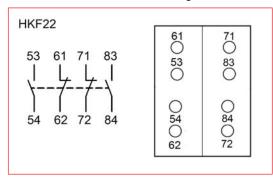
#### Schrack-Info

- Auxiliary contacts "frontside" HKF22 ...
- For extension of contactors K3-450 and K3-550 with integrated 2 NO + 2 NC auxiliary contacts to

		Auxiliary contacts (front) HKF
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Thermal rated current I <sub>th</sub> at 40°C and 690VAC	(A)	16
Utilization category AC-15		
Rated operational current I <sub>e</sub> at 40°C and 230 / 440VAC	(A)	3 / 1.6
Utilization category DC13¹)		
Rated operational current I <sub>e</sub> at 40°C up to 60 / 110 / 220VDC	(A)	-/0.5/0.2
Ambient temperature (operation)	(°C)	-40 +60
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1
1) 4 db	5 4 C . I I. /	

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 5mA), positively guided contacts

#### Circuit and Connection Diagram



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
DESCRIPTION	TIPE NO.	AVAILABLE	OKDEK NO.

## 3A, AC-15

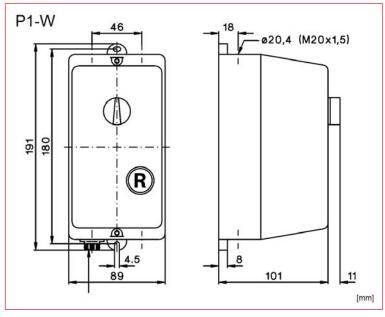
front 2NO+2NC, 3A (230V, AC-15) for K3-450 to K3-550	HKF22	LA 190147

## Direct on Line Starters D.O.L. with Selector Switch



#### Schrack-Info

- Plastic-housings IP65, with selector switch Man-O-Auto, reset-button for thermal overload relais and
- Thermal overload relais U12/16..K3 has to be ordered seperately (range according rated current of
- Available for motor powers of up to 4kW, up to 7.5kW and up to 11kW AC-3
- Cable entry cut-out for one cable gland M20x1.5 at upper side of housing, diameter = 20.4mm
- Cable entry cut-outs at rear side of housing,  $4 \times \text{diameter} = 23 \text{mm}$



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
DOL-starter 4kW/400V AC3 (for U12/16EK3)	P1-W10	555 0-6	LA003115K3
DOL-starter 7.5kW/400V AC3 (for U12/16EK3)	P1-W18	000 0-0	LA003116K3
DOL-starter 11 kW/400V AC3 (for U12/16EK3)	P1-W22		LA003117K3



LSDD0723

#### Schrack-Info

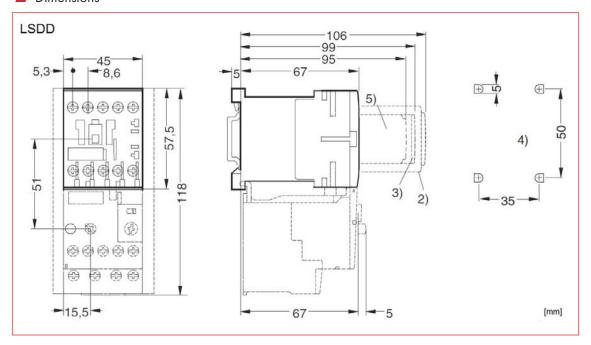
- Contactors from 3kW up to 5.5kW, 3-pole with integrated auxiliary contact NC or NO
- Contactors LSDD with one included auxiliary contact NO retrofit with one additional auxiliary contact 1-pole LSZD05.. or 4-pole LSZDD2..
- Contactors LSDD with one included auxiliary contact NC retrofit with one additional auxiliary contact 1-pole LSZD05.. or 4-pole LSZDH5..
- Contactors LSSD can not be equipped by additional auxiliary contacts
- Contactors LSSD with reduced coil power consumption of 2,3W and coil voltage 17-30VDC, specially suitable for control by PLC
- Fitting surge supressors LSZD0001 up to LSZD0004
- Contactors LSDD and LSSD are suitable for use of Thermal overload relais type LSTD
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)
- · Coil and main contacts are not exchangeable
- Contactors LSDD and LSSD can be fitted by solder pin adaptor LSZDD002 for mounting to printed boards
- Mountable to DIN-rail TS35 or mounting plate
- Further accessories find attached

		LSDD07 LSSD07	LSDD09 LSSD09	LSDD12 LSSD12		
Rated insulation voltage U <sub>i</sub>	(VAC)		690			
Utilization category AC-1 cos φ = 1						
Rated power at 400VAC	(kW)	11	13	13		
Rated operational current $I_e = I_{th}$ at 40°C and 690VAC	(A)	18	22	22		
Utilization category AC-2 and AC-3						
Rated power at 400VAC	(kW)	3	4	5,5		
Rated operational current I <sub>e</sub> at 380-440VAC	(A)	7	9	12		
Ambient temperature (operation)	(°C)		-25 +60			
Permissible mounting position			360° 22,5° 22,5°			
Rules and regulations according			IEC 60947-4-1, EN60947-4-1			
			Included Auxiliary contacts			
Rated insulation voltage U <sub>i</sub>	(VAC)		690			
Thermal rated current I <sub>th</sub> at 40°C and 690VAC	(A)		10			
Utilization category AC-15						
Rated operational current I <sub>e</sub> at 40°C and 230/400VAC	(A)	6/3				
Utilization category DC13 1)						
Rated operational current I <sub>e</sub> at 40°C up to 60/110/220VDC	(A)		2/1/0,3			
Ambient temperature (operation)	(°C)		-25 +60			
Rules and regulations according			IEC 60947-5-1, EN 60947-5-1			

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 1 mA). Positively guided contacts.



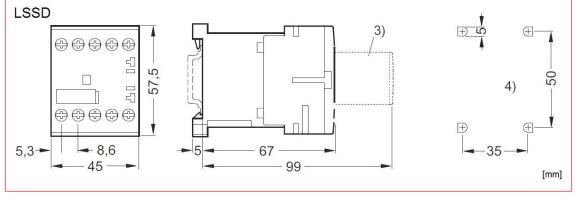
#### Dimensions



Screw terminals with surge suppressor, auxiliary contact block and mounted thermal overload relay LSTD. Lateral distance to grounded components = 6mm.

- 2) Auxiliary contact block
- 3) Surge suppressor
- 4) Drilling pattern
- 5) Auxiliary contact block 1-pole

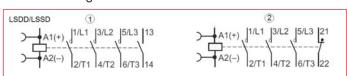
#### Dimensions



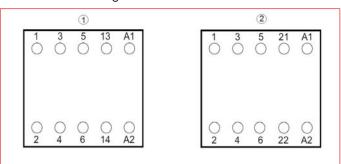
3) Surge suppressor

4) Drilling pattern

#### Circuit Diagrams



#### Connection Diagrams



1) With 1 NO included

2) With 1 NC included

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 00 - type LSDD - 7A			
Contactor 3kW / 7A AC-3, 24VAC, 50Hz, with 1 NO, size 00	LSDD	000 0-0	LSDD0710
Contactor 3kW / 7A AC-3, 24VAC, 50Hz, with 1 NC, size 00	LSDD	000 0-0	LSDD0720
Contactor 3kW / 7A AC-3, 110VAC, 50Hz, with 1 NO, size 00	LSDD	000 0-0	LSDD0712
Contactor 3kW / 7A AC-3, 110VAC, 50Hz, with 1 NC, size 00	LSDD	555 0-6	LSDD0722
Contactor 3kW / 7A AC-3, 230VAC, 50/60Hz, with 1 NO, size 00	LSDD	000 0-0	LSDD0713
Contactor 3kW / 7A AC-3, 230VAC, 50/60Hz, with 1 NC, size 00	LSDD	000 0-0	LSDD0723
Contactor 3kW / 7A AC-3, 24VDC, with 1 NO, size 00	LSDD	000 0-0	LSDD0715
Contactor 3kW / 7A AC-3, 24VDC, with 1 NC, size 00	LSDD	000 0-0	LSDD0725
Size 00 - type LSDD - 9A			
Contactor 4kW / 9A AC-3, 24VAC, 50Hz, with 1 NO, size 00	LSDD	555 0- 0	LSDD0910
Contactor 4kW / 9A AC-3, 24VAC, 50Hz, with 1 NC, size 00	LSDD	000 0-0	LSDD0920
Contactor 4kW / 9A AC-3, 110VAC, 50Hz, with 1 NO, size 00	LSDD	000 0-0	LSDD0912
Contactor 4kW / 9A AC-3, 110VAC, 50Hz, with 1 NC, size 00	LSDD		LSDD0922
Contactor 4kW / 9A AC-3, 230VAC, 50/60Hz, with 1 NO, size 00	LSDD	300 0-0	LSDD0913
Contactor 4kW / 9A AC-3, 230VAC, 50/60Hz, with 1 NC, size 00	LSDD	000 0-0	LSDD0923
Contactor 4kW / 9A AC-3, 24VDC, with 1 NO, size 00	LSDD	555 0-2	LSDD0915
Contactor 4kW / 9A AC-3, 24VDC, with 1 NC, size 00	LSDD		LSDD0925
Size 00 - type LSDD - 12A	1000	000 0=0	13000723
Contactor 5.5kW / 12A AC-3, 24VAC, 50Hz, with 1 NO, size 00	LSDD	000 0-0	LSDD 1210
Contactor 5.5kW / 12A AC-3, 24VAC, 50Hz, with 1 NC, size 00	LSDD	James I Fra	LSDD 1220
Contactor 5.5kW / 12A AC-3, 110VAC, 50Hz, with 1 NO, size 00	LSDD		LSDD 1212
Contactor 5.5kW / 12A AC-3, 110VAC, 50Hz, with 1 NC, size 00	LSDD		LSDD 1212
	LSDD	355 0-0	LSDD 1212
Contactor 5.5kW/12A AC-3, 230VAC, 50/60Hz, with 1 NO, size 00		000 0-0	
Contactor 5.5kW/12A AC-3, 230VAC, 50/60Hz, with 1 NC, size 00	LSDD	000 0-0	LSDD 1223
Contactor 5.5kW / 12A AC-3, 24VDC, with 1 NO, size 00	LSDD	000 0-0	LSDD 1215
Contactor 5.5kW / 12A AC-3, 24VDC, with 1 NC, size 00	LSDD	555 0-8	LSDD 1225
Size 00 - type LSSD for PLC - 7A	1000	- 3-00 (Fg.)	LCCDOTLC
3kW/400V, 1 NO, 17-30VDC for PLC, size 00	LSSD	000 0-0	LSSD071G
3kW/400V, 1 NC, 17-30VDC for PLC, size 00	LSSD		LSSD072G
Size 00 - type LSSD for PLC - 9A		Simulation (mg)	
4kW/400V, 1 NO, 17-30VDC for PLC, size 00	LSSD	000 0=0	LSSD091G
4kW/400V, 1 NC, 17-30VDC for PLC, size 00	LSSD	000 0-0	LSSD092G
Size 00 - type LSSD for PLC - 12A		- The second sec	
5.5kW/400V, 1 NO, 17-30VDC for PLC, size 00	LSSD	900 0-0	LSSD121G
5.5kW/400V, 1 NC, 17-30VDC for PLC, size 00	LSSD	000 0-0	LSSD122G
Auxiliary contacts			
1NC size 00, DIN 50005, wiring from bottom	LSZD	000 0-0	LSZD0501
1NO size 00, DIN 50005, wiring from bottom	LSZD	555 0-5	LSZD0510
1NC size 00, DIN 50012	LSZD	000 0-0	LSZDD201
1NO+2NC size 00, DIN 50012	LSZD	555 0- 6	LSZDD212
1NO+3NC size 00, DIN 50012	LSZD	000 0-0	LSZDD213
2NO+2NC size 00, DIN 50012	LSZD	000 0-0	LSZDD222
2NO+2NC size 00, DIN 50005	LSZD	555 0-0	LSZDH522
3NO+1NC size 00, DIN 50005	LSZD	555 0- 6	LSZDH531
4NO size 00, DIN 50005	LSZD	000 0-0	LSZDH540







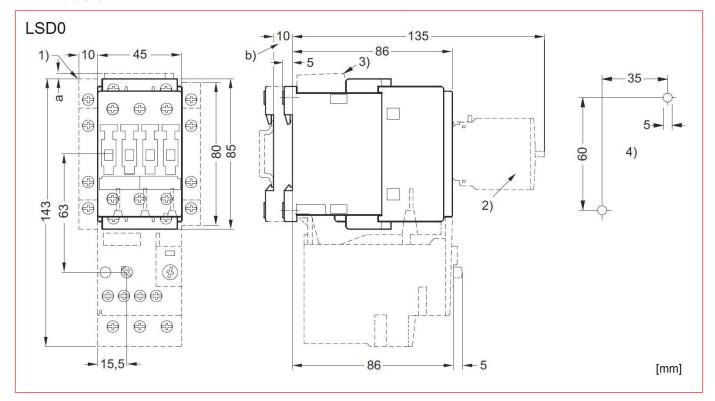
LSD02533

#### Schrack-Info

- Contactors from 4kW up to 11kW, 3-pole
- Contactors LSDO retrofit in maximum with 6 auxiliary contacts (four 1-pole auxiliary contacts LSZODO.., LSZOD9.. or one 4-pole LSZOD1.., as well as one "side mounted" LSZOD711) but in maximum 4 NC
- Contactors LSSO retrofit in maximum with 2 auxiliary contacts (two 1-pole auxiliary contacts LSZODO.. or LSZOD9..)
- Contactors LSSO with reduced coil power consumption of 4,2W and coil voltage of 17-30VDC, suitable for control by PLC
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)
- Fitting surge supressors LSZD0005, LSZD0006, LSZ00001 up to LSZ00003
- Contactors LS.O are suitable for use of Thermal overload relais of type LSTO
- Coil and main contacts are exchangeable on request
- Mountable to DIN-rail TS35 or mounting plate
- Further accessories find attached

		LSD009	LSD012 / LSS012	LSD017 / LSS017	LSD025 / LSS025
Rated insulation voltage U <sub>i</sub>	(VAC)		69	0	
Utilization category AC-1 cos φ = 1					
Rated power at 400VAC	(kW)		23	3	
Rated operational current $I_e = I_{th}$ at 40°C and 690VAC	(A)		40	)	
Utilization category AC-2 and AC-3					
Rated power at 400VAC	(kW)	4	5,5	7,5	11
Rated operational current I <sub>e</sub> at 380-440VAC	(A)	9	12	17	25
Ambient temperature (operation)	(°C)		-25	+60	
Permissible mounting position			360°	22,5° 22,5°	
Rules and regulations according			IEC 60947-4-1.	EN60947-4-1	

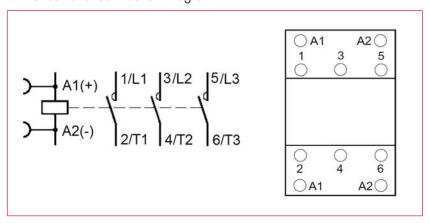
#### Dimensions



 $Screw \ terminals \ with surge \ suppressor, \ auxiliary \ contact \ block \ and \ mounted \ thermal \ overload \ relay. \ Lateral \ distance \ to \ grounded \ components = 6mm.$ 

- $a = 3 mm \ at < 240 V; \ a = 7 mm \ at > 240 V$
- b = DC 10mm deeper than AC
- 1) Auxiliary contact block, laterally mountable
- 2) Auxiliary contact block, mountable on the front, 1 and 4 pole  $\,$
- 3) Surge suppressor
- Drilling pattern

#### Circuit and Connection Diagram



Terminal designations according to EN 50012



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 0 - type LSD0 - 9A			
Contactor 4kW / 9A AC-3, 24VAC, 50Hz, size 0	LSD0	000 0-0	LSD00930
Contactor 4kW / 9A AC-3, 24VDC, size 0	LSD0	388 0- 0	LSD00935
Contactor 4kW / 9A AC-3, 110VAC, 50Hz, size 0	LSD0	000 0-0	LSD00932
Contactor 4kW / 9A AC-3, 230VAC, 50/60Hz, size 0	LSD0	388 0- 6	LSD00933
Size 0 - type LSD0 - 12A			
Contactor 5.5kW / 12A AC-3, 24VDC, size 0	LSD0	555 <del>0 0</del>	LSD01235
Contactor 5.5kW / 12A AC-3, 24VAC, 50Hz, size 0	LSD0	000 0-0	LSD01230
Contactor 5.5kW / 12A AC-3, 110VAC, 50Hz, size 0	LSD0	000 0-0	LSD01232
Contactor 5.5kW / 12A AC-3, 230VAC, 50/60Hz, size 0	LSD0	000 0-0	LSD01233
Size 0 - type LSD0 - 17A			
Contactor 7.5kW / 17A AC-3, 24VAC, 50Hz, size 0	LSD0	000 0-0	LSD01730
Contactor 7.5kW / 17A AC-3, 24VDC, size 0	LSD0	000 0-0	LSD01735
Contactor 7.5kW / 17A AC-3, 110VAC, 50Hz, size 0	LSD0	000 0-0	LSD01732
Contactor 7.5kW / 17A AC-3, 230VAC, 50/60Hz, size 0	LSD0	000 0-0	LSD01733
Contactor 7.5kW / 17A AC-3, 400VAC, 50Hz, size 0	LSD0	000 0-0	LSD01734
Size 0 - type LSD0 - 25A			
Contactor 11 kW / 25A AC-3, 24VAC, 50Hz, size 0	LSD0	000 0-0	LSD02530
Contactor 11 kW / 25A AC-3, 24VDC, size 0	LSD0	388 0- 8	LSD02535
Contactor 11 kW / 25A AC-3, 110VAC, 50Hz, size 0	LSD0	000 0-0	LSD02532
Contactor 11 kW / 25A AC-3, 230VAC, 50/60Hz, size 0	LSD0	388 0-0	LSD02533
Size 0 - type LSS0 for PLC - 12A			
Contactor 5.5kW, AC-3, 17-30VDC, for PLC, size 0	LSSO	999 0- 8	LSS0123H
Size 0 - type LSS0 for PLC - 17A			
Contactor 7.5kW, AC-3, 17-30VDC, for PLC, size 0	LSS0	000 0-0	LSS0173H
Size 0 - type LSS0 for PLC - 25A			
Contactor 11.0kW, AC-3, 17-30VDC, for PLC, size 0	LSSO	000 <del>0 0</del>	LSS0253H
Auxiliary contacts			
Auxiliary contact block for size 0-12, 1NC	LSZ0	000 0-0	LSZ0D001
Auxiliary contact block for size 0-12, 1NO	LSZ0	000 0-0	LSZOD010
Auxiliary contact block for size 0-12, 1NO + 3NC	LSZ0	555 0- 5	LSZOD113
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012	LSZ0	000 0-0	LSZOD 122
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	LSZ0	000 0- 0	LSZOD 122F
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012	LSZ0	000 0-0	LSZOD 131
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005	LSZ0	000 0-0	LSZOD 131 F
Auxiliary contact block for size 0-12, 4NO, DIN EN 50005	LSZ0	000 0-0	LSZOD 140F
Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position	LSZ0	999 0- 8	LSZ0D711
Auxiliary contact block for size 0-12, 1NC, delayed	LSZ0		LSZ0D901
Auxiliary contact block for size 0-12, 1NO, delayed	LSZ0		LSZ0D910





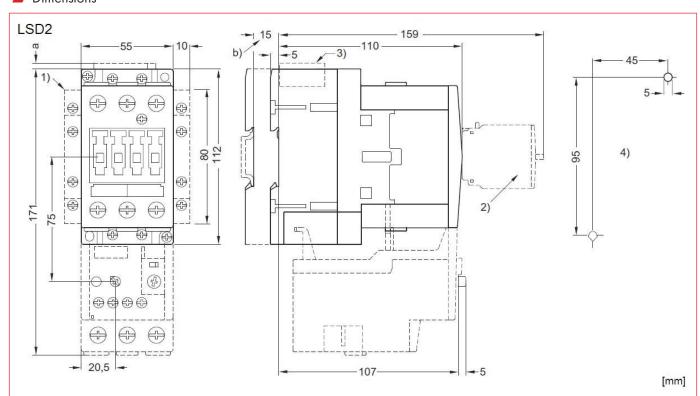


#### Schrack-Info

- Contactors from 15kW up to 22kW, 3-pole
- Contactors LSD2 can be fitted in maximum with 6 auxiliary contacts (four 1-pole auxiliary contacts LSZODO.., LSZOD9.. or one 4-pole LSZOD1.., as well as one "side mounted" LSZOD711) but in maximum 4 NC
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)
- Fitting surge supressors LSZ00001, LSZ00002 or LSZ20001
- Contactors LSD2 are suitable for use of Thermal overload relais of type LST2
- Coil and main contacts are exchangeable on request
- Mountable to DIN-rail TS35 or mounting plate
- Further accessories find attached

		LSD232	LSD240	LSD250
Rated insulation voltage U <sub>i</sub>	(VAC)		690	
Utilization category AC-1 cos φ = 1				
Rated power at 400VAC	(kW)	31	38	38
Rated operational current $I_e = I_{fh}$ at 40°C and 690VAC	(A)	50	60	60
Utilization category AC-2 and AC-3				
Rated power at 400VAC	(kW)	15	18,5	22
Rated operational current I <sub>e</sub> at 500/690VAC	(A)	32/20	40/24	50/24
Ambient temperature (operation)	(°C)		-25 +60	
Permissible mounting position		360° 22,5° 22,5°		
Rules and regulations according		IE	C 60947-4-1, EN60947-4	4-1

#### Dimensions

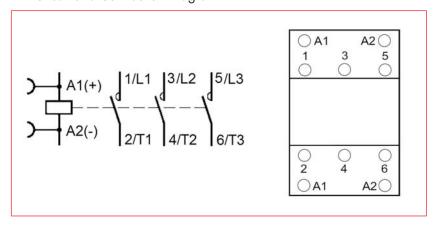


Screw terminals with surge suppressor, auxiliary contact block and mounted thermal overload relay.

- a = 0mm with varistor < 240V, diode assembly
- a = 3.5mm with varistor > 240V
- $\alpha$  = 17mm with RC element
- b = DC 15mm deeper than AC
- 1) Auxiliary contact block, laterally mountable
- 2) Auxiliary contact block, mountable on the front, 1- and 4-pole
- 3) Surge suppressor
- 4) Drilling pattern



## Circuit and Connection Diagram



Terminal designations according to EN 50012

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 2 - type LSD2 - 32A			
Contactor 15kW / 32A AC-3 24VAC, 50Hz, size 2	LSD2	000 0-0	LSD23230
Contactor 15kW / 32A AC-3, 24VDC, size 2	LSD2	388 0-8	LSD23235
Contactor 15kW / 32A AC-3 110VAC, 50Hz, size 2	LSD2	000 0-0	LSD23232
Contactor 15kW / 32A AC-3 230VAC, 50/60Hz, size 2	LSD2	000 0-0	LSD23233
Size 2 - type LSD2 - 40A			
Contactor 18,5kW / 40A AC-3, 24VAC, 50Hz, size 2	LSD2	000 0-0	LSD24030
Contactor 18,5kW / 40A AC-3, 24VDC, size 2	LSD2	000 0-0	LSD24035
Contactor 18,5kW / 40A AC-3, 110VAC, 50Hz, size 2	LSD2	999 0-8	LSD24032
Contactor 18,5kW / 40A AC-3, 230VAC, 50/60 Hz, size 2	LSD2	000 0-0	LSD24033
Size 2 - type LSD2 - 50A			
Contactor 22kW / 50A AC-3, 24VAC, 50Hz, size 2	LSD2	000 0-0	LSD25030
Contactor 22kW / 50A AC-3, 24VDC, size 2	LSD2	000 0-0	LSD25035
Contactor 22kW / 50A AC-3, 110VAC, 50Hz, size 2	LSD2	000 0-0	LSD25032
Contactor 22kW / 50A AC-3, 230VAC, 50/60 Hz, size 2	LSD2	000 0-0	LSD25033
Auxiliary contacts			
Auxiliary contact block for size 0-12, 1NC	LSZ0	555 0- 8	LSZOD001
Auxiliary contact block for size 0-12, 1NO	LSZ0	000 0-0	LSZOD010
Auxiliary contact block for size 0-12, 1NO + 3NC	LSZ0	000 0-0	LSZOD113
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012	LSZ0	000 0-0	LSZOD 122
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	LSZ0	000	LSZOD122F
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012	LSZ0	000 0=0	LSZOD 131
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005	LSZ0	000 0-0	LSZOD 131 F
Auxiliary contact block for size 0-12, 4NO, DIN EN 50005	LSZ0	000 0-0	LSZOD140F
Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position	LSZ0	000	LSZ0D711
Auxiliary contact block for size 0-12, 1 NC, delayed	LSZ0		LSZ0D901
Auxiliary contact block for size 0-12, 1NO, delayed	LSZ0		LSZ0D910



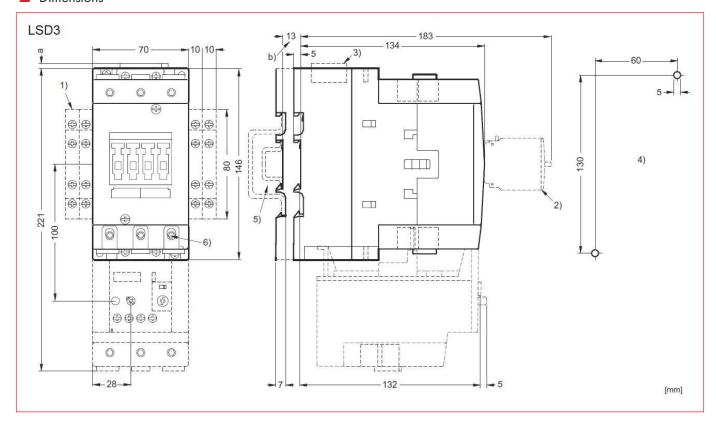
LSD39533

#### Schrack-Info

- Contactors from 30kW up to 45kW, 3-pole
- Contactors LSD3 can be fitted in maximum with 8 auxiliary contacts (four 1-pole auxiliary contacts LSZ0D0.., LSZ0D9.. or one 4-pole LSZ0D1.., as well as 2 "side mounted" auxiliary contacts LSZ0D711 or LSZ3D811) but in maximum 4 NC
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)
- Fitting surge supressors LSZ00001, LSZ00002 or LSZ20001
- Contactors LSD3 are suitable for use of Thermal overload relais of type LST3
- Coil and main contacts are exchangeable on request
- Mountable to high DIN-rail TH35, TH75 or mounting plate
- Further accessories find attached

		LSD363	LSD380	LSD395
Rated insulation voltage U <sub>i</sub>	(VAC)	690		
Utilization category AC-1 cos φ = 1				
Rated power at 400VAC	(kW)	59	66	66
Rated operational current $I_e = I_{th}$ at $40^{\circ}$ C and $690$ VAC	(A)	100	120	120
Utilization category AC-2 and AC-3				
Rated power at 400VAC	(kW)	30	37	45
Rated operational current I <sub>e</sub> at 500/690VAC	(A)	65/47	80/58	95/58
Ambient temperature (operation)	(°C)		-25 +60	
Permissible mounting position		360° 22,5° 22,5°		
Rules and regulations according		IEC 60947-4-1, EN60947-4-1		

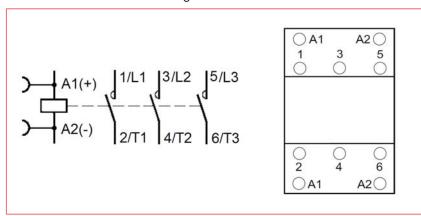
#### Dimensions



Screw terminals with surge suppressor, auxiliary contact block and mounted thermal overload relay.

- a = 0mm with varistor < 240V, diode assembly
- a = 3.5mm with varistor and > 240V
- $\alpha$  = 17mm with RC element
- b = DC 13mm deeper than AC
- 1) Auxiliary contact block, laterally mountable
- 2) Auxiliary contact block, mountable on the front, 1- and 4-pole, same dimensions for versions with screw or Cage Clamp terminals
- 3) Surge suppressor
- 4) Drilling pattern
- 5) For mounting on TH 35 standard mounting rail according to EN 60715 (15mm deep) or TH 75 standard mounting rail according to EN 60715
- 6) Allen screw 4mm

#### Circuit and Connection Diagram



Terminal designations according to EN 50012

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 3 - type LSD3 - 65A			
Contactor 30kW / 65A AC-3, 24VAC, 50Hz, size 3	LSD3	555 0- 0	LSD36530
Contactor 30kW / 65A AC-3, 24VDC, size 3	LSD3	000 0-0	LSD36535
Contactor 30kW / 65A AC-3, 110VAC, 50Hz, size 3	LSD3	000 0-0	LSD36532
Contactor 30kW / 65A AC-3, 230VAC, 50/60 Hz, size 3	LSD3	000	LSD36533
Contactor 30kW/65A AC-3, w.2 N/O+2 NC, 230VAC, 50 Hz, size 3	LSD3	000 0-0	LSD36553
Size 3 - type LSD3 - 80A			
Contactor 37kW / 80A AC-3, 24VAC, 50Hz, size 3	LSD3	000 0-0	LSD38030
Contactor 37kW / 80A AC-3, 24VDC, size 3	LSD3	000 0-0	LSD38035
Contactor 37kW/80A AC-3, with 2 NO +2 NC, 24VAC, 50 Hz, size 3	LSD3	000 0-0	LSD38050
Contactor 37kW / 80A AC-3, 110VAC, 50Hz, size 3	LSD3	555 0-0	LSD38032
Contactor 37kW/80A AC-3, with 2 NO+2 NC, 110VAC, 50 3	LSD3		LSD38052
Contactor 37kW / 80A AC-3, 230VAC, 50/60Hz, size 3	LSD3	000 0-0	LSD38033
Size 3 - type LSD3 - 95A			
Contactor 45kW / 95A AC-3, 24VAC, 50Hz, size 3	LSD3	000 0-0	LSD39530
Contactor 45kW / 95A AC-3, 24VDC, size 3	LSD3	000 0-0	LSD39535
Contactor 45kW / 95A AC-3, 230VAC, 50/60Hz, size 3	LSD3	999 0-0	LSD39533
Contactor 45kW/95A AC-3, with 2 NO+2 NC, 230VAC, 50 3	LSD3	000 0-0	LSD39553
Auxiliary contacts			
Auxiliary contact block for size 0-12, 1NC	LSZ0	000 000	LSZOD001
Auxiliary contact block for size 0-12, 1NO	LSZ0	000 0-0	LSZOD010
Auxiliary contact block for size 0-12, 1NO + 3NC	LSZ0	000 0-0	LSZOD113
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012	LSZ0	999 0-0	LSZ0D122
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	LSZ0	000 0-0	LSZOD122F
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012	LSZ0	000 0-0	LSZ0D131
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005	LSZ0	000 0-0	LSZOD 131F
Auxiliary contact block for size 0-12, 4NO, DIN EN 50005	LSZO	000 0-0	LSZOD140F
Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position	LSZO	000 0-0	LSZOD711
Auxiliary contact block for size 0-12, 1NC, delayed	LSZO		LSZ0D901
Auxiliary contact block for size 0-12, 1NO, delayed	LSZ0		LSZ0D910
Auxiliary contact block for size 3-12, 1NO + 1NC, 2. position	LSZ3	555 0- 8	LSZ3D811



## LSD Contactors and Vacuum Contactors, 3-pole, Size 6 / 10 / 12 / 14







LSDE305F

LSDH64G3

#### Schrack-Info

- Contactors LSD6115F are fitted with box terminals up to 70mm<sup>2</sup>
- · All other contactor types fitted with screw connection (busbar connection). Box terminals on request
- Contactors LSD6 up to LSDG are fitted with a withdrawable coil unit. At mounting contactor, please to consider dimension "k" (clearance upwards) for exchanging the coil
- Contactors LSD6 up to LSDG fitted as standard with 2 "side mounted" auxiliary contacts LSZ0D711 (2S+2Ö) can be extended in
  maximum up to 8 auxiliary contacts (additional four 1-pole auxiliary contacts LSZ0D0.., LSZ0D9.. or one 4-pole LSZ0D1.., or two "side
  mounted" auxiliary contacts LSZ3D811) but in maximum 4 NC.
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)
- Vacuum-Contactors LSDH fitted as standard with 8 "side mounted" auxiliary contacts (4S+4Ö) can not be extended by additional auxiliary contacts
- Fitting surge supressors (RC-units) for contactors LSD6 up to LSDG LSZ60001.
- Vacuum-Contactors LSDH are already fitted with one integrated varistor-circuit and a "burn-off" indication of main contacts, can be seen
  from outside
- · Contactors only suitable for electronic overload relais on request
- · Coil and main contacts for contactors LSD6 up to LSDG are exchangeable on request
- · Vacuum tubes for contactors LSDH on request
- Mountable to mounting plate
- Further accessories find attached

# $\blacksquare$ LSD Contactors and Vacuum Contactors, 3-pole, Size 6 / 10 / 12 / 14

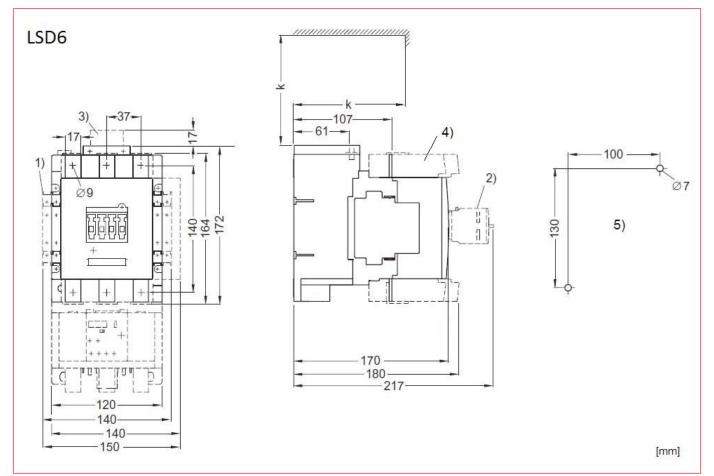
		LSD611	LSD615	LSD619	LSDE22	LSDE26	LSDE30
Rated insulation voltage U <sub>i</sub>	(VAC)		1000			1000	
Utilization category AC-1 cos φ = 1							
Rated power at 400VAC	(kW)	92	105	121	164	197	197
Rated operational current $I_e = I_{th}$ at $40^{\circ}$ C and $690$ VAC	(A)	160	185	215	275	330	330
Utilization category AC-2 and AC-3							
Rated power at 400VAC	(kW)	64	84	104	128	151	171
Rated operational current I <sub>e</sub> at 500/690VAC	(A)	115/115	150/150	185/170	225/225	265/265	300/280
Ambient temperature (operation)	(°C)	-25 +60					
Permissible mounting position		90° 22.5°, 22.5°					
Rules and regulations according		IEC 60947-4-1, EN60947-4-1					

		LSDG41	LSDG51	LSDH6	LSDH8
Rated insulation voltage U <sub>i</sub>	(VAC)	1000			
Utilization category AC-1 cos φ = 1					
Rated power at 400VAC	(kW)	263	362	415	558
Rated operational current I <sub>e</sub> = I <sub>th</sub> at 40°C and 690VAC	(A)	430	610	700	910
Utilization category AC-2 and AC-3					
Rated power at 400VAC	(kW)	231	291	347	450
Rated operational current I <sub>e</sub> at 690/1000VAC	(A)	400/400	500/450	630/435	820/580
Ambient temperature (operation)	(°C)	-25 +60			
Permissible mounting position		90° 22,5° 22,5°			
Rules and regulations according		IEC 60947-4-1, EN60947-4-1			

		Inkludierte Auxiliary contacts
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Thermal rated current Ith at 40°C and 690VAC	(A)	10
Utilization category AC-15		
Rated operational current I <sub>e</sub> at 40°C and 230/400VAC	(A)	5,6/3,6
Utilization category DC13		
Rated operational current $I_e$ at 40 °C up to 60/110/220VDC	(A)	5/1,14/0,48
Ambient temperature (operation)	(°C)	-25 +60
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1



- $\blacksquare$  LSD Contactors and Vacuum Contactors, 3-pole, Size 6 / 10 / 12 / 14
- Dimensions: LSD6 Contactors, Size 6

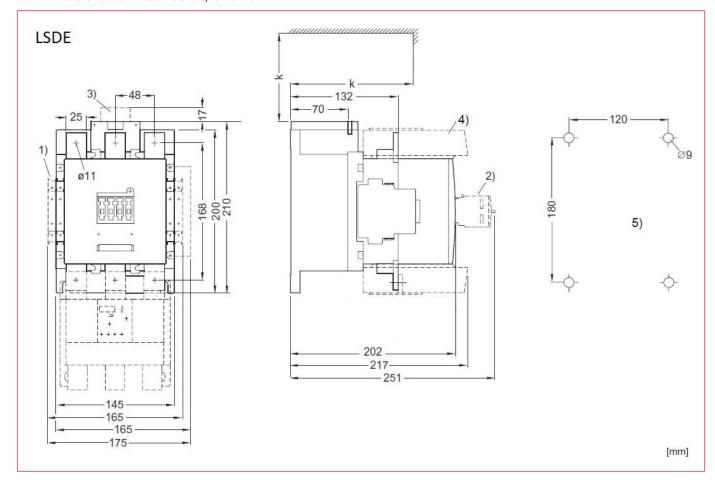


Distance from grounded parts: Lateral: 10mm, Front: 20mm,  $\boldsymbol{k}$ 

- = 120mm (minimum clearance for removing the withdrawable coil)
- 1) 2nd auxiliary contact block, lateral
- 4) Box terminals\*
- 2) Auxiliary contact block, mountable on the front
- 5) Drilling pattern

- 3) RC elemen
- $^*\mbox{LSD6115F}$  with box terminal, LSD6155F and LSD6195F without box terminal

- $\blacksquare$  LSD Contactors and Vacuum Contactors, 3-pole, Size 6 / 10 / 12 / 14
- Dimensions: LSDE Contactors, Size 10

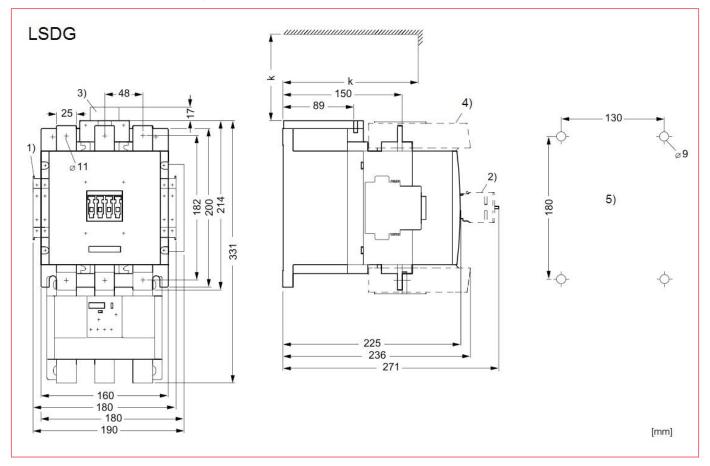


Distance from grounded parts: Lateral: 10mm, Front: 20mm, k = 150mm (minimum clearance for removing the withdrawable coil)

- 1) 2nd auxiliary contact block, lateral
- 2) Auxiliary contact block, mountable on the front
- 3) RC element

- 4) Box terminals, optional
- 5) Drilling pattern

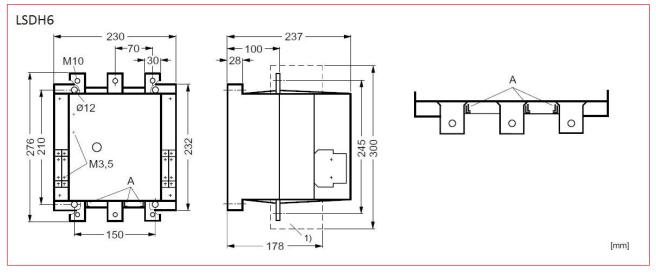
- LSD Contactors and Vacuum Contactors, 3-pole, Size 6 / 10 / 12 / 14
- Dimensions: LSDG Contactors, Size 12



Distance from grounded parts: Lateral: 10mm, Front: 20mm, k = 150mm (minimum clearance for removing the withdrawable coil)

- 1) 2nd auxiliary contact block, lateral
- 4) Box terminals, optional
- 2) Auxiliary contact, mountable on the front
- 5) Drilling pattern

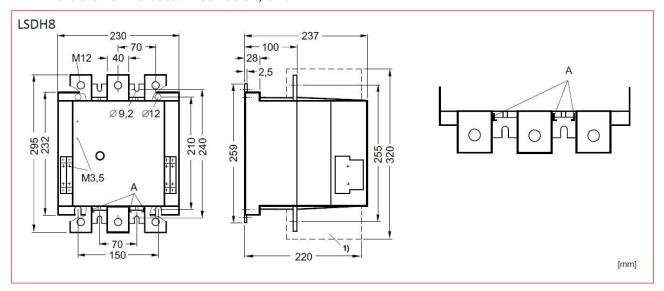
- 3) RC element
- Dimensions: LSDH6 Vacuum Contactors, Size 14



1) With box terminals for laminated copper bars (on request). Terminal cover for touch protection LSZHD001. Detail: A = Contact erosion indication for vacuum interrupter contacts

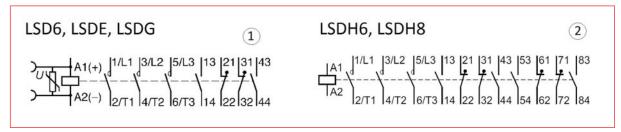
## LSD Contactors and Vacuum Contactors, 3-pole, Size 6 / 10 / 12 / 14

#### Dimensions: LSDH8 Vacuum Contactors, Size 14



1) With box terminals for laminated copper bars (on request). Terminal cover for touch protection LSZHD001. Detail: A = Contact erosion indication for vacuum interrupter contacts

#### Circuit Diagrams

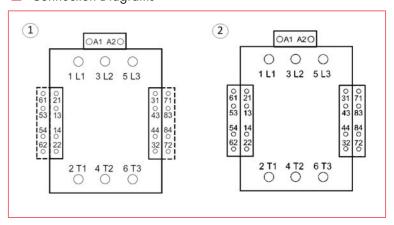


Terminal designations according to EN 50012.

1) 2NO+2NC, with front mounted 4-pole LSZ0D122 auxiliary contact block or with lateral 2-pole LSZ0D711 auxiliary contact block

2) 4NO+4NO

#### Connection Diagrams



Terminal designations according to EN 50012

1) 2NO+2NC or 4NO+4NC

With laterally included auxiliary contact block LSZ0D711 (2 NO + 2 NC)

Can be extended by LSZ3D811 to 4 NO + 4 NC

2) 4NO+4NC

No further auxiliary contacts possible



## $\blacksquare$ LSD Contactors and Vacuum Contactors, 3-pole, Size 6 / 10 / 12 / 14

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 6 - type LSD6 - 185A			
Contactor 55KW, 220-240VUC, with 2NO + 2NC, size 6 (with terminal box)	LSD6	555 0-6	LSD6115F
Contactor 75KW, 220-240VUC, with 2NO + 2NC, size 6	LSD6	388 0- 8	LSD6155F
Contactor 90KW, 220-240VUC, with 2NO + 2NC, size 6	LSD6	000 0-0	LSD6195F
Size 10 - type LSDE - 300A			
Contactor 110KW, AC-3, 220-240VUC, with 2NO + 2NC, 50Hz, size 10	LSDE	000 0-0	LSDE225F
Contactor 132KW, AC-3, 220-240VUC, with 2NO + 2NC, 50Hz, size 10	LSDE	000 0-0	LSDE265F
Contactor 160KW, AC-3, 220-240VUC, with 2NO + 2NC, 50Hz, size 10	LSDE	000 0-0	LSDE305F
Size 12 - type LSDG - 500A			
Contactor 200KW, AC-3, 220-240VUC, with 2NO + 2NC, 50Hz, size 12	LSDG	000 0-0	LSDG415F
Contactor 250KW, AC-3, 220-240VUC, with 2NO + 2NC, 50Hz, size 12	LSDG	300 0- 0	LSDG515F
Size 14 - type LSDH - 820A			
Contactor 335KW, AC-3, 220-240VAC, with 4NO + 4NC, 50Hz, size 14	LSDH	000 0- 0	LSDH63G3
Contactor 600KW, AC-3, 220-240VAC, with 4NO + 4NC, 50Hz, size 14	LSDH		LSDH64G3
Contactor 450KW, AC-3, 220-240VAC, with 4NO + 4NC, 50Hz, size 14	LSDH	000 0-0	LSDH82G3
Contactor 800KW, AC-3, 220-240VAC, with 4NO + 4NC, 50Hz, size 14	LSDH		LSDH83G3
Auxiliary contacts			
Auxiliary contact block for size 0-12, 1NC	LSZ0	000 0-0	LSZOD001
Auxiliary contact block for size 0-12, 1NO	LSZ0	000 0- 0	LSZODO10
Auxiliary contact block for size 0-12, 1NC, delayed	LSZ0		LSZ0D901
Auxiliary contact block for size 0-12, 1NO, delayed	LSZ0		LSZ0D910
Auxiliary contact block for size 0-12, 1NO + 3NC	LSZ0	000 0-0	LSZOD 113
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012	LSZ0	000 0-0	LSZOD122
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	LSZ0	000 0-0	LSZOD 122F
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012	LSZO	000 0-0	LSZOD 131
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005	LSZ0	500 0-0	LSZOD131F
Auxiliary contact block for size 0-12, 4NO, DIN EN 50005	LSZ0	000 0-0	LSZOD140F
Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position	LSZ0	000 0-0	LSZOD711
Auxiliary contact block for size 3-12, 1NO + 1NC, 2. position	LSZ3	355 0- 6	LSZ3D811



## LSU Contactors with 2 NO and 2 NC, 4-pole, Size 00 / 0 / 2



LSUD12C3

#### Schrack-Info

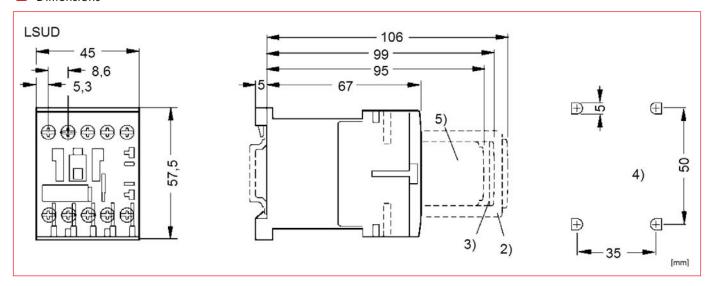
- 4-pole Contactors with 2 NO and 2 NC (switch over contactors)
- Contactors LSUD can be fitted in maximum with 4 auxiliary contacts (one 1-pole auxiliary contact LSZD05.. or one 4-pole LSZDH5..)
- Contactors LSUO and LSU2 can be fitted in maximum with 6 auxiliary contacts (four 1-pole auxiliary contacts LSZ0D0.., LSZ0D9.. or one 4-pole LSZ0D1.., as well as one "side mounted" auxiliary contact LSZ0D711) but in maximum 4 NC
- Fitting surge supressors for contactors LSUD LSZD0001 up to LSZD0004
- Fitting surge supressors for contactors LSUO LSZ00001, LSZ00002 or LSZ00003
- Fitting surge supressors for contactors LSU2 LSZ00001, LSZ00002 or LSZ20001
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)
- · Coil and main contacts for contactors LSUD are not exchangeable
- Coil and main contacts for contactors LSUO and LSU2 are exchangeable on request
- Electrical data of LSUD up to LSU2 are identical to according contactors LSD of size 00 up to size 2
- When using mechanical interlock for two contactors LSUO, the "right side mounted" (4th) pole of left contactor has to be changed to the left side of contactor
- Mountable to DIN-rail TS35 or mounting plate
- Further accessories find attached

		LSUD12	LSU025	LSU240
Rated insulation voltage U <sub>i</sub>	(VAC)	4C) 690		
Utilization category AC-1 cos φ = 1				
Rated power at 230VAC	(kW)	7,5	13,3	22
Rated operational current $I_e = I_{th}$ at 40 °C and 690VAC	(A)	22	40	60
Utilization category AC-2 and AC-3				
Rated power at 230VAC	(kW)	3	5,5	11
Rated operational current I <sub>e</sub> at 380-440VAC	(A)	11	22	40
Ambient temperature (operation)	(°C)	-25 +60		
Permissible mounting position		360° 22,5° 22,5°		
Rules and regulations according			EC 60947-4-1, EN60947-4	4-1



## LSU Contactors with 2 NO and 2 NC, 4-pole, Size 00 / 0 / 2

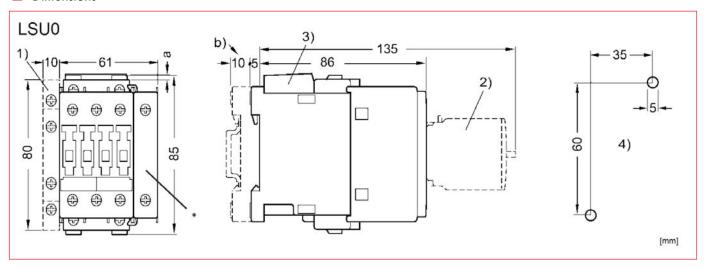
#### Dimensions



Lateral distance to grounded components = 6mm

- 2) Auxiliary contact block
- 4) Drilling pattern
- 3) Surge suppressor
- 5) Auxiliary contact block 1-pole

#### Dimensions

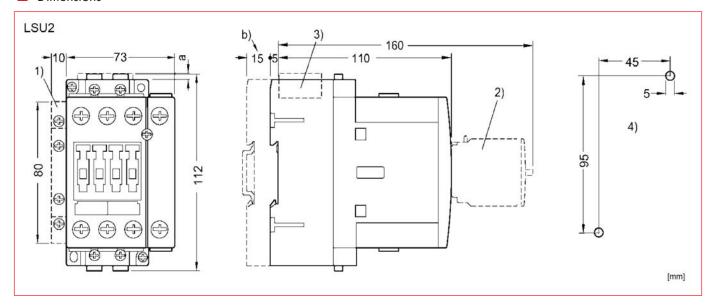


Lateral distance to grounded components = 6 mm

- $\alpha$  = 3mm at < 250V and mounting of surge suppressor
- a = 7 mm at > 250 V and mounting of surge suppressor
- b = DC 10mm deeper than AC
- ${}^{\star}4^{\rm th}$  Pole can be changed to left side without tool
- 1) Auxiliary contact block, laterally mountable (left)
- 2) Auxiliary contact block, mountable on the front
- 3) Surge suppressor
- 4) Drilling pattern

## LSU Contactors with 2 NO and 2 NC, 4-pole, Size 00 / 0 / 2

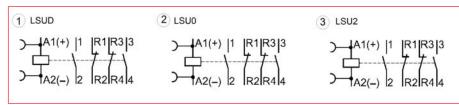
#### Dimensions



Lateral distance to grounded components = 6mm

- a = 0mm with varistor < 240V
- a = 3.5mm with varistor > 240V
- a = 17mm with RC element and diode assembly
- b = Size 2: DC 15mm deeper than AC
- 1) Auxiliary contact block, laterally mountable (right or left)
- 2) Auxiliary contact block, mountable on the front, (1 and 4 pole)
- 3) Surge suppressor
- 4) Drilling pattern

#### Circuit Diagrams



Terminal designations according to EN 50005

#### 1) LSUD contactors with 2NO + 2NC main contacts

Auxiliary contacts blocks LSZDH5.. and LSZDO5.. can be snapped on

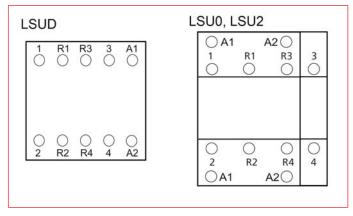
#### 2) LSU0 contactors with 2NO + 2NC main contacts

 $Auxiliary\ contacts\ LSZOD0..,\ LSZOD9..\ and\ auxiliary\ contacts\ blocks\ LSZOD1..F\ can\ be\ snapped\ on$ 

#### 3) LSU2 contactors with 2NO + 2NC main contacts

Auxiliary contacts LSZ0D0.., LSZ0D9.. and auxiliary contacts blocks LSZ0D1..F can be snapped on

#### Connection Diagrams



Terminal designations according to EN 50005



## $\blacksquare$ LSU Contactors with 2 NO and 2 NC, 4-pole, Size 00 / 0 / 2

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 00 - type LSUD - 12A			
5.5kW/400V, 2NO + 2NC, 230VAC, 50/60Hz, size 00	LSUD	000 0-0	LSUD12C3
Size 0 - type LSU0 - 25A			
11kW/400V, 2NO + 2NC, 230VAC, 50/60Hz, size 0	LSU0	000 0-0	LSU025C3
Size 2 - type LSU2 - 40A			
18,5kW/400V, 2NO + 2NC, 230VAC, 50/60Hz, size 2	LSU2	000 0-0	LSU240C3
Auxiliary contacts			
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012	LSZ0	000 0-0	LSZOD122
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	LSZ0	000 0- 0	LSZOD122F
2NO+2NC size 00, DIN 50012	LSZD	000	LSZDD222
2NO+2NC size 00, DIN 50005	LSZD	555 0- 6	LSZDH522

## LSR Contactors 4-pole, for Switching Resistive Loads AC-1, Size 00 / 0 / 2 / 3





LSR03540

#### Schrack-Info

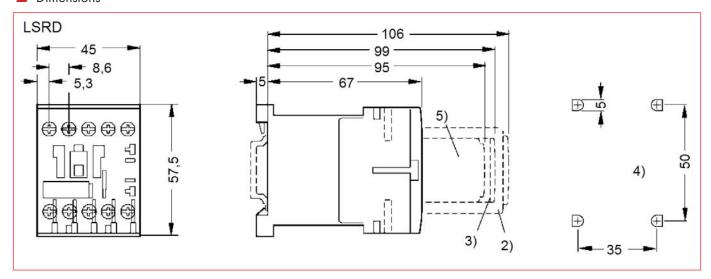
- 4-pole Contactors with 4 NO, from 22A up to 140A AC-1 loads
- Contactors LSRD can be fitted in maximum with 4 auxiliary contacts (one 1-pole auxiliary contact LSZD05.. or one 4-pole LSZDH5..)
- Contactors LSRO and LSR2 can be fitted in maximum with 6 auxiliary contacts (four 1-pole auxiliary contacts LSZ0D0.., LSZ0D9.. or one 4-pole LSZOD1.. and one "side mounted" auxiliary contact LSZOD711) but in maximum 4 NC
- · Contactors LSR3 can be fitted in maximum with 8 auxiliary contacts (four 1-pole auxiliary contacts LSZ0D0.. or LSZ0D9.. or one 4-pole LSZ0D1.. and 2 "side mounted" auxiliary contacts LSZ0D711 or LSZ3D811) but in maximum 4 NC
- Fitting surge supressors for contactors LSRD LSZD0001 up to LSZD0004
- Fitting surge supressors for contactors LSRO LSZ00001, LSZ00002 or LSZ00003
- Fitting surge supressors for contactors LSR2 and LSR3 LSZ00001, LSZ00002 or LSZ20001
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)
- Coil and main contacts for contactors LSRD are not exchangeable
- Coil and main contacts for contactors LSRO up to LSR3 are exchangeable on request
- Electrical data of LSRD up to LSR3 are identical to according contactors LSDD up to LSD3
- When using mechanical interlock for two contactors LSRO, the "right side mounted" (4th) pole of left contactor has to be changed to the left side of contactor
- Mountable to DIN-rail TS35 or mounting plate
- Further accessories find attached

		LSRD18	LSRD22	LSR035	LSR040	LSR260	LSR311	LSR314
Rated insulation voltage U <sub>i</sub>	(VAC)			•	690	•		
Utilization category AC-1 cos φ = 1								
Rated power at 400VAC	(kW)	12	14,5	22	26	39	72	92
Rated operational current $I_e = I_{th}$ at 40 °C and 690VAC	(A)	18	22	35	40	60	110	140
Utilization category AC-2 and AC-3								
Rated power at 400VAC	(kW)	4	5,5	7,5	11	11	-	-
Rated operational current I <sub>e</sub> at 400VAC	(A)	9	12	17	25	26	-	-
Ambient temperature (operation)	(°C)				-25 +60			
Permissible mounting position		360° 22,5° 22,5°						
Rules and regulations according		IEC 60947-4-1. EN60947-4-1						



## $\blacksquare$ LSR Contactors 4-pole, for Switching Resistive Loads AC-1, Size 00 / 0 / 2 / 3

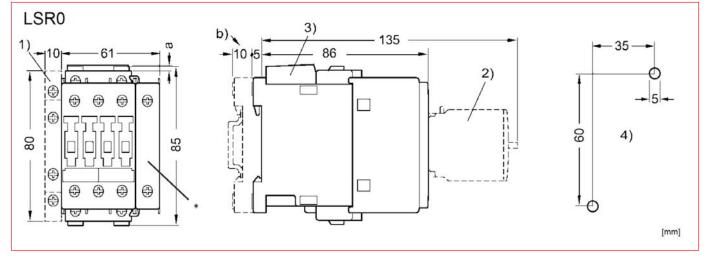
### Dimensions



Lateral distance to grounded components = 6mm

- 2) Auxiliary contact block
- 3) Surge suppressor
- 4) Drilling pattern
- 5) Auxiliary contact block 1-pole

#### Dimensions



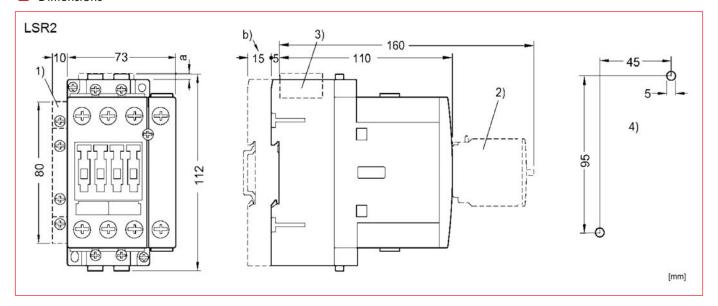
Lateral distance to grounded components = 6mm

- $\alpha$  = 3mm at < 250V and mounting of surge suppressor
- a = 7 mm at > 250 V and mounting of surge suppressor
- b = DC 10mm deeper than AC
- $^\star 4^{\text{th}}$  Pole can be changed to left side without tool

- 1) Auxiliary contact block, laterally mountable (left)
- 2) Auxiliary contact block, mountable on the front
- 3) Surge suppressor
- 4) Drilling pattern

## LSR Contactors 4-pole, for Switching Resistive Loads AC-1, Size 00 / 0 / 2 / 3

#### Dimensions

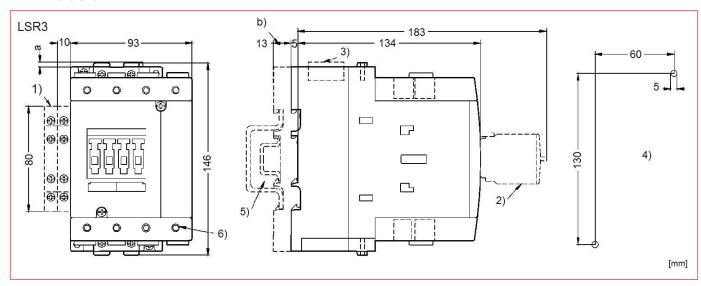


Lateral distance to grounded components = 6mm

- a = 0mm with varistor < 240V
- a = 3.5mm with varistor > 240V
- $\alpha$  = 17mm with RC element and diode assembly
- b = Size 2: DC 15mm deeper than AC

- 1) Auxiliary contact block, laterally mountable (right or left)
- 2) Auxiliary contact block, mountable on the front, (1- and 4-pole)
- 3) Surge suppressor
- 4) Drilling pattern
- 5) For mounting on TH 35 standard mounting rail according to EN 60715 (15mm deep) EN 60715
- 6) Allen screw 4mm

#### Dimensions



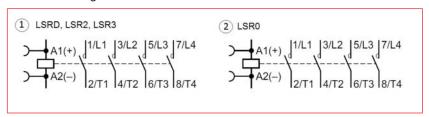
Lateral distance to grounded components = 6 mm

- a = 0mm with varistor  $\leq 240$ V
- a = 3.5mm with varistor > 240V
- a = 17mm with RC element and diode assembly
- b = Size 3: DC 13mm deeper than AC
- 1) Auxiliary contact block, laterally mountable (right or left)
- 2) Auxiliary contact block, mountable on the front, (1- and 4-pole)
- 3) Surge suppressor
- 4) Drilling pattern
- 5) For mounting on TH 35 standard mounting rail according to EN 60715 (15 mm deep) or for size 3 also to TH 75 standard mounting rail according to EN 60715
- 6) Allen screw 4mm



## LSR Contactors 4-pole, for Switching Resistive Loads AC-1, Size 00 / 0 / 2 / 3

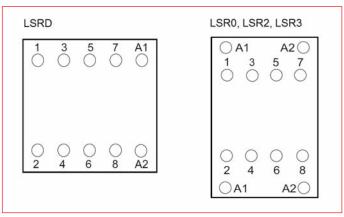
#### Circuit Diagrams



Terminal designations according to EN 50005

- 1) 4NO, LSZDH5.. And LSZD05.. auxiliary contact blocks can be snapped on
- 2) 4NO, LSZODO.., LSZOD9.. auxiliary contact and LSZOD1..F auxiliary contact blocks can be snapped on

#### Connection Diagrams



Terminal designations according to EN 50005

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 00 - type LSRD - 12A			
Contactor 18A AC1, 24VAC, 50Hz, size 00	LSRD		LSRD1840
Contactor 18A AC1, 24VDC, size 00	LSRD		LSRD1845
Contactor 18A AC1, 230VAC, 50/60Hz, size 00	LSRD	000 0-0	LSRD1843
Contactor 22A AC1, 24VAC, 50Hz, size 00	LSRD		LSRD2240
Contactor 22A AC1, 24VDC, size 00	LSRD	000 0-0	LSRD2245
Contactor 22A AC1, 230VAC, 50/60Hz, size 00	LSRD	000 0-0	LSRD2243
Auxiliary contacts for LSRD contactors			
1NC size 00, DIN 50005, wiring from bottom	LSZD	388 0-0	LSZD0501
1NO size 00, DIN 50005, wiring from bottom	LSZD	000 0-0	LSZD0510
4NO size 00, DIN 50005	LSZD	555 0-0	LSZDH540
3NO+1NC size 00, DIN 50005	LSZD	000 0-0	LSZDH531
2NO+2NC size 00, DIN 50005	LSZD	500 0-0	LSZDH522
Size 0 - type LSR0 - 40A			
Contactor 35A AC1, 24VAC, 50Hz, size 0	LSRO		LSR03540
Contactor 35A AC1, 24VDC, size 0	LSRO	000 0-0	LSR03545
Contactor 35A AC1, 230VAC, 50/60Hz, size 0	LSRO	388 0-8	LSR03543
Contactor 40A AC1, 24VAC, 50Hz, size 0	LSRO		LSR04040
Contactor 30A AC1, 24VDC, size 0	LSRO		LSR04045
Contactor 40A AC1, 230VAC, 50/60Hz, size 0	LSRO	555 0-0	LSR04043
Auxiliary contacts for LSRO contactors			
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012	LSZO	000 0-0	LSZOD 131
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012	LSZO	388 0-0	LSZ0D122
Auxiliary contact block for size 0-12, 1NO + 3NC	LSZ0	000 0-0	LSZOD113
Auxiliary contact block for size 0-12, 4NO, DIN EN 50005	LSZO	555 0-6	LSZOD140F
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005	LSZ0	000 0-0	LSZOD 131 F
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	LSZO	000 0-0	LSZOD 122F
Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position	LSZO	000 0-0	LSZOD711

## $\blacksquare$ LSR Contactors 4-pole, for Switching Resistive Loads AC-1, Size 00 / 0 / 2 / 3

Size 2 - type LSR2 - 60A   Contector 60A ACI, 24VAC, 50Hz, size 2   LSR26040   LSR26043   LSR26043   LSR26043   LSR26043   LSR26043   LSR26044   LSR26044   LSR26044   LSR26045   LSR2604	DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Contactor 60A AC I, 24VAC, 50Hz, size 2	Auxiliary contacts for LSRO contactors			
LSR2	Size 2 - type LSR2 - 60A			
SERIEST   SERI	Contactor 60A AC1, 24VAC, 50Hz, size 2	LSR2		LSR26040
Auxiliary contacts for LSR2 contactors  Auxiliary contact block for size 0-12, 1NO  LSZ00001  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ00001  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ00001  Auxiliary contact block for size 0-12, 1NO, the layed  Auxiliary contact block for size 0-12, 1NO + 1NC, 1, position  LSZ00001  Auxiliary contact block for size 0-12, 1NO + 1NC, 1, position  LSZ00001  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50012  LSZ00111  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  LSZ00122  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  LSZ00122  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  LSZ00123  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ000113  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ000113  Auxiliary contact block for size 0-12, 2NO + 1NC, DIN EN 50005  LSZ000113  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ000113  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ000113  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ000122  LSZ001131  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ000122  LSZ00131  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ000131  LSZ00131  LSZ001314  Contactor 110A AC1, 24VDC, Size 3  LSZ00131  LSZ00131  LSZ00131  LSZ00131  Auxiliary contact block for size 0-12, 1NO  LSZ000131  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ000131  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ000131  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ000131  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ000131  Auxiliary contact block for size 0-12, 1NO, Din EN 50012  LSZ00131  Auxiliary contact block for size 0-12, 1NO, Din EN 50012  LSZ00131  Auxiliary contact block for size 0-12, 1NO, Din EN 50012  LSZ00131  Auxiliary contact block for size 0-12, ANO, Din EN 50012  LSZ00131F  Auxiliary contact block for	Contactor 60A AC1, 230VAC, 50/60Hz, size 2	LSR2	000 0-0	LSR26043
Auxiliary contact block for size 0-12, 1NC  Auxiliary contact block for size 0-12, 1NC  Auxiliary contact block for size 0-12, 1NC, delayed  Auxiliary contact block for size 0-12, 1NC, delayed  Auxiliary contact block for size 0-12, 1NC, delayed  Auxiliary contact block for size 0-12, 1NC, delayed  ISZO  ISZODP10  Auxiliary contact block for size 0-12, 1NC, Delayed  ISZO  ISZODP11  Auxiliary contact block for size 0-12, 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  ISZO  ISZODI13  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  ISZO  ISZODI34  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  ISZO  ISZODI35  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  ISZO  ISZODI36  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  ISZO  ISZODI37  ISZODI38  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  ISZO  ISZODI38  ISR3  ISR3  ISR3  ISR3  ISR31140  Contactor 110A AC1, 24VAC, 50Hz, size 3  ISR3  ISR31143  Contactor 110A AC1, 24VAC, size 3  ISR3  Contactor 110A AC1, 24VAC, size 3  ISR3  ISR31445  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO, delayed  ISZO  ISZODI01  Auxiliary contact block for size 0-12, 1NO, delayed  ISZO  ISZODI01  Auxiliary contact block for size 0-12, 1NO, delayed  ISZO  ISZODI01  Auxiliary contact block for size 0-12, 1NO, Delayed  ISZO  ISZODI01  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  ISZO  ISZODI01  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  ISZO  ISZODI01  ISZODI01  ISZODI01  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50012  ISZODI013  Auxiliary contact block for size 0-12, NO + 1NC	Contactor 60A AC1, 24VDC, size 2	LSR2		LSR26045
Auxiliary contact black for size 0-12, 1NC, delayed  LSZ0  LSZ00910  Auxiliary contact black for size 0-12, 1NC, delayed  LSZ0  LSZ00910  Auxiliary contact black for size 0-12, 1NC, delayed  LSZ0  LSZ00910  Auxiliary contact black for size 0-12, 1NC, delayed  LSZ0  LSZ00910  Auxiliary contact black for size 0-12, 1NC, DIN EN 50012  LSZ00D11  Auxiliary contact black for size 0-12, 3NO + 1NC, DIN EN 50012  LSZ0D131  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50012  LSZ0D132  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D133  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D134  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D134  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D134  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D134  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D134  Contactor 110A AC1, 24VAC, 50Hz, size 3  LSR3  LSR31143  Contactor 110A AC1, 24VAC, 50Hz, size 3  LSR3  LSR31145  Contactor 140A AC1, 24VAC, size 3  LSR3  LSR31443  Contactor 140A AC1, 24VDC, size 3  LSR3  LSR31443  Contactor 140A AC1, 24VDC, size 3  LSR31445  Auxiliary contact black for size 0-12, 1NO  LSZ0D010  Auxiliary contact black for size 0-12, 1NO  LSZ0D010  Auxiliary contact black for size 0-12, 1NO  LSZ0D011  Auxiliary contact black for size 0-12, 1NO, delayed  LSZ0  LSZ0D011  Auxiliary contact black for size 0-12, 1NO, blackyed  LSZ0  LSZ0D011  Auxiliary contact black for size 0-12, 1NC, blackyed  LSZ0D011  Auxiliary contact black for size 0-12, 1NC, blackyed  LSZ0D011  Auxiliary contact black for size 0-12, 1NC, blackyed  LSZ0D113  Auxiliary contact black for size 0-12, 1NC, blackyed  LSZ0D113  Auxiliary contact black for size 0-12, 1NC, blackyed  LSZ0D113  Auxiliary contact black for size 0-12, 1NC, blackyed  LSZ0D113  Auxiliary contact black for size 0-12, 1NC, blackyed  LSZ0D113  Auxiliary contact black for size 0-12, 1NC, blackyed  LSZ0D113	Auxiliary contacts for LSR2 contactors			
Auxiliarry contact block for size 0-12, INO, delayed  LSZO  LSZOD910  Auxiliarry contact block for size 0-12, INO, delayed  LSZO  LSZOD911  Auxiliarry contact block for size 0-12, INO, delayed  LSZO  LSZOD711  Auxiliarry contact block for size 0-12, INO, DIN EN 50012  LSZOD131  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50012  LSZOD131  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50012  LSZOD132  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50012  LSZOD133  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD133  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD133  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD133  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD131  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD131  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD131  LSZOD131  LSZOD132  LSZOD132  LSZOD132  LSZOD134  Contactor 110A AC1, 24VAC, 50Hz, size 3  LSR31143  Contactor 110A AC1, 230VAC, 50/60Hz, size 3  LSR31145  Contactor 140A AC1, 230VAC, 50/60Hz, size 3  LSR31443  Contactor 140A AC1, 24VAC, size 3  LSR31443  Contactor 140A AC1, 24VAC, size 3  LSR31445  Auxiliarry contact block for size 0-12, INO  Auxiliarry contact block for size 0-12, INO  Auxiliarry contact block for size 0-12, INO  Auxiliarry contact block for size 0-12, INO ellayed  LSZOD001  Auxiliarry contact block for size 0-12, INO ellayed  LSZOD011  Auxiliarry contact block for size 0-12, INO + INC, IN EN 50012  LSZOD131  Auxiliarry contact block for size 0-12, INO + INC, DIN EN 50012  LSZOD131  Auxiliarry contact block for size 0-12, NO + INC, DIN EN 50012  LSZOD131  Auxiliarry contact block for size 0-12, NO + INC, DIN EN 50015  LSZOD131  Auxiliarry contact block for size 0-12, NO + INC, DIN EN 50005  LSZOD131  Auxiliarry contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZOD131  Auxiliarry contact block for size 0-12, NO + INC	Auxiliary contact block for size 0-12, 1NO	LSZO	388 0- 8	LSZ0D010
Auxiliary contact block for size 0-12, 1NO, delayed  LSZO  LSZOD901  Auxiliary contact block for size 0-12, 1NO + 1NC, 1, position  LSZO  LSZOD711  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  LSZOD131  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  LSZOD122  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZOD133  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZOD140  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZOD140  Auxiliary contact block for size 0-12, 2NO + 1NC, DIN EN 50005  LSZOD140  Auxiliary contact block for size 0-12, 2NO + 1NC, DIN EN 50005  LSZOD140  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZOD122F  Size 3 - type LSR3 - 140A  Contactor 110A AC1, 24VAC, 50Hz, size 3  LSR31140  Contactor 110A AC1, 24VAC, size 3  LSR31143  Contactor 110A AC1, 24VAC, size 3  LSR31144  Contactor 140A AC1, 230VAC, 50/60Hz, size 3  LSR31445  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO, delayed  LSZOD101  Auxiliary contact block for size 0-12, 1NO, blo EN 50012  Auxiliary contact block for size 0-12, 1NO, blo EN 50012  Auxiliary contact block for size 0-12, 1NO + 1NC, 1, position  LSZOD131  Auxiliary contact block for size 0-12, 1NO, blo EN 50012  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 1NC, DIN EN 50015  LSZOD131  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50005  LSZOD131  Auxiliary contact	Auxiliary contact block for size 0-12, 1NC	LSZO	000 0-0	LSZ0D001
Auxiliarry contact block for size 0-12, 1NO + 1NC, 1, position  LSZ0  LSZ0D711  Auxiliarry contact block for size 0-12, 3NO + 1NC, DIN EN 50012  LSZ0D131  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  LSZ0D132  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZ0D133  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZ0D134  Auxiliary contact block for size 0-12, 1NO + 1NC, DIN EN 50005  LSZ0  LSZ0D134  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D135  LSZ0D136  LSZ0D136  LSZ0D137  LSZ0D137  LSZ0D137  LSZ0D137  LSZ0D138  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D122F  LSZ0D131  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D131  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D131  Auxiliary contact block for size 0-12, 1NO, DIN EN 50012  LSZ0D131  Auxiliary contact block for size 0-12, 1NO, DIN EN 50012  LSZ0D131  Auxiliary contact block for size 0-12, 1NO SIN EN 50012  LSZ0D131  Auxiliary contact block for size 0-12, 1NO SIN EN 50012  LSZ0D131  Auxiliary contact block for size 0-12, 1NO SIN EN 50015  LSZ0D131F  Auxiliary contact block for size 0-12, 1NO, DIN EN 50005  LSZ0  LSZ0D131F  Auxiliary contact block for size 0-12, 1NO, DIN EN 50005  LSZ0D132F  LSZ0D132	Auxiliary contact block for size 0-12, 1 NO, delayed	LSZO		LSZ0D910
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  Auxiliary contact block for size 0-12, 1NO + 3NC  Auxiliary contact block for size 0-12, 1NO + 3NC  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZO LSZOD131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO LSZOD131  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO LSZOD131  LSZOD131  LSZOD131  Auxiliary contact block for size 0-12, 3NO + 2NC, DIN EN 50005  LSZOD131  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO, delayed  LSZOD131  Auxiliary contact block for size 0-12, 1NO, delayed  LSZOD131  Auxiliary contact block for size 0-12, 1NO, delayed  LSZOD131  Auxiliary contact block for size 0-12, 1NO, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZOD131  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZOD131  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZOD131  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZOD131  Auxiliary contact block for size 0-12, 1NO, DIN EN 50005	Auxiliary contact block for size 0-12, 1 NC, delayed	LSZO		LSZ0D901
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZ0  LSZ0 LSZ0D113  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZ0  LSZ0D131F  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZ0  LSZ0D131F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D131F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D122F  Size 3 - type LSR3 - 140A  Contactor 110A AC1, 24VAC, 50Hz, size 3  LSR31140  Contactor 110A AC1, 24VAC, 50Hz, size 3  LSR31143  Contactor 110A AC1, 24VAC, 50Hz, size 3  LSR31145  Contactor 110A AC1, 24VAC, 50/60Hz, size 3  LSR31145  Contactor 140A AC1, 24VAC, 50/60Hz, size 3  LSR31443  Contactor 140A AC1, 24VAC, 50/60Hz, size 3  LSR31445  Auxiliary contact for LSR3 contactors  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0D001  Auxiliary contact block for size 0-12, 1NC, delayed  LSZ0D011  Auxiliary contact block for size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO, the size 0-12, 1NO the size	Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position	LSZO	555 0- 0	LSZOD711
Auxiliary contact block for size 0-12, 1NO + 3NC  LSZO	Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012	LSZO	000 0-0	LSZOD131
Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZO  LSZOD 131F  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZOD 131F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD 122F  Size 3 - type LSR3 - 140A  Contactor 110A AC1, 24VAC, 50Hz, size 3  LSR3  LSR3  LSR3  LSR3  LSR3  LSR3  LSR3  LSR31143  Contactor 110A AC1, 23VAC, 50/60Hz, size 3  LSR3  LSR3  LSR3  LSR3  LSR3  LSR3  LSR31445  Contactor 140A AC1, 230VAC, 50/60Hz, size 3  LSR3  LSR3  LSR31445  Contactor 140A AC1, 230VAC, 50/60Hz, size 3  LSR3  LSR3  LSR3  LSR3  LSR3  LSR3  LSR31445  Contactor 140A AC1, 24VDC, size 3  LSR3	Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012	LSZO	000 0-0	LSZOD122
Auxiliary contact black for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZO  LSZO  LSZO  LSZO  LSZO  LSZO  LSZO  LSZO  LSZO  LSZOD131F  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD122F  Size 3 - type LSR3 - 140A  Contactor 110A AC1, 24VAC, 50Hz, size 3  LSR3  LSR3  LSR3  LSR3  LSR3  LSR31143  Contactor 110A AC1, 230VAC, 50/60Hz, size 3  LSR3  LSR3  LSR31145  Contactor 140A AC1, 230VAC, 50/60Hz, size 3  LSR3  LSR31145  Contactor 140A AC1, 230VAC, 50/60Hz, size 3  LSR3  LSR3  LSR31145  Contactor 140A AC1, 24VDC, size 3  LSR3  LSR3  LSR31445  Auxiliary contacts for LSR3 contactors  Auxiliary contact black for size 0-12, 1NO  LSZO  LSZOD010  Auxiliary contact black for size 0-12, 1NO, delayed  LSZO  LSZOD901  Auxiliary contact black for size 0-12, 1NO + 1NC, 1, position  LSZO  LSZOD911  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50015  LSZOD131  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD131  Auxiliary contact black for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZOD131  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD131  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD131  Auxiliary contact black for size 0-12, 2NO + 2NC, DIN EN 50005	Auxiliary contact block for size 0-12, 1NO + 3NC	LSZO	000 0-0	LSZOD113
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LS	Auxiliary contact block for size 0-12, 4NO, DIN EN 50005	LSZO	388 0- 8	LSZOD140F
Size 3 - type LSR3 - 140A	Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005	LSZO	000 0=0	LSZOD 131 F
LSR3   LSR31140	Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	LSZO	588 0- 8	LSZOD 122F
Contactor 110A AC1, 230VAC, 50/60Hz, size 3  LSR3  LSR31145  Contactor 110A AC1, 24VDC, size 3  LSR3  LSR31145  Contactor 140A AC1, 230VAC, 50/60Hz, size 3  LSR3  LSR31443  Contactor 140A AC1, 24VDC, size 3  LSR3  LSR31445  Contactor 140A AC1, 24VDC, size 3  LSR3  LSR31445  Auxiliary contacts for LSR3 contactors  Auxiliary contact block for size 0-12, 1NO  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D910  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  LSZ0  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZ0D113  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZ0D131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZ0D131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZ0D131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZ0D131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZ0D131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZ0D131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZ0D131  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	Size 3 - type LSR3 - 140A			
Contactor 110A AC1, 24VDC, size 3  LSR3  LSR31145  Contactor 140A AC1, 230VAC, 50/60Hz, size 3  LSR3  LSR31443  Contactor 140A AC1, 24VDC, size 3  LSR3  LSR31445  Auxiliary contacts for LSR3 contactors  Auxiliary contact block for size 0-12, 1NO  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D910  Auxiliary contact block for size 0-12, 1NO, 1NO, 1NO, 1NO, 1NO, 1NO, 1NO, 1NO	Contactor 110A AC1, 24VAC, 50Hz, size 3	LSR3		LSR31140
Contactor 140A AC1, 230VAC, 50/60Hz, size 3  LSR3  LSR3  LSR3  LSR3  LSR31445  Auxiliary contacts for LSR3 contactors  Auxiliary contact block for size 0-12, 1NO  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  LSZ0  LSZ0D711  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZ0  LSZ0D113  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZ0  LSZ0D113  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZ0  LSZ0D131F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZ0  LSZ0D122F  LSZ0D122F  LSZ0D122F	Contactor 110A AC1, 230VAC, 50/60Hz, size 3	LSR3	000 0-0	LSR31143
Contactor 140A AC1, 24VDC, size 3  LSR31445  Auxiliary contacts for LSR3 contactors  Auxiliary contacts for LSR3 contactors  Auxiliary contact block for size 0-12, 1NO  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D010  Auxiliary contact block for size 0-12, 1NO, delayed  LSZ0  LSZ0D910  Auxiliary contact block for size 0-12, 1NO, telayed  LSZ0  LSZ0D911  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  LSZ0  LSZ0D711  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZ0  LSZ0D113  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZ0  LSZ0D113  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZ0  LSZ0D131F  Auxiliary contact block for size 0-12, 3NO + 2NC, DIN EN 50005  LSZ0D122F	Contactor 110A AC1, 24VDC, size 3	LSR3		LSR31145
Auxiliary contacts for LSR3 contactors  Auxiliary contact block for size 0-12, 1NO  LSZO  LSZODO10  Auxiliary contact block for size 0-12, 1NC  LSZO  LSZODO11  Auxiliary contact block for size 0-12, 1NO, delayed  LSZO  LSZOD910  Auxiliary contact block for size 0-12, 1NO, delayed  LSZO  LSZOD911  Auxiliary contact block for size 0-12, 1NO + 1NC, 1, position  LSZO  LSZOD911  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZOD113  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZOD 131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZOD 131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZOD 131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZOD 131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZOD 131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZOD 131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZOD 131  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZOD 132  LSZOD 132  LSZOD 132  LSZOD 132  LSZOD 132  LSZOD 132  LSZOD 132  LSZOD 132	Contactor 140A AC1, 230VAC, 50/60Hz, size 3	LSR3	000 0-0	LSR31443
Auxiliary contact block for size 0-12, 1NO  Auxiliary contact block for size 0-12, 1NC  Auxiliary contact block for size 0-12, 1NO, delayed  Auxiliary contact block for size 0-12, 1NO, delayed  Auxiliary contact block for size 0-12, 1NO, delayed  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  Auxiliary contact block for size 0-12, 3NO + 2NC, DIN EN 50005  LSZOD 131F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZOD 132F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZOD 132F  LSZOD 132F  LSZOD 132F	Contactor 140A AC1, 24VDC, size 3	LSR3	000 0-0	LSR31445
Auxiliary contact block for size 0-12, 1NC  Auxiliary contact block for size 0-12, 1NO, delayed  LSZO  LSZOD910  Auxiliary contact block for size 0-12, 1NO, delayed  LSZO  LSZOD901  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  LSZO  LSZOD901  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZO  LSZOD113  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZO  LSZOD113  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZO  LSZOD140F  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZOD121F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	Auxiliary contacts for LSR3 contactors			
Auxiliary contact block for size 0-12, 1NO, delayed  LSZO  LSZOD910  Auxiliary contact block for size 0-12, 1NC, delayed  LSZO  LSZOD901  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  LSZO  LSZOD711  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZO  LSZOD113  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZO  LSZOD114  LSZO  LSZOD115  LSZOD116  LSZOD117  LSZOD117  LSZOD118  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZOD131  LSZOD131  LSZOD131  LSZOD131  LSZOD132  LSZOD140F  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZOD131F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	Auxiliary contact block for size 0-12, 1NO	LSZO	000 0-0	LSZOD010
Auxiliary contact block for size 0-12, 1NC, delayed  LSZO  LSZOD901  Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  LSZO  LSZOD711  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  LSZO  LSZOD LSZO	Auxiliary contact block for size 0-12, 1NC	LSZO	555 0= 5	LSZOD001
Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position  LSZO  LSZOD711  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  LSZO  LSZO  LSZOD131  LSZO  LSZOD122  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZO  LSZOD130  LSZOD131  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZOD140F  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZOD131  LSZOD140F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD122F	Auxiliary contact block for size 0-12, 1NO, delayed	LSZO		LSZ0D910
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZO  LSZO  LSZO  LSZO  LSZO  LSZOD113  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZO  LSZOD140F  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZOD131F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD122  LSZOD131  LSZOD131F	Auxiliary contact block for size 0-12, 1NC, delayed	LSZO		LSZ0D901
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012  Auxiliary contact block for size 0-12, 1NO + 3NC  LSZO  LSZO  LSZO  LSZOD122  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZO  LSZOD140F  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZOD131F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD122F	Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position	LSZO	000 0-0	LSZOD711
Auxiliary contact block for size 0-12, 1NO + 3NC  LSZO  LSZOD113  Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZO  LSZOD140F  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZOD122F	Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012	LSZO	000 0-0	LSZOD 131
Auxiliary contact block for size 0-12, 4NO, DIN EN 50005  LSZO  LSZOD140F  Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZOD122F  LSZOD122F	Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012	LSZO	555 0- 6	LSZOD122
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005  LSZO  LSZO  LSZOD131F  Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005  LSZO  LSZOD122F	Auxiliary contact block for size 0-12, 1NO + 3NC	LSZO	000 0-0	LSZOD113
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	Auxiliary contact block for size 0-12, 4NO, DIN EN 50005	LSZO	000 0-0	LSZOD140F
	Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005	LSZO	000 0-0	LSZOD 131F
Auxiliary contact block for size 3-12, 1NO + 1NC, 2. position LSZ3 LSZ3D811	Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	LSZO	388 0- 6	LSZOD122F
	Auxiliary contact block for size 3-12, 1NO + 1NC, 2. position	LSZ3	000 0-0	LSZ3D811





## LSK Capacitor Switching Contactors, Size 00 / 0 / 3





#### Schrack-Info

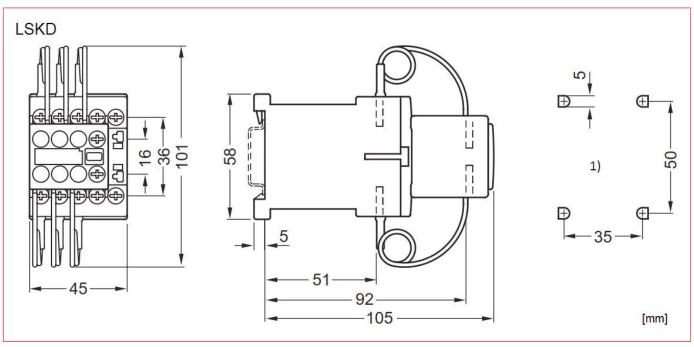
 Capacitor switching contactors LSK are a special design of ALEA contactors size 00 up to 3.

With 3 frontside mounted - early make NO-auxiliary contacts with resistors, the capacitors are pre-charged, when contactor is switching on. Short time delayed to this, the main contacts close. This function prevents, that dangerous backlash of mains causes welding of contactor's main contacts. LSK contactors only may switch discharged capacitors. The frontside mounted auxiliary contact block of contactos size 00 includes - besides the mentioned 3 early make NO - one NC auxiliary contact and one NO in the basic device. At size 0 and 3, the frontside mounted auxiliary contact block includes - beside the mentioned 3 early make NO - one NO for free disposal. To contactors of size 3, one additional side mounted auxiliary contact of type LSZOD711 can be snapped on.

- Technical data according IEC 60 947 EN 60 947
- Capacitor switching contactors have covers for protection against direct contact according EN 50274 and are climateproof
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)
- Mountable to DIN-rail TS35 or mounting plate
- Further accessories find attached

		LSKD17	LSK032	LSK362
Rated insulation voltage U <sub>i</sub>	(VAC)		690	
Utilization category AC-6b				
Rated power at 400VAC	(kVAr)	5 12,5	6 25	5 50
Rated operational current I <sub>e</sub> at 50° and 380-400VAC	(A)	8 18	9 36	8 72
Ambient temperature (operation)	(°C)		-25 +60	
Permissible mounting position		360° 22,5° 22,5°		
Rules and regulations according		I	EC 60947-4-1, EN60947-4	1

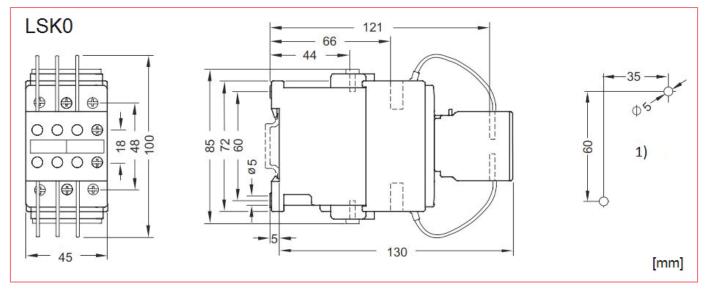
#### Dimensions





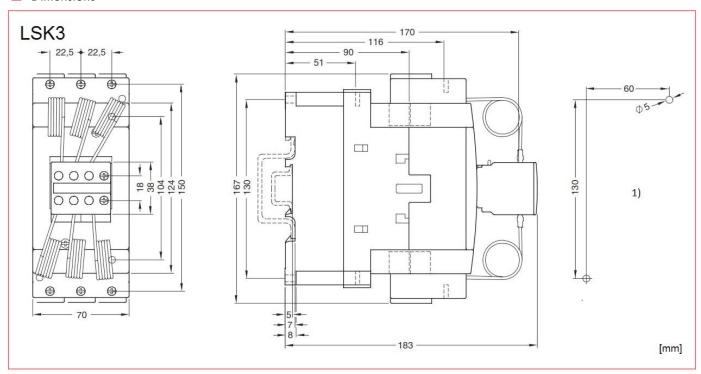
## LSK Capacitor Switching Contactors, Size 00 / 0 / 3

#### Dimensions



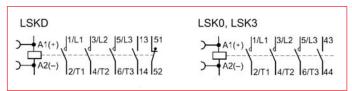
1) Drilling pattern

#### Dimensions



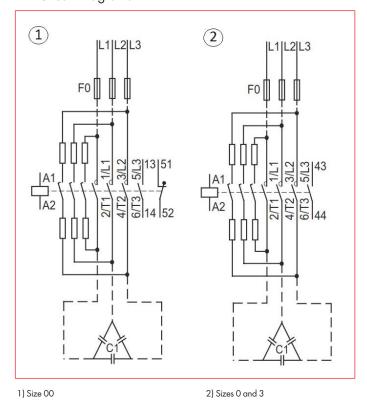
1) Drilling pattern

#### Circuit Diagrams

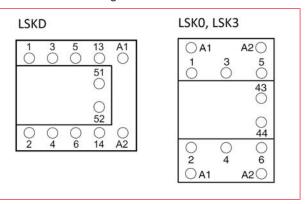


## LSK Capacitor Switching Contactors, Size 00 / 0 / 3

## Circuit Diagrams



## ■ Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 00 - 12.5kVAr			
Capacitor switching Contactors 12.5 kVar, 220-240VAC, 1NO/1NC	LSKD	000 0-0	LSKD17B3
Size 0 - 25kVAr			
Capacitor switching Contactors 25 kVar, 220-240VAC, 1 N/O	LSK0	000 0-0	LSK03213
Size 3 - 50kVAr			
Capacitor switching Contactors 50.0 kVar, 220-240VAC, 1NO	LSK3	000 0-0	LSK36213
Auxiliary contacts			
Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position	LSZ0	000 0=0	LSZOD711

## LSHD Auxiliary Contactors 4-pole, Size 00



LSHD0683

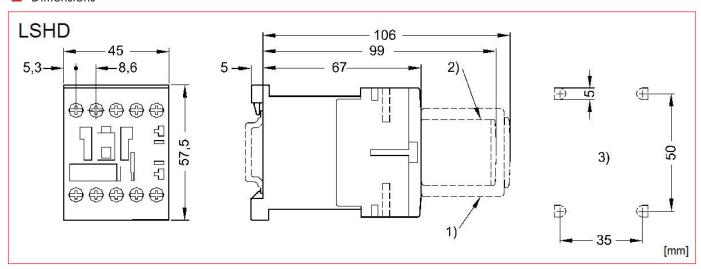
#### Schrack-Info

- 4-pole Auxiliary contactors for control functions
- Auxiliary contactors LSHD can be extended with additional auxiliary contacts to 8-pole (one 4-pole LSZDH5..) but in maximum 4 NC
- Auxiliary contactors LSHD...N and LSHD...G with reduced power consumption of coil 3,2W and coil voltage of 17-30VDC are specially designed for control by PLC
- Auxiliary contactors LSHD...N and LSHD...G can not be extended with additional auxiliary contacts
- Contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)
- Coil and main contacts for contactors LSHD are not exchangeable
- 4-pole auxiliary contactors LSHD can be retrofitted with a soldering adaptor LSZDD002 for mounting to printed boards
- Mountable to DIN-rail TS35 or mounting plate
- Further accessories find attached

		LSHD
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Thermal rated current $I_{th}$ at $40^{\circ}\text{C}$ and $400\text{VAC}$	(A)	10
Utilization category AC-15		
Rated operational current I <sub>e</sub> at 40°C and 230/400VAC	(A)	6/3
Utilization category DC13 1)		
Rated operational current I <sub>e</sub> at 40°C up to 60/110/220VDC	(A)	2/1/0,3
Ambient temperature (operation)	(°C)	-25 +60
Permissible mounting position		360° 22,5° 22,5°
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 1mA). Positively guided contacts.

