Electronic switchgear and motor control

Switching devices for starting, reversing, and protecting electric motors rank among the components used in automation technology. These components are designed redundantly for safety-sensitive applications. When it comes to reducing installation time and space requirements, CONTACTRON hybrid motor starters are the state-of-the-art alternative.

This is because CONTACTRON hybrid motor starters combine up to four functions in a single device. They are integrated into popular fieldbus systems via the Interface system connection.

For protection of the entire system, the product range now includes the electronic motor manager (EMM). In addition to typical measured values such as voltage and current, the behavior of the system is monitored and protected by means of active power measurement. The process data in all popular fieldbus systems can be supplied with the gateway and evaluated by a controller.

Product range overview

Motor management

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Hybrid motor starters

Network-capable hybrid motor starters with reversing function
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Hybrid motor starters with reversing function
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Network-capable hybrid motor starters with direct start function
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Hybrid motor starters with direct start function
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Solid-state contactors

3-phase solid-state reversing contactors
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3-phase solid-state contactors
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Solid-state reversing contactors for DC motors
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Single-phase solid-state contactors
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Hybrid motor starters with short-circuit protection

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Power distribution boards

Power distribution boards

Page 50

Electronic motor management (EMM)

The electronic motor management modules offer all the advantages of modern active power monitoring.

The measuring and evaluation electronics for all performance classes. EMM offers the same functionality for all performance classes, but without a power unit.

Power within limits

Monitoring is based on freely configurable switching and signaling thresholds for overload and underload detection. Identical or separate settings can be made for the thresholds for both directions of rotation. The active power consumed