#### Dimensions



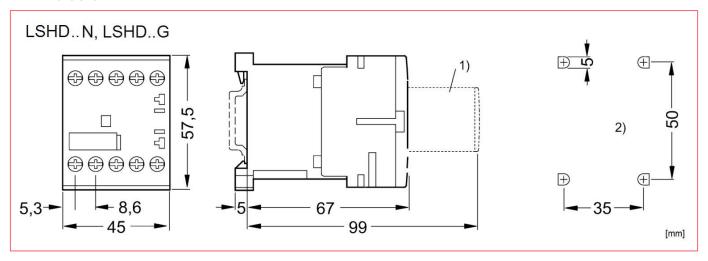
Lateral distance to grounded components = 6mm.

- 1) Auxiliary contact block
- 2) Surge suppressor
- 3) Drilling pattern



## LSHD Auxiliary Contactors 4-pole, Size 00

#### Dimensions



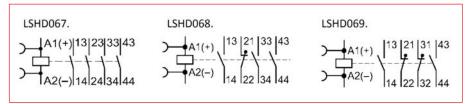
Lateral distance to grounded components = 6mm. All types: no further auxiliary contacts or contact blocks can be snapped on.

LSHD...N: surge suppressor can be inserted

LSHD...G: with built-in diode

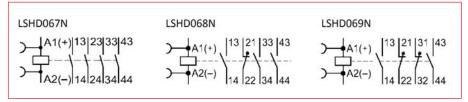
- 1) Surge suppressor
- 2) Drilling pattern

#### Circuit Diagrams



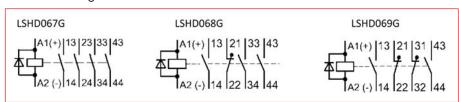
Terminal designations according to EN 50011. Surge suppression can be plugged in. Fitting auxiliary contacts according to EN 50005 - LSZD05.. and LSZDH5..

#### Circuit Diagrams



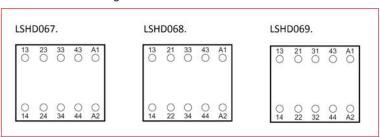
Terminal designations according to EN 50011 (no auxiliary contacts can be snapped on), surge suppressor can be plugged in.

#### Circuit Diagrams



Terminal designations according to EN 50011 (no auxiliary contacts can be snapped on), diode integrated.

#### Connection Diagrams





## ■ LSHD Auxiliary Contactors 4-pole, Size 00

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 00 - type LSHD			
6A 4NO AC24V, 50/60Hz	LSHD	000 0-0	LSHD0670
6A 4NO DC24V	LSHD	300 0-0	LSHD0675
6A 4NO AC230V, 50/60Hz	LSHD	000 0-0	LSHD0673
6A 3NO+1NC AC24V, 50/60Hz	LSHD	555 0- 6	LSHD0680
6A 3NO+1NC DC24V	LSHD	000 0-0	LSHD0685
6A 3NO+1NC AC230V, 50/60Hz	LSHD	000 0-0	LSHD0683
6A 2NO+2NC AC24V, 50/60Hz	LSHD	000 0-0	LSHD0690
6A 2NO+2NC DC24V	LSHD	000 0-0	LSHD0695
6A 2NO+2NC AC230V, 50/60Hz	LSHD	000 0=0	LSHD0693
Auxiliary contacts for LSHD contactors			
1NC size 00, DIN 50005, wiring from bottom	LSZD	000 0-0	LSZD0501
1NO size 00, DIN 50005, wiring from bottom	LSZD	000 0-0	LSZD0510
4NO size 00, DIN 50005	LSZD	000 0-0	LSZDH540
3NO+1NC size 00, DIN 50005	LSZD	000 0-0	LSZDH531
2NO+2NC size 00, DIN 50005	LSZD	000 0-0	LSZDH522
Size 00 - type LSHD for PLC			
6A 4NO DC17-30V, for PLC	LSHDN		LSHD067N
6A 4NO DC17-30V, for PLC, with diode	LSHDG		LSHD067G
6A 3NO+1NC DC17-30V, for PLC	LSHDN		LSHD068N
6A 2NO+2NC DC17-30V, for PLC	LSHDN		LSHD069N
6A 2NO+2NC DC 17-30V, for PLC, with diode	LSHDG		LSHD069G

## Frontmounted Auxiliary Contacts for Contactors Size 00, LSDD with one included NO



#### Schrack-Info

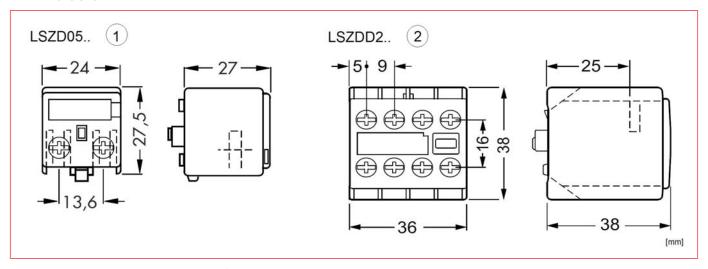
- 1- and 4-pole Auxiliary Contacts for Contactors LSDD with one included NO
- Contact designation according to DIN 50005 or DIN 50012
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)

LSZDD213

		Auxiliary contacts
		LSZDO5, LSZDD, LSZDH, LSZOD
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Thermal rated current I <sub>th</sub> at 40°C and 690VAC	(A)	10
Utilization category AC-15		
Rated operational current I <sub>e</sub> at 40°C and 230/400VAC	(A)	6/3
Utilization category DC13 <sup>1)</sup>		
Rated operational current I <sub>e</sub> at 40°C up to 60/110/220VDC	(A)	2/1/0,3
Ambient temperature (operation)	(°C)	-25 +60
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 1 mA). Positively guided contacts.

#### Dimensions



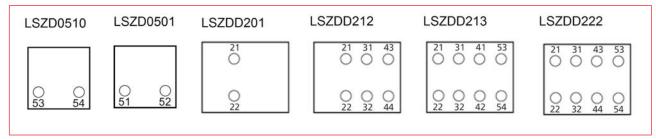
- 1) according to EN 50005, Screw terminals, cable entry from below, 1-pole  $\,$
- 2) according to EN 50012, Screw terminals, 1- to 4-pole

## Frontmounted Auxiliary Contacts for Contactors Size 00, LSDD with one included NO

#### Circuit Diagrams

LSZD0510	LSZD0501	LSZDD201	LSZDD212	LSZDD213	LSZDD222
53    -  -  -  -  -	51 	21 	21 31 43	21 31 41 53	21 31 43 53

#### Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
1NO size 00, DIN 50005, wiring from bottom	LSZD	555 0- 5	LSZD0510
1NC size 00, DIN 50005, wiring from bottom	LSZD	000 0-0	LSZD0501
1NC size 00, DIN 50012	LSZD	999 0-8	LSZDD201
1NO+2NC size 00, DIN 50012	LSZD	000 0-0	LSZDD212
1NO+3NC size 00, DIN 50012	LSZD	000 0-0	LSZDD213
2NO+2NC size 00, DIN 50012	LSZD	- 555 O- 6	LSZDD222

# Frontmounted Auxiliary Contacts for Contactors Size 00, LSDD with one included NC, also for LSRD, LSUD and Auxiliary Contactors LSHD



#### Schrack-Info

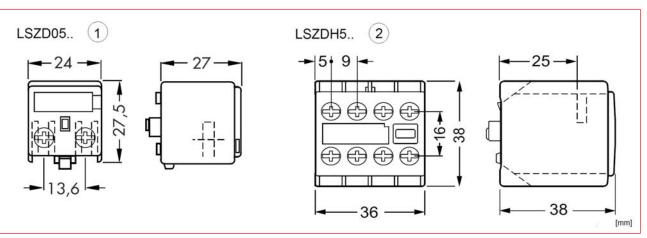
- 1- and 4-pole Auxiliary Contacts for Contactors LSDD with one included NC, for contactors LSRD, LSUD and auxiliary contactors LSHD
- Contact designation according to DIN 50005
- All auxiliary contacts are suitable for electronic circuits according EN 60947-5-4 (17VDC, 1mA)

LSZDH522

		Auxiliary contacts LSZD05, LSZDD, LSZDH, LSZOD
Rated insulation voltage U;	(VAC)	690
Thermal rated current I <sub>th</sub> at 40°C and 690VAC	(A)	10
Utilization category AC-15		
Rated operational current I <sub>e</sub> at 40°C and 230/400VAC	(A)	6/3
Utilization category DC13 <sup>1)</sup>		
Rated operational current I <sub>e</sub> at 40°C up to 60/110/220VDC	(A)	2/1/0,3
Ambient temperature (operation)	(°C)	-25 +60
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 1 mA). Positively guided contacts.

#### Dimensions



Auxiliary contact block, size 00

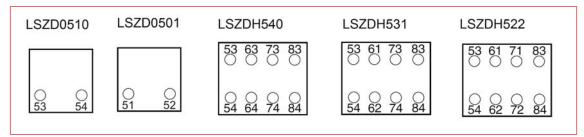
- 1) according to EN 50005, Screw terminals, 1- to 4-pole
- 2) according to EN 50005, Screw terminals, cable entry from below, 1-pole

Frontmounted Auxiliary Contacts for Contactors Size 00, LSDD with one included NC, also for LSRD, LSUD and Auxiliary Contactors LSHD

#### Circuit Diagrams

LSZD0510	LSZD0501	LSZDH540	LSZDH531	LSZDH522
53 	51 	53 63 73 83	53 61 73 83 	53 61 71 83 
-/-	<del>-</del> 7-	+-+-+/	-\\	\
[ 54	 52			

## Connection Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
1NO size 00, DIN 50005, wiring from bottom	LSZD	300 0- 0	LSZD0510
1NC size 00, DIN 50005, wiring from bottom	LSZD	000 0-0	LSZD0501
4NO size 00, DIN 50005	LSZD	000	LSZDH540
3NO+1NC size 00, DIN 50005	LSZD	000 0-0	LSZDH531
2NO+2NC size 00, DIN 50005	LSZD	555 0-0	LSZDH522

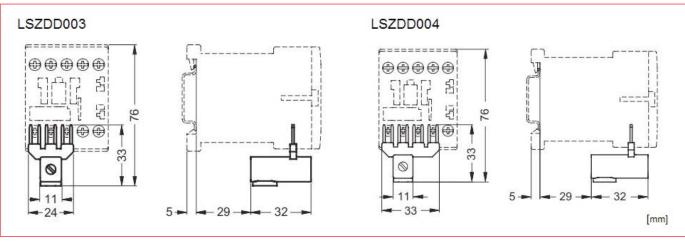
## Parallel Connectors (Star Jumper) and Feed Terminals, Size 00



#### Schrack-Info

- 3-pole parallel connectors (star jumpers) size 00 can be shortened by one pole to 2-pole connectors
- 3- or 4-pole parallel connectors (star jumpers) size 00 with feed terminal have a maximum cross section of 25mm<sup>2</sup>
- 3-pole feed terminal size 00 with 3 terminals also are permitted as feed terminal for motor protection switches BESD up to a maximum cross section of  $6\,\text{mm}^2$

#### Dimensions



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Parallel connectors			
Parallel connector 4-pole for LSDD 1 terminal	LSZD		LSZDD004
Star jumper 3-pole for LSDD size 00	LSZD		LSZDY002
Feed terminals			
Feed terminal 3 phase for LSDD 6mm², 3 terminals	LSZD		LSZDD001

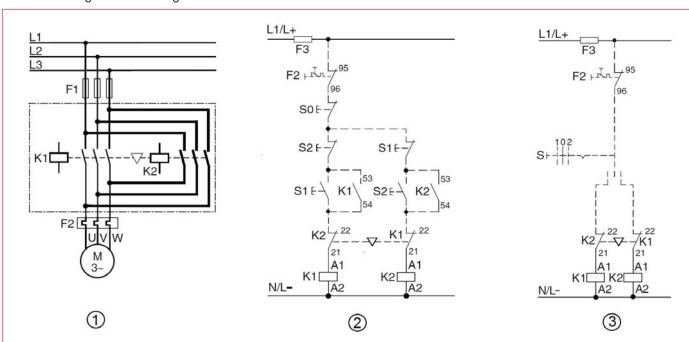
## Wiring Sets, Mechanical Interlock and Connection Clips, Size 00



#### Schrack-Info

- Wiring set LSZDW001 for reversing contactor combinations includes besides necessary bridges for mains also the wiring for electrical interlock, the connection clips for both contactors and the integrated, mechanical interlocking link. Mechanical interlocking link does not increase width of reversing contactor assembly
- Wiring set LSZDY001 for Y-D contactor combinations includes besides necessary bridges for mains, the star jumper - the wiring for electrical interlock (between Y- and Delta-contactor) and the clips for connection of all contactors and the integrated, mechanical interlocking link between Y- and Deltacontactor. Mechanical interlocking link does not increase width of Y-D contactor assembly (total width of combination = summary of all single contactor widths + width of Y-D timer). Y-D timer has to be ordered seperately
- Contactor assemblies LSYD and LSWD are suitable for thermal overload relais of type LSTD
- Value of current for overload relais at Y-D combinations = rated current of motor  $\ln x \ 0.58$

#### Circuit Diagram - Reversing Assemblies



#### Main circuit, Size 00:

1) The LSZDW001 wiring set contains, among other things, wiring connectors for connecting the main circuit.

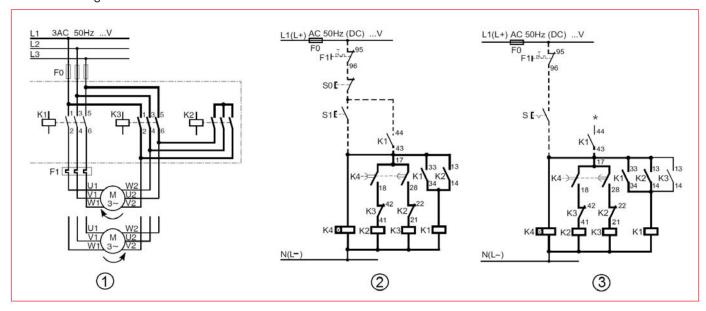
#### Control circuit, Size 00:

The terminal designations for the contactors comply with EN 50012. The LSZDW001 wiring set contains, among other things, the electrical interlock.

- 2) For momentary-contact operation
- 3) For maintained-contact operation
- SO Button "OFF"
- S1 Button "Clockwise ON"
- S2 Button "Counter clockwise ON"
- S Button "CW-OFF-CCW"
- K1 Clockwise contactor
- K2 Counter clockwise contactor
- F1 Fuses for main circuit
- F3 Fuses for control circuit
- F2 Thermal overload relays

## ■ Wiring Sets, Mechanical Interlock and Connection Clips, Size 00

## Circuit Diagram - Y-D Assemblies



#### Main circuit:

1) The LSZDW001 wiring set contains, among other things, wiring connectors for connecting the main circuit.

#### Control circuit:

with LSZD0101 Y-Delta timer, laterally mounted (example circuits). The contact element K4:17/18 is only closed in the wye stage; the contact element is open in the delta stage as well as in the de-energized state. S1 (S) is connected to clamping point K1:33.

- 2) For momentary-contact operation
- 3) For maintained-contact operation, \* Clamping point K1:44 remains unwired in this version

SO Button "OFF"

S1 Button "ON"

S Maintained-contact switch K1 Line contactor

K2 Star contactor

K3 Delta contactor

K4 Solid-state, time-delay auxiliary contact block or timing relay

FO Fuses

F1 Thermal overload relays

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Wiring Set for Reversing-Assemblies size 00, including mechanical interlock	LSZD	000 0-0	LSZDW001
Mechanical connector for 2 contactors size 00	LSZD	000 0-0	LSZDW002
Wiring Set for YD-Assemblies size 00, including mechanical Interlock	LSZD	999 0-6	LSZDY001

## Solder Pin Adapter, Size 00



#### Schrack-Info

Mouting of contactors LSDD, LSSD as well as 4-pole auxiliary ontactors LSHD to printed boards

#### LSZDD002

DESCRIPTION	TYPE NO. AVAILABLE	ORDER NO.
Solder pin adaptor for LS.D, size 00, 10-pole	LSZD	LSZDD002

#### Star-Delta Timers



#### Schrack-Info

- Y-D timer LSZD0101 ... adjustable up to 20s, operating voltage 24VDC and 24VAC up to 240VAC
- Y-D timer LSZD0101 ... adjustable up to 60s, operating voltage 24VDC and 24VAC up to 240VAC
- Y-D timer LSZD010 have fixed dead-time of 50ms

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Star-Delta timer 20s	LSZD	388 0-8	LSZD0101
Star-Delta timer 60s	LSZD	000 0-0	LSZD0102

#### Connection Link for Motor Protection Switches and Contactors, Size 00 (0)



#### Schrack-Info

- Connection link LSZDD005 for connection of motor protection switch BESD size 00 with AC or DC operated contactor LSDD or LSSD
- Connection link LSZDD006 for connection of motor protection switch BESO size 0 with AC or DC operated contactor LSDD or LSSD

LSZDD005

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Connector for LSDD (AC or DC operated) and BESD, electrical and mechanical	LSZD	000 0-0	LSZDD005
Connector for LSDD (AC or DC operated) and BESO, electrical and mechanical	LSZD	000 0-0	LSZDD006

## ■ Surge Supressors (plug in), Size 00



#### Schrack-Info

- Surge supressors for frontside mounting to all contactors of size 00
- Surge supressors do not only protect the coil of the contactor, they also preseve the driving contacts of control
- LSZD0001 and LSZD002 designed as varistor, for AC and DC
- LSZD0003 designed as RC-combination, for AC and DC
- LSZD0004 designed as diode-assembly, only for DC

LSZD0001

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Varistor AC24-48V, DC24-70V size 00, plug-in type	LSZD	333 0-6	LSZD0001
Varistor AC127-240V, DC150-250V size 00, plug-in type	LSZD	900 0-0	LSZD0002
Suppressor AC127-240V, DC150-250V size 00, plug-in type	LSZD	300 0-6	LSZD0003
Suppressor diode DC12-250V size 00, plug-in type	LSZD	000 0-0	LSZD0004

## Frontmounted Auxiliary Contacts, 1-pole, Size 0 - 12



LSZ0D001

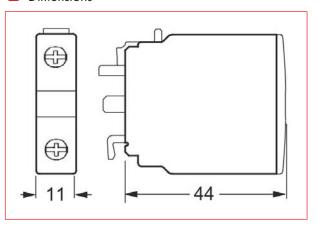
#### Schrack-Info

- 1-pole auxiliary contacts for frontside mounting, according to DIN EN 50005 bzw. 50012
- Available as NO, NC, early make NO or delayed NC
- For contactors LS., size 0 up to 12
- Complete terminal designation of the auxiliary contacts results out of the combination of mounting place at contactor (auxiliary contact - column) and the printed terminal number at the auxiliary
- As possible, a symmetrical arrangement of NO and NC contacts has to be considered.
- Auxiliary contacts are suitable for electronic circuits according IEC 60947-5-4 (17VDC, 1mA) and are positively driven

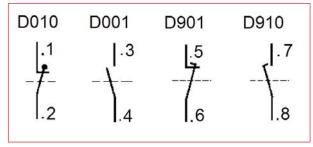
		Auxiliary contacts
		LSZDO5, LSZDD, LSZDH, LSZOD
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Thermal rated current I <sub>th</sub> at 40°C and 690VAC	(A)	10
Utilization category AC-15		
Rated operational current I <sub>e</sub> at 40°C and 230/400VAC	(A)	6/3
Utilization category DC13 <sup>1)</sup>		
Rated operational current I <sub>e</sub> at 40°C up to 60/110/220VDC	(A)	2/1/0,3
Ambient temperature (operation)	(°C)	-25 +60
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1
	· · · · · · · · · · · · · · · · · · ·	

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 1 mA). Positively guided contacts.

#### Dimensions



#### Circuit Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Auxiliary contact block for size 0-12, 1NC	LSZ0	588 0-8	LSZ0D001
Auxiliary contact block for size 0-12, 1NO	LSZ0	000 0-0	LSZ0D010
Auxiliary contact block for size 0-12, 1NC, delayed	LSZ0		LSZ0D901
Auxiliary contact block for size 0-12, 1NO, delayed	LSZ0		LSZ0D910

## Frontmounted Auxiliary Contacts, 4-pole, Size 0 - 12



#### Schrack-Info

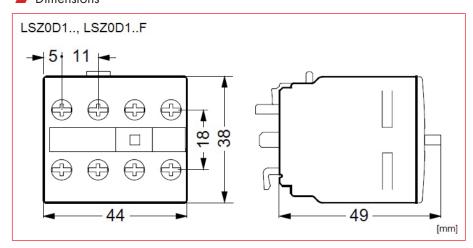
- 4-pole auxiliary contacts for frontside mounting, according to DIN EN 50005 or 50012
- Available with 4 contacts in several combinations of NO and NC
- For contactors LS., size 0 up to 12
- Auxiliary contacts are suitable for electronic circuits according IEC 60947-5-4 (17VDC, 1mA) and are positively driven

LSZOD 131

	Auxiliary contacts LSZD05, LSZDD, LSZDH, LSZ0D
(VAC)	690
(A)	10
(A)	6/3
(A)	2/1/0,3
(°C)	-25 +60
	IEC 60947-5-1, EN 60947-5-1
	(A) (A) (A)

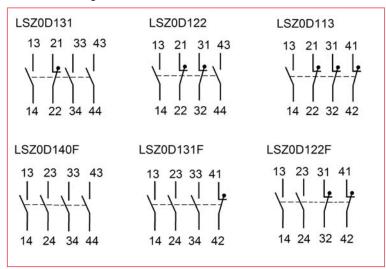
<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 1 mA). Positively guided contacts.

#### Dimensions



According to EN 50012 and \*EN 50005 (LSZOD1..F), Screw terminals, 4-pole

#### Circuit Diagrams





- Frontmounted Auxiliary Contacts, 4-pole, Size 0 12
- Connection Diagrams

	LSZ0D122	LSZ0D113
13 21 33 43	13 21 31 41 ○ ○ ○ ○	13 21 31 41
0 0 0 0	0000	0000
14 22 34 44	14 22 32 44	14 22 32 42
.SZ0D140F	14 22 32 44 LSZ0D131F	14 22 32 42 LSZ0D122F

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50012	LSZ0	000 0-0	LSZOD 131
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50012	LSZ0	000 0-0	LSZOD122
Auxiliary contact block for size 0-12, 1NO + 3NC	LSZ0	383 0-6	LSZOD113
Auxiliary contact block for size 0-12, 4NO, DIN EN 50005	LSZ0	000 0-0	LSZOD140F
Auxiliary contact block for size 0-12, 3NO + 1NC, DIN EN 50005	LSZ0	383 0- 6	LSZOD131F
Auxiliary contact block for size 0-12, 2NO + 2NC, DIN EN 50005	LSZ0	000 0=0	LSZOD 122F

## Sidemounted Auxiliary Contacts, 2-pole, Size 0 - 12



LSZ0D711

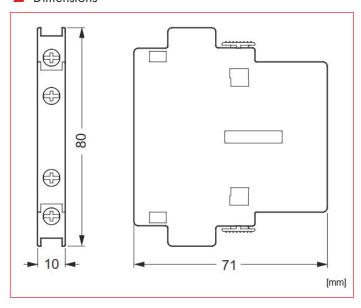
#### Schrack-Info

- 2-pole auxiliary contacts for side mounting, according to DIN EN 50012
- Available as 1 NO + 1 NC
- For contactors LS., size 0 up to 12 as "first" side mounted (LSZ0D711) respectively as "second" side mounted at size 3 up to 12 (LSZ3D811)
- Correct terminal designation of the auxiliary contacts depends on the mounting-side at contactor (left or right side)
- "Second" side mounted auxiliary contact at contactor LSZ3D811, can be snapped onto "first" auxilliary contact LSZ0D711 (maximum number of retrofittable auxiliary contacts has to be
- As possible, a symmetrical arrangement of NO and NC contacts has to be considered.
- Auxiliary contacts are suitable for electronic circuits according IEC 60947-5-4 (17VDC, 1mA) and are positively driven

		Auxiliary contacts LSZDO5, LSZDD, LSZDH, LSZOD
Rated insulation voltage U <sub>i</sub>	(VAC)	690
Thermal rated current I <sub>th</sub> at 40°C and 690VAC	(A)	10
Utilization category AC-15		
Rated operational current I <sub>e</sub> at 40°C and 230/400VAC	(A)	6/3
Utilization category DC13 <sup>1)</sup>		
Rated operational current I <sub>e</sub> at 40°C up to 60/110/220VDC	(A)	2/1/0,3
Ambient temperature (operation)	(°C)	-25 +60
Rules and regulations according		IEC 60947-5-1, EN 60947-5-1

<sup>1)</sup> Auxiliary contacts suitable for electronic circuits, according EN60947-5-4 for rated voltage 24VDC (Test ratings 17VDC, 1 mA). Positively guided contacts.

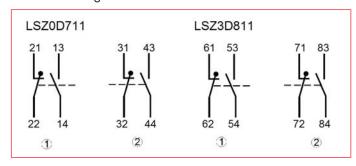
#### Dimensions



Auxiliary contact block, Size 0-12 (LSZOD711) / 3-12 (LSZOD811) according to EN 50012, laterally mountable, Screw terminals, 2-pole



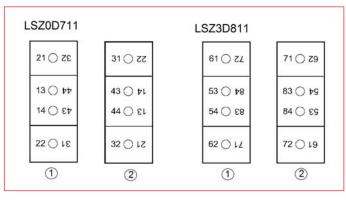
## Circuit Diagrams



Terminal designations according to EN 50012

- 1) mounted left
- 2) mounted right

### Connection Diagrams



- 2) mounted right

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Auxiliary contact block for size 0-12, 1NO + 1NC, 1. position	LSZ0	388 0-8	LSZOD711
Auxiliary contact block for size 3-12, 1NO + 1NC, 2. position	LSZ3	300 0-0	LSZ3D811

SCHRACK

### Connection Links for Motor Protection Switches and Contactors, Size 0 - 3



LSZ2D004

#### Schrack-Info

- Contactors with AC-coil have less hight than those with DC-coil, therefore different connection links are necessary
- Connection link LSZ0D002, for connection of Motor protection switch BESO with AC operated contactor LSDO or LSSO
- Connection link LSZ0D004, for connection of Motor protection switch BESO with DC operated contactor LSDO or LSSO
- Connection link LSZ2D004, for connection of Motor protection switch BES2 with AC operated contactor LSD2
- Connection link LSZ2D005, for connection of Motor protection switch BES2 with DC operated contactor LSD2
- Connection link LSZ3D004, for connection of Motor protection switch BES3 with AC operated contactor LSD3
- Connection link LSZ3D003, for connection of Motor protection switch BES3 with DC operated contactor LSD3

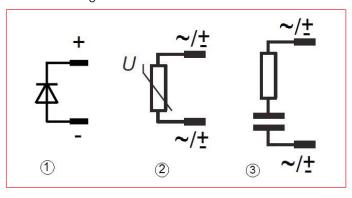
DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
for contactors size 0 (AC operated) and motor protection switch size 0	LSZ0	000 0-0	LSZ0D002
for contactors size 0 (DC operated) and motor protection switch size 0	LSZ0	000 0-0	LSZOD004
for contactors size 2 (AC operated) and motor protection switch size 2	LSZ2	555 0-6	LSZ2D004
for contactors size 2 (DC operated) and motor protection switch size 2	LSZ2	333 0-8	LSZ2D005
for contactors size 3 (AC operated) and motor protection switch size 3	LSZ3	333 0- 0	LSZ3D004
for contactors size 3 (DC operated) and motor protection switch size 3	LSZ3	000 0=0	LSZ3D003

LSZ20001

#### Schrack-Info

- At contactors of size 0 up to 3, surge supressors can be snapped in at top- or bottom-side of contactor. At contactors of size 6 up to 12, only at the top
- When a surge supressor is used together with connection link and motor protection switch, the supressor generally should be snapped in at bottom-side of contactor (to enable easy exchange)
- When a surge supressor is used at a combination of contactor and thermal overload relais, the supressor generally should be snapped in at top-side of contactor (to enable easy exchange)
- The diode assemblies for contactors size 0 have a defined polarity (marked with "+" and "-") therefore they are of different design for top or bottom mounting

#### Circuit Diagram



- 1) Diode assembly
- 2) Varistor
- 3) RC element

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Diode-assembly DC24V top mounted, size 0	LSZD	000 0-0	LSZD0005
Diode-assembly DC24V bottom mounted, size 0	LSZD	000 0-0	LSZD0006
Varistor for size 0, 24-48VAC, 24-70VDC	LSZ0	000 0-0	LSZ00001
Varistor for size 0, 127-240VAC, 150-250VDC	LSZ0	000 0-0	LSZ00002
Surge suppressor, RC for size 0, 127-240VAC, 150-250VDC	LSZ0	555 0- 8	LSZ00003
Surge suppressor, RC for size 2-3, 127-240VAC, 150-250VDC	LSZ2	000 0=0	LSZ20001
Surge suppressor, RC for size 6, 127-240VAC, 150-250VDC	LSZ6	000 0-0	LSZ60001

## 251

## Latching Block, Mechanical and Electrical, Size 0 - 2

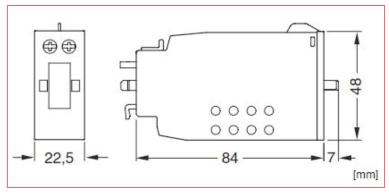


LSZ00113

#### Schrack-Info

- For frotside mounting ontos contactors of size 0 up to 2
- After contactor has switched on, the latching block catches the contactor in position "ON", also without control voltage. Release of latching block is realised by a short impuls of 24VAC or DC (terminal E1/E2)
- The Latching block additionally comes with one additional button for manual switching on and one reset-button for manual switching off
- Latching block occupies 2 of the 4 frontside plug-in slots of contactor and has to be assessed as a 2 NC at the summary number of maximum possible auxiliary contacts

#### Dimensions



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Mechanical latching block for s. 0-2, remains "ON" if voltage fails	LSZ0	988 0- 8	LSZ00113

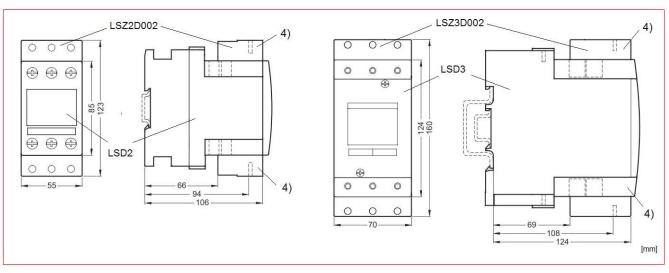
## ■ Terminal Covers, Size 2 - 12



#### Schrack-Info

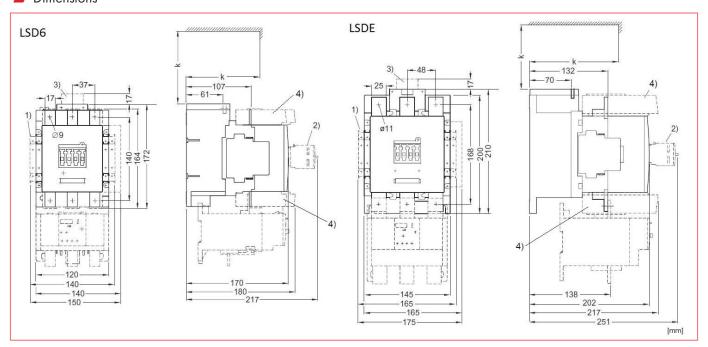
- Additional terminal covers for contactors of size 2 and 3 with box terminals (Mouting onto box terminal)
- Short terminal covers (38 or 42mm) for contactors of size 6 up to 14 (without box terminal) as a cover for the terminals of contactor assemblies
- Long terminal covers (100 or 120mm) for contactors size 6 up to 14 (without box terminal) as a cover for the terminals of contactors feeded by busbar or cable lug
- One cover is necessary for one side of contactor, 2 pcs. have to be ordered for both-sided covering of one contactor

#### Dimensions



4) Terminal cover

#### Dimensions

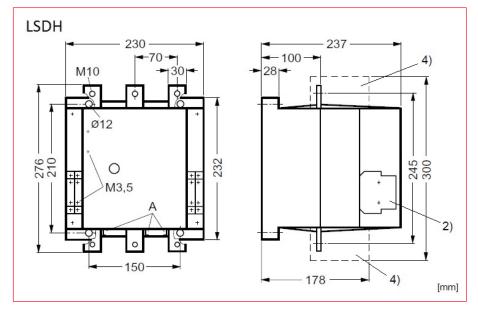


- 1) 2nd auxiliary contact block, lateral
- 3) RC element
- 2) Auxiliary contact block, mountable on the front
- Terminal cover



# ■ Terminal Covers, Size 2 - 12

### Dimensions



- 2) Auxiliary contact block, mountable on the front
- 4) Terminal cover

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Terminal cover for contactors size 2, for one side of contactor	LSZ2	000 0- 0	LSZ2D002
Terminal cover for contactors size 3, for one side of contactor	LSZ3	000 0-0	LSZ3D002
Terminal cover for size 6, contactors with cable lug or busbar	LSZ6	000 0-0	LSZ6D001
Terminal cover short version for size 10/12 for contactors with cable lug	LSZ6	000 0-0	LSZ6D002
Terminal cover for size 10 / 12	LSZE	555 0- 5	LSZED001
Term. cover short version for size 10/12 for contactors with cable lug	LSZE	000 0-0	LSZED002
Terminal cover for contactors size 14 with cable lug	LSZH		LSZHD001





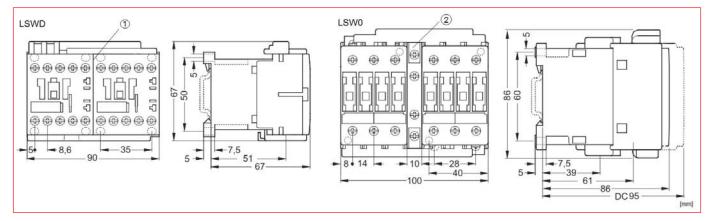
LSW02533

### Schrack-Info

- Fully wired Reversing contactor assemblies up to 45kW with integrated mechanical interlock
- Additional, posible auxiliary contacts see "auxiliary contact"" for die according size of contactors LSD.
- Thermal overload relais LST (not included in Reversing contactor assemblies) are additionally necessary
- For rated current of motor 0.11 A up to 12 A ... contactors size 00. use overload relais LSTD
- For rated current of motor 1.8A up to 25A ... contactors size 0. use overload relais LSTO
- For rated current of motor 5.5A up to 50A ... contactors size 2, use overload relais LST2
- For rated current of motor 18A up to 100A ... contactors size 3, use overload relais LST3
- Thermal overload relais LST are designed for direct mouting to contactor or in "stand alone installation" by help of holder LSZ. TEO1 to DIN-rail TS35
- Higher power for Reversing contactor assemblies (> 45kW up to 450kW) can all be built by single components
- Therefore necessary, electronic overload relais with rated currents of >100A up to 630A for direct mouting to contactor or in "stand alone" version - on request

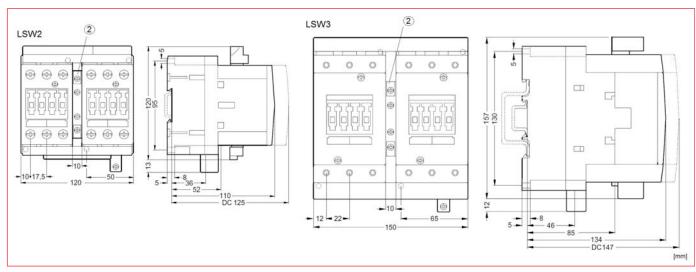
		1	l	l	l	1	l	l	l	1	l	1	l
		LSWD07	LSWD09	LSWD12	LSW012	LSW017	LSW025	LSW232	LSW240	LSW250	LSW365	LSW380	LSW395
Rated insulation voltage U <sub>i</sub>	(VAC)						69	90					
Utilization category AC-2 and AC-3													
Rated power at 400VAC	(kW)	3	4	5,5	5,5	7,5	11	15	18,5	22	30	37	45
Rated operational current I <sub>e</sub> at 380440VAC	(A)	7	9	12	12	17	25	32	40	50	65	80	95
Ambient temperature (operation)	(°C)						-25	. +60					
Permissible mounting position		360° 22,5° 22,5°											
Rules and regulations according						IEC	60947-4-1	. EN60947	-4-1				

#### Dimensions



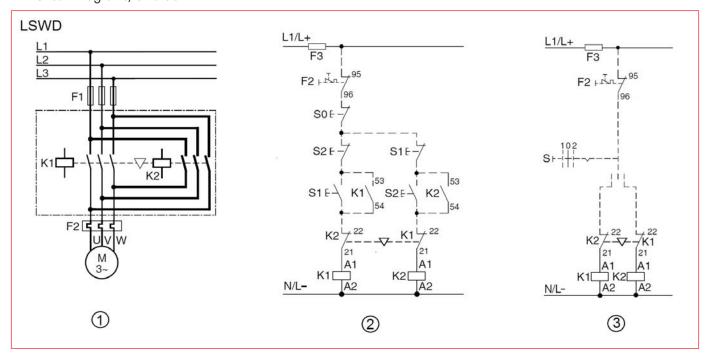
- 1) with or without LSZDW002 mechanical interlock link
- 2) with LSZ0W002 mechanical interlock

#### Dimensions



2) with LSZOW002 mechanical interlock.

Circuit Diagrams, Size 00



#### Main circuit, Size 00:

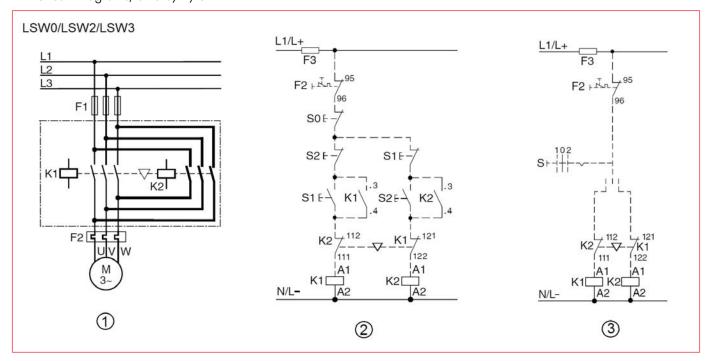
1) The LSZDW001 wiring set contains, among other things, wiring connectors for connecting the main circuit.

#### Control circuit, Size 00:

The terminal designations for the contactors comply with EN 50012. The LSZDW001 wiring set contains, among other things, the electrical interlock.

- 2) For momentary-contact operation
- 3) For maintained-contact operation
- SO Button "OFF"
- S1 Button "Clockwise ON"
- S2 Button "Counter clockwise ON"
- S Button "CW-OFF-CCW"
- K1 Clockwise contactor
- K2 Counter clockwise contactor
- F1 Fuses for main circuit
- F3 Fuses for control circuit
- F2 Thermal overload relays

Circuit Diagrams, Size 0/2/3



#### Main circuit, Sizes 0 to 3:

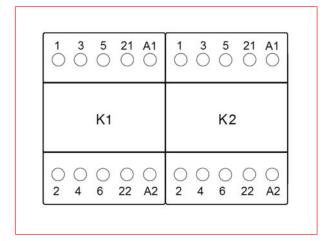
1) The LSZ.W001 wiring set contains, among other things, the wiring modules on the top and bottom for connecting the main current paths.

#### Control circuit, Sizes 0 to 3:

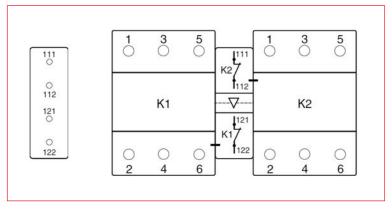
The terminal designations for the contactors comply with EN 50012. The LSZOW002 mechanical interlock contains  $2\,NC$  contact, one for each contactor interlock.

- 2) For momentary-contact operation
- 3) For maintained-contact operation
- SO Button "OFF"
- S1 Button "Clockwise ON"
- S2 Button "Counter clockwise ON"
- S Button "CW-OFF-CCW"
- K1 Clockwise contactor
- K2 Counter clockwise contactor
- F1 Fuses for main circuit
- F3 Fuses for control circuit
- F2 Thermal overload relays

### Connection Diagrams, Size 00



### ■ Connection Diagrams, Size 0/2/3



Terminal designations according to EN 50005. LSZOW002 mechanical interlock (laterally mountable), integrated in reversing contactor assemblies (reversing starters), contains 2 NC contacts for the electrical interlock, one for each contactor.

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 00 - 5.5kW			
Reversing Contactors Assembly, 3kW, AC3, 230VAC, size 00	LSWD	000 0-0	LSWD0733
Reversing Contactors Assembly, 4kW, AC3, 230VAC, size 00	LSWD	999 0-8	LSWD0933
Reversing Contactors Assembly, 5.5kW, AC3, 230VAC, size 00	LSWD	000 0-0	LSWD1233
Size 0 - 11kW			
Reversing Contactors Assembly, 5.5kW, AC3, 230VAC, size 0	LSW0	900 0-0	LSW01233
Reversing Contactors Assembly, 7.5kW, AC3, 230VAC, size 0	LSW0	999 0-8	LSW01733
Reversing Contactors Assembly, 11 kW, AC3, 230VAC, size 0	LSW0	000 0-0	LSW02533
Size 2 - 22kW			
Reversing Contactors Assembly, 15kW, AC3, 230VAC, size 2	LSW2	000 0-0	LSW23233
Reversing Contactors Assembly, 18,5kW, AC3, 230VAC, size 2	LSW2		LSW24033
Reversing Contactors Assembly, 22kW, AC3, 230VAC, size 2	LSW2		LSW25033
Size 3 - 45kW			
Reversing Contactors Assembly, 30kW, AC3, 230VAC, size 3	LSW3		LSW36533
Reversing Contactors Assembly, 37kW, AC3, 230VAC, size 3	LSW3		LSW38033
Reversing Contactors Assembly, 45kW, AC3, 230VAC, size 3	LSW3		LSW39533

### Mechanical Interlock for Contactors, Size 0 - 12

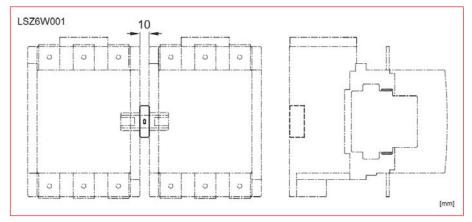


LSZ0W002

#### Schrack-Info

- Devices for mechanical interlocking of 2 contactors
- Mechanical interlock LSZOW002 for 2 contactors of size 0 up to 3 additionally contain 2 NC contacts for the electrical interlock between both contactors
- Mechanical interlock LSZ6W001 for 2 contactors of size 6 up to 12 (no auxiliary contacts are
- For assembling of mechanical interlocked contactors of size 0 up to 6, 2 additional connection clips are necessary
- Interlocked contactors of size 10 and 12 do not need connection clips, because they have to be fixed onto mounting plate
- When using mechanical interlock for two contactors LSR and LSU of size 0, the "right side mounted" (4th) pole of left contactor has to be changed to the left side of contactor

#### Dimensions



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Mech. interlock for contactors size 0-3 (included 2 NC auxiliary contacts)	LSZ0	383 0- 6	LSZOW002
Mechanical interlock for contactors size 6 - 12	LSZ6	300 0-0	LSZ6W001

### Wiring Sets for Reversing Contactor Combinations, Size 0 - 12



#### LSZ0W001

#### Schrack-Info

- Wiring sets for "self-assembling" of Reversing contactor assemblies
- Wiring set LSZOW001 for Reversing contactor assemblies size 0 contains all necessary bridges for mains. The mechanical interlock (to be ordered seperately) increases the total breadth of contactor assembly by 10mm. Connection clips are not necessary, this function is realised by the bridges for mains
- Wiring set LSZ2W001 for Reversing contactor assemblies size 2 contains all necessary bridges for mains and connection clips. The mechanical interlock (to be ordered seperately) increases the total breadth of contactor assembly by 10mm
- Wiring set LSZ3W001 for Reversing contactor assemblies size 3 contains all necessary bridges for mains and connection clips. The mechanical interlock (to be ordered seperately) increases the total breadth of contactor assembly by 10mm
- Wiring set LSZ6W002 for Reversing contactor assemblies size 6 contains all necessary bridges for mains. The mechanical interlock (to be ordered seperately) increases the total breadth of contactor assembly by 10mm
- Wiring set LSZEW001 for Reversing contactor assemblies size 10 contains all necessary bridges for mains. The mechanical interlock (to be ordered seperately) increases the total breadth of contactor assembly by 10mm
- Wiring set LSZGW001 for Reversing contactor assemblies size 12 contains all necessary bridges for mains. The mechanical interlock (to be ordered seperately) increases the total breadth of contactor assembly by 10mm

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Wiring set for reversing assemblies size 0	LSZ0	000 0-0	LSZ0W001
Wiring set for reversing assemblies size 2, including connection clips	LSZ2		LSZ2W001
Wiring set for reversing assemblies size 3, including connection clips	LSZ3	000 0-0	LSZ3W001
Wiring set for reversing assemblies size 12	LSZG	000 0-0	LSZGW001

### Connection Clips for Contactors, Size 0 - 6



- Set contain 2 clips for 1 contactor assembly (connecting of 2 contactors)
- Connection clips for direct fixing of 2 contactors (without gap) or for assembling 2 contactors with mechanical interlock in between (10mm)
- Connection clips can be mounted without any tool

LSZ2D001
----------

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Connection clips for 3/4-pole contactors, size 0, not interlocked	LSZ0	383 0- 6	LSZ0W003
Connection clips for 3/4-pole contactors, size 0, interlocked	LSZ0	985 0-6	LSZ0W004
Connection clips for 4-pole contactors, size 2, interlocked	LSZ2	388 0-6	LSZ2W002
Connection clips for 4-pole contactors, size 3, interlocked	LSZ3	000 0-0	LSZ3W002
Connection clips for 3-pole contactors, size 2/3/6, interlocked	LSZ2	000 0-0	LSZ2W003
Connection clips for 3/4-pole contactors, size 2/3, not interlocked	LSZ2		LSZ2D001

### Star-Delta Contactor Combinations LSY, Size 00 / 0 / 2



#### LSY03233

#### Schrack-Info

- Fully wired Y-D contactor assemblies up to 22kW with integrated mechanical interlock between Delta- and Star-contactor
- For additional auxiliary contacts see "auxiliary contacts" for contactors LSD.
- Thermal overload relais LST (not included at Y-D contactor assembliy) has to be ordered seperately
- Rated currrent values 0.11 A up to 12A (up to 7,5kW YD) ... for contactors size 00. use Thermal overload relais LSTD
- Rated currrent values 1.8A up to 25A (up to 15kW YD) ... for contactors size 0 use Thermal overload relais LSTO
- Rated currrent values 5.5A up to 50A (up to 22kW YD) ... for contactors size 2 use Thermal overload relais LST2
- Rated currrent values 18A up to 100A (> 22kW YD) ... for Contactors size 3 use Thermal overload relais LST3
- Thermal overload relais LST are designed for direct mouting to contactor or in "stand alone installation" by help of holder LSZ.TE01 to DINrail TS35
- Higher power for Y-D contactor assemblies (> 22kW up to 500kW) can all be built by existing single components. Therefore necessary, electronic overload relais with rated currents of >100A up to 630A for direct mouting to contactor or in "stand alone" version on request
- Adjusting values for thermal overload relais at Y-D use = rated current of motor In x 0.58

		LSYD	LSY0	LSY2		
Rated insulation voltage U <sub>i</sub> (VAC) 690						
Utilization category AC-2 and AC-3	category AC-2 and AC-3					
Rated power at 400VAC	(kW)					
Rated operational current I <sub>e</sub> at 380440VAC	(A)	17	32	50		
Ambient temperature (operation)	(°C)	-25 +60				
Permissible mounting position		90° 22.5°, 22.5°				
Rules and regulations according	IEC 60947-4-1, EN60947-4-1					

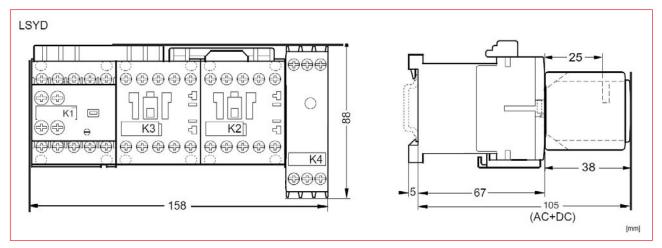
#### Rated Data at AC 50Hz 400V

Rating kW	Operational current I <sub>e</sub> A	Motor current	Size	Line/delta contactor	Star contactor	WYE-Delta timer	Order No.
up to 7.5	17	17	00-00-00	LSDD 1213	LSDD0713	LSZD0101	LSYD 1733
up to 15	32	34	0-0-0	LSD02533	LSD01213	LSZD0101	LSY03233
up to 22	50	43	2-2-0	LSD23233	LSD02533	LSZD0101	LSY25033

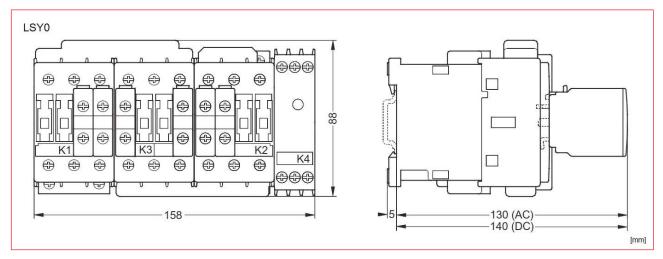


# Star-Delta Contactor Combinations LSY, Size 00 / 0 / 2

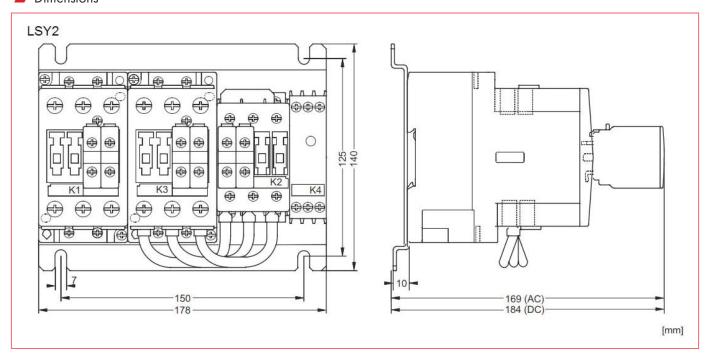
#### Dimensions



#### Dimensions

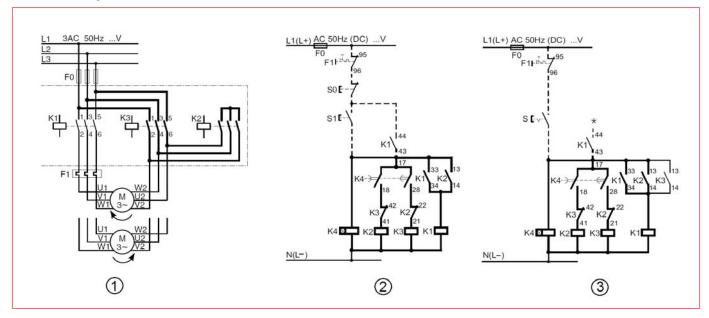


#### Dimensions



## Star-Delta Contactor Combinations LSY, Size 00 / 0 / 2

#### Circuit Diagrams



#### Main circuit:

1) The LSZDW001 wiring set contains, among other things, wiring connectors for connecting the main circuit.

with LSZD0101 Y-Delta timer, laterally mounted (example circuits). The contact element K4:17/18 is only closed in the wye stage; the contact element is open in the delta stage as well as in the de-energized state. S1 (S) is connected to clamping point K1:33.

- 2) For momentary-contact operation
- 3) For maintained-contact operation, \* Clamping point K1:44 remains unwired in this version

SO Button "OFF" K3 Delta contactor

S1 Button "ON" K4 Solid-state, time-delay auxiliary contact block or timing relay

S Maintained-contact switch FO Fuses

K1 Line contactor F1 Thermal overload relays

K2 Star contactor

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Size 00 - 7.5kW			
WYE-Delta Assembly, AC3, 7.5kW, 32A, 230VAC, size 00	LSYD	000 0-0	LSYD1733
Size 0 - 15kW			
WYE-Delta Assembly, AC3, 15kW, 32A, 230VAC, size 0	LSY0	000 0-0	LSY03233
Size 2 - 22kW			
WYE-Delta Assembly, AC3, 22/30kW, 32A, 230VAC, size 2	LSY2	000 0-0	LSY25033

### ■ Parallel Connectors (Star Jumper) and Feed Terminals, Size 0 - 12



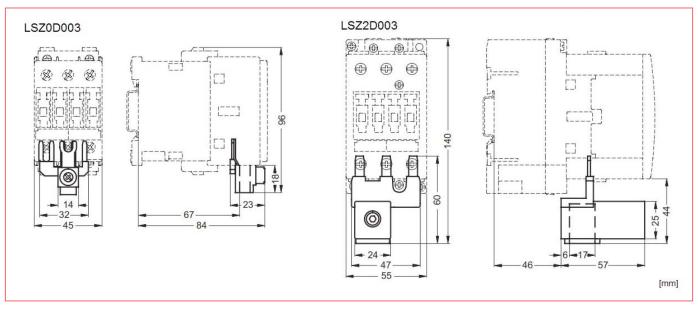




#### Schrack-Info

- 3-pole Parallel connectors (star jumpers) without terminal for contactors of size 0 up to 3 can be shortened by one pole (2-pole)
- Recommended covers for Paralllconnectors for contactors of size 6 LSZ6D002, for size 10 and 12 LSZED002
- 3-pole Feed terminals BEZ00116 and BEZ00216 with three terminals can be used either for the feeding of contactors LSD, or for the feeding of Motor protection switches BES of according size
- 1-pole Feed terminals LSZ3D001 can be used either for the feeding of contactors LSD3, or for the feeding of Motor protection switches BES3. Therefore 3 of these terminals are necessary

#### **Dimensions**



DESCRIPTION	TYPE NO. AVAILAB	LE ORDER NO.
Feed terminals		
Feed terminal, 95mm² for size 3, 1-pole + terminal	LSZ3	LSZ3D001
Parallel connectors		
Parallel connector, 35mm² for size 0, 3-pole + terminal	LSZ0	LSZ0D003
Parallel connector, star jumper 3-pole for contactors size 0	LSZ0	LSZ0Y002
Parallel connector, 3-pole for contactors size 2, with feed-terminal 95mm <sup>2</sup>	LSZ2	LSZ2D003
Parallel connector, star jumper 3-pole for contactors size 2	LSZ2	LSZ2Y005
Parallel connector, star jumper 3-pole for contactors size 3	LSZ3	LSZ3Y004
Parallel connector, star jumper 3-pole for contactors size 6	LSZ6	LSZ6Y003
Parallel connector, star jumper 3-pole for contactors size 10, 12	LSZE	LSZEY003

### Wiring Sets for Star-Delta Contactor Combinations, Size 0 - 2



#### Schrack-Info

- Wiring sets for "self assembling" of Y-D contactor assemblies
- Wiring set LSZ0Y001 for Y-D contactor assemblies size 0-0-0 (up to 15kW )includes all necessary bridges for mains. The mechanical interlock (to be ordered seperately) increases the total breadth of contactor assembly by 10mm. Connection clips and star jumper also are included. The Y-D timer also has to be ordered seperately
- Wiring set LSZ2Y003 for Reversing contactor assemblies size 2-2-2 (up to 37kW) only includes
  the wiring for bottom side of contactors and the star jumper. For feeding Net- and Delta-contactor
  double infeed is recommended. The mechanical interlock (to be ordered seperately) increases
  the total width of contactor assembly by 10mm. Connection clips are because of recommended
  mounting plate LSZ2Y002 not necessary. The Y-D timer also has to be ordered seperately
- Wiring sets or mounting plates for assemblies of size 3 up to 12 on request

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Wiring set for Y-D assemblies size 0-0-0, including wiring, connection clips and star jumper	LSZ0	999 0-0	LSZ0Y001
Wiring set for Y-D assemblies size 2-2-0, including wiring bottom and star jumper	LSZ2		LSZ2Y004
Wiring set for Y-D assemblies size 2-2-2, including wiring bottom and star jumper	LSZ2		LSZ2Y003
Base-plate for YD-assemblies, size 2-2-0, for side arranged YD relay	LSZ2		LSZ2Y001
Base-plate for YD-assemblies, size 2-2-2, for side arranged YD relay	LSZ2		LSZ2Y002

### ■ Contactors Series CUBICO Mini, 3-pole

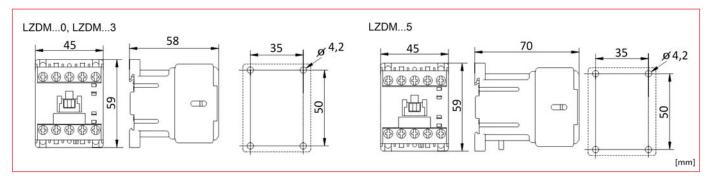


#### Schrack-Info

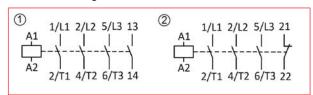
- Contactors from 3kW/6A, 4kW/9A or 5,5kW/12A, 3-pole with integrated auxiliary contact
- Available with 230VAC, 24VAC or 24VDC coil
- Auxiliary contact NC or NO, depends of type
- Fitting surge suppressors are available
- Mountable to DIN-rail TS35 or mounting plate
- Further accessories find attached

		LZDM06	LZDM09	LZDM12	
Rated insulation voltage U <sub>i</sub>	(VAC)		690		
Utilization category AC-1 cos φ = 1					
Rated operational current I <sub>e</sub> at 40°C	(A)	20	20	20	
Utilization category AC-2 and AC-3					
Rated power at 400VAC	(kW)	2,2	4	5,5	
Rated operational current I <sub>e</sub> 400VAC	(A)	6	9	12	
Ambient temperature (operation)	(°C)	- 5 + 40			
Permissible mounting position		Horizontal and vertical +/- 22.5°			
Rules and regulations according			IEC/EN 60947-4-1		

#### Dimensions

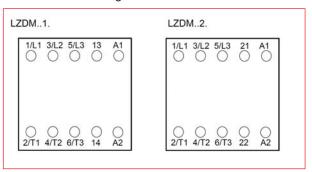


### Circuit Diagrams



- 1) 3-pole with auxiliary contact, 1 NO
- 2) 3-pole with auxiliary contact, 1 NC

#### ■ Connection Diagrams



# ■ Contactors Series CUBICO Mini, 3-pole

DESCRIPTION	AVAILABLE	ORDER NO.
6A		
3-pole, 3kW, 6A, 1NO, 230VAC	555 0-0	LZDM0613
3-pole, 3kW, 6A, 1NC, 230VAC	950 <del>0- 0</del>	LZDM0623
3-pole, 3kW, 6A, 1NO, 24VAC		LZDM0610
3-pole, 3kW, 6A, 1NC, 24VAC	350 <del>0- 0</del>	LZDM0620
3-pole, 3kW, 6A, 1NO, 24VDC	000 000	LZDM0615
3-pole, 3kW, 6A, 1NC, 24VDC	358 0-0	LZDM0625
9A		
3-pole, 4kW, 9A, 1NO, 230VAC	333 <del>0- 5</del>	LZDM0913
3-pole, 4kW, 9A, 1NC, 230VAC		LZDM0923
3-pole, 4kW, 9A, 1NO, 24VAC	558 0-0	LZDM0910
3-pole, 4kW, 9A, 1NC, 24VAC	355 0-0	LZDM0920
3-pole, 4kW, 9A, 1NO, 24VDC	939 0-6	LZDM0915
3-pole, 4kW, 9A, 1NC, 24VDC		LZDM0925
12A		
3-pole, 5,5kW, 12A, 1NO, 230VAC		LZDM1213
3-pole, 5,5kW, 12A, 1NC, 230VAC	355 <del>0-8</del>	LZDM1223
3-pole, 5,5kW, 12A, 1NO, 24VAC		LZDM1210
3-pole, 5,5kW, 12A, 1NC, 24VAC	222 0-6	LZDM1220
3-pole, 5,5kW, 12A, 1NO, 24VDC		LZDM1215
3-pole, 5,5kW, 12A, 1NC, 24VDC	955 0-5	LZDM1225

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### Accessories Series CUBICO Mini

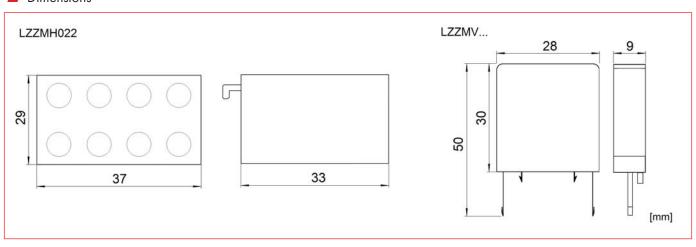




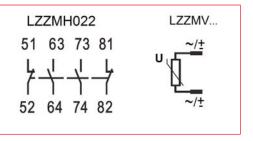
#### Schrack-Info

- Auxiliary contacts for front-mounting for contactors series CUBICO Mini
- Protective modules for 24V and 230V coil of the contactors

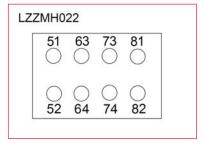
#### Dimensions



### Circuit Diagram



#### Connection Diagram



DESCRIPTION	AVAILABLE	ORDER NO.
Auxiliary contacts		
Auxiliary contacts front-type for CUBICO Mini 2NO+2NC	080 0-0	LZZMH022
Surge supressors		
Varistor Mini 24 - 48 V AC/DC	000 O- 0	LZZMV024
Varistor Mini 110 - 250 V AC	999 0-0	LZZMV230

### ■ Contactors Series CUBICO Classic, 3-pole

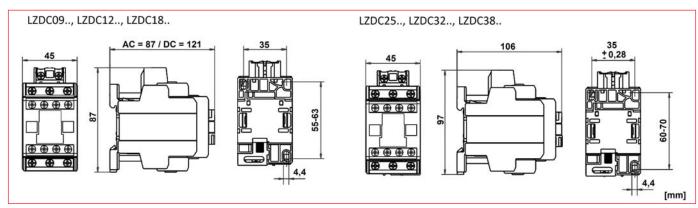


#### Schrack-Info

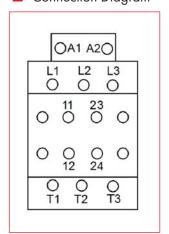
- Contactors from 4kW/9A up to 18,5kW/38A
- 3-pole with integrated auxiliary contact
- Avialable with 230VAC, 24VAC or 24VDC coil
- Auxiliary contact NC or NO, depends of type
- Fitting surge suppressors are available
- Mountable to DIN-rail TS35 or mounting plate
- Further accessories find attached

		LZDC09	LZDC12	LZDC18	LZDC25	LZDC32	LZDC38
Rated insulation voltage U <sub>i</sub>	(VAC)			6'	90		
Utilization category AC-1 cos φ = 1							
Rated operational current I <sub>e</sub> at 40°C	(A)	25	25	32	40	50	50
Utilization category AC-2 and AC-3							
Rated power at 400VAC	(kW)	4	5,5	7,5	11	15	18,5
Rated operational current I <sub>e</sub> 400VAC	(A)	9	12	18	25	32	38
Ambient temperature (operation)	(°C)	- 5 + 40					
Permissible mounting position		Horizontal and vertical +/- 22.5°					
Rules and regulations according		IEC/EN 60947-4-1					

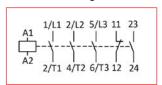
#### Dimensions



#### Connection Diagram



### Circuit Diagram





# Contactors Series CUBICO Classic, 3-pole

# ■ Contactors Series CUBICO Classic, 3-pole

DESCRIPTION	AVAILABLE	ORDER NO.
4kW / 9A		
3-pole, 4kW, 9A, 1NO+1NC, 230VAC	555 0-0	LZDC09B3
3-pole, 4kW, 9A, 1NO+1NC, 24VAC	555 0-5	LZDC09B0
3-pole, 4kW, 9A, 1NO+1NC, 24VDC	000 0-0	LZDC09B5
5,5kW / 12A		
3-pole, 5,5kW, 12A, 1NO+1NC, 230VAC	000 0-0	LZDC12B3
3-pole, 5,5kW, 12A, 1NO+1NC, 24VAC	555 0-5	LZDC12B0
3-pole, 5.5kW, 12A, 1NO+1NC, 24VDC	000 0-0	LZDC12B5
7,5kW / 18A		
3-pole, 7,5kW, 18A, 1NO+1NC, 230VAC	000 0-0	LZDC18B3
3-pole, 7,5kW, 18A, 1NO+1NC, 24VAC	555	LZDC18B0
3-pole, 7.5kW, 18A, 1NO+1NC, 24VDC	000 0-0	LZDC18B5
11kW / 25A		
3-pole, 11kW, 25A, 1NO+1NC, 230VAC	555 0-0	LZDC25B3
3-pole, 11kW, 25A, 1NO+1NC, 24VAC	000 0-0	LZDC25B0
15kW / 32A		
3-pole, 15kW, 32A, 1NO+1NC, 230VAC	555 0-5	LZDC32B3
3-pole, 15kW, 32A, 1NO+1NC, 24VAC	000 0-0	LZDC32B0
18,5kW / 38A		
3-pole, 18,5kW, 38A, 1NO+1NC, 230VAC	000 0-0	LZDC38B3
3-pole, 18,5kW, 38A, 1NO+1NC, 24VAC	000 0-0	LZDC38B0

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### Accessories Series CUBICO Classic

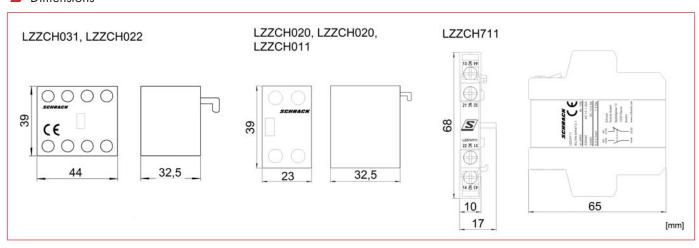




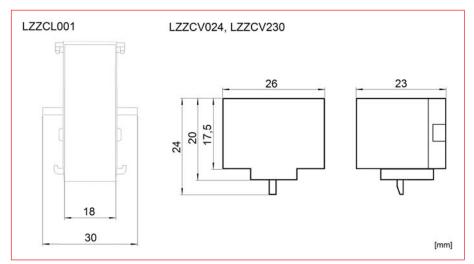
#### Schrack-Info

- Auxiliary contacts for front or side-mounting for contactors series CUBICO Classic
- Mechanical interlock for two contactors series Classic
- Protective modules for 24V and 230V coil of the contactors

### Dimensions



#### Dimensions



### Circuit Diagrams

LCCH031	LCCH022	LCCH020	LZZCH002	LCCH011	LCCCH711
53 61 73 83	53 61 71 83	53 63	51 61 L 	53 61	13/43 21/31
54 62 74 84	54 62 72 84	54 64	52 62	54 62	14/44 22/32



# Contactors Series CUBICO Classic, 3-pole

## Accessories Series CUBICO Classic

DESCRIPTION	AVAILABLE	ORDER NO.
Auxiliary contact block		
Auxiliary contact front-type for CUBICO Classic, 3NO+1NC	000 0-0	LZZCH031
Auxiliary contact front-type for CUBICO Classic, 2NO+2NC	000 0-0	LZZCH022
Auxiliary contacts front-type for CUBICO Classic, 2NO	000 0-0	LZZCH020
Auxiliary contact front-type for CUBICO Classic, 2NC	000 0-0	LZZCH002
Auxiliary contact front-type for CUBICO Classic, 1NO+1NC	000 0-0	LZZCH011
Auxiliary contact block - side		
Auxiliary contact side-type for CUBICO Classic, 1NO+1NC	000 0-0	LZZCH711
Mechanical interlock		
Mechanical interlock for CUBICO Classic	000 0-0	LZZCL001
Surge supressors		
Varistor Classic 24 - 48 V AC/DC	000 0-0	LZZCV024
Varistor Classic 110 - 250 V AC	000 0-0	LZZCV230

# Technical Information

## ■ Terminal Screws

Devices	Kind of conn	ection						
	Screw with	Screw with		Screw		Screw driver	Tightenin	
	washer	clamp box	_	w.nut			Nm	lb. inch
Туре	rb.	黒		ф				
Micro Contactors, all conductors			•					
					(F)(S)			
K0	M2,5	-	-	-		Pz 1	0.6-0.8	5-7
Mini Contactors, all conductors					(F)			
K1	M3,5	-	-	-	(A)	Pz2	0.8-1.4	7-12
Auxiliary Contactors, all					_			
conductors					$(\mathscr{A})$			
K(G)3-07	M3,5	-	-	-		Pz2	0.8-1.4	7-12
Contactors								
Main conductor					(A)			
K(G)3-10 to K3-22	M3,5	-	-	-	(X)	Pz2	0.8-1.4	7-12
K(G)3-24 to K3-40 K3-50 to K3-74	-	M5 M6	-			Pz2 Pz3	2.5-3 3.5-4.5	22-26 31-40
K3-30 10 K3-74	-	1410					3.3-4.3	31-40
K2-23, -30, -37A00-40	M4	-	-	-	(F)(S)	Pz2	1.2-1.8	11-16
K2-45, -60A00-40	-	M6	-	-		Pz3	3.5-4.5	31-40
K3-90, K3-115	-	-	M8	-		4mm hex socket	4-6.5	35-57
K3-116 to K3-176	-	-	-	M8			17	150
K3-210 to K3-316	-	-	-	M10	$\bigcirc$		35	315
K3-450 and K3-550	-	-	-	M 12			60	540
Auxiliary conductor								
K(G)3-10 to K3-22	M3,5	-	-	-	(F)S)	Pz2	0.8-1.4	7-12
Coil conductor					(A)			
K(G)3-10 to K3-550	M3,5	-	-	-		Pz2	0.8-1.4	7-12
Accessories								
HK, HKM	M3,5	-	-	-	$\mathcal{F}$	Pz2	0.8-1.4	7-12
HA, HN, K2, HB	M3,5	_	-	-		Pz2	0.8-1.4	7-12



## ■ Micro Contactors LA, Size M

### ■ Technical Specifications according to IEC 60947-4-1, VDE 0660, EN 60947-4-1

Main contacts		Туре	KO-05D
Rated insulation voltage U <sub>i</sub>	.11	VAC	440 1)
Making capacity I <sub>eff</sub>	at U <sub>e</sub> = 440VAC	A	65
Breaking capacity I <sub>eff</sub>	400VAC	Α	50
cos φ = 0,65			
Utilization category AC1 Switching of resistive load			
Rated operational current l <sub>e</sub> (=l <sub>sh</sub> ) at 40°C, open		Α	12
Rated operational current i <sub>e</sub> (-1 <sub>th</sub> ) at 40°C, open  Rated operational power of three-phase resistive loads	230V	kW	4.7
saled operational power of infee-phase resistive loads 50-60 Hz, cos φ= 1	240V	kW	4.8
50-60 Hz, cos Ψ= 1			
	400V	kW	8.3
	415V	kW	8.6
Data I	440V	kW	9.0
Rated operational current I <sub>e</sub> (=I <sub>th</sub> ) at 60°C, open	2201	A	8
Rated operational power of three-phase resistive loads	230V	kW	3.1
50-60 Hz, cos φ = 1	240V	kW	3.3
	400V	kW	5.5
	415V	kW	5.7
and the second second	440V	kW	6.0
Minimum cross-section of conductor at load with I <sub>e</sub> (=I <sub>th</sub> )		mm <sup>2</sup>	1.5
Utilization category AC2 and AC3			
Switching of three-phase motors	,		
Rated operational current I <sub>e</sub>	220V	A	6.2
open and enclosed	230V	A	6.2
	240V	A	5.6
	380-400V	Α	5
	415-440V	A	5
Rated operational power of three-phase motors	220-240V	kW	1.5
50-60 Hz	380-440V	kW	2.2
Utilization category AC4			
Switching of squirrel cage motors, inching			
Rated operational current l <sub>e</sub>	220V	Α	4.9
open and enclosed	230V	Α	4.9
	240V	Α	4.1
	380-400V	A	3.5
	415-440V	A	3.5
Rated operational power of three-phase motors	220-240V	kW	1.1
50-60 Hz	380-440V	kW	1.5
Jtilization category AC5a			
Switching of gas discharge lamps			
Rated operational current l <sub>e</sub> per pole at 220/230V			
Fluorescent lamps,			
uncompensated and serial compensated		Α	6
parallel compensated		Α	0.5
dual-connection		Α	9
Metal halide lamps <sup>2)</sup> ,			
uncompensated		Α	6
parallel compensated		Α	0.5
Mercury-vapour lamps <sup>3)</sup> ,			
uncompensated		Α	9
parallel compensated		A	0.5
Mixed light lamps <sup>4)</sup>		A	9
.ED-Lamps			,
consider the inrush current of the lamp ballast			inrush current of contactor
and cos φ of the lamp	max.lamps per p	ole $(I_{nLED} \le I_{th})=$	inrush current of lamp/EVG
and doo if or moraling			iniosii coneiii or idiip/ L¥O
max inrush current of contactor		A	91
Utilization category AC5b			
Switching of incandescent lamps 5)			
per pole at 220/230V		A	3
1 =			

Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U<sub>imp</sub> = 4 kV. Data for other conditions on request.



<sup>&</sup>lt;sup>2)</sup> Metal halide lamps on sodium-vapour lamps (high- and low-pressure lamps).

<sup>3)</sup> High-pressure lamps.

<sup>&</sup>lt;sup>4)</sup> Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps).

<sup>&</sup>lt;sup>5)</sup> Current inrush approx. 16 x le

## ■ Micro Contactors LA, Size M

### ■ Technical Specifications according to IEC 60947-4-1, VDE 0660, EN 60947-4-1

Main contacts		Туре	K0-05D
Utilization category DC1			
Switching of resistive load	1 pole 24V	Α	12
Time constant L/R ≤1 ms	60V	Α	12
Rated operational current l <sub>e</sub>	110V	Α	-
	220V	Α	-
	3 poles in series 24V	Α	12
	60V	Α	12
	110V	Α	12
	220V	Α	-
Utilization category DC3 and DC5			
Switching of shunt motors	1 pole 24V	A	12
and series motors	, 60V	A	<u>-</u>
Time constant L/R ≤15ms	110V	Α	-
Rated operational current l <sub>e</sub>	220V	Α	-
	3 poles in series 24V	Α	12
	60V	A	12
	110V	A	12
	220V	A	- -
Maximum ambient temperature			
Operation	open	°C	-40 to +60 (+90) 1)
	enclosed	°C	-40 to +40
Storage	55.000	°C	-50 to +90
Short circuit protection		-	
or contactors without thermal overload relay			
Coordination-type "1" according to IEC 947-4-1			
Contact welding without hazard of persons			
max. fuse size	gL (gG)	A	32
Coordination-type "2" according to IEC 947-4-1	9: (90)	,,	02
ight contact welding accepted			
nax. fuse size	gL (gG)	A	_
Contact welding not accepted	gr (gO)	^	-
max. fuse size	gL (gG)	A	
For contactors with thermal overload relay the	gr (gO)	^	-
device with the smaller admissible backup ruse			
(contactor of thermal overload relay) determines the fuse size			
Cable cross-sections			
or contactors	solid of stranded	mm <sup>2</sup>	0.5-1.5
nain connector	solid of stranded flexible	mm mm²	
			0.5-1.5
S.H	flexible with multicore cable end	mm <sup>2</sup>	0.5-1.5
Cables per clamp		A)A/C	2
	solid of stranded	AWG	20-14
Frequency of operation z	without load	1/h	10000
contactors without thermal overload relay	AC3, I <sub>e</sub>	1/h	600
	AC4, I <sub>e</sub>	1/h	120
	DC3, I <sub>e</sub>	1/h	600
Mechanical life	AC operated	S x 10 <sup>6</sup>	3
	DC operated	S x 10 <sup>6</sup>	4
Short time current	10s-current	Α	50
Power loss per pole	at I <sub>e</sub> /AC3 400V	W	0.2
Resistance to shock according to IEC 68-2-27			
Shock time 20 ms sine-wave			
AC operated	NO	g	2.5
	NC	g	2.5

<sup>1) 90°</sup>C: reduces the control voltage range to 0.9 up to 1.0xU<sub>s</sub> and reduces the rated current I<sub>e</sub>/AC1 to the value of I<sub>e</sub>/AC3



# Technical Specification - Electromechanical Contactors Series LA

## Micro Contactors LA, Size M

### ■ Technical Specifications according to IEC 60947-5-1, VDE 0660, EN 60947-5-1

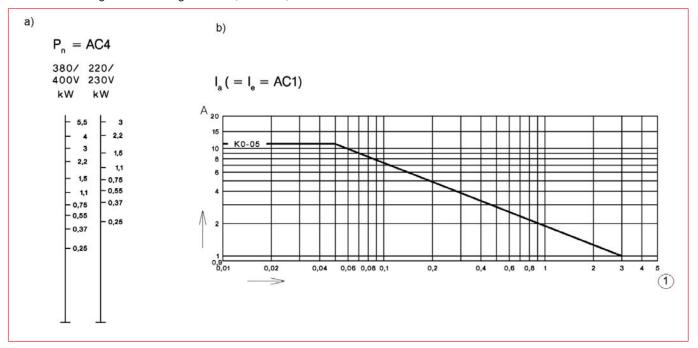
Auxiliary contacts		Туре	K0-04D K0-05D
Rated insulation voltage	U <sub>i</sub>	VAC	440 1)
Thermal rated current I <sub>th</sub> to 440 V			
Ambient temperature	40°C	Α	5
	60°C	Α	3
Power loss per pole	at I <sub>th</sub>	W	0.25
Utilization category AC15			
Rated operational current I <sub>e</sub>	220-240V	Α	3
	380-415V	Α	1.5
	440V	Α	1
Utilization category DC13			
Rated operational current I <sub>e</sub>	24-60V	Α	0.5
Maximum ambient temperature			
Operation	open	°C	-40 to +60 (+90) <sup>2)</sup>
•	enclosed	°C	-40 to +40
Storage		°C	-40 to +90
Short circuit protection			
short circuit current 1kA,			
contact welding not accepted			
max. fuse size	gL (gG)	Α	10
For contactors with thermal overload relay the device	0 10 1		
with the smaller admissible control fuse			
(contactor of thermal overload relay) determines the fuse size.			
Power consumption of coils			
AC operated	inrush	VA	9
	sealed	VA	4
		W	1.8
DC operated	inrush	W	2.5
	sealed	W	2.5
Operation rage of coils			
in multiples of control voltage U <sub>s</sub>			0.85-1.1
Switching time at control voltage U <sub>s</sub> ± 10% 3)			
AC operated	make time	ms	13-18
	release time	ms	5-10
	arc duration	ms	10-15
DC operated	make time	ms	10-20
	release time	ms	2-10
	arc duration	ms	10-15
Cable cross-section			
all connectors	solid	mm <sup>2</sup>	0.5-1.5
	flexible	mm <sup>2</sup>	0.5-1.5
	flexible with multicore	mm <sup>2</sup>	0.5-1.5
	cable end	mm	0.5-1.5
Clamps per pole			2
	solid or stranded	AWG	20-14

<sup>1)</sup> Suitable at 690 V for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard industry): U<sub>imp</sub> = 4kV. Data for other conditions on request.

<sup>2)</sup>  $90^{\circ}$ C: reduces the control voltage range to 0.9 up to  $1.0xU_s$  and reduces the thermal rated current 1th to  $1.0xU_s$  and reduces the thermal rated current 1th to  $1.0xU_s$  and  $1.0xU_s$  and  $1.0xU_s$  and  $1.0xU_s$  are  $1.0xU_s$  and  $1.0xU_s$  and  $1.0xU_s$  are  $1.0xU_s$  and  $1.0xU_s$  and  $1.0xU_s$  are  $1.0xU_s$  are  $1.0xU_s$ 

<sup>3)</sup> Summary switching time = release time + arc duration.

- Micro Contactors LA, Size M
- Motor Rating and Breaking Current (KO-05D)



- 1) Millions of Operations
- a) Motor Rating
- b) Breaking Current

# Technical Specification - Electromechanical Contactors Series LA

## ■ Mini Contactors LA, Size 1

■ Technical Specifications according to IEC 947-4-1, VDE 0660, EN 60947-4-1

Main contacts		Туре	K1-09D
Rated insulation voltage U <sub>i</sub>		V AC	690 1)
Making capacity I <sub>eff</sub>	at $U_e = 690V$ AC	A	165
Breaking capacity l <sub>eff</sub>	400V AC	A	100
$\cos \varphi = 0.65$	500V AC	A	90
	690V AC	A	80
Jtilization category AC1 - Switching of resistive load		_	
Rated operational current I <sub>e</sub> (=I <sub>th</sub> ) at 40°C, open		A	20
Rated operational power of three-phase resistive loads	230V	kW	7.9
50-60 Hz, $\cos \varphi = 1$	240V	kW	8.3
	400V	kW	13.8
	415V	kW	14.3
Rated operational current I <sub>e</sub> (=I <sub>th</sub> ) at 60°C, enclosed		A	16
Rated operational power of three-phase resistive loads	230V	kW	6.3
$50-60 \text{ Hz}, \cos \varphi = 1$	240V	kW	6.7
	400V	kW	11
	415V	kW	11.5
Minimum cross-section of conductor at load with I <sub>e</sub> (=I <sub>th</sub> )		mm <sup>2</sup>	2.5
Utilization category AC2 and AC3 - Switching of three-pha			
Rated operational current I <sub>e</sub>	220V	A	12
open and enclosed	230V	A	11.5
	240V	A	11
	380-400V	A	9
	415-440V	A	8
	500V	A	7
	660-690V	A	5
Rated operational power of three-phase motors	220-240V	kW	3
50-60Hz	380-440V	kW	4
	500-690V	kW	4
Utilization category AC4 - Switching of squirrel cage motor	-		
Rated operational current I <sub>e</sub>	220V	A	12
open and enclosed	230V	A	11.5
	240V	A	11
	380-400V	A	9
	415-440V	A	8
	500V	A	7
	660-690V	A	5
Rated operational power of three-phase motors	220-240V	kW	3
50-60Hz	380-440V	kW	4
	500-690V	kW	4
Utilization category AC5a - Switching of gas discharge lan	nps		
Rated operational current l <sub>e</sub> per pole at 220/230V			
Fluorescent lamps,			
	uncompensated and serial compensated	A	10
	parallel compensated	A	2
	·		
	dual-connection	A	16
Metal halide lamps <sup>3)</sup> ,			
	uncompensated	A	10
	parallel compensated	A	2
Manager (4)	paraner compensated		4
Mercury-vapour lamps 4)			
	uncompensated	A	16
_	parallel compensated	A	2
Mixed light lamps <sup>5)</sup>		A	16
LED-Lamps			
consider the inrush current of the lamp ballast		max. lamps per pole	inrush current of contactor
and cos φ of the lamp		(I <sub>nLED</sub> ≤ I <sub>th</sub> ) =	inrush current of lamp/EVG
and coo $\phi$ of the fullip		,	in oan coneil of lattip/ LVO
max. inrush current of contactor		A	233
Utilization category AC5b Switching of incandescent lamp	s 6)	^	200
Rated operational current le per pole at 220/230 V	<b>3</b>	A	8
taica operational content to per pole at 220/ 200 V		^	U

<sup>1)</sup> Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV. Data for other conditions on request.



<sup>3)</sup> Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps).

High-pressure lamps.

<sup>5)</sup> Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps).

<sup>6)</sup> Current inrush approx. 16 x  $\rm I_{\rm e}$ 

# Mini Contactors LA, Size 1

### ■ Technical Specifications according to IEC 947-4-1, VDE 0660, EN 60947-4-1

Main contacts		Туре	K1-09D
Utilization category DC1			
Switching of resistive load	1 pole 24V	Α	20
Time constant L/R ≤ 1 ms	60V	Α	20
Rated operational current I <sub>e</sub>	110V	Α	5
	220V	Α	0.6
	3 poles in series 24V	Α	20
	60V	Α	20
	110V	Α	20
	220V	Α	16
Utilization category DC3 and DC5			
Switching of shunt motors	1 pole 24V	Α	20
and series motors	60V	Α	5
Time constant L/R ≤ 15 ms	110V	Α	1
Rated operational current l <sub>e</sub>	220V	Α	0.15
	3 poles in series 24V	А	20
	5 poles III series 24v	A	20
	110V	A	20
	220V	A	20 2
Maximum ambient temperature	2201	- / (	-
Operation	open	°C	-40 to +60 (+90) 1)
	enclosed	°C	-40 to + 40
with thermal overload relay	open	°C	-25 to +60
,	enclosed	°C	-25 to +40
Storage		°C	-50 to +90
Short circuit protection - for contactors without thermal overload relay			
Coordination-type "1" according to IEC 947-4-1			
Contact welding without hazard of persons			
max. fuse size	gL (gG)	Α	40
Coordination-type "2" according to IEC 947-4-1	9-19-7	, ,	
Light contact welding accepted			
max. fuse size	gL (gG)	Α	25
Contact welding not accepted	3-13-7		
max. fuse size	gL (gG)	Α	10
For contactors without thermal overload relay the	9-19-7	, ,	
device with the smaller admissible backup fuse			
(contactor or thermal overload relay) determines the fuse size.			
Cable cross-sections			
for contactors without thermal overload relay			
main connector	solid or stranded	$mm^2$	0.5-2.5
	flexible	$mm^2$	0.5-2.5
	flexible with multicore cable end	$mm^2$	0.5-1.5
Cables per clamp			2
	solid or stranded		18-14
Frequency of operations z	without load	1/h	10000
Contactors without thermal overload relay	AC3, I <sub>e</sub>	1/h	600
	AC4, I <sub>e</sub>	1/h	120
	DC3, I <sub>e</sub>	1/h	600
Mechanical life	AC operated - Sx	106	5
Chti'	DC operated - Sx	106	15
Short time current Power loss per pole	at le/AC3 400V	A W	96 0.15
Resistance to shock according to IEC 68-2-27	at le/ AC3 400V	٧٧	0.15
Shock time 20 ms sine-wave			
AC operated	NO	ď	5
, 10 openalou	NC NC	g g	5
DC operated	NO	g g	8
5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 -	NC NC	g g	6
	110	9	ı

<sup>1) 90 °</sup>C: reduces the control voltage range to 0.9 up to 1.0xU<sub>s</sub> and reduces the rated current I<sub>e</sub>/AC1 to the value of I<sub>e</sub>/AC3



# Technical Specification - Electromechanical Contactors Series LA

## ■ Mini Contactors LA, Size 1

### ■ Technical Specifications according to IEC 947-5-1, VDE 0660, EN 60947-5-1

A	Ü	т	K1 00D	K1 00D -	l IIIz
Auxiliary contacts		Type VAC	<b>K1-09D</b> 690 <sup>1)</sup>	<b>K1-09D =</b> 690 <sup>1)</sup>	<b>HK</b> 690 <sup>1)</sup>
Rated insulation voltage U; Thermal rated current I <sub>th</sub> to 690V		VAC	090	090	090
<del></del>	40°C	Α	10	10	10
Ambient temperature	40°C	A	6	6	6
Power loss per pole	at I <sub>th</sub>	W	0.5	0.5	0.5
Utilization category AC15	000 0 / 01 /				
Rated operational current I <sub>e</sub>	220-240V	A	3	3	3
	380-415V	A	2	2	2
	440V	A	1.6	1.6	1.6
	500V	A	1.2	1.2	1.2
	660-690V	Α	0.6	0.6	0.6
Utilization category DC13			_	_	_
Rated operational current I <sub>e</sub>	60V	Α	2	2	2
	110V	Α	0.4	0.4	0.4
	220V	A	0.1	0.1	0.1
Maximum ambient temperature					
Operation	open	°C		-40 to +60 (+90) <sup>3)</sup>	
		°C		-40 to +40	
Storage		°C		-40 to +90	
Short circuit protection					
short-circuit current 1kA					
contact welding not accepted					
max. fuse size	gL (gG)	Α	20	20	20
For contactors with thermal overload relay the					
device with the smaller admissible control fuse					
(contactor or thermal overload relay)					
determines the fuse size.					
Power consumption of coils					
AC operated	inrush	VA	25	-	-
	sealed	VA	4-5	-	-
		W	1.2	-	-
DC operated	inrush	W	-	2.5	-
	sealed	W	-	2.5	-
Operation range of coils			19-30 V DC		
in multiples of control voltage U <sub>s</sub>			0.85-1.1	0.8-1.1	-
Switching time at control voltage U <sub>s</sub> ±10 % <sup>4) 5)</sup>					
AC operated	make time	ms	15-19	-	-
	release time	ms	8-25	-	-
	arc duration	ms	10-15	-	-
DC operated	make time	ms	-	15-25	-
	release time	ms	-	8-25	-
	arc duration	ms	-	10-15	-
Cable cross-section					
all connectors	solid	$mm^2$	0.5-2.5	0.5-2.5	0.5-2.5
	flexible	$mm^2$	0.5-2.5	0.5-2.5	0.5-2.5
	flexible with				
	multicore cable	$mm^2$	0.5-1.5	0.5-1.5	0.5-1.5
	end				
Clamps per pole			2	2	2

<sup>1)</sup> Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV. Data for other conditions on request.

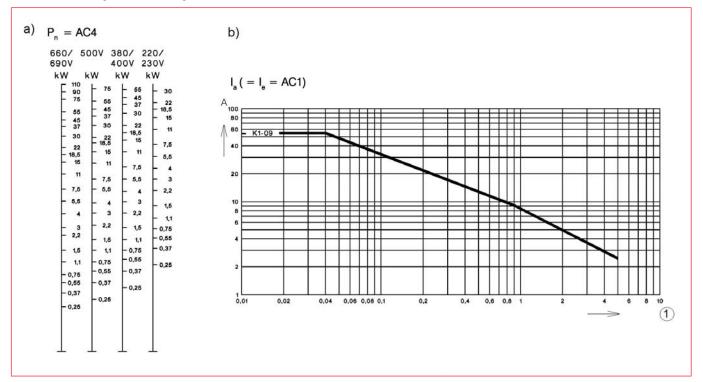


<sup>3)</sup>  $90^{\circ}$ C: reduces the control voltage range to 0.9 up to 1.0xUs and reduces the thermal rated current 1th to the value of 1e/AC15.

<sup>4)</sup> Summary switching time = release time + arc duration.

<sup>5)</sup> Release time of NC make time of NO increase when suppressor units for voltage peak protection are use (Varistor, RC-units, Diode units).

- Mini Contactors LA, Size 1
- Motor Rating and Breaking Current (K1-09D)



- 1) Millions of Operations
- a) Motor Rating
- b) Breaking Current

# Technical Specification - Electromechanical Contactors Series LA

# Auxiliary Contactors LA

■ Technical Specifications according to IEC 947-5-1, VDE 0660, EN 60947-5-1

		Туре	K3-07ND	K3-07ND=	KG3-07A	KG3-07D
Rated insulation voltage U <sub>i</sub> 1)		VAC <sup>1)</sup>	690	690	690	690
Thermal rated current I <sub>th</sub> to 690V						
Ambient temperature	40°C	Α	10	10	20	10
	60°C	Α	6	6	16	6
Frequency of operations z		1/h	10000	10000	10000	10000
Mechanical life		S x 10 <sup>6</sup>	10	10	10	50
Utilization category AC15						
Rated operational	220-240V	Α	4	4	12	4
current I <sub>e</sub>	380-415V	Α	2	2	4	2
	440V	Α	1.6	1.6	4	1.6
	500V	Α	1.2	1.2	3	1.2
	660-690V	Α	0.6	0.6	1	0.6
Utilization category DC13						
Rated operational	24-60V	Α	3.5	3.5	8	3.5
current I <sub>e</sub>	110V	Α	0.5	0.5	1	0.5
per pole	220V	Α	0.1	0.1	0.1	0.1
Power consumption of coils						
AC operated	inrush	VA	30-45	-	-	-
	sealed	VA	7-10	-	-	-
		W	2.6-3	-	-	-
DC operated	inrush	W	-	75	3	3
	sealed	W	-	2	3	3
Operation range of coils						
in multiples of control voltage U <sub>s</sub>			0.85-1.1	0.8-1.1	0.8-1.1	0.8-1.1
Switching time at control voltage U <sub>s</sub> ± 10%						
	make time	ms	8-16	8-16	65-85	65-85
	release time	ms	5-13	5-13	20-30 <sup>3)</sup>	20-30 <sup>3)</sup>
Maximum ambient temperature						
Operation	open	°C			00 (+90) 2)	
	enclosed	°C			o +40	
Storage		°C		-40 t	o +90	
Short circuit protection						
short-circuit current 1 kA, contact welding not accepted						
max. fuse size	gL (gG)	Α	20	20	25	20
Cable cross-section						
Connector	solid	mm <sup>2</sup>			75-6	
	flexible	mm <sup>2</sup>		1	-4	
	flexible with multicore	mm <sup>2</sup>		0.7	75-4	
	cable end	2				
Magnet coil	solid	mm <sup>2</sup>			5-2.5	
	flexible	mm <sup>2</sup>		0.75	5-2.5	
	flexible with multicore	mm <sup>2</sup>		0.5	-1.5	
	cable end				2	
Clamps per pole	D. I.	414.0			2	
Connector	solid	AWG			-10	
	flexible	AWG			-10	
Clamps per pole	1. 1				2	
Magnet coil	solid	AWG			-12	
	flexible	AWG			- 12	
Clamps per pole					2	

<sup>1)</sup> Suitable at 690 V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV. Data for other conditions on request.



<sup>2)</sup>  $90^{\circ}$  reduces the control voltage range to 0.9 up to  $1.0 \text{xU}_s$  and reduces the thermal rated current  $I_{th}/AC1$  to the value of  $I_e/AC15$ 

<sup>3)</sup> With built-in coil suppressor.

### Capacitor Switching Contactors LA, Size 3

#### Rated Operational Power at 50/60Hz

Ambient Temp	erature					Auxiliary Contacts			Туре			
50°C			60°C				Built-in Add				Coil v	oltage 1)
380V	415 V	660 V	380 V	415 V	660 V	\						
400V	440 V	690 V	400 V	440 V	690 V		) /			Pack	Weight	
kVAr	kVAr	kVAr	kVAr	kVAr	kVAr	NO	NC	pcs.			pcs.	kg/pc.
0-12.5	0-13	0-20	0-12.5	0-13	0-20	1	_	1 2)	K3-18NK10	230	1	0.34
0-12.5	0-13	0-20	0-12.5	0-13	0-20	-	1	1 2)	K3-18NK01	230	1	0.34
10-20	10.5-22	17-33	10-20	10.5-22	17-33	-	_	3 <sup>3)</sup>	K3-24K00	230	1	0.62
10-25	10.5-27	17-41	10-25	10.5-27	17-41	-	-	3 3)	K3-32K00	230	1	0.62
20-33.3	23-36	36-55	20-33.3	23-36	36-55	-	_	3 <sup>3)</sup>	K3-50K00	230	1	1.0
20-50	23-53	36-82	20-50	23-53	36-82	-	-	3 3)	K3-62K00	230	1	1.0
20-75 <sup>4)</sup>	23-75 4)	36-120 <sup>4)</sup>	20-60	23-64	36-100	-	-	3 3)	K3-74K00	230	1	1.0
22.00	24.00	£7 100	22.75	24.77	£7 100			6 <sup>5)</sup>	K3 00K00	220	,	
33-80 33-100 <sup>6)</sup>	36-82 36-103 <sup>6)</sup>	57-120 57-148 <sup>6)</sup>	33-75 33-90 <sup>6)</sup>	36-77 36-93 <sup>6)</sup>	57-120 57-148 <sup>6)</sup>	-	-	6 5)	K3-90K00 K3-115K00	230 230	1	2.3

 $Specification: Contactors\ K3-..K\ are\ suitable\ for\ switching\ low-inductive\ and\ low\ loss\ capacitors\ in\ capacitor\ banks$ 

(IEC70 and 831, VDE 0560) without and with reactors.

Capacitor switching contactors are fitted with early make contacts and damping resistors, to reduce the value of make current  $< 70 \times I_e$ .

 $Operating\ Conditions: Capacitor\ switching\ contactors\ are\ protected\ against\ contact\ welding\ for\ a\ prospective\ making\ current\ of\ 200\ x\ l_e.$ 

- 1) See coil voltage range and non-standard coil voltages
- 2) 1 HN.. Or HA.. snap-on.
- 3) 2HB.. for side mounting and 1 HN.. or HA.. snap-on.
- 4) Consider the max. thermal current of the contactor K3-74A: I<sub>th</sub> 130A.
- 5) 2 HB.. on the left or right side and 4 HN.. or HA.. snap-on.
- 6) Consider the min. cross-section of conductor at max. load.

### ■ Technical Specifications according to IEC 947-4-1, IEC 947-5-1, EN 60947-4-1, EN 60947-5-1, VDE 0660

Туре			K3-18NK	K3-24K	K3-32K	K3-50K	K3-62K	K3-74K	K3-90K	K3-115K
Max. frequency of operations z		1/h	120	120	120	120	120	80	80	80
Contact life	non reactive capacitor banks	S x 10 <sup>3</sup>	250	150	150	150	150	120	120	120
	reactive capacitor banks	S x 10 <sup>3</sup>	400	300	300	300	300	200	200	200
Rated operational current I <sub>e</sub>	at 50°C	Α	0-18	14-28	14-36	30-48	30-72	30-108	50-115	50-144
AC6b	at 60°C	Α	0-18	14-28	14-36	30-48	30-72	30-87	50-108	50-130
Rated operational current I <sub>th</sub>	at 50°C	Α	32	45	60	100	110	120	155	190
AC1	at 60°C	Α	32	40	55	90	100	110	145	170
Overload factor	at 50°C	%	78	60	67	108	53	11	35	32
acc. To EN 61921: 30 % min.	at 60°C	%	78	43	53	88	39	26	34	31
Fuses gL (gG)	from/to	Α	35/63	50/80	63/100	80/160	125/160	160/200	160/200	160/250

# Technical Specification - Electromechanical Contactors Series LA

# ■ Capacitor Switching Contactors LA, Size 3

Contactor	Туре		K3-18NK10	K3-18NK01	K3-24K	K3-32K	
Capacitor rating at	230V, 50/60Hz	kVAr	0 – 7	0 – 7	5 – 11	5 – 14	
rated power	400V, 50/60Hz	kVAr	0 - 12,5	0 - 12,5	10 – 20	10 – 25	
(Utilization category AC-6b)	525V, 50/60Hz	kVAr	0 – 15	0 – 15	12 – 25	12 – 32	
	690V, 50/60Hz	kVAr	0 – 20	0 – 20	17 – 33	17 – 41	
Auxiliary contact mounted			1NO	1NC			
Auxiliary contacts mountable	snap on front		1NC/6A	1NC/6A			
			HA01	HA01			
			1NO/3A	1NO/3A	1NO/3A	1NO/3A	
			HN10	HN10	HN10	HN10	
			1NC/3A	1NC/3A	1NC/3A	1NC/3A	
			HN01	HN01	HN01	HN01	
	side mounted				1NO+1NC/3A HB11	1NO+1NC/3A HB11	
Magnetic coil operating range							
Max. switching frequency		h <sup>-1</sup>	120	120	120	120	
Electrical endurance		operating cycles	250000	250000	150000	150000	
Rated operational current I.	at 50°C	Α	0 – 18	0 – 18	14 – 28	14 – 36	
	at 60°C	Α	0 – 18	0 – 18	14 – 28	14 – 36	
Ambient temperature		°C	≤ 60 (90) 1)	≤ 60 (90) <sup>1)</sup>	≤ 60 (90) 1)	≤ 60 (90) 1)	
Standards				IEC 947-4-1 / EN 60	947-4-1 / VDE 0660		
Short-circuit protection	fuse gL/gG	Α	35 – 63	35 – 63	50 – 80	63 – 100	
Conductor cross-sections							
overload relay			120				
1 cable per clamp	solid or stranded	mm²	0.7	5 – 6	1.5 – 25		
	flexible	mm <sup>2</sup>	1	- 4	2.5	- 16	
	flexible with multicore cable end	mm <sup>2</sup>	0.7	5 – 4	1.5	- 16	
2 cable per clamp	solid or stranded	mm <sup>2</sup>	6+(1-6)/	4+(0.75 – 4)	16 + (2.5 – 6)	/ 10 + (4 – 10)	
			2.5 + (0.75 - 2.5)	/ 1.5 + (0.75 – 1.5)	6+(4-6)/	4 + (2.5 – 4)	
	flexible	mm <sup>2</sup>	6+(1.5 – 6	) / 4 + (1 – 4)	16 + (2.5 – 6)	/ 10 + (4 – 10)	
			2.5 + (0.75 – 2.5)	/ 1.5 + (0.75 – 1.5)		4 + (2.5 – 4)	
Cables per clamp				2	2	2	
For main connector							
1 cable per clamp	solid	AWG		- 10		- 10	
. 0	flexible	AWG		- 10		- 4	
2 cable per clamp	solid	AWG	, ,	/ 12 + (18 – 12) / 16 + (18 – 16)	10 + (16 – 10) , 14 + (18 – 16) ,	/ 12 + (18 – 12) / 16 + (18 – 16)	
	flexible	AWG		/ 12 + (18 – 12)	4+(18 - 10)		
	IICVINIC	AVVG		/ 16 + (18 – 16)		10 + (18 – 12)	
Cables per clamp			14 · (10 - 14)	2		2	
Coil voltage				-	1	-	
	0,85 – 1,1 x U <sub>N</sub>			230VA	C; 50Hz		
Mechanical life	AC operated S x 10 <sup>6</sup>			10	-, - <del></del>	10	
	DC operated S x 10 <sup>6</sup>			10		10	
Short time current	10 S current	А		144		240	
B I I	.1 / 400 4001/	147		0.5		1.0	

0.5

1.3



Power loss per pole at I<sub>e</sub> / AC3 400V W

1) With reduced control voltage range 0.9 up to 1.0 x U<sub>e</sub> and with reduced rated current I<sub>e</sub>/AC1 according to I<sub>e</sub>/AC3

# Capacitor Switching Contactors LA, Size 3

Contactor	Туре		K3-50K	K3-62K	K3-74K	K3-90K	K3-115K		
Capacitor rating at	230V, 50/60Hz	kVAr	12 – 20	12 – 28	12 – 30	22 – 40	20 – 50		
rated power	400V, 50/60Hz	kVAr	20 - 33.3	20 – 50	20 – 75	33 – 80	33 – 100		
(utilization category AC-6b)	525V, 50/60Hz	kVAr	26 – 43	26 – 64	26 <i>- 7</i> 5	45 – 95	45 – 115		
· · · · · · · · · · · · · · · · · · ·	690V, 50/60Hz	kVAr	36 – 55	36 – 82	36 – 120	57 – 120	57 – 148		
Auxiliary contacts mounted (unassigned)									
Auxiliary contacts mountable	snap on front		1NC/6A						
			HA01						
			1NO/3A	1NO/3A	1NO/3A	1NO/3A	1NO/3A		
			HN10	HN10	HN10	HN10	HN10		
			1NC/3A	1NC/3A	1NC/3A	1NC/3A	1NC/3A		
			HN01	HN01	HN01	HN01	HN01		
	side mounted		1NO+1NC/3A	1NO+1NC/3A	1NO+1NC/3A	1NO+1NC/3A	1NO+1NC/3		
			HB 11	HB 11	HB 11	HB 11	HB11		
Magnetic coil operating range									
Max. switching frequency		h-1	120	120	80	80	80		
Electrical endurance		Operating cycles	150000	150000	120000	120000	120000		
Rated operational current le	at 50°C	A	30 – 48	30 – 72	30 – 108	50 – 115	50 – 144		
	at 60°C	A	30 - 48	30 – 72	30 – 78	50 - 108	50 – 130		
Ambient temperature		°C	≤ 60 (90) <sup>1)</sup>	≤ 60 (90) 1)	≤ 60 (90) 1)	≤ 60 (90) <sup>1)</sup>			
Standards				IEC 947-4-1	,	,			
Short-circuit protection	fuse gL/gG	A	80 – 160	125 – 160	160 – 200	160 – 200	160 – 250		
For contactors without thermal overload relay			Ø						
• 1 cable per clamp	solid or stranded flexible	mm²	4 - 50 10 - 35						
	flexible with multicore cable end	mm <sup>2</sup>	6 –	35					
2 cable per clamp	solid or stranded	$mm^2$	50 + 4 / 35 + 6	/ 25 + (6 – 16) / 10 + (6 – 16)	top 0.5 – 95		ow 120		
	flexible	$\text{mm}^2$	50 + (4 – 10)	/ 35 + (4 – 16) / 16 + (4 – 16)	0.5 – 70	10 -	- 95		
Cables per clamp				2		1+1			
For main connector									
• 1 cable per clamp	solid	AWG		- 10					
	flexible	AWG	10	- O					
2 cable per clamp					top	be	ow		
	solid	AWG		0) / 12 + 12	18 – 10		-		
	flexible	AWG		/ 2 + (8 – 12)	18 – 3 / 0	8 – 4	4/0		
			3 + (12 - 8) / 4 + (10 - 6)						
Cables per clamp			2	2		1 + 1			
Coil voltage	0.05 1.1 11				220 VAC 50 !!				
AA 1 ' 11'6	0.85 – 1.1 x U <sub>N</sub>		10	10	230 VAC; 50 Hz	10	-		
Mechanical life	AC operated S x 10 <sup>6</sup>		10	10	10	10	5		
Ch t time	DC operated S x 10 <sup>6</sup>		10	10	10	10	5		
Short time current	10 S current	A	360	504	592	680	880		
Power loss per pole	at I <sub>e</sub> / AC3 400V	W	2.2	3.9	5.5	4.3	6		



# Technical Specification - Electromechanical Contactors Series LA

# Capacitor Switching Contactors LA, Size 3

Mounted auxiliary contacts	Туре		K3-18NK	K3-24K, K3-32K	K3-50K, K3-62K K3-74K	K3-90K, K3-115K
Control circuit				1		
Power consumption of coils						
AC operated	inrush	VA	33-45	90-115	140-165	190-280
	sealed	VA	7-10	9-13	13-18	2.5-5
		W	2.6-3	2.7-4	5.4-7	2.5-5
DC operated	inrush	W	75	140	200	190-280
	sealed	W	2	2	6	2.5-5
Operation range of coils						
in multiples of control voltage U <sub>s</sub>	AC operated		0.85-1.1	0.85-1.1	0.85-1.1	0.85-1.1
	DC operated		0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1
Switching time						
At control voltage U <sub>s</sub> ±10% <sup>2) 3)</sup>						
AC operated	make time	ms	8-16	10-25	12-28	20-35
•	release time	ms	5-13	8-15	8-15	35-50
	arc duration	ms	10-15	10-15	10-15	10-15
DC operated	make time	ms	8-12	10-20	12-23	20-35
	release time	ms	8-13	10-15	10-18	35-50
	arc duration	ms	10-15	10-15	10-15	10-15
Cable cross-section						.5 10
Auxiliary connector	solid	$mm^2$	0.75-6			
Addition Confidence	flexible	mm <sup>2</sup>	1-4			
	flexible with multicore cable		1-4			
	end	$mm^2$	0.75-4			
Magnet coil	solid	$mm^2$	0.75-2.5	0.75-2.5	0.75-2.5	0.75-2.5
Magner con	flexible	mm <sup>2</sup>	0.5-2.5	0.5-2.5	0.75-2.5	0.5-2.5
		mm	0.3-2.3	0.3-2.3	0.5-2.5	0.5-2.5
	flexible with multicore cable	$mm^2$	0.5-1.5	0.5-1.5	0.5-1.5	0.5-1.5
	end		0	0	0	0
Clamps per pole	1. 1	11110	2	2	2	2
Auxiliary connector	solid	AWG	18-10			
	flexible	AWG	18-10			
Magnet coil	solid	AWG	14-12	14-12	14-12	14-12
	flexible	AWG	18-12	18-12	18-12	18-12
Clamps per pole			2	2	2	2
Rated insulation voltage U <sub>i</sub> 1)	V~		690			
Thermal rated current Ith to 690V						
Ambient temperature	40°C	Α	16			
	60°C	Α	12			
Utilization category AC15						
Rated operational current I <sub>e</sub>	220-240V	Α	12			
•	380-415V	Α	4			
	440V	Α	4			
	500V	Α	3			
	660-690V	Α	1			
Utilization category DC13						
Rated operational current l <sub>e</sub>	60V	Α	8			
	110V	A	1			
	220V	A	0.1			
Short circuit protection	===:	- •				<u> </u>
short-circuit current 1kA, contact welding not accepted						
max. fuse size	gL (gG)	Α	25			
Auxiliary contacts snap on or side mounted	Туре	/ /	HA01	HB11	HN10	HN01
			1 NC	1 NO+1 NC	1 NO	1 NC
AC15	230V	A	6	3	3	3
AC15	400V					1
		A	3	2	2	2
AC1	690V	Α	25	10	10	10

<sup>1)</sup> Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV. Data for other conditions on request



<sup>2)</sup> Total breaking time = release time + arc duration

<sup>3)</sup> Values for delay of the release time of the make contact and the make time of the break contact will be increased, if magnet coils are protected against voltage peaks (varistor, RC-unit, diode-unit)

### Power Contactors

### ■ Technical Specifications according to IEC 947-4-1, EN 60947-4-1, VDE 0660

Main contacts		Туре	K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Rated insulation voltage U <sub>i</sub> 1)		V AC	690	690	690	690	690	690	690	830	830	830
Making capacity I <sub>eff</sub>	at $U_e$ =	Α	200	200	200	200	400	500	500	700	900	900
Making capacity left	690VAC		200	200	200	200	400	300	300	700	/00	/00
	1000VAC	Α	-	-	-	-	-	-	-	-	-	-
Breaking capacity I <sub>eff</sub>	400VAC	Α	180	180	200	200	380	400	400	600	800	800
K3-10 to K3-22 $\cos \varphi = 0.65$	500VAC	Α	150	150	180	180	300	370	370	500	700	700
$K3-24$ to $K3-1200$ cos $\phi = 0.35$	690VAC	Α	100	100	150	150	260	340	340	400	500	500
	1000VAC	Α	-	-	-	-	-	-	-	-	-	-
Utilization category AC1												
Switching of resistive load	(00)/		0.5	0.5		-00				110	100	100
Rated operational current I <sub>e</sub> (=I <sub>th</sub> )	690V	Α	25	25	32	32	50	65	80	110	120	130
at 40 °C, open Rated operational power	220V	kW	9.5	9.5	12.2	12.2	19.0	24.7	30.4	41.9	45.7	49.5
of three-phase resistive loads	230V	kW	9.9	9.9	12.7	12.7	19.9	25.9	31.8	43.8	47.7	51.7
50-60 Hz, cos $φ = 1$	240V	kW	10.4	10.4	13.3	13.3	20.8	27.0	33.2	45.7	49.8	54.0
30-00 Hz, cos ψ = 1	380V	kW	16.4	16.4	21.0	21.0	32.9	42.7	52.6	72.3	78.9	85.5
	400V	kW	17.3	17.3	21.0	21.0	34.6	45.0	55.4	72.3 76.1	83.0	90.0
	400V 415V	kW	17.3	17.3	23.0	23.0	35.9	46.7	57.4	79.0	86.2	93.3
	440V	kW	19.9	19.0	24.4	24.4	38.1	49.5	60.9	83.7	91.3	99.0
	500V	kW	21.6	21.6	27.7	27.7	43.3	56.2	69.2	95.2	103.8	112.5
	660V	kW	28.5	28.5	36.5	36.5	57.1	74.2	91.3	125.6	137.0	148.4
	690V	kW	29.8	29.8	38.2	38.2	59.7	77.6	95.5	131.3	143.2	155.2
	1000V	kW	29.0	27.0	30.2	30.2	39.7	- 77.0	- 45.5	-	- 143.2	133.2
D-t				25								110
Rated operational current $I_e$ (= $I_{the}$ ) at 60 °C, enclosed	690V	Α	25	25	32	32	40	55	65	90	100	110
Rated operational power	220V	kW	9.5	9.5	12.2	12.2	15.2	20.9	24.7	34.3	38.1	41.9
of three-phase resistive loads	230V	kW	9.9	9.9	12.7	12.7	15.9	21.9	25.9	35.8	39.8	43.8
50-60 Hz, $cosφ = 1$	240V	kW	10.4	10.4	13.3	13.3	16.6	22.8	27.0	37.4	41.5	45.7
	380V	kW	16.4	16.4	21.0	21.0	26.3	36.2	42.7	59.2	65.7	72.3
	400V	kW	17.3	17.3	22.1	22.1	27.7	38.1	45.0	62.3	69.2	<i>7</i> 6.1
	415V	kW	17.9	17.9	23.0	23.0	28.7	39.5	46.7	64.6	71.8	79.0
	440V	kW	19.0	19.0	24.4	24.4	30.4	41.9	49.5	68.5	76.1	83.7
	500V	kW	21.6	21.6	27.7	27.7	34.6	47.6	56.2	77.9	86.5	95.2
	660V	kW	28.5	28.5	36.5	36.5	45.7	62.8	74.2	102.8	114.2	125.6
	690V	kW	29.8	29.8	38.2	38.2	47.7	65.7	77.6	107.4	119.4	131.3
	1000V	kW	-	-	-	-	-	-	- 1	-	-	-
Minimum cross-section of conductor $I_e$ (= $I_{th}$ )	at load with	$mm^2$	4	4	6	6	10	16	25	35	50	50
Utilization category AC2 and AC3	,											
Switching of three-phase motors	•											
Rated operational current I.	220V	Α	12	15	18	22	24	30	40	50	63	74
open and enclosed	230V	A	11.5	14.5	18	22	24	30	40	50	63	74
open and enclosed	240V	A	11.5	15	18	22	24	30	40	50	63	74
	380-400V	Ā	10	14	18	22	24	30	40	<b>50</b>	<b>63</b>	74
	415V	A	9	14	18	22	24	30	40	50	63	74
	440V	A	9	14	18	22	24	30	40	50	63	74
	500V	A	8.9	11.9	15	15	22.5	28.5	28.5	44	54	64.5
	660-690V	A	6.7	9	12	12	17.5	20.3	20.3	33	42	49
	1000V	A	0.7	7	12	12	17.5		- 21	-	42	47
Rated operational power	220-230V	kW	3	4	5	6	6	8.5	11	12.5	18.5	22
of three-phase motors	220-230V 240V	kW	3	4	5	7	7	9 8.5	11.5	12.5	18.5	22
50-60 Hz	380-400V	kW	4	5.5	7.5	11	11	1	1 1	13.5 <b>22</b>	30	23 <b>37</b>
JU-UU ПZ	<b>380-400V</b> 415V	kW	1	6	l	1	1	15 16	18.5		1	ł
	415V 440V		4.5	6	8.5	12 12	12 12	16	20 20	24	33 33	40
	500V	kW kW	4.5 5.5	7.5	8.5 10	10	15	16 18.5	18.5	24	33	40 45
	660-690V	kW	5.5	7.5	10	10	15	18.5	18.5	30 30	37	45
			3.5	/.5	10	10	15	l	10.5	30	3/	45
	1000V	kW	-	-	-	-	-	-	-	-	-	

<sup>1)</sup> Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV. pollution degree 3 (standard-industry): U<sub>imp</sub> = 8 kV. Data for other conditions on request.



# Power Contactors

### ■ Technical Specifications according to IEC 947-4-1, EN 60947-4-1, VDE 0660

Main Contacts		Туре	К3-90	K3-115	K3-116	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550
Rated insulation voltage U <sub>i</sub> <sup>1)</sup>		VAC	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Making capacity I <sub>eff</sub>	at $U_e =$	Α	1100	1200	1200	1500	2000	2100	2600	3200	4500	5500
making capacity terr	690VAC											
n 1: 5 :	1000VAC	A	540	600	600	720	840	1020	1200	1500	2400	3000
Breaking capacity I <sub>eff</sub>	400VAC	A	950	1100	1000	1200	1500	1600	2100	2600	4500	5500
K3-10 up to K3-22 $\cos \varphi = 0.65$	500VAC	A	850	1000	1000	1200	1500 800	1600	2100 1900	2600	4500	5500
K3-24 up to K3-1200 $\cos \varphi = 0.35$	690VAC 1000VAC	A A	600 450	600 450	800 400	1000 500	600	1200 700	850	2300 1000	3200	4400
11/11 11 1 461	TOUUVAC	Α	430	430	400	300	000	700	630	1000	-	-
Utilization category AC1												
Switching of resistive load		_										
Rated operational current I <sub>e</sub> (=I <sub>th</sub> )	690V	Α	160	200	200	230	250	350	450	500	700	760
at 40°C, open												
Rated operational power	220V	kW	60	76	76	87	95	133	171	190	266	289
of three-phase resistive loads	230V	kW	63	79	79	91	99	139	179	199	279	302
50-60Hz, cos $φ$ = 1	240V	kW	66	83	83	95	103	145	187	207	291	315
	380V	kW	105	131	131	151	164	230	296	329	460	500
	400V	kW	110	138	138	159	173	242	311	346	485	526
	415V	kW	115	143	143	165	179	251	323	359	503	546
	440V	kW	121	152	152	175	190	266	342	381	533	579
	500V	kW	138	173 228	173 228	199	216 285	303	389	453	606	658
	660V 690V	kW kW	182 191	239	239	262 274	298	400 418	514 537	571 597	800 836	868 908
	1000V	kW	221	277	216	318	346	433	546	606	692	866
Pated aparational surrent L (-L )	10004		221	2//	210	310	340	433	340	000	072	000
Rated operational current I <sub>e</sub> (=I <sub>th</sub> )	(00)(		1.45	170	170	100	000	000	0.40	400	5.50	/ / / /
at 60°C, enclosed	690V	A	145	170	170	180	200	280	360	400	550	600
Rated operational power	220V 230V	kW kW	55 57	64 67	64 67	68 <i>7</i> 1	76 79	106 111	137 143	152 159	209 219	228 239
of three-phase resistive loads 50-60Hz, cos φ = 1	240V	kW	59	70	70	74	83	116	150	166	219	249
30-80Hz, cos ψ = 1	380V	kW	95	111	111	118	131	184	237	263	362	395
	400V	kW	100	117	117	124	138	193	249	277	381	415
	415V	kW	104	122	122	129	143	201	259	287	395	431
	440V	kW	110	129	129	137	152	213	274	304	419	457
	500V	kW	125	147	147	155	173	242	312	346	476	519
	660V	kW	165	194	194	205	228	320	412	457	628	685
	690V	kW	173	202	202	215	239	334	430	478	657	717
	1000V	kW	166	187	216	277	346	388	499	554	692	866
Minimum cross-section of conductor												
at load with I <sub>e</sub> (=I <sub>th</sub> )		mm <sup>2</sup>	95	120	95	95	120	240	2×150	2x(30x6)	2x(40x5)	2x(50x5)
Utilization category AC2 and AC3												
Switching of three-phase motors												
Rated operational current I <sub>e</sub>	220V	Α	90	115	115	150	175	210	260	315	450	550
open and enclosed	230V	Α	90	115	115	150	175	210	260	315	450	550
	240V	Α	90	115	115	150	175	210	260	315	450	550
	380-400V	Α	90	115	115	150	175	210	260	315	450	550
	415V	Α	90	115	115	150	175	210	260	315	450	550
	440V	Α	90	115	115	150	175	210	260	315	450	550
	500V	Α	79	79	115	150	175	210	260	315	450	550
	660-690V	Α	60	60	100	120	140	150	180	240	400	500
	1000V	Α	45	45	45	60	70	85	100	125	200	250
Rated operational power	220-230V	kW	25	33	30	40	50	60	75	90	132	175
of three-phase motors	240V	kW	27	35	35	45	55	65	80	100	140	185
50-60Hz	380-400V	kW	45	55	55	75	90	110	132	160	250	300
	415V	kW	49	63	59	80	95	115	140	180	257	315
	440V	kW	49	63	63	85	100	125	150	190	270	335
	500V	kW	55	55	75	90	100	132	160	210	300	375
	660-690V	kW	55	55 55	90	110	132	132	160	210	375	500
1) 5	1000V	kW	55		55	75	90	110	132	160	280	355

<sup>1)</sup> Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ . Data for other conditions on request.



Main contacts		Туре	K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Utilization category AC4												
Switching of squirrel cage motors,												
inching												
Rated operational current I <sub>e</sub>	220V	Α	12	15	18	18	24	30	40	50	63	63
open and enclosed	230V	Α	11.5	14,5	18	18	24	30	40	50	62	62
	240V	Α	11	14	18	18	24	32	40	50	62	62
	380-400V	Α	10	14	18	18	24	32	40	50	62	62
	415V	Α	9	14	18	18	23	30	37	45	60	60
	440V	Α	9	14	18	18	23	30	37	45	55	55
	500V	Α	9	12	16	16	17,5	21	21	33	42	42
	660V	Α	7	9	9	9	17	20	20	31	40	40
	690V	Α	6,5	8,5	8,5	8,5	17	20	20	31	40	40
	1000V	Α	-	-	-	5	-	-	-	-	-	-
Rated operational power	220-230V	kW	3	4	5	5	6	8,5	11	12,5	18,5	18,5
of three-phase motors	240V	kW	3	4	5	7,5	7	9	11,5	13,5	19	19
50-60Hz	380-400V	kW	4				11	15		22	30	30
JU-OUFIZ			1	5,5	<i>7</i> ,5 8,5	8,5	11 12		18,5 20		33	30
	415V	kW	4,5	6		8,5		16		24		
	440V	kW	4,5	6	8,5	10	12	16	20	24	33	33
	500V	kW	5,5	7,5	10	10	15	18,5	18,5	30	37	37
	660-690V	kW	5,5	7,5	10	-	15	18,5	18,5	30	37	37
Utilization category AC5a	1000V	kW	-	-	-		-	-	-	-	-	-
Switching of gas discharge lamps Rated operational current I <sub>e</sub> per pole at 220/230V Fluorescent lamps,												
uncompensated and serial compensated		Α	20	20	25	25	40	52	64	88	96	104
parallel compensated		A	7	9	9	9	18	22	22	30	40	45
dual-connection		Ā	22,5	22,5	28	28	45	58	72	98	108	117
Metal halide lamps 1),		A	22,3	22,3	20	20	43	30	12	70	100	117
·		٨	12	15	19	19	30	39	48	66	72	<i>7</i> 8
uncompensated		A	7	9	9	9	18				40	
parallel compensated Mercury-vapour lamps <sup>21</sup> ,		Α	/	9	9	9	18	22	22	30	40	45
uncompensated		Α	22,5	25	28	28	45	58	72	99	108	117
parallel compensated		Α	7	9	9	9	18	22	22	30	40	45
Mixed light lamps <sup>3)</sup>		Α	20	20	25	25	40	52	64	88	96	104
LED-Lamps												
consider the inrush current of the lamp ballast					may	. lamps per p	( ا > ۱۰۰۰ ا مام	=	inrush	current of co	ntactor	
and cos φ of the lamp					mux	pu pui p	O.O (INLED - Ith)		inrush c	urrent of lam	p/EVG	•
max inrush current of contactor		Α	282	282	282	282	564	705	705	987	1269	1268
Utilization category AC5b												
Switching of incandescent lamps <sup>4)</sup>												
Rated operational current l <sub>e</sub>												
per pole at 220/230V		Α	12.5	12.5	12.5	12.5	25	31	31	43	56	56
hei hoie ai 550/ 590 A		А	12.5	12.5	12.3	12.5	23	JI	JI	40	50	

<sup>1)</sup> Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)



<sup>2)</sup> High-pressure lamps

<sup>3)</sup> Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps)

<sup>4)</sup> Current inrush approx. 16 x I<sub>e</sub>

# Technical Specification - Electromechanical Contactors Series LA

### Power Contactors

Main Contacts		Туре	К3-90	K3-115	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550
Utilization category AC4		-7	110.10		110 101		110 210				
Switching of squirrel cage motors,											
inching											
Rated operational current le	220V	Α	85	98	55	63	85	100	120	150	180
open and enclosed	230V	Α	85	98	55	63	85	100	120	150	180
•	240V	Α	85	98	55	63	85	100	120	150	180
	380-400V	Α	85	85	55	63	85	100	120	150	180
	415V	Α	85	85	55	63	85	100	120	150	180
	440V	Α	85	85	55	63	85	100	120	150	180
	500V	Α	85	85	-	-	-	-	-	-	-
	660V	Α	60	60	-	-	-	-	-	-	-
	690V	Α	57.5	57.5	-	-	-	-	-	-	-
	1000V	Α	-	-	-	-	-	-	-	-	-
Rated operational power	220-230V	kW	25	30	15	18,5	25	30	37	45	51
of three-phase motors	240V	kW	27	32	15,5	19	26	31	38	47	53
50-60Hz	380-400V	kW	45	45	25	30	45	55	63	75	90
	415V	kW	49	49	25	33	45	55	65	80	100
	440V	kW	49	49	30	34	48	55	67	85	100
	500V	kW	55	55	25	30	55	65	<i>7</i> 5	100	110
	660-690V	kW	55	55	25	30	55	65	<i>7</i> 5	100	110
	1000V	kW	-	-	-	-	-	-	-	-	-
Utilization category AC5a											
Switching of gas discharge lamps											
Rated operational current le											
per pole at 220/230V											
Fluorescent lamps,											
uncompensated and serial compensate		Α	100	120	120	140	180	220	280	360	450
parallel compensated		Α	55	70	85	100	130	160	200	300	360
dual-connection		Α	112	144	120	140	180	220	280	360	450
Metal halide lamps <sup>1)</sup>											
uncompensated		Α	85	90	95	110	140	180	230	300	380
parallel compensated		Α	55	70	75	85	110	140	170	260	300
Mercury-vapour lamps <sup>2)</sup>											
uncompensated		Α	112	144	120	140	180	220	280	360	450
parallel compensated		Α	55	70	75	85	110	140	170	260	300
Mixed light lamps <sup>3)</sup>		Α	100	120	100	120	160	200	250	320	400
LED-Lamps				c. lamps per	nala (InLED :	< 1+h\	=	i	nrush curren	t of contacto	r
consider the inrush current of the lamp ballas	st		IIId	t. Idilips pei	pole (IIILLD .	≥ IIII)	_	ir	rush current	of lamp/EV	G
and cos φ of the lamp											
max inrush current of contactor		Α	1551	1692	2115	2820	2961	3666	4512	6345	7755
Utilization category AC5b											
Switching of incandescent lamps <sup>4)</sup>											
Rated operational current le											
per pole at 220/230V		Α	69	75	100	120	160	190	220	260	315

<sup>1)</sup> Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)

<sup>2)</sup> High-pressure lamps

<sup>3)</sup> Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a flourescent glass bulb (daylight lamps)

<sup>4)</sup> Current inrush approx. 16 x le

Main Contacts		Туре	K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Utilization category AC6 <sub>A</sub>												
Transformer primary switching												
at inrush		n	30	30	30	30	30	30	30	30	30	30
Rated operational current I <sub>e</sub>	400V	Α	4,5	5,5	7,5	7,5	10,5	13,5	13,5	20	27	33
Rated operational power	220-230V	kVA	1,8	2,2	3	3	4,2	5,4	5,4	8	10,7	13
dependent on inrush n	240V	kVA	1,9	2,3	3,1	3,1	4,3	5,6	5,6	8,3	11,2	13,5
•	380-400V	kVA	3,1	3,8	5,2	5,2	7,3	9,3	9,3	13,5	18,5	22,5
For different inrush-factors x	415-440V	kVA	3,4	4,2	5,7	5,7	8	10,2	10,2	15	20,5	25
use the following formula:	500V	kVA	3,9	4,8	6,5	6,5	9	11,5	11,5	17	23	28
Px=Pn*(n/x)	660-690V	kVA	5,4	6,5	9	9	12,5	16	16	24	32	39
Utilization category AC6b				·								
Switching of three-phase capacitors	•											
Maximum inrush current (peak value) as multiple k of the												
capacitor rated current		k	35	25	20	20	25	25	25	25	25	20
Rated operational current l <sub>e</sub>	500V	Α	8	12	15,5	15,5	23	32	32	45	60	70
Rated operational power	220-230V	kVAr	3	4,5	6	6	8,5	12	12	17	24	28
$(\sin \phi \rightarrow 1)$	240V	kVAr	3,5	5	6,5	6,5	9,5	13	13	18,5	25	29
	380-400V	kVAr	5	7,5	10	10	15	20	20	29	39	46
For different multiples x	415-440V	kVAr	5,5	8	11	11	16	22	22	32	43	50
use the following formula:	500V	kVAr	7	10	13	13	20	26	26	39	50	58
Px=Pk*(k/x)	660-690V	kVAr	7	10	13	13	20	26	26	40	50	58
Switching of												
reactive capacitor banks												
Rated operational current l <sub>e</sub>	690V	Α	8	13	18	20	28	36	42	48	72	108 1)
Rated operational power	220-230V	kVAr	2,9	5	7	7,5	11	14	16	20	28	33
	240V	kVAr	3,1	5,4	7	8	11	14	1 <i>7</i>	20	28	36
	380-400V	kVAr	5	9	12,5	13	20	25	27,5	33,3	50	<b>75</b> 1)
	415-440V	kVAr	5,5	9,5	13	14	22	27	30	36	53	75 <sup>1)</sup>
	500V	kVAr	6	11	15	17	25	30	36	40	60	75
	660-690V	kVAr	8	15	20	22	33	41	48	55	82	100
	1000V	kVAr	-	-	-	-	-	-	-	-	-	-
Utilization category DC1												
Switching of resistive load												
Time constant L/R ≤1 ms												
Rated operational current l <sub>e</sub>	1 pole 24V	Α	20	25	32	32	50	65	80	110	120	130
	60V	Α	20	25	32	32	50	65	80	110	120	130
	110V	Α	6	6	6	6	10	10	10	12	12	12
	220V	Α	0,8	0,8	0,8	0,8	1,4	1,4	1,4	1,4	1,4	1,4
3 poles in series	s 24V	Α	20	25	32	32	50	65	80	110	120	130
	60V	Α	20	25	32	32	50	65	80	110	120	130
	110V	Α	20	25	32	32	50	65	80	110	120	130
	220V	Α	16	20	20	20	30	35	35	63	80	80
Utilization category DC3 and DC5												
Switching of shunt motors												
and series motors												
Time constant L/R ≤15ms												
Rated operational current l <sub>e</sub>	1 pole 24V	Α	20	25	32	32	50	65	80	110	120	130
	60V	Α	6	6	6	6	30	30	30	60	60	60
	110V	Α	1,2	1,2	1,2	1,2	1,8	1,8	1,8	1,8	1,8	1,8
	220V	Α	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,25	0,25	0,25
3 poles in series		Α	20	25	32	32	50	65	80	110	120	130
	60V	Α	20	25	32	32	40	40	40	80	80	80
	110V	Α	20	20	20	20	40	40	40	80	80	80
	220V	Α	2,5	2,5	2,5	2,5	4	4	4	5	5	5

<sup>1)</sup> Consider resistive load (I<sub>th</sub>)



Main Contacts		Туре	К3-90	K3-115	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550
Utilization category AC6 <sub>A</sub>											
Transformer primary switching											
at inrush		n	30	30	30	30	30	30	30	30	30
Rated operational current I <sub>e</sub>	400V	Α	38	50	65	80	90	120	142	203	248
Rated operational power	220-230V	kVA	15	20	25	30	34	45	54	77	95
dependent on inrush n	240V	kVA	15,5	20,5	27	33	37	50	59	80	100
	380-400V	kVA	26	34	45	55	60	80	95	140	170
For different inrush-factors x	415-440V	kVA	29	38	46	57	63	85	100	145	175
use the following formula:	500V	kVA	33	43	55	69	75	100	120	170	210
Px=Pn*(n/x)	660-690V	kVA	45	60	56	69	100	135	160	200	250
Utilization category AC6b											
Switching of three-phase capacitors											
Maximum inrush current (peak value)											
as multiple k of the											
capacitor rated current		k	20	20	20	20	25	20	20	20	20
Rated operational current l <sub>e</sub>	500V	Α	87	100	120	155	195	225	255	300	370
Rated operational power	220-230V	kVAr	33	38	45	60	75	90	100	115	145
$(\sin \phi \rightarrow 1)$	240V	kVAr	36	42	52	62	78	94	104	120	150
= hm . h. l	380-400V	kVAr	57	65	80	100	130	155	170	200	250
For different multiples x use the following formula:	415-440V	kVAr	60 70	70 80	95 100	110 130	135 170	165 194	175	210 260	260 320
Px=Pk*(k/x)	500V 660-690V	kVAr kVAr	70	80	100	130	170	194	220 220	260	320
Switching of	000-0907	KVAI	/ / /	80	100	130	170	174	220	200	320
reactive capacitor banks											
•	690V		115	144	11.5	140	200	225	250	330	420
Rated operational current I <sub>e</sub> Rated operational power	220-230V	A kVAr	115 45	144 55	115 43	140 53	200 76	85	250 95	125	160
Raied operational power	240V	kVAr	45	55	45	55	80	90	100	130	170
	380-400V	kVAr	80	100	75	90	130	145	160	210	270
	415-440V	kVAr	100	120	80	100	140	160	170	230	290
	500V	kVAr	105	125	95	120	170	190	210	280	350
	660-690V	kVAr	120	148	125	150	200	230	260	350	450
	1000V	kVAr	160	200	155	200	300	340	400	500	650
Utilization category DC1											
Switching of resistive load											
Time constant L/R ≤1ms											
Rated operational current l <sub>e</sub>	1 pole 24V	Α	160	200	-	_	-	-	_	_	_
· · · · · · · · · · · · · · · · · · ·	60V	Α	160	200	-	-	-	-	-	-	-
	110V	Α	20	25	-	-	-	-	-	-	-
	220V	Α	2	2,5	-	-	-	-	-	-	-
	3 poles in series	Α	160	200	200	250	350	400	450	600	<i>7</i> 60
	24V										
	60V	A	160	200	200	250	350	400	450	600	760
	110V 220V	A A	160	200 160	80	170	250 150	280 180	200	400 250	315
Utilization category DC3 and DC5	2201	۲٦	100	100	30	100	130	100	200	230	313
Switching of shunt motors											
and series motors											
Time constant L/R ≤15ms		,									
Rated operational current I <sub>e</sub>	1 pole 24V	A	160	200	-	-	-	-	-	-	-
	60V	A	85	110	-	-	-	-	-	-	-
	110V	A	2	2,5	-	-	-	-	-	-	-
	220V	Α	0,5	0,5	-	-	-	-	_	-	-
	3 poles in series 24V	Α	160	200	-	-	-	-	-	-	-
	60V	Α	100	110	_	_	_	_	_	_	_
	110V	A	100	110	_	_	_	_	_	_	_
	220V	Α	7	8	_	_	_	_	_	_	_



Main contacts		Туре	K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Maximum ambient temperature												
Operation	open	°C					-40 to +60	(+90) 1)				
	${\sf enclosed}$	°C					-40 to	+40				
with thermal overload relay	open	°C					-25 to					
enclosed		°C					-25 to					
Storage		°C					-50 to	+90				
Short circuit protection												
for contactors without thermal overload relay												
Coordination-type "1" according to IEC 947-4	1-1											
Contact welding without hazard of persons							100	100	100	1.0	1.40	1/0
max. fuse size	gL (gG)	Α	63	63	63	63	100	100	100	160	160	160
Coordination-type "2" according to IEC 947-4	4-1											
Light contact welding accepted max. fuse size	al (aC)	Α	25	35	35	35	50	50	50	100	125	125
Contact welding not accepted	gL (gG)	A	23	33	33	33	30	30	30	100	123	123
max. fuse size	gL (gG)	Α	16	16	16	16	25	35	35	50	63	63
For contactors with thermal overload relay the			1								00	00
Tel comunicion with memory encode relay me	401100 11111			no backop n	200 (00	, ooa.		, ,				
				_	<b></b>			$\Box$			$\Box$	
					5			皿			Щ	
Cable cross-sections				c Car	100							
Cable (1033-36tholis								TIME			TIME	
for contactors without thermal overload relay												
1 cable per clamp												
main connector												
	stranded	mm <sup>2</sup>		0.73	5 - 6			1.5 - 25			4 - 50	
	flexible	$mm^2$		1 -	- 4			2.5 - 16			10 - 35	
flexible with multicore of	cable end	$\mathrm{mm}^2$		0,7	5 - 4			1.5 - 16			6 - 35	
2 cables per clamp												
solid or	stranded	$\mathrm{mm^2}$		6+(1-6)/	4+(0,75-4)		16+(2,	5-16) / 10-	+(4-16)	50+4/	35+6 / 25	+(6-16)
			2.5+		/ 1.5+(0.75	-1.5)		-16) / 4+(2.			-16) / 10+	
	flexible	mm <sup>2</sup>			/ 4+(1-4)			.5-6) / 10+			-10) / 35+	
			2.5+	-(0.75-2.5)	/ 1.5+(0.75	-1.5)	6+(4	-16) / 4+(2.	.5-16)	25+(4	-25) / 16+	(4-16)
1 cable per clamp												
main connector												
	solid	AWG		18	- 10			16 - 10			12 - 10	
	flexible	AWG		18 -	- 10			14 - 4			10 - 0	
2 cables per clamp												
	solid	AWG	1		/ 12+(18-12			6-10) / 12+		10+(	12-10) / 12	2+12
	0 41		1		/ 16+(18-16			3-14) / 16+		1 . / 10	10) /0./	0 101
	flexible	AWG			/ 12+(18-12 / 14 - (10-14			8-12) / 6+(			2-10) / 2+(	
Frequency of operations z				14*(10-14)	/ 16+(18-16	1	8+(18	3-8) / 10+(	10-12)	3+(1.	2-8) / 4+(1	0-01
Contactors without thermal overload relay												
	hout load	1/h		100	000			7000			7000	
****	AC3, I <sub>e</sub>	1/h			00			600			400	
	AC4, I <sub>e</sub>	1/h			20			120			120	
	DC3, I <sub>e</sub>	1/h			00			600			400	
Mechanical life												
AC operated	S x 10 <sup>6</sup>				0			10			10	
DC operated	S x 10 <sup>6</sup>				0			10			10	
DC-solenoid operated (KG3)	S x 10 <sup>6</sup>				0			50			-	
	Os-current	Α	96	120	144	176	184	240	296	450	504	592
	Os-current	Α	42	52	58	66	80	97	110	195	203	222
Power loss per pole	at I <sub>e</sub> /AC3	W	0,21	0,35	0,5	0,75	0,7	1,3	2	2,2	3,9	5,5
	400V											
contact resistance		mOhm	2,1	1,8	1,5	1,5	1,2	1,2	1,2	1	1	1
Resistance to shock acc. to IEC 68-2-27												
Shock time 20ms sine-wave	NO	g	10	10	10	10	8	8	8	8	8	8
	NC	9 9	6	6	6	6	-	-	-	-	-	-

<sup>1) 90°</sup> reduces the control voltage range to 0.9 up to 1.0xU<sub>s</sub> and reduces the rated current I<sub>e</sub>/AC1 to the value of I<sub>e</sub>/AC3



'		0		•		•						
Main contacts		Туре	K3-90	K3-115	K3-116	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550
Maximum ambient temperature												
Operation	open	°C	-40 to +6	60 (+90) <sup>2)</sup>				-25 to +	55 (+70) <sup>2)</sup>			
	enclosed	°C	1	to +40					to +40			
with thermal overload relay	open	°C	1	o +60					to +55			
enclosed		°C	1	to +40					to +40			
Storage		°C	-50 t	to +90				-55	to +80			
Short circuit protection												
for contactors without thermal overload relay												
Coordination-type "1" according to IEC 947-4-1												
Contact welding without hazard of												
persons max. fuse size	gL (gG)	Α	250	250	200	250	315	400	450	500	630	630
Coordination-type "2" according to IEC 947-4-1	gr (gG)	A	250	230	200	250	313	400	430	300	030	030
Light contact welding accepted												
max. fuse size	gL (gG)	Α	160	200	160	200	250	315	400	400	500	560
Contact welding not accepted	3 13 - 7											
max. fuse size	gL (gG)	Α	100	125	125	160	200	250	315	_	_	_
For contactors with thermal overload rel			1							ıse size.		
Cable cross-sections	,				, , , , , ,			,,				
for contactors without thermal overload												
relay			5			Ф			中		ф	Ф
			- 5			100000			200000		100000	100000
				-		4			Ф.		4	4
1 cable per clamp				2							674	62
	solid or											
main connector	stranded	mm <sup>2</sup>	0.5 - 95	10 - 120								
	flexible	mm <sup>2</sup>	0.5 - 70	25 - 95		busbar			busbar		busbar	busbar
	flexible with											
	multicore	$\rm mm^2$	0.5 - 70	10 - 95		18 x 4			25 x 6		30 x 5	40 x 6
	cable end											
2 cables per clamp	1. 1					screw			screw		screw	screw
	solid or stranded	$\mathrm{mm^2}$	0.5 - 95	+ 10 - 120		M8			M10		M 12	M 12
	flexible	mm <sup>2</sup>	0.5 - 70	+ 25 - 95								
1 cable per clamp	пехіыс		0.0 70	20 70								
·	solid	AWG	10 10									
main connector	flexible		18 - 10	8 - 4/0								
2hl	liexible	ATTO	10 - 5/ 0	0 - 4/ 0								
2 cables per clamp	[6.1	A)A/C										
		AWG AWG	18 2/0	- +8-4/0								
	nexible	AVVG	10-3/0	0-4/0								<u> </u>
Frequency of operations z												
Contactors without thermal overload relay												
reidy	without load	1/h	30	000							12	00
	AC3, I <sub>e</sub>	1/h	1	00							1	i00
	AC3, I <sub>e</sub>	1/h	1	20							1	-
	DC3, I <sub>e</sub>	1/h	1	00								-
Mechanical life		-										
AC operated	S × 10 <sup>6</sup>	S x 106		5		10			5			5
DC operated		S x 106	1	5		10			5		1	5
DC-solenoid operated (KG3)		S x 106		-		-			-			-
Short time current	10s-current	Α	680	880	920	1200	1400	1800	2200	2600	3600	4400
	120s-current	Α	275	330	410	500	575	800	900	1000	1400	1750
Power loss per pole	at I <sub>e</sub> /AC3	W	4,8	7,9	7,9	9	11	8	11	14,9	26,3	33,3
• •	400V		1								20,0	55,6
contact resistance		mOhm	0,6	0,5	0,5	0,4	0,35	0,18	0,16	0, 15		
Resistance to shock acc. to IEC 68-2-27												
Shock time 20ms sine-wave	NO	g	7	7	_	_	_	_	_	_	_	_
	NO	9 9	5	5	-	-	-	-	-	-	-	-
-1 1 1 1 1		<u>~</u>										

<sup>1) 90°</sup> reduces the control voltage range to 0.9 up to 1.0xU<sub>s</sub> and reduces the rated current I<sub>e</sub>/AC1 to the value of I<sub>e</sub>/AC3



<sup>2)</sup>  $70^{\circ}$  reduces the control voltage range to  $1.0xU_s$  and reduces the rated current  $I_e/AC1$  to the value of  $I_e/AC3$ 

<sup>3)</sup> After each  $1 \times 10^6$  operations magnetic core and built-in auxiliary contact block must be changed

Auxiliary Contacts		Туре	K(G)3-10	K(G)3-14 K(G)3	-18 K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Rated insulation voltage U <sub>i</sub> 1)		V~	, , , , ,	690		T	-	, - , -			
Thermal rated current I <sub>th</sub> to 690V		•		0,0							
Ambient temperature	40°C	Α	1	0	(16) <sup>5)</sup>		_				
7 tilibletii temperatore	60°C	Α		6	(12)5)		_			_	
Utilization category AC15	- 00 C		,	<u> </u>	(12)	<del> </del>					
• ,	220-240V	٨		3	(12)5)						
Rated operational current l <sub>e</sub>		A					-			-	
	380-415V	A		2	(4) <sup>5)</sup>		-			-	
	440V	Α	1	,6	(4) <sup>5)</sup>		-			-	
	500V	Α	1	,2	(3)5)		-			-	
	660-690V	Α	0	,6	(1) <sup>5)</sup>		-				
Utilization category DC13											
Rated operational current l <sub>e</sub>	60V	Α		,5	(8) <sup>5)</sup>		-			-	
	110V	Α	0	,5	(1) <sup>5)</sup>		-			-	
	220V	Α		0,1			-			-	
Short circuit protection				For contactors wi	th thermal overlo	ad relay the d	evice with the	smaller admi	issible cont	rol	
short-circuit current 1kA,				fuse	(contactor or the	rmal overload	relay) deterr	nines the fuse			
contact welding not accepted											
max. fuse size	gL (gG)	Α	2	.0	(25)5)		-			-	
Control Circuit	3 10 - 7				, -,						
Power consumption of coils											
AC operated	inrush	VA		33-45			90-115			140-165	
AC operaled	sealed	VA		7-10			9-13			13-18	
	sealea										
		W		2.6-3			2.7-4			5.4-7	
DC operated	inrush	W		75			140			200	
double winding coil	sealed	W		2			2			6	
DC solenoid operated	inrush	W		3			4			-	
(KG3)	sealed	W		3			4			-	
Operation range of coils											
in multiples of control voltage U <sub>s</sub>											
	AC operated			0.85-1.1			0.85-1.1			0.85-1.1	
	DC operated			0.8-1.1			0.8-1.1			0.8-1.1	
Switching time at control voltage U	J, ±10% 2) 3)										
AC operated	make time	ms		8-16			10-25			12-28	
·	release time	ms		5-13			8-15			8-15	
	arc duration	ms		10-15			10-15			10-15	
DC operated	make time	ms		8-12			10-20			12-23	
double winding coil	release time	ms		8-13			10-15			10-18	
double winding con	arc duration	ms		10-15			10-15			10-15	
DC solenoid operated	make time	ms		65 - 85			65 - 85			10-15	
(KG3)	release time			20 - 30 <sup>4)</sup>			20 - 30 4)			-	
(KG3)		ms		10-15						-	
	arc duration	ms		10-15		-	10-15				
Cable cross-section	1. 1			/							
Auxiliary connector	solid	mm <sup>2</sup>		0.75-6			-			-	
	flexible	mm <sup>2</sup>		1-4			-			-	
	flexible with										
	multicore	mm <sup>2</sup>		0.75-4			-			-	
	cable end										
Magnet coil	solid	$mm^2$		0.75-2.5			0.75-2.5			0.75-2.5	
	flexible	$\mathrm{mm^2}$		0.5-2.5			0.5-2.5			0.5-2.5	
	flexible with										
	multicore	$\mathrm{mm^2}$		0.5-1.5			0.5-1.5			0.5-1.5	
	cable end										
Clamps per pole				2			2			2	
Auxiliary connector	solid	AWG		18 - 10			-			-	
-	flexible	AWG		18 - 10			-			-	
Magnet coil	solid	AWG		14 - 12			14 - 12			14 - 12	
Ŭ	flexible	AWG		18 - 12			18 - 12			18 - 12	
Clamps per pole				2			2			2	
			1			1					

<sup>1)</sup> Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV. Data for other conditions on request



<sup>2)</sup> Total breaking time = release time + arc duration

<sup>3)</sup> Values for delay of the release time of the make contact and the make time of the break contact will be increased, if magnet coils are protected against voltage peaks (varistor, RC-unit. diode-unit)

<sup>4)</sup> with built-in coil suppressor

<sup>5)</sup> for contactors KG3-A.. only.

Auxiliary Contacts		Туре	КЗ-90 КЗ-115	K3-116 K3-151 K3-176	K3-210 K3-260 K3-316	K3-450 K3-550
Rated insulation voltage Ui <sup>1)</sup>		-71-	110 10			110 110 110 110
Thermal rated current I <sub>th</sub> up to	4001/	V~				690
	40°C	۷~ A	-	-	-	10
Ambient temperature	40°C	A	-	-	-	10
Utilization category AC15	00 C		-	-	-	-
Rated operational current I <sub>e</sub>	220-240V	A	-	-	-	3
kalea operational current i <sub>e</sub>	380-415V	A	-	-	-	2
	440V	A	_			1.5
	500V	A	_	_		1.5
	660-690V	Α	_	_	_	1
Utilization category DC13						
	(0)/					
Rated operational current l <sub>e</sub>	60V	A	-	-	-	- 1
	110V	A A	-	-	-	0.5
	220V	Α	-	-	-	0.5
Short-circuit protection						
short-circuit current 1kA						
contact welding not accepted						
max. fuse size	gL (gG)	Α	-	-	-	10
Control circuit						
Power consumption of coils						
AC operated	inrush	VA	165-220	350	360	800-950
·	sealed	VA	2.5-5	5	5	9-11
		W	2.5-5	5	5	9-11
DC operated	inrush	W	250	350	360	700-850
·	sealed	W	5	5	5	8-10
DC solenoid operated (KG3)	inrush	W	-	-	-	-
	sealed	W	-	-	-	-
Operation range of coils						
in multiples of control voltage $U_{\scriptscriptstyle S}$						
	AC operated		0.85-1.1	0.85-1.1	0.85-1.1	0.85-1.1
	DC operated		0.8-1.1	0.85-1.1	0.85-1.1	0.85-1.1
Switching time at control volta	ge U, ±10% <sup>2)3)</sup>					
AC operated	make time	ms	20-35	30-60	40-60	50-100
	release time	ms	35-50	30-80	15-45	150-200 / 500-1000 <sup>1)</sup>
	arc duration	ms	10-15			_
DC operated	make time		20-35	30-60	40-60	
double winding coil	release time	ms ms	35-50	30-80	15-45	-
double willding con	arc duration	ms	10-15	-	-	_
DC solenoid operated	make time	ms	-	_	_	
(KG3)	release time	ms	_	_		
(1.00)	arc duration	ms	_	_	_	_
Cable cross-sections						
Auxiliary connector	solid	mm <sup>2</sup>	_	_	_	0.75-2,5
, textinary commedies	flexible	mm <sup>2</sup>	_	<u>-</u>	_	0.75-2,5
	flexible with					
	multicore cable end	mm <sup>2</sup>	-	-	-	-
Magnet coil	solid	mm <sup>2</sup>	0.75-2.5	1-2.5	1-2.5	1-2.5
	flexible	$\mathrm{mm}^2$	0.5-2.5	1-2.5	1-2.5	1-2.5
	flexible with	mm <sup>2</sup>	0.5-1.5	_	_	_
	multicore cable end	111111-				
Clamps per pole	1- 1	41470	2	2	2	2
Auxiliary connector	solid	AWG	-	-	-	16 - 12
Mt:I	solid	AWG AWG	- 14 - 12	- 16 - 12	16 - 12	16 - 12 16 - 12
Magnet coil	solid solid	AWG	14 - 12	16 - 12	16 - 12	16 - 12
Clamps per pole	JUIIU	7440	2	2	2	2
Ciambs her hore						

<sup>1)</sup> Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV. Data for other conditions on request



<sup>2)</sup> Total breaking time = release time + arc duration

<sup>3)</sup> Values for delay of the release time of the make contact and the make time of the break contact will be increased, if magnet coils are protected against voltage peaks (varistor, RC-unit, diode-unit)

Main contacts		Туре	K2-23	K2-30	K2-37	K2-45	K2-60
Rated insulation voltage U <sub>i</sub> 1)		V~	690	690	690	690	690
Making capacity I <sub>eff</sub>	at $U_e = 690V$ AC	Α	400	500	500	700	900
Breaking capacity I <sub>eff</sub>	400V~	Α	380	400	400	600	800
K2-09 to K2-16	$\cos \varphi = 0.65$ 500V AC	Α	300	370	370	500	700
K2-23 to K3-1200	$\cos \varphi = 0.35$	Α	260	340	340	400	500
	1000V~	Α	-	-	-	-	-
Utilization category AC1 Switching of resistive load							
Rated operational current I <sub>e</sub> (=I <sub>th</sub> )							
at 40°C, open		Α	45	50	50	80	100
Rated operational power	220V	kW	17	19	19	30	38
of three-phase resistive loads	230V	kW	18	20	20	31,5	40
$50-60$ Hz, $\cos \varphi = 1$	240V	kW	18,5	20,5	20,5	33	41
•	380V	kW	29,5	33	33	52	65
	400V	kW	31	34,5	34,5	55	69
	415V	kW	32	36	36	57	71
	440V	kW	34	38	38	61	76
	500V	kW	39	43	43	69	86
	660V	kW	51	57	57	91	114
	690V	kW	53,5	60	60	95	119
Rated operational current I <sub>e</sub> (=I <sub>the</sub> )		Α	35	40	40	63	80
at 60°C, enclosed	220V	kW	13	15	15	24	30
Rated operational power	230V	kW	13,5	16	16	25	31,5
of three-phase resistive loads	240V	kW	14,5	16,5	16,5	26	33
50-60Hz, $cosφ = 1$	380V	kW	23	26	26	41	52
•	400V	kW	24	27,5	27,5	43	55
	415V	kW	25	28,5	28,5	45	57
	440V	kW	26,5	30	30	48	61
	500V	kW	30	34	34	54	69
	660V	kW	40	45	45	72	91
	690V	kW	42	48	48	<i>7</i> 5	95
Minimum cross-section of conductor at load with I <sub>a</sub> (=I <sub>b</sub> )		$mm^2$	10	10	10	25	35
Utilization category AC2 and AC3							
Switching of three-phase motors							
Rated operational current I <sub>e</sub>	220V	Α	23	30	37	45	63
open and enclosed	230V	Α	23	30	37	45	61
•	240V	Α	23	30	37	45	60
	380-400V	Α	23	30	37	45	60
	415-440V	Α	23	30	37	45	60
	500V	Α	23	30	30	45	55
	660V	Α	17,5	21	21	33	42
	690V	Α	17	20	20	31	40
Rated operational power	220-230V	kW	6	8,5	11	12,5	18,5
of three-phase motors	240V	kW	7	9	11,5	13,5	19
50-60Hz	380-400V	kW	11	15	18,5	22	30
	415V	kW	12	16	20	24	33
	440V	kW	12	16	20	24	33
	500V	kW	15	18,5	18,5	30	37
	660-690V	kW	15	18,5	18,5	30	37

<sup>1)</sup> Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV. Data for other conditions on request.



Main contacts		Туре	K2-23	K2-30	K2-37	K2-45	K2-60
Utilization category AC4							
Switching of squirrel cage motors, inchi	ing						
Rated operational current I <sub>e</sub>	220V	Α	23	30	37	45	63
open and enclosed	230V	Α	23	30	37	45	61
'	240V	Α	23	30	37	45	60
	380-400V	Α	23	30	37	45	60
	415V	A	21	28	37	45	60
	440V	A	21	28	37	45	60
	500V	A	17	23	23	45	55
	660V	Ā	13	17	17	33	42
	690V	A		16,5	16,5	31	40
D. I I	220-230V		12,5				
Rated operational power		kW	6	8,5	11	12,5	18,5
of three-phase motors	240V	kW	7	9	11,5	13,5	19
50-60Hz	380-400V	kW	11	15	18,5	22	30
	415-440V	kW	11	15	20	24	33
	500V	kW	11	15	15	30	37
	660-690V	kW	11	15	15	30	37
Utilization category AC5a							
Switching of gas discharge lamps							
Rated operational current le							
per pole at 220/230V							
Fluorescent lamps, uncompensated		Α	35	40	40	65	85
Fluorescent lamps, compensated		Α	18	22	22	30	40
Fluorescent lamps, dual-connection		Α	41	45	45	72	90
Metal-halide lamps <sup>1)</sup> , uncompensated		A	28	30	30	50	62
Metal-halide lamps <sup>1)</sup> , compensated		A	18	22	22	30	40
Mercury-vapour lamps <sup>2</sup> , uncompensated		A	41	45	45	72	90
Mercury-vapour lamps <sup>2)</sup> , compensated			18	22	22	30	40
Mercury-vapour lamps , compensated		A	35		40		
Mixed light lamps <sup>3)</sup>		A	33	40	40	65	85
Utilization category AC5b							
Switching of incandescent lamps <sup>4)</sup>							
Rated operational current l <sub>e</sub>							
per pole at 220/230V		Α	25	31	31	43	56
Utilization category AC6 <sub>A</sub>							
Transformer primary switching							
at inrush		n	30	30	30	30	30
Rated operational current I <sub>e</sub>	400V	Α	10,5	13,5	13,5	20	27
Rated operational power	220-230V	kVA	4,2	5,4	5,4	8	10,7
	240V	kVA	4,3	5,6	5,6	8,3	11,2
dependent on inrush n	380-400V	kVA	7,3	9,3	9,3	13,5	18,5
For different inrush-factors x	415-440V	kVA	8	10,2	10,2	15	20,5
use the following formula:	500V	kVA	9	11,5	11,5	17	23
Px=Pn*(n/x)	660-690V	kVA	12,5	16	16	24	32
Utilization category DC1	000-0904	KVA	12,3	10	10	24	32
Switching of resistive load		.	4-		5.0		
Time constant L/R ≤1 ms	1 pole 24V	A	45	50	50	80	100
Rated operational current l <sub>e</sub>	60V	A	45	50	50	80	100
	110V	A	10	10	10	12	12
	220V	A	1,4	1,4	1,4	1,4	1,4
2	poles in series 24V	A	45	50	50		
	60V	Α	45	50	50		
	110V	Α	45	50	50		
	220V	Α	10	10	10		
3 :	poles in series 24V	Α	45	50	50	80	100
- 1	60V	A	45	50	50	80	100
	110V	A	45	50	50	80	100
	220V	A	30	35	35	63	80

<sup>1)</sup> Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)



<sup>2)</sup> High-pressure lamps

<sup>3)</sup> Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps)

<sup>4)</sup> Current inrush approx. 16 x l<sub>e</sub>

<sup>5)</sup> With central compensation pay attention to the current inrush (capacitor switching contactors)

Main contacts		Туре	K2-23	K2-30	K2-37	K2-45	K2-60
Utilization category DC3 and DC5							
Switching of shunt motors							
and series motors							
Time constant L/R ≤15ms	1 pole 24V	Α	45	50	50	80	100
Rated operational current l <sub>e</sub>	60V	Α	30	30	30	60	60
	110V	Α	1,8	1,8	1,8	1,8	1,8
	220V	Α	0,2	0,2	0,2	0,25	0,25
2 poles in se	ries 24V	Α	45	50	50		
	60V	Α	45	50	50		
	110V	Α	30	30	30		
	220V	Α	1,8	1,8	1,8		
3 poles in se	ries 24V	Α	45	50	50	80	100
·	60V	Α	40	40	40	80	80
	110V	Α	40	40	40	80	80
	220V	Α	4	4	4	5	5
Maximum ambient temperature					1		
Operation	open	°C		-	40 to +60 (+90)	1)	
•	enclosed	°C			-40 to +40		
vith thermal overload relay	open	°C			-25 to +60		
······································	enclosed	°C			-25 to +40		
· ·	enciosed						
Storage Short circuit protection		°C			-50 to +90		
or contactors without thermal overload relay, Coordinatio max. fuse size	gL (gG)	Α	80	80	80	160	160
	ntact welding accepted						
Coordination-type "2" according to IEC 947-4-1, Light co	ntact welding accepted gL (gG)	А	50	50	50	100	125
Coordination-type "2" according to IEC 947-4-1, Light co max. fuse size		А	50	50	50	100	125
Coordination-type "2" according to IEC 947-4-1, Light co max. fuse size Contact welding not accepted max. fuse size	gL (gG)	А	25	35	35	50	125
Coordination-type "2" according to IEC 947-4-1, Light co nax. fuse size Contact welding not accepted nax. fuse size	gL (gG)	А	25	35	35	50	
Coordination-type "2" according to IEC 947-4-1, Light co max. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with	gL (gG)	А	25	35	35	50	
Coordination-type "2" according to IEC 947-4-1, Light co max. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections	gL (gG)	А	25	35	35	50 size.	63
Coordination-type "2" according to IEC 947-4-1, Light common that size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay	gL (gG)	А	25	35	35	50 size.	63 35 <sup>2)</sup>
Coordination-type "2" according to IEC 947-4-1, Light common that size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay	gL (gG) gL (gG) the smaller admissible backu	A up fuse (conto	25	35 overload relay) d	35	50 size.	63
Coordination-type "2" according to IEC 947-4-1, Light co max. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections or contactors without thermal overload relay	gL (gG)  gL (gG) the smaller admissible backu	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6	35	50 size.	63 35 <sup>2)</sup>
Coordination-type "2" according to IEC 947-4-1, Light common that size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector	gL (gG)  gL (gG)  the smaller admissible backu  solid or stranded flexible flexible with multicore cable end	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1	35 etermines the fuse	50 size. 4 - : 6 - : 4 -	63 35 <sup>2)</sup> 25 <sup>2)</sup>
Coordination-type "2" according to IEC 947-4-1, Light common transmission of the common transmission of the common transmission of the contact welding not accepted max. fuse size  For contactors with thermal overload relay the device with the contactors with thermal overload relay the device with the contactors without thermal overload relay main connector	gL (gG) gL (gG) the smaller admissible backs solid or stranded flexible flexible with multicore cable end solid	A up fuse (conto mm² mm²	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4	35 etermines the fuse	50 size. 4 - : 6 - : 4 -	63 35 <sup>2)</sup> 25 <sup>2)</sup>
Coordination-type "2" according to IEC 947-4-1, Light common that size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector	gL (gG)  gL (gG)  the smaller admissible backu  solid or stranded flexible flexible with multicore cable end	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1	35 etermines the fuse	50 size. 4 - : 6 - : 4 -	63 35 <sup>2)</sup> 25 <sup>2)</sup>
Coordination-type "2" according to IEC 947-4-1, Light conax. fuse size Contact welding not accepted nax. fuse size for contactors with thermal overload relay the device with Cable cross-sections or contactors without thermal overload relay nain connector  Cables per clamp nain connector  Cables per clamp	gL (gG) gL (gG) the smaller admissible backs solid or stranded flexible flexible with multicore cable end solid	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10	35 etermines the fuse	50 size. 4 - : 6 - : 4 -	63 35 <sup>2)</sup> 25 <sup>2)</sup> 25 1
Coordination-type "2" according to IEC 947-4-1, Light conax. fuse size Contact welding not accepted nax. fuse size for contactors with thermal overload relay the device with Cable cross-sections or contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp	gL (gG) gL (gG) the smaller admissible backs solid or stranded flexible flexible with multicore cable end solid	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 14 - 8 + 14 - 10	35 etermines the fuse	50 size. 4 - : 6 - : 4 -	63  35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 0 - 2
Coordination-type "2" according to IEC 947-4-1, Light commax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z	gL (gG) gL (gG) the smaller admissible backs solid or stranded flexible flexible with multicore cable end solid	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 14 - 8 + 14 - 10	35 etermines the fuse	50 size. 4 - : 6 - : 4 -	63  35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 0 - 2
Coordination-type "2" according to IEC 947-4-1, Light conax. fuse size Contact welding not accepted nax. fuse size For contactors with thermal overload relay the device with Cable cross-sections or contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z	gL (gG) gL (gG) the smaller admissible backs solid or stranded flexible flexible with multicore cable end solid	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 14 - 8 + 14 - 10	35 etermines the fuse	50 size. 4 - 6 - 3 4 -	63 35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 0 - 2
Coordination-type "2" according to IEC 947-4-1, Light commax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z	gL (gG) gL (gG) the smaller admissible backu solid or stranded flexible flexible with multicore cable end solid flexible	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 14 - 8 + 14 - 10 1+1	35 etermines the fuse	50 size. 4 - 6 - 1 10	63 35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 0 - 2
Coordination-type "2" according to IEC 947-4-1, Light commax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z	gL (gG) gL (gG) the smaller admissible backu solid or stranded flexible flexible with multicore cable end solid flexible	A up fuse (conto  mm² mm² mm² AWG AWG	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 14 - 8 + 14 - 10 1+1	35 etermines the fuse	50 size. 4 - : 6 - : 4 - 1 10	63 35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 0 - 2 1
Coordination-type "2" according to IEC 947-4-1, Light conax. fuse size Contact welding not accepted nax. fuse size For contactors with thermal overload relay the device with Cable cross-sections or contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z	gL (gG) gL (gG) the smaller admissible backu solid or stranded flexible flexible with multicore cable end solid flexible without load AC3, Ie	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 14 - 8 + 14 - 10 1+1	35 etermines the fuse	50 size.  4 - : 6 - : 1 10	63 35 <sup>21</sup> 25 <sup>25</sup> 10 0 - 2 1
Coordination-type "2" according to IEC 947-4-1, Light comax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z  Contactors without thermal overload relay	gL (gG) gL (gG) the smaller admissible backu solid or stranded flexible flexible with multicore cable end solid flexible without load AC3, Ie AC4, Ie	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 1+1 7000 600 120	35 etermines the fuse	50 size.  4 - : 6 - : 1 10	63 35 <sup>21</sup> 25 <sup>22</sup> 25 1 0 - 2 1
Coordination-type "2" according to IEC 947-4-1, Light commax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z Contactors without thermal overload relay	gL (gG) gL (gG) the smaller admissible backu solid or stranded flexible flexible with multicore cable end solid flexible without load AC3, Ie AC4, Ie	A  up fuse (conto  mm²  mm²  mm²  AWG  AWG  1/h  1/h  1/h  1/h  1/h	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 1+1 7000 600 120	35 etermines the fuse	50 size.  4 - : 6 - : 1 10  70 44 12 44	63 35 <sup>21</sup> 25 <sup>22</sup> 25 1 0 - 2 1
Coordination-type "2" according to IEC 947-4-1, Light comax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections For contactors without thermal overload relay main connector Cables per clamp Frequency of operations z Contactors without thermal overload relay  Mechanical life AC operated	gL (gG) gL (gG) the smaller admissible backu solid or stranded flexible flexible with multicore cable end solid flexible without load AC3, Ie AC4, Ie	A up fuse (conto	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 1+1 7000 600 120 600	35 etermines the fuse	50 size.  4 - : 6 - : 1 10  70 44 12 40	63 35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 0 - 2 1 1 1 000 000 000 000
Coordination-type "2" according to IEC 947-4-1, Light comax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z  Contactors without thermal overload relay  Mechanical life AC operated DC operated with economy resistor	gL (gG) gL (gG) the smaller admissible backu solid or stranded flexible flexible with multicore cable end solid flexible without load AC3, Ie AC4, Ie	A  up fuse (conto  mm²  mm²  mm²  AWG  AWG  1/h  1/h  1/h  1/h  1/h	25	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 1+1 7000 600 120 600	35 etermines the fuse	50 size.  4 - : 6 - : 1 10  70 44 12 40	63  35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 00 2 1 000 00 00 00 00
Coordination-type "2" according to IEC 947-4-1, Light comax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z  Contactors without thermal overload relay  Mechanical life AC operated DC operated with economy resistor  Short time current	gL (gG) gL (gG) the smaller admissible backs solid or stranded flexible flexible with multicore cable end  solid flexible without load AC3, I <sub>e</sub> AC4, I <sub>e</sub> DC3, I <sub>e</sub>	A up fuse (conto  mm² mm² mm² AWG AWG  1/h 1/h 1/h 1/h 1/h 5 x 106 5 x 106	25 actor or thermal	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 14 - 8 + 14 - 10 1+1 7000 600 120 600	35 etermines the fuse	50 size. 4 - : 6 - : 1 10 70 40 12 40	63 35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 0 - 2 1 1 000 00 00 00 00
Coordination-type "2" according to IEC 947-4-1, Light commax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z  Contactors without thermal overload relay  Mechanical life AC operated DC operated with economy resistor  Short time current  Power loss per pole	gL (gG) gL (gG) the smaller admissible backs solid or stranded flexible flexible with multicore cable end solid flexible without load AC3, I <sub>e</sub> AC4, I <sub>e</sub> DC3, I <sub>e</sub>	A  up fuse (conto  mm² mm²  mm²  AWG  AWG  1/h  1/h  1/h  1/h  1/h  1/h  A  S x 106  S x 106  A	25 actor or thermal	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 14 - 8 + 14 - 10 1+1 7000 600 120 600	35 etermines the fuse	50 size.  4 - 3 6 - 3 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 -	63  35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 0 - 2 1 1 000 00 00 0 504
Coordination-type "2" according to IEC 947-4-1, Light comax. fuse size Contact welding not accepted max. fuse size For contactors with thermal overload relay the device with Cable cross-sections for contactors without thermal overload relay main connector  Cables per clamp main connector  Cables per clamp Frequency of operations z  Contactors without thermal overload relay  Mechanical life AC operated DC operated with economy resistor  Short time current	gL (gG) gL (gG) the smaller admissible backs solid or stranded flexible flexible with multicore cable end  solid flexible without load AC3, I <sub>e</sub> AC4, I <sub>e</sub> DC3, I <sub>e</sub>	A  up fuse (conto  mm² mm²  mm²  AWG  AWG  1/h  1/h  1/h  1/h  1/h  1/h  A	25 actor or thermal	35 overload relay) d 1,5-10 + 1,5-6 1,5-6 + 1,5-4 1,5-6 + 1,5-4 1+1 14 - 10 + 14 - 10 14 - 8 + 14 - 10 1+1 7000 600 120 600	35 etermines the fuse	50 size. 4 - : 6 - : 1 10 70 40 12 40	63 35 <sup>2)</sup> 25 <sup>2)</sup> 25 1 0 - 2 1 1 000 00 00 0 504

<sup>1) 90°</sup> reduces the control voltage range to 0.9 up to  $1.0xU_s$  and reduces the rated current  $I_e/AC1$  to the value of  $I_e/AC3$ 



<sup>2)</sup> Maximum cable cross-section with prepared conductor

# Technical Specification - Electromechanical Contactors Series LA

### Power Contactors

Auxiliary contacts	Туре	K2-23	K2-30	K2-37	K2-45	K2-60
Rated insulation voltage U <sub>i</sub> 1)	V AC		690			-
Thermal rated current I <sub>th</sub> to 690V						
Ambient temperature 40 °C	Α		16			-
60 °C	Α		12			-
Jtilization category AC15						
Rated operational current I <sub>e</sub> 220-240V	А		12			-
380-415V	А		4			-
440V	Α		4			-
500V	А		3			-
660-690V	A		1			-
Jtilization category DC13						
Rated operational current I <sub>e</sub> 60V	А		8			_
110V	A		1			_
220V	A		0,1			_
Short circuit protection	,,		٠, .			
hort-circuit current 1kA,						
contact welding not accepted						
nax. fuse size gL (gG)	A					
or contactors with thermal overload relay the device with the smaller admissible co		ator or thormal avarl	- a a d salaw) da	starminas tha fusa		-
or contactors with thermal overload relay the device with the smaller damissible co Control Circuit	l l	ctor or mermal overi	oda reidy) de	erermines the tuse.		
Power consumption of coils			00 115		1.40	17.5
AC operated inrush	VA		90-115			-165
sealed	VA		9 - 13			-18
	W		2.7-4			4-7
OC operated inrush	W		140			00
with economic circuit sealed	W		2			6
Operation range of coils						
n multiples of control voltage U <sub>s</sub> AC operated			0.85-1.1			5-1.1
DC operated			0.8-1.1		0.8	-1.1
Switching time at control voltage Us ±10% <sup>2)3)</sup>						
AC operated make time	ms		10-25			-28
release time	ms		8-15			15
arc duration	ms		10-15		10	-15
DC operated make time	ms		10-20		12	-23
with AC magnet system release time	ms		10-15		10	-18
arc duration	ms		10-15		10	-15
Cable cross-section						
Auxiliary connector solid	mm <sup>2</sup>		-			-
flexible	mm <sup>2</sup>		-			-
flexible with multico	ore					
cable end	mm <sup>2</sup>		-			-
Magnet coil solid	mm <sup>2</sup>		0.75-2.5		0.75	5-2.5
flexible	mm <sup>2</sup>		0.5-2.5		0.5	-2.5
	are.					1.5
flexible with multico						
flexible with multico cable end	mm <sup>2</sup>		0.5-1.5		0.5	-1.5

<sup>1)</sup> Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV. Data for other conditions on request



<sup>2)</sup> Total breaking time = release time + arc duration

<sup>3)</sup> Values for delay of the release time of the make contact and the make time of the break contact will be increased, if magnet coils are protected against voltage peaks (varistor, RC-unit, diode-unit)

### Contact Life

For selection of the suitable contactor-type according to supply voltage, power rating and application (utilization category AC1, AC3 or AC4) use contact life characteristic diagram.

For the most common supply voltages four scales of power ratings  $P_n$  are provided for each utilization category.

Select contactor-type according to utilization category AC3 (breaking current  $I_o = I_e$ ) using the motor rating scales to the right, according to

utilization category AC4 (breaking current  $I_{\rm a}$  = 6 x  $I_{\rm e}$ ) using the motor rating scales to the left.  $^{1)}$ 

Select contactor-type according to utilization category AC1 (breaking current  $I_o$  =  $I_o/AC1$ ) using the breaking current scale. <sup>1)</sup>

For contactors frequently used under AC3/AC4-mixed service conditions calculate contact life with the formula:

$$M = \frac{AC3}{1 + \frac{\%AC4}{100}} \times (\frac{AC3}{AC4} - 1)$$

M = Contact life (switching cycles) for AC3/AC4-mixed operations AC3 = Contact life (switching cycles) for AC3 operations (normal switching conditions).

Breaking current I<sub>a</sub> = rated motor current I<sub>n</sub>.

AC4 = Contact life (switching cycles) for AC4 operations (inching).

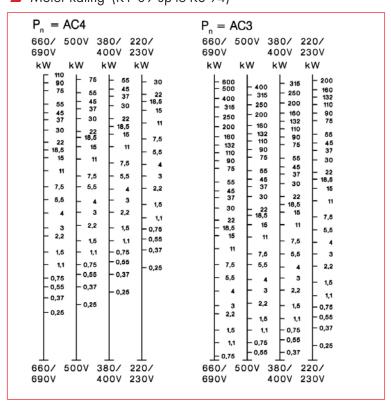
Breaking current Ia= multiples of rated motor current In-

%AC4 = Percents of AC4-operations related to the total cycles.

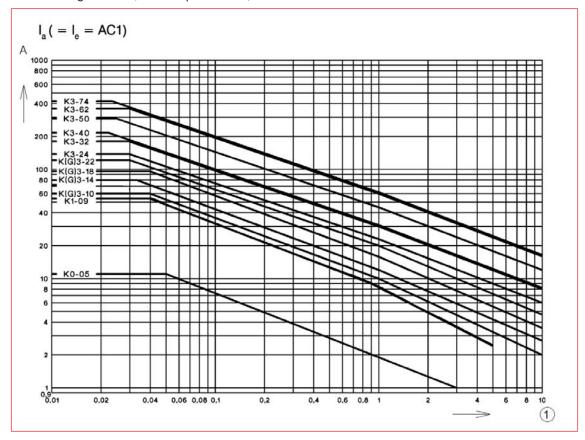
1) Pay attention to the approved rated values of the selected contactor according to the national approvals

### Power Contactors - Contact life

### ■ Motor Rating (K1-09 up to K3-74)

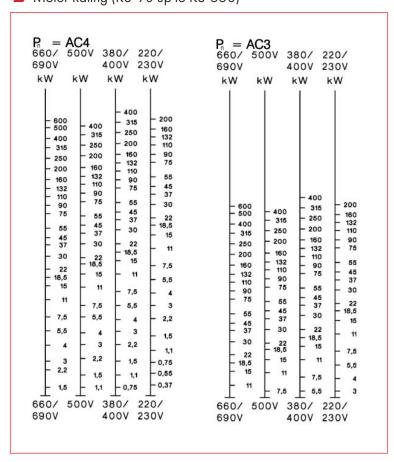


- Power Contactors Contact life
- Breaking Current (K1-09 up to K3-74)

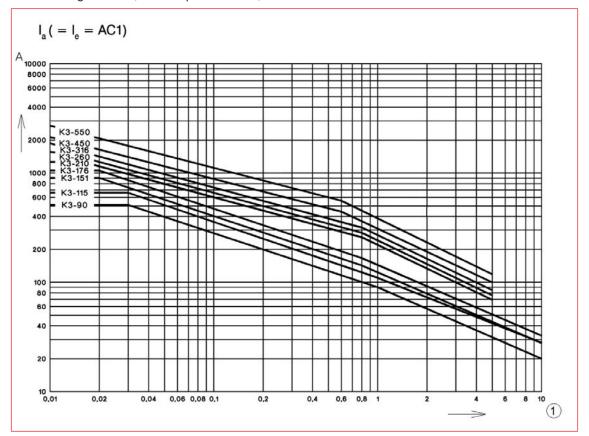


1) Millions of Operations

■ Motor Rating (K3-90 up to K3-550)



- Power Contactors Contact life
- Breaking Current (K3-90 up to K3-550)



1) Millions of Operations

## Accessories - Auxiliary Contacts and Latch

## ■ Technical Specifications according to IEC 947-5-1, EN 60947-5-1, VDE 0660

Туре			HN	HTN	HA	НВ	HKT/HKA	HKF	K2-L <sup>2)</sup>
Rated insulation voltage U <sub>i</sub> 1)		V AC	690	690	690	690	690	690	690
Thermal rated current I <sub>th</sub>	to 690V								
Ambient temperature	max. 40°C	Α	10	10	25	10	10	16	10
	max. 60°C	Α	6	6	20	6	-	-	6
Frequency of operations z		1/h	3000	-	3000	3000	-	-	3000
Mechanical life		S x 10 <sup>6</sup>	10	10	10	10	-	-	10
Power loss per pole at I <sub>e</sub> /AC1		W	0.5	0.5	1.5	0.4	-	-	-
Utilization category AC15									
Rated operational	220-240V	Α	3	3	6	3	3	3	3
current le	380-400V	Α	2	2	3	2	2	2	2
	440V	Α	1,6	1,6	2	1,6	1,5	1,5	1,6
	500V	Α	1,2	1,2	2	1,2	1,5	1,5	1
	660-690V	Α	0,6	0,6	1	0,6	1	1	0,5
Utilization category DC13									
Rated operational	60V	Α	2	2	8	2	-	-	2
current le	110V	Α	0.4	0.4	1	0.4	0.5	0.5	0.4
	220V	Α	0.1	0.1	0.1	0.1	0.5	0.2	0.1
Short circuit protection									
short-circuit current 1kA,									
contact welding not accepted									
max. fuse size	gL (gG)	Α	20	20	25	20	10	10	10
For contactors with thermal overload re	elay or auxiliary contacts the device with th	ne smaller	admissible co	ontrol fuse (co	ntactor or the	rmal overloa	d relay) determi	nes the fuse	size.
Cable cross-sections									
	solid or stranded	$\mathrm{mm}^2$				0.75-2.5			
	flexible	$\mathrm{mm}^2$				0.75-2.5			
	flexible with multicore cable end	$mm^2$				0.5-1.5			

solid AWG flexible AWG 18 - 12

Cables per clamp

### Direct on Line Starters D.O.L. with Selector Switch

### D.O.L. Starters with Selector Switch

4	K3-10ND10	2	U12/16 K3	IP65	Ø 20.5mm	P1W10	1	0,6
7.5	K3-18ND10	2	U12/16 K3	IP65	Ø 20.5mm	P1W18	1	0,6
11	K3-22ND10	2	U12/16 K3	IP65	Ø 20.5mm	P1W22	1	0,6

#### **Enclosures for Contactors**

Suitable for	Protection	Conduit Entries		Туре	Pack	Weight
contactor	Degree	Тор	Bottom		pcs.	kg/pc.
K3-07 to K3-22 K3-24 <sup>1)</sup> to K3-40 <sup>1)</sup>	IP65	2 x Ø 20.5mm	2 x Ø 20.5mm	P1	1	0,35

### Enclosures for D.O.L. Starters with reset button

Suitable for	Protection	Conduit Entries		Туре	Pack	Weight
contactor	Degree	Тор	Bottom		pcs.	kg/pc.
K3-10 to K3-22 +U 12/16 K3	IP65	2 x Ø 20.5mm	2 x Ø 20.5mm	P1R	1	0,35

<sup>1)</sup> Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV. Data for other conditions on request. 2) Command duration min. 30ms, 10% duty cycle, max. 30 eec.

## ■ Contactors for Photovoltaic Plants, 1000V DC

### **Rated Operational Current**

DC1			Additional				Pack	Weight
600V	1000V	1200V	Aux. Contacts	Туре		Coil voltage 1)	pcs.	kg/pc
30A	30A	-	2 HKA11	K3PV-30	230	220-230V 50Hz, 240V 60Hz	1	0.9

### Contactors for DC-Switching for PV-installations, as remote controlled fire protection defeat device

In most Photovoltaic-installations, the switch disconnectors according to IEC 60364-7-712 are integrated in the DC/AC-inverter. So the wires between solar-panels and inverter are continuously under voltage.

According to ÖVE-R11-1: 2013, Photovoltaic installations must have a fire protection defeat device.

For this purpose, contactors for DC switching, used as a fire protection defeat device, can switch off the Photovoltaic-installation with a remote controlled fire brigade Emergency-Stop button.

1) Other coil voltages from 24 to 600VAC, on request

### Technical Specifications

Туре				K3PV-30
Rated insulation voltage			VDC	1000
U <sub>imp</sub>			kV	8
Pole in series				6
DC1	600VDC	l <sub>e</sub>	A	30
DC1	1000VDC	ا	A	30
DC1	1200VDC	l <sub>e</sub>	A	-
DC3/5	310VDC	ا	A	15
DC3/5	460VDC	l <sub>e</sub>	A	15
DC3/5	600VDC	I <sub>e</sub>	A	
Main pole resistance			mOhm	1.8
Poles in series resistance			mOhm	10.8
Mechanical life			106	10
Protection degree				IP20
Main poles				
Cable cross sections			mm <sup>2</sup>	2 x 1.5 - 10
Tightening torque			Nm	2.3 - 2.7
Mounting				DIN-rail or screws
Operating range of coils			Uc	0.85 - 1.1
Power consumption of coils				
AC .	inrush		VA	180
	sealed		VA/W	18 / 6
DC	inrush		w	230
	sealed		w	5
Suppressor Unit				
Coil			AC	-
x integrated			DC	-
Switching time				
AC	make time		ms	10 - 25
	release time		ms	6 - 18
DC	make time		ms	15 - 25
	release time		ms	40 - 70
Maximum ambient temperature			-	
Operation °C				-40 to +40 (+70) 2)
Storage °C				-40 to +70
Short circuit protection for contactors				
Coordination-type "1"				
max. fuse size gPV				
5. · · · · · · · · · · · · · · · · · · ·	600 VDC	Α		<del>-</del>
	1000 VDC	Α		63
Coordination-type "2"				
max. fuse size gPV				
	400 VDC	Α	1	_
	600 VDC	_		
	1000 VDC	A		50

<sup>2) &</sup>gt; 40° ... 1% / C° de-rating (e.g.. at 60°C 20% de-rating)



## General Information - Main Contacts for Contactors LSD, LSR, LSS and LSU

### Endurance of the Main Contacts

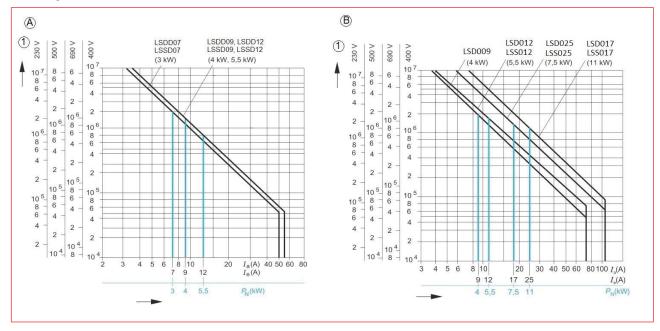
The characteristic curves show the contact endurance of the contactors when switching resistive and inductive AC loads (AC-1/AC-3) depending on the breaking current and rated operational voltage. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system. The rated operational current le complies with utilization category AC-4 (breaking six times the rated operational current) and is intended for a contact endurance of at least 200 000 operating cycles.

If a shorter endurance is sufficient, the rated operational current 1 e /AC-4 can be increased. If the contacts are used for mixed operation, i.e. normal switching (breaking the rated operational current according to utilization category AC-3) in combination with intermittent inching (breaking several times the rated operational current according to utilization category AC-4), the contact endurance can be calculated approximately from the following equation:

$$X = \frac{A}{1 + \frac{C}{100} \left(\frac{A}{B} - 1\right)}$$

- X Contact endurance for mixed operation in operating cycles
- A Contact endurance for normal operation ( $I_a = I_e$ ) in operating cycles
- B Contact endurance for inching (  $I_a$  = multiple of  $I_e$  ) in operating cycles
- C Inching operations as a percentage of total switching operations

### Diagram: Endurance of the Main Contacts - Size 00/0



A) Size 00

 $P_N$  = Rated power for squirrel-cage motors at 400V

B) Size O

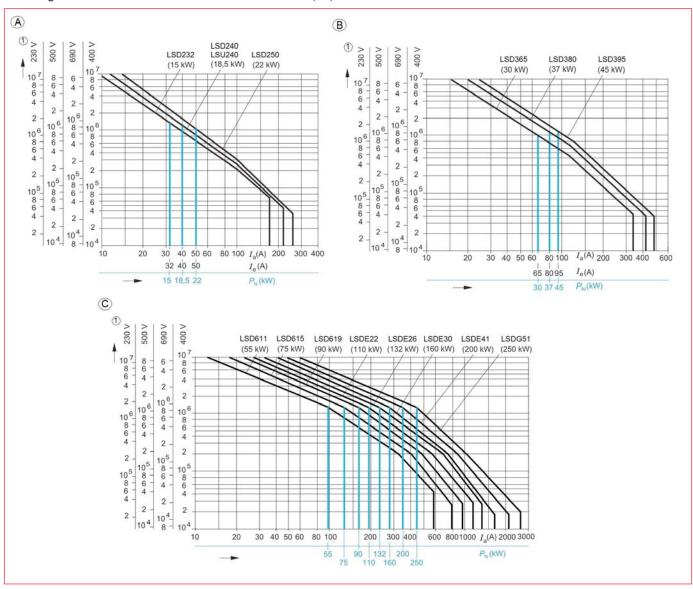
 $I_{\alpha}$  = Breaking current

1) Operating cycles

I<sub>e</sub> = Rated operational current

### General Information - Main Contacts for Contactors LSD, LSR, LSS and LSU

■ Diagram: Endurance of the Main Contacts - Size 2/3/6-12



A) Size 2 B) Size 3 1) Operating cycles

C) Size 6 (LSD6)

 $P_N$  = Rated power for squirrel-cage motors at 400V

Size 10 (LSDE) Size 12 (LSDG)  $I_a$  = Breaking current  $I_e$  = Rated operational current

#### Electromagnetic compatibility (EMC)

Limited value class

The contactors with solid-state operating mechanism comply with the requirements for operation in industrial installations.

#### Interference immunity

•	Emitted interference			
	Electromagnetic field	IEC 61000-4-3	10V/m	
	Electrostatic discharge	IEC 61000-4-2	8/15kW	
	Surge	IEC 61000-4-5	4kW	
	Burst	IEC 61000-4-4	4kW	

EN 55011



## Technical Specification - Electromechanical Contactors Series ALEA LS

## General Information - Auxiliary Contacts for Contactors LSD, LSR, LSS and LSU

### Rated Data of the Auxiliary Contacts

ALEA controls are climate-proof and are suitable and tested for use worldwide.

If the devices are used in ambient conditions which deviate from common industrial conditions (EN60721-3-3 "Stationary Use, Weather-Protected"), the manufacturer must be consulted about possible restrictions with regard to the reliability and endurance of the device and possible protective measures.

Туре			LSS, LSD
Size			00 12
Rated data of the auxiliary contacts			
Acc. to IEC 60947-5-1/EN 60947-5-1 (VDE 0660 Part 200)			
The data apply to integrated auxiliary contacts and contacts in the auxiliary	contact blocks for contactor sizes 00 to	12 1)	
Rated insulation voltage U; (degree of pollution <sup>3)</sup>		V	690
For LSZ laterally mountable auxiliary contact blocks		V	max. 500
Continuous thermal current Ith = Rated operational current Ic/A	C-12	A	10
AC load			
Rated operational current I <sub>e</sub> /AC-15/AC-14			
for rated operational voltage U <sub>e</sub>	24V	Α	6
	110V	A	6
	125V	A	6
	220V	Α	6
	230V	Α	6
	380V	Α	3
	400V	Α	3
	500V	Α	2
	660V <sup>2)</sup>	Α	1
	690V <sup>2)</sup>	Α	1
DC load			
Rated operational current I <sub>e</sub> /DC-12			
or rated operational voltage U <sub>e</sub>			
, , ,	24V	Α	10
	60V	Α	6
	110V	Α	3
	125V	Α	2
	220V	Α	1
	440V	A	0.3
	600V <sup>2)</sup>	A	0.15
Rated operational current I <sub>e</sub> /DC-13			
for rated operational voltage U <sub>e</sub>			
1	24V	Α	10 1)
	60V	A	2
	110V	A	1
	125V	A	0.9
	220V	A	0.3
	440V	A	0,14
	600V <sup>2)</sup>	A	0,1
Contact reliability at 17V, 1mA acc. to EN 60947-5-4		< 10 <sup>-8</sup> i.e. <1 fault per 100 million o	

<sup>1)</sup> Attachable auxiliary contact blocks for size S00 and laterally mountable auxiliary contact blocks for 0 to 12: 6A

### Endurance of the Auxiliary Contacts

It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

The contact endurance is mainly dependent on the breaking current.

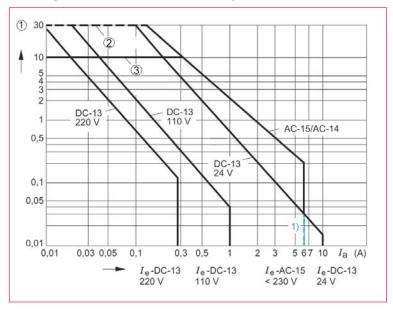
The characteristic curves apply to

- Integrated auxiliary contacts for LSS/LSD
- LSZ..... auxiliary contact blocks for contactor sizes 00 to 12.



<sup>2)</sup> Up to 500V switching capacity for laterally mountable auxiliary contact blocks.

- General Information Auxiliary Contacts for Contactors LSD, LSR, LSS and LSU
- Diagram: Endurance of the Auxiliary Contacts



#### Legend:

- I<sub>a</sub> = Breaking current
- $I_e$  = Rated operational current
- 1) Million operating cycles
- 2) Basic unit
- 3) Basic unit with auxiliary block snapped on

# Technical Specification - Electromechanical Contactors Series ALEA LS

## Contactors LSDD, LSSD and LSUD

General Data - Contactors LSDD, LSSD

Туре			LSDD, LSSD
Size			00
Allgemeine Daten			
Permissible mounting position	AC and DC operation		360° 22,5° 22,5°
The contactors are designed for			With DC operation and slope to the front until 22,5°
operation on a vertical mounting surface.			Operating range 0.85 1.1 x U <sub>s</sub>
Upright mounting position:	AC operation		Special version required.
	DC operation		Standard version
Mechanical endurance	Basic unit	Operating	30 million
	Basic unit with snap-on auxiliary contact block	cycles	10 million
	Solid-state compatible auxiliary contact		5 million
et	block		1)
Electrical endurance	······································	V	690
Rated insulation voltage $U_i$ (degree of pollution 3, o Rated impulse withstand voltage $U_{imp}$	vervoltage category III)	kV	6
Safe isolation between the coil and the main contact	s acc to EN 60947-1 Appendix N	V	400
Ambient temperature	During operation	°C	-25 +60
Ambient temperature	During storage	°C	-55 +80
Degree of protection acc. to EN 60947-1, Appendix C	2 0.1g 0.0.0.g0		IP20, coil assembly IP40
Touch protection acc. to EN 50274			Finger-safe
Shock resistance rectangular pulse	AC operation	g/ms	7/5 and 4,2/10
• '	DC operation	g/ms	7/5 and 4,2/10
Shock resistance sine pulse	AC operation	g/ms	9,8/5 and 5,9/10
	DC operation	g/ms	9,8/5 and 5,9/10
Conductor cross-sections			2)
Short-circuit protection for contactors without overlo relays	ad		
-	For short-circuit protection for contactors	with overload re	elays see Overload Relays
Main circuit			
Fuse links gL/gG LV HRC, DIAZED, NEOZED	Type of coordination "1"	Α	35
Acc. to IEC 60947-4-1 / D49EN 60947-4-1	Type of coordination "2"	Α	20
,	Weld-free <sup>3)</sup>	Α	10
Miniature circuit breakers (up to 230 V) with C characteristic		Α	10
Short-circuit current 1 kA, type of coordination "1"			
Auxiliary circuit			
Fuse links gL/gG DIAZED , NEOZED (weld-free protection ${\rm I}_{\rm k}$	≥ 1kA)	Α	10
Miniature circuit breakers up to 230 V with C characteristic S	nort-circuit current I <sub>k</sub> <400A	Α	6

<sup>1)</sup> See "Endurance of the main contacts"



<sup>2)</sup> See "Conductor cross-sections"

<sup>3)</sup> Test conditions according to IEC 60947-4-1

## Contactors LSDD, LSSD and LSUD

## ■ Control-Contactors LSDD, LSSD, LSUD

Туре			LSDD, LSUD	LSSD	
Size			00	00	
Magnetic coil operating range					
AC operation		50Hz	0.8 1.1 x U <sub>s</sub>		
		60Hz	0.85 1.1 x U <sub>s</sub>		
DC operation		up to 50Hz	0.8 1.1 x U,		
- Production		up to 60Hz	0.85 1.1 x U <sub>s</sub>	0.7 1.25 x U <sub>s</sub> (U <sub>s</sub> =17-13VDC	
Power consumption of the magnetic coils (when	n coil is cold and 1.0 x U <sub>s</sub> )			'	
AC operation, 50/60 Hz					
Standard version	<ul> <li>Closing</li> </ul>	VA	27,	/24.3	
	<ul> <li>P.f.</li> </ul>		0.8	/0.75	
	<ul> <li>Closed</li> </ul>	VA	1	4/3.4	
		٧٨		,	
	• P.f.			7/0.27	
<ul> <li>AC operation, 50 Hz, USA/Canada</li> </ul>	<ul> <li>Closing</li> </ul>	VA		26.4	
	<ul> <li>P.f. for closing</li> </ul>			0.81	
	<ul> <li>Closed</li> </ul>	VA	4.7		
	P.f. for closed			0.26	
<ul> <li>AC operation, 60 Hz, USA/Canada</li> </ul>	<ul> <li>Closing</li> </ul>	VA	31.7		
	<ul> <li>P.f. for closing</li> </ul>			).77	
	<ul> <li>Closed</li> </ul>	VA		5.1	
	P.f. for closed			).27	
DC operation	Closing = Closed	W	3.3	2,3	
Permissible residual current of the electronics (v signal)	vith 0				
	<ul> <li>AC operation</li> </ul>		< 3mA x	: (230V/Us)	
	<ul> <li>DC operation</li> </ul>		< 10mA	x (24V/U <sub>s</sub> )	
Operating times <sup>1)</sup>					
Total break time = Opening delay + Arcing time					
AC operation at 0.8 1.1 x U <sub>s</sub>	Closing delay	ms	8	35	
	Opening delay	ms		30	
• DC operation at 0.85 1.1 x U <sub>s</sub>	Closing delay	ms	25	100	
,	Opening delay	ms	7	10	
Arcing time	, ,	ms	10	) 15	
Operating times for 1.0 x U <sub>s</sub> 11					
AC operation	Closing delay	ms	10	25	
•	Opening delay	ms	5	30	
DC operation	Closing delay	ms	30	50	
	Opening delay	ms	7	′ 9	

<sup>1)</sup> The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

### Main Circuit-Contactors LSDD, LSSD, LSUD

Туре			LSDD07, LSSD07	LSDD09, LSSD09	LSDD12, LSSD12, LSUD12
Size			00	00	00
AC capacity					
Utilization category AC-1					
Switching resistive loads					
Rated operational current I <sub>e</sub>	at 40°C up to 690V	Α	18	22	22
	at 60°C up to 690V	Α	16	20	20
Rated power for AC loads <sup>1)</sup>	230V	kW	6.3	7.5	7.5
P.f.= 0.95 (at 60 °C)	400V	kW	11	13	13
	500V	kW	13.8	17	17
	690V	kW	19	22	22
Minimum conductor cross-section	at 40°C	$mm^2$	2.5	2.5	2.5
for loads with $\rm I_e$	at 60°C	mm <sup>2</sup>	2.5	2.5	2.5
Utilization categories AC-2 and AC-3					
Rated operational currents I <sub>e</sub>	up to 400V	Α	7	9	12
	440V	Α	7	9	11
	500V	Α	5	6.5	9
	690V	Α	4	5.2	6.3
Rated power for slipring or squirrel cage	at 230V	kW	2.2	3	3
motors at 50 and 60 Hz	400V	kW	3	4	5.5
	500V	kW	3.5	4.5	5.5
	690V	kW	4	5.5	5.5
Thermal load capacity	10 s current <sup>2)</sup>	Α	56	72	96

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).



## Contactors LSDD, LSSD and LSUD

## ■ Main Circuit-Contactors LSDD, LSSD, LSUD

Type Size			<b>LSDD07, LSSD07</b> 00	<b>LSDD09, LSSD09</b> 00	<b>LSDD12, LSSD12</b> 00
AC capacity					
Power loss per conducting path	at I <sub>e</sub> /AC-3	W	0,42	0,7	1,24
Utilization category AC-4 (at I <sub>a</sub> = 6 x I <sub>e</sub> ) 1)	2		-,		-,
Rated operational current I <sub>e</sub>	up to 400V	Α	6,5	8,5	8,5
Rated power for squirrel-cage motors with 50	•				
and 60Hz	up to 400V	kW	3	4	4
The following applies to a contact endurance of	about 200000				
operating cycles:					
- Rated operational currents I <sub>e</sub>	up to 400V	Α	2,6	4,1	4,1
•	690V	Α	1,8	3,3	3,3
- Rated power for squirrel-cage motors with 50 and	. 0001	1347			
60Hz	at 230V	kW	0,67	1,1	1,1
	400V	kW	1, 15	2	2
	500V	kW	1,45	2	2
	690V	kW	1, 15	2,5	2,5
Utilization category AC-5a					
Switching gas discharge lamps, inductive balla	st per main current pa	ıth at			
230V					
<ul> <li>Uncorrected, rated power per lamp/rated open</li> </ul>	rational current per lamp				
, , , , , , , , , , , , , , , , , , , ,	L 18W/0.37A	Units	54	59	59
	L 36W/0.43A	Units	46	51	51
	L 58W/0.67A	Units	29	32	32
	L 80W/0.79A	Units	25	27	27
DUO switching (two-lamp)	,				
0. 1.	L 18W/0.22A	Units	90 (≜ 2 x 90 lamps)	100 (≜ 2 x 100 lamps)	100 (≜ 2 x 100 lamp
	L 36W/0.42A	Units	47 (≜ 2 x 47 lamps)	52 (≜ 2 x 52 lamps)	52 (≜ 2 x 52 lamps)
	L 58W/0.63A	Units	31 (≜ 2 x 31 lamps)	34 (≜ 2 x 34 lamps)	34 (≜ 2 x 34 lamps)
	L 80W/0.87A	Units	22 (≜ 2 x 22 lamps)	25 (≜ 2 x 25 lamps)	25 (≜ 2 x 25 lamps)
	L 18W/4.5µF/0.11A L 36W/4.5µF/0.21A L 58W/7.0µF/0.32A	Units Units Units	1 <i>7</i> 16 10	22 22 14	22 22 14
	L 80W/7.0µF/0.49A	Units	6	9	9
With solid-state ballast 1) single lamp	1 00 11/7.0μ1/0.47Α	Oillis	9	,	,
vviiii solia-siale ballasi - sirigle latilp	I 10\\/ /4 OUE /O 1O \	Units	49	63	63
	L 18W/6.8µF/0.10A	1			
	L 36W/6.8µF/0.18A	Units	27	35	35
	L 58W/10µF/0.29A	Units	16	23	23
NG 51 1 1 1 1	L 80W/10µF/0.43A	Units	11	14	14
With solid-state ballast 1) two lamp					
	L 18W/10µF/0.18A	Units	27 (≜ 2 x 27 lamps)	35 (≜ 2 x 35 lamps)	35 (≜ 2 x 35 lamps)
	L 36W/10µF/0.35A	Units	14 (≜ 2 x 14 lamps)	18 (≜ 2 x 18 lamps)	18 (≜ 2 x 18 lamps)
	L 58W/22µF/0.52A	Units	9 (≜ 2 x 9 lamps)	12 (≜ 2 x 12 lamps)	12 (≜ 2 x 12 lamps)
	L 00\4/ /00E /0 0 / 4	Units	5 (≜ 2 x 5 lamps)	7 (≜ 2 x 7 lamps)	7 (≜ 2 x 7 lamps)
	L 80W/22µF/0.86A				
		kW	1,3	1,7	1,7
Per main current path at 230/220V		kW	1,3	1,7	
Per main current path at 230/220V Utilization category AC-6a		kW	1,3	1,7	
Per main current path at 230/220V  Utilization category AC-6a switching AC transformers		kW	1,3	1,7	
Per main current path at 230/220V  Utilization category AC-6a switching AC transformers  Rated operational current I <sub>o</sub>	cent lamps	kW			1,7
Per main current path at 230/220V  Utilization category AC-6a switching AC transformers  Rated operational current I <sub>e</sub> for inrush current n = 20	up to 400V	kW A	3,6	5,1	7,2
Per main current path at 230/220V  Utilization category AC-6a switching AC transformers  Rated operational current I <sub>e</sub> for inrush current n = 20	cent lamps				1,7
Per main current path at 230/220V  Utilization category AC-6a switching AC transformers  Rated operational current I <sub>e</sub> for inrush current n = 20	up to 400V	A	3,6	5,1	7,2 5,1
Per main current path at 230/220V  Utilization category AC-6a  witching AC transformers  Rated operational current I <sub>e</sub> for inrush current n = 20 for inrush current n = 30  Rated power P	up to 400V	A	3,6	5,1	7,2
Per main current path at 230/220V  Utilization category AC-6a switching AC transformers  Rated operational current I <sub>e</sub> for inrush current n = 20 for inrush current n = 30  Rated power P	up to 400V up to 400V	A A	3,6 2,4	5,1 3,3	7,2 5,1
Per main current path at 230/220V Utilization category AC-6a switching AC transformers  Rated operational current I <sub>e</sub> for inrush current n = 20 for inrush current n = 30  Rated power P	up to 400V up to 400V at 230V	A A kVA	3,6 2,4 1,4	5,1 3,3 2	7,2 5,1 2,9
Per main current path at 230/220V  Utilization category AC-6a  witching AC transformers  Rated operational current I <sub>e</sub> for inrush current n = 20 for inrush current n = 30  Rated power P	up to 400V up to 400V at 230V 400V	A A kVA kVA	3,6 2,4 1,4 2,5	5,1 3,3 2 3,5	7,2 5,1 2,9 5
Per main current path at 230/220V Utilization category AC-6a switching AC transformers  Rated operational current I <sub>e</sub> For inrush current n = 20 For inrush current n = 30  Rated power P For inrush current n = 20	up to 400V up to 400V at 230V 400V 500V	A A kVA kVA kVA	3,6 2,4 1,4 2,5 3,3	5,1 3,3 2 3,5 4,6 6	7,2 5,1 2,9 5 6,2
Per main current path at 230/220V  Utilization category AC-6a switching AC transformers  Rated operational current I <sub>e</sub> For inrush current n = 20 For inrush current n = 30  Rated power P For inrush current n = 20	up to 400V up to 400V up to 400V at 230V 400V 500V 690V at 230V	A A kVA kVA kVA kVA	3,6 2,4 1,4 2,5 3,3 4,3	5,1 3,3 2 3,5 4,6 6 1,3	7,2 5,1 2,9 5 6,2 8,6 2
For inrush current n = 20 For inrush current n = 30	up to 400V up to 400V up to 400V at 230V 400V 500V 690V	A A kVA kVA kVA	3,6 2,4 1,4 2,5 3,3 4,3	5,1 3,3 2 3,5 4,6 6	7,2 5,1 2,9 5 6,2 8,6

<sup>1)</sup> Depending on the electronic ballast used, higher lamp numbers are also possible



## Contactors LSDD, LSSD and LSUD

## ■ Main Circuit-Contactors LSDD, LSSD, LSUD

Туре			LSDD07, LSSD07	LSDD09, LSSD09	LSDD12, LSSD12
Size			00	00	00
DC capacity					
Utilization category DC-1 Switching resistive loads (L/	'R ≤ 1 ms)				
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> </ul>					
- 1 conducting path	up to 24V	Α	15	2	.0
	60V	Α	15	2	20
	110V	Α	1.5		.1
	220V	Α	0.6		.8
	440V	Α	0.42		.6
	600V	A	0.42		.6
2 conducting paths in series	up to 24V	Α	15		20
	60V	Α	15		20
	110V	Α	8.4		2
	220V	Α	1.2		.6
	440V	Α	1.6		.8
	600V	Α	0.5		.7
3 conducting paths in series	up to 24V	Α	15		20
	60V	Α	15		20
Rated operational current I <sub>e</sub> (at 60 °C)	110V	Α	15		20
	220V	Α	15		20
	440V	Α	0.9	1	.3
	600V	Α	0.7		1
Jtilization category DC-3 und DC-5, Shunt-wound and	d series-wound motors (L/R≤15ms)				
1 conducting path	up to 24V	Α	15	20	
<b>3</b> F	60V	Α	0.35	0	.5
	110V	Α	0.1	0.	15
	220V	Α			·-
	440V	Α			
	600V	Α		-	
2 conducting paths in series	up to 24V	Α	15	2	.0
	60V	Α	3.5	,	5
	110V	Α	0.25	0.	35
	220V	Α			<b></b>
	440V	Α			
	600V	Α			<b></b>
3 conducting paths in series	up to 24V	Α	15	2	20
	60V	Α	15	2	.0
	110V	Α	15	2	.0
	220V	Α	1.2	1	.5
	440V	Α	0.14	0	.2
	600V	Α	0.14	l .	.2
witching frequency z in operating cycles/hour				'	
	No-load switching frequency	h <sup>-1</sup>		1000	
Contactors without overload relay	AC	h"		1000	
	No-load switching frequency	1 -1		1000	
	DC	h <sup>-1</sup>		1000	
Dependence of the switching	Rated operation				
requency z' on the operational current	AC-1 (AC/DC)	h <sup>-1</sup>		1000	
' and operational voltage U ':	AC-2 (AC/DC)	h <sup>-1</sup>		750	
$z = z \cdot (I_e/I) \cdot (400 \text{ V/U})^{1,5} \cdot 1/h$	AC-3 (AC/DC)	h <sup>-1</sup>		<i>7</i> 50	
· · · · · · · · · · · / · · /	AC-4 (AC/DC)	h <sup>-1</sup>		250	
	AC-4 (AC) DC)				
<ul> <li>Contactors with overload relays (mean value)</li> </ul>		h <sup>-1</sup>		15	

### Conductor Cross-Sections-Contactors LSDD, LSSD, LSUD

(1 or 2 conductors can be connected)	Main and auxiliary conductors; coil connections:		Screw terminals
For standard screwdriver size 2 and	<ul> <li>Solid</li> </ul>	$mm^2$	2 x (0.5 1.5) <sup>1)</sup> ; 2 x (0.75 2.5) <sup>1)</sup> acc. to IEC 60947;
Pozidriv 2			max. 2 x (1 4)
	<ul> <li>Finely stranded with end sleeve</li> </ul>	$mm^2$	2 x (0.5 1.5) <sup>1)</sup> ; 2 x (0.75 2.5) <sup>1)</sup>
	<ul> <li>Solid or stranded, AWG cables</li> </ul>	AWG	2 x (20 16) <sup>1)</sup> ; 2 x (18 14) <sup>1)</sup> ; 1 x 12
	<ul> <li>Terminal screw</li> </ul>		M3
	- tightening torque	Nm	0.8 1.2 (7 10.3 lb.in)
(1 or 2 conductors can be connected)	Main and auxiliary conductors; coil connections:		Cage Clamp terminals (on request)
	Solid	mm <sup>2</sup>	2 x (0.25 2.5)
	Finely stranded with end sleeve	$mm^2$	2 x (0.25 1.5)
	Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.25 2.5)
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	2 x (24 14)

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.



## Contactors LSD0, LSS0 and LSU0

■ General Data - Contactors LSDO, LSSD, LSUD

·							
Туре				LSD009	LSD012 LSS012	LSD017 LSS017	LSD025 LSS025
Size				0	0	0	0
Permissible mounting position	•	AC and DC operation					
The contactors are designed for operation on a vertical mounting surfa	ace.				360°	22,5° 22,5°	]
Upright mounting position:	•	AC operation			Standar	d version	
	•	DC operation			Special vers	sion required.	
Mechanical endurance	•	Basic unit	Operating		10 n	nillion	
	conto	Basic unit with snap-on auxiliary	cycles		10 n	nillion	
	conto	Solid-state compatible auxiliary act block			5 m	illion	
Electrical endurance						1)	
Rated insulation voltage U i (degree of pollution 3, overvo	ltage ca	egory III)	V		6	90	
Rated impulse withstand voltage U <sub>imp</sub>			kV			6	
Safe isolation between the coil and the main contacts acc. to	EN 60	947-1, Appendix N	V		4	00	
Mirror contacts							
A mirror contact is an auxiliary NC contact that cannot	LSDC	, LSSO(removable auxiliary co	ntact block)	Yes	, acc. to EN 609	947-4-1, Append	lix F
be closed simultaneously with a NO main contact.	LSDO	, LSSO(permanent auxiliary co	ntact block)	A	cc. to SUVA requ	irements on requ	est
Ambient temperature	Durir	g operation	°C		-25 .	+60	
	Durir	ig storage	°C		-55 .	+80	
Degree of protection acc. to EN 60947-1, Appendix C					IP20, coil as	ssembly IP20	
Touch protection acc. to EN 50274					finge	er safe	
Shock resistance rectangular pulse	AC c	peration	g/ms		8.2/5 ar	nd 4.9/10	
	DC c	peration	g/ms		10/5 an	id 7.5/10	
Shock resistance sine pulse	AC c	peration	g/ms		12.5/5 a	nd 7.8/10	
	DC o	peration	g/ms		15/5 ar	nd 10/10	
Conductor cross-sections		-	-			2)	
Short-circuit protection for contactors without overload rela	ys		For short-circui see Overload	t protection for c Relays	ontactors with ov	verload relays	
Main circuit							
Fuse links gL/gG LV HRC, DIAZED, NEOZED		Type of coordination "1"					
- Acc. to IEC 60947-4-1/ D49EN 60947-4-1		Type of coordination "2"	Α		63		100
,		Weld-free 3)	A		25		35
Miniature circuit breakers (up to 230 V) with C characteristic			A		10		16
Short-circuit current 1 kA, type of coordination "1"			A		25		32
Auxiliary circuit							
Fuse links gL/gG DIAZED , NEOZED (weld-free protection like)	≥ 1kA)		Α		1	10	
Miniature circuit breakers up to 230 V with C characteristic Sh		current I <sub>k</sub> <400A	Α			10	
F				1			

<sup>1)</sup> See "Endurance of the main contacts"



<sup>2)</sup> See "Conductor cross-sections"

<sup>3)</sup> Test conditions according to IEC 60947-4-1

## Contactors LSDO, LSSO and LSUO

### ■ Control-Contactors LSDO, LSSO, LSUO

Туре			LSDO, LSUO	LSSO	
Size			0	0	
Magnetic coil operating range	AC/DC		0.8 1.1 x U <sub>s</sub>	0.7 1.25 x U <sub>s</sub> /U <sub>s</sub> =17-30VDC	
Power consumption of the magnetic coils (when	n coil is cold and 1.0 × U, )				
AC operation, 50/60 Hz	<ul> <li>Closing</li> </ul>	VA		51	
Standard version	• P.f.		0.	82	
	<ul> <li>Closed</li> </ul>	VA		7,8	
	• P.f.			24	
<ul> <li>AC operation, 50/60 Hz</li> </ul>	<ul> <li>Closing</li> </ul>	VA		/63	
Standard version	<ul> <li>P.f. for closing</li> </ul>			/0.74	
	<ul> <li>Closed</li> </ul>	VA		/6.8	
	P.f. for closed			/0.28	
<ul> <li>AC operation, 50 Hz, USA/Canada</li> </ul>	<ul> <li>Closing</li> </ul>	VA		51	
	<ul> <li>P.f. for closing</li> </ul>			82	
	<ul> <li>Closed</li> </ul>	VA		7,8	
	P.f. for closed			24	
<ul> <li>AC operation, 60 Hz, USA/Canada</li> </ul>	<ul> <li>Closing</li> </ul>	VA	69		
	<ul> <li>P.f. for closing</li> </ul>		0,76		
	<ul> <li>Closed</li> </ul>	VA		7,5	
	P.f. for closed		·	28	
DC operation	Closing = Closed	W	5,4	4,2	
Permissible residual current of the electronics (wasignal)	vith 0				
	<ul> <li>AC operation</li> </ul>	mA	<6 mA x (	230 V/U <sub>s</sub> )	
	<ul> <li>DC operation</li> </ul>	mA	<16 mA x	(24 V/U <sub>s</sub> )	
Operating times <sup>1)</sup>					
Total break time = Opening delay + Arcing time					
<ul> <li>AC operation at 0.8 1.1 x U<sub>s</sub></li> </ul>	Closing delay	ms	8	. 44	
·	Opening delay	ms	4	. 20	
<ul> <li>DC operation at 0.85 1.1 x U<sub>s</sub></li> </ul>	Closing delay	ms	50 .	170	
	Opening delay	ms	13.5	15.5	
Arcing time		ms	1	10	
Operating times for $1.0 \times U_s^{-1}$					
AC operation	Closing delay	ms	10	17	
	Opening delay	ms	4	. 20	
DC operation	Closing delay	ms	55	85	
	Opening delay	ms	14	. 15.5	

<sup>1)</sup> The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2ms to 5ms, diode assembly: 2 to 6 times).

### Main Circuit Contactors LSDO, LSSO, LSUO

Туре			LSD009	LSD012, LSS012	LSD017, LSS017	LSD025, LSS025 LSU025
Size			0	0	0	0
AC capacity						
Utilization category AC-1						
Switching resistive loads						
Rated operational current I <sub>e</sub>	at 40°C up to 690V	Α		4	10	
	at 60°C up to 690V	Α		3	35	
Rated power for AC loads <sup>1)</sup>	230V	kW		13	3,3	
P.f.= 0.95 (at 60 °C)	400V	kW		2	23	
	500V	kW		2	.9	
	690V	kW		4	10	
Minimum conductor cross-section	at 40°C	mm <sup>2</sup>		1	0	
for loads with $\rm I_e$	at 60°C	$mm^2$		1	0	
Utilization categories AC-2 and AC-3						
Rated operational currents I <sub>e</sub>	up to 400V	Α	9	12	17	25
	440V	Α	9	12	17	22
	500V	Α	6,5	12	17	18
	690V	Α	5,2	9	13	13
Rated power for slipring or squirrel cage	at 110V	kW	1,1	1,5	2,2	3
motors at 50 and 60 Hz	230V	kW	3	3	4	5,5
	400V	kW	4	5,5	7,5	11
	500V	kW	4,5	7,5	10	11
	660V/690V	kW	5,5	7,5	11	11
Thermal load capacity	10 s current <sup>2)</sup>	Α	80	110	150	200
Power loss per conducting path	at I <sub>e</sub> /AC-3	W	0,4	0,5	0,9	1,6

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).



<sup>2)</sup> According to IEC 60947-4-1. For rated values for various start-up conditions see Protection Equipment: Thermal Overload Relays.

## Contactors LSD0, LSS0 and LSU0

## ■ Main Circuit Contactors LSD0, LSS0, LSU0

Туре			LSD009	LSD012, LSS012	LSD017, LSS017	LSD025, LSS025 LSU025
Size			0	0	0	0
AC capacity						
Power loss per conducting path	at I <sub>e</sub> /AC-3					
Utilization category AC-4 (at $I_a = 6 \times I_e$ ) 1)						
Rated operational current l <sub>e</sub>	up to 400V	A	8,5	12,5	15,5	15,5
<ul> <li>Rated power for squirrel-cage motors with 50 and 60Hz</li> </ul>	up to 400V	kW	4	5,5	7,5	7,5
<ul> <li>The following applies to a contact endurance of</li> </ul>	about 200000 operating of	vcles:				
- Rated operational currents I <sub>e</sub>	up to 400V	Α Α	4,1	5,5	7,7	9
naida aparananar comanio i <sub>e</sub>	690V	A	3,3	5,5	7,7	9
- Rated power for squirrel-cage motors with 50 and			·			
60Hz	at 110V	kW	0,5	0,73	1	1,2
	230	kW	1, 1	1,5	2	2,5
	400V	kW	2	2,6	3,5	4,4
	500V	kW	2	3,3	4,6	5,6
	690V	kW	2,5	4,6	6	7,7
Utilization category AC-5a Switching gas discharge lamps, inductive ballast per main current path at 230V  Uncorrected, rated power per lamp/rated oper	rational current per lamp	I				
Uncorrected	L 18W/0.37A	Units		1	08	
	L 36W/0.43A	Units			93	
	L 58W/0.67A	Units			59	
	L 80W/0.79A	Units			50	
<ul> <li>DUO switching (two-lamp)</li> </ul>						
	L 18W/0.22A	Units			( 181 lamps)	
	L 36W/0.42A	Units			( 95 lamps)	
	L 58W/0.63A	Units			( 63 lamps)	
	L 80W/0.87A	Units		45 (≜ 2 >	( 45 lamps)	
Switching gas discharge lamps with correction						
Shunt compensation with inductive ballast, rated powe			nal current per lamp	0.7	1 42	1 41
Shunt compensation with inductive ballast	L 18W/4.5µF/0.11A	Units		37	41	61
	L 36W/4.5µF/0.21A	Units		30	30	51
	L 58W/7.0µF/0.32A	Units		20 13	20	33 22
AAM - Plant bull of 10 date to 10 and	L 80W/7.0µF/0.49A	Units		13	13	22
With solid-state ballast <sup>1)</sup> single lamp	I 10\A/ /4 0uE /0 10A	Units		105	119	175
	L 18W/6.8µF/0.10A L 36W/6.8µF/0.18A	Units		58	66	97
	L 58W/10µF/0.29A	Units		36	41	60
	L 80W/10µF/0.43A	Units		24	27	40
With solid-state ballast 1) two lamp	Ε δΟΥΥ/ ΤΟμΙ / Ο.43Α	UIIIIS			27	40
- Will solid-sidle buildsi Two lump	L 18W/10µF/0.18A	Units	59.1≙ 2	x 58 lamps)	66 (≜ 2 x 66 lamps)	07 (≜ 2 × 07 lamp
	L 36W/10µF/0.35A	Units		x 30 lamps)	34 (≜ 2 x 34 lamps)	
	L 58W/22µF/0.52A	Units	,	x 20 lamps)	22 (≜ 2 x 22 lamps)	
	L 80W/22µF/0.86A	Units		x 12 lamps)	1 1	20 (≜ 2 x 20 lamp
Utilization category AC-5b, switching incandes		kW	12 (= 2	2,8	3,2	4,7
Per main current path at 230/220V	com ramps	K**		2,0	0,2	٠,,
Utilization category AC-6a, switching AC transf	ormers				1	
Rated operational current I <sub>e</sub>						
For inrush current n = 20	up to 400V	Α		11,4		20,2
For inrush current n = 30	up to 400V	Α		7,6		13,5
Rated power P						
For inrush current n = 20	at 230V	kVA		4,5		8
	400V	kVA		7,9		13,9
	500V	kVA		9,9		15,5
F : 1	690V	kVA		13,6		15,5
For inrush current n = 30	at 230V	kVA		3		5,4
	400V	kVA		5,2		9,3
	500V 690V	kVA kVA		6,6 9,1		11, <i>7</i> 15,5
For deviating inrush current factors x, the power must b			<b>v</b>	۶,۱		13,3
Utilization category AC-6b, switching low-indu				<u> </u>		
Rated operational currents   e	up to 400V	A	Ac capacitor	5,8		10,8
Rated power for single capacitors or	at 230V	kVAr		2,5		4
banks of capacitors (minimum inductance	400V	kVAr		4		7,5
						1
of 6 µH between capacitors connected in	500V	kVAr		4		7,5

<sup>1)</sup> For  $I_e$  /AC-1 = 35A (60°C) and the corresponding minimum conductor cross-section  $10 \text{mm}^2$ .



<sup>2)</sup> Depending on the electronic ballast used, higher lamp numbers are also possible.

# ■ Contactors LSD0, LSS0 and LSU0

## ■ Main Circuit Contactors LSD0, LSS0, LSU0

Туре			LSD009	LSD012, LSS012	LSD017, LSS017	LSD025, LSS025 LSU025	
Size			0	0	0	0	
DC capacity							
Utilization category DC-1 Switching resistive load	ls (L/R≤1ms)						
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> </ul>							
- 1 conducting path	up to 24V	Α		3	35		
	60V	Α		2	20		
	110V	Α		4	l,5		
	220V	Α			1		
	440V	Α		C	),4		
	600V	Α		0,	,25		
- 2 conducting paths in series	up to 24V	Α		3	35		
	60V	Α		3	35		
	110V	Α		3	35		
	220V	Α			5		
	440V	Α			1		
	600V	Α		C	),8		
- 3 conducting paths in series	up to 24V	Α		3	35		
· ·	60V	Α		3	35		
	110V	Α		3	35		
	220V	Α		3	35		
	440V	Α		2	2,9		
	600V	Α			,4		
Utilization category DC-3 und DC-5, Shunt-woun  Rated operational current l <sub>e</sub> (at 60°C)	d and series-wound motors (	L/R≤ 15ms)					
- 1 conducting path	up to 24V	Α		2	20		
. condoming pain	60V	Α	5				
	110V	Α	2,5				
	220V	A	1				
	440V	A			.09		
	600V	A		,	.06		
- 2 conducting paths in series	up to 24V	Α			35		
	60V	A			35		
	110V	A			15		
	220V	A			3		
	440V	A			,27		
	600V	A			, 16		
- 3 conducting paths in series	up to 24V	A			35		
o condoming pains in conce	60V	A			35		
	110V	Ä			35		
	220V	A			10		
	440V	A			),6		
	600V	A			),6		
Switching frequency z in operating cycles/hour	0007				,,0		
	No-load switching						
<ul> <li>Contactors without overload relay</li> </ul>	frequency AC	h <sup>-1</sup>		50	000		
	No-load switching	1					
	frequency DC	h <sup>-1</sup>		15	500		
Dependence of the switching	Rated operation						
frequency z' on the operational current	AC-1 (AC/DC)	h <sup>-1</sup>		10	000		
I' and operational voltage U':	AC-2 (AC/DC)	h <sup>-1</sup>	1000	10		750	
$z' = z \cdot (  _{e}/  ) \cdot (400 \text{ V/U}  ^{1.5} \cdot 1/  _{h}$	AC-3 (AC/DC)	h <sup>-1</sup>	1000			750	
(.e., ., (+00 +/ 0)		h <sup>-1</sup>					
	AC-4 (AC/DC)		300			250	
Contactors with overload relays (mean value)		h <sup>-1</sup>			15		



## Contactors LSD0, LSS0 and LSU0

## ■ Conductor Cross-Section-Contactors LSDO, LSSO, LSUO

Тур	e		LSD009, LSS012, LSD012, LSS017, LSD017, LSS025, LSD025, LSU025
Size	•		0
	ductor cross-sections (1 or 2 conductors can nected)	be	
Ma	in conductors:		Screw terminals
•	Solid	mm <sup>2</sup>	$2 \times (1 \dots 2.5)^{1}$ ; $2 \times (2.5 \dots 6)^{1)}$ acc. to IEC 60947; max. $1 \times 10$
•	Finely stranded with end sleeve	mm <sup>2</sup>	$2 \times (1 \dots 2.5)^{1}$ ; $2 \times (2.5 \dots 6)^{1}$
•	AWG cables, solid	AWG	2 x (16 12)
•	AWG cables, solid or stranded	AWG	2 x (14 10)
•	AWG cables, stranded	AWG	1 x 8
•	Terminal screws		M4 (Pozidriv size 2)
- tigl	ntening torque	Nm	2 2.5 (18 22 lb.in)
Aux	ciliary conductors		
•	Solid	mm <sup>2</sup>	$2 \times (0.5 \dots 1.5)^{11}$ ; $2 \times (0.75 \dots 2.5)^{11}$ acc. to IEC 60947; max. $2 \times (0.75 \dots 4)$
•	Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 1.5) <sup>1)</sup> ; 2 x (0.75 2.5) <sup>1)</sup>
•	Solid or stranded AWG (2 x)	AWG	2 × (20 16) <sup>11</sup> ; 2 × (18 14) <sup>11</sup> ; 1 × 12
•	Terminal screws		M3
tight	ening torque	Nm	0.8 1.2 (7 10.3 lb.in)
Aux	ciliary conductors		Cage Clamp terminals (on request)
•	Solid	mm <sup>2</sup>	2 x (0.25 2.5)
•	Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.25 1.5)
•	Finely stranded without end sleeve	mm <sup>2</sup>	2 x (0.25 2.5)
•	AWG cables, solid or stranded	AWG	2 x (24 14)

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

## Contactors LSD2 and LSU2

## ■ General Data - Contactors LSD2, LSU2

Type Size			<b>LSD232</b>	<b>LSD240, LSU240</b>	<b>LSD250</b>
Permissible mounting position	AC and DC operation			360° 22,5° 22,	5°
The contactors are designed for operation on a vertical mounting surface.				n and 22.5 ° inclination to erating range 0,85 1,1 :	
Upright mounting position:	AC operation				
	DC operation			Special version required.	
Mechanical endurance	Basic unit	Operating		10 million	
	Basic unit with snap-on auxiliary contact l	block cycles		10 million	
	<ul> <li>Auxiliary contact block capable for electr</li> </ul>	onic circuits		5 million	
Electrical endurance				1)	
Rated insulation voltage U <sub>i</sub> (degree of pollu	ution 3, overvoltage category III)	٧		690	
Rated impulse withstand voltage U <sub>imp</sub>		kV		6	
Safe isolation between the coil and the mai	n contacts acc. to EN 60947-1, Appendix N	٧		400	
Mirror contacts					
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.	LSD, LSR (removable auxiliary contact block) LSD, LSR			c. to EN 60947-4-1, App	
· ·	(permanent auxiliary contact block)			·	
Ambient temperature	During operation	°C		-25 +60	
•	During storage	°C		-55 +80	
Degree of protection acc. to EN 60947-1, Appendix C			IP20	(terminal compartment IP AC-coil assembly IP40,	00),
				DC-coil assembly IP30	
Touch protection acc. to EN 50274				finger-safe	
Shock resistance - rectangular pulse	AC and DC operation	g/ms		10/5 and 5/10	
Shock resistance -sine pulse	AC and DC operation	g/ms		15/5 and 8/10	
Conductor cross-sections				2)	
Short-circuit protection for contactors witho	ut overload relays			tion for contactors with the on equipment: Thermal ove	,
Main circuit					
• Fuse links gL/gG NH, DIAZED, NEOZED					
acc. to IEC 60 947-4-1/DIN EN 60 947-4-1	Type of coordination "1"	Α	125	125	160
	Type of coordination "2"	Α	63	63	80
	Weld-free <sup>1)</sup>	Α	16	16	50
Auxiliary circuit					
Fuse links gL/gG					
DIAZED, NEOZED (weld-free protection at $I_k \ge 1 kA$	•	Α		10	
Miniature circuit breakers with C characteris	tic				
short-circuit current I <sub>k</sub> < 400A		A		10	
1) See "Endurance of the main contacts"					

<sup>1)</sup> See "Endurance of the main contacts"



<sup>2)</sup> See "Conductor cross-sections" pages onward

<sup>3)</sup> According to IEC 60 947-4-1.

## Contactors LSD2 and LSU2

## ■ Control-Contactors LSD2, LSU2

Туре			LSD232	LSD240, LSU240	LSD250
Size			2	2	2
Magnetic coil operating range	AC/DC			0.8 1.1 x U <sub>s</sub>	
Power consumption of the magnetic coils (who	en coil is cold and 1.0 x Us )				
AC operation, 50/60 Hz	<ul> <li>Closing</li> </ul>	VA	104	14:	5
Standard version	• P.f.		0,78	0,7	9
	<ul> <li>Closed</li> </ul>	VA	9,7	12,	5
	• P.f.		0,42	0,3	6
AC operation, 50/60 Hz	<ul> <li>Closing</li> </ul>	VA	127/113	170/	155
tandard version	<ul> <li>P.f. for closing</li> </ul>		0.73/0.69	0.76/	0.72
	<ul> <li>Closed</li> </ul>	VA	11.3/9.5	15/1	1.8
	P.f. for closed		0.41/0.42	0.35/0	0.38
<ul> <li>AC operation, 50 Hz, USA/Canada</li> </ul>	<ul> <li>Closing</li> </ul>	VA	108	150	)
	<ul> <li>P.f. for closing</li> </ul>		0,76	0,7	7
	<ul> <li>Closed</li> </ul>	VA	9,6	12,	5
	P.f. for closed		0,42	0,3	
<ul> <li>AC operation, 60 Hz, USA/Canada</li> </ul>	<ul> <li>Closing</li> </ul>	VA	120	160	
	<ul> <li>P.f. for closing</li> </ul>		0,7	0,7	
	<ul> <li>Closed</li> </ul>	VA	10,1	12,	
	P.f. for closed		0,42	0,3	7
• DC operation	Closing = Closed	W	13,3	13,	3
ermissible residual current of the electronics ( ignal)	(with 0				
	<ul> <li>AC operation</li> </ul>	mA	< 12mA x (230V/U <sub>s</sub> )	< 18mA x (2	230V/Us)
	<ul> <li>DC operation</li> </ul>	mA	< 38mA x (24V/U <sub>s</sub> )	< 38mA x (	24V/U <sub>s</sub> )
Operating times for 1)					
otal break time = Opening delay + Arcing time					
AC operation at 0.8 1.1 x U <sub>s</sub>	Closing delay	ms	11 30	10	24
	Opening delay	ms	7 10	7	10
<ul> <li>DC operation at 0.85 1.1 x U<sub>s</sub></li> </ul>	Closing delay	ms	50 95	60	100
	Opening delay	ms	20 30	20	25
Arcing time		ms	10	10	
Operating times for 1.0 x U <sub>s</sub> 1)		<u> </u>			<u> </u>
<ul> <li>AC operation</li> </ul>	Closing delay	ms	13 22	12	20
	Opening delay	ms	7 10	7	10
DC operation	Closing delay	ms	60 <i>7</i> 5	70	85
-	Opening delay	ms	20 30	20	25

<sup>1)</sup> The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2ms to 5ms, diode assembly: 2 to 6 times).

## ■ Contactors LSD2 and LSU2

## ■ Main Circuit-Contactors LSD2, LSU2

Туре			LSD232	LSD240, LSU240	LSD250
Size			2	2	2
AC capacity					
Utilization category AC-1, Switching resistive loads					
Rated operational current I <sub>e</sub>	at 40°C up to 690V	Α	50	60	60
	at 60°C up to 690V	Α	45	55	55
Rated power for AC loads <sup>1)</sup>	230V	kW	18	22	22
f.= 0.95 (at 60 °C)	400V	kW	31	38	38
	500V	kW	39	46	46
	690V	kW	54	66	66
Minimum conductor cross-section	at 40°C	mm <sup>2</sup>	16	16	16
or loads with I <sub>e</sub>	at 60°C	$mm^2$	10	16	16
Jtilization categories AC-2 and AC-3					
Rated operational currents I <sub>e</sub>	up to 500V	Α	32	40	50
	690V	Α	20	24	24
Rated power for slipping or squirrel cage	230V	kW	7,5	11	15
notors at 50 and 60 Hz	400V	kW	15	18,5	22
	500V	kW	18,5	22	30
	690V	kW	18,5	22	22
Thermal load capacity	10 s current <sup>2)</sup>	Α	320	400	400
Power loss per conducting path	at I <sub>e</sub> /AC-3	W	1,8	2,6	5
Jtilization category AC-4 (at $I_a = 6 \times I_e$ )					
Rated operational current I <sub>e</sub>	up to 400V	Α	29	35	41
<ul> <li>Rated power for squirrel-cage motors with 50 and 60Hz</li> </ul>	up to 400V	kW	15	18,5	22
<ul> <li>The following applies to a contact endurance of about 200</li> </ul>	, ,				
Rated operational currents I <sub>e</sub>	up to 400V	Α	15,6	18,5	24
	690V	Α	15,6	18,5	24
Rated power for squirrel-cage motors with 50 and 60Hz	230	kW	4,7	5,4	7,3
	400V	kW	8,2	9,5	12,6
	500V	kW	9,8	11,8	15,8
	690V	kW	13	15,5	21,8
Utilization category AC-5a, Switching gas discharge lan	nps, inductive ballast pe	r main			
current path at 230V					
Uncorrected, rated power per lamp/rated operational cu		11.50	10.5	162	1/0
<ul> <li>Uncorrected</li> </ul>	L 18W/0,37A	Units	135 116	139	162 139
	L 36W/0,43A	Units	74	89	89
	L 58W/0,67A L 80W/0, <i>7</i> 9A	Units Units	63	75	75
DUO switching (two-lamp)	L 00 VV / 0,7 4A	Offilis	03	/5	/3
5 DOO swiiching (two-lamp)	L 18W/0,22A	Units	227 (≜ 2x227 lamps)	272 (≜ 2×272 lamps)	272 (≜ 2x272 lamps)
	L 36W/0,42A	Units	119 (≜ 2x119 lamps)	142 (≜ 2×142 lamps)	142 (≜ 2×142 lamps)
	L 58W/0,63A	Units	79 (≜ 2x79 lamps)	95 (≜ 2x95 lamps)	95 (≜ 2x95 lamps)
	L 80W/0,87A	Units	57 (≜ 2x57 lamps)	68 (≜ 2x68 lamps)	68 (≜ 2x68 lamps)
				00 (= 2x00 lullips)	06 (= 2x06 idilips)
Switching age discharge lamps with correction per main		OTILIS	37 (= 2x37 idilips)		
	current path at 230V		37 (= 2x37 idinps)	, ,	
Shunt compensation with inductive ballast, rated power per lamp/	current path at 230V		37 (= 2x37 idilips)	, ,	
Shunt compensation with inductive ballast, rated power per lamp/ current per lamp	current path at 230V /capacitance/rated operati	onal			123
Shunt compensation with inductive ballast, rated power per lamp/	current path at 230V /capacitance/rated operation L 18W/4,5µF/0,11A	onal Units	78	98	123 123
Shunt compensation with inductive ballast, rated power per lamp/ current per lamp	current path at 230V /capacitance/rated operation L 18W/4,5μF/0,11A L 36W/4,5μF/0,21A	onal Units Units	78 78	98 98	123
Shunt compensation with inductive ballast, rated power per lamp/ current per lamp	current path at 230V /capacitance/rated operat L 18W/4,5µF/0,11A L 36W/4,5µF/0,21A L 58W/7,0µF/0,32A	onal Units Units Units	78 78 50	98 98 63	123 79
ihunt compensation with inductive ballast, rated power per lamp/ urrent per lamp  Shunt compensation with inductive ballast	current path at 230V /capacitance/rated operation L 18W/4,5μF/0,11A L 36W/4,5μF/0,21A	onal Units Units	78 78	98 98	123
Shunt compensation with inductive ballast, rated power per lamp/ current per lamp	current path at 230V /capacitance/rated operati L 18W/4,5μF/0,11A L 36W/4,5μF/0,21A L 58W/7,0μF/0,32A L 80W/7,0μF/0,49A	Units Units Units Units Units	78 78 50 50	98 98 63 63	123 79 73
ishunt compensation with inductive ballast, rated power per lamp/ current per lamp  Shunt compensation with inductive ballast	current path at 230V /capacitance/rated operation  L 18W/4,5μF/0,11A L 36W/4,5μF/0,21A L 58W/7,0μF/0,32A L 80W/7,0μF/0,49A  L 18W/6,8μF/0,10A	Units Units Units Units Units Units	78 78 50 50	98 98 63 63 280	123 79 73 350
Shunt compensation with inductive ballast, rated power per lamp/ current per lamp  • Shunt compensation with inductive ballast	current path at 230V /capacitance/rated operation L 18W/4,5µF/0,11A L 36W/4,5µF/0,21A L 58W/7,0µF/0,32A L 80W/7,0µF/0,49A L 18W/6,8µF/0,10A L 36W/6,8µF/0,18A	Units Units Units Units Units Units Units	78 78 50 50 50	98 98 63 63 280 155	123 79 73 350 194
Shunt compensation with inductive ballast, rated power per lamp/ current per lamp  Shunt compensation with inductive ballast	current path at 230V /capacitance/rated operate L 18W/4,5μF/0,11A L 36W/4,5μF/0,21A L 58W/7,0μF/0,32A L 80W/7,0μF/0,49A L 18W/6,8μF/0,10A L 36W/6,8μF/0,18A L 58W/10μF/0,29A	Units Units Units Units Units Units Units Units Units Units	78 78 50 50 224 124 77	98 98 63 63 280 155 96	123 79 73 350 194 120
Shunt compensation with inductive ballast, rated power per lamp/ current per lamp  Shunt compensation with inductive ballast  With solid-state ballast 3) single lamp	current path at 230V /capacitance/rated operation L 18W/4,5µF/0,11A L 36W/4,5µF/0,21A L 58W/7,0µF/0,32A L 80W/7,0µF/0,49A L 18W/6,8µF/0,10A L 36W/6,8µF/0,18A	Units Units Units Units Units Units Units	78 78 50 50 50	98 98 63 63 280 155	123 79 73 350 194
Shunt compensation with inductive ballast, rated power per lamp/ current per lamp  Shunt compensation with inductive ballast	Current path at 230V /capacitance/rated operation L 18W/4,5µF/0,11A L 36W/4,5µF/0,21A L 58W/7,0µF/0,32A L 80W/7,0µF/0,49A L 18W/6,8µF/0,10A L 36W/6,8µF/0,18A L 58W/10µF/0,29A L 80W/10µF/0,43A	Units Units Units Units Units Units Units Units Units Units Units Units	78 78 50 50 50 224 124 77 52	98 98 63 63 280 155 96 65	123 79 73 350 194 120 81
Shunt compensation with inductive ballast, rated power per lamp/ current per lamp  Shunt compensation with inductive ballast  With solid-state ballast 3) single lamp	current path at 230V /capacitance/rated operati L 18W/4,5µF/0,11A L 36W/4,5µF/0,21A L 58W/7,0µF/0,32A L 80W/7,0µF/0,49A L 18W/6,8µF/0,10A L 36W/6,8µF/0,18A L 58W/10µF/0,29A L 80W/10µF/0,43A L 18W/10µF/0,43A	Units Units Units Units Units Units Units Units Units Units Units Units Units Units	78 78 50 50 50 224 124 77 52 124 (≜ 2 x 124 lamps)	98 98 63 63 280 155 96 65	123 79 73 350 194 120 81
With solid-state ballast <sup>3)</sup> single lamp	Current path at 230V /capacitance/rated operation L 18W/4,5µF/0,11A L 36W/4,5µF/0,21A L 58W/7,0µF/0,32A L 80W/7,0µF/0,49A L 18W/6,8µF/0,10A L 36W/6,8µF/0,18A L 58W/10µF/0,29A L 80W/10µF/0,43A	Units Units Units Units Units Units Units Units Units Units Units Units	78 78 50 50 50 224 124 77 52	98 98 63 63 280 155 96 65	123 79 73 350 194 120 81

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).



<sup>2)</sup> According to IEC 60947-4-1. For rated values for various start-up conditions see: Thermal Overload Relays.

<sup>3)</sup> Depending on the electronic ballast used, higher lamp numbers are also possible.

# Technical Specification - Electromechanical Contactors Series ALEA LS

## Contactors LSD2 and LSU2

## ■ Main Circuit-Contactors LSD2, LSU2

Туре			LSD232	LSD240, LSU240	LSD250
Size			2	2	2
AC capacity					
Utilization category AC-5b, switching incandescent at 230/220V	lamps per main current path	kW	6	7,6	9,5
Utilization category AC-6a, switching AC transform	ers				
Rated operational current l <sub>e</sub>					
For inrush current n = 20	up to 400V	Α	31	36,5	43,2
For inrush current n = 30	up to 400V	Α	20,7	24,3	28,8
Rated power P					
For inrush current n = 20	at 230V	kVA	12,3	14,5	17,2
	400V	kVA	21,5	25,3	29,9
	500V	kVA	26,8	31,6	37,4
	690V	kVA	23,9	28,7	28,7
or inrush current n = 30	at 230V	kVA	8,2	9,7	11,5
	400V	kVA	14,3	16,8	20
	500V	kVA	17,9	21	24,9
	690V	kVA	23,9	28,7	28,7
or deviating inrush current factors x, the power must be reco	alculated as follows: $P_x = P_{n30} \cdot 30$	/x	•		
Jtilization category AC-6b, switching low-inductan	ce (low-loss, metallized diele	ctric) AC			
apacitors					
Rated operational currents   Le	up to 400V	Α	29	36	36
lated power for single capacitors or	at 230V	kVAr	12	15	15
anks of capacitors (minimum inductance	400V	kVAr	20	25	25
of 6 µH between capacitors connected in	525V	kVAr	25	33	33
parallel) at 50 Hz, 60 Hz	690V	kVAr	20	25	25

<sup>1)</sup> For I<sub>e</sub>/AC-1 = 35A (60°C) and the corresponding minimum conductor cross-section 10mm<sup>2</sup>.

<sup>2)</sup> Depending on the electronic ballast used, higher lamp numbers are also possible.

# Contactors LSD2 and LSU2

## ■ Main Circuit-Contactors LSD2, LSU2

Туре			LSD232	LSD240, LSU240	LSD250
Size			2	2	2
DC capacity					
Utilization category DC-1 Switching resistive loads (L/R S	(Ims)				
• Rated operational current I <sub>e</sub> (at 60°C)	. 0.07		4.5		
- 1 conducting path	up to 24V	A	45	55	55
	60V	A	20	23	23
	110V	A	4.5	4.5	4,5
Overland and the training	220V	A	2	2	2
	440V 600V	A	0.4 0.25	0.4 0.25	0.4 0.25
		A			
- 2 conducting paths in series	up to 24V	A	45	55	55
- 3 conducting paths in series	60V	A	45	45	45
	110V	A	45	45	45
	220V	A	5	5	5
	440V	A	1	1	1
	600V	A	0.8	0.8	0.8
	up to 24V	A	45	55	55
	60V	A	45	55	55
	110V	A	45	55	55
	220V	A	45	45	45
	440V	A	2.9	2.9	2.9
ust it is not best of it.	600V	A	1.4	1.4	1.4
Utilization category DC-3 und DC-5, Shunt-wound and se	eries-wound motors (L/R $\leq$ 15 n	ns)			
• Rated operational current I <sub>e</sub> (at 60°C)	. 0.07		0.5	0.5	0.5
- 1 conducting path	up to 24V	A	35	35	35
	60V	A	6	6	6
	110V	A	2.5		
	220V	A	2	2	2
	440V	A	0.1	0.1	0.1
- 2 conducting paths in series	600V	A	0.06	0.06	0.06
	up to 24V	A	45	55	55
	60V	A	45	45	45
	110V	A	25	25	25
	220V	A	5	5	5
	440V	A	0.27	0.27	0.27
	600V	Α .	0.16	0.16	0.16
- 3 conducting paths in series	up to 24V	Α	45	55	55
	60V	A	45	55	55
	110V	A	45	55	55
	220V	A	25	25	25
	440V	A	0.6	0.6	0.6
	600V	Α	0.35	0.35	0.35
Switching frequency z in operating cycles/hour					
Contactors without overload relay	No-load switching frequency AC	h <sup>-1</sup>	5000	5000	5000
	No-load switching frequency DC	h <sup>-1</sup>	1500	1500	1500
Dependence of the switching	Rated operation				
requency z' on the operational current	AC-1 (AC/DC)	h <sup>-1</sup>	1200	1200	1000
I' and operational voltage U':	AC-2 (AC/DC)	h <sup>-1</sup>	750	600	400
$z = z \cdot (I_e/I) \cdot (400 \text{ V/U})^{1.5} \cdot 1/h$	AC-3 (AC/DC)	h <sup>-1</sup>	1000	1000	800
	AC-4 (AC/DC)	h-1	250	300	300
Contactors with overload relays (mean value)		h-1	15	15	15
Confectors with eventual relays (mean value)		- 11	1.0	l i2	IJ



# Technical Specification - Electromechanical Contactors Series ALEA LS

## Contactors LSD2 and LSU2

■ Conductor Cross-Sections-Contactors LSD2, LSU2

Туре			LSD2 LSU2		
Size			2		
Conductor cross-sections (1 or	2 conductors can be connected)				
	Main conductors:		Screw terminals		
Front clamping point	<ul> <li>Finely stranded with end sleeve</li> </ul>	mm <sup>2</sup>	0.75 25		
connected	<ul> <li>Finely stranded without end sleeve</li> </ul>	mm <sup>2</sup>	0.75 25		
	<ul> <li>Stranded</li> </ul>	mm <sup>2</sup>	0.75 35		
	• Solid	mm <sup>2</sup>	0.75 16		
	<ul> <li>Ribbon cable conductors (number x width x thickness)</li> </ul>	mm <sup>2</sup>	6 x 9 x 0.8		
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	18 2		
Rear clamping point	Finely stranded with end sleeve	mm <sup>2</sup>	0.75 25		
connected	<ul> <li>Finely stranded without end sleeve</li> </ul>	mm <sup>2</sup>	0.75 25		
	<ul> <li>Stranded</li> </ul>	mm <sup>2</sup>	0.75 35		
	<ul> <li>Solid</li> </ul>	mm <sup>2</sup>	0.75 16		
	<ul> <li>Ribbon cable conductors (number x width x thickness)</li> </ul>	mm <sup>2</sup>	6 x 9 x 0.8		
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	18 2		
Both clamping points	Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.75 16)		
connected	<ul> <li>Finely stranded without end sleeve</li> </ul>	mm <sup>2</sup>	2 x (0.75 16)		
	<ul> <li>Stranded</li> </ul>	mm <sup>2</sup>	2 x (0.75 25)		
	• Solid	mm <sup>2</sup>	2 x (0.75 16)		
	<ul> <li>Ribbon cable conductors (number x width x thickness)</li> </ul>	mm <sup>2</sup>	$2 \times (6 \times 9 \times 0.8)$		
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	2 x (18 2)		
	<ul> <li>Terminal screw</li> </ul>		M6 (Pozidriv Gr. 2)		
	- tightening torque	Nm	3 4.5 (27 40 lb.in)		
	Auxiliary conductors:				
	• Solid	mm <sup>2</sup>	$2 \times (0.5 \dots 1.5)^{11}$ ; $2 \times (0.75 \dots 2.5)^{11}$		
			acc. to IEC 60947; max. 2 x (0.75 4)		
	<ul> <li>Finely stranded with end sleeve</li> </ul>	mm <sup>2</sup>	$2 \times (0.5 \dots 1.5)^{11}$ ; $2 \times (0.75 \dots 2.5)^{11}$		
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	$2 \times (20 \dots 16)^{11}$ ; $2 \times (18 \dots 14)^{11}$ ; $1 \times 12$		
	<ul> <li>Terminal screw</li> </ul>		M3		
	- tightening torque	Nm	0.8 1.2 (7 10.3 lb.in)		
	Auxiliary conductors:		Cage Clamp terminals (on request)		
	<ul> <li>Solid</li> </ul>	mm <sup>2</sup>	2 × (0.25 2.5)		
	<ul> <li>Finely stranded with end sleeve</li> </ul>	mm <sup>2</sup>	2 x (0.25 1.5)		
	<ul> <li>Finely stranded without end sleeve</li> </ul>	mm <sup>2</sup>	2 × (0.25 2.5)		
	<ul> <li>AWG cables, solid or stranded</li> </ul>	mm <sup>2</sup>	2 x (24 14)		

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.



## Contactors LSD3 and LSU3

### ■ General Data - Contactors LSD3

Туре			LSD365	LSD380	LSD395
Size			3	3	3
Permissible mounting position	AC and DC operation			360° 22,5° 22	2,5°
The contactors are designed for operation on a v	ertical mounting surface.			n and 22.5 ° inclination erating range 0.85 1.	
Upright mounting position:	AC operation				
	DC operation			Special version required	l.
Mechanical endurance	Basic unit	Operating		10 million	
	<ul> <li>Basic unit with snap-on auxiliary contact l</li> </ul>	olock cycles		10 million	
	<ul> <li>Auxiliary contact block capable for electr</li> </ul>	onic circuits		5 million	
Electrical endurance				1)	
Rated insulation voltage U <sub>i</sub> (degree of pollution 3	3, overvoltage category III)	٧		1000	
Rated impulse withstand voltage U <sub>imp</sub>		kV		6	
Safe isolation between the coil and the main of	ontacts acc. to EN 60947-1, Appendix N	٧		690	
Ambient temperature	During operation	°C		-25 +60	
	During storage	°C		-55 <b>+</b> 80	
Degree of protection acc. to EN 60947-1, Appendix C			IP20	(terminal compartment	
				AC-coil assembly IP40	
T				DC-coil assembly IP30	
Touch protection acc. to EN 50274	10 100 "	,		finger-safe	
Shock resistance - rectangular pulse	AC and DC operation	g/ms		6.8/5 and 4/10	
Shock resistance -sine pulse Conductor cross-sections	AC and DC operation	g/ms		10.6/5 and 6.2/10	
Short-circuit protection for contactors with	nout overload relays	For short-circu	•	tors with thermal overloc	ıd relays see Thermal
Main circuit	<u> </u>		ove	rload relays	
Fuse links gL/gG NH, DIAZED, NEOZEI					
acc. to IEC 60 947-4-1/DIN EN 60 947-4-1	Type of coordination "1"	A	250	2	50
ucc. 10 IEC 00 747-4-1/ DIIN EIN 00 947-4-1	Type of coordination "2"	Ä	125		60
	Weld-free <sup>1)</sup>	Ä	63		00
Auxilians circuit	3.0 1100			<u>'</u>	
Auxiliary circuit	III	,		10	
Fuse links gL/gG DIAZED, NEOZED (we	•	A		10	
<ul> <li>Miniature circuit breakers with C characte</li> </ul>	eristic short-circuit current I <sub>k</sub> < 400A	A	10		

<sup>1)</sup> See "Endurance of the main contacts"



<sup>2)</sup> See "Conductor cross-sections"

<sup>3)</sup> According to IEC 60 947-4-1

## Contactors LSD3 and LSU3

## ■ Control-Contactors LSD3

Туре			LSD365	LSD380	LSD395
Size			3	3	3
Magnetic coil operating range	AC/DC			0, 1.1 x U <sub>s</sub>	
Power consumption of the magnetic coils (wh	en coil is cold and 1.0 x U <sub>s</sub> )				
AC operation, 50/60 Hz	Closing	VA	218	2	70
Standard version	<ul> <li>P.f.</li> </ul>		0,61	0,	68
	<ul> <li>Closed</li> </ul>	VA	21		22
	<ul> <li>P.f.</li> </ul>		0,26	0,	27
AC operation, 50/60 Hz	Closing	VA	247/211	298	/274
Standard version	<ul> <li>P.f. for closing</li> </ul>		0.62/0.57	0.7,	/0.62
	<ul> <li>Closed</li> </ul>	VA	25/18	27	/20
	<ul> <li>P.f. for closed</li> </ul>		0.27/0.3	0.29	/0.31
AC operation, 50 Hz, USA/Canada	Closing	VA	218	2	70
	<ul> <li>P.f. for closing</li> </ul>		0,61	0,	68
	<ul> <li>Closed</li> </ul>	VA	21		22
	<ul> <li>P.f. for closed</li> </ul>		0,26	0,	27
AC operation, 60 Hz, USA/Canada	Closing	VA	232	3	00
	<ul> <li>P.f. for closing</li> </ul>		0,55	0,	.52
	<ul> <li>Closed</li> </ul>	VA	20		21
	<ul> <li>P.f. for closed</li> </ul>		0,28	0,	29
DC operation	Closing = Closed	W	15		15
Permissible residual current of the electronics	(with 0 signal)				
	<ul> <li>AC operation</li> </ul>	mA		<25mA x (230 V/U <sub>s</sub> )	
	DC operation	mA		<43mA x (24 V/U <sub>s</sub> )	
Operating times					
Total break time = Opening delay + Arcing time					
AC operation at 0.8 1.1 x U <sub>s</sub>	Closing delay	ms	16 57	17	90
	Opening delay	ms	10 19	10	25
<ul> <li>DC operation at 0.85 1.1 x U<sub>s</sub></li> </ul>	Closing delay	ms	90 230	90.	. 230
	Opening delay	ms	14 20	14	20
Arcing time		ms	10 15	10	15
Operating times for 1.0 x U <sub>s</sub> 1)					
AC operation	Closing delay	ms	18 34	18	30
·	Opening delay	ms	11 18	11 .	23
DC operation	Closing delay	ms	100 120		120
'	Opening delay	ms	16 20	16	

<sup>1)</sup> The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2ms to 5ms, diode assembly: 2 to 6 times)



## ■ Contactors LSD3 and LSU3

Туре			LSD365	LSD380	LSD395
Size			3	3	3
AC capacity					
Utilization category AC-1, Switching resistive loads					
Rated operational current I <sub>e</sub>	at 40°C up to 690V 1000V	A A	100 50	120 60	120 <i>7</i> 0
	at 60°C up to 690V	Α	90	100	100
	1000V	А	40	50	60
Rated power for AC loads <sup>1)</sup> P.f.= 0.95 (at 60 °C)	230V 400V	kW kW	34 59	38 66	38 66
(4	500V	kW	74	82	82
	690V	kW	102	114	114
Minimum conductor cross-section for loads with I.	1000V at 40°C at 60°C	kW mm² mm²	66 35 35	82 50 35	98 50 35
Utilization categories AC-2 and AC-3					
Rated operational currents I <sub>e</sub>	up to 500V 690V	A A	65 47	80 58	95 58
	1000V	Α	25	30	30
Rated power for slipping or squirrel cage	230V	kW	18,5	22	22
motors at 50 and 60 Hz	400V 500V	kW kW	30 37	37 45	45 55
	690V 1000V	kW kW	45 30	55 37	55 37
Thermal load capacity	10 s current <sup>2)</sup>	A	600	760	760
Power loss per conducting path	at I <sub>e</sub> /AC-3	W	4,6	7,7	10,8
Utilization category AC-4 (at $I_a = 6 \times I_e$ ) 1)					
<ul> <li>Rated operational current I<sub>e</sub></li> <li>Rated power for squirrel-cage motors with 50 and 60Hz</li> </ul>	up to 400V up to 400V	A kW	55 30	66 37	80 45
• The following applies to a contact endurance of about 200	0000 operating cycles:				
- Rated operational currents I <sub>e</sub>	up to 400V 690V	A A	28 28	34 34	42 42
	1000V	A	20	23	23
- Rated power for squirrel-cage motors with 50 and 60Hz	230	kW	8,7	10,4	12
· · · · · · · · · · · · · · · · · · ·	400V	kW	15,1	17,9	22
	500V 690V	kW kW	18,4 25,4	22,4 30,9	27 38
	1000V	kW	22	30	30

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

<sup>2)</sup> According to IEC 60947-4-1. For rated values for various start-up conditions see: Thermal Overload Relays.

<sup>3)</sup> Depending on the electronic ballast used, higher lamp numbers are also possible.

## Contactors LSD3 and LSU3

Туре			LSD365	LSD380	LSD395
Size			3	3	3
AC capacity					
Utilization category AC-5a, Switching gas dische	arge lamps, inductive ballast pe	er main cur	rent path at 230V		
<ul> <li>Uncorrected, rated power per lamp/rated operated</li> </ul>	ational current per lamp				
Uncorrected	L 18W/0.37A	Units	270	3	24
	L 36W/0.43A	Units	232	2	79
	L 58W/0.67A	Units	149		79
	L 80W/0.79A	Units	126	1	51
<ul> <li>DUO switching (two-lamp)</li> </ul>					
	L 18W/0.22A	Units	454 (≜ 2x454 lamps)	545 (≜ 2:	x545 lamps)
	L36W/0.42A	Units	238 (≜ 2x238 lamps)	285 (≜ 2:	<285 lamps)
	L 58W/0.63A	Units	158 (≜ 2x158 lamps)	190 (≜ 2:	<190 lamps)
	L 80W/0.87A	Units	114 (≜ 2x114 lamps)	137 (≜ 2:	c137 lamps)
Shunt compensation with inductive ballast, rated power pourrent per lamp					
<ul> <li>Shunt compensation with inductive ballast</li> </ul>	L 18W/4.5µF/0.11 A	Units	160	197	234
	L36W/4.5µF/0.21A	Units	160	197	234
	L 58W/7.0µF/0.32A	Units	103	127	150
	L 80W/7.0µF/0.49A	Units	103	126	146
<ul> <li>With solid-state ballast <sup>3)</sup> single lamp</li> </ul>					
	L 18W/6.8µF/0.10A	Units	455	560	665
	L 36W/6.8µF/0.18A	Units	253	311	369
	L 58W/10µF/0.29A	Units	156	193	229
	L 80W/10µF/0.43A	Units	105	130	154
With solid-state ballast <sup>3)</sup> two lamp					
	L 18W/10µF/0.18A	Units	253 (≜ 2x253 lamps)	311 (≜ 2x311 lamps)	369 (≜ 2x369 lamps)
	L 36W/10µF/0.35A	Units	130 (≜ 2x130 lamps)	160 (≜ 2x160 lamps)	190 (≜ 2x190 lamps)
	L 58W/22µF/0.52A	Units	88 (≜ 2x88 lamps)	108 (≜ 2x108 lamps)	128 (≜ 2x128 lamps)
	L 80W/22µF/0.86A	Units	52 (≜ 2x52 lamps)	65 (≜ 2x65 lamps)	77 (≜ 2x77 lamps)
<b>Utilization category AC-5b, Switching incandesc</b> at 230/220V	cent lamps per main current path	kW	12,3	15,2	18, 1

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).
2) According to IEC 60947-4-1. For rated values for various start-up conditions see: Thermal Overload Relays.

<sup>3)</sup> Depending on the electronic ballast used, higher lamp numbers are also possible.

# Contactors LSD3 and LSU3

Туре			LSD365	LSD380	LSD395
Size			3	3	3
AC capacity					
Utilization category AC-6a, switching AC transfo	rmers				
Rated operational current l <sub>e</sub>					
For inrush current n = 20	up to 400V	Α	63,5	80	84,4
	up to 690V	Α	47	58	58
For inrush current n = 30	up to 400V	Α	42,3	56,3	56,3
	up to 690V	Α	42,3	56,3	56,3
Rated power P	·		•	·	
For inrush current n = 20	230V	kVA	25,3	31,9	33,6
TOT IIII USTI COTTO III II – 20	400V	kVA	43,9	55,4	58
	500V	kVA	54,9	69,3	73,1
	690V	kVA	56,2	69,3	69,3
For inrush current n = 30	230V	kVA	16,8	22,4	22,4
TOT IIITUSTI COTTETITIT — 30	400V	kVA	29,3	39	39
	500V	kVA	29,3 36,6	48,7	48,7
	690V	kVA	50,3	67,3	67,3
For deviating inrush current factors x, the power must be r			30,3	07,3	07,3
Utilization category AC-6b, switching low-induction			angeitare		
Rated operational currents 1 e	up to 400V	A A	57	7	2
Rated power for single capacitors or	at 230V	kvar	24	2	
banks of capacitors (minimum inductance	400V	kvar	40	5	
of 6 µH between capacitors connected in	525V	kvar	50	6	
parallel) at 50 Hz, 60 Hz	690V	kvar	40	5	
DC capacity	0900	KVGI	40	J	0
Utilization category DC-1 Switching resistive load	ds (I /P < 1ms)				
Rated operational current I <sub>e</sub> (at 60°C)	as (1) K = 11115/				
- 1 conducting path	up to 24V	Α	90	100	100
. condoming pain	60V	A	23	60	60
	110V	A	4,5	9	9
	220V	A	1	2	2
	440V	A	0,4	0,6	0,6
	600V	A	0,26	0,4	0,4
- 2 conducting paths in series	up to 24V	A	90	100	100
2 conducting parts in sories	60V	Ä	90	100	100
	110V	Ä	90	100	100
	220V	Ā	5	100	10
	440V	Ä	1	1,8	1,8
	600V	A	0,8	1,0	1,8
- 3 conducting paths in series	up to 24V	A	90	100	100
- 5 conducting pairs in series	60V	A	90	100	100
	110V	A	90	100	100
	220V		90 70		80
		A		80	
	440V	A	2,9	1,8	4,5
	600V	A	1,4	1	2,6



# ■ Contactors LSD3 and LSU3

Туре			LSD365	LSD380	LSD395
Size			3	3	3
AC capacity					
Jtilization category DC-3 und DC-5, Shunt-wound	and series-wound motors (	L/R ≤ 15ms)			
<ul> <li>Rated operational current l<sub>e</sub> (at 60°C)</li> </ul>					
· 1 conducting path	up to 24V	A	40	40	40
	60V	A	6	6,5	6,5
	110V	A	2,5	2,5	2,5
	220V	A	1	1	1
	440V	Α	0,15	0,15	0, 15
	600V	Α	0,06	0,06	0,06
2 conducting paths in series	up to 24V	Α	90	100	100
	60V	A	90	100	100
	110V	A	90	100	100
	220V	Α	7	7	7
	440V	Α	0,42	0,42	0,42
	600V	A	0,16	0,16	0,16
3 conducting paths in series	up to 24V	Α	90	100	100
	60V	A	90	100	100
	110V	A	90	100	100
	220V	A	35	35	35
	440V	A	0,8	0,8	0,8
	600V	Α	0,35	0,35	0,35
witching frequency z in operating cycles/hour					
Contactors without overload relay	No-load switching frequency AC	h <sup>-1</sup>	5000	5000	5000
	No-load switching frequency DC	h <sup>-1</sup>	1000	1000	1000
ependence of the switching	AC-1 (AC/DC)	h <sup>-1</sup>	1000	900	900
equency z' on the operational current	AC-2 (AC/DC)	h <sup>-1</sup>	400	400	350
' and operational voltage U ':	AC-3 (AC/DC)	h <sup>-1</sup>	1000	1000	850
$= z \cdot (I_e/I) \cdot (400 \text{ V/U})^{1.5} \cdot 1/h$	AC-4 (AC/DC)	h <sup>-1</sup>	300	300	250
Contactors with overload relays (mean value)		h <sup>-1</sup>	15	15	15

### Contactors LSD3 and LSU3

### Conductor Cross-Sections-Contactors LSD3

Туре			LSD3
Size	3		
1 or 2 conductors can be connected			
	Main conductors:		Screw terminals
Front clamping point connected	<ul> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Stranded</li> <li>Solid</li> </ul>	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup>	2.5 35 4 50 2.5 16 4 70
Rear clamping point	Ribbon cable conductors (number x width x thickness)     AWG cables, solid or stranded     Finely stranded with end sleeve	mm <sup>2</sup> AWG	6×9×0.8 102/0 2.550
connected	Finely stranded without end sleeve  Stranded  Solid  Ribbon cable conductors (number x width x thickness)  AWG cables, solid or stranded	mm mm² mm² mm² mm² AWG	2.5 30 10 50 2.5 16 10 70 6 x 9 x 0.8 10 2/0
Both clamping points connected	Finely stranded with end sleeve Finely stranded without end sleeve Stranded Solid Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded Terminal screw	mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup> mm <sup>2</sup>	2 x (2.5 35) 2 x (4 35) 2 x (2.5 16) 2 x (4 50) 2 x (6 x 9 x 0.8) 2 x (10 1/0) M6 (Inbus. SW 4)
Connection for drilled copper bars 1) Without box terminal with cable lugs <sup>2)</sup> (1 or 2 conductors can be connected)	- tightening torque  Max. width  • Finely stranded with cable lug  • Stranded with cable lug  • AWG cables, solid or stranded	Nm mm	4 6 (36 53 lb.in) 10 10 50 <sup>3)</sup> 10 70 <sup>3)</sup> 7 1/0
	Auxiliary conductors:  Solid	mm <sup>2</sup>	2 x (0.5 1.5) <sup>4)</sup> ; 2 x (0.75 2.5) <sup>4)</sup> acc. to IEC 60947; max. 2 x (0.75 4)
	<ul> <li>Finely stranded with end sleeve</li> <li>AWG cables, solid or stranded</li> <li>Terminal screw</li> </ul>	mm² AWG	$2 \times (0.5 \dots 1.5) \ 4) ; 2 \times (0.75 \dots 2.5) \ 4)$ $2 \times (20 \dots 16)^{4} ; 2 \times (18 \dots 14)^{4} ; 1 \times 12$ M3
	- tightening torque	Nm	0.8 1.2 (7 10.3 lb.in)
	Auxiliary conductors:		Cage Clamp terminals (on request)
	• Solid	$mm^2$	2 × (0.25 2.5)
	<ul> <li>Finely stranded with end sleeve</li> </ul>	$mm^2$	2 x (0.25 1.5)
	Finely stranded without end sleeve	$mm^2$	2 x (0.25 2.5)
	AWG cables, solid or stranded	AWG	2 × (24 14)

<sup>1)</sup> If bars larger than 12 x 10mm are connected, a terminal cover is needed to comply with the phase clearance (on request).



<sup>2)</sup> If conductors larger than 25mm² are connected, a terminal cover is needed to comply with the phase clearance (on request).

<sup>3 )</sup> Only with crimped cable lugs according to DIN 46234. Cable lug max. 20mm wide.

<sup>4)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

# Contactors LSD6

### General Data - Contactors LSD6

Туре			LSD611	LSD615	LSD619
Size			6	6	6
Permissible mounting position	AC and DC operation		90°	90° 22,5° 2	2,5°
The contactors are designed for operation on a vertical mounting surfa	ace.				
Mechanical endurance		Operating		10 million	
Electrical endurance		cycles		1)	
Rated insulation voltage U <sub>i</sub> (degree of pollution 3, overvolt	tage category III)	V		1000	
Rated impulse withstand voltage U <sub>imp</sub>		kV		8	
Safe isolation between the coil and the main contacts acc. to	o EN 60947-1, Appendix N	V		690	
Mirror contacts					
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.			Yes, acc.	to EN 60947-4-1, Ap	pendix F
Ambient temperature	During operation	°C	-25	+60/+55 with AS-Int	erface
	During storage	°C		-55 <b>+</b> 80	
Degree of protection acc. to EN 60947-1, Appendix C Touch protection acc. to EN 50274			IPOC	open, coil assembly finger-safe	IP20
Shock resistance - rectangular pulse	AC and DC operation	g/ms		8.5/5 und 4.2/10	
Shock resistance -sine pulse	AC and DC operation	g/ms		13.4/5 und 6.5/10	
Conductor cross-sections				2)	
Electromagnetic compatibility (EMC)				3)	
Short-circuit protection without overload relays	For short-circuit protection for co	ntactors with overload	relays see: Overload I	Relays	
Main circuit					
Fuse links gL/gG NH, DIAZED, NEOZED					
acc. to IEC 60 947-4-1/DIN EN 60 947-4-1	Type of coordination "1"	Α	355	33	55
•	Type of coordination "2"	Α	315	3	15
	Weld-free <sup>1)</sup>	Α	80	10	50
Auxiliary circuit					
Fuse links gL/gG DIAZED, NEOZED (weld-free protection at $l_k \ge 1 kA$	A)	Α	10		
Miniature circuit breakers with C characteristic short-circuit current $\ l_k <$	: 400A	Α		10	
1\C "E   [d :"					

<sup>1)</sup> See "Endurance of the main contacts"

### ■ Control - Contactors LSD6

Туре			LSD6
Size			6
Operating range of the solenoid AC/DC (UC)	AC/DC		0.8 1.1 x U <sub>s</sub>
Power consumption of the solenoid			
<ul> <li>Conventional operating mechanism</li> </ul>			
- AC operation	Closing at U <sub>s</sub> min	VA/p.f.	250/0.9
	Closing at U₅ max	VA/p.f.	300/0.9
	Closed at U <sub>s</sub> min	VA/p.f.	4.8/0.8
	Closed at U <sub>s</sub> max	VA/p.f.	5.8/0.8
- DC operation	Closing at U <sub>s</sub> min	W	300
	Closing at U <sub>s</sub> max	W	360
	Closed at U <sub>s</sub> min	W	4,3
	Closed at U <sub>s</sub> max	W	5,2
PLC control input (EN 61131-2/type 2)		24\	/DC/≤ 30mA power consumption (operating range 17 30VDC)
Operating times (Total break time = Opening delay	r + Arcing time)		
Conventional operating mechanism			
- at 0,8 x U <sub>s</sub> min 1,1 x U <sub>s</sub> max	Closing delay	ms	20 95
	Opening delay	ms	40 60
- at U <sub>s</sub> min U <sub>s</sub> max	Closing delay	ms	25 50
	Opening delay	ms	40 60
Arcing time		ms	10 15



<sup>2)</sup> See "Conductor cross-sections"

<sup>3)</sup> See "Electromagnetic compatibility (EMC)"

<sup>4)</sup> According to IEC 60 947-4-1

## Contactors LSD6

Гуре			LSD611	LSD615	LSD619
Size			6	6	6
AC capacity		'			
Jtilization category AC-1, Switching resistive loads					
Rated operational current I <sub>e</sub>	at 40°C up to 690V	Α	160	185	215
	at 60°C up to 690V	Α	140	160	185
	at 60°C up to 1000V	Α	80	90	100
Rated power for AC loads <sup>1)</sup>	230V	kW	53	60	70
P.f.= 0.95 (at 60 °C)	400V	kW	92	105	121
	500V	kW	115	131	152
	690V	kW	159	181	210
	1000V		131	148	165
Minimum conductor cross-section	at 40°C	mm <sup>2</sup>	70	95	95
or loads with I <sub>e</sub>	at 60°C	mm <sup>2</sup>	50	70	95
Jtilization categories AC-2 and AC-3	ui oo c		30	70	/5
	up to 500V	A	115	150	185
Rated operational currents I <sub>e</sub>	690V	A		150	170
			115		
	1000V	Α	53	65	65
Rated power for slipping or squirrel cage	230V	kW	37	50	61
motors at 50 and 60 Hz	400V	kW	64	84	104
	500V	kW	81	105	132
	690V	kW	113	146	167
	1000V	kW	75	90	90
Thermal load capacity	10 s current <sup>2)</sup>	Α	1100	1300	1480
Power loss per conducting path	at I <sub>e</sub> /AC-3	W	7	9	13
Utilization category AC-4 (at I <sub>a</sub> = 6 × I <sub>e</sub> ) 1)	di le/ / te o			,	
Rated operational current I <sub>e</sub>	up to 400V	A	97	132	160
Rated power for squirrel-cage motors with 50 and 60Hz	'	kW	55	75	90
	up to 400V	KVV	33	/3	90
<ul> <li>The following applies to a contact endurance of about 200000 or</li> </ul>	perating cycles:				
Rated operational currents I <sub>e</sub>	up to 400V	Α	54	68	81
	690V	Α	48	57	65
	1000V	A	34	38	42
Rated power for squirrel-cage motors with 50 and 60Hz	230	kW	16	20	25
· Kalea power for squirter-cage motors with 50 and 60112					
	400V	kW	29	38	45
	500V	kW	37	47	57
	690V	kW	48	55	65
	1000V	kW	49	55	60
Jtilization category AC-6a, switching AC transformers					
Rated operational current l <sub>e</sub>					
For inrush current n = 20	up to 690V	Α	115	148	148
For inrush current n = 30	up to 690V	Α	90	99	99
Rated power P	at 230V	KVA	45	58	58
For inrush current n = 20	400V	KVA	79	102	102
	500V	KVA	99	128	128
	690V	KVA	137	176	176
	1000V	KVA	80	98	117
for inrush current n = 30	at 230V	KVA	35	39	39
	400V	KVA	62	68	68
	500V	KVA	77	85	85
	690V	KVA	107	118	118
	1000V	KVA	80	98	117
or deviating inrush current factors x, the power must be recalculated as fo					
Jtilization category AC-6b, switching low-inductance (low-los	s, metallized dielectric) AC cap	acitors			<u></u>
Ambient temperature 40 °C					
Rated operational currents I <sub>e</sub>	up to 500V	Α	105	125	145
Rated power for single capacitors or	at 230V	kvar	42	50	58
panks of capacitors (minimum	400V	kvar	72	86	100
nductance of 6 µH between capacitors	500V	kvar	90	108	125
connected in parallel) at 50Hz, 60Hz	690V	kvar	72	86	100

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account)



<sup>2)</sup> According to IEC 60947-4-1

## Contactors LSD6

Туре			LSD611	LSD615	LSD619	
Size			6	6	6	
DC capacity						
Utilization category DC-1 Switching resistive lo	ads (L/R ≤ 1 ms)					
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> </ul>						
- 1 conducting path	up to 24V	A		160		
	60V	Α		160		
	110V	Α		18		
	220V	A		3,4		
	440V	A		0,8		
	600V	Α		0,5		
- 2 conducting paths in series	up to 24V	Α		160		
	60V	A		160		
	110V	A		160		
	220V	A		20		
	440V	A		3,2		
	600V	Α		1,6		
- 3 conducting paths in series	up to 24V	Α		160		
	60V	Α		160		
	110V	Α		160		
	220V	Α	160			
	440V	Α	11,5			
	600V	Α		4		
15ms)						
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> </ul>	up to 24V	Δ		160		
•	up to 24V 60V	A A		160 7.5		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> </ul>	60V	Α		7,5		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> </ul>	•	A A		7,5 2,5		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> </ul>	60V 110V	Α		7,5 2,5 0,6		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> </ul>	60V 110V 220V	A A A		7,5 2,5 0,6 0,17		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> </ul>	60V 110V 220V 440V 600V	A A A A		7,5 2,5 0,6		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> </ul>	60V 110V 220V 440V	A A A		7,5 2,5 0,6 0,17 0,12		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> </ul>	60V 110V 220V 440V 600V up to 24V	A A A A		7,5 2,5 0,6 0,17 0,12		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V	A A A A		7,5 2,5 0,6 0,17 0,12 160 160		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 110V	A A A A A		7,5 2,5 0,6 0,17 0,12 160 160		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 110V 220V	A A A A A A		7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 110V 220V 440V 600V	A A A A A A A		7,5 2,5 0,6 0,17 0,12 160 160 160 2,5		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 110V 220V 440V 600V up to 24V	A A A A A A A A		7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65 0,37		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 110V 220V 440V 600V up to 24V 60V	A A A A A A A A A A A A A A A A A A A		7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65 0,37 160 160		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 110V 220V 440V 600V up to 24V 60V 110V	A A A A A A A A A A A A A A A A A A A		7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65 0,37 160 160		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 110V 220V 440V 600V up to 24V 60V 110V 220V	A A A A A A A A A A A A A A A A A A A		7,5 2,5 0,6 0,17 0,12 160 160 2,5 0,65 0,37 160 160 160		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 110V 220V 440V 600V up to 24V 60V 110V	A A A A A A A A A A A A A A A A A A A		7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65 0,37 160 160		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 110V 220V 440V 600V up to 24V 60V 110V 220V 440V 60V	A A A A A A A A A A A A A A A A A A A		7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65 0,37 160 160 160 160 1,4		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> <li>3 conducting paths in series</li> </ul>	60V 110V 220V 440V 600V Up to 24V 60V 110V 220V 440V 600V Up to 24V 600V Up to 24V 600V Vp to 24V 60V 110V 220V 440V 600V Vp to 24V 60V No-load switching	A A A A A A A A A A A A A A A A A A A	2000	7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65 0,37 160 160 160 160 160 1,4	100	
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> <li>3 conducting paths in series</li> <li>Switching frequency z in operating cycles/hour</li> <li>Contactors without overload relay</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 1110V 220V 440V 600V up to 24V 600V up to 24V 600V  1110V 220V 440V 600V  110V 220V 440V 600V	A A A A A A A A A A A A A A A A A A A	2000	7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65 0,37 160 160 160 160 1,4 0,75	000	
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> <li>3 conducting paths in series</li> <li>Switching frequency z in operating cycles/hour</li> <li>Contactors without overload relay</li> <li>Dependence of the switching</li> </ul>	60V 110V 220V 440V 600V Up to 24V 60V 110V 220V 440V 600V Up to 24V 600V Up to 24V 600V Vp to 24V 60V 110V 220V 440V 600V Vp to 24V 60V No-load switching	A A A A A A A A A A A A A A A A A A A		7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65 0,37 160 160 160 160 1,4 0,75		
<ul> <li>Rated operational current I<sub>e</sub> (at 60°C)</li> <li>1 conducting path</li> <li>2 conducting paths in series</li> <li>3 conducting paths in series</li> <li>Switching frequency z in operating cycles/hour</li> <li>Contactors without overload relay</li> </ul>	60V 110V 220V 440V 600V up to 24V 60V 1110V 220V 440V 600V up to 24V 600V 1110V 220V 440V 600V 1110V 220V 440V 600V The state of the st	A A A A A A A A A A A A A A A A A A A	800	7,5 2,5 0,6 0,17 0,12 160 160 160 2,5 0,65 0,37 160 160 160 160 160 1,4 0,75	00	



## Contactors LSD6

## ■ Conductor Cross-Sections-Contactors LSD6

Туре				LSD6
Size				6
Screw terminals	Mai	in conductors: without box terminal/busbar co	nnection	
	•	Finely stranded with cable lug <sup>1)</sup>	mm <sup>2</sup>	16 95
	•	Stranded with cable lug <sup>1)</sup>	$mm^2$	25 120
	•	AWG cables, solid or stranded	AWG	4 250 kcmil
	•	Connecting bar (max. width)	mm	17
	•	Terminal screw		M8 x 25 (SW 13)
	Tigh	tening torque	Nm	10 14 (89 124 lb.in)
	Aux	ciliary conductors:		
	•	Solid	$mm^2$	$2 \times (0.5 \dots 1.5)^{2}$ ; $2 \times (0.75 \dots 2.5)^{2}$ acc. to IEC 60947; max. $2 \times (0.75 \dots 4)$
	•	Finely stranded with end sleeve	$mm^2$	$2 \times (0.5 \dots 1.5)^{2}$ ; $2 \times (0.75 \dots 2.5)^{2}$
	•	AWG cables, solid or stranded	AWG	2 x (18 14)
	•	Terminal screw		M3 (PZ 2)
	Tigh	tening torque	Nm	0.8 1.2 (7 10.3 lb.in)
Cage Clamp termin (on request)	als Aux	ciliary conductors:		
- '	•	Solid	$mm^2$	2 x (0.25 2.5)
	•	Finely stranded with end sleeve	$mm^2$	2 x (0.25 1.5)
	•	Finely stranded without end sleeve	$mm^2$	2 x (0.25 2.5)
	•	AWG cables, solid or stranded	AWG	2 x (24 14)

<sup>1)</sup> When connecting cable lugs according to DIN 46235, use LSZ6D001 terminal cover for conductor cross-sections from 95mm² to ensure phase spacing.

<sup>2)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

## ■ Contactors LSDE

## ■ General data - Contactors LSDE

Туре			LSDE22	LSDE26	LSDE30	
Size		10	10	10		
Permissible mounting position  The contactors are designed for operation on a vertical mounting su	AC and DC operation		900	22,5°,22	2,5°	
Mechanical endurance		Operating		10 million		
Electrical endurance		cycles		1)		
Rated insulation voltage U <sub>i</sub> (degree of pollution 3, overve	oltage category III)	V		1000		
Rated impulse withstand voltage U <sub>imp</sub>		kV		8		
Safe isolation between the coil and the main contacts acc.	to EN 60947-1, Appendix N	٧		690		
Mirror contacts						
A mirror contact is an auxiliary NC contact that cannot be closed sin	multaneously with a NO main contact.		Yes, acc. to EN 60947-4-1, Appendix F			
Ambient temperature	During operation	°C	-25 +60/+55 with AS-Interface			
	During storage	°C	-55 <b>+</b> 80			
Degree of protection acc. to EN 60947-1, Appendix C			IPO	0/open, coil assembly I	P20	
Touch protection acc. to EN 50274				Finger-safe with cover		
Shock resistance	Rectangular pulse	g/ms		8.5/5 and 4.2/10		
	Sine pulse	g/ms		13.4/5 and 6.5/10		
Conductor cross-sections				2)		
Electromagnetic compatibility (EMC)				3)		
Short-circuit protection						
Main circuit						
Fuse links gL/gG NH, DIAZED, NEOZED						
acc. to IEC 60 947-4-1/DIN EN 60 947-4-1	Type of coordination "1"	Α		500		
	Type of coordination "2"	Α		400		
	Weld-free <sup>4)</sup>	Α		250		
Auxiliary circuit						
Fuse links gL/gG DIAZED, NEOZED (weld-free protection at $I_k \ge 11$	*	Α		10		
Miniature circuit breakers with C characteristic short-circuit current I,	k < 400A	Α		10		

<sup>1)</sup> See "Endurance of the main contacts"

### ■ Control-Contactors LSDE

Туре	LSDE22	LSDE26	LSDE30		
Size			10	10	10
Operating range of the solenoid AC/DC (UC)	AC/DC			0.8 1.1 x U <sub>s</sub>	
Power consumption of the solenoid					
Conventional operating mechanism					
- AC operation	Closing at U <sub>s</sub> min	VA/p.f.		490/0.9	
	Closing at U <sub>s</sub> max	VA/p.f.		590/0.9	
	Closed at U <sub>s</sub> min	VA/p.f.		5.6/0.9	
	Closed at U <sub>s</sub> max	VA/p.f.		6.7/0.9	
- DC operation	Closing at U <sub>s</sub> min	W		540	
	Closing at U <sub>s</sub> max	W			
	Closed at U <sub>s</sub> min	W			
	Closed at U <sub>s</sub> max	W		7,4	
PLC control input (EN 61131-2/type 2)			24VDC/≤ 30mA pow	er consumption, (operation	ng range 17 30VDC)
Operating times (Total break time = Opening de	lay + Arcing time)				
Conventional operating mechanism					
- at 0.8 x $U_s$ min 1.1 x $U_s$ max	Closing delay	ms		30 95	
	Opening delay	ms		40 80	
- at U <sub>s</sub> min U <sub>s</sub> max	Closing delay	ms		35 50	
	Opening delay	ms		50 80	
Arcing time		ms		10 15	



<sup>2)</sup> See "Conductor cross-sections"

<sup>3)</sup> See "Electromagnetic compatibility (EMC)" 4) According to IEC 60 947-4-1

# ■ Contactors LSDE

Type Size			<b>LSDE22</b>	<b>LSDE26</b>	<b>LSDE30</b>
AC capacity					
Jtilization category AC-1, Switching resistive loads					
Rated operational current I <sub>e</sub>	at 40°C up to 690V	Α	275	33	30
,	at 60°C up to 690V	Α	250	30	00
	at 60°C up to 1000V	Α	100	15	50
Rated power for AC loads <sup>1)</sup>	230V	kW	94	11	13
?.f.= 0.95 (at 60 °C)	400V	kW	164	19	97
	500V	kW	205	24	46
	690V	kW	283	34	40
	1000V	kW	164	24	46
Minimum conductor cross-section	at 40°C	mm <sup>2</sup>	150	18	35
or loads with I <sub>e</sub>	at 60°C	mm <sup>2</sup>	120		35
Jtilization categories AC-2 and AC-3	3.01				
Rated operational currents I <sub>e</sub>	up to 500V	Α	225	265	300
	690V	A	225	265	280
	1000V	A	68	95	95
lated power for slipping or squirrel cage	230V	kW	73	85	97
notors at 50 and 60 Hz	400V	kW	128	151	171
	500V	kW	160	189	215
	690V	kW	223	265	280
	1000V	kW	90	132	132
Thermal load capacity	10 s current <sup>2)</sup>	Α	1800	2400	2400
Power loss per conducting path	at I <sub>e</sub> /AC-3/500V	W	17	18	22
Utilization category AC-4 (at $I_a = 6 \times I_e$ ) 1)					
Rated operational current l <sub>e</sub>	up to 400V	Α	195	230	280
<ul> <li>Rated power for squirrel-cage motors with 50 and 60Hz</li> </ul>	up to 400V	kW	110	132	160
<ul> <li>The following applies to a contact endurance of about 200000 or</li> </ul>	perating cycles:				
Rated operational currents I <sub>e</sub>	up to 400V	A	96	117	125
	690V	Α	85	105	115
	1000V	A	42	57	57
Rated power for squirrel-cage motors with 50 and 60Hz	230	kW	30	37	40
rated power for squirter-cage motors with 50 and 60112	400V	kW	54	66	71
	500V	kW	67	82	87
	690V	kW	82	102	112
			62 59		80
Itilization autonomy AC 6m available - AC town of	1000V	kW	24	80	80
Jtilization category AC-6a, switching AC transformers					
• Rated operational current I <sub>e</sub>	4001/	,	227	2/5	070
for inrush current n = 20	up to 690V	A	227	265	273
for inrush current n = 30	up to 690V	Α	151	182	182
Rated power P	at 230V	KVA	90	105	109
or inrush current n = 20	400V	KVA	157	183	189
	500V	KVA	196	229	236
	690V	KVA	271	317	326
	1000V	KVA	117	164	164
or inrush current n = 30	at 230V	KVA	60	72	72
	400V	KVA	105	126	126
	500V	KVA	130	158	158
	690V	KVA	180	217	217
	1000V	KVA	117	164	164
or deviating inrush current factors x, the power must be recalculated as fo		N/A	11/	1 154	104
Itilization category AC-6b, switching low-inductance (low-los		acitors			
umbient temperature 40 °C	s, meranizea dielectric/ AC cap	ucii0i3		1	
•	t- 500V	,	102	01	20
Rated operational currents I <sub>e</sub>	up to 500V	A	183		20
tated power for single capacitors or	at 230V	kvar	<i>7</i> 3		8
panks of capacitors (minimum	400V	kvar	127		52
nductance of 6 µH between capacitors	500V	kvar	159		91
connected in parallel) at 50Hz, 60Hz	690V	kvar	127	1.5	52

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).



<sup>2)</sup> According to IEC 60947-4-1.

## ■ Contactors LSDE

Type Size			<b>LSDE22</b> 10	<b>LSDE26</b>	<b>LSDE30</b>
DC capacity					
Utilization category DC-1 Switching resistive loads (L/R ≤ 1 ms)  • Rated operational current I <sub>e</sub> (at 60°C)					
- 1 conducting path up to 2	4V A		200	30	00
61	OV A		200	30	00
110	OV A		18	3	3
220	OV A		3,4	3	,8
44	OV A		0,8	0	,9
600	OV A		0,5	0	,6
- 2 conducting paths in series up to 2	4V A		200	30	00
60	OV A		200	30	00
110	OV A		200	30	00
220	OV A		20	30	00
44	OV A		3,2		4
600	OV A		1,6	:	2
- 3 conducting paths in series up to 2	4V A		200	30	00
61	OV A		200	30	00
110	OV A		200	30	00
220	OV A		200	30	00
44	OV A		11,5	1	1
60	OV A		4	5	,2
Utilization category DC-3 und DC-5, Shunt-wound and series-wound motors (L/ • Rated operational current I <sub>e</sub> (at 60°C)	R ≤ 15ms)	)			
- 1 conducting path up to 2	4V A		200	30	00
6	OV A		7,5	1	1
110	OV A		2,5	;	3
220	OV A		0,6	0	,6
44	OV A		0,17	0,	18
600	OV A		0, 12	0,	125
- 2 conducting paths in series up to 2	4V A		200	30	00
60	OV A		200	30	00
110	OV A		200	30	00
220	OV A		2,5	2	,5
440	OV A		0,65	0,	65
600	OV A		0,37	0,	37
- 3 conducting paths in series up to 2	4V A		200	30	00
61	OV A		200	30	00
110	OV A		200	30	00
220	OV A		200	30	00
44	OV A		1,4	1	,4
600	OV A		0,75	0,	75
Switching frequency z in operating cycles/hour					
Contactors without overload relay     No-load switchi     frequency //	~ h		2000	2000	2000
Dependence of the switching AC			<i>7</i> 50	800	<i>7</i> 50
frequency z' on the operational current AC			250	300	250
I' and operational voltage U':			500	700	500
$z' = z \cdot (I_e/I) \cdot (400 \text{ V/U})^{1.5} \cdot 1/h$			130	130	130



## ■ Contactors LSDE

### ■ Conductor Cross-Sections-Contactors LSDE

Туре			LSDE
Size			10
Conductor cross-sections of n	nain conductors		
Screw terminals	Main conductors:  Finely stranded with cable lug <sup>1)</sup> Stranded with cable lug <sup>1)</sup> AWG cables, solid or stranded  Connecting bar (max. width)  Terminal screw  Tightening torque	mm² mm² AWG mm	50 240 70 240 2/0 500 kcmil 25 M10 x 30 (SW 17) 14 24 (124 210 lb.in)
	Auxiliary conductors:	INM	14 24 ( 124 210 lb.ln)
	Solid	mm <sup>2</sup>	$2 \times (0.5 \dots 1.5)^{2}$ ; $2 \times (0.75 \dots 2.5)^{2}$ acc. to IEC 60947; max. $2 \times (0.75 \dots 4)$
	Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 1.5) <sup>2</sup> ; 2 x (0.75 2.5) <sup>2</sup>
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	2 x (18 14)
	Terminal screw		M3 (PZ 2)
	- Tightening torque	Nm	0.8 1.2 (7 10.3 lb.in)
Cage Clamp terminals (on request)	Auxiliary conductors:		
	• Solid	mm <sup>2</sup>	2 × (0.25 2.5)
	Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.25 1.5)
	Finely stranded without end sleeve	mm <sup>2</sup>	2 × (0.25 2.5)
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	2 × (24 14)

<sup>1)</sup> When connecting cable lugs according to DIN 46235, use LSZ6 D001 terminal cover for conductor cross-sections from 95mm² to ensure phase spacing.

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

## ■ Contactors LSDG

### General Data - Contactors LSDG

Туре	LSDG41	LSDG51			
Size		12	12		
Permissible mounting position		90° ++++ 90	22.5°, 22.5°		
The contactors are designed for operation on a vertical mounting surfa	ce.				
Mechanical endurance		Operating		million	
Electrical endurance		cycles		1)	
Rated insulation voltage U <sub>i</sub> (degree of pollution 3, overvoltage categor	ory III)	٧	10	000	
Rated impulse withstand voltage U <sub>imp</sub>		kV		8	
Safe isolation between the coil and the main contacts acc. to EN 60	947-1, Appendix N	٧	6	90	
Mirror contacts					
A mirror contact is an auxiliary NC contact that cannot be closed simu	ltaneously with a NO main contact.		Yes, acc. to EN 60947-4-1, Appendix F		
Ambient temperature	During operation	°C	-25 +60/+55	with AS-Interface	
	During storage	°C	-55	+80	
Degree of protection acc. to EN 60947-1, Appendix C			IPOO/open, co	oil assembly IP20	
Touch protection acc. to EN 50274				e with cover	
Shock resistance	Rectangular pulse	g/ms		nd 4.2/10	
	Sine pulse	g/ms		nd 6.5/10	
Conductor cross-sections				2)	
Electromagnetic compatibility (EMC)				3)	
Short-circuit protection					
Main circuit					
<ul> <li>Fuse links gL/gG NH, DIAZED, NEOZED</li> </ul>					
acc. to IEC 60 947-4-1 /DIN EN 60 947-4-1	<ul> <li>Type of coordination "</li> </ul>	1" A	630	630	
	Type of coordination ":		500	500	
	• Weld-free <sup>4)</sup>	A	250	315	
Auxiliary circuit					
<ul> <li>Fuse links gL/gG DIAZED, NEOZED (weld-free protection at I)</li> </ul>	, ≥ 1kA)	A		10	
Miniature circuit breakers with C characteristic short-circuit curre		A		10	
1\C "Fl					

<sup>1)</sup> See "Endurance of the main contacts"

### ■ Control - Contactors LSDG

Туре			LSDG41	LSDG51	
Size			12	12	
Operating range of the solenoid AC/DC (UC)	AC/DC		0.8 1.1 x U <sub>s</sub>		
Power consumption of the solenoid					
Conventional operating mechanism					
- AC operation	Closing at U <sub>s</sub> min	VA/p.f.	700,	/0.9	
	Closing at U <sub>s</sub> max	VA/p.f.	830,	/0.9	
	Closed at U <sub>s</sub> min	VA/p.f.	7.6/	′0.9	
	Closed at U <sub>s</sub> max	VA/p.f.	9.2/	<b>′</b> 0.9	
- DC operation	Closing at U <sub>s</sub> min	W	770		
	Closing at U <sub>s</sub> max	W	92	20	
	Closed at U <sub>s</sub> min	W	8,	5	
	Closed at U <sub>s</sub> max	W	1	0	
PLC control input (EN 61131-2/type 2)			24VDC/≤ 30mA power consumption	on, (operating range 17 30VDC)	
Operating times (Total break time = Opening delay	+ Arcing time)				
Conventional operating mechanism					
- at $0.8 \times U_s$ min $1.1 \times U_s$ max	Closing delay	ms	45	100	
	Opening delay	ms	60	100	
- at U <sub>s</sub> min U <sub>s</sub> max	Closing delay	ms	50	. 70	
	Opening delay	ms	70	100	
Arcing time		ms	10	15	



<sup>2)</sup> See "Conductor cross-sections"

<sup>3)</sup> See "Electromagnetic compatibility (EMC)"

<sup>4)</sup> According to IEC 60 947-4-1

## ■ Contactors LSDG

Type Size			<b>LSDG41</b> 12	<b>LSDG51</b> 12
AC capacity		'		
Utilization category AC-1, Switching resistive loads				
Rated operational current I <sub>e</sub>	at 40°C up to 690V	Α	430	610
	at 60°C up to 690V	A	400	550
	at 60°C up to 1000V	A	200	200
Rated power for AC loads <sup>1)</sup>	230V	kW	151	208
P.f.= 0.95 (at 60 °C)	400V	kW	263	362
	500V	kW	329	452
	690V	kW	454	624
	1000V	kW	329	329
Minimum conductor cross-section	at 40°C	mm <sup>2</sup>	2 x 150	2 x 185
or loads with I <sub>e</sub>	at 60°C	mm <sup>2</sup>	240	2 x 185
Utilization categories AC-2 and AC-3				
lated operational currents I <sub>e</sub>	up to 500V	Α	400	500
alea operational correlits ie	690V	Ā	400	450
	1000V	Ä	180	180
Veted navar for dinning or squirrel	230V	kW	132	164
tated power for slipping or squirrel-cage				
notors at 50 and 60 Hz	400V	kW	231	291
	500V	kW	291	363
	690V	kW	400	453
	1000V	kW	250	250
hermal load capacity	10 s current <sup>2)</sup>	Α	3200	4000
Power loss per conducting path	at I <sub>e</sub> /AC-3/500V	W	35	55
Jtilization category AC-4 (at $I_a = 6 \times I_e$ ) 1)				
Rated operational current l <sub>e</sub>	up to 400V	A	350	430
<ul> <li>Rated power for squirrel-cage motors with 50 and 60Hz</li> </ul>	up to 400V	kW	200	250
<ul> <li>The following applies to a contact endurance of about 200000</li> </ul>	operating cycles:			
Rated operational currents I <sub>e</sub>	up to 400V	Α	150	175
	690V	Α	135	150
	1000V	A	80	80
B-t-d	230V	kW	48	56
Rated power for squirrel-cage motors with 50 and 60Hz				
	400V	kW	85	98
	500V	kW	105	123
	690V	kW	133	148
num at a second to the second	1000V	kW	113	113
Itilization category AC-6a, switching AC transformers				
Rated operational current l <sub>e</sub>			077	40.4
or inrush current n = 20	up to 690V	A	377	404
or inrush current n = 30	up to 690V	A	251	270
Rated power P				
or inrush current n = 20	at 230V	kVA	150	161
	400V	kVA	261	280
	500V	kVA	326	350
	690V	kVA	450	483
	1000V	kVA	311	311
or inrush current n = 30	at 230V	kVA	100	107
555 CONOUNT	400V	kVA	173	187
	500V	kVA	217	234
	690V	kVA	300	323
and the second and th	1000V	kVA	311	311
or deviating inrush current factors x, the power must be recalculated as		••		
tilization category AC-6b, switching low-inductance (low-lo	ss, metallized dielectric) AC cap	acitors		
mbient temperature 40 °C				
ated operational currents I <sub>e</sub>	up to 500V	A	287	407
lated power for single capacitors or	at 230V	kVAr	114	162
panks of capacitors (minimum	400V	kVAr	199	282
nductance of 6 µH between capacitors	500V	kVAr	248	352
connected in parallel) at 50Hz, 60Hz	690V	kVAr	199	282

<sup>1)</sup> Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account)



<sup>2)</sup> According to IEC 60947-4-1

# Contactors LSDG

Type Size			<b>LSDG41</b>	<b>LSDG51</b>
DC capacity				
Utilization category DC-1 Switching resistive load  • Rated operational current I <sub>e</sub> (at 60°C)	ds (L/R ≤ 1 ms)			
- 1 conducting path	up to 24V	Α	400	)
	60V	Α	330	)
	110V	Α	33	
	220V	Α	3,8	}
	440V	Α	0,9	)
	600V	Α	0,6	
2 conducting paths in series	up to 24V	Α	400	)
	60V	Α	400	)
	110V	Α	400	)
	220V	Α	400	)
	440V	Α	4	
	600V	Α	2	
3 conducting paths in series	up to 24V	Α	400	)
0,	, 60V	Α	400	)
	110V	Α	400	)
	220V	Α	400	)
	440V	Α	11	
	600V	Α	5,2	2
Utilization category DC-3 und DC-5, Shunt-woun Rated operational current I <sub>e</sub> (at 60°C) conducting path	up to 24V	Α	400	)
	60V	Α	11	
	110V	Α	3	
	220V	Α	0,6	
	440V	Α	0,18	8
	600V	Α	0, 12	25
2 conducting paths in series	up to 24V	Α	400	)
	60V	Α	400	)
	110V	Α	400	
	220V	Α	2,5	5
	440V	Α	0,6	
	600V	Α	0,3	7
3 conducting paths in series	up to 24V	Α	400	)
	60V	Α	400	)
	110V	Α	400	
	220V	Α	400	
	440V	Α	1,4	
	600V	Α	0,7.	5
witching frequency z in operating cycles/hour				
Contactors without overload relay	No-load switching frequency AC	h <sup>-1</sup>	2000	2000
Dependence of the switching	AC-1	h <sup>-1</sup>	700	500
			000	170
	AC-2	h <sup>-1</sup>	200	170
requency z' on the operational current ' and operational voltage U':	AC-2 AC-3	h <sup>-1</sup>	500	420



### ■ Contactors LSDG

### ■ Conductor Cross-Sections-Contactors LSDG

Туре			LSDG
Size			12
Screw terminals	Main conductors: without box terminal/busbar connection (box terminals on request)		
	<ul> <li>Finely stranded with cable lug<sup>1)</sup></li> </ul>	$mm^2$	50 240
	<ul> <li>Stranded with cable lug<sup>1)</sup></li> </ul>	$mm^2$	70 240
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	2/0 500 kcmil
	<ul> <li>Connecting bar (max. width)</li> </ul>	mm	25
	<ul> <li>Terminal screw</li> </ul>		M10 x 30 (SW 17)
	- Tightening torque	Nm	14 24 (124 210 lb.in)
	Auxiliary conductors:		
	• Solid	$mm^2$	2 x (0.5 1.5) <sup>2)</sup> ; 2 x (0.75 2.5) <sup>2)</sup> acc. to IEC 60947; max. 2 x (0.75 4)
	<ul> <li>Finely stranded with end sleeve</li> </ul>	$mm^2$	2 x (0.5 1.5) <sup>2)</sup> ; 2 x (0.75 2.5) <sup>2)</sup>
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	2 × (18 14)
	Terminal screw		M3 (PZ 2)
	- Tightening torque	Nm	0.8 1.2 (7 10.3 lb.in)
Cage Clamp terminals (on request)	Auxiliary conductors:		
	• Solid	$\mathrm{mm}^2$	2 × (0.25 2.5)
	Finely stranded with end sleeve	$\mathrm{mm}^2$	2 × (0.25 1.5)
	<ul> <li>Finely stranded without end sleeve</li> </ul>	$mm^2$	2 x (0.252.5)
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	2 x (24 14)

<sup>1)</sup> When connecting cable lugs according to DIN46234 for conductor cross-sections of 185mm<sup>22</sup> and more and according to DIN46235 for conductor cross-sections of 240mm<sup>2</sup> and more, the LSZED001 terminal cover must be used to keep the phase clearance.

<sup>2)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

# CSA and UL Rated Data for Contactors LSD, LSS and LSU

## CSA and UL Rated Data for Contactors LSDD/0, LSSD/0 and LSUD/0

Туре					LSSD07 LSDD07	LSSD09 LSDD09	LSUD12 LSSD12 LSDD12	LSD009	LSS012 LSD012	LSS017 LSD017	LSU025 LSS025 LSD025
Size					00	00	00	0	0	0	0
Rated insulation voltage				VAC				600			
Uninterrupted current, at 40 °C	•	Open and enclosed		Α				20			
Maximum horsepower ratings (CSA and U	JL app	roved values)									
<ul> <li>Rated power for induction motor at 60Hz</li> </ul>			at 200V	hp	1,5	2	3	2	3	5	7,5
			230V	hp	2	3	3	3	3	5	7,5
			460V	hp	3	5	7,5	5	7,5	10	15
			575V	hp	5	7,5	10	7,5	10	15	20
Short-circuit protection 1) (contactor or overload re	lay)		at 600V	kA	5	5	5	5	5	5	5
	•	CLASS RK5 fuse		Α	60	60	60	70	70	70	100
	•	Circuit breakers with	overload	Α	50	50	50	70	70	70	100
	prote	ction acc. to UL 489									
Combination motor controllers, type E acc	. to UL 3	508									
	at 48	30V		Туре				BESO			
				A				8	10	16	22
				kA				65	65	65	65
	at 60	OOV		Туре				BESO			
				A				8	10	12,5	12,5
				kA				25	25	25	25
NEMA/EEMAC ratings											
NEMA/EEMAC-Size				hp			0				1
Uninterrupted current	Ope	n		À			18				27
	Enclo	sed		Α			18				27
<ul> <li>Rated power for induction motor at 60Hz</li> </ul>		-	at 200V	hp			3				7,5
			230V	hp			3				7,5
			460V	hp			5				10
			575V	hp			5				10
Thermal Overload relays	Туре					LSTD			LS	STO	
	Settir	ig range		Α		0.11 12			1.8	25	

## CSA and UL Rated Data for Contactors LSD2, LSU2, LSD3

Туре				LSD232	LSU240 LSD240	LSD250	LSD365	LSD380	LSD395
Size				2	2	2	3	3	3
Rated insulation voltage			VAC				00	] 3	
Uninterrupted current, at 40 °C	Open and enclosed		A	45	55	50	90	105	105
Maximum horsepower ratings (CSA and UL appro			- / \	75	- 55	- 50	,,,	100	100
Rated power for induction	370a 7a1003j	at 200V	hp	10	10	15	20	25	30
motors at 60Hz		230V	hp	10	15	15	25	30	30
		460V	hp	25	30	40	50	60	75
		575V	hp	30	40	50	60	75	100
Short-circuit protection <sup>1)</sup> (contactor or overload rel	av)	at 600V	kA	5	5	5	10	10	10
(	CLASS RK5 fuse		A	125	150	200	250	300	350
	Circuit breakers with a	overload	Α	125	150	200	250	300	400
	protection acc. to UL 489								
<ul> <li>Combination motor controllers, type E acc.</li> </ul>	· -					I			
- //	at 480 V		Type		BES2			BES3	
			Á	32	40	50	63	75	100
			kA	65	65	65	65	65	65
	at 600 V		Type		BES3			BES3	•
			A	32	40	50	63	75	<i>7</i> 5
			kA	25	25	25	30	30	30
NEMA/EEMAC ratings									
NEMA/EEMAC-Size			hp			2			3
Uninterrupted current	Open		A			45			90
	Enclosed		Α			45			90
<ul> <li>Rated power for induction motor at 60Hz</li> </ul>	_	at 200V	hp			10			25
		230V	hp			15			30
		460V	hp			25			50
		<i>57</i> 5V	hp			25			50
Thermal Overload relays	Туре				LST2			LST3	
	Setting range		Α		5.5 50			18 100	



## CSA and UL Rated Data for Contactors LSD, LSS and LSU

## CSA and UL Rated Data for Auxiliary Contacts

Size		00	00 - 12				
		Screw terminals and	Screw terminals and	Screw terminals and			
		Cage Clamp terminals	Cage Clamp terminals	Cage Clamp terminals			
		Integrated or snap-on	1 - and 4-pole snap-on	Laterally mountable			
		auxiliary contact block	auxiliary contact block	auxiliary contact block			
Rated voltage	VAC	600	600	600			
Switching capacity		A 600, Q 600	A 600, Q 600	A 300, Q 300			
<ul> <li>Uninterrupted current at 240VAC</li> </ul>	Α	10	10	10			

## CSA and UL Rated Data for Contactors LSD6, LSDE

Туре			LSD611	LSD615	LSD619	LSDE22	LSDE26	LSDE30
Size			6	6	6	10	10	10
Rated insulation voltage		VAC			61	00		
Uninterrupted current, at 40°C	Open and enclosed	Α	140	195	195	250	330	330
Maximum horsepower ratings (CSA o	and UL approved values)							
Rated power for	at 200V	hp	40	50	60	60	<i>7</i> 5	100
induction motor at 60Hz	230V	hp	50	60	<i>7</i> 5	75	100	125
	460V	hp	100	125	150	150	200	250
	575V	hp	125	150	200	200	250	300
Short-circuit protection <sup>1)</sup> (contactor or	overload relay) at 600V	kA	10	10	10	10	18	18
	<ul> <li>CLASS RK5 fuse</li> </ul>	Α	450	500	500	700	800	800
	<ul> <li>Circuit breakers with overload</li> </ul>	Α	350	450	500	500	700	800
	protection acc. to UL 489							
NEMA/EEMAC ratings								
NEMA/EEMAC-Size		hp		4				5
<ul> <li>Uninterrupted current</li> </ul>	Open	A		150				300
	Enclosed	Α		135				270
<ul> <li>Rated power for</li> </ul>	at 200V	hp		40				75
induction motor at 60Hz	230V	hp		50				100
	460V	hp		100				200
	575V	hp		100				200

### CSA and UL Rated Data for Contactors LSDG

Тур				LSDG41	LSDG51
Size				12	12
Rated insulation voltage			VAC	60	00
Uninterrupted current, at 40 °C	Open and enclosed		А	400	540
Maximum horsepower ratings (CSA and UL approve	ed values)				
Rated power for induction motor at 60Hz		at 200V	hp	125	150
		230V	hp	150	200
		460V	hp	300	400
		<i>57</i> 5V	hp	400	500
Short-circuit protection (contactor or overload relay)		at 600V	kA	18	30
	<ul> <li>CLASS RK5 fuse</li> </ul>		Α	1000	1200
	<ul> <li>Circuit breakers with a</li> </ul>	verload	Α	900	900
	protection acc. to UL 489				
NEMA/EEMAC ratings					
NEMA/EEMAC-Size			hp		6
Uninterrupted current	Open		A		600
	Enclosed		Α		540
Rated power for induction motor at 60Hz		at 200V	hp		150
		230V	hp		200
		460V	hp		400
		<i>57</i> 5V	hp		400



### General Information - Vacuum Contactors LSDH

#### Vakuum Contactors LSDH - Overview

IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)

The LSDH contactors are climate-proof. They are finger-safe according to EN 50274. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices (see chapter "Accessories" – terminal covers).

#### **FUNCTION**

#### **MAIN CONTACTS**

#### Contact erosion indication with LSDH 6/8 vacuum contactors

The contact erosion of the vacuum interrupters can be checked during operation with the help of 3 white double slides on the contactor base. If the distance indicated by one of the double slides is < 0.5 mm while the contactor is in the closed position, the vacuum interrupter must be replaced.

To ensure maximum reliability, it is recommended to replace all 3 vacuum interrupters.

#### **AUXILIARY CONTACT**

#### Contact reliability

The auxiliary contacts are suitable for solid-state circuits

- with currents ≥ 1 mA
- and voltages from 17V

#### SURGE SUPPRESSION

#### Control circuit

Protection of coils against overvoltage:

#### **AC** operation

Fitted with varistors as standard

#### Fitted with DC operation

Retrofitting options:

• \A/ith variatora

If LSDH 6/8 is to be used for DC operation, an additional reversing contactor is required; this is included in the scope of supply in the same packaging as the vacuum contactor.

### Electromagnetic Compatibility

LSDH 6/8 contactors for AC operation are fitted with an electronically controlled solenoid operating mechanism with a high interference immunity.

Contactor type	Rated control supply voltage U <sub>s</sub>	Overvoltage type (IEC 60801)	Degree of severity (IEC 60801)	Overvoltage strength
LSDH6	110V 132V	Burst	3	2kV
LSDH8		Surge	4	6kV
	200V 277V	Burst	4	4kV
		Surge	4	5kV
	380V 600V	Burst	4	4kV
		Surge	4	6kV

#### Note:

During operation in installations in which the emitted interference limits cannot be observed, e.g. when used for output contactors in converters,

LSDH6/8 contactors without a main conductor path circuit are recommended (see description next page).

#### **APPLICATION**

The standard LSDH6. and LSDHB. contactors with electronically controlled contactor mechanism, have high resistance to electromagnetic interference.

Causes for such interference can be, for example:

- Frequency converters which are operated nearby can cause periodic overvoltages at the control level of the contactors.
- High-energy pulses cause by switching operations and atmospheric discharges can cause interference on the control cables.

To reduce interference voltages caused by frequency converters, the manufacturer recommends the use of e.g. input filters, output filters, grounding or shielding in the installation.

Further measures that should be applied for overvoltage damping:

- Feeding the contactors using control transformer according to EN 60204 rather than directly from the network
- Use of surge arresters, if required

#### Control circuit

The rectifier bridge is connected to varistors for protection against overvoltages. The built-in rectifier bridge affords sufficient protection for the coils.

#### Main circuit

As standard LSDH. contactors with integrated RC varistors.

#### Protection of the main current paths

An integrated RC varistor connection for the main current paths of the contactors dampens the switching overvoltage rises to safe values. This prevents multiple restriking. The operator of an installation can therefore rest assured that the motor winding cannot be damaged by switching overvoltages with steep voltage rises.

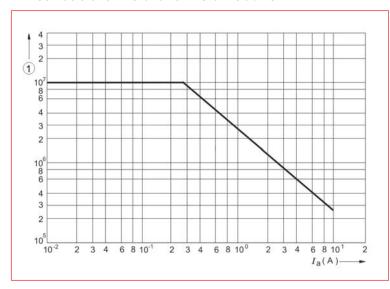
#### Important note

The overvoltage damping circuit is not required if LSDH 6/8 contactors are used in circuits with DC choppers, frequency converters or speed-variable operating mechanisms, for example. It could be damaged by the voltage peaks and harmonics which are generated. This may cause phase-to-phase short-circuits in the contactors.

Order special contactor version without overvoltage damping (on request).

### General Information - Vacuum Contactors LSDH

### Contactors LSDH6 and LSDH8 at 230VAC



### Endurance of the auxiliary contacts

The contact endurance for utilization category AC-12 or AC-15/AC-14 depends mainly on the breaking current. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

#### Diagram:

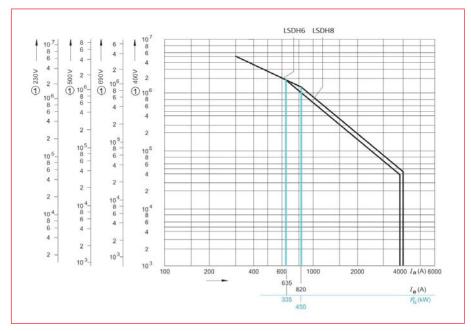
1) Operating cycles

### ■ Contact Erosion Indication with LSDH6 and LSDH8 Vacuum Contactors

The contact erosion of the vacuum interrupters can be checked during operation with the help of 3 white double slides on the contactor base.

If the distance indicated by one of the double slides is < 0.5mm while the contactor is in the closed position, the vacuum interrupter must be replaced. To ensure maximum reliability, it is recommended to replace all 3 vacuum interrupters.

### Endurance of the Main Contacts



1) Operating cycles at ...

P<sub>N</sub> = Rated power for squirrel-cage motors at 400V

I<sub>a</sub> = Breaking current

I<sub>e</sub> = Rated operational current



# ■ General Information - Vacuum Contactors LSDH

## Rated Data of the Auxiliary Contacts

Туре			LSDH6 and LSDH8 acc. to IEC 60947-5-1 (VDE 0660 Part 200)
Rated insulation voltage U <sub>i</sub> (degree of pollution 3, overvo	ltage category III)	V	690
Continuous thermal current I <sub>th</sub> = Rated operational current	I <sub>e</sub> /AC-12	Α	10
AC load, Rated operational current I <sub>e</sub> /AC-15/AC-14			
<ul> <li>for rated operational voltage U<sub>e</sub></li> </ul>	24V	Α	10
	110V	A	10
	125V	Α	10
	220V	A	6
	230V	Α	5,6
	380V	Α	4
	400V	Α	3,6
	500V	Α	2,5
	660V	Α	2,5
	690V	Α	2,3
DC load, Rated operational current I <sub>e</sub> /DC-12			
$\bullet$ $$ for rated operational voltage $U_{\rm e}$	24V	Α	10
	60V	Α	10
	110V	Α	3,2
	125V	Α	2,5
	220V	A	0,9
	440V	A	0,33
	600V	A	0,22
DC load, Rated operational current I <sub>e</sub> /DC-13			
<ul> <li>for rated operational voltage U<sub>e</sub></li> </ul>	24V	A	10
	60V	A	5
	110V	A	1, 14
	125V	A	0,98
	220V	A	0,48
	440V	Α	0,13
	600V	Α	0,07
CSA and UL rated data for the auxiliary contacts			
Rated voltage		VAC	600
raieu voliage		max.	000
Switching capacity			A 600, P 600

### General Information - Vacuum Contactors LSDH

### General Data - Vacuum Contactors LSDH6, LSDH8

Туре			LSDH6	LSDH8
Size			14	14
Permissible mounting position, installation instructions <sup>1) 2)</sup> The contactors are designed for operation on a vertical mounting surface.	AC and DC operation		90° ++++ 90	22,5°, 22,5°
Mechanical endurance		Operating	5 N	
Electrical endurance		cycles	5	3)
Rated insulation voltage U <sub>i</sub> (degree of pollution 3, overvoltage cate	gory III)	kV		
Rated impulse withstand voltage U <sub>imp</sub>		kV	3	3
Safe isolation between the coil and the main contacts acc. to EN 60947-1, App	oendix N	kV		1
Permissible ambient temperature	During operation	°C	-25	. +55
	During storage	°C	-55	. +80
<b>Degree of protection</b> acc. to EN 60947-1, Appendix C			IPOO/open, coil assembly IP40	
<b>Touch protection</b> acc. to EN 50274			Finger-safe	with cover
Shock resistance				
Rectangular pulse	AC operation	g/ms	8.1/5 and 4.7/10	9.5/5 and 5.7/10
	DC operation	g/ms	9/5 and 5.7/10	8.6/5 and 5.1/10
Sine pulse	AC operation	g/ms	12.8/5 and 7.4/10	13.5/5 and 7.8/10
	DC operation	g/ms	14.4/5 and 9.1/10	13.5/5 and 7.8/10
Conductor cross-sections			See "Conductor	Cross-Sections"
Electromagnetic compatibility (EMC)			See "Electromagnetic	compatibility (EMC)"
Short-circuit protection				
Fuse link gL/gG NH, DIAZED, NEOZED acc. to IEC 60 947-4-1/DIN	EN 60 947-4-1			
,	Type of coordination "1"	Α	1000	1250
	Type of coordination "2"	Α	500	630
	Weld-free <sup>4)</sup>	Α	400	500
Auxiliary circuit				
<ul> <li>Fuse links gL/gG DIAZED, NEOZED (weld-free protection at I<sub>k</sub> ≥ 1kA)</li> </ul>		Α	1	0
<ul> <li>Or miniature circuit breakers with C characteristic I<sub>k</sub> &lt; 400A</li> </ul>		Α	1	0

<sup>1)</sup> To easily replace the laterally mounted auxiliary switches it is recommended to maintain a minimum distance of 30mm between the contactors.

### ■ Vacuum Contactors LSDH

### ■ Control - Vacuum Contactors LSDH6, LSDH8

Туре			LSDH6	LSDH8		
Size	9			14	14	
Ma	gnetic coil operating range			0.8 1.	1 x U <sub>s</sub>	
Pov	ver consumption of the magnetic coils (	when coil is cold and 1.0 x U <sub>s</sub> )				
•	AC operation, U <sub>s max</sub>	Closing	VA/p.f.	1850/1	950/0.98	
		Closed	VA/p.f.	49/0.15	30.6/0.31	
•	AC operation, U <sub>s min</sub>	Closing	VA/p.f.	1200/1	600/0.98	
		Closed	VA/p.f.	13.5/0.47	12.9/0.43	
•	DC economy circuit <sup>1)</sup>	Closing at 24V	W	1010	960	
		Closed	W	28	20,6	
Op	erating times at 0.8 1.1 x U <sub>s</sub> (Total bre	ak time = Opening delay + Arcing time)		(Values apply to cold and warm coil)		
•	AC operation	Closing delay	ms	<i>7</i> 0 120	80 120	
		Opening delay	ms	70 100	<i>7</i> 0 80	
•	DC operation	Closing delay	ms	<i>7</i> 6 110	86 280	
		Opening delay	ms	50	19 25	
•	Arcing time		ms	10 15	10	
Ор	erating times at 1.0 x U <sub>s</sub> (Total break time	= Opening delay + Arcing time)				
•	AC operation	Closing delay	ms	80 100	85 100	
		Opening delay	ms	<i>7</i> 0 100	<i>7</i> 0	
•	DC operation	Closing delay	ms	80 90	90 125	
		Opening delay	ms	50	19 25	
Mir	nimum command duration	Standard	ms	120	120	
for c	closing	Reduced make-time	ms	90		
Min	imum interval time between two ON commar	nds	ms	100	300	

<sup>1)</sup> At 24VDC; for further voltages, deviations of up to ±10 % are possible.



<sup>2)</sup> If mounted at a 90° angle (conducting paths are horizontally above each other), the switching frequency is reduced by 80% compared with the normal values.

<sup>3)</sup> See page before "Endurance of the auxiliary contacts".

<sup>4)</sup> Test conditions according to IEC 60947-4-1.

## ■ Vacuum Contactors LSDH

## ■ Main Circuit - Vacuum Contactors LSDH6, LSDH8

Туре			LSDH6	LSDH8
AC capacity			14	14
Utilization category AC-1, Switching resistive loads			I	
Rated operational current I <sub>a</sub>	at 40°C up to 690V	Α	700	910
Nation operational content is	at 60°C up to 690V	A	630	850
	at 60°C up to 1000V	Α	450	800
Rated power for AC loads <sup>1)</sup>	230V	kW	240	323
P.f.= 0.95 (at 60 °C)	400V	kW	415	558
	500V	kW	545	735
	690V	kW	720	970
	1000V	kW	780	1385
Minimum conductor cross-section	at 40°C	mm <sup>2</sup>	2 x 24	I <sub>e</sub> ≥ 800A: 2 x 60 x 5 (Cu busbars)
for loads with I <sub>a</sub>	at 55°C	mm <sup>2</sup>	2 x 18	I <sub>a</sub> < 800A: 2 × 240
Utilization categories AC-2 and AC-3				
Rated operational currents I <sub>e</sub>	up to 690V	Α	630	820
,	1000V	Α	435	580
Rated power for slipping or squirrel-cage	at 230V	kW	200	260
motors at 50 and 60 Hz	400V	kW	347	450
	500V	kW	434	600
	690V	kW	600	800
	1000V	kW	600	800
Utilization category AC-4 (at $I_a = 6 \times I_e$ ) 1)				
Rated operational current I <sub>a</sub>	up to 690V	Α	610	690
Rated power for squirrel-cage motors with 50 and 60Hz	up to 400V	kW	355	400
The following applies to a contact endurance of about 200000 operating				
- Rated operational currents I <sub>e</sub>	up to 690V	Α	300	360
	1000V	Α	210	250
- Rated power for squirrel-cage motors with 50 and 60Hz	230V	kW	97	110
h-11-11-11-11-11-11-11-11-11-11-11-11-11	400V	kW	168	191
	500V <sup>1)</sup>	kW	210	250
	690V <sup>1)</sup>	kW	278	335
	1000V <sup>1)</sup>	Α	290	350
Utilization category AC-6a, switching AC transformers				
Rated operational current l <sub>e</sub>				
- For inrush current n = 20	up to 400V	Α	513	675
- For inrush current n = 30	up to 400V	A	342	450
Rated power P	at 230V	kVA	195	256
- For inrush current n = 20	400V	kVA	338	445
TOT WHOSH CONTOURN ZO	500V	kVA	444	584
	690V	kVA	586	771
	1000V	kVA	752	1003
- For inrush current n = 30	at 230V	kVA	130	171
	400V	kVA	226	297
	500V	kVA	296	389
	690V	kVA	390	514
	1000V	kVA	592	778
Utilization category AC-6b, switching low-inductance (low-loss, meta-			1	
Rated operational currents I <sub>e</sub>	up to 400V	A		433
<ul> <li>Rated power for single capacitors at 50Hz and 60Hz</li> </ul>	at 230V	kVAr		175
	400V	kVAr		300
	500V	kVAr		400
	690V	kVAr		300
<ul> <li>Rated power for single capacitors or banks of capacitors</li> </ul>	at 230V	kVAr		145
(minimum inductance of 6 $\mu H$ between capacitors	400V	kVAr		250
connected in parallel) at 50Hz, 60Hz	500V	kVAr		333
	690V	kVAr		250

<sup>1)</sup> Max. permissible rated operational current  $I_e$  /AC-4 =  $I_e$  /AC-3 up to 500V, for reduced contact endurance and reduced switching frequency



<sup>2)</sup> For deviating inrush current factors x, the power must be recalculated as follows:  $P_x = P_{n30} \cdot 30/x$ 

### Vacuum Contactors LSDH

### Main Circuit - Vacuum Contactors LSDH6, LSDH8

Туре			LSDH6	LSDH8	
	Size			14	14
AC	capacity				
Sho	rt-time current carrying capacity (5 30	s)			
•	CLASS 5 and 10		Α	630	820
•	CLASS 15		Α	630	662
•	CLASS 20		Α	536	572
•	CLASS 25		Α	479	531
•	CLASS 30		Α	441	500
Ther	mal current-carrying capacity 10-s-current <sup>1)</sup>		Α	5040	7000
Pov	ver loss per conducting path at I <sub>o</sub> /AC-3/6	590V	W	45	70
Swi	tching frequency				
Swit	ching frequency z in operating cycles/hour				
•	Contactors without overload relays	No-load switching frequency AC	1/h	2000	1000
		No-load switching frequency DC	1/h	1000	1000
		AC-1	1/h	700	700
		AC-2	1/h	200	200
		AC-3	1/h	500	500
		AC-4	1/h	150	150
•	Contactors with overload relays (mean value	)	1/h	15	15

<sup>1)</sup> Acc. to IEC 60947-4-1

### Conductor Cross Sections - Vacuum Contactors LSDH6, LSDH8

Туре		LSDH6	LSDH8		
Size		14	14		
Main conductors:		Screw te	rminals		
Busbar connections					
- finely stranded with cable lug	mm <sup>2</sup>	50 240	50 240		
- stranded with cable lug	mm <sup>2</sup>	70 240	50 240		
- solid or stranded	AWG	2/0 500 MCM	2/0 500 MCM		
- connecting bar (max. width)	mm	50	60 (U <sub>e</sub> ≤ 690 V)		
			50 (U <sub>e</sub> > 690 V)		
Terminal screw		M10 x 30	M12 x 40		
- tightening torque	Nm	14 24 (124 210 lb.in)	20 35 (177 310 lb.in)		
With box terminal (on request)					
- connectable copper bars					
- width	mm	15 25	15 38		
- max. thickness	mm	1 x 26 or 2 x 11	1 x 46 or 2 x 18		
- terminal screw		A/F 6 (hexagon socket)	A/F 8 (hexagon socket)		
- tightening torque	Nm	25 40 (221 354 lb.in)	35 50 (266 443 lb.in)		
Auxiliary conductors:		Screw te	rminals		
• Solid	mm <sup>2</sup>	$2 \times (0.5 \dots 1)^{3}$	'2 x (1 2.5) <sup>3)</sup>		
<ul> <li>Finely stranded with end sleeve</li> </ul>	$mm^2$	$2 \times (0.5 \dots 1)^{3} / 2 \times (0.75 \dots 2.5)^{3}$			
<ul> <li>Pin-end connector to DIN 46231</li> </ul>	mm <sup>2</sup>	2 x (1 .	1.5)		
Solid or stranded	AWG	2 x (18	12)		
Tightening torque	Nm	0.8 1.4 (7	12 lb.in)		

<sup>3)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

### CSA and UL Rated Data for Vacuum Contactors LSDH6, LSDH8

Туре				LSDH6	LSDH8	
Size				14	14	
Rated insulation voltage			VAC	600	600	
Uninterrupted current	Open and enc	losed	Α	630	820	
Maximum horsepower ratings (CSA and UL approved va	lues)					
<ul> <li>Rated power for induction motors at 60Hz</li> </ul>		at 200V	hp	231	290	
		230V	hp	266	350	
		460V	hp	530	700	
		575V	hp	664	860	
NEMA/EEMAC ratings						
NEMA/EEMAC size			hp	6	7	
Uninterrupted current	Open		A	600	820	
	Enclosed		Α	540	810	
Rated power for induction motors at 60Hz		at 200V	hp	150		
		230V	hp	200	300	
		460V	hp	400	600	
		575V	hp	400	600	



### Contactors LSR (4-pole) for Switching Resistive Loads

#### **AC und DC OPERATION**

According to EN60947-4-1 (VDE0660 Part 102). The contactors are suitable for use in any climate. They are finger-safe according to EN50274.

The accessories for the 3-pole ALEA contactors can also be used for the 4-pole versions.

#### **FUNCTION**

- Switching resistive loads
- Isolating systems with ungrounded or poorly grounded neutral conductors
- System transfers when alternative AC power supplies are used
- · As contactors, e.g. for variable-speed operating mechanisms which only have to carry current and not switch
- These contactors are also suitable for switching of combined loads at distribution plants (e.g.: supply of heatings, lamps, motors or PC´s)

with an  $\cos \Phi > 0.8$  according IEC 60947-4-1 for AC-1.

#### INTEGRATION

#### **MOUNTABLE AUXILIARY CONTACTS**

#### Size 00

Maximum 4 auxiliary contacts.

#### Size 0

Maximum 2 auxiliary contacts (either laterally mounted or snapped onto the top).

#### Size 2-3

Maximum 4 auxiliary contacts (either laterally mounted or snapped onto the top).

#### CONTACTOR ASSEMBLY WITH MECHANICAL INTERLOCK

The 4-pole LSR contactors with 4NO contacts as the main contacts are suitable for making contactor assemblies with a mechanical interlock, e.g. for system transfers.

#### Size 00

Contactor assemblies can be constructed from two LSRD contactors in conjunction with mechanical interlocks and two connecting clips (Order No.: LSZDW002).

#### Size 0

When constructing 4-pole contactor assemblies from two LSRO contactors, the fourth pole of the left contactor must always be moved to the left side.

If the laterally mountable LSZOW002 mechanical interlock is used, the contactor assembly is connected with LSZOW004 (2 pcs.).

#### Sizes 2 and 3

Contactor assemblies can be constructed from two LSR2 or two LSR3 contactors in conjunction with the laterally mountable LSZ0W002 mechanical interlock and the LSZ2W002 for size 2 or LSZ3W002 for size 3.

### General Data - Contactors LSR

Туре			LSRD18	LSRD22	LSR035	LSR040	LSR260	LSR311	LSR314	
Size			00	00	0	0	2	3	3	
Permissible mounting position 1)										
Mechanical endurance		Operating cycles	30 n	nillion			10 million			
Electrical endurance at I <sub>e</sub> /AC-1		Operating cycles			ar	oprox. 0.5 mill	ion			
Rated insulation voltage U; (degree of pollut category III)	ion 3, overvoltage	٧				690				
Permissible ambient temperature	During operation	°C				-25 +60				
	During storage	°C				-55 +80				
<b>Degree of protection acc. to</b> DIN EN 60947-1, Appendix C	Device			IP:	20			IP20		
	Connection range							IPOO	1	
Touch protection acc. to EN 50274			finger-safe							
Short-circuit protection of contactors without	thermal overload relay	rs .								
Main circuit										
• Fuse links gL/gG NH, DIAZED, NEOZED acc. to IEC 60947-4-1/DIN EN 60947-4-1										
	- Type of coordination "1"	1) A	3	35	6	53	160	250	250	
	- Type of coordination "2"	A A	2	20	25,	/35	63	125	160	
	- Weld-free	Α	1	0	1	16	50	63	100	

<sup>1)</sup> In accordance with the corresponding 3-pole LSD contactors



# ■ Contactors LSR (4-pole) for Switching Resistive Loads

## ■ Control - Contactors LSR

Туре	•				LSRD18	LSRD22	LSR035	LSR040	LSR260	LSR311	LSR314
Size			00	00	0	0	2	3	3		
Magnetic coil operating range											
		AC at	50Hz		0.8	1.1 x U <sub>s</sub>					
		AC at	60Hz		0.85	.1.1 x U <sub>s</sub>					
		DC at	50°C		0.8	1.1 x U <sub>s</sub>					
		DC at	60°C		0.85	1.1 x U <sub>s</sub>					
		AC/D	)C						0.8 1.1 x U <sub>s</sub>	.8 1.1 x U <sub>s</sub>	
Power consumption of the magnetic coils (when coil is cold and $1.0 \times U_s$ )											
•	AC operation, 50 Hz	•	Closing	VA				51	145	2	70
		•	P.f.	VA			0,82		0,79	0,68	
		•	Closed	VA			7	,8	12,5	2	22
		•	P.f.	VA			0,24		0,36	0,27	
•	AC operation, 50/60 Hz	•	Closing	VA	26.5/24.3		64/63		170/155	298	/274
		•	P.f.	VA	0.79	/0.75	0.82	/0.74	0.76/0.72	0.72	/0.62
		•	Closed	VA	4.4	/3.4	8.4	/6.8	15.11.2008	27,	/20
		•	P.f.	VA	0.27	/0.27	0.24	/0.28	0.35/0.38	0.29	/0.31
•	DC operation	•	Closing	W	3	,3	5,6		13,3	1	5
		= Clos	sed								
Ope	rating times for 0.8 1.1 x U,11										
Total	break time = Opening delay + Arcing tin	ne									
•	DC operation	Closin	ng delay	ms	25 100		30	90	50 110	110 .	200
		Open	ing delay	ms	7	10	13 .	40	15 30	14 .	20
•	AC operation	Closin	ng delay	ms	8 35 6		. 30	4 35	20	50	
	·		ing delay	ms	4	30	13 .	25	10 30	10.	25
•	Arcing time	·	- '	ms	10	15	10	15	10 15	10	15

<sup>1)</sup> With size 00, DC operation: Operating times at  $0.85 \dots 1.1 \times U_s$ 

# ■ Contactors LSR (4-pole) for Switching Resistive Loads

Type Size			<b>LSRD18</b>	<b>LSRD22</b>	<b>LSR035</b>	<b>LSRO40</b>	<b>LSR260</b>	<b>LSR311</b>	<b>LSR314</b>
AC capacity						1			
Utilization category AC-1, switching resistive loads									
Rated operational currents I <sub>a</sub>	at 40°C up to 690V	Α	18	22	35	40	60	110	140
е	at 60°C up to 690V	Α	16	20	30	35	55	100	120
Rated power for AC loads	230V	kW	7	8,5	12,5	15	23	42	53
P.f. = 0.95 (at 40 °C)	400V	kW	12	14,5	22	26	39	72	92
• Minimum conductor cross-section for loads with	at 40°C	$mm^2$	3	2,5	10	10	16	50	50
$I_{\rm e}$									
	at 55°C	mm <sup>2</sup>	3	2,5	10	10	16	50	50
Utilization category AC-2 and AC-3				10	1.7	0.5			
Rated operational currents I <sub>e</sub>	at 60°C, at 400V	A	9	12	17	25	26		
Rated power of slipring	at 230V	kW	3	3	4	5,5	5,5		
or squirrel-cage motors at 50 and 60Hz	400V	kW	4	5,5	7,5	11	11		
DC capacity			1						
Utilization category DC-1, switching resistive loc	ads (L/K ≤ Ims)								
Rated operational currents l <sub>e</sub> (at 40°C)	up to 241/	٨	18	22		15	50	70	80
- 1 conducting path	up to 24V 60V	A A	18	22	1	:0	23	23	60
	110V	A	2,1	2,1	1	,5	4,5	4,5	9
	220V	A	0,8	0,8	1	,s 1	1	1 1	2
	440V	A	0,6	0,6	1	,4	0,4	0,4	0,6
- 2 conducting paths in series	up to 24V	A	18	22		, <del>4</del> .5	50	70	80
- 2 conducting pains in series	60V	A	18	22	1	15	45	70	80
	110V	A	12	12	!	15	45	70	80
	220V	A	1,6	1,6	!	5	5	5	10
	440V	A	0,8	0,8	!	1	1	1	1,8
- 3 conducting paths in series	up to 24V	A	18	22		15	50	70	80
o conducting pains in series	60V	A	18	22		5	45	70	80
	110V	Α	18	22	!	5	45	70	80
	220V	Α	18	22	1	5	45	70	80
	440V	Α	1,3	1,3	!	,9	2,9	2,9	4,5
- 4 conducting paths in series	up to 24V	Α	18	22		5	50	70	80
	60V	Α	18	22	!	15	45	70	80
	110V	Α	18	22	!	15	45	70	80
	220V	Α	18	22	!	15	45	70	80
	440V	Α	1,3	1,3	2	,9	2,9	2,9	4,5
Utilization category DC-3/DC-5, Shunt-wound	and series-wound mo	tors (L/R	≤ 15ms)						
<ul> <li>Rated operational currents l<sub>e</sub> (at 40°C)</li> </ul>			1						
- 1 conducting path	up to 24V	Α	18	20	2	.0	20	20	20
	60V	Α	0,5	0,5		5	6	6	6,5
	110V	Α	0,15	0,15	2	,5	2,5	2,5	2,5
	220V	Α				1	1	1	1
	440V	Α				09	0,1	0,15	0,15
- 2 conducting paths in series	up to 24V	Α	18	20	!	15	45	70	80
	60V	Α	5	5		15	45	70	80
	110V	Α	0,35	0,35	1	5	25	70	80
	220V	Α			1	3	5	7	7
	440V	Α				27	0,27	0,42	0,42
- 3 conducting paths in series	up to 24V	Α	18	20	!	15	45	70	80
	60V	Α	18	20		15	45	70	80
	110V	Α	18	20	1	15	45	70	80
	220V	Α	1,5	1,5	1	0	25	35	35
	440V	Α	0,2	0,2		,6	0,6	0,8	0,8
- 4 conducting paths in series	up to 24V	Α	18	20	!	15	45	70	80
	60V	Α	18	20	1	15	45	70	80
	110V	Α	18	20	1	15	45	70	80
	220V	Α	1,5	1,5	1	15	45	70	80
	440V	Α	0,2	0,2	0	,6	0,6	0,8	0,8
Maximum breaking current AC									
e.g. for isolation of load distributions									
• 50/60Hz	400V	Α	72	96	2	00	400	520	760



## General Information - Auxiliary Contactors LSH

### ■ General Data - Auxiliary Contactors LSH

Туре		LSH
Size		00
Permissible mounting position  The contactors are designed for operation on a vertical mounting surfice.	AC and DC operation	360° 22,5° 22,5°
Upright mounting position	AC operation	
		Special version required
	DC operation	Standard version
Positively-driven operation of contacts in contactor relays LSH: Yes, in the basic unit and the auxiliary contact block as well as between	een the	Explanations: There is positively-driven operation if it is ensured that the NC and NO contacts cannot be closed at the same time.
basic unit and the snap-on auxiliary contact block (removable) acc. t  TH 1/457  EN 60947-5-1, Appendix L	to:	ZH1/457 Safety rules for control units on power-operated presses in the metalworking industry. EN 60947-5-1, Appendix L
		Low-voltage control gear, control equipment, and switching elements.  Special requirements for positively-driven contacts  SUVA
		Accident prevention regulations of the "Schweizer Unfallverhütungsanstalt" (Swiss Institute for Accident Insurance)
Contact reliability		Frequency of contact faults < 10 <sup>-8</sup> , d. h. < 1
Contact reliability at 17 V, 1 mA acc. to EN 60947-5-4		fault per 100 million operating cycles

### ■ Contact Endurance for AC-15/AC-14 and DC-13 Utilization Categories

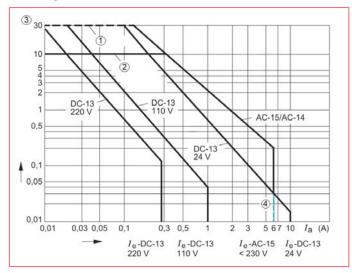
The contact endurance is mainly dependent on the breaking current. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

If magnetic circuits other than the contactor coil systems or solenoid valves are present, e.g. magnetic brakes, protective measures for the load circuits are necessary. RC elements and freewheel diodes would be suitable as protective measures. The characteristic curves apply to:

- LSH auxiliary contactors
- LSZDH5 and LSZD05 auxiliary contact blocks



### Diagram: Contact Endurance



- $I_a$  = Breaking current
- I<sub>e</sub> = Rated operational current
- 1) Basic unit
- 2) Basic unit with aux. Block snapped on
- 3) Million operating cycles
- 4) Snap-on auxiliary contact blocks: I<sub>e</sub>/DC-13 max. 6A

### CSA and UL Rated Data for Auxiliary Contactors LSHD

Туре			LSHD		
Size			00		
Basic units and auxiliary contact blocks					
<ul> <li>Rated control supply voltage</li> </ul>		VAC	max. 600		
Rated voltage		VAC	600		
Switching capacity		A	A 600, Q 60		
Uninterrupted current at 240VAC			10		
General data					
Mechanical endurance					
Basic units		Operating cycles	30 million		
<ul> <li>Basic unit with snap-on auxiliary contact block</li> </ul>		Operating cycles	10 million		
Solid-state compatible auxiliary contact block		Operating cycles	5 million		
Rated insulation voltage U <sub>i</sub> (Rated insulation voltage	e 3, overload category III)	V	690		
Rated impulse withstand voltage U <sub>imp</sub>		kV	6		
Safe isolation between the coil and the contacts in the basic Appendix $\ensuremath{N}$	unit acc. to EN 60947-1,	V	400		
Permissible ambient temperature	During operation	°C	-25 +60		
	During storage	°C	-55 +80		
Degree of protection acc. to EN 60947-1, Appendix C			IP20, coil assembly IP40		
Touch protection acc. to EN 50274			finger-safe		
Shock resistance	AC/DC operation				
Rectangular pulse		g/ms	10/5 and 5/10		
Sine pulse		g/ms	15/5 and 8/10		
Conductor cross-sections (1 or 2 conductors can be					
connected)					
Auxiliary conductor and coil terminals			Screw terminals		
• Solid		mm <sup>2</sup>	2 x (0,5 1,5); 2 x (0,75 2,5) acc. to IEC 60947; max. 2 x (1 4)		
<ul> <li>Finely stranded with end sleeve</li> </ul>		mm <sup>2</sup>	2 x (0,5 1,5); 2 x (0,75 2,5)		
<ul> <li>AWG cables, solid or stranded</li> </ul>		AWG	2 x (20 16); 2 x (18 14); 1 x 12		
<ul> <li>Terminal screws</li> </ul>			M3		
- tightening torque		Nm	0,8 1,2 (7 10,3 lb.in)		
Auxiliary conductor and coil terminals			Cage Clamp terminals (on request)		
• Solid		mm <sup>2</sup>	2 x (0,25 2,5)		
<ul> <li>Finely stranded with end sleeve</li> </ul>		mm <sup>2</sup>	2 × (0,25 1,5)		
<ul> <li>Finely stranded without end sleeve</li> </ul>		mm <sup>2</sup>	2 x (0,25 2,5)		
AWG cables, solid or stranded		AWG	2 × (24 14)		
Short-circuit protection					
(weld-free protection at $I_k \ge 1 \text{ kA}$ )					
• Fuse links, gL/gG operational class					
- DIAZED		A	10		
- NEOZED		A	10		
Or miniature circuit breakers with C characteristic (sho	ort-circuit current l <sub>k</sub> < 400A)	A	6		



## ■ Control - Auxiliary Contactors LSHD

Size  Magnetic coil operating range  AC at 50Hz AC at 60Hz DC at +50°C DC at +60°C  Power consumption of the magnetic coils AC operation, 50 Hz Closing Closed AC operation, 50/60 Hz Closing Closed DC operation Closing Closed Closing Closed Closing Closed Fermissible residual current of the electronics (with 0 signal)  for AC operation Operating times¹ (Total break time = OFF-delay + Arcing time) AC operation  AC operation ON-delay of NO contact AC operation OFF-delay of NO contact OR 1.1 x U, 1.0 x U, 0 8 1.1 x U, 1.0 x U, 0 9 Pening	VA/p.f. VA/p.f. VA/p.f. VA/p.f. W	00  0.8 1.1 x U <sub>1</sub> 0.85 1.1 x U <sub>2</sub> 0.8 1.1 x U <sub>3</sub> 0.85 1.1 x U <sub>4</sub> 0.85 1.1 x U <sub>5</sub> 27/0.8 4.6/0.27 24/0.75 3.5/0.27 3,2  < 3mA x (230V/U <sub>2</sub> ) < 10mA x (24V/U <sub>3</sub> )
AC at 50Hz AC at 60Hz DC at +50°C DC at +60°C  Power consumption of the magnetic coils AC operation, 50 Hz Closing Closed Closing Closed DC operation Closing Closed Closing Closed Closing Closed Closing Closed Closing Closed Fermissible residual current of the electronics (with 0 signal)  for AC operation  of the AC operation  of the electronics (with 0 signal)  AC operation  Operating times  (Total break time = OFF-delay + Arcing time)  AC operation  Values apply with coil in cold state and Closing ON-delay of NO contact  0.8 1.1 x U, 1.0 x U, 0.8 1.1 x U, 1.0 x U, 0Pening	VA/p.f. VA/p.f. VA/p.f.	0.85 1.1 x U <sub>s</sub> 0.8 1.1 x U <sub>s</sub> 0.85 1.1 x U <sub>s</sub> 27/0.8  4.6/0.27  24/0.75  3.5/0.27  3,2 <a by="" href="mailto:smaller:10pt shows by the smaller:10pt shows by the smal&lt;/th&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;AC at 60Hz DC at +50°C DC at +60°C  Power consumption of the magnetic coils  AC operation, 50 Hz Closing Closed Closing Closed DC operation DC operation Permissible residual current of the electronics (with 0 signal)  for AC operation  for DC operation  of the AC operation  of the electronics (with 0 signal)  AC operation  of the electronics (with 0 signal)  AC operation  Operating times  (Total break time = OFF-delay + Arcing time)  AC operation  Values apply with coil in cold state and closing  ON-delay of NO contact  O.8 1.1 x U, 1.0 x U,  OPF-delay of NC contact  O.8 1.1 x U, 1.0 x U,  Opening&lt;/td&gt;&lt;td&gt;VA/p.f.&lt;br&gt;VA/p.f.&lt;br&gt;VA/p.f.&lt;/td&gt;&lt;td&gt;0.85 1.1 x U&lt;sub&gt;s&lt;/sub&gt; 0.8 1.1 x U&lt;sub&gt;s&lt;/sub&gt; 0.85 1.1 x U&lt;sub&gt;s&lt;/sub&gt;  27/0.8  4.6/0.27  24/0.75  3.5/0.27  3,2  &lt;a href=" mailto:smaller:10pt="" shows="" smal<="" smaller:10pt="" td="" the=""></a>
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	VA/p.f. VA/p.f. VA/p.f.	0.8 1.1 x U <sub>s</sub> 0.85 1.1 x U <sub>s</sub> 27/0.8 4.6/0.27 24/0.75 3.5/0.27 3,2  < 3mA x (230V/U <sub>s</sub> )
Power consumption of the magnetic coils  AC operation, 50 Hz  AC operation, 50/60 Hz  Closing Closed  Closing Closed  Closing Closed  Closing Closed  Closing = Closed  Permissible residual current of the electronics (with 0 signal)  for AC operation  Poperating times  AC operation  AC operation  Values apply with coil in cold state and Closing  ON-delay of NO contact  OFF-delay of NC contact  OPening  Opening	VA/p.f. VA/p.f. VA/p.f.	0.85 1.1 x U,  27/0.8  4.6/0.27  24/0.75  3.5/0.27  3,2  < 3mA x (230V/U <sub>s</sub> )
Power consumption of the magnetic coils  AC operation, 50 Hz  AC operation, 50/60 Hz  Closing Closed  Closing Closed  Closing Closed  Closing Closed  Closing = Closed  Permissible residual current of the electronics (with 0 signal)  for AC operation  Poperating times  AC operation  AC operation  Values apply with coil in cold state and Closing  ON-delay of NO contact  OFF-delay of NC contact  OPening  Opening	VA/p.f. VA/p.f. VA/p.f.	0.85 1.1 x U,  27/0.8  4.6/0.27  24/0.75  3.5/0.27  3,2  < 3mA x (230V/U <sub>s</sub> )
Power consumption of the magnetic coils  AC operation, 50 Hz  Closing Closed  Closing Closed  Closing Closed  Closing Closed  Closing Closed  Closing Closed  Closing = Closed  Permissible residual current of the electronics (with 0 signal)  for AC operation  for DC operation  Poperating times¹ (Total break time = OFF-delay + Arcing time)  AC operation  Values apply with coil in cold state and Closing  ON-delay of NO contact  0.8 1.1 x U, 1.0 x U,  OFF-delay of NC contact  0.8 1.1 x U, 1.0 x U,  OPEning	VA/p.f. VA/p.f. VA/p.f.	27/0.8 4.6/0.27 24/0.75 3.5/0.27 3,2 < 3mA × (230V/U <sub>s</sub> )
AC operation, 50 Hz Closing Closed Closing Closed Closing Closed Closing Closed Closing = Closed Closing = Closed Closing = Closed  Permissible residual current of the electronics (with 0 signal)  for AC operation for DC operation  Operating times¹ (Total break time = OFF-delay + Arcing time)  AC operation Values apply with coil in cold state and Closing ON-delay of NO contact  0.8 1.1 x U, 1.0 x U, OPEN-delay of NC contact  0.8 1.1 x U, 1.0 x U,  Opening	VA/p.f. VA/p.f. VA/p.f.	4.6/0.27 24/0.75 3.5/0.27 3,2 < 3mA × (230V/U <sub>s</sub> )
Closed Closing Closed Closing Closed Closing = Closed Closing = Closed  Permissible residual current of the electronics (with 0 signal)  • for AC operation • for DC operation  Operating times¹ (Total break time = OFF-delay + Arcing time) • AC operation  Values apply with coil in cold state and Closing ON-delay of NO contact  0.8 1.1 x U, 1.0 x U, OPF-delay of NC contact  0.8 1.1 x U, 1.0 x U, Opening	VA/p.f. VA/p.f. VA/p.f.	4.6/0.27 24/0.75 3.5/0.27 3,2 < 3mA × (230V/U <sub>s</sub> )
AC operation, 50/60 Hz Closing Closed Closing = Closed  Permissible residual current of the electronics (with 0 signal)  for AC operation for DC operation  AC operation  Total break time = OFF-delay + Arcing time)  AC operation  Values apply with coil in cold state and Closing  DN-delay of NO contact  0.8 1.1 x U, 1.0 x U,  DFF-delay of NC contact  0.8 1.1 x U, 1.0 x U,  DPF-ing	VA/p.f. VA/p.f.	24/0.75 3.5/0.27 3,2 < 3mA × (230V/U <sub>s</sub> )
Closed Closing = Closed  Permissible residual current of the electronics (with 0 signal)  • for AC operation • for DC operation • for DC operation  Operating times¹ (Total break time = OFF-delay + Arcing time) • AC operation  Values apply with coil in cold state and Closing ON-delay of NO contact  0.8 1.1 x U, 1.0 x U,  OFF-delay of NC contact  0.8 1.1 x U, 1.0 x U,	VA/p.f.	3.5/0.27 3,2 < 3mA × (230V/U <sub>s</sub> )
DC operation  Permissible residual current of the electronics (with 0 signal)      of or AC operation     for DC operation     for DC operation  Permissible residual current of the electronics (with 0 signal)      of or AC operation  Permissible residual current of the electronics (with 0 signal)      for AC operation  Values apply with coil in cold state and closing  ON-delay of NO contact  O.8 1.1 x U,  1.0 x U,  OPF-delay of NC contact  O.8 1.1 x U,  1.0 x U,		3,2 < 3mA × (230V/U <sub>s</sub> )
Permissible residual current of the electronics (with 0 signal)  • for AC operation • for DC operation  Operating times¹  (Total break time = OFF-delay + Arcing time) • AC operation  Values apply with coil in cold state and Closing  ON-delay of NO contact  0.8 1.1 x U, 1.0 x U,  OFF-delay of NC contact  0.8 1.1 x U, 1.0 x U,		3,2 < 3mA × (230V/U <sub>s</sub> )
Permissible residual current of the electronics (with 0 signal)  • for AC operation • for DC operation  Operating times¹  (Total break time = OFF-delay + Arcing time) • AC operation  Values apply with coil in cold state and Closing  ON-delay of NO contact  0.8 1.1 x U, 1.0 x U,  OFF-delay of NC contact  0.8 1.1 x U, 1.0 x U,		< 3mA × (230V/U <sub>s</sub> )
signal)  for AC operation for DC operation  for DC operation  Operating times¹  (Total break time = OFF-delay + Arcing time)  AC operation  Values apply with coil in cold state and closing  ON-delay of NO contact  0.8 1.1 x U, 1.0 x U,  OFF-delay of NC contact  0.8 1.1 x U, 1.0 x U,		
• for AC operation • for DC operation  Operating times¹  (Total break time = OFF-delay + Arcing time) • AC operation  Values apply with coil in cold state and Closing  ON-delay of NO contact  0.8 1.1 x U, 1.0 x U,  OFF-delay of NC contact  0.8 1.1 x U, 1.0 x U,		
• for DC operation  Operating times¹ (Total break time = OFF-delay + Arcing time)  • AC operation  Values apply with coil in cold state and Closing  ON-delay of NO contact  0.8 1.1 x U, 1.0 x U,  OFF-delay of NC contact  0.8 1.1 x U, 1.0 x U,  Opening		
Operating times¹         Values apply with coil in cold state and Closing           ON-delay of NO contact         0.8 1.1 x U <sub>s</sub> 1.0 x U <sub>s</sub> OFF-delay of NC contact         0.8 1.1 x U <sub>s</sub> 1.0 x U <sub>s</sub> Opening		
(Total break time = OFF-delay + Arcing time)         • AC operation       Values apply with coil in cold state and Closing         ON-delay of NO contact       0.8 1.1 x U <sub>s</sub> 1.0 x U <sub>s</sub> OFF-delay of NC contact       0.8 1.1 x U <sub>s</sub> 1.0 x U <sub>s</sub>		
• AC operation Values apply with coil in cold state and Closing ON-delay of NO contact $0.8 \dots 1.1 \times U_s$ $1.0 \times U_s$ OFF-delay of NC contact $0.8 \dots 1.1 \times U_s$ $1.0 \times U_s$ Opening		
Closing         ON-delay of NO contact       0.8 1.1 x U,         1.0 x U,         OFF-delay of NC contact       0.8 1.1 x U,         1.0 x U,    Opening		
ON-delay of NO contact  0.8 1.1 x U,  1.0 x U,  OFF-delay of NC contact  0.8 1.1 x U,  1.0 x U,	ar operating temperature for	operating range
$1.0 \times U_s$ OFF-delay of NC contact $0.8 \dots 1.1 \times U_s$ $1.0 \times U_s$ Opening		005
OFF-delay of NC contact $0.8 \dots 1.1 \times U_s$ $1.0 \times U_s$ Opening	ms	8 35
1.0 x U,  Opening	ms	10 25
Opening	ms	6 20
·	ms	7 20
• •		
OFF-delay of NO contact $0.8 1.1 \times U_s$	ms	4 30
1.0 x U <sub>s</sub>	ms	5 30
ON-delay of NC contact 0.8 1.1 x U,		5 30
,	ms	
1.0 x U <sub>s</sub>	ms	7 20
• DC operation		
Closing           ON-delay of NO contact         0.8 1.1 x U,		25 100
	ms	
1.0 x U <sub>s</sub>	ms	30 50
FF-delay of NC contact $0.8 1.1 \times U_s$	ms	20 90
$1.0 \times U_s$	ms	25 45
Opening		
OFF-delay of NO contact $0.8 \dots 1.1 \times U_s$	ms	7 10
1.0 x U₅	ms	79
ON-delay of NC contact 0.8 1.1 x U,		13 16
	ms	
1.0 x U <sub>s</sub>	ms	13 15
Arcing time Dependence of the switching frequency z'v on the operational current I and operational voltage U	ms	10 15

<sup>1)</sup> The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5ms).



## ■ Contact Capacity - Auxiliary Contactors LSHD

уре			LSHD
ize			00
tated operational currents l <sub>e</sub>			
AC-12		A	10
AC-15/AC-14	up to 230V	A	6
or rated operational voltage U <sub>s</sub>	400V	A	3
	500V	A	2
	690V	A	1
OC-12 for rated operational voltage U <sub>s</sub>			
1 conducting path	24V	A	10
	60V	A	6
	110V	A	3
	220V	A	1
	440V	A	0,3
	600V	A	0, 15
2 conducting paths in series	24V	А	10
	60V	A	10
	110V	A	4
	220V	A	2
	440V	A	1,3
	600V	A	0,65
<ul> <li>3 conducting paths in series</li> </ul>	24V	A	10
g pane meeter	60V	A	10
	110V	A	10
	220V	A	3,6
	440V	A	2,5
	600V	A	1,8
PC-13 for rated operational voltage U <sub>s</sub> 1 conducting path	24V	A	10 <sup>1)</sup>
r conducting pain	60V	A	2
	110V	A	1
	220V	A	0,3
	440V	A	0,14
	600V	A	0,1
2 conducting paths in series	24V	A	10
	60V	A	3,5
	110V	A	1,3
	220V	A	0,9
	440V	A	0,2
	600V	Α	0,1
<ul> <li>3 conducting paths in series</li> </ul>	24V	A	10
	60V	A	4,7
	110V	A	3
	220V	A	1,2
	440V	A	0,5
	600V	A	0,26
witching frequency z			•
In operating cycles/h	AC-12/DC-12	h-1	1000
luring normal duty	AC-15/AC-14	h <sup>-1</sup>	1000
or utilization category	DC-13	h <sup>-1</sup>	1000
<ul> <li>No-load switching frequency</li> </ul>		h <sup>-1</sup>	10000

<sup>1)</sup> Snap-on auxiliary contact blocks: 6A



#### DC OPERATION

IEC 60947 and EN 60947 (VDE 0660).

The LSH auxiliary contactors for switching auxiliary circuits are tailored to the special requirements of working with electronic controls.

The LSHD  $\dots$  G/N auxiliary contactors cannot be extended with auxiliary contact blocks.

#### FLINICTION

No auxiliary contact blocks can be snapped onto these auxiliary contactors. They have a low power consumption, an extended magnetic coil operating range and an integrated surge suppressor for damping opening surges (exception: LSHD ... N).

#### **TECHNICAL SPECIFICATIONS**

All technical specifications not mentioned in the table below are identical to those of the LSHD06.0., LSHD06.5., LSHD06.3 auxiliary contactors.

### ■ General Data - Auxiliary Contactors LSH

Туре		LSHDN	LSHG		
Size		00	00		
Magnetic coil operating range		0.7 1.25 x U <sub>s</sub>			
Power consumption of the magnetic coil (for cold coil)					
Closing = closed					
at $U_s = 17V$	W	1,	.2		
at $U_s = 24V$	W	2,	,3		
$at U_s = 30V$	W	3,	,6		
Permissible residual current of the electronics for 0 signal	<10mA x (24V/U <sub>s</sub> )				
Overvoltage configuration of the magnetic coil		No overvoltage damping	With diode integrated		
		$\mathfrak{f}_{\mathcal{O}}\mathfrak{f}$	→		
Operating times			I		
Closing at 17 V					
- ON-delay NO	ms	40	. 120		
- OFF-delay NC	ms	30.	70		
• At 24 V					
- ON-delay NO	ms	30 60			
- OFF-delay NC	ms	20 40			
• At 30 V					
- ON-delay NO	ms	20 50			
- OFF-delay NC ms		15 30			
• Closing at 17 30 V					
- OFF-delay NO	ms	7 17	40 60		
- ON-delay NC	ms	22 30	60 70		
Upright mounting position		please ask			



### General Information - Contactors LSS

#### DC OPERATION

IEC 60947, EN 60947 (VDE 0660).

The LSS contactors for switching motors are tailored to the special requirements of working with electronic controls. The LSSD contactors cannot be extended with auxiliary contacts or contact blocks. Two single-pole auxiliary contacts can be fitted to the LSSO contactors.

#### FUNCTION

LSS contactors have a low power consumption, an extended operating range of the magnetic coil and an integrated surge suppressor for damping opening surges.

#### **TECHNICAL SPECIFICATIONS**

All technical specifications not mentioned in the table below are identical to those of the LSDD and LSDO contactors for switching motors. The LSSD contactors cannot be extended with auxiliary contacts or contact blocks. Two single-pole auxiliary contacts LSZOD010/D001 can be fitted to the LSSO contactor (see Accessories).

### General data - Auxiliary Contactors LSSD, LSSO

Туре		LSSDG	LSSOH
Size		00	0
General data			
Mechanical endurance	Operating cycles	30 million	10 million
Safe isolation between the coil and the main contacts acc. to EN 60947-1, Appendix N	٧	40	00
Control			
Magnetic coil operating range		0.7 1	.25 x U <sub>s</sub>
Power consumption of the magnetic coil (for cold coil)			
Closing = closed			
at $U_s = 17V$	W	1,2	2,1
at $U_s = 24V$	W	2,3	4,2
at $U_s = 30V$	W	3,6	6,6
Permissible residual current of the electronics (for 0 signal)		< 10mA x ( 24V/U <sub>s</sub> )	< 6mA x ( 24V/U <sub>s</sub> )
Overvoltage configuration of the magnetic coil		With diode	With varistor
		<del>- N</del>	- <del>5</del> -
Operating times of the contactors for PLC-use			
• Closing			
• at 17V			
- ON-delay NO	ms	40 120	93 270
- OFF-delay NC	ms	30 <i>7</i> 0	83 250
• at 24V			
- ON-delay NO	ms	30 60	64 87
- OFF-delay NC	ms	20 40	55 <b>7</b> 8
• at 30V			
- ON-delay NO	ms	20 50	53 64
- OFF-delay NC	ms	15 30	45 56
Opening at 17 30V			
- ON-delay NO	ms	7 17	18 19
- OFF-delay NC	ms	22 30	24 25

# Technical Specification - Electromechanical Contactors Series ALEA LS

## Accessories for LSD and LSH Contactors and Auxiliary Contactors

### Operation

In the case of the versions for rated control supply voltages of 110 V and 230 V, either AC voltage or DC voltage can be applied on the line side, whereas the variant for 24 V is designed for DC operation only. A DC-operated contactor is connected to the output in accordance with the input voltage that is applied. The mean value of the OFF-delay is approximately 1.5 times the specified minimum time.

### Surge Suppression

All LSD contactors and LSH auxiliary contactors can be retrofitted with RC elements or varistors for damping opening surges in the coil. Diodes or diode assemblies can be used. The surge suppressors are plugged onto the front of size 00 contactors. Space is provided for them next to a snap-on auxiliary contact block. With all size 0 to 3 contactors, varistors, RC elements and diode assemblies can be plugged on directly at the coil terminals, either on the top or underneath. With all size 0 to 3 contactors, varistors, RC elements and diode assemblies can be plugged on directly at the coil terminals, either on the top or underneath. The plug-in direction of the diodes and diode assemblies is determined by a coding device. Auxiliary contactors are supplied either without overvoltage damping or already fitted with a diode-assembly. According to the version. Note: The OFF-delay times of the NO contacts and the ON-delay times of the NC contacts increase if the contactor coils are damped against voltage peaks

Note: The OFF-delay times of the NO contacts and the ON-delay times of the NC contacts increase if the contactor coils are damped against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

### Soldier Pin Adapter

The solder pin adapters can be used for all contactors of size 00.

### Technical Data

		LSZ00113
		Mechanical latching block for the LSDO, LSUO, LSD2, LSU2
Rated insulation voltage U <sub>e</sub>		
(degree of pollution 3)	V	690
Mechanical endurance •	with LSDO	3 million
(operating cycles)	with LSD2	50000
Permissible ambient temperature		
During operation	°C	-25 +60
During storage	°C	-50 +80
Degree of protection acc. to EN 60947-1, Appendix C		IP20
Operating range of the magnetic coil		0.85 1.1 x U <sub>s</sub>
at AC 50/60 Hz and DC		
Power consumption of the magnetic coils of the unlocking magnet	W	ca. 4
(for cold coil and $1.0 \times U_s$ ) AC and DC operation		
Command duration for de-energizing		
AC operation	ms	18 31
DC operation	ms	18 26
Conductor cross-sections		
• Solid	$mm^2$	2 x (0.5 2.5); 1 x 4
	AWG	2 x 14; 1 x 12
Finely stranded with end sleeve	$mm^2$	2 x (0.5 2.5); 1 x 2.5
	AWG	2 x 14; 1 x 12
Tightening torque of the terminal screws	Nm	0.8 1.1
	lb.in	7 9.5

## Capacitor Switching Contactors LSK

### ■ Capacitor Contactors LSK

### **AC OPERATION**

IEC 60947, EN 60947 (VDE 0660)

The contactors are suitable for use in any climate. They are finger-safe according to EN 50274. The LSK capacitor contactors are special version of the size 00 to 3 ALEA contactors. The capacitors are precharged by means of the mounted leading NO contacts and resistors; only then do the main contacts close.

This prevents disturbances in the network and welding of the contactors. Only discharged capacitors are permitted to be switched on with capacitor contactors.

The auxiliary contact block which is snapped onto the capacitor contactor contains the three leading NO contacts and in the case of 00 one standard NC contact and in the case of 0 and 3 one standard NO contact, which is unassigned. Size 00 also contains another unassigned NO contact in the basic unit.

In addition, a 2-pole auxiliary contact block can be mounted laterally on the LSK3 capacitor contactors (1 NO + 1 NC versions); type LSZ0D711. The fitting of auxiliary switches for LSKD and LSK0 is not expandable. For the capacitor switching capacity of the basic LSD contactor version, see Technical specifications.

### MOUNTING INSTRUCTIONS

In the area of capacitor switching contactors, difficulty inflammable and self-extinguishing materials may be used only, because abnormal temperatures within the area of the resistance spirals cannot be excluded.

### TECHNICAL SPECIFICATIONS

All technical specifications not mentioned in the table below are identical to those of the LSDD contactors for size 00, to those of the LSDO contactors for size 0 and to those of the LSD3 contactors for size 3



# ■ Capacitor Switching Contactors LSK

# ■ Technical Data - Capacitor Contactors LSK

Туре			LSKD17B3	LSK03213	LSK36213
Size			00	0	3
Capacitor rating at	230V, 50/60Hz	kvar	3 <i>7.</i> 5	3.5 15	3.5 30
rated power	400V, 50/60Hz	kvar	5 12.5	6 25	5 50
(utilization category AC-6b)	525V, 50/60Hz	kvar	7.5 15	7.8 30	7.5 60
	690V, 50/60Hz	kvar	10 21	10 42	10 84
Auxiliary contacts mounted (un	assigned)		1NO+1NC	1NO	
Auxiliary contacts mountable (le	ateral), not for sizes 00 a	nd 0		-	2NC+2NO or 1NO+1NC
Magnetic coil operating range				0.8 1.1 x U <sub>s</sub>	
Max. switching frequency			180	100	
Electrical endurance	(	Operating cycles	> 250000	> 150000	> 100000
Ambient temperature		°C		60	
Standards			IEC 6	60947/DIN EN 60947 (VDE 0660)	
Short-circuit protection				1.6 2.2 x l <sub>e</sub>	_
Conductor cross-sections (1 or 2	conductors can be conne	ected)			
Main conductors				Screw terminals	
<ul> <li>Solid</li> </ul>		mm <sup>2</sup>	2 x (0.5 1.5); 2 x (0.75 2.5)	2 x (1 2.5); 2 x (2.5 6)	-
			acc. to IEC 60947; max. 2 x (1 4)	acc. to IEC 60947; max. 1 x 10 <sup>1)</sup>	-
<ul> <li>Finely stranded with end sleev</li> </ul>	/e		2 x (0.5 1.5); 2 x (0.75 2.5)	2 x (1 2.5); 2 x (2.5 6) <sup>1)</sup>	-
<ul> <li>AWG cables</li> </ul>					-
- solid		AWG	2 x (20 16)	2 x (16 12)	-
- solid or stranded		AWG	2 x (18 14)	2 x (14 10)	-
- stranded		AWG	1 x 12	1 x 8	-
<ul> <li>Terminal screws</li> </ul>			M3	M4 (Pozidriv Gr. 2)	-
- tightening torque		Nm	0.8 1.2	2 2.5	-
		lb.in	7 10.3	18 22	-
Coil voltage	0.85 – 1.1 x U <sub>N</sub>		230VAC; 50/60Hz	230VAC; 50/60Hz	230VAC; 50/60Hz

<sup>1)</sup> BEZ00116 feeder terminal for 25mm<sup>2</sup>

# Capacitor Switching Contactors LSK

## Conductor Cross Sections - Capacitor Contactors LSK

Туре			LSKD17B3	LSK03213	LSK36213
Size			00	0	3
(1 or 2 conductors can be connected)					
	Main conductors:			Screw terminals	
	with box terminal				
Front clamping point	Finely stranded with end sleeve	$mm^2$	-	_	2.5 35
connected	<ul> <li>Finely stranded without end sleeve</li> </ul>	$mm^2$	-	-	4 50
雷	<ul> <li>Solid</li> </ul>	$mm^2$	-	-	2.5 16
	<ul> <li>Stranded</li> </ul>	$mm^2$	-	-	4 70
	Ribbon cable conductors (number x width x	$mm^2$	_	_	6 x 9 x 0.8
	thickness)  • AWG cables solid or stranded				
Rear clamping point	AWG cables, solid or stranded     Finely stranded with end sleeve	AWG mm <sup>2</sup>	-	-	10 2/0 2.5 50
connected	Finely stranded without end sleeve	mm <sup>2</sup>	_		10 50
Connected	Solid	mm <sup>2</sup>	_		2.5 16
	Stranded	mm <sup>2</sup>	_	_	10 70
	Ribbon cable conductors (number x width x				
	thickness)	mm <sup>2</sup>	-	-	6 x 9 x 0.8
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	-	-	10 2/0
Both clamping points	<ul> <li>Finely stranded with end sleeve</li> </ul>	mm <sup>2</sup>	-	-	max. 2 x 35
connected	Finely stranded without end sleeve	mm <sup>2</sup>	-	-	max. 2 x 35
	<ul><li>Solid</li><li>Stranded</li></ul>	mm <sup>2</sup> mm <sup>2</sup>	-	-	max. 2 x 16
	Ribbon cable conductors (number x width x	mm	-	-	max. 2 x 50
	thickness)	mm <sup>2</sup>	-	-	2 x (6 x 9 x 0.8)
	<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	-	-	2 x (10 1/0)
	Terminal screw		-	-	M6 (Inbus, SW 4)
	- tightening torque	Nm	-	-	4 6
		lb.in			36 53
Connection for drilled copper bars <sup>1)</sup>	Max. width	mm	-	-	10
Without box terminal with cable lugs <sup>2)</sup>	<ul> <li>Finely stranded with cable lug</li> </ul>	$mm^2$	-	-	10 50 <sup>3)</sup>
	<ul> <li>Stranded with cable lug</li> </ul>	mm <sup>2</sup>	-	-	10 70 <sup>3)</sup>
(1 or 2 conductors can be connected)	AWG cables, solid or stranded	AWG	-	-	7 1/0
	Auxiliary conductors:				
	• Solid	$mm^2$	2 x (0.5 1.5) <sup>4)</sup> ;	2 x (0.	5 1.5) <sup>4)</sup> ;
			2 x (0.75 2.5) <sup>4)</sup>	2 x (0.75 2.5)	<sup>4)</sup> acc. to IEC 60947;
			acc. to IEC 60947;	max 2	× (0.75 4)
			•	11107.1.27	. (0., 0 1)
			max. 2 x (1 4)		
	<ul> <li>Finely stranded with end sleeve</li> </ul>	$mm^2$		2 × (0.5 1.5) <sup>4)</sup> ;	
				$2 \times (0.75 \dots 2.5)^{4)}$	
	AWG cables,	AWG		2 x (20 16) <sup>4)</sup> ;	
	solid or stranded		2	x (18 14) <sup>4)</sup> ; 1 x 12	
	Terminal screw			M3	
	- tightening torque	Nm		0.8 1.2	
		lb.in		7 10.3	
Cage Clamp terminals (on request)	Auxiliary conductors:				
	• Solid	$\mathrm{mm}^2$		2 x (0.25 2.5)	
	Finely stranded with end sleeve	$mm^2$		2 x (0.25 1.5)	
	Finely stranded without end sleeve	$mm^2$		2 x (0.252.5)	
	AWG cables, solid or stranded				
	AVVG cables, solid or stranded	AWG		2 x (24 14)	



<sup>2)</sup> When connecting conductors which are larger than 25mm<sup>2</sup>, the terminal cover must be used to keep the phase clearance. (on request)

<sup>3)</sup> Only with crimped cable lugs according to DIN 46234. Cable lug max. 20mm wide.

<sup>4)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

# Technical Specifications - Reversing Contactor Combinations Series LSW

## Reversing Contactor Combinations

The LSW reversing contactor assemblies can be ordered as follows:

### Sizes 00 to 3

Fully wired and tested, with mechanical and electrical interlock. For assemblies with AC operation and 50/60Hz, a dead interval of 50ms must be provided when used with voltages  $\geq 500$ V; a dead interval of 30ms is recommend for use with voltages  $\geq 400$ V. These dead times do not apply to assemblies with DC operation.

### Sizes 00 to 12

As components for self-assembly.

In addition, there are accessories (auxiliary switch blocks, surge suppressors, etc.), which have to be ordered separately.

For overload relays for motor protection, see "Thermal overload relays". The LSW contactor assemblies have screw terminals and are suitable for screwing or snapping onto 35mm standard mounting rails.

### Complete units up to size 3

The fully wired reversing contactor assemblies are suitable for use in any climate. They are finger-safe according to EN 50274. The contactor assemblies consist of 2 contactors with the same power, with one NC contact in the basic unit. The contactors are mechanically and electrically interlocked (NC contact interlock).

For motor protection, LST thermal overload relays for direct mounting or stand-alone installation must be ordered separately.

### Rated Data AC-2 and AC-3 at AC 50Hz 400V

Rating	Operational current I <sub>e</sub>	Size	Order No.	Mechanical	Wiring set	Fully wired and tested
kW	A		Contactor	interlock <sup>2)</sup>	3	contactor assemblies
3	7	00	LSDD07	-	LSZDW001 <sup>5)</sup>	LSWD0733
4	9		LSDD09			LSWD0933
5,5	12		LSDD 12			LSWD 1233
5,5	12	0	LSD012	LSZ0W002	LSZ0W001 <sup>6)</sup>	LSW01233
7,5	17		LSD017			LSW01733
11	25		LSD025			LSW02533
15	32	2	LSD232	LSZ0W002	LSZ2W001 <sup>7)</sup>	LSW23233
18,5	40		LSD240			LSW24033
22	50		LSD250			LSW25033
30	65	3	LSD365	LSZ0W002	LSZ3W001 <sup>7)</sup>	LSW36533
37	80		LSD380			LSW38033
45	95		LSD395			LSW39533

- 2) Laterally mountable with two auxiliary contacts, one for each contactor.
- 5) Wiring set contains: mechanical interlock; connecting clips for 2 contactors; wiring modules on the top and bottom.
- 6) Wiring set contains: wiring modules on the top and bottom.
- 7) Wiring set contains: 2 connecting clips for contactors; wiring modules on the top and bottom.

### COMPONENTS FOR CUSTOMER ASSEMBLY

For customer assembly of reversing contactor assemblies size 6, 10 and 12, following components are available.

Contactors, thermal overload relays, the mechanical interlock (as of size 0) and – for momentary-contact operation – auxiliary contact blocks for latching must be ordered separately.

DESCRIPTION	Order No.
Wiring set for size 6	LSZ6W002
Wiring set for size 10	LSZEW001
Wiring set for size 12	LSZGW001
Mechanical interlock for size 6, 10, 12	LSZ6W001

The operating times of the individual LSD contactors are rated in such a way that no overlapping of the contact making and the arcing time between two contactors can occur on reversing, providing they are interlocked by way of their auxiliary switches (NC contact interlock) and the mechanical interlock. For assemblies with AC operation and 50/60Hz, a dead interval of 50 ms must be provided when used with voltages  $\geq 500$ V. This dead times does not apply to assemblies with DC operation. The operating times of the individual contactors are not affected by the mechanical interlock. The following points should be noted:

### Size 00

• For maintained-contact operation:

Use contactors with an NC contact in the basic unit for the electrical interlock.

For momentary-contact operation:

Use contactors with an NC contact in the basic unit for the electrical interlock; in addition, an auxiliary contact block with at least one NO contact for latching is required per contactor.

### Sizes 0 to 3

For maintained-contact operation:

The contactors have no auxiliary contact in the basic unit; NC contacts for the electrical interlock are therefore integrated in the mechanical interlock that can be mounted on the side of contactor (one contact each for the left and right-hand contactors).

For momentary-contact operation:

Electrical interlock as for maintained-contact operation; for the purpose of latching an auxiliary contact with an NO contact is additionally required for each contactor. This contact can be snapped onto the top of the contactors. Alternatively, auxiliary contact blocks mounted on the side can be used; they must be fitted onto the outside of each contactor.

### SURGE SUPPRESSION

### Sizes 00 to 3

All contactor assemblies can be fitted with RC elements or varistors for damping opening surges in the coil.

As with the individual contactors, the surge suppressors can either be plugged onto the top of the contactors (size 00) or fitted onto the coil terminals on the top or bottom (size 0 to 3).

### **TECHNICAL SPECIFICATIONS**

The technical specifications are identical to those of the LSD  $\ldots$  contactors.

The CSA and UL approvals only apply to the complete contactor assemblies and not to the individual parts for customer assembly.



# Technical Specifications - Star-delta Contactor Combinations Series LSY

### Star-Delta Contactor Combinations

These LSY contactor assemblies for wye-delta starting are designed for standard applications.

### Note

Contactor assemblies for wye-delta starting in special applications such as very heavy starting or wye-delta starting of special motors must be customized.

Help with designing such special applications is available.

### Complete units up to size 2

The LSY contactor assemblies for wye-delta starting can be ordered as follows:

### Sizes 00 to 2

Fully wired and tested, with electrical interlock, dead interval of up to 10 s on reversing (size 00 with electrical and mechanical interlocks)

A dead interval of 50ms on reversing is already integrated in the time relay function. There is also a range of accessories (auxiliary contact blocks, surge suppressors, etc.) that must be ordered separately.

For overload relays for motor protection, see "Thermal Overload Relays"

The LSY contactor assemblies have screw terminals and are suitable for screwing or snapping onto 35 mm standard mounting rails. Fully wired and tested LSY contactor assemblies have one unassigned NO contact which is mounted onto the front of the K3 delta contactor. A timing relay is mounted onto the right side of the assemblies.

### Rated Data at AC 50Hz 400V

Rating kW	Operational current I <sub>e</sub>	Motor current	Size	Line/delta contactor	Star contactor	WYE-Delta timer	Order No.
up to 7.5	17	17	00-00-00	LSDD 1213	LSDD0713	LSZD0101	LSYD1733
up to 15	32	34	0-0-0	LSD02533	LSD01213	LSZD0101	LSY03233
up to 22	50	43	2-2-0	LSD23233	LSD02533	LSZD0101	LSY25033

### COMPONENTS FOR CUSTOMER ASSEMBLY

Installation kits with wiring modules and, if necessary, mechanical connectors are available for contactor assemblies for wyedelta starting. Contactors, overload relays, wye-delta timers, auxiliary contacts for electrical interlock – if required also feeder terminals, mechanical interlocks (exception: In the case of the wiring set for size 00 contactor assemblies the mechanical interlock between the delta contactor and the star contactor is included in the kit) and base plates – must be ordered separately.

The wiring sets for sizes 00 and 0 contain the top and bottom main conducting path connections between the line and delta contactors (top) and between the delta and star contactors (bottom). In the case of sizes 2 to 12 only the bottom main conducting path connection between the delta and star contactors is included in the wiring module, owing to the larger conductor cross-section at the infeed

DESCRIPTION	Order No.
Wiring set for Y-D assemblies size 0-0-0, including wiring, connection clips and star jumper <sup>1)</sup>	LSZ0Y001
Parallel connector, star jumper 3-pole for contactors size Q <sup>2)</sup>	LSZ0Y002
Base-plate for YD-assemblies, size 2-2-0, for side arranged YD relay <sup>3)</sup>	LSZ2Y001
Wiring set for Y-D assemblies size 2-2-0, including wiring bottom and star jumper	LSZ2Y004
Parallel connector, star jumper 3-pole for contactors size 2	LSZ2Y005
Star-Delta timer 20s	LSZD0101
Star-Delta timer 60s	LSZD0102
Wiring Set for YD-Assemblies size 00, including mechanical Interlock	LSZDY001
Star jumper 3-pole for LSDD size 00	LSZDY002

- 1) Wiring set contains: mechanical interlock, 3 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and wye-contactor); star jumper.
- 2) Wiring set contains: 5 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and wye-contactor); star jumper.
- 3) Wiring set includes the wiring at bottom between star and delta contactor and the star jumper.

### MOTOR PROTECTION

Thermal overload relays can be used for overload protection. The overload relay can be either mounted onto the line contactor or separately fitted.

It must be set to 0.58 times the rated motor current.

### FUNCTION

Wye-delta starting can only be used either if the motor normally operates in a  $\Delta$  connection or starts softly or if the load torque during Y starting is low and does not increase sharply. On the Y step the motors can carry approximately 50 % (class KL 16) or 30 % (class KL 10) of their rated torque; The tightening torque is approximately 1/3 of that during direct on-line starting. The starting current is approximately 2 to 2.7 times the rated motor current.

The changeover from Y to  $\Delta$  must not be effected until the motor has run up to rated speed. Operating mechanisms which require this changeover to be performed earlier are unsuitable for weedelth starting.

The ratings given in the table are only applicable to motors with a starting current ratio IA  $\leq 8.4 \times IN$  and using wye-delta timing relayLSZD0101/LSZD0101 with a dead interval of approximately 50ms.

### SURGE SUPPRESSION

### Sizes 00 to 3:

All contactor assemblies can be fitted with RC elements, varistors or diode assemblies for damping opening surges in the coil. As with the individual contactors, the surge suppressors can either be plugged onto the top of the contactors (size 00) or fitted onto the coil terminals on the top or bottom (size 0 to 3).

### Sizes 6 to 12:

The contactors are fitted with varistors as standard.



# Technical Specifications - Star-delta Contactor Combinations Series LSY

# Star-Delta Contactor Combinations

## Technical Specifications

Short-circuit protection with fuses for motor feeders with short-circuit currents up to 50kA and 690V. For Thermal overload relays see: Thermal Overload Relays.

				Setting range	Permissible back-	p fuses for starters	5,			
					comprising contac	tor assemblies and	d overload relay	S		
					Single or double i	nfeed <sup>1)</sup>	LV HRC		British	
Rating	Sizes	Rated motor	Thermal		Fuse links		Operational class	listed	Standard	
	of contactors	current	overload relay	(the thermal overload	LV HRC, DIAZED,	NEOZED	αM	fuses	Fuses	
	K1-K3-K2			relays must be set to	gL/gG operation	al class	Type of	CLASS	BS88	
				0.58 times the rated	Type of co	ordination	coordination	RK5/L	Type of co	oordination
				motor current)	"1"	"2"	"2"		"1"	"2"
kW		A	Туре	A	Α	Α	A	A	A	A
5,5	00-00-00	12	LSTD0800	5.5 8	35	20	10	30	35	20
7,5	00-00-00	16	LSTD 1000	7 10	35	20	16	40	35	20
11	0-0-0	22	LST01600	11 16	63	25	20	60	63	25
15	0-0-0	29	LST02000	14 20	100	35	20	80	100	35
18,5	0-0-0	35	LST02500	20 25	100	35	20	100	100	35
22	2-2-0	41	LST23200	22 32	125	63	35	125	125	63

<sup>1)</sup> The maximum rated motor current must not be exceeded.

# Star-Delta Contactor Combinations

## ■ Technical Specifications

Size			LSYD	LSY0	LSY2
Туре			00-00-00	0-0-0	2-2-0
All technical specifications not mentioned in the table be	low are identical to those of the in	ndividual LSD c	ontactors and LST thermal ove	rload relays.	I
Utilization category DC-1		Operating		3 million	
		cycles		1)	
Short-circuit protection without overload relay Maximum rated current of the fuse				,	
Main circuit					
Fuse links, gL/gG, NH, DIAZED, NEOZED					
Single or double infeed	Type of coordination "1"	Α	35	100	125
acc. to IEC 60947-4-1/DIN EN 60947-4-1	Type of coordination "2"	A	20	35	63
Control circuit	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
Fuse links, gL/gG DIAZED, NEOZED		Α		10	
(short-circuit current I <sub>k</sub> ≤ 1kA)		Α	6 <sup>2)</sup> , if the auxiliary contact of	of the Thermal overload relay i	s connected in the contactor
(short-circuit current I <sub>k</sub> ≤ 1 kA)		A		coil circuit	
Miniature circuit breaker with C characteristic		Α		10	
		Α	6 <sup>2)</sup> , if the auxiliary contact of	s connected in the contactor	
C. f. h.l. l	K1 lt		D 10	coil circuit	200
Size of individual contactors	K1 line contactor	Type LSD	D12	025	232
	K3 delta contactor	Type LSD	D12	025	232
Unassigned auxiliary contacts of the individual	K2 star contactor	Type LSD	D07	012	025
Current-carrying capacity with reversing time	confactors				
up to 10s					
Rated operational current I <sub>a</sub>	at 400V	Α	17	40	65
	500V	A	11.3	31.2	55.4
	690V	Α	9	22.5	53.7
Rated power for induction motors at	at 230V	kW	4.7	12	20.4
50Hz and 60Hz and	400V	kW	8.2	21	35
	500V	kW	6.9	20.5	38
	690V	kW	7.5	20.4	51
	1000V	kW			
Switching frequency with overload relay		h <sup>-1</sup>	15	15	15
Current-carrying capacity with reversing time up to 15s					
Rated operational current I <sub>e</sub>	at 400V	Α	17	31	44
	500V	A	11.3	31	44
	690V	Α	9	22.5	44
Rated power for induction motors at	at 230V	kW	4.7	9.4	13.8
50Hz and 60Hz and	400V	kW	8.2	16.3	24
	500V	kW	6.9	20.4	30
	690V	kW	7.5	20.4	42
	1000V	kW			
Switching frequency with overload relay		h <sup>-1</sup>	15	15	15
Current-carrying capacity with reversing time up to 20s					
Rated operational current I <sub>a</sub>	at 400V	Α	17	28	39
,	500V	Α	11.3	28	39
	690V	Α	9	22.5	39
Rated power for induction motors at	at 230V	kW	4.7	8.5	12.2
50Hz and 60Hz and	400V	kW	8.2	14.7	21.3
	500V	kW	6.9	18.4	26.7
	690V	kW	7.5	20.4	37
	1000V	kW			
<ul> <li>Switching frequency with Thermal</li> </ul>		h-1	15	15	15

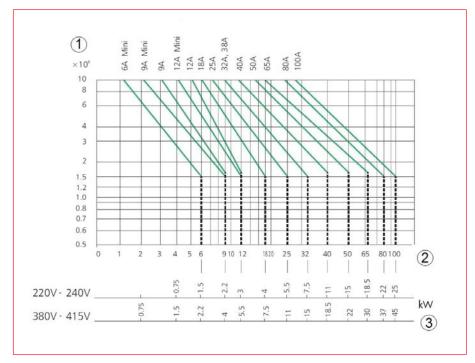
<sup>1)</sup> Short-circuit protection with overload relays, see Thermal Overload Relays.



<sup>2)</sup> Up to  $I_k < 0.5kA$ ;  $\le 260V$ 

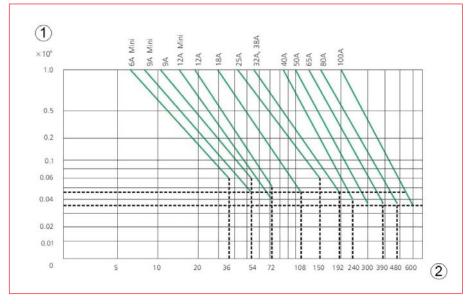
<sup>3)</sup> For Circuit diagram see chapter "Star-Delta Contactor combinations"

### ■ Electric Life Curve AC3



- 1) Electric life curve
- 2) Rated current (A)
- 3) Rated outputs of three-phase motors AC-3 (50Hz)

### Electric Life Curve AC4



- 1) Electric life curve
- 2) Rated current (A)

## ■ Technical Specifications

			LZDM06	LZDM09	LZDM12	
Standard				IEC/EN 60947-4-1		
Rated insulation voltage				690VAC		
Rated frequency				50/60Hz		
Rated impulse withstand voltage	ge			6kV		
Overvoltage category			20.4		20.4	
Rated current AC1		0001/	20A	20A	20A	
Rated current AC3		230V	6A	9A	12A	
		400V	6A	9A	12A	
		415V	6A	9A	12A	
		690V	3.8A	4.9A	4.9A	
tated current AC4		230V	6A	9A	12A	
		400V	6A	9A	9A	
		415V	6A	9A	9A	
8 . 1 . 12		690V	3.8A	4.9A	4.9A	
Rated making capacity				10 x I <sub>e</sub> (AC3) / 12 x I <sub>e</sub> (AC4)		
ated breaking capacity	•		40.4	8 x I <sub>e</sub> (AC3) / 10 x I <sub>e</sub> (AC4)	0/1	
hort-time withstand current 10	Os	2001/	48A	72A	96A	
ated power AC3		230V	1.5kW	2.2kW	3kW	
•		400V	2.2kW	4kW	5.5kW	
		415V	2.2kW	4kW	5.5kW	
		690V	3kW	4kW	4kW	
perating frequency		AC3		1.200 operations/h		
1 . 1 100 .1		AC4		300 operations/h		
lectrical lifetime		AC3		1.200.000 operations		
Mechanical lifetime			07:2	10.000.000 operations	2112	
Configuration of main contacts		3-pole	3 NO	3 NO	3 NO	
rotection degree			IP20	IP20	IP20	
mbient air temperature			- 5 up to + 40°C	- 5 up to + 40°C	- 5 up to + 40°C	
torage temperature			- 25 up to + 55°C	- 25 up to + 55°C	- 25 up to + 55°0	
Correction coefficient		40°C	1	1	1	
		50°C	0,875	0,875	0,875	
		60°C	0,75	0,75	0,75	
		70°C	0,625	0,625	0,625	
Altitude			2000m	2000m	2000m	
tmosphere conditions				50% humidity at +40°C		
nstallation position			horizontal and vertical +/- 22,5°			
Coil voltage		Us	0.50/	24VAC, 230VAC or 24VDC	0.50/ 11.00/ 11	
Coil acting range		attraction	85% - 110% Us	85% - 110% Us	85% - 110% Us	
		release	AC: 20%-70% Us	AC: 20%-70% Us	AC: 20%-70% U:	
*1			DC: 10%-60% Us	DC: 10%-60% Us	DC: 10%-60% Us	
oil average power		start holding	40VA 7VA	40VA 7VA	40VA 7VA	
<b>-</b>		nolaing	4W	7 VA 4W	4W	
eat wastage		.1				
Aain contact action time		close	10 - 18ms	10 - 18 ms	10 - 18ms	
erminal capacity of main		disconnection	4 - 16ms	4 - 16 ms	4 - 16ms	
erminal capacity of main ircuit	flexible with end sleeve	1 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
		2 x	1 - 2.5mm²	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
	rigid cable	1 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
	J	2 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
	screw size		M3	M3	M3	
	torque		0.8Nm	0.8Nm	0.8Nm	
erminal capacity of control	flexible with end sleeve	1 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm²	1 - 2.5mm <sup>2</sup>	
		2 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
	rigid cable	1 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
	rigia cabie	2 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
	screw size	<u> </u>	M3	M3	M3	
	torque		0.8Nm	0.8Nm	0.8Nm	
erminal capacity of auxiliary	flexible with end sleeve	1 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
ontacts						
	2.9111.	2 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
	rigid cable	1 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
		2 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	
	screw size		M3	M3	M3	
	torque	<del></del>	0.8Nm	0.8Nm	0.8Nm	



# Application in Illumination Circuit

144			LZDM06	LZDM09	LZDM12	
W	A	μF	max. number of lamps per phase			
Incandescent lamp						
60	0,27	-	35	35	35	
75	0,34	-	28	28	28	
100	0,45	-	21	21	21	
150	0,68	-	14	14	14	
200	0,71	-	10	10	10	
300	1,4	-	6	6	6	
500	2,3	-	4	4	4	
750	3,4	-	2	2	2	
1000	4,6	-	2	2	2	
Single fluorescent la	mp with starter, without co	ompensation	•	•	•	
20	0,39	-	24	24	24	
40	0,45	-	21	21	21	
64	0,7	-	12	12	12	
80	0,8	-	12	12	12	
110	1,15	-	8	8	8	
	mp with starter, parallel co	ompensation		1	1	
20	0,18	5	83	83	83	
40	0,26	5	58	58	58	
65	0,42	7	35	35	35	
80	0,52	7	28	28	28	
100	0,6	16	23	23	23	
110	0,7	18	21	21	21	
	dual mounting with starte					
2 x 20	2 × 0,22	-	21	21	21	
2 x 40	2 x 0,41	_	11	11	11	
2 x 65	2 x 0,67	-	7	7	7	
2 x 80	2 x 0,82	-	5	5	5	
2 x 110	2 x 0,82 2 x 1,10	-	4	4	4	
	dual mounting with starte			4	4	
2 x 20	2 x 0, 13		36	36	36	
2 x 40	2 x 0,13	-	20	20	20	
			12	12	12	
2 x 65 2 x 80	2 x 0,39	-	10	10	10	
2 x 110	2 x 0,48	-	7	7	7	
	2 x 0,65 mp without starter, withou		/	/	/	
20	0,43	or compensation	22	22	22	
40		-	17	17	17	
	0,55	-	12	12	12	
65	0,8	-				
80	0,95	=	10	10	10	
110	0,4		6	6	6	
	mp with starter, with para		I 50		T 50	
20	0,19	5	50	50	50	
40	0,29	5	33	33	33	
<u>65</u>	0,46	7 7	20 16	20	20	
	-		<u> </u>			
110	0,79	16	-	-	-	
	thout starter, without com		I			
2 x 20	2 x 0,25	-	19	19	19	
2 x 40	2 x 0,47	-	10	10	10	
2 x 65	2 x 0,76	-	6	6	6	
2 x 80	2 x 0,93	-	5	5	5	
2 x 110	2 x 1,3	-	3	3	3	

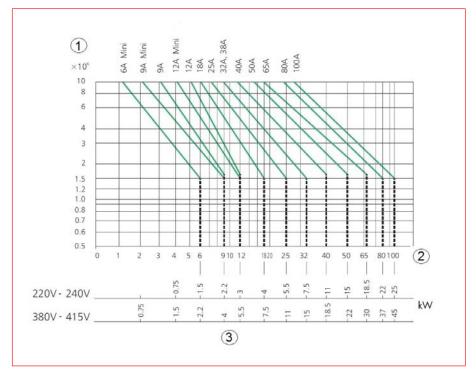


# Application in Illumination Circuit

w			LZDM06	LZDM09	LZDM12	
	Α	μF	max. number of lamps per phase			
luorescent lamp in du	ual mounting without st	arter, with compense	ation in series			
2 x 20	2 x 0, 15	-	34	34	34	
2 x 40	2 x 0,26	-	18	18	18	
2 x 65	2 x 0,43	-	11	11	11	
2 x 80	2 x 0,53	-	9	9	9	
2 x 110	2 x 0,72	-	6	6	6	
Low press sodium vap	or lamps with parallel	compensation				
35	0,3	17	•	-	-	
55	0,4	17	-	-	-	
90	0,6	25	-	-	-	
135	0,9	36	-	-	-	
150	1	36	-	-	-	
180	1,2	36	-	-	-	
200	1,3	36	-	-	-	
ow press sodium vap	oor lamps without comp	ensation				
150	1,9	-	4	4	4	
250	3,2	-	2	2	2	
400	5	-	1	1	1	
700	8,8	-	-	-	-	
1000	12,4	-	-	-	-	
Low press sodium vap	or lamps with parallel	compensation				
150	0,84	20	-	-	-	
250	1,4	32	-	-	-	
400	2,2	48	-	-	-	
700	3,6	96	-	-	-	
1000	5,5	120	-	-	-	
High press hydrargyr	um lamps without comp	pensation				
50	0,54	-	14	14	14	
80	0,81	-	9	9	9	
125	1,2	-	6	6	6	
250	2,3	-	3	3	3	
400	4,1	-	1	1	1	
700	6,8	-	-	-	-	
1000	9,9	-	-	-	-	
High press hydrargyr	um lamps with parallel	compensation				
50	0,3	10	-	-	-	
80	0,45	10	-	-	-	
125	0,67	10	-	-	-	
250	1,3	18	-	-	-	
400	2,3	25	-	-	-	
700	3,8	40	-	-	-	
1000	5,5	60	_	-	-	

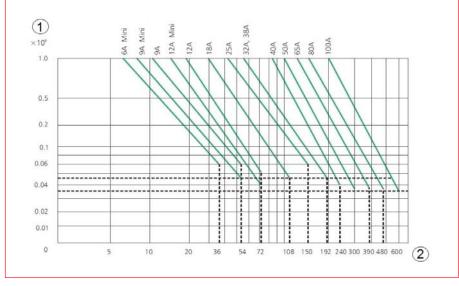


### ■ Electric Life Curve AC3



- 1) Electric life curve
- 2) Rated current (A)
- 3) Rated outputs of three-phase motors AC-3 (50Hz)

### ■ Electric Life Curve AC4



- 1) Electric life curve
- 2) Rated current (A)

# ■ Technical Specifications

	L	LZDC09	LZDC12	LZDC18	LZDC25	LZDC32	LZDC38	
Standard					50947-4-1			
Rated insulation voltage					OVAC 60Hz			
Rated frequency Rated impulse withstand voltage					ovnz kV			
Overvoltage category					III			
Rated current AC1		25A	25A	32A	40A	50A	50A	
Rated current AC3	230V	9A	12A	18A	25A	32A	38A	
	400V	9A	12A	18A	25A	32A	38A	
	415V	9A	12A	18A	25A	32A	38A	
	690V	6.7A	9A	10.6A	17.3A	21.9A	21.9A	
Rated current AC4	230V	9A	12A	18A	25A	32A	38A	
	400V	9A	12A	18A	25A	32A	32A	
	415V	9A	12A	18A	25A	32A	32A	
	690V	6.7A	9A	9A	17.3A	21.9A	21.9A	
Rated making capacity					/ 12 x I <sub>e</sub> (AC4)			
Rated breaking capacity					/ 10 x I <sub>e</sub> (AC4)			
Short-time withstand current 10s		72A	96A	144A	200A	256A	304A	
Rated power AC3	230V	2.2kW	4kW	4kW	5.5kW	7.5kW	9kW	
	400V	4kW	5.5kW	7.5kW	11 kW	15kW	18.5kW	
	415V	4kW	5.5kW	9kW	11kW	15kW	18.5kW	
- · · · ·	690V	5.5kW	7.5kW	9kW	15kW	18.5kW	18.5kW	
Operating frequency	AC3				erations/h			
Electrical lifetime	AC4 AC3				erations/h O operations			
Mechanical lifetime	AC3				<u> </u>			
Mechanical literime  Configuration of main contacts	2 -				0 operations NO			
Configuration of main contacts  Configuration of auxiliary contacts	3-pole				ind 1 NC			
Protection degree					220			
Ambient air temperature					o+40°C			
Storage temperature					to + 55°C			
Correction coefficient	40°C	1	1	1	1	1	1	
Correction Coefficient	50°C	0,875	0,875	0,875	0,875	0,875	0,875	
	60°C	0,75	0,75	0,75	0,75	0,75	0,75	
	70°C	0,625	0,625	0,625	0,625	0,625	0,625	
Altitude	70 0	2000m	2000m	2000m	2000m	2000m	2000m	
Atmosphere conditions		2000	2000		lity at +40°C	2000	2000	
Installation position					rertical +/- 22,5°			
Coil voltage	Us	230VAC or 24VAC						
Coil acting range	attraction	85% - 110% Us						
	release			AC: 20%	%-70% Us			
Coil average power	start	70VA	70VA	70VA	70VA	70VA	70VA	
	holding	10VA	10VA	10VA	10VA	10VA	10VA	
Heat wastage		4W	4W	4W	4W	4W	4W	
Main contact action time	close	12 - 25ms   25ms						
	disconnection	5 - 20ms	5 - 20ms	5 - 20ms	5 - 20ms	5 - 20ms	5 - 20ms	
Terminal capacity of main circuit								
flexible with	1 x	1 - 4mm²	1 - 4mm <sup>2</sup>	1.5 - 6mm <sup>2</sup>	2.5 - 10mm <sup>2</sup>	2.5 - 10mm <sup>2</sup>	2.5 - 10mm	
end sleeve	2 x	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 4mm <sup>2</sup>	2.5 - 6mm <sup>2</sup>	2.5 - 6mm <sup>2</sup>	2.5 - 6mm <sup>2</sup>	
rigid cable	1 x	1 - 4mm²	1 - 4mm <sup>2</sup>	1.5 - 6mm <sup>2</sup>	2.5 - 10mm <sup>2</sup>	2.5 - 10mm <sup>2</sup>	2.5 - 10mm	
	2 x	1 - 4mm <sup>2</sup>	1 - 4mm <sup>2</sup>	1.5 - 6mm <sup>2</sup>	2.5 - 10mm <sup>2</sup>	2.5 - 10mm <sup>2</sup>	2.5 - 10mm	
screw size		M3.5	M3.5	M3.5	M4	M4	M4	
torque		1.2Nm	1.2Nm	1.2Nm	2Nm	2Nm	2Nm	
Terminal capacity of control circuit	, ,	1 4 2	1 ( )	1 1 1	1 , , ,	1 ,	1	
flexible with	1 x	1 - 4mm <sup>2</sup>                                 4mm <sup>2</sup>						
end sleeve	2 x	1 - 2.5mm <sup>2</sup>                               2.5mm <sup>2</sup>						
rigid cable	1 x	1 - 4mm <sup>2</sup>                                 4mm <sup>2</sup>						
<del></del>	2 x	1 - 4mm <sup>2</sup>                                 4mm <sup>2</sup>						
screw size		M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	
torque		1.2Nm	1.2Nm	1.2Nm	1.2Nm	1.2Nm	1.2Nm	
Terminal capacity of auxiliary contacts	1	1 42	1 42	1 42	1 42	1 42	1 4 2	
flexible with	1 x 2 x	1 - 4mm <sup>2</sup>                                 4mm <sup>2</sup>						
	∠ X	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup>	1 - 2.5mm <sup>2</sup> 1 - 4mm <sup>2</sup>	1 - 2.5mm <sup>2</sup> 1 - 4mm <sup>2</sup>	1 - 2.5mm <sup>2</sup> 1 - 4mm <sup>2</sup>	
end sleeve	1	1 4 2	1 /2				ı - 4mm²	
end sleeve rigid cable	1 x	1 - 4mm <sup>2</sup>	1 - 4mm <sup>2</sup>	1 - 4mm <sup>2</sup>	-			
	1 x 2 x	1 - 4mm <sup>2</sup> 1 - 4mm <sup>2</sup> M3.5	1 - 4mm <sup>2</sup> 1 - 4mm <sup>2</sup> M3.5	1 - 4mm <sup>2</sup> 1 - 4mm <sup>2</sup> M3.5	1 - 4mm <sup>2</sup> 1 - 4mm <sup>2</sup> M3.5	1 - 4mm <sup>2</sup> M3.5	1 - 4mm <sup>2</sup> M3.5	



# Application in Illumination Circuit

w	A	μF	LZDC09	LZDC12	LZDC18	LZDC25	LZDC32	LZDC38
**	^	μг			max. number o	f lamps per phase		
Incandescent lar	np							
60	0,27	-	59	59	77	92	129	129
<i>7</i> 5	0,34	-	47	47	61	73	103	103
100	0,45	-	35	35	46	55	77	77
150	0,68	-	23	23	30	36	51	51
200	0,71	-	17	17	23	27	38	38
300	1,4	-	11	11	15	18	25	25
500	2,3	-	7	7	8	11	15	15
<i>7</i> 50	3,4	-	4	4	6	7	10	10
1000	4,6	-	3	3	4	5	7	7
Single fluorescer	nt lamp with starter,	without comp	ensation	•	'	•		
20	0,39	-	41	41	53	66	89	89
40	0,45	-	35	35	46	57	77	77
64	0,7	-	22	22	30	37	50	50
80	0,8	-	20	20	26	32	43	43
110	1,15	-	12	12	15	20	26	26
	nt lamp with starter,	parallel comp	ensation	1			1	1
20	0,18	5	94	94	105	155	215	215
40	0,26	5	65	65	75	107	150	150
65	0,42	7	40	40	45	66	92	92
80	0,52	7	32	32	36	53	74	74
100	0,6	16	26	26	29	43	59	59
110	0,7	18	24	24	27	40	55	55
	<u> </u>		ithout compensation					
2 x 20	2 x 0,22		36	36	46	58	78	78
2 x 40	2 x 0,41	_	18	18	24	30	42	42
2 x 65	2 x 0,67		10	10	14	18	26	26
2 x 80	2 x 0,82	_	8	8	12	14	20	20
2 x 110	2 x 1,10	-	6	6	8	10	14	14
	_	with starter w	 ith compensation in	1	0	10	14	14
2 x 20			60	60	80	100	134	134
	2 x 0, 13	-	32	32	42	54	72	72
2 x 40 2 x 65	2 x 0,24	-	20	20	26	32	44	44
	2 x 0,39		+		+	+		<u> </u>
2 x 80	2 x 0,48	-	16	16	20	26	36 26	36 26
2 x 110	2 x 0,65	-	1	IZ	10	20	20	20
	nt lamp without star	ter, without co	T'	27	40	40	97	97
20	0,43	-	37	37	48	60		
40	0,55	-	29	29	38	32	63	63
65	0,8	-	20	20			43	
80	0,95	-	16	16	22	27	36	36
110	0,4	- 11	11	11	15	18	25	25
	nt lamp with starter,			1 04	110	10 /	10.4	10.4
20	0,19	5	84	84	110	136	184	184
40	0,29	5	55	55	72	89	101	101
65	0,46	7	34	34	45	56	76	76
80	0,57	7	28	28	36	45	61	61
110	0,79	16	20	20	26	32	44	44
	without starter, wi	thout compens		T		T .		1
2 x 20	2 x 0,25	-	32	32	42	52	70	70
2 x 40	2 x 0,47	-	16	16	22	26	36	36
2 x 65	2 x 0,76	-	10	10	12	16	22	22
2 x 80	2 x 0,93	-	8	8	10	12	18	18
2 x 110	2 x 1,3	-	6	6	8	10	12	12



# Application in Illumination Circuit

w	A	μF	LZDC09	LZDC12	LZDC18	LZDC25	LZDC32	LZDC38
**	^	μг			max. number of	lamps per phase		
luorescent lamp	in dual mounting v	vithout starter, v	with compensation	in series				
2 x 20	2 x 0, 15	-	56	56	74	92	124	124
2 x 40	2 x 0,26	-	30	30	40	50	66	66
2 x 65	2 x 0,43	-	18	18	24	30	40	40
2 x 80	2 x 0,53	-	14	14	18	24	32	32
2 x 110	2 x 0,72	-	10	10	14	18	24	24
ow press sodium	n vapor lamps with	parallel compe	ensation					
35	0,3	17	40	40	50	63	86	86
55	0,4	17	30	30	37	47	65	65
90	0,6	25	-	-	25	31	43	43
135	0,9	36	-	-	-	21	28	28
150	1	36	-	-	-	19	26	26
180	1,2	36	-	-	-	15	21	21
200	1,3	36	-	-	-	14	20	20
ow press sodium	vapor lamps with	out compensati	on	•	•			
150	1,9	-	6	6	7	10	13	13
250	3,2	-	3	3	4	5	8	8
400	5	-	2	2	3	3	5	5
700	8,8	-	-	-	2	2	2	2
1000	12,4	-	-	-	1	1	2	2
ow press sodium	vapor lamps with	parallel compe	ensation	'	'		'	
150	0,84	20	-	-	17	22	30	30
250	1,4	32	-	-	-	13	18	18
400	2,2	48	-	-	-	8	11	11
700	3,6	96	-	-	-	-	6	6
1000	5,5	120	-	-	-	-	-	-
ligh press hydra	rgyrum lamps with	out compensati	ion	'	'	'		
50	0,54	-	22	22	27	35	48	48
80	0,81	-	14	14	18	23	32	32
125	1,2	-	9	9	12	15	21	21
250	2,3	-	5	5	6	8	11	11
400	4,1	-	2	2	3	4	6	6
700	6,8	-	1	1	2	2	3	3
1000	9,9	-	1	1	1	1	2	2
ligh press hydra	rgyrum lamps with	parallel compe	ensation				l	1
50	0,3	10	40	40	50	63	86	86
80	0,45	10	26	26	33	42	57	57
125	0,67	10	17	17	22	28	38	38
250	1,3	18	9	9	11	14	20	20
400	2,3	25	-	-	6	8	11	11
	· · · · · · · · · · · · · · · · · · ·	40		-	-	5	6	6
700	3,8		-					



Motor Protection Relays Series LA, U12/16E...K3



Thermal Overload Relays LST, Size 0



Thermal Overload Relays LST, Size 3



Thermal Overload Relays LST, Size 00



Thermal Overload Relays LST, Size 2



Thermal Overload Relays Series CUBICO



# Thermal Overload Relays

Index

## 



## ■ Motor Protection Relays U12/16E...K3 with Manual Reset for Contactors K(G)3-10 to K(G)3-22

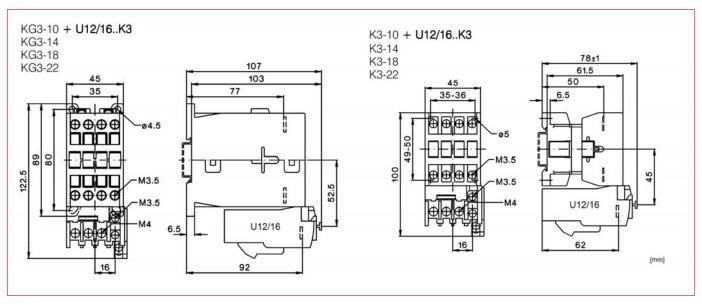


## LA300108K3

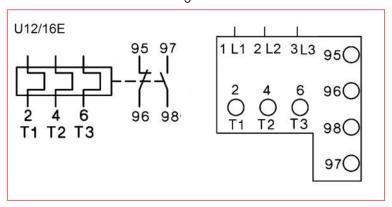
### Schrack-Info

- For direct mounting onto contactors K(G)3-10 up to K(G)3-22
- Rated currents for direct starter of 0.12A up to 30A
- Rated currents for YD starter of 7A up to 52A
- Adjustment of relay: rated current of motor In x 0.58
- Auxiliary contacts 1NC and 1NO (95/96, 97/98)
- Reset by hand

### Dimensions



### Circuit and Connection Diagram



# ■ Motor Protection Relays U12/16E...K3 with Manual Reset for Contactors K(G)3-10 to K(G)3-22

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
0.12-0.18A U12/16EK3 Manual-Reset	U12/16 K3	555 0- 8	LA300100K3
0.18-0.27A U12/16EK3 Manual-Reset	U12/16 K3	000 O- 0	LA300101K3
0.27-0.4A U12/16EK3 Manual-Reset	U12/16 K3	999 0- 8	LA300102K3
0.4-0.6A U12/16EK3 Manual-Reset	U12/16 K3	000 0-0	LA300103K3
0.6-0.9A U12/16EK3 Manual-Reset	U12/16 K3	355 0-6	LA300104K3
0.8-1.2A U12/16EK3 Manual-Reset	U12/16 K3	000 0-0	LA300105K3
1.2-1.8A U12/16EK3 Manual-Reset	U12/16 K3	355 0- 5	LA300106K3
1.8-2.7A U12/16EK3 Manual-Reset	U12/16 K3	000 0-0	LA300107K3
2.7-4A U12/16EK3 Manual-Reset	U12/16 K3	999 0- 8	LA300108K3
4-6A U12/16EK3 Manual-Reset	U12/16 K3	000 000	LA300109K3
6-9A U 12/16EK3 Manual-Reset	U12/16 K3	555 0- 8	LA300110K3
8-11 A U 12/16EK3 Manual-Reset	U12/16 K3	000 0-0	LA300111K3
10-14A U12/16EK3 Manual-Reset	U12/16 K3	000 0-0	LA300112K3
13-18A U12/16EK3 Manual-Reset	U12/16 K3	000 0-0	LA300113K3
17-23A U12/16EK3 Manual-Reset	U12/16 K3	300 0-0	LA300114K3
22-30A U12/16EK3 Manual-Reset	U12/16 K3	000 0-0	LA300126K3

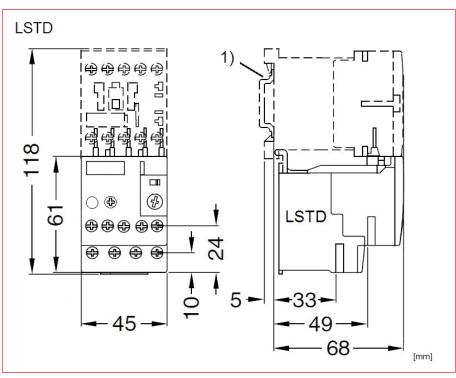
# ■ Thermal Overload Relays LST, Size 00



Schrack-Info

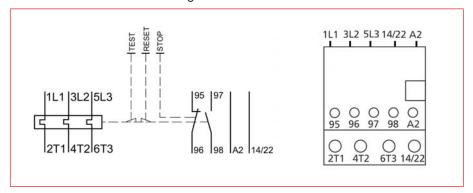
- Thermal overload relais with phase failure monitoring for direct mounting onto contactors of size 00
- Seperate mouting can be realised by "stand alone holder" LSZDTE01
- Devices are equipped with potential-free auxiliary contact 1 NO + 1 NC, manual- and automatic-RESET, display of operating state, TEST-function, STOP-button and rated current adjusting knob with sealable cover. The terminals of contactors auxiliary contact 14/22 as well as contactors terminal (coil) A2 are connected through the device

Dimensions



1) For mounting on TH35-7,5 standard mounting rail according to EN 60715

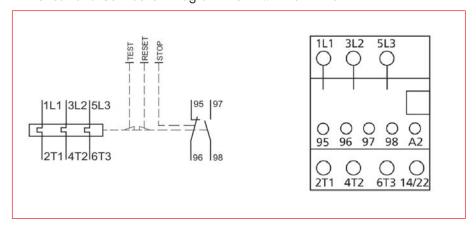
### Circuit and Connection Diagram - LSTD





# Thermal Overload Relays LST, Size 00

## Circuit and Connection Diagram - LSTD with LSZDTE01



Thermal Overload Relay 0.11-0.16A size 00  Thermal Overload Relay 0.14-0.2A size 00  Thermal Overload Relay 0.18-0.25A size 00	LSTD LSTD LSTD LSTD	005 0-6 005 0-6	LSTD0016 LSTD0020 LSTD0025
,	LSTD	388 0-6	
Thermal Overload Relay 0.18-0.25A size 00			LSTD0025
	LSTD		
Thermal Overload Relay 0.22-0.32A size 00		000 0-0	LSTD0032
Thermal Overload Relay 0.28-0.40A size 00	LSTD	555 0-0	LSTD0040
Thermal Overload Relay 0.35-0.50A size 00	LSTD	000 0-0	LSTD0050
Thermal Overload Relay 0.45-0.63A size 00	LSTD	000 0-0	LSTD0063
Thermal Overload Relay 0.55-0.80A size 00	LSTD	000 0-0	LSTD0080
Thermal Overload Relay 0.70-1,00A size 00	LSTD	000 0-0	LSTD0100
Thermal Overload Relay 0.9-1,25A size 00	LSTD	000 0-0	LSTD0125
Thermal Overload Relay 1.1-1.6A size 00	LSTD	000 0-0	LSTD0160
Thermal Overload Relay 1.4-2.00 A size 00	LSTD	000 0-0	LSTD0200
Thermal Overload Relay 1.8-2.5A size 00	LSTD	000 0-0	LSTD0250
Thermal Overload Relay 2.2-3.2A size 00	LSTD	000 0=0	LSTD0320
Thermal Overload Relay 2.8-4.00 A size 00	LSTD	000 0-0	LSTD0400
Thermal Overload Relay 3.5-5.00 A size 00	LSTD	000 0-0	LSTD0500
Thermal Overload Relay 4.5-6.3A size 00	LSTD	300 0-0	LSTD0630
Thermal Overload Relay 5.5-8.00 A size 00	LSTD	000 0-0	LSTD0800
Thermal Overload Relay 7.00 -10.00 A size 00	LSTD	000	LSTD1000
Thermal Overload Relay 9.00 - 12.00 A size 00	LSTD	900 0-0	LSTD1200

# ■ Thermal Overload Relays LST, Size 0

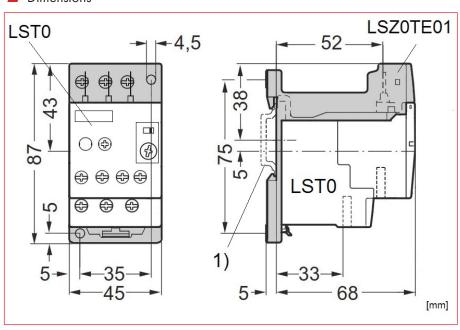
# SCHRACH STOP HIST ST

### Schrack-Info

- Thermal overload relais with phase failure monitoring for direct mounting onto contactors of size 0
- Seperate mouting can be realised by "stand alone holder" LSZOTE01
- Devices are equipped with potential-free auxiliary contact 1 NO + 1 NC, manual- and automatic-RESET, display of operating state, TEST-function, STOP-button and rated current adjusting knob with sealable cover.

LST02200

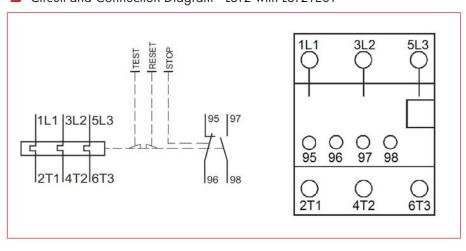
### Dimensions



with terminal bracket for stand-alone installation

1) For mounting on TH35-7,5 standard mounting rail according to EN 60715  $\,$ 

## Circuit and Connection Diagram - LST2 with LST2TE01



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# ■ Thermal Overload Relays LST, Size 0

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Thermal Overload Relay 1.8-2.5A size 0	LSTO	000 0-0	LST00250
Thermal Overload Relay 2.2-3.2A size 0	LST0	000 0-0	LST00320
Thermal Overload Relay 2.8-4.0A size 0	LSTO	000 0-0	LST00400
Thermal Overload Relay 3.5-5.00 A size 0	LSTO	000 0-0	LST00500
Thermal Overload Relay 4.5-6.3A size 0	LSTO	500 0-0	LST00630
Thermal Overload Relay 5.5-8.00 A size 0	LSTO	000 0-0	LST00800
Thermal Overload Relay 7.00 -10.00A size 0	LSTO	988 0-8	LST01000
Thermal Overload Relay 9-12.5A size 0	LSTO	000 0-0	LST01250
Thermal Overload Relay 11-16A size 0	LSTO	000 0-0	LST01600
Thermal Overload Relay 14-20A size 0	LSTO	000 0-0	LST02000
Thermal Overload Relay 17-22A size 0	LSTO	555 0-0	LST02200
Thermal Overload Relay 20-25A size 0	LST0	000 0-0	LST02500

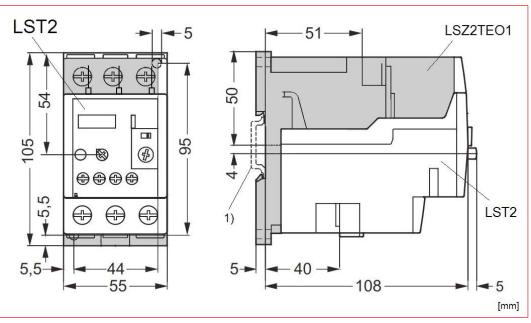
# Thermal Overload Relays LST, Size 2

### Schrack-Info

- Thermal overload relais with phase failure monitoring for direct mounting onto contactors of size 2
- Seperate mouting can be realised by "stand alone holder" LSZ2TE01
- Devices are equipped with potential-free auxiliary contact 1 NO + 1 NC, manual- and automatic-RESET, display of operating state, TEST-function, STOP-button and rated current adjusting knob with sealable cover.

LST23200

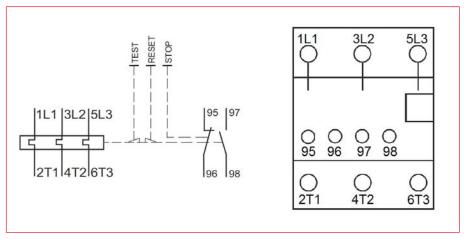
### Dimensions



with terminal bracket for stand-alone installation

1) For mounting on TH35-15 or TH75 standard mounting rail acc. to EN 60715

### Circuit and Connection Diagram - LST2 with LST2TE01



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Thermal Overload Relay 5.5-8A size 2	LST2	555 0-0	LST20800
Thermal Overload Relay 7-10A size 2	LST2	000 0-0	LST21000
Thermal Overload Relay 11-16A size 2	LST2	388 0-8	LST21600
Thermal Overload Relay 14-20A size 2	LST2	000 0-0	LST22000
Thermal Overload Relay 18-25A size 2	LST2	000 0-0	LST22500
Thermal Overload Relay 22-32A size 2	LST2	000 0-0	LST23200
Thermal Overload Relay 28-40A size 2	LST2	388 0-8	LST24000
Thermal Overload Relay 36-45A size 2	LST2	000 0-0	LST24500
Thermal Overload Relay 40-50A size 2	LST2	388 0-8	LST25000

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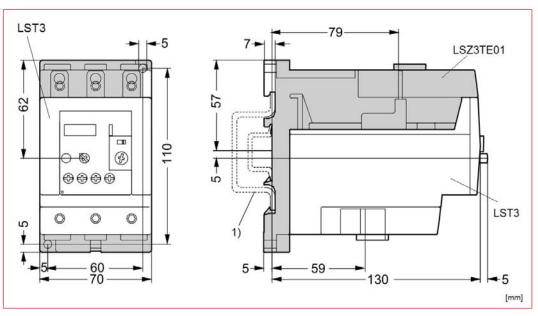
## Thermal Overload Relays LST, Size 3



### Schrack-Info

- Thermal overload relais with phase failure monitoring for direct mounting onto contactors of size 3
- Seperate mouting can be realised by "stand alone holder" LSZ3TE01
- Devices are equipped with potential-free auxiliary contact 1 NO + 1 NC, manual- and automatic-RESET, display of operating state, TEST-function, STOP-button and rated current adjusting knob with

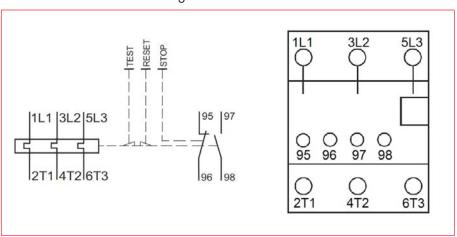
### Dimensions



with terminal bracket for stand-alone installation

1) For mounting on TH35-7,5 standard mounting rail according to EN 60715.

## Circuit and Connection Diagram - LST3 with LST3TE01



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Thermal Overload Relay 18-25A size 3	LST3	000 0-0	LST32500
Thermal Overload Relay 28-40A size 3	LST3	000 0-0	LST34000
Thermal Overload Relay 36-50A size 3	LST3	900 0- 8-	LST35000
Thermal Overload Relay 45-63A size 3	LST3	000 0-0	LST36300
Thermal Overload Relay 57-75A size 3	LST3	333 0- 6	LST37500
Thermal Overload Relay 70-90A size 3	LST3	000 0-0	LST39000
Thermal Overload Relay 80-100A size 3	LST3	988 0-0	LST39999

# Thermal Overload Relays Series ALEA LST

# $\blacksquare$ Holder for Stand-alone Installation of Thermal Overload Relays, Size 00 / 0 / 2 / 3



### Schrack-Info

- For seperate mouting of Thermal overload relais LST to DIN-rail TS35 or TH35
- Stand alone holder size 3 (LSZ3TE01) also can be mounted to DIN-rail TS75 or TH75

LSZOTE01

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Holder for LSTD size 00	LSZD	000 0-0	LSZDTE01
Holder for LST Thermal overload relay, size 00	LSZ0	000 0-0	LSZOTE01
Holder for LST Thermal overload relay, size 2	LSZ2	385 0-6	LSZ2TE01
Holder for LST Thermal overload relay, size 3	LSZ3	000 0-0	LSZ3TE01

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# ■ Thermal Overload Relays Series CUBICO Mini

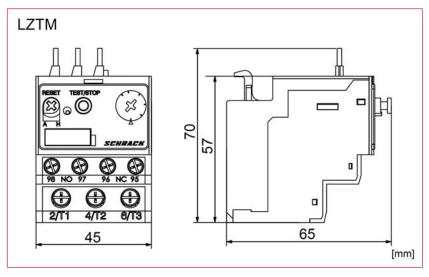


LZTM0016

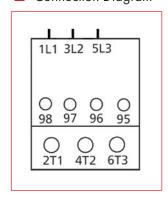
### Schrack-Info

- Matching on contactor series CUBICO Mini
- Plug-in type
- Included auxiliary contacts
- Phase failure protection
- Manual and automatic reset
- Temperature compensation
- Tripping indicator
- Test- and Stop-button

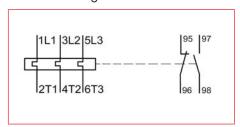
## Dimensions



## Connection Diagram



### Circuit Diagram



# Thermal Overload Relays Series CUBICO

# ■ Thermal Overload Relays Series CUBICO Mini

DESCRIPTION	AVAILABLE	ORDER NO.
Bimetal-version		
0,1 - 0,16A	000 0-0	LZTM0016
0,16 - 0,25A	333 0-0	LZTM0025
0,25 - 0,40A	000 0-0	LZTM0040
0,4 - 0,63A	333 0-0	LZTM0063
0,63 - 1A	000 0-0	LZTM0100
1 - 1,6A	333 0-8	LZTM0160
1,6 - 2,5A	333 0-8	LZTM0250
2,5 - 4A	333 0- 8	LZTM0400
4 - 6A	000 0-0	LZTM0600
5,5 - 8A	555 0-0	LZTM0800
7 - 10A	000 0-0	LZTM1000
9 - 13A	999 O- 8	LZTM1300

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# ■ Thermal Overload Relays Series CUBICO Classic

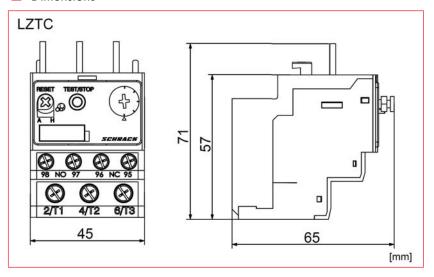


LZTC0025

### Schrack-Info

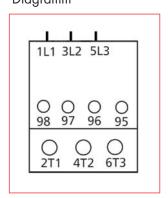
- Matching on contactor series CUBICO Classic
- Plug-in type
- Included auxiliary contacts
- Phase failure protection
- Manual and automatic reset
- Temperature compensation
- Tripping indicator
- Test- and Stop-button

### Dimensions

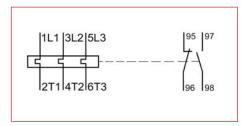


### Connection

# Diagramm



## Circuit Diagram



# Thermal Overload Relays Series CUBICO

# ■ Thermal Overload Relays Series CUBICO Classic

DESCRIPTION	AVAILABLE	ORDER NO.
Bimetal-version		
0,16A - 0,25A		LZTC0025
0,25 - 0,4A		LZTC0040
0,4 - 0,63A		LZTC0063
0,63 - 1A		LZTC0100
1 - 1,6A		LZTC0160
1,6 - 2,5A	500 0-0	LZTC0250
2,5 - 4A	000 0-0	LZTC0400
4 - 6A	000 0-0	LZTC0600
5,5 - 8A	000 0=0	LZTC0800
7 - 10A	500 0-0	LZTC1000
9 - 13A	000 0-0	LZTC1300
12 - 18A	000 0-0	LZTC1800
16 - 24A	000 000	LZTC2400
23 - 32A	300 0-0	LZTC3200
30 - 38A	000 0-0	LZTC3800

# Motor Protection Relays

## Relays with Standard Tripping Characteristic

Tripping time depending on the multiple of the current setting from cold condition

			Tripping time dependi	ng on the multiple of the	e current setting from c	old condition				
(tolerance ±20% of the tripping time)										
Setti	Setting Range		I <sub>A</sub> /I <sub>N</sub>	I <sub>A</sub> /I <sub>N</sub>	I <sub>A</sub> /I <sub>N</sub>	I <sub>A</sub> /I <sub>N</sub>	I <sub>A</sub> /I <sub>N</sub>	I <sub>A</sub> /I <sub>N</sub>		
Α			3	4	5	6	7,2	8		
U12/16	E		S	S	s	s	s	s		
0.12	-	0.18	18.5	10.4	7.2	5.5	4.3	3.6		
0.18	-	0.27	16,7	9,8	6,5	5	4,1	3,5		
0.27	-	0.4	19,4	12,1	8,2	5,9	4,9	4,2		
0.4	-	0.6	18, <i>7</i>	11,2	8	6	4,9	4,1		
0.6	-	0.9	19,7	11,6	8,1	6,1	4,9	4,2		
0,8	-	1,2	22,9	13,6	10	7,3	6	5,2		
1,2	-	1,8	22,2	13,2	9,2	7,6	5,8	5,3		
1,8	-	2,7	23	13,7	9,3	7,6	5,7	5,1		
2,7	-	4	24	14,4	9,9	7,8	5,9	5,1		
4	-	6	24,7	13,8	9,9	7,3	5,6	4,8		
6	-	9	22	13,4	8	5,7	4,1	3,5		
8	-	11	17,4	9,2	5,9	4,1	2,9	2,3		
10	-	14	26,4	12,9	7,6	5,2	3,5	2,8		
13	_	18	14,7	7,7	4,8	3,2	2,3	1,7		
17	_	23	16,2	8,4	5	3,6	2,4	1,8		
22	_	30	16,8	8,5	5	3,6	2,3	1,9		
U3/32			s	s	s	s	s	S		
0.12	_	0.18	16, 1	9,6	6,8	5,3	4,2	3,7		
0.18	_	0.27	16,6	9,7	6,7	5,2	4,1	3,6		
0.27	_	0.4	19,4	11,4	7,9	6,1	4,7	4,2		
0.4	_	0.6	18,7	10,9	7,6	5,9	4,6	4		
0.6	_	0.9	19,2	11,2	7,7	5,9	4,6	4,1		
0,8	_	1,2	20,8	12,3	8,5	6,6	5,2	4,6		
1,2	_	1,8	25,5	14,1	9,8	7,6	5,9	5,2		
1,8		2,7	26,6	15,6	10,9	8,3	6,5	5,7		
2,7	_	4	22,7	13,6	9,5	7,4	5,8	5,1		
4	_	6	22,2	13,3	9,3	7,1	5,6	4,9		
6		9	20,4	11,9	8,2	6,1	4,7	4		
8	_	11	20,9	11,8	7,9	5,7	4,3	3,5		
10		14	21,3	11,7	7,4	5,1	3,7	3		
13	_	18	21,2	12,1	8	6,2	4,6	4,1		
17	_	24	20,4	12	8,6	6,3	4,5	3,7		
23		32	20,2	10,2	6,7	4,7	3,4	2,8		
U3/42			s	s	s	s	s	s		
10		14	21,8	11,4	7	5	3,7	2,8		
14		20	22,4	11,2	6,7	4,5	3,2	2,4		
20		28	21,8	10,8	6,5	4,5	3,3	2,5		
28	_	42	25,2	13,3	8	5,5	4	3,1		
U3/74		72	S .	s	s	s	s	s		
20		28	21,8	10,8	6,5	4,5	3,3	2,5		
28		42	25,2	13,3	8	5,5	4	3,1		
40	- 1	52	18,3	9,2	5,6	3,9	2,8	2,2		
52		65	17,8	8,7	5,2	3,4	2,5	1,9		
U85	÷	00	s	s	5,2 S	5,4 S	s .	s		
60	-	90	19,5	13,5	11	10	9,5	8,5		
80		120	18	11	10	9	8,5	8		
		120	10	11	10	· '	0,5			



# ■ Motor Protection Relays

**■** Fuses for U3/32, U3/42, U3/74, U12/16E, U85, U180, U320 and U800

Туре	I		Settino	Range	Max. Fuse Size According to Coordination-type		Fuse UL	SCCR				
Турс		dire	_	Range	ΥΔ		quick	slow, gL (gG)	slow, gL (gG)	аМ		
		Α			Α		Α	Α	Α	Α	Α	kA
12/16E	0,12	-	0,18		-		0,5 2)	0,5 2)	25	-	15	5
U3/32	0,18	-	0,27		-		1,0 2)	1,0 2)	25	-	15	5
	0,27	-	0,4		-		2	2	25	-	15	5
	0,4	_	0,6		_		2	2	25	_	15	5
	0,6	-	0,9		_		4	4	25	_	15	5
	0,8	-	1,2		-		4	4	25	2	15	5
	1,2	-	1,8		_		6	6	25	2	15	5
	1,8	-	2,7		-	İ	10	10	25	4	15	5
	2,7	-	4		-		16	10	25	4	15	5
	4	-	6	7	-	10,5	20	16	25	6	15	5
	6	-	9	10,5	-	15,5	35	25	35	10	25	5
	8	-	11	14	-	19	35	25	35	16	30	5
	10	-	14	18	-	24	50	35	63	16	40	5
	13	-	18	23	-	31	50	35	63	20	50	5
	17	-	(23)24	30	-	(40)41	63	50	63	25	60	5
	(22)23	-	(30)32	(38)40	-	(52)55	80	63	80	35	70	5
U3/42	10	-	14	18	-	24	50	35	80	16	40	5
	14	-	20	24	-	35	63	50	80	25	60	5
	20	-	28	35	-	48	80	63	80	35	80	5
	28	-	42	48	-	<i>7</i> 3	100	80	150	50	110	5
U3/74	20	-	28	35	-	48	100	80	150	35	80	5
	28	-	42	48	-	<i>7</i> 3	125	100	150	50	110	5
	40	-	52	70	-	90	160	100	150	63	200	5
	52	-	65	90	-	112	160	125	150	80	250	10
	60	-	74	104	-	128	160	125	150	80	250	10
U85	60	-	90	104	-	156					300	10
	80	-	120	140	-	207					-	10
									ing overload rel	,	-	-
				anges			currer		e fuse according	g to the	-	-
			all ro	anges				contactor of th	ne combination.			

<sup>1)</sup> Coordination-type according to IEC 947-4-1:

### ■ Terminal Screws

Devices	Kind of conn	ection						
	Screw with	Screw with		Screw		Screw driver	Tightenir	ig torque
	washer	clamp box	ф	w.nut			Nm	lb. inch
Туре								
Motor Protection Relays					22.			
Main conductor					(			
U12/16	M4	-	-	-		Pz2	1.2-1.8	11-16
U3/32	M3,5	-	-	-		Pz2	0.8-1.4	7-12
U3/42	M5	-	-	-	()	Pz2	2.5-3	22-26
U3/74	-	M6	-	-		Pz3	3.5-4.5	31-40
Auxiliary conductor								
•					$\mathscr{F}$			
All devices	M3,5	-	-	-		Pz2	0.8-1.4	7-12

<sup>&</sup>quot;1" Welding of contactor and damage of the thermal overload relay allowed.

<sup>&</sup>quot;2" Light contact welding accepted. Thermal overload relay must not be damaged.

<sup>2)</sup> Miniature fuse

# ■ Motor Protection Relays

# Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

Туре			U12/16 <sup>4)</sup>	U3/32	U3/42	U3/74	U85
Rated insulation volta	ıge U <sub>i</sub> 1)	V~	690	690	690	690	750
Permissible ambient t	temperature						
operation	open	°C		-25 to	o + 60		
storage		°C		-50 to	o + 70		
Trip class			10A	10A	10A	20A	10A
Cable cross-section							
Main connector							
	solid or stranded	${\rm mm}^2$	0.75-6+0.75-2.5 <sup>2)</sup>	0.75-6	0.75-10	4-35 <sup>2)</sup>	3)
	flexible	${\rm mm}^2$	0.75-4+0.5-2.5 <sup>2)</sup>	1-4	0.75-6	6-25 <sup>2)</sup>	
	flexible with multicore cable end	$mm^2$	0.5-2.5+0.5-1.5	0.75-4	0.75-6	4-25	
Cables per clamp	number		1+1	2	2	1	
Auxiliary connector						,	
	solid or stranded	$mm^2$		0.75	-2.5 <sup>2)</sup>		
	flexible	$mm^2$		0.5-	·2.5 <sup>2)</sup>		
	flexible with multicore cable end	$\mathrm{mm}^2$		0.5	-1.5		
Cables per clamp	number				2		

Туре			U3/32	U12/16E	U3/42 U3/74	U85
Auxiliary contacts						
Rated insulation voltage U <sub>i</sub> 1)						
same potential		V~	690	690	690	690
different potential		V~	440	440	250	440
Utilization category AC15						
Rated operational	24V	Α	3	5	4	5
current I <sub>e</sub>	230V	Α	2	3	2,5	3
	400V	Α	1	2	1,5	2
	690V	Α	0,5	0,6	0,6	0,6
Utilization category DC13						
Rated operational	24V	Α	1	1,2	1,2	1,2
current I <sub>e</sub>	110V	Α	0,15	0,15	0, 15	0,15
	220V	Α	0,1	0,1	0,1	0,1
Short circuit prot. (without weld 1kA)	ling					
highest fuse rating	gL (gG)	Α	4	6	6	6

Туре	U12/16	U12/16E4)	U3/32	U3/42	U3/42	U3/74	U3/74	U85
Setting range	to 23A	22 - 30A	all	to 28A	28 - 42A	to 52A	52 - 65A	all
Power loss per current path (max.)								
minimum setting value W	1,1	1,7	1, 1	1,3	1,3	2	2.9	1.1
maximum setting value W	2,3	3,7	2,3	2,6	3,3	3,7	4.5	2.5

### Temperature Compensation

In case of higher ambient temperature use the following formula:

(Ambient temperature - 20) x 0, 125 = correction factor in % of the full load motor current

Example: Ambient temperature 70  $^{\circ}\text{C}\text{, full load motor current 7A}$ 

 $(70 - 20) \times 0, 125 = 6,25\%$ Setting value: 7A + 6,25% = 7,44A

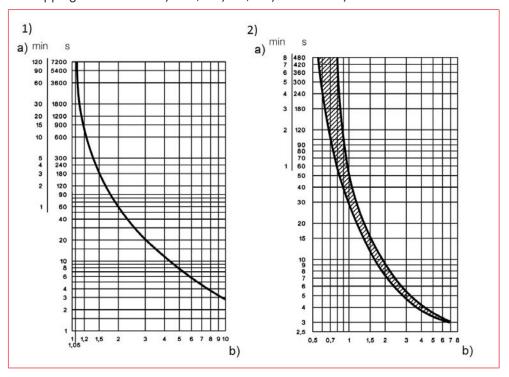
1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U<sub>Imp</sub> = 4kV (at 440V), 6kV (at 690V). Data for other conditions on request.

- 2) Maximum cable cross-section with prepared conductor  $\,$
- 3) Without terminals, suitable for bushing one connector 70mm<sup>2</sup> (stranded) per phase
- 4) U12/16E... 30A: Cable cross-section for main connector like type U3/42, one connector only



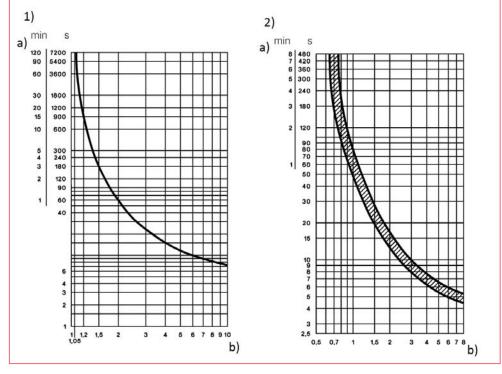
# Tripping Characteristics

Tripping Curves for U12/16E, U3/32, U3/42 and U3/74



- 1) with three-phase load Proceeding from service condition the times decrease to 20-30% of the characteristic values.
- 2) with two-pole load Proceeding from service condition the times decrease to 70-80% of the characteristic values.
- a) Tripping time (Average value of typical tolerance curves from cold condition)
- b) F. L. C. multiplication factor

### Tripping Curves for U85



- 1) with three-phase load-Proceeding from service condition the times decrease to 20-30% of the characteristic values.
- 2) with two-pole load Proceeding from service condition the times decrease to 70-80% of the characteristic values.
- a) Tripping time (Average value of typical tolerance curves from cold condition)
- b) F. L. C. multiplication factor

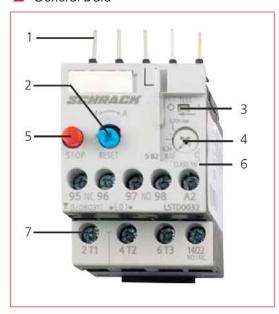


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### General Information

Overload relays	Current measurement	Current range		Contactors (type,	size, rating in kW)	
			LSSD+LSDD/S00	LSSO+LSDO/SO	LSD2/S2	LSD3/S3
Туре	Туре	Α	3/4/5.5	5.5/7.5/11	15/18.5/22	30/37/45
LSTD	integrated	0.11 12	yes			
LSTO	integrated	1.8 25		yes		
LST2	integrated	5.5 50			yes	
LST3	integrated	18 100				yes

### General Data



- 1) Connection for mounting onto contactors: Optimally adapted in electrical, mechanical and design terms to the contactors and soft starters, these connecting pins can be used for direct mounting of the overload relays. Standalone installation is possible as an alternative (in some cases in conjunction with a stand-alone installation module). 2) Selector switch for manual/automatic RESET and RESET button: With this switch you can choose between  $manual\ and\ automatic\ RESET.\ A\ device\ set\ to\ manual\ RESET\ can\ be\ reset\ locally\ by\ pressing\ the\ RESET\ button.\ A$ remote RESET is possible using the RESET modules (accessories), which are independent of size (on request). 3) Switch position indicator and TEST function of the wiring: Indicates a trip and enables the wiring test.
- 5) STOP button: If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream. The NC contact is closed again when the button is released. 6) Transparent, sealable cover Secures the motor current setting, TEST function and the selector switch for manual/

4) Motor current setting: Setting the device to the rated motor current is easy with the large rotary knob.

- automatic RESET against adjustment.  $7) \ Supply \ terminals: The \ generously \ sized \ terminals \ permit \ connection \ of two \ conductors \ with \ different \ cross-sections$
- for the main and auxiliary circuits. The auxiliary circuit can be connected with screw terminals and alternatively with spring-loaded terminals (on request).

Connection type		Screw terminals				
Terminal screw		Pozidriv size 2 Nm 0.8 1.2				
Tightening torque						
• Conductor cross-sections (min./max.), 1 or 2	conductors					
- solid	mm <sup>2</sup>	1 × (0.5 4), 2 × (0.5 2.5)				
- finely stranded without end sleeve	$mm^2$	-				
- finely stranded with end sleeve	mm <sup>2</sup>	1 × (0.5 2.5), 2 × (0.5 1.5)				
- stranded	mm <sup>2</sup>	_				
- AWG cables, solid or stranded	AWG	2 × (20 14)				
Connection type		Spring-loaded terminals on request				
• Conductor cross-sections (min./max.), 1 or 2	conductors					
- solid	mm <sup>2</sup>	2 × (0.25 1.5)				
- finely stranded without end sleeve	mm <sup>2</sup>					
- finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.25 1.5)				
- stranded	mm <sup>2</sup>	2 × (0.25 1.5)				
- AWG cables, solid or stranded	AWG	2 × (24 16)				



# Technical Specifications - Thermal Overload Relays Series ALEA LST

### General Information

### Schrack-Info

The LST thermal overload relays up to 100 A have been designed for inverse-time delayed protection of loads with normal starting against excessive temperature rises due to overload or phase failure. An overload or phase failure results in an increase of the motor current beyond the set rated motor current. Via heating elements, this current rise heats up the bimetal strips inside the device which then bend and as a result trigger the auxiliary contacts by means of a tripping mechanism. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and set current le and is stored in the form of a long-term stable tripping characteristic.

The tripped status is signalled by means of a switch position indicator. Resetting takes place either manually or auto matically after the recovery time has elapsed. The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials.

### Mounting

The thermal overload relais LST are designed electrical and mechanical to contactors LSS/LSD. Therefore a direct mounting to contactor is standard.

Alternatively the LST can be mounted separate by using stand alone holder LSZ.TEO1

### Connection

The thermal overload relais LST are with screwed connection performed.

### Overload relays in contactor assemblies for wye-delta starting

When overload relays are used in combination with contactor assemblies for wye-delta starting it must be noted that only 0.58 times the motor current flows through the line contactor. An overload relay mounted onto the line contactor must be set to 0.58 times the motor current.

### Operation with frequency converter

The LST thermal overload relays are suitable for operation with frequency converters. Depending on the frequency of the converter, a higher current than the motor current must be used in some cases due to eddy-currents and skin effects.

### Phase failure protection

The LST thermal overload relays are fitted with phase failure sensitivity in order to minimize temperature rises of the load in the case of a phase failure during single-phase operation.

### Setting

The LST thermal overload relays are set to the rated motor current by means of a rotary knob. The scale of the rotary knob is shown in ampere.

### Manual and automatic reset

Automatic and manual reset is selected by pressing and turning the blue button (RESET button). If the button is set to manual reset, the overload relay can be reset directly by pressing the RESET button. Resetting is possible in combination with mechanical and electrical reset options from the range of accessories. If the blue button is set to automatic RESET, the relay is reset automatically. The time between tripping and resetting is determined by the recovery time.

### Recovery time

After tripping due to overload, the LST thermal overload relays require some time until the bimetal strips have cooled down. The device can only be reset after the bimetal strips have cooled down. This time (recovery time) depends on the tripping characteristics and strength of the tripping current. The recovery time allows the load to cool down after tripping due to overload.

### **Test function**

The TEST slide can be used to check whether the operational LST thermal overload relay is working properly. Actuating the slide simulates tripping of the relay. During this simulation the NC contact (95-96) is opened and the NO contact (97-98) is closed. This tests whether the auxiliary circuit has been correctly connected to the overload relay. If the LST thermal overload relay has been set to automatic RESET, the overload relay is automatically reset when the TEST slide is released. The relay must be reset with the RESET button if it has been set to manual RESET.

### Stop function

If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream and thus the load.

The load is switched on again when the STOP button is released.

### Display of the operating state

The respective operating state of the LST thermal overload relay is displayed by means of the position of the marking on the TEST function/switch position indicator slide. After tripping due to overload or phase failure, the marking on the slide is to left on the "O" mark, otherwise it is on the "I" mark.

### Auxiliary contacts

The LST thermal overload relays are fitted with an NO contact for the "tripped" signal, and an NC contact for disconnecting the contactor.

# ■ Thermal Overload Relays LSTD, LST0, LST2, LST3

#### ■ Technical Specifications

Type Size	LSTD 00	LSTO O	LST2 2	LST3			
General data				_			
Width		45mm	45mm	55mm	70mm		
Trips in the event of		4511111		d phase failure	7 0111111		
Trip class acc. to IEC 60947-4-1	CLASS			0			
•			-				
Phase failure sensitivity				es			
Overload warning			N	lo			
Reset and recovery							
Reset options after tripping			Manual and a	utomatic RESET			
Recovery time							
- for automatic RESET	min	Deper	nds on the strength of the tr	ipping current and chara	cteristic		
- for manual RESET	min		nds on the strength of the tr				
- for remote RESET	min		nds on the strength of the tr				
Features		2000.	iao on mo onongm or mo n	ipping corroll and chara	0.0.10.10		
			[TECT (	/ 10.1 100 100 100 100 100 100 100 100 10	D. I.		
Display of operating state on device		Yes,	by means of TEST function		r slide		
TEST function				es			
RESET button				es			
STOP button			Y	es			
Ambient temperature							
Storage/transport	°C		-55	+80			
Operation	°C			+70			
Temperature compensation	°C			o 60			
Permissible rated current at	-		٠, ٩٠				
temperature inside control cabinet 60°C	%		100 (over +60 °C curren	t raduction is not required	١		
•	%			7	1		
- temperature inside control cabinet 70°C	/0		o				
Repeat terminals							
Coil repeat terminal		Yes		Not required			
Auxiliary contact repeat terminal		Yes		Not required			
Degree of protection acc. to IEC 60529		IP20		IP20 2)			
Touch protection acc. to IEC 61140		Finge	er-safe				
Shock resistance with sine acc. to IEC 60068-2-27	g/ms			10			
Electromagnetic compatibility (EMC) – Interference immuni							
Conductor-related interference	• 7						
Conductor-related interference							
- burst acc. to IEC 61000-4-4 (corresponds to degree of severity	kV	EMC inte	erference immunity is not r	elevant for thermal overlo	ad relays		
3)							
surge acc. to IEC 61000-4-5 (corresponds to degree of severity	<sup>′</sup> kV	EMC inte	erference immunity is not r	elevant for thermal overla	ad relavs		
3)			,		•		
Electrostatic discharge acc. to IEC 61000-4-2	kV	EMC inte	EMC interference immunity is not relevant for thermal overload relays				
(corresponds to degree of severity 3)							
<ul> <li>Field-related interference acc. to IEC 61000-4-3</li> </ul>	V/m	EMC interference immunity is not relevant for thermal overload relays					
(corresponds to degree of severity 3)							
Electromagnetic compatibility (EMC) – Emitted interference		EMC inte	erference immunity is not r	elevant for thermal overla	ad relays		
Resistance to extreme climates – Air humidity	%			00	,		
Installation altitude above sea level				this, please enquire			
	m	71 1:					
Mounting position			s show the permissible mo				
		stand-alone ir	nstallation. For installation		tting correction		
			of 10% must be	'			
			Stand-alone	e installation:			
			0°				
				45°	0° 45°		
		( =	⇒ \	1 1	1		
		+-+	-15 - <del>- /</del>	I <sub>e</sub> x 1,1	1 <sub>e</sub> x 1,1		
		135°	135°	90° 1 1	1 1 1 90°		
		1.	x 1,1		NSB01364		
		1 <sub>e</sub> )	COLUMN TO THE PARTY OF THE PART				
			Contactor + o	verload relay:			
			Confidence + 0	Torroug relay.			
					0° 00.50		
			T /	22,5°	22,5		
		( F.	<del>-</del> [3]		17		
	E	# 7	\	44			
		135° VIIII	135°		M- <del>2</del> -		
		Ie	k 1,1				
Type of mounting		Direct mounting 3)	Direct mo	unting/stand-alone insta	llation with		
7r		stand-alone	25311110	stand alone holder			
		installation with		Jana diono noidel			
		stand alone holder					



Terminal compartment: degree of protection IPO0.
 The LSTD thermal overload relay with Cage Clamp terminals can only be used as a stand-alone installation.

# Technical Specifications - Thermal Overload Relays Series ALEA LST

# ■ Thermal Overload Relays LSTD, LST0, LST2, LST3

#### ■ Technical Specifications

Type		LSTD	LSTO	LST2	LST3
Size Main circuit		00	0	2	3
Rated insulation voltage U; (degree of pollution 3)	V		690		1000
	kV		6		8
Rated impulse withstand voltage U <sub>imp</sub>	V		1000		
Rated operational voltage U。 Type of current	ν		690		1000
Direct current			Ye		
Alternating current			Yes, frequency rai	· <del>-</del>	
Set current	A	0.11 0.16 to	1.8 2.5 to	5.5 8 to	18 25 to
Sei Correnii	A	9 12	20 25	40 50	80 100
Power loss per unit (max.)	W	3.9 6.6	3.9 6	6 9	10 16.5
Short-circuit protection	**	0.7 0.0	0.7 0	V /	10 10.0
With fuse without contactor					
		See "Technical specific	ations" (short-circuit protec	tion with fuses/motor sta	rter protectors for mo
With fuse and contactor		our recinical specific	feed	,	nor protocioro for mo
Safe isolation between main and auxiliary		500		,	
conducting path acc. to IEC 60947-1	٧	500		690	
Connection for main circuit					
Connection type			Screw terminals v	vith box terminal	
Terminal screw			Pozidriv size 2		Allen screw 4mr
Tightening torque	Nm	0.8 1.2	2 2.5	3 4.5	4 6
<ul> <li>Conductor cross-sections (min./max.),</li> </ul>					
or 2 conductors					
solid	$mm^2$	2 x (0.5 1.5) <sup>2)</sup>	2 x (1 2.5) <sup>2)</sup>	2 x (0.75 16)	2 x (2.5 16)
		2 x (0.75 2.5) <sup>2)</sup>	2 x (2.5 6) <sup>2)</sup>		
		Max. 2 x (1 4) <sup>2)</sup>	Max. 2 x (2.5 10 <sup>2)</sup> )		
finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 1.5) <sup>2)</sup>	2 x (1 2.5) <sup>2)</sup>	2 x (0.75 16)	2 x (2.5 35)
		2 x (0.75 2.5) <sup>2)</sup>	2 x (2.5 6) <sup>2)</sup>	1 x (0.75 25)	1 x (2.5 50)
stranded	mm <sup>2</sup>	2 x (0.5 1.5) <sup>2)</sup>	2 x (1 2.5) <sup>2)</sup>	2 x (0.75 25)	2 x (10 50)
		2 x (0.75 2.5) <sup>2)</sup>	2 x (2.5 6) <sup>2)</sup>	1 x (0.75 35)	1 x (10 70)
		Max. 2 x (1 4) <sup>2)</sup>	Max. 2 x (2.5 10) <sup>2)</sup>		
AWG cables, solid or stranded	AWG	2 x (18 14)	2 x (14 10)	2 x (18 3)	2 x (10 1/0)
				1 x (18 1)	1 x (10 2/0)
ribbon cable conductors (number x width x thickness)	mm			2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8
Busbar connection			Busbar co	nnection <sup>1)</sup>	
Terminal screw					M6 x 20
Tightening torque	Nm				4 6
<ul> <li>Conductor cross-sections (min./max.)</li> </ul>					
finely stranded with cable lug	$mm^2$				2 x 70
stranded with cable lug	mm <sup>2</sup>				3 x 70
AWG cables, solid or stranded, with cable lug	AWG				2/0
with connecting bar (max. width)	mm				12
Connection type			Cage Clamp termi	inals (on request)	•
<ul> <li>Conductor cross-sections (min./max.)</li> </ul>					
solid	$mm^2$	2 x (0.25 2.5)			
finely stranded without end sleeve	$mm^2$	2 x (0.25 2.5)			
finely stranded with end sleeve	$mm^2$				
stranded	$mm^2$				
- AWG cables, solid or stranded	AWG	2 x (24 14)			

<sup>1)</sup> The box terminal is removable. Rail and cable lug connections are possible if the box terminal is removed.

<sup>2)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction

# ■ Thermal Overload Relays LSTD, LST0, LST2, LST3

#### ■ Technical Specifications

Type Size		LSTD 00	LSTO O	LST2 2	LST3	
oize Auxiliary circuit		00	U	2	3	
Number of NO contacts				1		
Number of NC contacts				<u> </u> 		
Auxiliary contacts – assignment				ignal "tripped",		
ADAIRGI Y COIRIGCIS – GSSIGIIII EIII				ecting the contactor		
Rated insulation voltage U; (degree of pollution 3)	V			90		
Rated impulse withstand voltage U <sub>imp</sub>	kV			5		
Contact rating of the auxiliary contacts						
NC contact with alternating current AC-14/AC-15,						
rated operational current I <sub>e</sub> at U <sub>e</sub> :						
- 24V	A			4		
120V	A			4		
125V	A			4		
- 230V	A			3		
- 400V	A			2		
- 600V	A			.6		
- 690V	A			.5		
NO contact with alternating current AC-14/AC-15,				.0		
rated operational current I <sub>e</sub> at U <sub>e</sub> :						
- 24V	A			3		
- 120V	Ä			3		
- 125V	Ä			3		
- 230V	Ä			2		
- 400V	Â			1		
- 600V	Â			.6		
- 690V - 690V	Â			.5		
NC contact, NO contact with direct current DC-13,				.5		
rated operational current I <sub>a</sub> at U <sub>a</sub> :						
ralea operalional current l <sub>e</sub> at 0 <sub>e</sub> : - 24V				1		
	A			<b>1</b>		
- 60V	A					
- 110V	A			22		
- 125V	A			22		
- 220V  Continuous thermal current Ith	A			.11 .2)		
<ul> <li>Continuous thermal current Ith</li> <li>Contact reliability (suitability for PLC control; 17V, 5mA)</li> </ul>	A			es		
Short-circuit protection			<u>'</u>	es		
With fuse						
				4		
· gL/gG operational class · Quick	A A	6 10				
With miniature circuit breaker (C characteristic)	Ä			5		
Safe isolation between main and auxiliary conducting	V			<u>.                                    </u>		
path acc. to IEC 60947-1	v		4	IJ		
CSA, UL, UR rated data						
Auxiliary circuit – switching capacity			P400	R300		
Connection of the auxiliary circuit			ВООО	, K300		
-	<u> </u>		C			
Connection type				erminals		
Terminal screw     Tightening torque	NI			v size 2		
Tightening torque     Condustor cross sections (min /max ) 1 or 2 condustors	Nm		0.8 .	1.2		
<ul> <li>Conductor cross-sections (min./max.), 1 or 2 conductors</li> </ul>	mm <sup>2</sup>		2 [0 5 1 513]	2 × (0.75 2.5) <sup>3)</sup>		
- solid - finely stranded without end sleeve			∠ x (U.3 1.3) · ′ ,	2 X (U./) 2.3)		
·	mm <sup>2</sup>		2 × 10 5 1 5131	2 × 10 75 2 51 <sup>3</sup> )		
- finely stranded with end sleeve - stranded		$2 \times (0.5 \dots 1.5)^{3}, 2 \times (0.75 \dots 2.5)^{3}$				
- stranded - AWG cables, solid or stranded	mm <sup>2</sup>	2 x (0.5 1.5) <sup>3)</sup> , 2 x (0.75 2.5) <sup>3)</sup> 2 x (18 14)				
·	AWG					
Connection type			cage clamp ferr	ninals on request		
Conductor cross-sections (min./max.)			0 100	5 2.5)		
solid		2 x (0.25 2.5)				
finely stranded without end sleeve		2 × (0.25 2.5)				
- finely stranded with end sleeve		2 x (0.25 1.5)				
- stranded			0 10			
- AWG cables, solid or stranded  1) On request.			2 x (24	4 14)		

<sup>1)</sup> On request



<sup>2)</sup> Up to  $I_k \le 0.5 \text{ kA}; \le 260 \text{ V}.$ 

<sup>3)</sup>If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

# Technical Specifications - Thermal Overload Relays Series ALEA LST

# Thermal Overload Relays LSTD and LSTO

With short-circuit currents up to 50kA at 50/60Hz 690VAC Permissible short-circuit protection fuse for motor starters comprising overload relay and contactor, type of coordination "2" 1

Overload relays	3kW	/≜ LSSD/LSD	DD07	4kV	/≜ LSSD/LSD	D09	5.5k	W≜ LSSD/LS	DD 12	UL-listed fuses
Setting range	(a	I <sub>e</sub> max = 7A t AC 50Hz 400	)V)	(0	I <sub>e</sub> max = 9A (at AC 50Hz 400V)		I <sub>e</sub> max = 12A (at AC 50Hz 400V)			RK5
Α	gL/gG	aM	BS 88	gL/gG	αM	BS 88	gL/gG	aM	BS 88	A
Size 00										
0.11 0.16	0.5	-	-	0.5	-	-	0.5	-	-	1
0.14 0.2	1	-	-	1	-	-	1	-	-	1
0.18 0.25	1	-	-	1	-	-	1	-	-	1
0.22 0.32	1.6	-	2	1.6	-	2	1.6	-	2	1
0.28 0.4	2	-	2	2	-	2	2	-	2	1.6
0.35 0.5	2	-	2	2	-	2	2	-	2	2
0.45 0.63	2	-	4	2	-	4	2	-	4	2.5
0.55 0.8	4	-	4	4	-	4	4	-	4	3
0.7 1	4	-	6	4	-	6	4	-	6	4
0.9 1.25	4	-	6	4	-	6	4	-	6	5
1.1 1.6	6	-	10	6	-	10	6	-	10	6
1.4 2	6	-	10	6	-	10	6	-	10	8
1.8 2.5	10	-	10	10	-	10	10	-	10	10
2.2 3.2	10	-	16	10	-	16	10	-	16	12
2.8 4	16	-	16	16	-	16	16	-	16	16
3.5 5	20	6	20	20	6	20	20	6	20	20
4.5 6.3	20	6	20	20	6	20	20	6	20	25
5.5 8	20	10	20	20	10	20	20	10	20	30
7 10	-	-	-	20	16	20	20	16	20	40
9 12	-	-	-	-	-	-	20	16	25	45

Overload relays	5.5 k	W≜ LSSO/L	SD012	7.5 k	W≜ LSSO/LS	SD017	5.5 k	W≜ LSSO/LS	D025	UL-listed fuses
Setting range	(a	I <sub>e</sub> max = 12A (at AC 50Hz 400V)				I <sub>e</sub> max = 25A (at AC 50Hz 400V)		RK5		
А	gL/gG	αM	BS 88	gL/gG	аМ	BS 88	gL/gG	aM	BS 88	А
Size O										
1.8 2.5	10	-	10	10	-	10	10	-	10	10
2.2 3.2	10	-	16	10	-	16	10	-	16	12
2.8 4	16	-	16	16	-	16	16	-	16	16
3.5 5	20	6	20	20	6	20	20	6	20	20
4.5 6.3	20	6	25	20	6	25	20	6	25	25
5.5 8	25	10	25/32 <sup>2)</sup>	25	10	25/32 <sup>2)</sup>	25	10	32	30
7 10	25	16	25/32 <sup>2)</sup>	25	16	25/32 <sup>2)</sup>	32	16	35	40
9 12.5	25	20	25/32 <sup>2)</sup>	25	20	25/32 <sup>2)</sup>	35	20	35	45
11 16	25	20	25/32 <sup>2)</sup>	25	20	25/32 <sup>2)</sup>	35	20	35	60
14 20	-	-	-	25	20	25/32 <sup>2)</sup>	35	20	35	80
17 22	-	-	-	-	-	-	35	20	35	80
20 25	_	_	_	_	_	_	35	20	35	100

<sup>1)</sup> Assignment and short-circuit protective devices according to IEC60947-4-1:



The contactor or starter must not endanger persons or the installation in the event of a short-circuit.

Type of coordination 1: The contactor or the starter may be non-operational after every short-circuit release.

Type of coordination 2: The contactor or the starter must be operational after a short-circuit release (without replacement of parts).

Welding of the contacts is permissible however.

<sup>2)</sup> At max. 415V

# ■ Thermal Overload Relays LST2 and LST3

With short-circuit currents up to 50kA at 50/60Hz 690VAC Permissible short-circuit protection fuse for motor starters comprising overload relay and contactor, type of coordination "2" 1

Overload relays	3	kW≜ LSD23	2	4	kW ≜ LSD24	0	5.	5 kW ≜ LSD2	50	UL-listed fuses
C . III		I <sub>e</sub> max = 32A		I <sub>e</sub> max = 40A			I <sub>e</sub> max = 50A			RK5
Setting range	(a	it 50Hz 400VA	C)	(at 50Hz 400VAC)		(at 50Hz 400VAC)			KK5	
А	gL/gG	aM	BS 88	gL/gG	aM	BS 88	gL/gG	aM	BS 88	Α
Size 2										
5.5 8	25	10	25	25	10	25	25	10	25	30
7 10	32	16	32	32	16	32	32	16	32	40
9 12.5	35	16	35	35	16	35	35	16	35	50
11 16	40	20	40	40	20	40	40	20	40	60
14 20	50	25	50	50	25	50	50	25	50	80
18 25	63	32	63	63	32	63	63	32	63	100
22 32	63	35	63	63	35	63	80	35	80	125
28 40	63	50	63	63	50	63	80	50	80	150
36 45				63	50	80	80	50	80	175
40 50							80	50	80	200

Overload relays	3	0 kW ≜ LSD3	55	37	7 kW ≜ LSD38	30	4.	5 kW ≜ LSD39	95	UL-listed fuses
Setting range		I <sub>e</sub> max = 65A			I <sub>e</sub> max = 80A		I <sub>e</sub> max = 95A			RK5
3 - 3 -	(0	at 50Hz 400VA	C)	(c	ıt 50Hz 400VA	C)	(c	t 50Hz 400VA	C)	
A	gL/gG	αM	BS 88	gL/gG	aM	BS 88	gL/gG	αM	BS 88	A
Size 3										
18 25	63	32	63	63	32	63	63	32	63	100
22 32	80	35	80	80	35	80	80	35	80	125
28 40	80	50	80	80	50	80	80	50	80	150
36 50	125	50	125	125	50	125	125	50	125	200
45 63	125	63	125	160	63	160	160	63	160	250
57 75				160	80	160	160	80	160	300
<i>7</i> 0 90							160	100	160	350
80 100							160	100	160	350

<sup>1)</sup> Assignment and short-circuit protective devices according to IEC60947-4-1:

The contactor or starter must not endanger persons or the installation in the event of a short-circuit.

 $Type \ of \ coordination \ 1: The \ contactor \ or \ the \ starter \ may \ be \ non-operational \ after \ every \ short-circuit \ release.$ 

Type of coordination 2: The contactor or the starter must be operational after a short-circuit release (without replacement of parts).

Welding of the contacts is permissible however.

# Technical Specifications - Thermal Overload Relays series ALEA LST

#### Accessories

#### Overview

- For the four overload relay sizes 00 to 3 one terminal bracket each for stand-alone installation
- Terminal covers

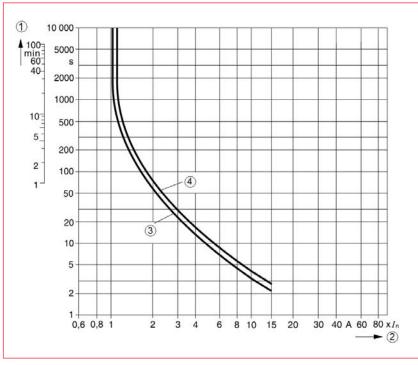
Туре		LSZDTE01	LSZ0TE01	LSZ2TE01	LSZ3TE01
For overload relays		LSTD	LST0	LST2	LST3
Mounting type		For screw and snap-on mou	nting onto TH 35 standard m	ounting rails, size S3 also for T	H 75 standard mounting rails
Connection for main circuit					
Connection type		Screw to	erminals	Screw terminals	with box terminal
Terminal screw			Pozidriv size 2		Allen screw 4 mm
Conductor cross-section (min./max.), 1 or 2 condu	ctors				
- solid	mm <sup>2</sup>	1 x (0.5 2.5),	1 x (1 6),	2 x (0.75 16)	2 x (2.5 16)
		max. 1 x ( 4)	max. 1 x ( 10)		
- finely stranded without end sleeve	$mm^2$				
- finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.5 2.5)	1 x (1 6)	2 x (0.75 16),	2 x (2.5 35),
				1 x (0.75 25)	1 x (2.5 50)
- stranded	$mm^2$	1 x (0.5 2.5),	1 x (1 6),	2 x (0.75 25),	2 x (10 50),
		max. 1 x ( 4)	max. 1 x ( 10)	1 x (0.75 35)	1 x (10 70)
- AWG cables, solid or stranded	AWG	1 x (18 14)	1 x (14 10)	2 x (18 3),	2 x (10 1/0),
				1 x (18 1)	1 x (10 2/0)
- ribbon cable conductors (number x width x thickness)	mm			2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)

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#### Thermal Overload Relays - Tripping Characteristics

The tripping characteristics show the relationship between the tripping time and tripping current as multiples of the set current le and are given for symmetrical three-pole and two-pole loads (from the cold state). The smallest current that causes a tripping is called "minimum tripping current". According to IEC 60947-4-1, this current must be within specified limits. The limits of the minimum tripping current for the LST thermal overload relays for symmetrical three-pole loads are between 105% and 120% of the set current. The tripping characteristic starts with the minimum tripping current and continues with higher tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe the time intervals within which the overload relays have to trip with 7.2 times the set current le from the cold state for symmetrical three-pole loads. The tripping characteristic for a three-pole LST thermal overload relay (see characteristic curve for symmetrical three-pole loads from the cold state) applies, if all three bimetal strips are simultaneously loaded with a current in same hight. If only two bimetal strips are Loaded (heated) - due to a phase failure - these two strips have to generate the full, necessary force to trigger the tripping mechanism which would result in a longer tripping time or would allow a higher current. If these higher currents are applied over a longer period, they usually cause damage to the load. To avoid this damaging, the LST thermal overload relays are fitted with phase failure sensitivity which ensures faster tripping in accordance with the characteristic curve for double-pole loads from the cold state by means of a suitable mechanism. Compared with cold load, a load at operating temperature obviously has a lower temperature reserve. This is taken into account by the LST Thermal overload relay. In this case, the tripping time is reduced by 25%, when loaded with the set current le for an extended period.

#### Schematic Representation of a Characteristic Curve



1) Tripping time 3) 2-pole loading 2) Current 4) 3-pole loading

The characteristic curves for the individual LST thermal overload relays can be requested from Technical Assistance.

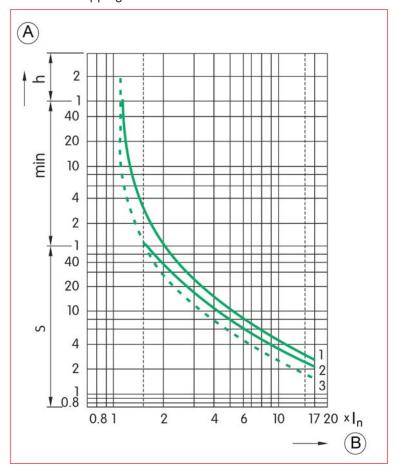
# Technical Specification - Thermal Overload Relays Series CUBICO

# ■ Thermal Overload Relays Series CUBICO Mini

# ■ Technical Specifications - LZTM

Standard		IEC/EN 60947-4-1
Rated insulation voltage		690VAC
Rated frequency		50/60Hz
Rated impulse withstand voltage		6kV
Overvoltage category		III
Rated current		0.1A - 13A
Tripping class		Class 10A
Rated current I <sub>N</sub>		0.1 - 0.16A
		0.16 - 0.25A
		0.25 - 0.4A
		0.4 - 0.63A
		0.63 - 1A
		1 - 1.6A
		1.6 - 2.5A
		2.5 - 4A
		4 - 6A
		5.5 - 8A
		7 - 10A
		9- 13A
Match to contactor		LZDM
Matching fuse	0.1 - 0.16A	2AgG/gL
v	0.16 - 0.25A	2AgG/gL
	0.25 - 0.4A	2AgG/gL
	0.4 - 0.63A	2AgG/gL
	0.63 - 1A	4AgG/gL
	1 - 1.6A	4AgG/gL
	1.6 - 2.5A	6AgG/gL
	2.5 - 4A	10AgG/gL
	4 - 6A	16AgG/gL
	5.5 - 8A	20AgG/gL
	7 - 10A	20AgG/gL
	9 - 13A	25AgG/gL
Overload protection	1.05 x I <sub>N</sub>	No operation within 2h
·	1.2 x I <sub>N</sub>	Operation within 2h
	1.5 x I <sub>N</sub>	Operation within 2min
	7.2 x I <sub>N</sub>	2s < Tripping ≤ 10s
Mounting		Plug-in type
Auxiliary contacts		1NO+1NC
Rated current of auxiliary contact	AC-15 230V	2.61A
	AC-15 400V	1.5A
	DC-13 220V	0.2A
Terminal cross section main circuit		
Single-core conductor		1 - 2.5mm <sup>2</sup>
Stranded conductor		1 - 2.5mm <sup>2</sup>
Terminal screw		M4
Terminal cross section auxiliary circuit		
Single-core conductor		0.5 - 2.5mm <sup>2</sup>
Stranded conductor		0.5 - 2.5mm <sup>2</sup>
Terminal screw		M3.5

- Thermal Overload Relays Series CUBICO Mini
- Electric Tripping Curves Class 10A



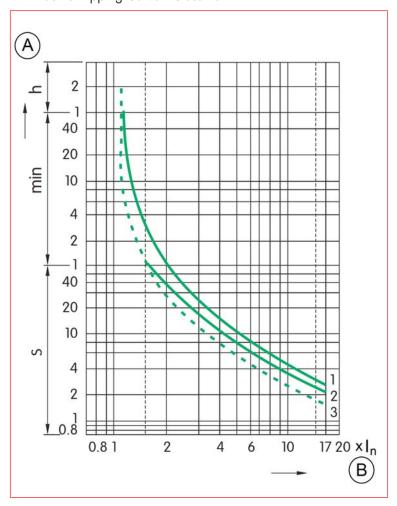
- A) Tripping time
- B) Current
- 1) 1-phase operation, cold state start
- 2) 2-phase operation, cold state start
- 3) 3-phase operation, cold state start

# ■ Thermal Overload Relays Series CUBICO Classic

# ■ Technical Specifications - LZTC

Standard			IEC/EN 60947-4-1
Rated insulation voltage			690VAC
Rated frequency			50/60Hz
Rated impulse withstand vol	tage		6kV
Overvoltage category			III
Rated current			0.16A - 38A
Tripping class			Class 10A
Rated current I <sub>N</sub>			0.16A-0.25A
			0.25-0.4A
			0.4-0.63A
		-	0.63-1A
			1-1.6A
			1.6-2.5A
			2.5-4A
		-	4-6A
		-	5.5-8A
		-	7-10A
		-	
		-	9-13A
		-	12-18A
		-	16-24A
		-	23-32A
			30-38A
Matching contactor			LZDC
Matching fuse		0.16-0.25A	2AgG/gL
		0.25-0.4A	2AgG/gL
		0.4-0.63A	2AgG/gL
		0.63-1A	4AgG/gL
		1-1.6A	4AgG/gL
		1.6-2.5A	6AgG/gL
		2.5-4A	10AgG/gL
		4-6A	16AgG/gL
		5.5-8A	20AgG/gL
		7-10A	20AgG/gL
		9-13A	25AgG/gL
		12-18A	35AgG/gL
		16-24A	50AgG/gL
		23-32A	63AgG/gL
		30-38A	80AgG/gL
Overload protection		1.05 x I <sub>N</sub>	No operation within 2h
		1.2 x I <sub>N</sub>	Operation within 2h
		1.5 x I <sub>N</sub>	Operation within 2min
		7.2 x I <sub>N</sub>	2s < Tripping ≤ 10s
Mounting			Plug-in type
Auxiliary contact			1NO + 1NC
Rated current of auxiliary		AC-15 230V	2.6A
contact		AC-15 250V	2.0A
		AC-15 400V	1.5A
		DC-13 220V	0.2A
Terminal cross section main			
	Single-core conductor		1 - 10mm²
	Stranded conductor		1 - 10mm²
	Terminal screw		M4
Terminal cross section auxili	•		
	Single-core conductor		0.5 - 2.5mm <sup>2</sup>
	Stranded conductor		0.5 - 2.5mm <sup>2</sup>
	Terminal screw		M3.5

- Thermal Overload Relays Series CUBICO Classic
- Electric Tripping Curve Class 10A



- A) Tripping time B) Current
- 1) 1-phase operation, cold state start
- 2) 2-phase operation, cold state start
- 3) 3-phase operation, cold state start



■ Motor Protection Switches Series BE6



■ Motor Protection Switches Series BES, Size 0 ■ Motor Protection Switches Series BES, Size 2





Auxiliary Contacts for Motor Protection Switches
Signaling Switch for Motor Protection Switches





# Motor Protection Switches

# Index Motor Protection Switches Series BE5, BE6 Motor Protection Switches Series ALEA BES Page 410 Technical Specification Page 425





#### Schrack-Info

• Motor protection switch 3-pole from 0.16A up to 32A

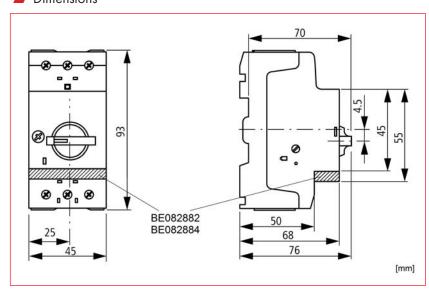
BE500400

Standards			EN 60647, IEC 60947		
Rated current In			0,1 - 25A		
Rated uninterrupted current = rated operational current I <sub>u</sub> =	l <sub>e</sub>		25A or current setting of the overcurrent release		
Rated operational voltage U <sub>e</sub>			690VAC		
Rated frequency			40 – 60Hz		
Tripping	Overload		adjustable 0,6 - 1 x ln		
	Short circuit		set permanently on 14 x I <sub>n</sub>		
Phase failure protection			Yes		
Tripping capacity	0,1 - 10A		0,1 - 10A: inherently stable (100kA)		
	10 - 16A		50kA		
	16 - 25A		16kA		
Direction of electric current			any		
Rated impulse withstand voltage U <sub>imp</sub>			6000VAC		
Overvoltage category			III		
Current heat loss (3 pole at operating temperature)			6W		
Lifespan	mechanical		10.000 operations		
	electrical (AC-3At 400V)		10.000 operations		
Maximum operating frequency	40 operations per hour				
Short-circuit rating	AC-3 (up to 690V)		25A		
	DC-5 (up to 250V)		25A (3 contacts in series)		
Rated making capacity	$\cos \varphi = 0.45$	230 - 690VAC	110A		
Rated breaking capacity	$\cos \varphi = 0.45$	230VAC	90A		
	$\cos \varphi = 0.45$	400VAC	90A		
	$\cos \varphi = 0.45$	500VAC	64A		
	$\cos \varphi = 0.45$	690VAC	54A		
Rated operational current enclosed, not enclosed I <sub>e</sub>	AC-1-application	230VAC	16A		
		400VAC	16A		
		440VAC	16A		
		500VAC	16A		
		690VAC	16A		
	AC-3-application	230VAC	8,7A		
		400VAC	8,8A		
		440VAC	7,7A		
		500VAC	6,4A		
		690VAC	4,8A		
	AC-4-application	230VAC	6,6A		
		400VAC	6,6A		
		440VAC	6A		
		500VAC	5A		
		690VAC	3,4A		

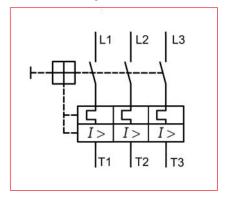
Degree of protection	Device	Device IP20
	Terminations	Terminations IPOO
Protection against direct contact		Finger and back-of-hand proof
Mechanical shock resistance half-sinusoidal s 60068-2-27	shock 10ms to IEC	25g
Altitude		max. 2000m
Climatic proofing		Damp heat, constant, to IEC 60068-2-78
		Damp heat, cyclic, to IEC 60068-2-30
Pollution degree		3
Ambient temperature		Stock -25°C up to 80°C
		Not enclosed -25°C up to 55°C
		Enclosed -25°C up to 40°C
Terminals	Screw-terminals	Single wire 1 x 1 - 6mm <sup>2</sup> / 2 x 1 - 2,5mm <sup>2</sup>
		Flexible with ferrule 1 x 1 - 4mm <sup>2</sup> / 2 x 1 - 2,5mm <sup>2</sup>
Torque		Mains 1,7Nm

	max. rated operational power AC-3				Continuous rated current	Setting	g range	
Article	220V, 230V, 240V	380V, 400V, 415V	440V	500V	660V, 690V		Overload tripping	Short circuit tripping
	P [kW]	P [kW]	P [kW]	P [kW]	P [kW]	I <sub>u</sub>	I <sub>r</sub>	I <sub>rm</sub>
BE500160	-	-	-	-	0.06	0.16	0.1 - 0.16	2.2
BE500250	-	0.06	0.06	0.06	0.12	0.25	0.16 - 0.25	3.5
BE500400	0.06	0.09	0.12	0.12	0.18	0.4	0.25 - 0.4	5.6
BE500630	0.09	0.12	0.18	0.25	0.25	0.63	0.4 - 0.63	8.8
BE501000	0.12	0.25	0.25	0.37	0.55	1	0.63 - 1	14
BE501600	0.25	0.55	0.55	0.75	1.1	1.6	1 - 1.6	22
BE502500	0.37	0.75	1.1	1.1	1.5	2.5	1.6 - 2.5	35
BE504000	0.75	1.5	1.5	1.5	3	4	2.5 - 4	56
BE506300	1.1	2.2	3	3	4	6.3	4 - 6.3	88
BE510000	2.2	4	4	4	7.5	10	6.3 - 10	140
BE516000	4	7.5	9	9	12.5	16	10 - 16	224
BE520000	5.5	9	11	12.5	15	20	16 - 20	280
BE525000	5.5	12.5	12.5	15	22	25	20 - 25	350

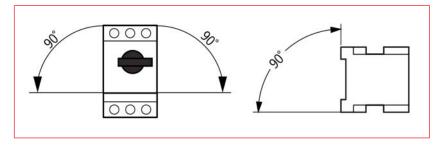
#### Dimensions



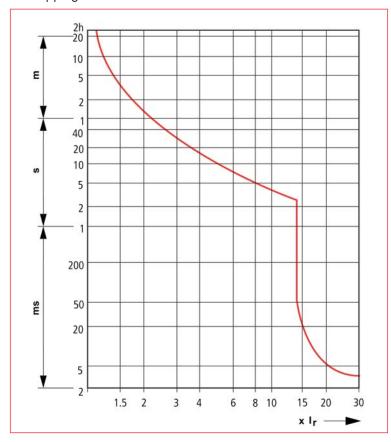
- Motor Protection Switches Series BE5
- Circuit Diagram



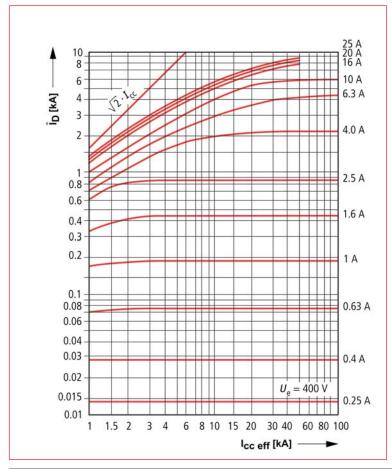
Mounting Position



■ Tripping Characteristic Curve



#### Let-through Energy Diagram



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Motor protection switches series BE5			
0.16 - 0.25A		000 0-0	BE500250
0.25 - 0.40A		000 0-0	BE500400
0.40 - 0.63A		000 0-0	BE500630
0.63 - 1.00A		000 0-0	BE501000
1.00 - 1.60A		000 0-0	BE501600
1.60 - 2.50A		000 0-0	BE502500
2.5A-4.0A		000 0-0	BE504000
4.0-6.3A		000 0-0	BE506300
6.3-10A		500 0= 0	BE510000
10-16A		000 0-0	BE516000
16-20A		000 0-0	BE520000
20-25A		000 0- 0	BE525000
25-32A		000 0-0	BE532000
Auxiliary contacts			
Auxiliary contact front, 1NO+1NC	BE5/6-HIF11	000 0-0	BE082882
Auxiliary contact front, 1NO	BE5/6-HIF10	000 0-0	BE082884



Schrack-Info

• Motor protection switch 3-pole from 24A up to 63A

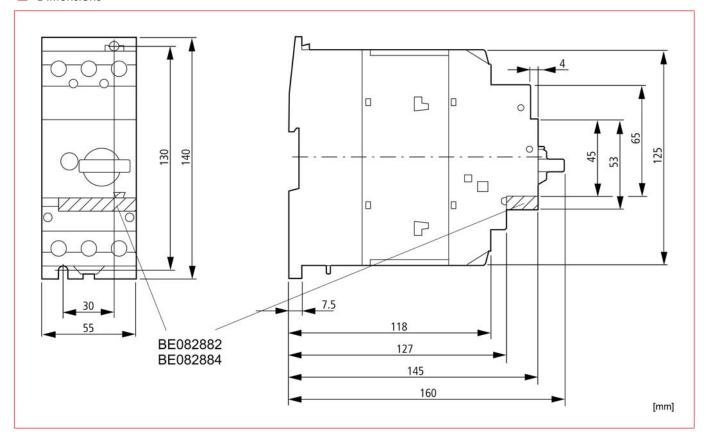
BE632000

Standards		EN 60647, IEC 60947
Rated current I <sub>n</sub>		32 - 63A
Rated uninterrupted current = rated operational current	$  \cdot  _{u} =  _{e}$	63 A or current setting of the overcurrent release
Rated operational voltage g U <sub>e</sub>		690VAC
Rated frequency		40 – 60Hz
Tripping	Overload	adjustable 0,6 - 1 x ln
	Short circuit	set permanently on 14 x I <sub>n</sub>
Phase failure protection		yes
Tripping capacity		50kA
Direction of electric current		any
Rated impulse withstand voltage U <sub>imp</sub>		6000VAC
Overvoltage category		III
Current heat loss (3 pole at operating temperature)		9,5W
Lifespan	mechanical	30.000 operations
	electrical (AC-3 at 400V)	30.000 operations
Maximum operating frequency		40 operations per hour
Short-circuit rating	AC-3 (up to 690V)	63A
	DC-5 (up to 250V)	63A (3 contacts in series)
Degree of protection	Device	IP20
	Terminations	IP00
Protection against direct contact		Finger and back-of-hand proof
Mechanical shock resistance half-sinusoidal shock 10 60068-2-27	ms to IEC	15g
Altitude		max. 2000 m
Climatic proofing		Damp heat, constant, to IEC 60068-2-78
		Damp heat, cyclic, to IEC 60068-2-30
Pollution degree		3
Ambient temperature		Stock -25°C up tp 70°C
'		Not enclosed -25°C up to 55°C
		Enclosed -25°C up to 40°C
Terminals	Screw-terminals	Single wire 1 x 1 - 50mm <sup>2</sup> / 2 x 1 - 35mm <sup>2</sup>
		Flexible with ferrule 1 x 1 - 35mm <sup>2</sup> / 2 x 1 -35mm <sup>2</sup>
Torque		Mains 3Nm

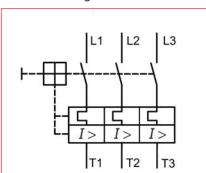


Article		max. rated	l operational p	ower AC-3		Continuous rated current	Setting	g range
	220V, 230V, 240V	380V, 400V, 415V	440V	500V	660V, 690V		Overload tripping	Short circuit tripping
	P [kW]	P [kW]	P [kW]	P [kW]	P [kW]	I <sub>u</sub>	l,	I <sub>rm</sub>
BE632000	7,5	15	17,5	22	22	32	25 - 32	448
BE640000	11	20	22	24	30	40	32-40	560
BE650000	14	25	30	30	45	50	40-50	700
BE658000	17	30	37	37	55	58	50-58	812
BE663000	18,5	34	37	45	55	65	55-63	882

#### Dimensions



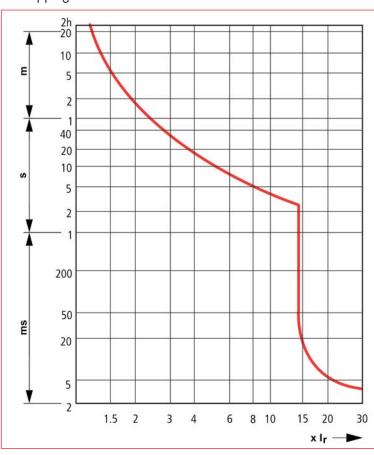
Circuit Diagram



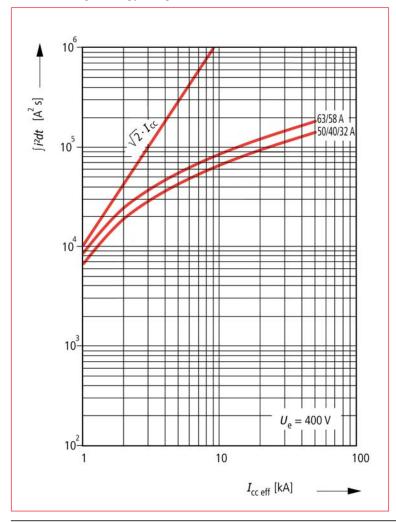
Mounting Position

000

#### Tripping Characteristic Curve



#### Let-through Energy Diagram



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Motor Protection Switches Series BE6			
24-32A		000 0-0	BE632000
32-40A		355 0-0	BE640000
40-50A		000 0-0	BE650000
50-58A			BE658000
55-63A		000 0-0	BE663000
Auxiliary contacts			
Auxiliary contact front, 1NO+1NC	BE5/6-HIF11	000 0-0	BE082882
Auxiliary contact front, 1NO	BE5/6-HIF10	000 0-0	BE082884

# Feeding Terminal Blocks for BE5



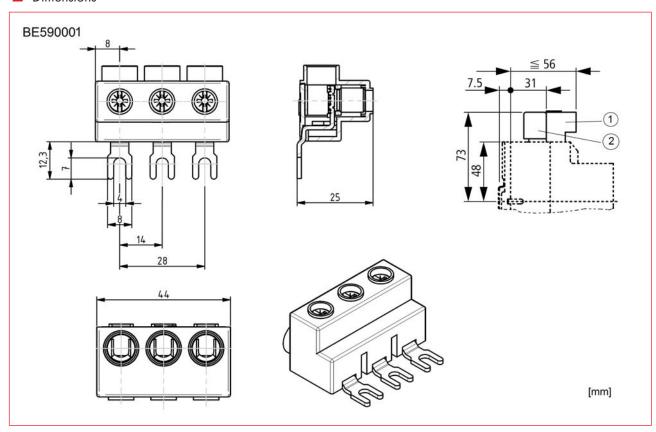
#### Schrack-Info

- Feed terminals BE590001 for Motor protection switches, additionally mountable to busbars, cover for modular devices (slot 45mm) can be mounted
- Feed terminals BE590002 for Motor protection switches, additionally mountable to busbars, cover for modular devices (slot 45mm) can not be mounted

BE590001

	BE590001	BE590002		
Max.current:	63	3 A		
Max. voltage:	69	0 V		
Terminal-material:	br	ass		
Pin-material:	br	ass		
Cover:	PC / ABS - UL-VO			
Thermal properties:	EN ISO 306 = 138°C			
Screw:	St	5.8		
Stripped insulation:	12	mm		
Terminal cross section:	U - single wire: 6 - 25 mm <sup>2</sup>			
	R - stranded wire: 6 - 25mm <sup>2</sup>			
	K - flexible with sleeve: 4 - 16 mm <sup>2</sup>			
	F - flexible with sleeve: 4 - 16 mm <sup>2</sup>			
Torque of screw:	21	Nm		

#### Dimensions



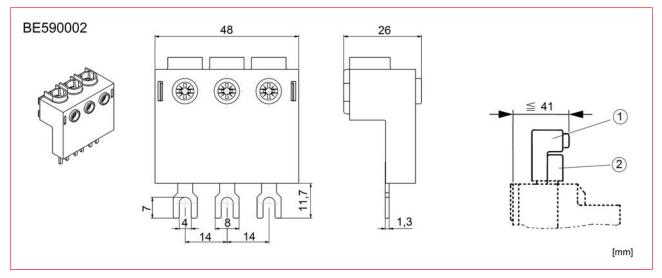
1) Feeding terminal block

2) Busbar



# Feeding Terminal Blocks for BE5

#### Dimensions



1) Feeding terminal block

2) Busbar

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
3-pole infeed terminal for BE5, 63A, up to 25mm², no cover can be mounted	BE5	555 0-8	BE590001
3-pole infeed terminal for BE5, 63A, up to 25mm², cover can be mounted	BE5	300 0-0	BE590002

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#### Busbars for BE5



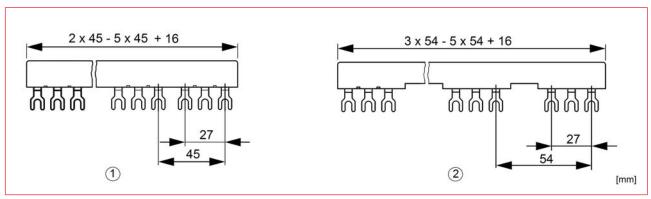
#### Schrack-Info

- Fork-busbar, rated current 63A
- Busbar for up to 5 Motor protection switches BE5, available for BE5 with or without "side mounted" auxiliary contacts
- Front mounted auxiliary contacts do not increase width of Motor protection switches
- When total current exceeds 63A use busbar with 63A and feed in "centric" (middle infeed)

#### BE590245

Bausbar type:	Fork-busbar
Number of poles:	3-pole
Max. current Is/Phase	63 A
Mounting type:	not possible to break off
Cross section:	10 mm <sup>2</sup>
Phase sequence:	L1, L2, L3,
Standards:	EN 60947-1 / IEC 60947-1
Material of busbar:	E – Cu 58 F25
Insulation coordination:	Overvoltage category III
	Degree of pollution 2
Protection class:	IP20
Impulse voltage strength:	≥ 4,5 kV (1 kV/mm clearance)

#### Dimensions



1) BE5 without auxiliary contact

2) BE5 with auxiliary contact

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
3 phase busbar for 2xBE5 45mm fork	BE5	999 0- 8	BE590245
3 phase busbar for 3xBE5 45mm fork	BE5	000 0-0	BE590345
3 phase busbar for 3xBE5+auxiliary contact, 54mm fork 63A	BE5	000 0-0	BE590354
3 phase busbar for 4xBE5 45mm fork	BE5	000 0-0	BE590445
3 phase busbar for 4xBE5+auxiliary contact, 54mm fork 63A	BE5	355 0- 0	BE590454
3 phase busbar for 5xBE5 45mm fork	BE5	000 0-0	BE590545
3 phase busbar for 5xBE5+auxiliary contact, 54mm fork 63A	BE5	000 0-0	BE590554

#### Connection Link for Motor Protection Switches BE5, BE6



#### Schrack-Info

• Connection links for BE5 and contactors K3-10 up to K3-22 for construction of D.O.L. (direct on line) combinations, coordination type "1"  $3\sim400V$ 

#### BE590011

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Connection block for BE5 to LA3 contactor	BE5		BE590011



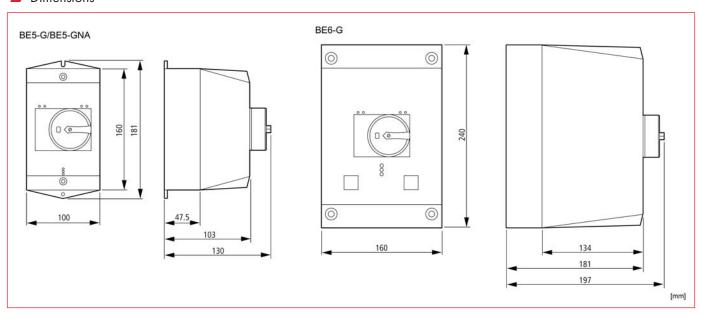
# Enclosures for BE5, BE6



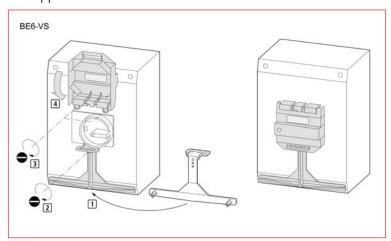
#### Schrack-Info

• Plastic-housings for Motor protection switches series BE5 and BE6

#### Dimensions

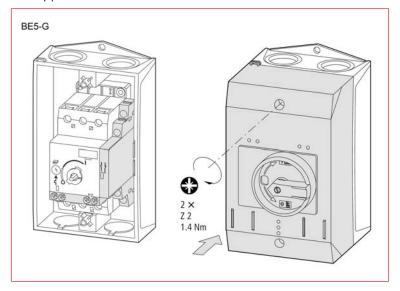


#### Application

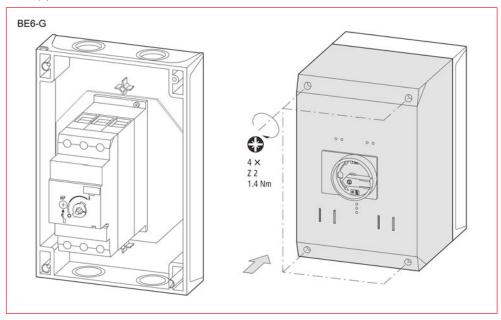


# Enclosures for BE5, BE6

# Application



# Application



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Box for motor protection switch BE5	BE5-G	300 0- 0	BE599654
Box with emergency stop button for BE5	BE5-GNA		BE599655
Box for motor protection switch BE6	BE6-G	000 0-0	BE695524
Padlock for box with main-switch for BE6	BE6-VS		BE695526

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# Accessories for BE5, BE6







BE590851

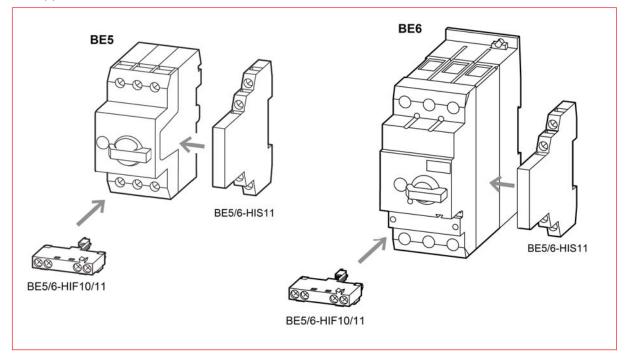
#### Schrack-Info

• Accessories for Motor protection switches series BE5 or BE6

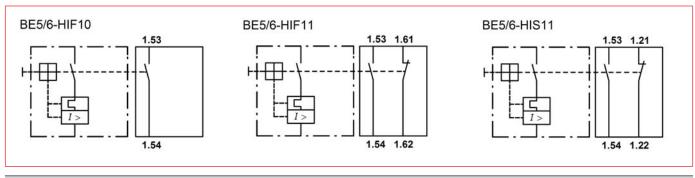
Articles			BE082884	BE082882	BE072896
Туре			Auxiliary-contact	Auxiliary-contact	Auxiliary-contact
Mounting			front	front	side
For product			BE5 and BE6	BE5 and BE6	BE5 and BE6
Contacts			1 NO	1 NO + 1 NC	1 NO + 1 NC
Rated impulse withstand vol	tage U <sub>imp</sub>		4 k\	/-AC	6 kV-AC
Overvoltage category / Po	llution degree			III/3	
Rated operational voltage			440	V-AC	500 V-AC
			250	V-DC	250 V-DC
Safe isolation according VDE 0106 part 101 and part 101/A1 between auxiliary contacts and main contacts			690	V-AC	690 V-AC
Rated current	AC-15 220 – 240 V I <sub>e</sub>		1 A		3,5 A
		380 - 415 V I <sub>e</sub>	-	-	2 A
		440 - 550 V I <sub>e</sub>	-	-	1 A
	DC-13 L/R F 100 ms	24 V I <sub>e</sub>	-	-	2 A
		60 V I <sub>e</sub>	-	-	1,5 A
		110 V I <sub>e</sub>	-	-	1A
		220 V I <sub>e</sub>	-	-	0,25 A
Lifespan	mechanical		> 10000 operations		> 10000 operations
	electrical		> 10000 operations		> 5000 operations
Contact reliability		Failure rate < 10 <sup>-8</sup> < 1 Failure on 1 x 10 <sup>8</sup> ope		<sup>B</sup> operations	
Force guided contacts according ZH 1/457			-	-	yes
Short circuit rating without	without melting-	fuse	-	-	BM918104
welding of contacts	with melting-fuse	е	10 A gG/gL	10 A gG/gL	10 A gG/gL
Terminals	Single or flexible	e wire with ferrule	0,75 -	1,5 mm <sup>2</sup>	0,75 - 2,5 mm <sup>2</sup>
	Single- or strand	ded wire AWG	18	- 16	18 – 14

# Accessories for BE5, BE6

#### Application



#### Circuit Diagrams



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Auxiliary contact front, 1NO	BE5/6-HIF10	000 0-0	BE082884
Auxiliary contact front, 1NO+1NC	BE5/6-HIF11	000 0-0	BE082882
Auxiliary contact side, 1NO+1NC	BE5/6-HIS11	988 0-6	BE072896
Rotary knob for BE5, lockable with up to 3 pad-locks	BE5-DK	000 0-0	BE590851

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#### ■ Motor Protection Switches BES, Size 00

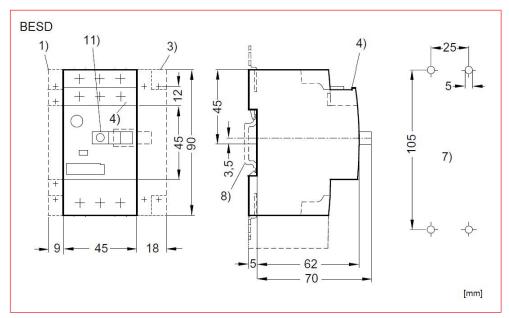


BESD0100

#### Schrack-Info

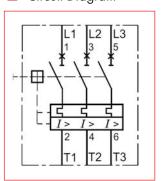
- Motor protection switch Class 10 for rated current of motors from 0.11A up to 6.3A (0.04kW up to 2.2kW) at Icu = 100kA
- Motor protection switch Class 10 for rated current of motors from 5.5A up to 12A (3kW up to 5.5kW) at Icu = 50kA
- Frontside transverse arranged and "side mounted" auxiliary contacts, shunt release and undervoltage release can be snapped on
- Can be combined with contactors of size 00
- Busbars for up to zu 5 Motor protection switches (without "side mounted" accessories) are available
- Busbars for Motor protection switches with "side mounted" auxiliary contact on request
- For assembling of BESD with AC or DC-operated contactors size 00 (D.O.L.- Combination) the connection link LSZDD005 has to be used
- Mountable to DIN-rail TS35/TH35 or mounting plate
- Further accessories find attached

#### Dimensions



- 1) Side mounted auxiliary switch, 2-pole BEZ00001,2  $\,$
- 3) Auxiliary trip unit: undervoltage release BEZ00006,7; shunt trip BEZ00008,9
- 4) Front mounted auxiliary switch BEZ00003,4
- 7) Drilling pattern
- 8) Standard mounting rail TH 35 according to EN 60715
- 11) Lockable in "OFF" position with 3.5 ... 4.5mm shackle diameter

#### Circuit Diagram



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# ■ Motor Protection Switches BES, Size 00

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Motor protection switches size 00 / 100kA (Short circuit switching capacity Icu at 400VAC)			
0.11-0.16A, Class 10	BESD	000 0-0	BESD0016
0.14-0.20A, Class 10	BESD	000 0-0	BESD0020
0.18-0.25A, Class 10	BESD	000 0-0	BESD0025
0.22-0.32A, Class 10	BESD	000 0-0	BESD0032
0.28-0.40A, Class 10	BESD	000 0-0	BESD0040
0.35-0.50A, Class 10	BESD	000 0-0	BESD0050
0.45-0.63A, Class 10	BESD	000 0-0	BESD0063
0.55-0.80A, Class 10	BESD	000 0-0	BESD0080
0.7-1.00A, Class 10	BESD	000 0-0	BESD0100
0.9-1.25A, Class 10	BESD	555	BESD0125
1.1-1.6A, Class 10	BESD	000 0-0	BESD0160
1.4-2.0A, Class 10	BESD	000 0- 0	BESD0200
1.8-2.5A, Class 10	BESD	000 0-0	BESD0250
2.2-3.2A, Class 10	BESD	000 0-0	BESD0320
2.8-4,0A, Class 10	BESD	000 0-0	BESD0400
3.5-5,0A, Class 10	BESD	555 0- 8	BESD0500
4,5-6,3A, Class 10	BESD	000 0-0	BESD0630
Motor protection switches size 00 / 50kA (Short circuit switching capacity Icu at 400VAC)			
5.5-8A, Class 10	BESD	000 0-0	BESD0800
7-10A, Class 10	BESD	565 0- 6	BESD1000
9-12A, Class 10	BESD	000 0-0	BESD1200

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#### Motor Protection Switches BES, Size 0

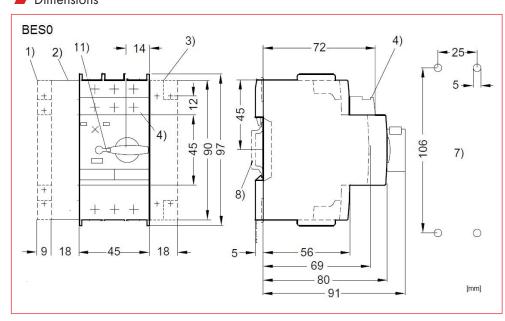


BES00400

#### Schrack-Info

- Motor protection switch Class 10 for rated current of motors from 0.11A up to 12.5A (0.04kW up to 5.5kW) at Icu = 100kA
- Motor protection switch Class 10 for rated current of motors from 11A up to 25A (7.5kW up to 11kW) at Icu = 50kA
- Frontside transverse arranged and "side mounted" auxiliary contacts, signaling switch, shunt release and undervoltage release can be snapped on
- Can be combined with contactors of size 00 and 0
- Busbars for up to zu 5 Motor protection switches (without "side mounted" accessories) are available
- When using busbar for 5 Motor protection switch and summary load current > 63A, double infeed (left and right end of busbar) is recommended
- Busbars for Motor protection switches with "side mounted" auxiliary contact on request
- For assembling of BESO with AC or DC-operated contactors size 00 (D.O.L.- Combination) the connection link LSZDD006 has to be used
- For assembling of BESO with AC-operated contactors size 0 (D.O.L.- Combination) the connection link LSZ0D002 has to be used
- For assembling of BESO with DC-operated contactors size 0 (D.O.L.- Combination) the connection link LSZ0D004 has to be used
- Mountable to DIN-rail TS35/TH35 or mounting plate
- Further accessories find attached

#### Dimensions

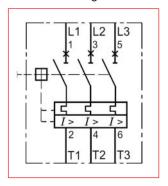


- 1) Side mounted auxiliary switch, 2-pole BEZ00001,2
- 2) Signal switch
- 3) Auxiliary trip unit: undervoltage release BEZ00006,7; shunt trip BEZ00008,9
- 4) Front mounted auxiliary switch BEZ00003,4
- 7) Drilling pattern
- 8) Standard mounting rail TH 35 according to EN 60715  $\,$
- 11) Lockable in "OFF" position with 3.5 ... 4.5 mm shackle diameter



# ■ Motor Protection Switches BES, Size 0

#### Circuit Diagram



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Motor protection switches size 0 / 100kA (Short circuit switching capacity Icu at 400VAC)			
0.11-0.16A, Class 10	BESO	000 0-0	BES00016
0.14-0.20A, Class 10	BESO	333 0-6	BES00020
0.18-0.25A, Class 10	BESO	000 0-0	BES00025
0.22-0.32A, Class 10	BESO	333 0-6	BES00032
0.28-0.40A, Class 10	BESO	000 0-6	BES00040
0.35-0.50A, Class 10	BESO	333 0-6	BES00050
0.45-0.63A, Class 10	BESO	000 0-0	BES00063
0.55-0.80A, Class 10	BESO	999 0- 6	BES00080
0.7-1.00A, Class 10	BESO	000 0=0	BES00100
0.9-1.25A, Class 10	BESO	000 0-0	BES00125
1.1-1.6A, Class 10	BESO	000 0-0	BES00160
1.4-2.0A, Class 10	BESO	000 0-0	BES00200
1.8-2.5A, Class 10	BESO	000 0-0	BES00250
2.2-3.2A, Class 10	BESO	999 0-8	BES00320
2.8-4,0A, Class 10	BESO	000 0-0	BES00400
3.5-5,0A, Class 10	BESO	000 0-6	BES00500
4,5-6,3A, Class 10	BESO	000 0 0	BES00630
5.5-8A, Class 10	BESO	333 0- 6	BES00800
7-10A, Class 10	BESO	000 0-0	BES01000
9-12.5A, Class 10	BESO	999 6-8	BES01200
Motor protection switches size 0 / 50kA (Short circuit switching capacity Icu at 400VAC)			
11-16A, Class 10	BESO	000 0-6	BES01600
14-20A, Class 10	BESO	555 0-8	BES02000
17-22A, Class 10	BESO	000 0-0	BES02200
20-25A, Class 10	BESO	000 0-0	BES02500

Page

SCHRACK TECHNIK

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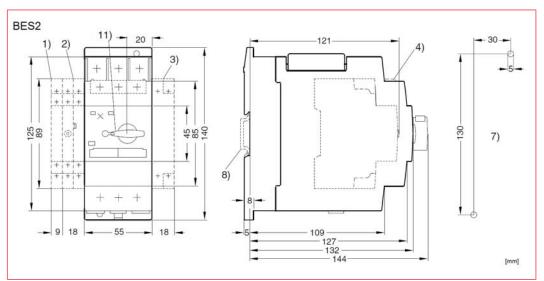
#### ■ Motor Protection Switches BES, Size 2



#### Schrack-Info

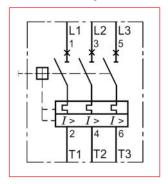
- Motor protection switch Class 10 for rated current of motors from 18A up to 50A (11kW up to 22kW)
- Frontside transverse arranged and "side mounted" auxiliary contacts, signaling switch, shunt release and undervoltage release can be snapped on
- Can be combined with contactors of size 2
- Busbars for up to zu 3 Motor protection switches (without "side mounted" accessories) are available
- When using busbar for 3 Motor protection switches and summary load current > 108A), double infeed (left and right end of busbar) is recommended
- Busbars for Motor protection switches with "side mounted" auxiliary contact on request
- For assembling of BES2 with AC-operated contactors size 2 (D.O.L.- Combination) the connection link LSZ2D004 has to be used
- For assembling of BES2 with DC-operated contactors size 2 (D.O.L.- Combination) the connection link LSZ2D005 has to be used
- Mountable to DIN-rail TS35/TH35 or mounting plate
- Further accessories find attached

#### Dimensions



- 1) Side mounted auxiliary switch, 2-pole BEZ00001,2
- 2) Signal switch
- 3) Auxiliary trip unit: undervoltage release BEZ00006,7; shunt trip BEZ00008,9
- 4) Front mounted auxiliary switch BEZ00003,4
- 7) Drilling pattern
- 8) Standard mounting rail TH 35 according to EN 60715
- 11) Lockable in "OFF" position with 3.5 ... 4.5 mm shackle diameter

- Motor Protection Switches BES, Size 2
- Circuit Diagram



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Motor protection switches size 2 / 50kA (Short circuit switching capacity Icu at 400VAC)			
18-25A, Class 10	BES2	000 0-0	BES22500
22-32A, Class 10	BES2	300	BES23200
28-40A, Class 10	BES2	000 0=0	BES24000
36-45A, Class 10	BES2	300 0-0	BES24500
40-50A, Class 10	BES2	000 0-0	BES25000

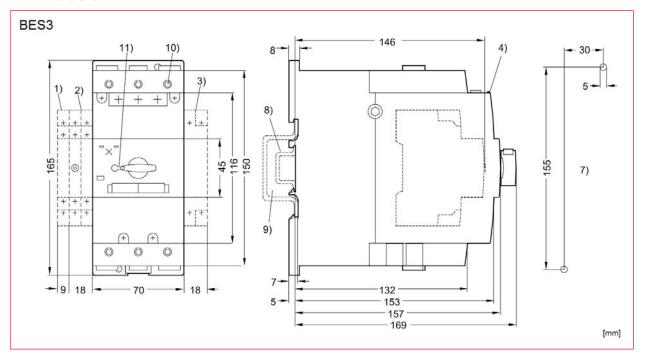
#### Motor Protection Switches BES, Size 3



#### Schrack-Info

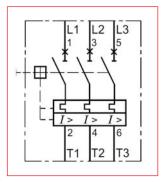
- $\bullet$  Motor protection switch Class 10 for rated current of motors from 45A up to 100A (30kW up to 45kW) at Icu = 50kA
- Frontside transverse arranged and "side mounted" auxiliary contacts, signaling switch, shunt release and undervoltage release can be snapped on
- Can be combined with contactors of size 3
- For assembling of BES3 with AC-operated contactors size 3 (D.O.L.- Combination) the connection link LSZ3D004 has to be used
- For assembling of BES3 with DC-operated contactors size 3 (D.O.L.- Combination) the connection link LSZ3D003 has to be used
- Mountable to DIN-rail TS35/TH35, TS75/TH75 or mounting plate
- Further accessories find attached

#### Dimensions



- 1) Side mounted auxiliary switch, 2-pole BEZ00001,2
- 2) Signalling switch (S0  $\dots$  S3) side mounted BEZ00005
- 3) Auxiliary trip unit: undervoltage release BEZ00006,7; shunt trip BEZ00008,9
- 4) Front mounted auxiliary switch BEZ00003,4
- 7) Drilling pattern
- 8) Standard mounting rail TH 35 according to EN 60715
- 9) For mounting on TH 75 standard mounting rail
- 10) Allen screw 4mm
- 11) Lockable in "OFF" position with 3.5 ... 4.5mm shackle diameter

- Motor Protection Switches BES, Size 3
- Circuit Diagram



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Motor protection switches size 3 / 50kA (Short circuit switching capacity Icu at 400VAC)			
45-63A, Class 10	BES3	000 0-0	BES36300
57-75A, Class 10	BES3	588 0-6	BES37500
70-90A, Class 10	BES3	000 0-0	BES39000
80-100A, Class 10	BES3	000 0-0	BES39999

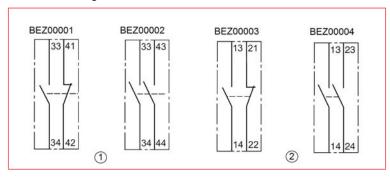
### Auxiliary Contacts for Motor Protection Switches



### Schrack-Info

- Frontside or "side mounted" auxiliary contacts for signaling of operating state "ON" or "OFF"
- Arranged at left side of Motor protection switch
- Fitting to all sizes
- Busbars for Motor protection switches with " side arranged" auxiliary contact only is realisable by special version of busbars - on request

## Circuit Diagrams



#### 1) Lateral auxiliary switch (side mounted)

BEZ00001 - 1NO + 1NC BEZ00002 - 2NO

#### 2) Transverse auxiliary switch (front mounted)

BEZ00003 - 1NO + 1NC BEZ00004 - 2NO

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Auxiliary Contact, side mounted, 1 NO+1NC	BEZO	000 0-0	BEZ00001
Auxiliary Contact, front mounted, 1 NO+1NC	BEZO	000 0-0	BEZ00003
Auxiliary Contact, side mounted, 2 NO	BEZO	000 0-0	BEZ00002
Auxiliary Contact, front mounted, 2 NO	BEZO	000 0-0	BEZ00004

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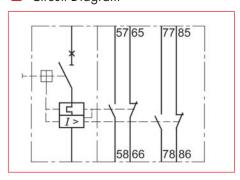
### Signaling Switch for Motor Protection Switches



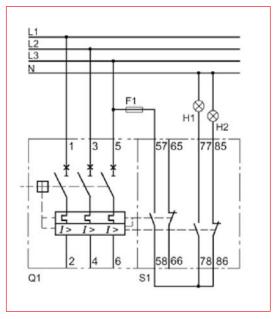
### Schrack-Info

- Signaling switch for signaling of "Tripped by overload or short circuit" for Motor protection switch of size 0 up to 3
- Left side mounted
- When necessary to monitor Motor protection switch of size 00 for overload or short circuit, the Motor protection switch size 00 has to be replaced by such of size 0
- Signaling switch is provided with 2 contacts for "overload" (1 NO + 1 NC) and 2 contacts for "short circuit" (1 NO + 1 NC)
- Busbars for Motor protection switches with side arranged signaling switch are not available

### Circuit Diagram



### Switching Example



BESO to BES3 motor protection switches with BEZO0005 signalling switch Separate "tripped" and "short-circuit" signals:

- S1 Signalling switch
- Q1 Motor protection switch
- F1 Fuse (gL/gG), max. 10A
- H1 Signal lamp "Short-circuit"
- H2 Signal lamp "Overload" or "Tripping by auxiliary trip unit"

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Signalling switch 1NO+1NC, for BES size 0,2,3	BEZO	000 0-0	BEZ00005

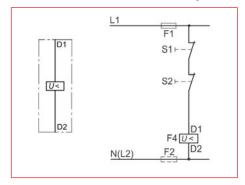
### Under Voltage Release Motor Protection Switches



#### Schrack-Info

- Under voltage release unit for remote "switching off" the Motor protection switches (closed-circuit
- Right side mounted
- Fitting to all sizes
- Only one release unit can be mounted at Motor protection switch (either undervoltage or shunt
- Busbars for Motor protection switches with side arranged release unit are not available

### Connection and Control Diagram



S0, S1, S2 OFF pushbutton in the system

Q1 Motor protection switch

S Auxiliary switch of the motor protection switch Q1

F1; F2 Fuse (gL/gG) max. 10A

F3 Shunt trip

F4 Undervoltage releases

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Under voltage release 230VAC/50Hz, 240VAC/60Hz	BEZO	333 0-6	BEZ00006
Under voltage release 400VAC/50Hz, 440VAC/60Hz	BEZO	000 0-0	BEZ00007

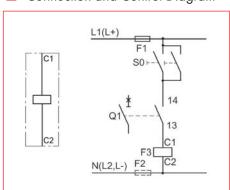
### Shunt Release for Motor Protection Switches



Schrack-Info

- Shunt release unit for remote "switching off" the Motor protect Right side mounted ion switches (open-circuit principle)
- Right side mounted
- Fitting to all sizes
- Only one release unit can be mounted at Motor protection switch (either undervoltage or shunt
- Busbars for Motor protection switches with side arranged release unit are not available

#### Connection and Control Diagram



SO, S1, S2 OFF pushbutton in the system

Q1 Motor protection switch

S Auxiliary switch of the motor protection switch Q1

F1; F2 Fuse (gL/gG) max. 10A

F3 Shunt trip

F4 Undervoltage releases

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Shunt trip 20-24VAC, 50/60Hz	BEZO		BEZ00008
Shunt trip 210-240VAC, 50/60Hz	BEZO	000 0-0	BEZ00009



### Housings and Locking Plate for Motor Protection Switches



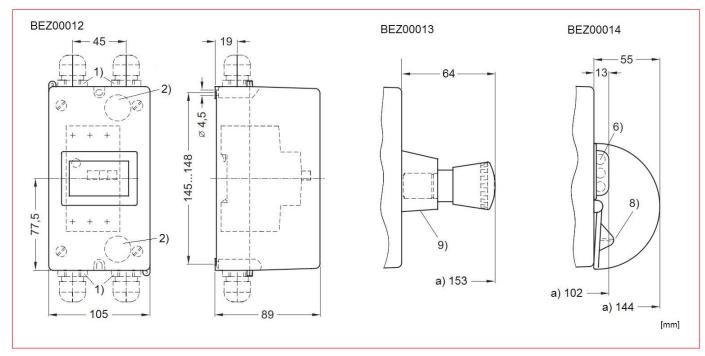




#### Schrack-Info

- · All housings fulfill the protection degree IP55, the rated operational voltage Ue for built-in Motor protection switches is reduced from
- Housings for Motor protection switch of size 00 with membrane (optional Emergency -Stop mushroom button available)
- Housings for Motor protection switch of size 0-2 are fitted with lockable black or red/yellow rotary handle
- Housings for Motor protection switch of size 3 are not available
- All housings are fitted with Neutral conductor- and PE-terminal
- The housings are prepared with cable entry cut-outs for metric cable glands at upper side and bottom of housing. Also the rear sides of housings are prepared with cable entry cut-outs
- Installation of Motor protection switches with Signaling switch is not possible
- Installation of Motor protection switches with front or side mounted auxiliary contacts is possible at all housings
- Installation of Motor protection switch with auxiliary contacts and overvoltage/shunt release in housings of size 2 is possible
- Housings of size 00 with membrane can be fitted with an additional locking plate (for 3 padlocks, 8mm shackle-diameter)

#### Dimensions



BEZ00012 with membrane, BEZ00013 with emergency stop mushroom head for motor protection switches size 00

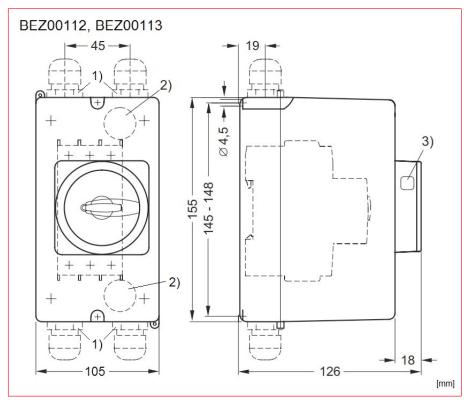
- 1) Knock-outs for M25
- 2) Knock-outs for rear cable entry M20
- 6) Max. shackle diameter for padlock 8mm

- 8) Locking plate BEZ00014
- 9) EMERGENCY-STOP mushroom button
- a) Dimensions refer to mounting surface



### Housings and Locking Plate for Motor Protection Switches

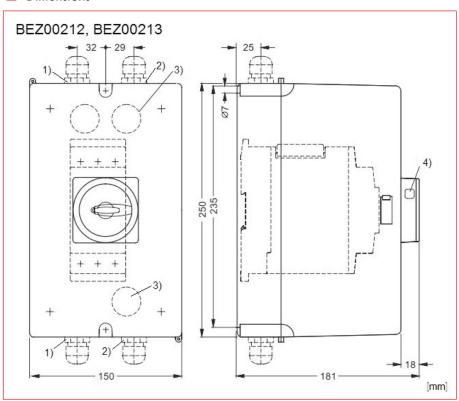
#### Dimensions



 ${\tt BEZ00112}\ rotary\ handle,\ {\tt BEZ00113}\ rotary\ handle\ for\ emergency\ stop\ for\ motor\ protection\ switches\ size\ 0$ 

- 1) Knock-outs for M25
- 2) Knock-outs for rear cable entry M20
- 3) Opening for padlock with shackle diameter max. 6-8mm

### Dimensions



BEZO0212 rotary handle, BEZO0213 rotary handle for emergency stop for motor protection switches size 2

- 1) Knock-outs for M32 (left)
- 2) Knock-outs for M40 (right)
- 3) Knock-outs for rear cable entry M32
- 4) Opening for padlock with shackle diameter max. 6 ... 8mm

### Housings and Locking Plate for Motor Protection Switches

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Housings			
Insulated enclosure with membrane, size 00, IP55	BEZO	555 0-8	BEZ00012
Emergency Stop button for insulated enclosure, size 00, IP55	BEZO	000 0- 0	BEZ00013
Insulated enclosure with rotary handle, size 0, IP55	BEZO	000 0-0	BEZ00112
Insulated enclosure with rotary handle, size 2, IP55	BEZO		BEZ00212
Insulated enclosure with Emergency Stop, size 2, IP55	BEZO		BEZ00213
Locking plate			
Locking plate for 3 padlocks, size 00	BEZO		BEZ00014

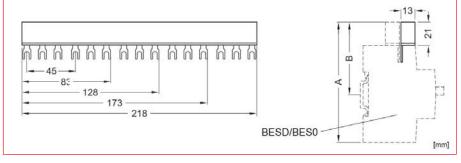
### Bus Bars for Motor Protection Switches



Schrack-Info

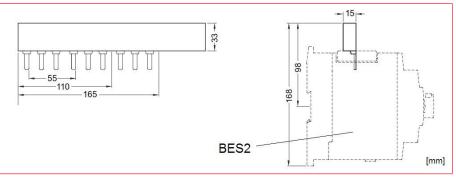
- Busbars for Motor protection switches without side mounted accessories, for size 00 up to 2
- Maximum rated current In for busbars size 00/0 ... 63A, for size 2 ... 108A
- Motor protection switches size 00 and 0 can not wired with the same busbar because of different position (hight) of their terminals
- Busbars for for Motor protection switches with side mounted auxiliary contacts on request
- Busbars for Motor protection switch with side mounted Signaling switch are not available
- Busbars for Motor protection switches of size 3 are not available

#### Dimensions



	Α	В
BESD	111	67
BESO	119	70

### Dimensions



DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Busbar for 2 BESD/BESO	BEZO	000 0-0	BEZ00017
Busbar for 3 BESD/BESO	BEZO	000 0-0	BEZ00018
Busbar for 4 BESD/BESO	BEZO	555 0- 8	BEZ00020
Busbar for 5 BESD/BESO	BEZO	000 0-0	BEZ00021
Busbar for 2 BES2	BEZO		BEZ00217
Busbar for 3 BES2	BEZO		BEZ00218

### Covers for Spare Places of Motor Protection Switches



#### Schrack-Info

• For covering of empty places of installation (spare places) at busbar (protection against contact)

BEZ00019

DESCRIPTION	TYPE NO. AVAILABLE	ORDER NO.
Cover for spare place size 00/0 (45mm)	BEZO	BEZ00019
Cover for spare place size 2 (55mm)	BEZO	BEZ00219

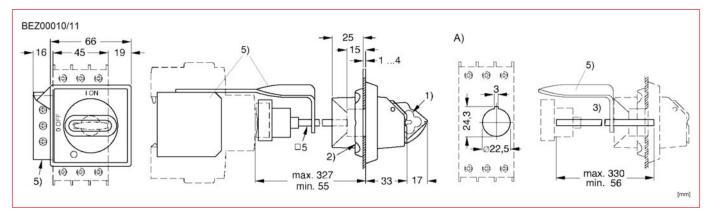
### Rotary Operating Mechanisms (Door Coupling) for Motor Protection Switches



### Schrack-Info

- Door couplig- rotary handles for Motor protection switches size 0 up to 3
- Available in black or for "Emergency Off" applications in red/yellow
- Included door(cover) interlock against opening the housing at position "ON" of Motor protection switch
- Lockable in "Off"-position with in maximum 3 padlocks, shackle diameter 8mm
- PE-terminal for wires up to 35mm<sup>2</sup> and support bracket for actuation axle included

#### Dimensions



BEZ00010/11 for motor protection switches size 0, 2, 3

Long shaft (with bracket)3)

A) Drilling pattern

- 1) Lockable in neutral position with max. 8mm shackle diameter.
- 2) Mounted with screw cap.
- 3) Supplied with a shaft length of 330mm; can be adjusted by shortening the shaft.
- 5) Grounding terminal 35mm<sup>2</sup> and sheet-metal bracket for shaft.

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Door coupling rotary handle for size 0-3	BEZO	000 0-0	BEZ00010
Door coupling rotary handle Emergency-Stop, for size 0-3	BEZO		BEZ00011

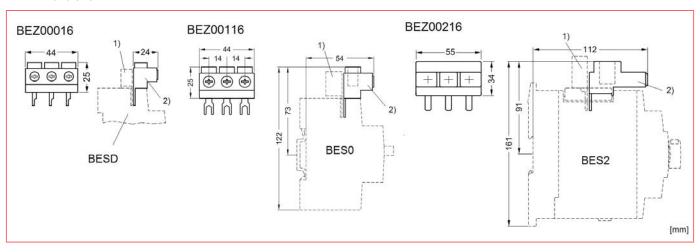
### Feed Terminals for Motor Protection Switches



#### Schrack-Info

- Feed terminals for busbar of Motor protection switch size 0 up to 2
- Feed terminals size 00 and 0 for in maximum Anschlussquerschnitt Ye and Ym 25mm², Yf 16mm²
- Feed terminals size 2 for in maximumen Anschlussquerschnitt Ye and Ym 50mm², Yf 35mm²
- For feeding busbar, centered (middle) position of terminal or when summary load current exceeds rated current of busbar - both sided arrangement of feeding terminals is recommended

#### Dimensions



- 1) Bus bars
- 2) Feed terminals

DESCRIPTION	TYPE NO.	AVAILABLE	ORDER NO.
Feed terminal 3-phase up to 25mm², for BES size 00	BEZO	355 0- 0	BEZ00016
Feed terminal 3-phase up to 25mm², for BES size 0	BEZO	000 0-0	BEZ00116
Feed terminal 3-phase up to 50mm², for BES size 2	BEZO		BEZ00216

### ■ Motor Protection Switches Series BES - Overview

Туре		BESD / BESO / BES2 / BES3			
Applications					
System protection		yes <sup>1)</sup>			
Motor protection			es		
Size		00, 0	, 2, 3		
Rated current In					
• Size 00		up to	12A		
• Size 0		up to	25A		
• Size 2		up to	50A		
• Size 3		up to	100A		
Rated operational voltage Ue according to IEC		690	VAC <sup>2)</sup>		
Rated frequency		50/	60Hz		
Trip class		Class 10			
Thermal overload release		0.11	0.16A		
		up to 80	100A		
Electronic trip units a multiple of the rated current		13 T	imes		
Short-circuit breaking capacity Icu at 400VAC		50/1	00kA		
Accessories for sizes	00	0	2	3	
Auxiliary switches	yes	yes	yes	yes	
Signalling switches		yes	yes	yes	
Undervoltage releases	yes	yes	yes	yes	
Shunt trip units	yes	yes	yes	yes	
Insulated three-phase busbar systems	yes	yes	yes		
Busbar adapters	yes	yes	yes	yes	
Door-coupling rotary operating mechanisms		yes	yes	yes	
Link modules	yes	yes	yes	yes	
Enclosures for surface mounting	yes	yes	yes		
Feed terminal	yes	yes	yes		

<sup>1)</sup> For symmetrical loading of the three phases

yes: Has this function or can use this accessory.

#### Mounting location and function

The BES motor protection switches have three main contact elements. In order to achieve maximum flexibility, auxiliary switches, signalling switches, auxiliary trip units and door coupling rotary operating mechanism can be supplied separately.

These components can be fitted as required on the motor protection switches without using tools.

Front side	Transverse auxiliary switches	An auxiliary switch block can be inserted transversely on the front.
Notes:	1 NO + 1 NC / 2 NO	The overall width of the motor protection switches remains unchanged.
A maximum of 4 auxiliary contacts with auxiliary switches can be attached to each motor protection switch.		
Left-hand side Notes:  A maximum of 4 auxiliary contacts with auxiliary switches can be attached to each motor protection switch. Auxiliary	Lateral auxiliary switches (2 contacts) 1 NO + 1 NC / 2 NO	One of the two auxiliary switches can be mounted laterally for each motor protection switches The contacts of the auxiliary switch close and open together with the main contacts of the motor protection switches. The overall width of the lateral auxiliary switch with 2 contacts is 9 mm.
can be attached to each motor protection switch. AUXIIIary switches (2 contacts) and signalling switches can be mounted separately or together.	Signalling switches for sizes 0, 2 and 3 Tripping 1 NO + 1 NC Short-circuit 1 NO + 1 NC	One signalling switch can be mounted at the side of each motor protection switches with a rotary operating mechanism. The signalling switch has two contact systems. One contact system always signals tripping irrespective of whether this was caused by a short-circuit, an overload or an auxiliary trip unit. The other contact system only switches in the event of a short-circuit. There is no signalling as a result of switching off with the handle. In order to be able to switch on the motor protection switches again after a short-circuit, the signalling switch must be reset manually after the error cause has been eliminated. The overall width of the signalling switch is 18mm.
Right-hand side Notes:	Shunt trip units	For remote-controlled tripping of the motor protection switches. The release coil should only be energized for short periods (see schematics).
	or	
One auxiliary trip unit can be mounted per motor protectior switch.	Undervoltage releases	Trips the motor protection switches when the voltage is interrupted and prevents the motor from being restarted accidentally when the voltage is restored. Used for remote-controlled tripping of the motor protection switches. Particularly suitable for the protection of the motor protection of the pro

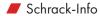


EMERGENCY-STOP disconnection by way of the corresponding EMERGENCY-STOP pushbutton according to DIN VDE 0113.

<sup>2) 500</sup>VAC with moulded-plastic enclosure

<sup>--:</sup> does not have this function or cannot use this accessory.

#### Motor Protection Switches Series BES - General Information



Motor Protection Switches BES are used for the switching and protecting of 3-phase motors up to 45kW at 400VAC, as well as for electrical consumers up to 100A.

#### TYPE OF CONSTRUCTION

The motor protection switches are available in four sizes:

- Size 00 width 45mm, max. rated current 12A,At 400VAC suitable for induction motors up to 5.5kW
- Size 0 width 45mm, max. rated current 25A,At 400VAC suitable for induction motors up to 11kW
- Size 2 width 55mm, max. rated current 50A, At 400VAC suitable for induction motors up to 22kW
- Size 3 width 70mm, max. rated current 100A, At 400VAC suitable for induction motors up to 45kW

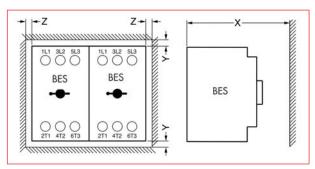
#### SCREW TERMINALS

BES motor protection switches of sizes 00 and 0 are fitted with terminals with captive screws and clamping pieces, allowing the connection of 2 conductors with different cross-sections. The box terminals of the size 2 and 3 motor protection switches also enable 2 conductors with different cross-sections to be connected. With the exception of size 3 motor protection switches which are equipped with 4 mm Allen screws, all terminal screws are tightened with a Pozidriv screwdriver size 2. The box terminals of the size 3 motor protection switches can be removed in order to connect conductors with cable lugs or connecting bars. A terminal cover is available as touch protection and to ensure that the required clearances and creepage distances are maintained if the box terminals are removed.

#### MOUNTING

The motor protection switches are snap-fitted an a 35mm standard mounting rail. A standard mounting rail with a height of 15mm is required for size 3 motor protection switches. A 75mm standard mounting rail can be used as an alternative for size 3. Size 2 and 3 motor protection switches can also be screwed directly onto a base plate. When mounting the motor protection switches, the following clearances must be maintained to grounded or live parts and to cable ducts made of molded plastic.





			Distance to grounded or				
Motor prote	ction switche	es / circuit breakers	live parts acc. To IEC 60947-2				
Type	Size	l <sub>e</sub>	Υ	Χ	Z		
		V	mm	mm	mm		
BESD	00	up to 690	20	70	9		
BESO	0	up to 500	30	90	9		
		up to 690	50	90	30		
BES2	2	up to 690	50	140	30		
BES3	3	up to 240	50	167	10		
		up to 440	70	167	10		
		up to 500	110	167	10		
		up to 690	150	167	30		

#### TRIP UNITS

BES motor protection switches are equipped with

- inverse-time delayed overload release based on the bimetal principle
- instantaneous electronic trip units (electromagnetic short-circuit releases).

The Motor protection switch BES can be adjusted to the rated current of the load.

Its short circuit release is automatically fixed to 13 times of rated current, to enable an unproblematic "running up" of the motor. When BES size 00 trips, its rocker changes to position "OFF", at BES size 0 up to size 3 the rotary operating handle changes to position "TRIP" and optical indicates a tripping.

Before switching on again, the handle has to be moved mechanical in the "OFF"-position, to prevent a unwanted switching on to an existing short circuit. The tripping of BES with rotary handle can a be monitored electrically by an additional signalling switch BEZ00005.

#### TRIP CLASSES

The trip classes of thermally delayed trip units are based on the tripping time (t A) at 7.2 times the set current in cold state (excerpt from IEC 60947-4):

• CLASS 10: 4 s < t A < 10 s

The motor protection switches must trip within this time!

#### OPERATING MECHANISMS

Size 00 motor protection switches are actuated by a rocker operating mechanism and size 0, 2 and 3 motor protection switches by a rotary operating mechanism. If the motor protection switches trips, the rotary operating mechanism switches to the tripped position to indicate this. Before the motor protection switches is reclosed, the rotary operating mechanism must be reset manually to the 0 position. Only then can the motor protection switches be set again to the I position. In the case of motor protection switches with rotary operating mechanisms, an electrical signal can be output by a signalling switch to indicate that the motor starter protector has tripped. All operating mechanisms can be locked in the 0 position with a padlock (shackle diameter 3.5 mm to 4.5 mm). The motor protection switches isolating function complies with IEC 60947-2.

#### PREVENTION OF UNINTENDED TRIPPING

In order to prevent premature tripping due to the integrated phase failure sensitivity, motor protection switches should always be connected to ensure current flows through all three main current paths.

#### SHORT-CIRCUIT PROTECTION

If a short-circuit occurs, the short-circuit releases of BES motor protection switches isolate the faulty load feeder from the network and thus prevent further damage. Motor protection switches with a short-circuit breaking capacity of 50 kA or 100 kA are virtually short-circuit resistant at a voltage of 400 V AC, since higher short-circuit currents are not to be expected in practice.

#### MOTOR PROTECTION

The tripping characteristics of BES motor protection switches are designed mainly to protect induction motors. The motor protection switches are therefore also referred to as motor circuit breakers. The rated current In of the motor to be protected is set on the setting scale. Factory setting of the short-circuit release is 13 times the rated current of the motor protection switches. This permits trouble-free starting and ensures that the motor is properly protected. The phase failure sensitivity of the motor protection switches ensures that it is tripped in time in the event of a phase failure and overcurrents that occur as a result in the other phases. Motor protection switches with thermal overload releases are normally designed in accordance with trip class 10.



### Motor Protection Switches Series BES - General Information

#### SYSTEM PROTECTION

The BES motor protection switches for motor protection are also suitable for plant protection. In order to prevent premature tripping due to phase failure sensitivity, the three conducting paths must always be uniformly loaded. The conducting paths must be connected in series the case of single-phase loads.

#### MAIN AND EMERGENCY-STOP SWITCHES

The BES motor protection switches comply with the isolating function to IEC 60947-2, therefore they can be used – taking IEC 60204-1 into account – as main and EMERGENCY-STOP switches. BES door-coupling rotary operating mechanisms for heavy duty also comply with the requirements for the isolating function.

#### **USE IN IT SYSTEMS (IT NETWORKS)**

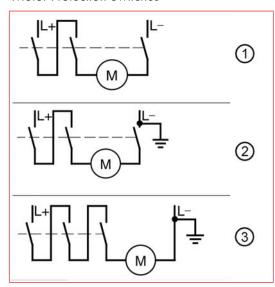
BES motor protection switches are suitable for operation in IT systems according to IEC 60947-2. In the event of a 3-pole short-circuit, their response in this system is the same as in others: Therefore, the same short-circuit breaking capacity  $I_{co}$  and  $I_{cs}$  applies, see "Technical specifications". An initial fault (ground fault) does not necessarily force immediate disconnection of the network when operating IT systems. If a second independent error occurs (ground fault), the switching capacity of the motor protection switches might be reduced. This is the case if both ground faults occur in different phases and if one of the ground faults occurs on the input side and the other on the outgoing terminal of the motor protection switches. In order to maintain the short-circuit function of the motor protection switches even with two independent ground faults (double ground faults), the reduced short-circuit breaking capacity with double ground faults must be taken into account in IT systems I culT (see "Technical specifications"). If a ground fault is instantaneously recognized and remedied (ground-fault monitoring), the risk of double ground fault and thus reduced short-circuit breaking capacity I culT can be minimized.

#### **SWITCHING OF DC CURRENTS**

BES motor protection switches for alternating currents are also suitable for DC switching. The maximum permissible DC voltage per conducting path must, however, be adhered to. Higher voltages require a series connection with 2 or 3 conducting paths. The response values of the overload release remain unchanged; the response values of a short-circuit release increase by approximately 30% for DC. The example circuits for DC switching can be seen in the table below.

#### Example Circuit for Size 00 to 3 BES

#### Motor Protection Switches



	Maximum permitted DC voltage U <sub>e</sub>	Notes
1	150VDC	2-pole switching, non-grounded system <sup>1)</sup>
		If there is no possibility of a ground fault, or if every ground fault is rectified immediately
		(ground-fault monitoring), then the maximum permitted DC voltage can be tripled.
2	300VDC	2-pole switching, grounded system
		The grounded pole is always assigned to the individual conducting path, so that there
		are always 2 conducting paths in series in the event of a ground fault.
3	450VDC	1-pole switching, grounded system
		3 conducting paths in series. The grounded pole is assigned to the unconnected
		conducting path.

1) It is assumed that this circuit always provides safe disconnection even in the event of a double ground fault that bridges two contacts.

### ■ Motor Protection Switches Series BES - Size 00 up to 3

This table shows the rated ultimate short-circuit breaking capacity  $l_{co}$  and the rated service short-circuit breaking capacity  $l_{co}$  of the BES motor protection switches with different inception voltages dependent of the rated current  $l_{co}$  of the motor protection switches. Motor protection switches infeed is permissible at the upper or lower terminals without restricting the rated data. If the short-circuit current at the place of installation exceeds the rated short-circuit breaking capacity of the motor protection switches as specified in the table, a back-up fuse is required. Alternatively, a motor protection switches with a limiter function can be connected upstream. The maximum rated current for the back-up fuse is specified in the tables. The rated ultimate short-circuit breaking capacity then applies as specified on the fuse.

Circuit breakers/ Motor starter	Rated current I <sub>n</sub>	Uį	o to AC	240V <sup>1)</sup>	Up to	AC 400	V <sup>1)</sup> /415V <sup>2)</sup>	Up to A	AC 440\	V <sup>1)</sup> /460V <sup>2)</sup>	Up to A	AC 500\	V <sup>1)</sup> /525V <sup>2)</sup>	Up	to AC	690V <sup>1)</sup>
protectors		I <sub>cu</sub>	I <sub>cs</sub>	max. fuse (gL/gG)	I <sub>cu</sub>	I <sub>cs</sub>	max. fuse (gL/gG) <sup>3)</sup>	I <sub>cu</sub>	l <sub>cs</sub>	max. fuse (gL/gG) <sup>3)</sup>	I <sub>cu</sub>	I <sub>cs</sub>	max. fuse (gL/gG) <sup>3)</sup>	I <sub>cu</sub>	l <sub>cs</sub>	max. fuse (gL/gG) <sup>3)</sup>
Туре	Α	kA	kA	Α	kA	kA	Α	kA	kA	Α	kA	kA	Α	kA	kA	Α
Size 00																
BESD	0.16 1	100	100	۰	100	100	٥	100	100	٥	100	100	۰	100	100	٥
	1.25; 1.6	100	100	۰	100	100	۰	100	100	0	100	100	۰	2	2	20
	2; 2.5	100	100	۰	100	100	۰	100	100	•	10	10	35	2	2	35
	3.2; 4	100	100	۰	100	100	٥	50	10	40	3	3	40	2	2	40
	5; 6.3	100	100	۰	100	100	۰	50	10	50	3	3	50	2	2	50
	8	100	100	۰	50	12.5	80	50	10	63	3	3	63	2	2	63
	10	100	100	۰	50	12.5	80	10	10	63	3	3	63	2	2	63
	12	100	100	۰	50	12.5	80	10	10	80	3	3	80	2	2	80
Size 0													•			
BESO	0.16 1.6	100	100	٥	100	100	٥	100	100	٥	100	100	۰	100	100	٥
	2; 2.5	100	100	٥	100	100	٥	100	100	٥	100	100	۰	8	8	25
	3.2	100	100	۰	100	100	٥	100	100	0	100	100	۰	8	8	32
	4; 5	100	100	٥	100	100	0	100	100	٥	100	100	۰	6	3	32
	6.3	100	100	٥	100	100	٥	100	100	٥	100	100	۰	6	3	50
	8	100	100	٥	100	100	٥	50	25	63	42	21	63	6	3	50
	10	100	100	٥	100	100	0	50	25	80	42	21	63	6	3	50
	12.5	100	100	٥	100	100	0	50	25	80	42	21	80	6	3	63
	16	100	100	٥	50	25	100	50	10	80	10	5	80	4	2	63
	20	100	100	۰	50	25	125	50	10	80	10	5	80	4	2	63
	22; 25	100	100	۰	50	25	125	50	10	100	10	5	80	4	2	63
Size 2																
BES2	16	100	100	٥	50	25	100	50	25	100	12	6	63	5	5	63
	20	100	100	۰	50	25	100	50	25	100	12	6	80	5	5	63
	25	100	100	۰	50	25	100	50	15	100	12	6	80	5	5	63
	32	100	100	۰	50	25	125	50	15	125	10	5	100	4	4	63
	40; 45	100	100	۰	50	25	160	50	15	125	10	5	100	4	4	63
	50	100	100	۰	50	25	160	50	15	125	10	5	100	4	4	80
Size 3	1															
BES3	40	100	100	0	50	25	125	50	20	125	12	6	100	6	3	63
	50	100	100	۰	50	25	125	50	20	125	12	6	100	6	3	80
	63	100	100	٥	50	25	160	50	20	160	12	6	100	6	3	80
	75	100	100	٥	50	25	160	50	20	160	8	4	125	5	3	100
	90; 100	100	100	0	50	25	160	50	20	160	8	4	125	5	3	125
	1,											· ·				

Short-circuit resistant up to at least 50kA



No back-up fuse required, since short-circuit resistant up to 100kA

<sup>1) 10%</sup> overvoltage.

<sup>2) 5%</sup> overvoltage.

<sup>3)</sup> Back-up fuse only required if the short-circuit current at the place of installation  $> l_{\rm cu}$ 

BES motor protection switches are suitable for operation in IT systems. Values valid for triple-pole short-circuit are Icu up to Icu. In case of double ground fault on different phases at the input and output side of a motor protection switches, the special short-circuit breaking capacity Icut applies. The specifications in the table below apply to BES motor protection switches. In the coloured areas, I<sub>cult</sub> is 100kA, or in some ranges it is 50kA. Therefore the motor protection switches are short-circuit resistant in these ranges. If the short-circuit current at the place of installation exceeds the rated short-circuit breaking capacity of the motor protection switches as specified in the table, a back-up fuse is required. The maximum rated current for the back-up fuse is specified in the tables. The rated short-circuit breaking capacity then applies as specified on the fuse.

Motor starter	Rated current	Up to AC	240V <sup>1)</sup>	Up to AC 40	00V <sup>1)</sup> /415V <sup>2)</sup>	Up to AC 50	00V <sup>1)</sup> /525V <sup>2)</sup>	Up to A	C 690V1)
protectors	I <sub>n</sub>	I <sub>culT</sub>	Max. fuse (gL/gG) <sup>3)</sup>	I <sub>culT</sub>	Max. fuse (gL/gG) <sup>3)</sup>	I <sub>cult</sub>	Max. fuse (gL/gG) <sup>3)</sup>	I <sub>culT</sub>	Max. fuse (gL/gG) <sup>3)</sup>
Туре	Α	kA	A	kA	A	kA	A	kA	A
Size 00			'				1		
BESD	0.16 0.63	100	۰	100	٥	100	0	100	0
	0.8; 1	100	0	100	0	100	0	2	16
	1.25; 1.6	100	0	2	20	2	20	2	20
	2; 2.5	100	0	2	35	2	35	2	35
	3.2; 4	100	0	2	40	2	40	2	40
	5; 6.3	100	0	2	50	2	50	2	50
	8; 10	50	80	2	63	2	63	2	63
	12	50	80	2	80	2	80	2	80
Size 0	•				•				
BESO	0.16 0.63	100	۰	100	0	100	٥	100	0
	0.8; 1	100	0	100	0	100	0	6	16
	1.25; 1.6	100	0	100	0	8	20	6	20
	2; 2.5	100	0	8	25	8	25	6	25
	3.2	100	0	8	32	8	32	6	32
	4; 5	100	0	6	32	4	32	3	32
	6.3 10	100	0	6	50	4	50	3	50
	12.5	100	0	6	63	4	63	3	63
	1625	50	80	4	63	3	63	2	63
Size 2	•				•		•		
BES2	16	50	100	8	100	6	80	5	63
	20	50	125	8	100	6	80	5	63
	25	50	125	8	100	6	80	5	63
	32	50	125	6	125	4	100	3	80
	40 50	50	160	6	125	4	100	3	80
Size 3	•				•				
BES3	40	50	125	10	63	5	50	5	50
	50	50	125	8	80	3	63	3	63
	63	50	160	6	80	3	63	3	63
	75	50	160	5	100	2	80	2	80
	90; 100	50	160	5	125	2	100	2	100

Short-circuit resistant up to at least 50kA

445

No back-up fuse required, since short-circuit resistant up to 100kA

<sup>1) 10%</sup> overvoltage.

<sup>2) 5%</sup> overvoltage.

<sup>3)</sup> Back-up fuse only required, if short-circuit current at the place of installation  $> I_{\text{culT}}$ .

# ■ Motor Protection Switches Series BES - Size 00 up to 3

General technical specifications Type			BESD	BESO	BES2	BES3
tandards					-102	, 5130
<ul> <li>IEC 60947-1, EN 60947-1 (VDE 0660 F</li> </ul>	Part 100)			,	/es	
• IEC 60947-1, EN 60947-1 (VDE 0660 F	·				es /es	
• IEC 60947-4-1, EN 60947-4-1 (VDE 060)	·				es /es	
,	102)					
• UL489, CSA C22.2-No.5-02			00		No.	1 0
Size			00	0	2	3
Number of poles					3	
Max. rated current I <sub>n</sub> max (= max. rated ope	rational current I <sub>e</sub> )	A	12	25	50	100
Permissible ambient temperature						
<ul> <li>Storage/transport</li> </ul>		°C		-50	+80	
Operation		°C		-20.	+70 <sup>2)</sup>	
Permissible rated current at inside temperatu	re of control cabinet					
• +60°C		%		1	00	
• +70°C		%		8	37	
Motor protection switches/circuit breaker in	side enclosure					
Permissible rated current at ambient temper						
• +35°C		%		1	00	
• +60°C		%			37	
Rated operational voltage U <sub>e</sub>		/0				
Acc. to IEC		VAC		٨.	90 <sup>3)</sup>	
Acc. to UL/CSA		VAC			00	
Rated frequency		Hz			/60	
Rated insulation voltage U <sub>i</sub>		V			90	
Rated impulse withstand voltage U <sub>imp</sub>		kV			6	
Jtilization categories						
<ul> <li>IEC 60947-2 (motor protection switches/</li> </ul>	circuit breaker)				A	
• IEC 60947-4-1 (motor starter)				A	C-3	
Trip class CLASS Acc. to IEC60947-4-1				10		
OC short-circuit breaking capacity (time cons	stant t = 5ms)					
<ul> <li>1 conducting path 150VDC</li> </ul>		kA			10	
<ul> <li>2 conducting paths in series 300VDC</li> </ul>		kA			10	
<ul> <li>3 conducting paths in series 450VDC</li> </ul>		kA			10	
Power loss Pv per motor starter	I₀: 1.25A	W	5			
protector/circuit breaker	I <sub>n</sub> : 1.6 6.3A	w	6			
Dependent on rated current In	I <sub>n</sub> : 8 12A	w	7			
•	"	<u> </u>		-	1	
upper setting range)	I <sub>n</sub> : 0.63A	W		5	1	
	I <sub>n</sub> : 0.8 6.3A	W		6		
R <sub>per conducting path</sub> = P/I <sup>2</sup> x 3	I <sub>n</sub> : 8 16A	W		7		
	I <sub>n</sub> : 20 25A	W		8		
	I <sub>n</sub> : 25A	W			12	
	I <sub>n</sub> : 32A	W			15	
	I <sub>n</sub> : 40 50A	W			20	
	I <sub>a</sub> : 63A	W				20
	In: 75 and 90A	w				30
		W				+
the also we also we are	I <sub>n</sub> : 100A			25 / 11 /	and the Color	38
shock resistance	Acc. to IEC 60068-2-27	g/ms			e and sine pulse)	
Degree of protection	Acc. to IEC 60529				204)	
ouch protection	Acc. to EN 50274				er-safe	
emperature compensation	Acc. to IEC 60947-4-1	°C			+60	
Phase failure sensitivity	Acc. to IEC 60947-4-1				/es	
solating function	Acc. to IEC 60947-2				/es	
Main and EMERGENCY-STOP switch	Acc. to IEC 60204-1			١	/es	
haracteristics <sup>5)</sup>	(VDE 0113)					
afe isolation between main and	Acc. to EN 60947-1					
auxiliary circuits, req. for PELV applications	ACC. 10 LIN 00747-1					
• Up to 400V + 10%				`	⁄es	
•				ì	/es	
<ul> <li>Up to 415V + 5% (higher voltages on requ</li> </ul>	Jestj	-		150101:-	Laure 1 1	
<ul> <li>Up to 415V + 5% (higher voltages on requ</li> <li>Permissible mounting positions</li> </ul>	Jestj	_			mmand "I" right-hand	
Up to 415V + 5% (higher voltages on requermissible mounting positions  Mechanical endurance	Jest)	Operating cycles	100	0000	50	000
<ul> <li>Up to 415V + 5% (higher voltages on requ</li> <li>Permissible mounting positions</li> </ul>	Jestj	Operating cycles Operating cycles	100		50	

<sup>2)</sup> Above +60°C current reduction.



<sup>3) 500</sup>V with moulded-plastic enclosure.

<sup>4)</sup> Terminal compartment IPOO.

<sup>5)</sup> With appropriate accessories.

### ■ Motor Protection Switches Series BES - Size 00 up to 3

Туре		BESD	BESO	BES2	BES3	
Connection type	Screw to	erminals	Screw terminals with box terminals			
Terminal screw	Pozidri	v size 2	Pozidriv size 2	4mm Allen screw		
Prescribed tightening torque	Nm	0.81.2	22.5	34.5	46	
Conductor cross-sections (1 or 2 conductors connectable)						
• Solid	mm <sup>2</sup>	$2 \times (0.5 \ 1.5)^{4}$ $2 \times (0.75 \ 2.5)^{4}$	2 x (1 2.5) <sup>4)</sup> 2 x (2.5 6) <sup>4)</sup>	2 x (0.75 16)	2 x (2.5 16)	
Finely stranded with end sleeve	mm <sup>2</sup>	2 x (0.5 1.5) <sup>4)</sup> 2 x (0.75 2.5) <sup>4)</sup>	2 x (1 2.5) <sup>4)</sup> 2 x (2.5 6) <sup>4)</sup>	2 x (0.75 16), 1 x (0.75 25)	2 x (2.5 35), 1 x (2.5 50)	
• Stranded	mm <sup>2</sup>	2 × (0.5 1.5) <sup>4)</sup> 2 × (0.75 2.5) <sup>4)</sup>	1 x (1 2.5) <sup>4)</sup> 2 x (2.5 6)	2 x (0.75 25), 1 x (0.75 35)	2 x (1050), 1 x (1050)	
AWG cables, solid or stranded	AWG	2 x (18 14)	2 x (14 10)	2 x (18 2), 1 x (18 2)	2 x (10 1/0), 1 x (10 2/0)	
Ribbon cable conductors (number x width x thickness)	mm		-	2 x (6 x 9 x 0.8)		
Removable box terminals <sup>1)</sup> • With copper bars <sup>2)</sup> • With cable lugs <sup>3)</sup>					18 x 10 up to 2 x 70	
Connection type			Cage Clamp ter	minals on request		
Conductor cross-sections (1 or 2 conductors connectable)				i i		
• Solid	mm <sup>2</sup>	2 x (0.25 2.5)				
<ul> <li>Finely stranded with end sleeve</li> </ul>	mm <sup>2</sup>	2 x (0.25 1.5)				
<ul> <li>Finely stranded without end sleeve</li> </ul>	$mm^2$	2 x (0.25 2.5)				
<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	2 x (24 14)				
Max. external diameter of the cable insulation	mm		3	3.6		

<sup>1)</sup> Cable-lug and busbar connection possible after removing the box terminals.

<sup>2)</sup> If bars larger than 12mmx10mm are connected, a terminal cover is needed to comply with the phase clearance (on request).

3) If conductors larger than 25mm² are connected, a terminal cover is needed to comply with the phase clearance (on request).

<sup>4)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

If identical cross-sections are used, this restriction does not apply.

### Motor Protection Switches Series BES - Size 00 up to 3

Motor protection switches of the BES series are approved for UL/CSA and according to UL 508 and CSA C22.2 No. 14 they can be used on their own or as a load feeder in combination with a contactor. These motor protection switches can be used as "Manual Motor Controllers" for "Group Installations", as

"Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" and as "Self-Protected Combination Motor Controllers" (Type E).

#### BES motor protection switches as "Manual Motor Controllers"

If used as a "Manual Motor Controller", the motor protection switches is always operated in combination with an upstream short-circuit protection device. Approved fuses or a circuit breaker according to UL489/CSAC22.2 No. 5-02 can be used. These devices must be dimensioned according to the National Electrical Code (UL) or Canadian Electrical Code (CSA).

Motor protection switches		hp rating	1) for FLA <sup>2)</sup>	Rated current	240	OVAC	480	VAC	600	VAC
3Wildies		m	ax.	I <sub>n</sub>	UL I <sub>bc</sub> <sup>3)</sup>	CSA I <sub>bc</sub> <sup>3)</sup>	UL I <sub>bc</sub> <sup>3)</sup>	CSA I <sub>bc</sub> <sup>3)</sup>	UL I <sub>bc</sub> <sup>3)</sup>	CSA I <sub>bc</sub> <sup>3)</sup>
Туре	V	1-phase	3-phase	A	kA	kA	kA	kA	kA	kA
Size 00	<u> </u>									
BESD				0.16 2	65	65	65	65	10	10
				2.5	65	65	65	65	10	10
FLA <sup>2)</sup> max. 12A,	115	1/2		3.2	65	65	65	65	10	10
600V	200	1 1/2	3	4	65	65	65	65	10	10
NEMA size 00	230	2	3	5	65	65	65	65	10	10
	460		7 1/2	6.3	65	65	65	65	10	10
	575/600		10	8	65	65	65	65	10	10
				10	65	65	65	65	10	10
				12	65	65	65	65	10	10
Size 0										
BESO				0.16 3.2	65	65	65	65	30	30
				4	65	65	65	65	30	30
FLA <sup>2)</sup> max. 25A,	115	2		5	65	65	65	65	30	30
600V	200	3	5	6.3	65	65	65	65	30	30
NEMA size 1	230	3	7 1/2	8	65	65	65	65	30	30
	460		15	10	65	65	65	65	30	30
	575/600		20	12.5	65	65	65	65	30	30
				16	65	65	65	65	10	10
				20	65	65	65	65	10	10
				22	65	65	65	65	10	10
				25	65	65	65	65	10	10
Size 2										
BES2				16	65	65	65	65	30	25
				20	65	65	65	65	30	25
FLA <sup>2)</sup> max. 50A,	115	3		25	65	65	65	65	30	25
600V	200	7 1/2	15	32	65	65	65	65	30	25
NEMA size 2	230	10	20	40	65	65	65	65	30	25
	460		40	45	65	65	65	65	30	25
	575/600		50	50	65	65	65	65	30	25
Size 3										
BES3				16	65	65	65	65	30	30
				20	65	65	65	65	30	30
FLA <sup>2)</sup> max. 99A,	115	7 1/2		25	65	65	65	65	30	30
600V	200	20	30	32	65	65	65	65	30	30
NEMA size 3	230	20	40	40	65	65	65	65	30	30
	460		75	50	65	65	65	65	30	30
	575/600		100	63	65	65	65	65	30	30
				75	65	65	65	65	30	30
				90	65	65	65	65	10	10
				100	65	65	65	65	10	10

<sup>1)</sup> hp rating = Power rating in horse power (maximum motor rating).

<sup>3)</sup> Complies with "short-circuit breaking capacity" according to UL.



<sup>2)</sup> FLA = Full Load Amps/Motor full load current.

### ■ Motor Protection Switches Series BES - Size 00 up to 3

The application "Manual Motor Controllers" is only accepted by UL. CSA does not recognize this approval!

When application "Manual Motor Controllers" according CSA is prescribed - an upstream short-circuit protection device - e.g. a certified pre-fuse or a motor protection switch according UL489 has to be used. These devices must apply to the current national regulations.

Circuit breaker		hp rating Max.	1) for FLA <sup>2)</sup>	Rated current	240VAC UL I <sub>bc</sub> <sup>3)</sup>	Up to 480VAC UL I <sub>bc</sub> <sup>3)</sup>	Up to 600VAC UL Ibc <sup>3)</sup>
Туре	l v	1-phase	3-phase	A	kA	kA	kA
Size 00	'	ļ				-	
BESD				0.16 0.8	65	65	10
				1	65	65	10
FLA <sup>2)</sup> max. 8A,	115	1/3		1.25	65	65	10
480V	200	3/4	2	2	65	65	10
NEMA size 0	230	1	2	2.5	65	65	10
	460		5	3.2	65	65	10
	575/600			4	65	65	10
	0.0,000			5	65	65	10
				6.3	65	65	10
				8	65	65	10
Size 0							
BESO				0.16 1.6	65	65	30
DE30				2	65	65	30
FLA <sup>2)</sup> max.	115	2		2.5	65	65	30
22A, 480V	200	3	5	3.2	65	65	30
12.5A, 600V	230	3	7 1/2	4	65	65	30
12.5A, 600V	460		15	5	65	65	30
NEMA size 1	575/600		10	6.3	65	65	30
NEMA SIZE I	3/3/800		10	8	65	65	30
				10	1		
					65	65	30
<u>c'</u> 0				12.5	65	65	30
Size 2			1				
BES3				16	65	65	25
2)				20	65	65	25
FLA <sup>2)</sup> max.	115	3		25	65	65	25
50A, 600V	200	7 1/2	15	32	65	65	25
NEMA size 2	230	10	20	40	65	65	25
	460		40	45	65	65	25
	575/600		50	50	65	65	25
Size 3			1		1		1
BES4				16	65	65	30
				20	65	65	30
FLA <sup>2)</sup> max.	115	7 1/2		25	65	65	30
100A, 480V	200	20	30	32	65	65	30
75A, 600V	230	20	40	40	65	65	30
	460		75	50	65	65	30
NEMA size 3	575/600		75	63	65	65	30
				75	65	65	30
				90	65	65	
				100	65	65	

<sup>1)</sup> hp rating = Power rating in horse power (maximum motor rating).

<sup>2)</sup> FLA = Full Load Amps/Motor full load current.

<sup>3)</sup> Complies with "short-circuit breaking capacity" according to UL.

# ■ Motor Protection Switches Series BES - Accessories

		Lateral auxiliary switches	
Туре		with 1NO + 1NC	Transverse auxiliary switches with
		and signalling switch	1NO + 1NC
Max. rated voltage			
Acc. to NEMA (UL)	VAC	600	250
Acc. to NEMA (CSA)	VAC	600	250
Uninterrupted current	A	10	2.5
Switching capacity		A600	C300
		Q300	R300

Front transverse auxiliary switches (front mo	unted)	Switching capacity for different voltages 1NO + 1NC, 2NO				
Rated operational current I <sub>e</sub>						
At AC-15, alternating voltage						
- 24V	Α	2				
- 230V	Α	0.5				
- 400V	Α					
- 690V	Α					
At AC-12 = I <sub>th</sub> , alternating Voltage						
- 24V	Α	2.5				
- 230V	Α	2.5				
- 400V	Α					
- 690V	Α					
<ul> <li>At DC-13, direct voltage L/R 200ms</li> </ul>						
- 24V	Α	1				
- 48V	Α	0.3				
- 60V	Α	0.15				
- 110V	Α					
- 220V	Α					
Minimum load capacity	٧	17				
	mA	1				

Lateral auxiliary switches and signalling sw mounted)	itch (side	Switching capacity for different voltages					
		1 NO + 1 NC, 2 NO and signalling switch					
Rated operational current I <sub>e</sub>	Rated operational current I <sub>e</sub>						
At AC-15, alternating Voltage							
- 24V	Α	6					
- 230V	Α	4					
- 400V	Α	3					
- 690V	Α	1					
At AC-12 = I <sub>th</sub> , alternating Voltage							
- 24V	Α	10					
- 230V	Α	10					
- 400V	Α	10					
- 690V	Α	10					
At DC, direct Voltage L/R 200 ms							
- 24V	Α	2					
- 110V	Α	0.5					
- 220V	Α	0.25					
- 440V	Α	0.1					
Minimum load capacity	٧	17					
•	mA	1					

Auxiliary trip units		Undervoltage release	Shunt trip unit
Power consumption			
During pick-up			
- AC voltages	VA/W	20.2 / 13	20.2 / 13
- DC voltages	W	20	13 80
During continuous duty			
- AC voltages	VA/W	7.2 / 2.4	
- DC voltages	W	2.1	
Response voltage			
Tripping	V	0.35 0.7 x U <sub>s</sub>	
• Pickup	V	0.85 1.1 x U <sub>s</sub>	0.7 1.1 x U <sub>s</sub>
Maximum opening time	ms	20	

### ■ Motor Protection Switches Series BES - Accessories

Melting fuses gL/gG	Α	10				
Miniature circuit breaker, C characteristic	Α	6 Prospective short-circuit current < 0.4 kA				
Conductor cross-sections for auxiliary and control circuits						
Connection type		Screw terminals				
Terminal screw		Pozidriv size 2				
Prescribed tightening torque	Nm	0.8 1.2				
Conductor cross-sections (1 or 2 conductors)						
• Solid	$mm^2$	$2 \times (0.5 \dots 1.5)^{11}/2 \times (0.75 \dots 2.5)^{11}$				
Finely stranded with end sleeve	$mm^2$	$2 \times (0.5 \dots 1.5)^{11}/2 \times (0.75 \dots 2.5)^{11}$				
• Stranded	$mm^2$	$2 \times (0.5 \dots 1.5)^{11}/2 \times (0.75 \dots 2.5)^{11}$				
AWG cables	AWG	2 x (18 14)				
Connection type		Cage Clamp terminals (on request)				
Conductor cross-sections (1 or 2 conductors connectable)						
• Solid	$mm^2$	2 x (0.25 2.5)				
Finely stranded with end sleeve	$mm^2$	2 x (0.25 1.5)				
Finely stranded without end sleeve	$mm^2$	2 x (0.25 2.5)				
<ul> <li>AWG cables, solid or stranded</li> </ul>	AWG	2 x (24 14)				
Max. external diameter of the cable insulation	mm	3.6				

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

### ■ Motor Protection Switches Series BES - Characteristic Curve

The time/current characteristic, the current limiting characteristics and the  $1^2$ t characteristic curves were determined according to DIN VDE 0660 and IEC 60947.

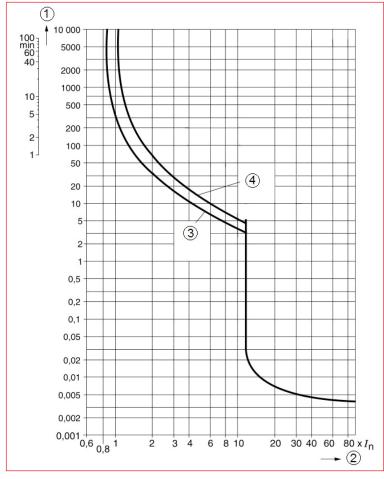
The tripping characteristic applies to the time/current characteristic of DC and AC with a frequency of 0Hz to 400Hz

The characteristic curves apply to the cold state. At operating temperature, the tripping times of the thermal trip units are reduced to approximately 25%.

Under normal operating conditions, all three poles of the device must be loaded. To protect single-phase or DC loads, the current paths must be connected in series.

The shown characteristic curve for the motor protection switch BES is a typical, individual curves for all ranges are available (on request).

### Representation of Typical Time / Current Characteristic of BES



- 1) Opening time
- 2) Current
- 3) 2-pole loading Class 10
- 4) 3-pole loading Class 10

Solid State Contactor



Solid State Reversing Contactor for Starting of 3-phase Motors



Solid State Contactors for Analog Controlled Torque Limiters Starting of Motors





Softstarter, 2-phase Controlled with Integrated Bypass



■ Softstarter, 3-phase Controlled



# Solid State Contactors

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### Solid State Contactor, Single Phase Controlled

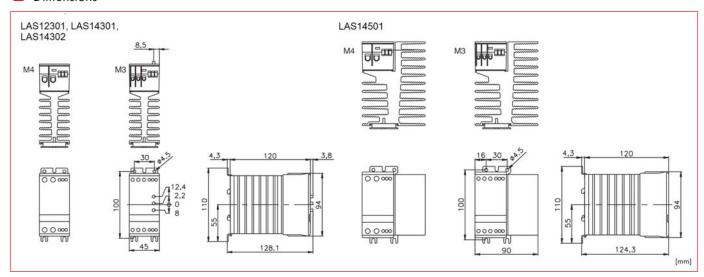


### Schrack-Info

- Solid state contactors products of Schrack are designed for applications, where silently and bouncefree switching is advantageous and long life span without EMC problems in service is claimed.
- The noninductive drive and the switching at zero-crossing of voltage are further features that prevents undefined switching status which are caused by conventional, mechanical contactors. Solid state contactors applies to actuating drives, power units with frequently Stop/Start processes as well as to drives with frequently change of rotation direction

	LAS 12301	LAS12301 LAS14301 LAS14302 LAS1450						
Main contacts								
Operational voltage	12-240VAC 50/60Hz		24-480VAC 50/60Hz	2				
Operational current AC-1/51	30A	30A	30A	50A				
Operational current AC-3			15A					
Operational current AC-55b		2	20A					
Operational current AC-56a			15A					
Control								
Control voltage	5-24VDC	5-24VDC	24-230VAC/DC	5-24VDC				
min. response voltage	4.25VDC	4.25VDC	20.4VAC/DC	4.25VDC				
min. dropout voltage	1.5VDC	1.5VDC	7.2VAC/DC	1.5VDC				
Thermal and mechanical characteristic								
Power loss at PD max.		1.2	W/A					
Power loss at periodic duty		1.2W/A x	operating cycle					
Cooling	natural convection							
Mounting	vertical +/- 30°							
Mounting distance - vertical mounting	Omm / horizontal min. 80mm							
Mounting distance - horizontal mounting	max. 50% operational currents at 0mm (not recommended)							
Operating temperature range according to EN60947-4-3	-5 up to 40°C							
Storage temperature range according to EN60947-4-3	-20 up to 80°C							
max. operating temperature		60°C						
Derating	10	00% at 40°C, 80%	at 50°C, 70% at 60°C	2				
Width	45mm	45mm	45mm	90mm				
Height	94mm	94mm	94mm	94mm				
Depth	128.1 mm	128.1 mm	128.1 mm	124.3mm				
Protective equipment								
Short-circuit protection Installation - fuse		max. 5	OA gL/gG					
Short-circuit protection Installation and solid-state contactors - fuse		max.	1800A <sup>2</sup> s					
Thermal overload protection		optiona	l: LASUP62					

### Dimensions



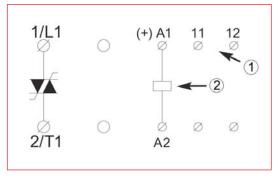


### Solid State Contactor, Single Phase Controlled

Wiring Connections (Module 45/90mm) Wiring type with or without cable/sleeves and other type of terminals *UL tested	. []		шшб	mm g	mmg	ww.g	*		
L1 T1 / L2 T2 / L3 T3	1 x 1.5 - 6	2 x 1.5 - 6	1 x 1.5 - 16	2 x 1.5 - 6	1 x 1 - 16	2 x 1 - 6	N.A.	Pozidriv 2	6mm
M4 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	1.2Nm Max.	1.2Nm Max.
L1 T1 / L2 T2 / L3 T3	1 x 0.75 - 4	2 x 1	1 x 0.75 - 6	2 x 0.75 - 2,5	1 x 0.75 - 6	2 x 0.75 - 1.5	NI A	Pozidriv 1	4mm
M3 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	N.A.	0.5Nm Max.	0.5Nm Max.
A1 A2 / 11 12	1 x 0.5 - 1.5	2 x 0.5 - 0.75	1 x 0.5 - 1.5	2 x 0.5 - 1.5	1 x 0.5 - 1.5	2 x 0.5 - 1.5	N.A.	N.A.	3mm
Input terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	IN.A.	0.5Nm Max.

Important: When using electric or pneumatic tools for screw terminals observe the maximum torque limits

### Circuit Diagram



- Rated operational current up to 63A AC-1
- 1) for LASUP62 (see "Accessories for Solid State Contactors and Controllers")
- 2) Control voltage A1-A2

DESCRIPTION	AVAILABLE	ORDER NO.
30A		
30A/12-230VAC, control voltage 5-24VDC		LAS 12301
30A/24-480VAC, control voltage 5-24VDC	999 6-	LAS14301
30A/24-480VAC, control voltage 24-230VAC/DC	933 0- 9	LAS14302
50A		
50A/24-480VAC, control voltage 5-24VDC	355 0-4	LAS14501

### Solid State Contactors, 2-phase Controlled



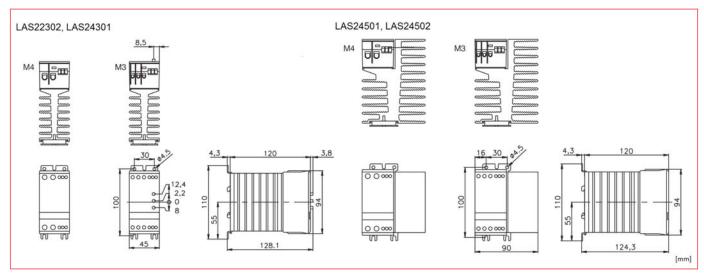
### Schrack-Info

- Solid state contactors products of Schrack are designed for applications, where silently and bouncefree switching is advantageous and long life span without EMC problems in service is claimed
- The noninductive drive and the switching at zero-crossing of voltage are further features that prevents undefined switching status - which are caused by conventional, mechanical contactors. Solid state contactors applies to actuating drives, power units with frequently Stop/Start processes as well as to drives with frequently change of rotation direction

LAS2

	LAS22302	LAS24301	LAS24501	LAS24502
Main contacts				•
Operational voltage	12-240VAC 50/60Hz		24-480VAC 50/60H	Z
Operational current AC-1/51	30A (2x	15A)	50A	(2x25A)
Operational current AC-3		15A (:	2×7.5A)	
Operational current AC-55b		20A (	2x10A)	
Operational current AC-56a		7A (2	x3.5A)	
Control				
Control voltage	24-230VAC/DC	5-24VDC	5-24VDC	24-230VAC/DC
min. response voltage	20.4VAC/DC	4,25VDC	4,25VDC	20.4VAC/DC
min. dropout voltage	7.2VAC/DC	1.5VDC	1.5VDC	7.2VAC/DC
Thermal and mechanical characteristic				
Power loss at PD max.		2.2	W/A	
Power loss at periodic duty		2.2W/A x c	perating cycle	
Cooling		natural c	convection	
Mounting		vertical	+/- 30°	
Mounting distance - vertical mounting		0mm / horizo	ntal min. 80mm	
Mounting distance - horizontal mounting	max.	50% operational curre	nt at 0mm (not recomme	nded)
Operating temperature range according to EN60947-4-3		-5 up	to 40°C	
Storage temperature range according to EN60947-4-3		-20 up	to 80°C	
max. operating temperature		60	D°C	
Derating		100% at 40°C, 80%	at 50°C, 70% at 60°C	
Width	45mm	45mm	90mm	90mm
Height	94mm	94mm	94mm	94mm
Depth	128.1 mm	128.1 mm	124.3mm	124.3mm
Protective gear				
Short-circuit protection installation - fuse		max. 50	A gL/gG	
Short-circuit protection Installation and solid-state contactors - fuse		max.	1800A <sup>2</sup> s	
Thermal overload protection		optional	: LASUP62	

#### Dimensions



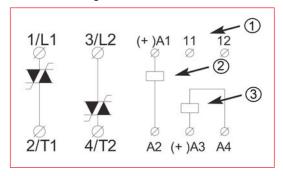


### Solid State Contactors, 2-phase Controlled

Wiring Connections (Module 45/90mm) Wiring type with or without cable/sleeves and other type of terminals *UL tested			mm 6	шшб	ww.6	<u> </u>	*		
L1 T1 / L2 T2 / L3 T3	1 x 1.5 - 6	2 x 1.5 - 6	1 x 1.5 - 16	2 x 1.5 - 6	1 x 1 - 16	2 x 1 - 6	N.A.	Pozidriv 2	6mm
M4 Power terminals	$mm^2$	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	1.2Nm Max.	1.2Nm Max.
L1 T1 / L2 T2 / L3 T3	1 x 0.75 - 4	2 x 1	1 x 0.75 - 6	2 x 0.75 - 2,5	1 x 0.75 - 6	2 x 0.75 - 1.5	NI A	Pozidriv 1	4mm
M3 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	N.A.	0.5Nm Max.	0.5Nm Max.
A1 A2 / 11 12	1 x 0.5 - 1.5	2 × 0.5 - 0.75	1 x 0.5 - 1.5	2 x 0.5 - 1.5	1 x 0.5 - 1.5	2 x 0.5 - 1.5	NI A	NI A	3mm
Input terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	N.A.	N.A.	0.5Nm Max.

Important: When using electric or pneumatic tools for screw terminals observe the maximum torque limits

### Circuit Diagram



Rated operational current up to 50A AC-1 / 2x15 A AC-3 Two independent single-pole contactors in one housing

1) for LASUP62 (see "Accessories for Solid State Contactors and Controllers")

- 2) Control voltage A1-A2
- 3) Control voltage A3-A4

DESCRIPTION	AVAILABLE	ORDER NO.
30A		
2-pole, 2x15A/1x30A/12-230VAC, control voltage 24-230VAC/DC		LAS22302
2-pole, 2x15A/1x30A/24-480VAC, control voltage 5-24VDC		LAS24301
50A		
2-pole, 2x25A/1x50A/24-480VAC, control voltage 5-24VDC		LAS24501
2-pole, 2x25A/1x50A/24-480VAC, control voltage 24-230VAC/DC		LAS24502

### Solid State Contactors, 3-phase Controlled





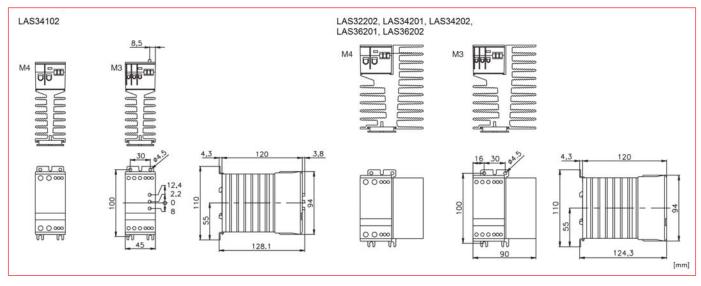
LAS34201

### Schrack-Info

- Solid state contactors products of Schrack are designed for applications, where silently and bounce-free switching is advantageous and long life span without EMC problems in service is claimed
- The noninductive drive and the switching at zero-crossing of voltage are further features that prevents undefined switching status - oftentimes caused by conventional, mechanical contactors. Solid state contactors applies to actuating drives, power units with frequently Stop/Start processes as well as to drives with frequently change of rotation direction

	LAS32202	LAS34102	LAS34201	LAS34202	LAS36201	LAS36202
Main contacts			•			•
Operational voltage	12-240VAC 50/60Hz	2	4-480VAC 50/60	)Hz	48-600VAC 50/60Hz	
Operational current AC-1/51	20A	10A	20A	20A	20A	20A
Control						
Control voltage	24-230	VAC/DC	5-24VDC	24-230VAC/DC	5-24VDC	24-230VAC/DC
min. response voltage	20.4\/	AC/DC	4.25VDC	20.4VAC/DC	4.25VDC	20.4VAC/DC
min. dropout voltage	7.2VA	C/DC	1.5VDC	7.2VAC/DC	1.5VDC	7.2VAC/DC
Thermal and mechanical characteristic						
Power loss at PD max.			3.3	BW/A		
Power loss at periodic duty			3.3W/A x	operating cycle		
Cooling			natural	convection		
Mounting			vertico	ıl +/- 30°		
Mounting distance - vertical mounting			0mm / horiz	ontal min. 80mm		
Mounting distance - horizontal mounting		max. 50'	% operational curre	ents at 0mm (not recom	mended)	
Operating temperature range according to EN60947-4-3			-5 up	to 40°C		
Storage temperature range according to EN60947-4-3			-20 u	p to 80°C		
max. operating temperature			6	0°C		
Derating		10	00% at 40°C, 80%	at 50°C, 70% at 60°	,C	
Width	90mm	45mm	90mm	90mm	90mm	90mm
Height	94mm	94mm	94mm	94mm	94mm	94mm
Depth	124.3mm	128.1 mm	124.3mm	124.3mm	124.3mm	124.3mm
Protective gear			•			•
Short-circuit protection Installation - fuse	max. 50A gL/gG					
Short-circuit protection Installation and solid-state contactors	max. 450A <sup>2</sup> s					
- fuse			max.	45UA S		
Thermal overload protection			optiona	l: LASUP62		

### Dimensions



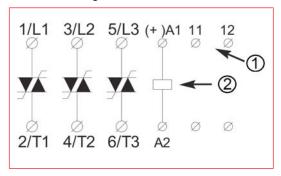


### Solid State Contactors, 3-phase Controlled

Wiring Connections (Module 45/90mm) Wiring type with or without cable/sleeves and other type of terminals *UL tested			9 0 0	шшб	auu b	шш <u>6</u>	X		
L1 T1 / L2 T2 / L3 T3	1 x 1.5 - 6	2 x 1.5 - 6	1 x 1.5 - 16	2 x 1.5 - 6	1 x 1 - 16	2 x 1 - 6	N.A.	Pozidriv 2	6mm
M4 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	1.2Nm Max.	1.2Nm Max.
L1 T1 / L2 T2 / L3 T3	1 x 0.75 - 4	2 x 1	1 x 0.75 - 6	2 x 0.75 - 2,5	1 x 0.75 - 6	2 x 0.75 - 1.5	N.A.	Pozidriv 1	4mm
M3 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	0.5Nm Max.	0.5Nm Max.
A1 A2 / 11 12	1 x 0.5 - 1.5	2 x 0.5 - 0.75	1 x 0.5 - 1.5	2 x 0.5 - 1.5	1 x 0.5 - 1.5	2 x 0.5 - 1.5	N.A.	N.A.	3mm
Input terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	IN.A.	0.5Nm Max.

Important: When using electric or pneumatic tools for screw terminals observe the maximum torque limits

### Circuit Diagram



Rated operational current up to 3x20A AC-1 / 10A AC-3

- 1) for LASUP62 (see "Accessories for Solid State Contactors and Controllers")
- 2) Control voltage A1-A2

DESCRIPTION	AVAILABLE	ORDER NO.
10A		
10A/24-480VAC, control voltage 24-230VAC/DC		LAS34102
20A		
20A/12-230VAC, control voltage 24-230VAC/DC	000 0-0	LAS32202
20A/24-480VAC, control voltage 5-24VDC	000	LAS34201
20A/24-480VAC, control voltage 24-230VAC/DC	000 0-0	LAS34202
20A/48-600VAC, control voltage 5-24VDC		LAS36201
20A/48-600VAC, control voltage 24-230VAC/DC		LAS36202

# Solid State Contactors for Direct Starting of 3-phase Motors



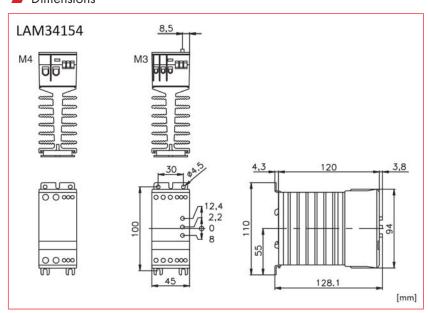
Schrack-Info

• Solid state contactor for direct starting of 3-phase motors fulfills the standard of EN60947-4-2 and has a required space of only 45mm. A control voltage range of 24-60VDC or 24-480VAC and the operational current up to 15A (AC-3, at 40°C) provides a wide range of applications within the realms of "silently switching"

LAM34154

	LAM34154
Main contacts	
Operational voltage	400-480VAC 50/60Hz
Operational current AC-53/AC-4	15A AC-3
Control	
Control voltage	24-60VDC / 24-480VAC
min. response voltage	20.4VAC/DC
min. dropout voltage	5VAC/DC
Thermal and mechanical characteristic	
Power loss at PD max.	2.2W/A
Power loss at periodic duty	2.2W/A x operating cycle
Cooling	natural convection
Mounting	vertical +/- 30°
Mounting distance - vertical mounting	Omm / horizontal min. 80mm
Mounting distance - horizontal mounting	max. 50% operational currents at 0mm (not recommended)
Operating temperature range according to EN60947-4-3	-5 up to 40°C
Storage temperature range according to EN60947-4-3	-20 up to 80°C
max. operating temperature	60°C
Derating	100% at 40°C, 80% at 50°C, 70% at 60°C
Width	45mm
Height	94mm
Depth	128.1 mm
Protective gear	
Short-circuit protection Installation - fuse	max. 50A gL/gG
Short-circuit protection Installation and solid-state contactor - fuse	max. 1800A <sup>2</sup> s
Thermal overload protection	optional: LASUP62

### Dimensions

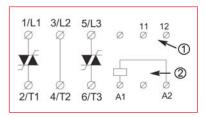


### ■ Solid State Contactors for Direct Starting of 3-phase Motors

Wiring Connections (Module 45/90mm) Wiring type with or without cable/sleeves and other type of terminals *UL tested			hum 6	Bumg	m m m	mmo	X		
L1 T1 / L2 T2 / L3 T3	1 x 1.5 - 6	2 x 1.5 - 6	1 x 1.5 - 16	2 x 1.5 - 6	1 x 1 - 16	2 x 1 - 6	N.A.	Pozidriv 2	6mm
M4 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	1.2Nm Max.	1.2Nm Max.
L1 T1 / L2 T2 / L3 T3	1 x 0.75 - 4	2 x 1	1 x 0.75 - 6	2 x 0.75 - 2,5	1 x 0.75 - 6	2 x 0.75 - 1.5	N.A.	Pozidriv 1	4mm
M3 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	0.5Nm Max.	0.5Nm Max.
A1 A2 / 11 12	1 x 0.5 - 1.5	2 x 0.5 - 0.75	1 x 0.5 - 1.5	2 x 0.5 - 1.5	1 x 0.5 - 1.5	2 x 0.5 - 1.5	N.A.	N.A.	3mm
Input terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	14.A.	0.5Nm Max.

Important: When using electric or pneumatic tools for screw terminals observe the maximum torque limits

### Circuit Diagram



1) for LASUP62 (see "Accessories for Solid State Contactors and Controllers")

2) Control voltage A1-A2

DESCRIPTION	AVAILABLE	ORDER NO.
3-pole, 15A/380-480VAC	000 0-0	LAM34154

# ■ Solid State Reversing Contactor for Starting of 3-phase Motors



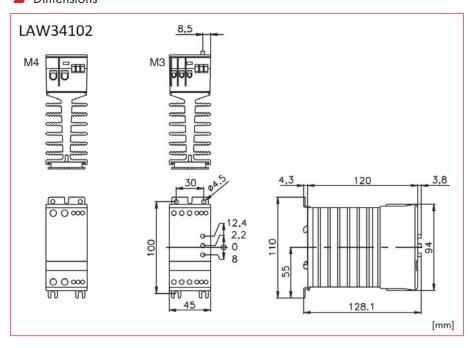
Schrack-Info

 Long life span, compact design and unlimited number of cycles per hour characterise these semiconductor based Reversing contactors. The devices apply especially to control of cranes and to conveyor- or packaging machines

LAW34102

	LAW34102
Main contacts	
Operational voltage	400-480VAC 50/60Hz
Operational current AC-53, AC-4	10A AC-53/AC-3 / 8A AC-4
Control	
Control voltage	24-230VAC/DC
min. response voltage	20.4VAC/DC
min. dropout voltage	7.2VAC/DC
Thermal and mechanical characteristic	
Power loss at PD max.	2.2W/A
Power loss at periodic duty	2.2W/A x operating cycle
Cooling	natural convection
Mounting	vertical +/- 30°
Mounting distance - vertical mounting	Omm / horizontal min. 80mm
Mounting distance - horizontal mounting	max. 50% Operational currents at 0mm (not recommended)
Operating temperature range according to EN60947-4-3	-5 up to 40°C
Storage temperature range according to EN60947-4-3	-20 up to 80°C
max. operating temperature	60°C
Derating	100% at 40°C, 80% at 50°C, 70% at 60°C
Width	45mm
Height	94mm
Depth	128.1 mm
Protective gear	
Short-circuit protection Installation - fuse	max. 50A gL/gG
Short-circuit protection Installation and solid-state contactor - fuse	max. 450A <sup>2</sup> s
Thermal overload protection	optional: LASUP62

### Dimensions



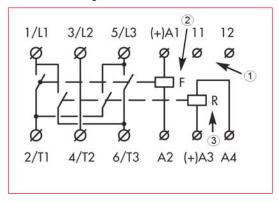


### ■ Solid State Reversing Contactor for Starting of 3-phase Motors

Wiring Connections (Module 45/90mm) Wiring type with or without cable/sleeves and other type of terminals *UL tested			hum 6	mmg	um 60	mm <sub>0</sub>	X		
L1 T1 / L2 T2 / L3 T3	1 x 1.5 - 6	2 x 1.5 - 6	1 x 1.5 - 16	2 x 1.5 - 6	1 x 1 - 16	2 x 1 - 6	N.A.	Pozidriv 2	6mm
M4 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	1.2Nm Max.	1.2Nm Max.
L1 T1 / L2 T2 / L3 T3	1 x 0.75 - 4	2 x 1	1 x 0.75 - 6	2 x 0.75 - 2,5	1 x 0.75 - 6	2 x 0.75 - 1.5	NI A	Pozidriv 1	4mm
M3 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	N.A.	0.5Nm Max.	0.5Nm Max.
A1 A2 / 11 12	1 x 0.5 - 1.5	2 × 0.5 - 0.75	1 x 0.5 - 1.5	2 x 0.5 - 1.5	1 x 0.5 - 1.5	2 x 0.5 - 1.5	N.A.	N.A.	3mm
Input terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	IN.A.	0.5Nm Max.

Important: When using electric or pneumatic tools for screw terminals observe the maximum torque limits

### Circuit Diagram



- 1) for LASUP62 (see "Accessories for Solid State Contactors and Controllers")
- 2) Control voltage, rotation clockwise
- 3) Control voltage, rotation anticlockwise

DESCRIPTION	AVAILABLE	ORDER NO.
3-pole, 10A/24-480VAC/DC	300 0-0	LAW34102

### Solid State Contactors for Analog Controlled Starting of Motors



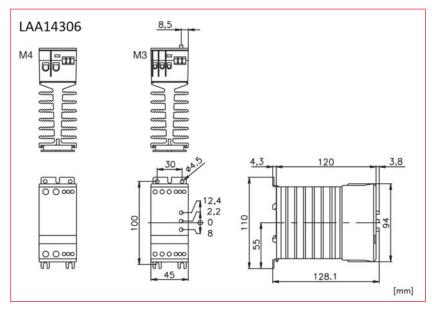
LAA14306

### Schrack-Info

- Der Solid state analog controllers have been designed for analog control of heating elements, infrared lamp radiators applications at the packaging industry.
- The high accuracy at the control of process temperatures is performed by phase angle or shock impuls. Universal control signals are: current loop ... 0-20mA or 4-20mA Control voltage ... 0-10VDC or potentiometer control 10kOhm.

	LAA14306
Main contacts	
Operational voltage	380-480VAC
Operational current AC-1/51	30A
Operational current AC-55b	30A
Operational current AC-56a	30A
Analogue control signals	
Current loop control (voltage drop max. 3V)	0-20mA / 20-0mA
Input resistance (impedance min. 300kOhm)	0-10VDC / 10-0VDC
Manual control with potentiometer	0-10kOhm / 10-0kOhm
External operating voltage / power supply	24VAC/24DC max. 30mA
Thermal and mechanical characteristic	
Power loss at PD max.	1.2W/A
Power loss at periodic duty	1,2W/A x operating cycle
Cooling	natural convection
Mounting	vertical +/- 30°
Mounting distance - vertical mounting	0mm / horizontal min. 80mm
Mounting distance - horizontal mounting	max. 50% operational currents at 0mm (not recommended)
Operating temperature range according to EN60947-4-3	-5 up to 40°C
Storage temperature range according to EN60947-4-3	-20 up to 80°C
max. operating temperature	60°C
Derating	100% at 40°C, 80% at 50°C, 70% at 60°C
Width	45mm
Height	94mm
Depth	128.1 mm
Protective gear	
Short-circuit protection Installation - fuse	max. 50A gL/gG
Short-circuit protection Installation and solid-state contactor - fuse	max. 1800A <sup>2</sup> s
Thermal overload protection	optional: LASUP62

### Dimensions



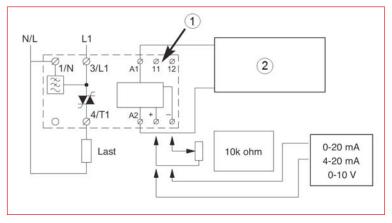


# Solid State Contactors for Analog Controlled Starting of Motors

Wiring Connections (Module 45/90mm) Wiring type with or without cable/sleeves and other type of terminals *UL tested			am a	nme g	E B B B B B B B B B B B B B B B B B B B	mm <sub>0</sub>	X		
L1 T1 / L2 T2 / L3 T3	1 x 1.5 - 6	2 x 1.5 - 6	1 x 1.5 - 16	2 x 1.5 - 6	1 x 1 - 16	2 x 1 - 6	N.A.	Pozidriv 2	6mm
M4 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	1.2Nm Max.	1.2Nm Max.
L1 T1 / L2 T2 / L3 T3	1 x 0.75 - 4	2 x 1	1 x 0.75 - 6	2 x 0.75 - 2,5	1 x 0.75 - 6	2 x 0.75 - 1.5	NI A	Pozidriv 1	4mm
M3 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	N.A.	0.5Nm Max.	0.5Nm Max.
A1 A2 / 11 12	1 x 0.5 - 1.5	2 x 0.5 - 0.75	1 x 0.5 - 1.5	2 x 0.5 - 1.5	1 x 0.5 - 1.5	2 x 0.5 - 1.5	N.A.	N.A.	3mm
Input terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	IN.A.	0.5Nm Max.

Important: When using electric or pneumatic tools for screw terminals observe the maximum torque limits

### Circuit Diagram



- 1) for LASUP62 (see "Accessories for Solid State Contactors and Controllers")
- 2) External power supply 24VAC or 24VDC, max 30mA

DESCRIPTION	AVAILABLE	ORDER NO.
30A	333 0-0	LAA14306

### Accessories for Solid State Contactors and Controllers



### Schrack-Info

• For all Solid state contactor, Motor controllers, Reversing contactors and Analog controllers a Thermal overload relais is recommended. The optional thermal protection unit has to be snapped directly into the allocated space of device and wired to its accoding terminals. At overheating of Solid state contactor, the thermal protection unit disconnects the supply. Reset can be done manually or automatically according cooling down status of drive.

LASUP62

DESCRIPTION	AVAILABLE	ORDER NO.
Thermal overload protection / thermostat	300 0- 0	LASUP62



### ■ Torque Limiters



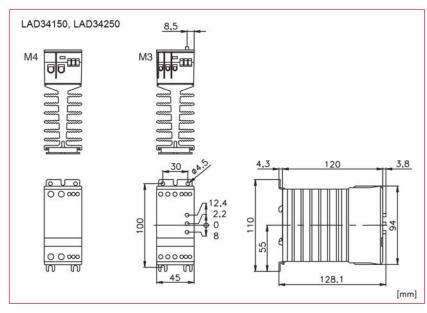
Schrack-Info

• Torque limiter reduces by adjusting the starting torque the mechanical strain of drive is essentially reduced. Same design of devices for 1- and 3-phase motors with adjustable running up time of 0.5up to 5 seconds. Also the torque at starting is adjustable.

LAD34150

	LAD34150	LAD34250		
Main contacts				
Operational voltage	400-480VAC	50/60Hz		
Operational current AC-53a	15A AC-53a	25A AC-53a		
eak current	5mA	AC		
min. operational current	50n	nA		
Class index AC-52a	X-Tx:8-3 : 1	00-3000		
Overload relay protection class AC-53a	10 or	10A		
Thermal and mechanical characteristic				
Power loss at PD max.	1W,	/A		
Power loss at periodic duty	1W/A x ope	rating cycle		
Cooling	natural convection			
Mounting	vertical +/- 30°			
Mounting distance - vertical mounting	Omm / horizontal min. 80mm			
Mounting distance - horizontal mounting	max. 50% Operational current	s at 0mm (not recommended)		
Operating temperature range according to EN60947-4-3	-5 up to	40°C		
Storage temperature range according to EN60947-4-3	-20 up to	o 80°C		
max. operating temperature	60°	C		
Derating	100% at 40°C, 80% at	50°C, 70% at 60°C		
Width	45m	nm		
Height	94m	nm		
Depth	128.1	mm		
Protective facilities		<u> </u>		
Short-circuit protection Installation - fuse	max. 50A gL/gG	max. 80A gL/gG		
Short-circuit protection Installation and solid-state contactor - fuse	max. 1800A <sup>2</sup> s	max. 6300A <sup>2</sup> s		
Thermal overload protection	optional: L	ASUP62		

### Dimensions

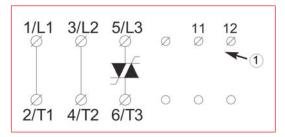


### ■ Torque Limiters

Wiring Connections (Module 45/90mm) Wiring type with or without cable/sleeves and other type of terminals *UL tested			m m b	Bumg	mm6	mmg	*		
L1 T1 / L2 T2 / L3 T3	1 x 1.5 - 6	2 x 1.5 - 6	1 x 1.5 - 16	2 x 1.5 - 6	1 x 1 - 16	2 x 1 - 6	N.A.	Pozidriv 2	6mm
M4 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	1.2Nm Max.	1.2Nm Max.
L1 T1 / L2 T2 / L3 T3	1 x 0.75 - 4	2 x 1	1 x 0.75 - 6	2 x 0.75 - 2,5	1 x 0.75 - 6	2 x 0.75 - 1.5	N.A.	Pozidriv 1	4mm
M3 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	N.A.	0.5Nm Max.	0.5Nm Max.
A1 A2 / 11 12	1 x 0.5 - 1.5	2 x 0.5 - 0.75	1 x 0.5 - 1.5	2 x 0.5 - 1.5	1 x 0.5 - 1.5	2 x 0.5 - 1.5	N.A.	N.A.	3mm
Input terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	IN.A.	0.5Nm Max.

Important: When using electric or pneumatic tools for screw terminals observe the maximum torque limits

### Circuit Diagram



1) for LASUP62 (see "Accessories for Torque Limiters and Soft Starters")

DESCRIPTION	AVAILABLE	ORDER NO.
15A/230-480VAC	388 6-8	LAD34150
25A/230-480VAC	000 0-6	LAD34250

# Softstarter, 2-phase Controlled





LAK34255

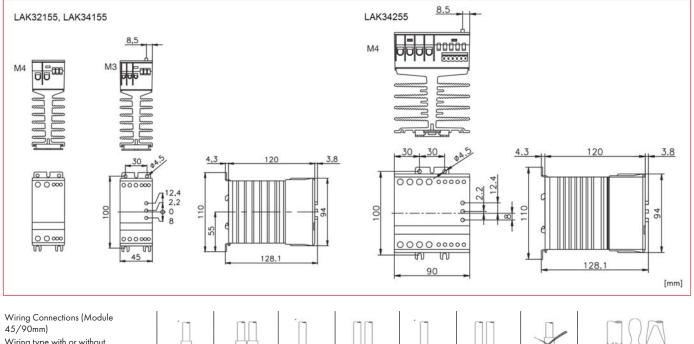
### Schrack-Info

- The reduction of mechanical strikes at starting and vibations during operation are only two aspects for the application of semiconductor based Softstarters. Not necessary replacement of Y-D assemblies, variable ratio transformers or series resistors and therefore increased flexibility makes Softstarters to an efficient solution. A wide range of products for variable power with rated currents up to 200A is available.
- Scopes of application are compressors, conveyors, water pumps and fans

	LAK32155	LAK34155	LAK34255
Main contacts			
Operational voltage	208-240VAC 50/60Hz 400-480VAC 50/60Hz		C 50/60Hz
Operational current AC-53a (without bypass)	15A	15A	25A
Operational current AC-53b (with bypass)	-	-	-
Connection	3-conductor		
Class index AC-53a (without bypass)	X-Tx: 8-3 : 100-3000		
	8x rated current for max. 3s		
	100% duty cycle, 3000 Switching cycles / h		
Load class	10 or 10A		
Leakage current	max. 5mA		
Load current	min. 50mA		
Start time setting range	0.5-10s		
Stop time setting range	0.5-10s		
Torque adjustment	0-85% of the nominal torque Kick-Start (200ms)		
Thermal overload relay	extern		
Control			
Control voltage	24-230VAC/DC	24-480	VAC/DC
Active control range		-	
Inactive control range			
max. response voltage	20.4VAC/DC		
min. dropout voltage	5VAC/DC		
max. current for no operation	1mA		
max. response time	70ms		
max. current / power	15mA / 2VA		
Thermal and mechanical characteristic			
Power loss at PD max., without bypass	2W/A without Bypass		
Power loss at bridged contactor	max. 4W		
Cooling	natural convection		
Mounting	vertical +/- 30°		
Mounting distance - vertical mounting	Omm / horizontal min. 80mm		
Mounting distance - horizontal mounting	max. 50% operational currents at 0mm (not recommended)		
Operating temperature range according to EN60947-4-3	-5 up to 40°C		
Storage temperature range according to EN60947-4-3	-20 up to 80°C		
max. operating temperature	60°C		
Derating	100% at 40°C, 80% at 50°C, 70% at 60°C		
Rated insulation voltage U <sub>i</sub>	660V		
Impulse withstand voltage U <sub>imp</sub>	4kV		
Installation category	III		
Degree of protection	IP20		
Degree of pollution	3		
Width	45mm	45mm	90mm
Height	94mm	94mm	94mm
Depth	128.1 mm	128.1 mm	128.1 mm
Weight	690g	690g	1150g
Material	enclosure: PPO UL94V1; heat sink: aluminium; base plate: galvanized steel		
Protective equipment		-	-
Short-circuit protection installation - fuse	50A gL/gG	50A gL/gG	80A gL/gG
Short-circuit protection installation and solid-state contactor - fuse	1800A <sup>2</sup> s	1800A <sup>2</sup> s	6300A <sup>2</sup> s
Thermal overload protection	LASUP62		

# Softstarter, 2-phase Controlled

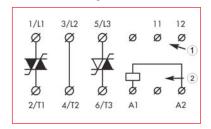
### **Dimensions**



cable/sleeves and other type of terminals *UL tested			mm6	mm6	m m m m	um0 €			
L1 T1 / L2 T2 / L3 T3	1 x 1.5 - 6	2 x 1.5 - 6	1 x 1.5 - 16	2 x 1.5 - 6	1 x 1 - 16	2 x 1 - 6	N.A.	Pozidriv 2	6mm
M4 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	1.2Nm Max.	1.2Nm Max.
L1 T1 / L2 T2 / L3 T3	1 x 0.75 - 4	2 x 1	1 x 0.75 - 6	2 x 0.75 - 2,5	1 x 0.75 - 6	2 x 0.75 - 1.5	N.A.	Pozidriv 1	4mm
M3 Power terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	IN.A.	0.5Nm Max.	0.5Nm Max.
A1 A2 / 11 12	1 x 0.5 - 1.5	2 x 0.5 - 0.75	1 x 0.5 - 1.5	2 x 0.5 - 1.5	1 x 0.5 - 1.5	2 x 0.5 - 1.5	N.A.	N.A.	3mm
Input terminals	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	14.A.	IN.A.	0.5Nm Max.

Important: When using electric or pneumatic tools for screw terminals observe the maximum torque limits

## Circuit Diagram



- 1) for LASUP62 (see "Accessories for Torque Limiters and Soft Starters")
- 2) Control voltage

DESCRIPTION	AVAILABLE	ORDER NO.
3-pole, 2-phase controlled, 15A, 208-230VAC		LAK32155
3-pole, 2-phase controlled, 15A, 400-480VAC	000 0-6	LAK34155
3-pole, 2-phase controlled, 25A, 400-480VAC	000 0-0	LAK34255

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# Softstarter, 2-phase Controlled with Integrated Bypass

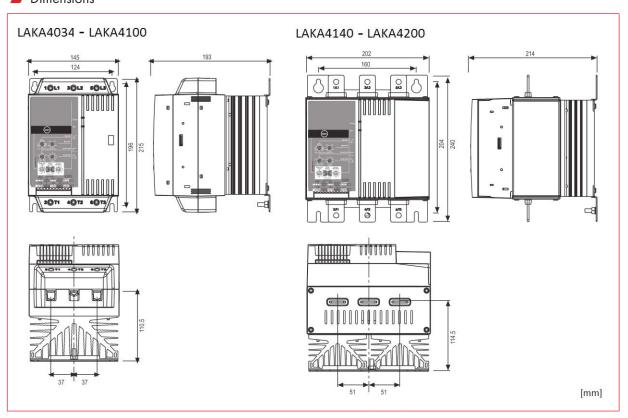
### Schrack-Info

- The reduction of mechanical strikes at starting and vibations during operation are only two aspects for
  the application of semiconductor based Softstarters. Not necessary replacement of Y-D assemblies,
  variable ratio transformers or series resistors and therefore increased flexibility makes Softstarters to
  an efficient solution. A wide range of products for variable power with rated currents up to 200A is
  available.
- Scopes of application are compressors, conveyors, water pumps and fans

LAKA...

		LAKA4				
Main contacts						
Operational voltage	3 x 200VAC - 440VAC (+10%/-15%) / 45-66Hz					
	Operational cu	rrent AC-53b (with bypass) - nor	mal operation			
		at 40°	at 50°			
	LAKA4034	34A	31 A			
	LAKA4042	42A	38A			
	LAKA4048	48A	44A			
	LAKA4060	60A	55A			
Operational current AC-53b (with bypass)	LAKA4075	<i>7</i> 5A	69A			
	LAKA4085	85A	78A			
	LAKA4100	100A	100A			
	LAKA4140	140A	133A			
	LAKA4170	170A	157A			
	LAKA4200	200A	186A			
		4-6:594				
Class index 53b		4x rated current for max. 6s				
		min. 594s between start cycles				
Connection		3-wire				
Thermal overload relay		not integrated				
Control		-				
Control voltage	100-240VAC	(+10%/-15%) / 380-440VAC (	+10%/-15%)			
Power consumption - normal operation		≤100mA				
Power consumption - start		≤10mA				
Terminal Start N1		NO contact, max. 300VAC				
Terminal Stop N2		NC contact, max. 300VAC				

## Dimensions

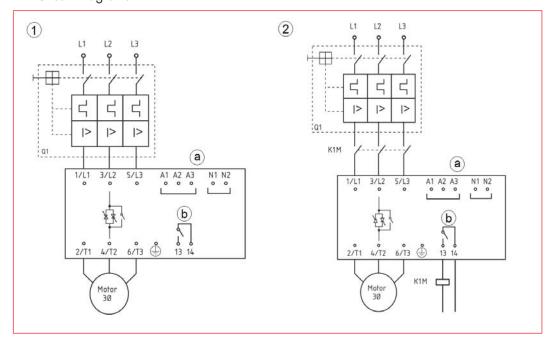


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# Softstarter, 2-phase Controlled with Integrated Bypass

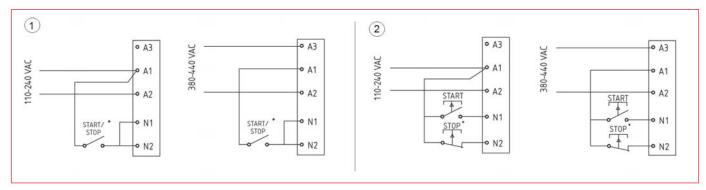
# Circuit Diagrams



#### Examples:

- 1) LAKA soft starter installed with a motor protection switch/circuit breaker
- 2) LAKA soft starter installed with a motor protection switch/circuit breaker and line contactor K1M
- a) Control voltage
- b) Control contacts 13-14: max 6A at 30VDC/AC11 max 2A at 400VAC/AC11

### Control Circuits



- 1) Two wire control
- 2) Three wire control
- \*Also resets the soft starter

DESCRIPTION	AVAILABLE	ORDER NO.
3-pole, 2-phase controlled 200-440V/34A without motor protection		LAKA4034
3-pole, 2-phase controlled 200-440V/42A without motor protection		LAKA4042
3-pole, 2-phase controlled 200-440V/48A without motor protection		LAKA4048
3-pole, 2-phase controlled 200-440V/60A without motor protection		LAKA4060
3-pole, 2-phase controlled 200-440V/75A without motor protection		LAKA4075
3-pole, 2-phase controlled 200-440V/85A without motor protection		LAKA4085
3-pole, 2-phase controlled 200-440V/100A without motor protection		LAKA4100
3-pole, 2-phase controlled 200-440V/140A without motor protection		LAKA4140
3-pole, 2-phase controlled 200-440V/170A without motor protection		LAKA4170
3-pole, 2-phase controlled 200-440V/200A without motor protection		LAKA4200



# ■ Softstarter, 2-phase Controlled with Integrated Bypass and Function "Motor Protection"



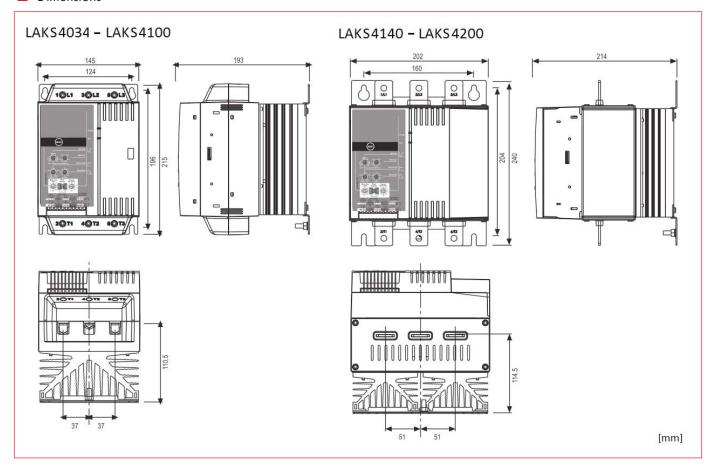
#### LAKS....

# Schrack-Info

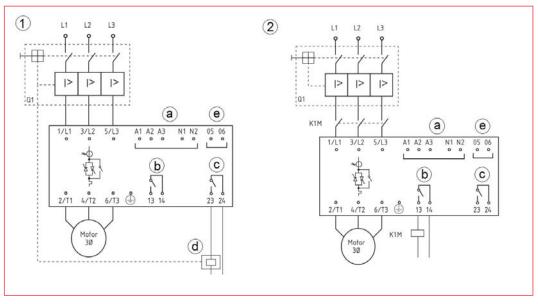
- The reduction of mechanical strikes at starting and vibations during operation are only two aspects for
  the application of semiconductor based Softstarters. Not necessary replacement of Y-D assemblies,
  variable ratio transformers or series resistors and therefore increased flexibility makes Softstarters to
  an efficient solution. A wide range of products for variable power with rated currents up to 200A is
  available.
- Scopes of application are compressors, conveyors, water pumps and fans

		LAKS4	
Main contacts			
Operational voltage	3 x 200 <sup>n</sup>	VAC - 440VAC (+10%/-15%) / 4	15-66Hz
	Operational c	urrent AC-53b (with bypass) - noi	mal operation
		at 40°	at 50°
	LAKS034	34A	31 A
	LAKS042	42A	38A
ass index 53b	LAKS048	48A	44A
	LAKS060	60A	55A
	LAKS075	<i>7</i> 5A	69A
	LAKS085	85A	78A
	LAKS100	100A	100A
	LAKS140	140A	133A
	LAKS170	170A	157A
	LAKS200	200A	186A
		4-6:594	
Department AC-53b (with bypass)  Class index 53b  Connection hermal overload relay  Control  Control voltage lower consumption - normal operation ower consumption - start		4x rated current for max. 6s	
		min. 594s between start cycles	
Connection		3-wire	
Thermal overload relay		integrated	
Control		-	
Control voltage	100-240VAC	C (+10%/-15%) / 380-440VAC (	+10%/-15%)
Power consumption - normal operation		≤100m	
Power consumption - start		≤10mA	
Terminal Start N1		NO contact, max. 300VAC	
Terminal Stop N2		NC contact, max. 300VAC	

### Dimensions



# Circuit Diagrams



#### Examples:

- 1) LAKS soft starter installed with a system protection circuit breaker complete with a shunt trip device
- 2) LAKS soft starter installed with a system protection circuit breaker and line contactor K1M
- a) Control voltage

c) Auxiliary contact for "Trip"

b) Control contacts 13-14: max 6A at 30VDC/AC11 d) shunt release

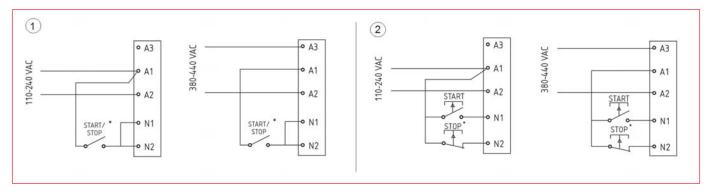
max 2A at 400VAC/AC11

e) thermistor connection

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# ■ Softstarter, 2-phase Controlled with Integrated Bypass and Function "Motor Protection

# Control Circuits



- 1) Two wire control
- 2) Three wire control
- \*Also resets the soft starter

DESCRIPTION	AVAILABLE	ORDER NO.
3-pole, 2-phase controlled 200-440V/34A with motor protection		LAKS4034
3-pole, 2-phase controlled 200-440V/42A with motor protection		LAKS4042
3-pole, 2-phase controlled 200-440V/48A with motor protection		LAKS4048
3-pole, 2-phase controlled 200-440V/60A with motor protection		LAKS4060
3-pole, 2-phase controlled 200-440V/75A with motor protection		LAKS4075
3-pole, 2-phase controlled 200-440V/85A with motor protection		LAKS4085
3-pole, 2-phase controlled 200-440V/100A with motor protection		LAKS4100
3-pole, 2-phase controlled 200-440V/140A with motor protection		LAKS4140
3-pole, 2-phase controlled 200-440V/170A with motor protection		LAKS4170
3-pole, 2-phase controlled 200-440V/200A with motor protection		LAKS4200

# Softstarter, 3-phase Controlled





LATD4605

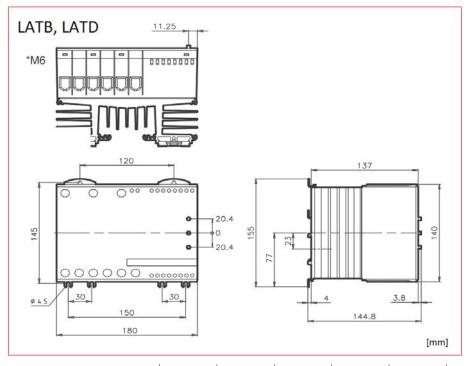
# Schrack-Info

- The reduction of mechanical strikes at starting and vibations during operation are only two aspects for the application of semiconductor based Softstarters. Not necessary replacement of Y-D assemblies, variable ratio transformers or series resistors and therefore increased flexibility makes Softstarters to an efficient solution. A wide range of products for variable power with rated currents up to 200A is available.
- Scopes of application are compressors, conveyors, water pumps and fans

	LATB4355	LATD4605
Main contacts	100 1001110	50 //011
ine voltage	400-480VAC	· · · · · · · · · · · · · · · · · · ·
Operational current AC-53a (without Bypass)	35A	60A
Operational current AC-53b (with Bypass)	50A	86A
Connection	3-wires	6-wires (Wurzel3)
	X-Tx: 6-6 : 1	00-120
Class index AC-53a (without Bypass)	6x rated current	for max. 6s
	100% duty cycle, 120 s	witching cycles / h
	X-Tx: 6-6	: 30
Class index AC-53b (with Bypass)	6-facher rated curre	ent for max. 6s
	min. 30s between	n start cycles
oad class	10 or 1	0A
eakage current	max. 5r	mA
oad current	min. 50	mA
Start time setting range	0.5-30	)s
Stop time setting range	0.5-60	)s
Forque adjustment	0-85% of the nominal torq	ue Kick-Start (200ms)
Thermal overload relay	extern	1
Control		
Control voltage	24-480 VA	C/DC
Active control range	24-528 VA	,
nactive control range	0-5 VAC,	<u>'</u>
max. response voltage	_	-
min. dropout voltage	_	
nax. current for no operation	1mA	
max. response time	70ms	
nax. current / power	15mA /	
Thermal and mechanical characteristic	15111/1/	2 77 1
Power loss at PD max., without bypass	3W/A withou	it hypass
Power loss at bridged contactor	5W/A with	, ·
Cooling	natural con-	7.1
Mounting	vertical +/	
Mounting distance - vertical mounting	Omm / horizonta	
· · · · · · · · · · · · · · · · · · ·	max. 50% operational currents of	
Mounting distance - horizontal mounting	-5 up to 4	
Operating temperature range according to EN60947-4-3		
Storage temperature range according to EN60947-4-3	-20 up to	
max. operating temperature		
Derating	100% at 40°C, 80% at 3	
Rated insulation voltage U <sub>i</sub>	660\	<u>'</u>
mpulse withstand voltage U <sub>imp</sub>	4kV	
nstallation category	III	
Degree of protection	IP20	
Pollution degree	3	
Width	180mm	180mm
Height	140mm	140mm
Depth	144.8mm	144.8mm
Weight	2700g	2700g
Material	enclosure: PPO UL94V1; heat sink: alum	iinium; base plate: galvanized stee
Protective equipment		
	I	
Short-circuit protection installation - fuse	125A gL/gG	125A gL/gG 25300A²s

# Softstarter, 3-phase Controlled

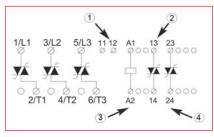
### Dimensions



Die genannten Drahtstärken gelten für Anschlussdrähte mit und ohne Aderendhülsen oder andere lötfreie Anschlussarten.			15 mm		15 mm		*		
L1 T1 / L2 T2 / L3 T3	1 x *4 -	2 x *2 -	1 x 4 -	2 x 4 -	1 x 4 -	2 x 4 -		Pozidriv 3	
*M6 Betriebsspannungsklemmen	*35mm <sup>2</sup>	16mm <sup>2</sup>	35mm <sup>2</sup>	10mm <sup>2</sup>	*50mm <sup>2</sup>	16mm <sup>2</sup>	N.A.	4Nm, *5,5Nm Max.	N.A.

Wichtig: Wenn Sie für die Montage elektrisch oder pneumatisch betriebene Werkzeuge einsetzen, müssen Sie unbedingt auf die angegebenen maximalen Drehmomente achten.

# Circuit Diagram



- 1) for LASUP62 (see "Accessories for Torque Limiters and Soft Starters")
- 2) Connections 13-14: for Start/Stop function
- 3) Control voltage A1-A2
- 4) Connections 23-24: for bypass protection

DESCRIPTION	AVAILABLE	ORDER NO.
35A/400-480VAC	333 0- 6	LATB4355
60A/400-480VAC	000 0=0	LATD4605

# Accessories for Torque Limiters and Soft Starters



# Schrack-Info

• For all Solid state contactor, Motor controllers, Reversing contactors and Analog controllers a Thermal overload relais is recommended. The optional thermal protection unit has to be snapped directly into the allocated space of device and wired to its according terminals. At overheating of Solid state contactor, the thermal protection unit disconnects the supply. Reset can be done manually or automatically according cooling down status of drive.

DESCRIPTION AVAILABLE ORDER NO. Thermal overload protection / thermostat LASUP62



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A discourse of a possible	100	Mechanical Interlock and Connection Clips	241	Relay Sockets for Schrack, Series MT	50
Auxiliary Contactors, Size 3, DC Coil	193	Mechanical Interlock for Contactors	259	Relay Sockets for Schrack, Series PT	45
		Micro Auxiliary Contactors, Size M	189	Relay Sockets for Schrack, Series RT	37
C	105	Micro Contactors LA, Size M	172	Relay Sockets for Schrack, Series XT	40 4
Capacitor Switching Contactors LA, Size 3	195	Mini Auxiliary Contactors, Size 1	191	Relays	254
Connection Clips for Contactors	260	Mini Contactors LA, Size 1	174	Reversing Contactor Combinations LS	234
Connection Link for Motor Protection Switches	0.40	Modular Contactors	156	Reversing Contactor Combinations	054
and Contactors	243	, ,	163	Series ALEA LSW	254
Contactors for Photovoltaic Plants	187	Modular Contactors "R" AC-1, AC Coil	158	C	
Contactors Series CUBICO Classic, 3-pole	269	Modular Contactors "R" AC-1, ACDC Coil	161	S Colored to Colored Colored	
Contactors Series CUBICO Mini	266	" !	163	Sidemounted Auxiliary Contacts for Contactors	
Contactors Series CUBICO Mini, 3-pole	266	Modular Contactors "R" AC-1, AC Coil	158	K3-24 to K3-115	198
		Modular Contactors "R" AC-1, ACDC Coil	161	Solder Pin Adapter	242
D District to DDG	154	Modular Relays	92	Solid State Contactors	452
Diode Combination DBS	154	Motor Protection Relays Series LA	378	Star-Delta Contactor Combinations LSY	261
Direct on Line Starters D.O.L.		Motor Protection Switches	408	Star-Delta Contactor Combinations	0.41
with Selector Switch	202	Motor Protection Switches Series ALEA BES	452	Series ALEA LSY	261
_		Motor Protection Switches Series BE5, BE6	410	Star-Delta Timers	243
E		_		Summary Alarm Indicators	152
EASY PLC Series	94	P		Summary Alarm Indicators SSM11-24V-DC	152
Electromechanical Contactors	170	Parallel Connectors (Star Jumper)	264	Supressor Units	250
Electromechanical Contactors Series ALEA LS	203	Parallel Connectors (Star Jumper)		Surge Supressors (plug in)	243
Electromechanical Contactors Series LA	172	and Feed Terminals	240		
		PLC Series EASY	94	T	
F		Plug-in Relays	6	Terminal Covers	252
Feed Terminals	264	Plug-in Relays S-Relay, Series 4	18	Thermal Overload Relays	376
Force-guided Contacts Relays Schrack,		Plug-in Relays Schrack, Series MT	27	Thermal Overload Relays Series ALEA LST	380
Series SR	85	Plug-in Relays Schrack, Series PT	23	Thermal Overload Relays Series CUBICO	387
Force-guided Contacts Relays Schrack,		Plug-in Relays Schrack, Series RM	30	Timer Relays	96
Series SR,		Pluggable Interface Relay Schrack, Series XT	15	Timer Relays Series AMPARO	112
in DIN Rail Module	89	Power Contactors LA, Size 2	176	Timer Relays Series ZR4	107
Force-guided Contacts Relays Schrack,		Power Contactors LA, Size 3	176	Timer Relays Series ZR4, for Round 11 Pole	
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### **General Terms of Delivery**

### issued by the Austrian Electrical and Electronics Industry Association (FEEI)



#### 1. Scope

- 1.1. These General Terms shall govern legal transactions between business enterprises, namely the delivery of commodities and, mutatis mutandis, the rendering of services. Software transactions are with precedence governed by the Software Conditions issued by the Austrian Electrical and Electronics Industry Association, assembly work by the Terms and Conditions for Assembly Work issued by the Austrian Power Current and Light Current Engineering Industry and/or (where applicable) the Terms and Conditions for the Assembly of Electrical Equipment used in Medicine issued by the Austrian Electrical and Electronics Industry (the current versions are available at www.feei.at).
- 1.2. Any departure from the terms and conditions mentioned in 1.1 above shall be valid only if expressly accepted in writing by Seller.

#### 2. Submission of offers

- 2.1. Seller's offers shall be deemed offers without engagement.
- 2.2. Tender documents and project documentation must not be duplicated nor made available to third parties without the permission of Seller. They may be claimed back at any time and shall be returned to Seller immediately if the order is placed elsewhere.

#### 3. Conclusion of contract

- 3.1. The contract shall be deemed concluded upon written confirmation by Seller of an order received or upon dispatch of a delivery.
- 3.2. Particulars appearing in catalogues, folders etc. as well as any oral or written statements shall only be binding if Seller makes express reference to them in the confirmation of the order.
- 3.3. Subsequent amendments of or additions to the contract shall be subject to written confirmation.

#### 4. Prices

- 4.1. Prices shall be quoted ex works or ex Seller's warehouse without VAT, packing and packaging, loading, disassembly, take-back and proper recycling and disposal of waste electrical and electronic equipment for commercial purposes as defined by the Ordinance Regulating the Handling of Waste Electrical Equipment. Buyer shall be liable for any and all charges, taxes or other duties levied in respect of delivery. If the terms of delivery include transport to a destination designated by Buyer, transport costs as well as the cost of any transport insurance desired by Buyer shall be borne by the latter. Delivery does not, however, include unloading and subsequent handling. Packaging materials will be taken back only by express agreement.
- 4.2. Seller reserves the right to modify prices if the order placed is not in accordance with the offer submitted.
- 4.3. Prices are based on costs obtaining at the time of the first quotation. In the event that the costs have increased by the time of delivery, Seller shall have the right to adjust prices accordingly.
- 4.4. In carrying out repair orders, Seller shall provide all services deemed expedient and shall charge Buyer for the same on the basis of the work input and/or expenditures required. The same holds for any services or additional services the expediency of which becomes apparent only as the repair order is executed. In such an event special notification of Buyer shall not be required.
- 4.5. Expenses for estimates of costs of repair and maintenance or for expert valuations shall be invoiced to Buyer.

#### 5. Delivery

- 5.1. The period allowed for delivery shall commence at the latest of the following dates:

   a) the date of order confirmation by Seller;
  - b) the date of fulfilment by Buyer of all the conditions, technical, commercial and other, for which he is responsible;
  - c) the date of receipt by Seller of a deposit or security due before delivery of the goods in question.
- 5.2. Buyer shall obtain whatever licences or approvals may be required from authorities or third parties for the construction of plant and equipment. If the granting of such licences or approvals is delayed for any reason the delivery period shall be extended accordingly.
- 5.3. Seller may carry out, and charge Buyer for, partial or advance deliveries. If delivery on call is agreed upon, the commodity shall be deemed called off at the latest one year after the order was placed.
- 5.4. In case of unforeseeable circumstances or circumstances beyond the parties control, such as all cases of force majeure, which impede compliance with the agreed period of delivery, the latter shall be extended in any case for the duration of such circumstances; these include in particular armed conflicts, official interventions and prohibitions, delays in transport or customs clearance, damages in transit, energy shortage and raw materials scarcity, labour disputes, and default on performance by a major component supplier who is difficult to replace. The aforesaid circumstances shall be deemed to prevail irrespective of whether they affect Seller or his subcontractor(s).
- 5.5. If a contractual penalty for default of delivery was agreed upon by contracting parties when the contract was concluded, it shall be executed as follows, and any deviations concerning individual items shall not affect the remaining provisions: Where delay in performance can be shown to have occurred solely through the fault of Seller, Buyer may claim for each completed week of delay an indemnity

- of at most one half of one per cent, a total of no more than 5 %, however, of the value of that part of the goods to be delivered which cannot be used on account of Seller's failure to deliver an essential part thereof, provided the Buyer has suffered a damage to the aforesaid extent. Assertion of rights of damages exceeding this extent is precluded.
- 6. Passage of risk and place of performance
- 6.1. Unless otherwise agreed, the delivery of goods is considered sold EXW in accordance with INCOTERMS® 2010.
- 6.2. For services, the place of performance shall be the place indicated in the written order confirmation, secondary to that at which the service is actually rendered by Seller. The risk in respect of such services or any part thereof shall pass to Buyer at the time the services have been rendered.

#### 7. Payment

- 7.1. Unless otherwise agreed, one third of the purchase price shall fall due at the time of receipt by Buyer of the order confirmation of Seller, one third after half the delivery period has elapsed and the balance at the time of delivery. Irrespective thereof the turnover tax comprised in the amount of the invoice shall be paid within 30 days of the invoice date. If bankruptcy proceedings are instituted against the assets of Buyer or if an application for bankruptcy proceedings is not granted for insufficiency of assets, deliveries shall only be made against cash in advance.
- 7.2. In the case of part settlements the individual part payments shall fall due upon receipt of the respective invoices. The same shall apply to amounts invoiced for additional deliveries or resulting from additional agreements beyond the scope of the original contract, irrespective of the terms of payment agreed upon for the principal delivery.
- 7.3. Payment shall be made without any discount free Seller's domicile in the agreed currency. Drafts and checks shall be accepted on account of payment only, with all interest, fees and charges in connection therewith (such as collection and discounting charges) to be borne by Buyer.
- 7.4. Buyer shall not be entitled to withhold or offset payment on the grounds of any warranty claims or other counterclaims.
- 7.5. Payment shall be deemed to have been effected on the date at which the amount in question is at Seller's disposal.
- 7.6. If Buyer fails to meet the terms of payment or any other obligation arising from this or other legal transactions, Seller may without prejudice to his other rights
  - a) suspend performance of his own obligations until payments have been made or other obligations fulfilled, and exercise his right to extend the period of delivery to a reasonable extent,
  - b) call in debts arisen from this or any other legal transactions and charge default interest amounting to 1.25 % per month plus turnover tax for these amounts beginning with the due dates, unless Seller proves costs exceeding this.
  - c) only perform other legal transactions against cash in advance in the case of qualified insolvency, in other words, following two delays in payment.
  - In any case Seller has the right to invoice all expenses arising prior to a lawsuit, especially reminder charges and lawyer's fees.
- 7.7. Discounts or bonuses are subject to complete payment in due time.
- 7.8. Seller retains title to all goods delivered by him until receipt of all amounts invoiced including interests and charges. Buyer herewith assigns his claim out of a resale of conditional commodities, even if they are processed, transformed or combined with other commodities, to Seller to secure the latter's purchase money claim. In the case of resale granting respite Buyer shall have the power of disposal of the product under retention of ownership only with the proviso that upon reselling Buyer notifies the secondary buyer of the assignment for security or enters the assignment in his account books. Upon request Buyer has to notify the assigned claim and the debtor thereof to Seller, and to make all information and material required for his debt collection available and to notify the assignment to the third-party debtor. If the goods are attached or otherwise levied upon, Buyer shall draw attention to Sellers title and immediately inform Seller of the attachment or levy.

#### 8. Warranty and acceptance of obligation to repair defects

- 8.1. Once the agreed terms of payment have been complied with, Seller shall, subject to the conditions hereunder, remedy any defect existing at the time of acceptance of the article in question whether due to faulty design, material or manufacture, that impairs the functioning of said article. From particulars appearing in catalogues, folders, promotional literature as well as written or oral statements which have not been included in the agreement no warranty obligations may be deduced.
- 8.2. Unless special warranty periods operate for individual items the warranty period shall be 12 months. These conditions shall also apply to any goods supplied, or services rendered in respect of goods supplied, that are firmly attached to buildings or the ground. The warranty period begins at the point of passage of risk acc. to paragraph 6.
- 8.3. For improved or exchanged parts, the warranty period shall start again, but shall end in any case 6 months after the original warranty period has expired.
- 8.4. If delivery or the performance of services is delayed for reasons outside the control of Seller, the warranty period shall begin 2 weeks after Seller is ready to deliver or perform services.

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- 8.5. The foregoing warranty obligations are conditional upon the Buyer giving within a reasonable period notice in writing of any defects that have occurred and such notice reaching the Seller. Buyer shall prove within a reasonable period the presence of a defect, in particular he shall make available within a reasonable period to Seller all material and data in his possession. Upon receipt of such notice Seller shall, in the case of a defect covered by the warranty under 8.1 above, have the option to replace the defective goods or defective parts thereof or else to repair them on Buyer's premises or have them returned for repair, or to grant a fair and reasonable price reduction.
- 8.6. Any expenses incurred in connection with rectifying defects (e. g. expenses for assembly and disassembly, transport, waste disposal, travel and siteto-quarters time) shall be borne by Buyer. For warranty work on Buyer's premises Buyer shall make available free of charge any assistance, hoisting gear, scaffolding and sundry supplies and incidentals that may he required. Replaced parts shall become the property of Seller.
- 8.7. If an article is manufactured by Seller on the basis of design data, design drawings, models or other specifications supplied by Buyer, Seller's warranty shall be restricted to non-compliance with Buyers specifications.
- 8.8. Seller's warranty obligation shall not extend to any defects due to assembly and installation work not undertaken by Seller, inadequate equipment, or due to non-compliance with installation requirements and operating conditions, overloading of parts in excess of the design values stipulated by Seller, negligent or faulty handling or the use of inappropriate materials, nor for defects attributable to material supplied by Buyer. Nor shall Seller be li- able for damage due to acts of third parties, atmospheric discharges. Excess voltage and chemical influences. The warranty does not cover the replacement of parts subject to natural wear and tear. Seller accepts no warranty for the sale of used goods.
- 8.9. The warranty shall lapse immediately if, without written consent of Seller, Buyer himself or a third party not expressly authorised undertakes modifications or repairs on any items delivered.
- 8.10. Claims acc. to § 933b ABGB are struck by the statute of limitation with lapse of the period mentioned under point 8.2.
- 8.11. The provisions of sub-paragraphs 8.1 to 8.10 shall apply, mutatis mutandis, to all cases where the obligation to repair defects has to be accepted for other reasons laid down by law.

#### 9. Withdrawal from contract

- 9.1. Buyer may withdraw from the contract only in the event of delays caused by gross negligence on the part of Seller and only after a reasonable period of grace has elapsed. Withdrawal from contract shall be notified in writing by registered mail.
- 9.2. Irrespective of his other rights Seller shall be entitled to withdraw from the contract
  - a) if the execution of delivery or the inception or continuation of services to be rendered under the contract is made impossible for reasons within the responsibility of Buyer and if the delay is extended beyond a reasonable period of grace allowed:
  - b) if doubts have arisen as to Buyer's creditworthiness and if same fails, on Seller's request, to make an advance payment or to provide adequate security prior to delivery, or
  - c) if, for reasons mentioned in 5.4, the period allowed for delivery is extended by more than half of the period originally agreed or by at least 6 months, or
  - d) if Buyer does not or does not properly meet the obligations imposed as per paragraph 13.
- 9.3. For the reasons given above withdrawal from the contract shall also be possible in respect of any outstanding part of the delivery or service contracted for.
- 9.4. If bankruptcy proceedings are instituted against Buyer or an application for bankruptcy proceedings is not granted for insufficiency of assets, Seller may withdraw from the contract without allowing a period of grace. If this withdrawal is taken, it shall take effect immediately upon the decision that the business will not be continued. If the business will be continued, a withdrawal shall not take effect until 6 months after the institution of bankruptcy proceedings or after an application for bankruptcy proceedings has not been granted for insufficiency of assets. In any case, the contract shall be terminated immediately unless the bankruptcy law to which Buyer is subject conflicts with this or if termination of the contract is necessary to prevent significant damages to Seller.
- 9.5. Without prejudice to Seller's claim for damages including expenses arising prior to a lawsuit, upon withdrawal from contract any open accounts in respect of deliveries made or services rendered in whole or in part shall be settled according to contract This provision also covers deliveries or services not yet accepted by Buyer as well as any preparatory acts performed by Seller. Seller shall, however, have the option alternatively to require the restitution of articles already delivered.
- 9.6. Withdrawal from contract shall have no consequences other than those stipulated above.
- 9.7. The assertion of claims on the ground of laesio enormis, error, or lapse of purpose by the Buyer is excluded.

#### 10. Disposal of waste electrical and electronic equipment

- 10.1. The Buyer of electrical/electronic equipment for commercial purposes, incorporated in Austria, is responsible for the financing of the collection and treatment of waste electrical and electronic equipment as defined by the Ordinance Regulating the Handling of Waste Electrical Equipment, if he is himself the user of the electrical/electronic equipment. If the Buyer is not the end user, he shall transfer the full financial commitment to his customer by agreement and furnish proof thereof to the Seller.
- 10.2. The Buyer incorporated in Austria shall ensure that the Seller is provided with all information necessary to meet the Seller's obligations as manufacturer/ importer, particularly according to §§ 11 and 24 of the Ordinance Regulating the Handling of Waste Electrical Equipment and the Waste Management Act.
- 10.3. The Buyer incorporated in Austria is liable vis-à-vis the Seller for any damage and other financial disadvantages incurred by Seller due to Buyer's failure to meet or fully meet his financing commitment or any other obligations according to Article 10. The Buyer shall bear the burden of proof of performance of this obligation.

#### 11. Seller's liability

- 11.1. Outside the scope of the Product Liability Act, Seller shall be liable only if the damage in question is proved to be due to intentional acts or acts of gross negligence, within the limits of statutory provisions. Seller's total liability in cases of gross negligence is limited to the net value of the order or EUR 500,000, depending on which amount is lower.
- 11.2. For each incident of damage, Seller shall be liable for 25% of the net value of the order or EUR 125,000, depending on which amount is lower.
- 11.3. Seller shall not be liable for damage due to acts of ordinary negligence nor for consequential damages or damages for pure economic loss, indirect damages, loss of production, financing costs, costs for replacement energy, loss of energy, data or information, loss of profits, loss of savings or interest, or damage resulting from third-party claims against buyer.
- 11.4. Seller shall not be liable for damages in case of non-compliance with instructions for assembly, commissioning and operation (such as are contained in instructions for use) or non-compliance with licensing requirements.
- 11.5. Claims that exceed the contractual penalties that were agreed on are excluded from the respective title. The provisions of paragraph 11 apply exclusively for all claims by Buyer against Seller, regardless of the legal basis or entitlement, and also apply to all employees, subcontractors and subsuppliers of Seller.

#### 12. Industrial property rights and copyrights

- 12.1. Buyer shall indemnify Seller and hold him harmless against any claims for any infringement of industrial property rights raised against him if Seller manufactures an article pursuant to any design data, design drawings, models or other specifications made available to him by Buyer.
- 12.2. Design documents such as plans and drawings and other technical specifications as well as samples, catalogues, prospectuses, pictures and the like shall remain the intellectual property of Seller and are subject to the relevant statutory provisions governing reproduction, imitation, competition etc. The provisions of 2.2 above shall also cover design documents.

### 13. Compliance with export provisions

- 13.1. When passing on goods delivered by Seller to third parties (as well as any related documentation, regardless of the method of provision or the services performed by Seller [including technical support of any kind]), Buyer must comply with the applicable regulations of national and international (re-)export provisions. In any case, Buyer must observe the (re-)export provisions of Seller's country of residence, the European Union and the United States of America.
- 13.2. If necessary for export controls, Buyer must provide Seller with all necessary information immediately after being requested to do so, for example, information about the final recipient, final destination and purpose of the goods or services.

#### 14. General

Should individual provisions of the contract or of these provisions be invalid the validity of the other provisions shall not be affected. The invalid provision shall be replaced by a valid one, which comes as close to the target goal as possible.

#### 15. Jurisdiction and applicable law

Any litigations arising under the contract including litigations over the existence or non-existence thereof shall fall within the exclusive jurisdiction of the competent court at Sellers domicile; the competent court of the Bezirksgericht Innere Stadt, Vienna, shall have exclusive jurisdiction if Seller is domiciled in Vienna. The contract is subject to Austrian law excluding the referral rules. Application of the UN Convention on Contracts for the International Sale of Goods is renounced.

#### 16. Proviso

The execution of the contract by Seller is subject to the condition that there are no obstacles standing in the way of execution due to national or international (re-)export provisions, and especially no embargos and/or other sanctions.

Last revised in September 2011



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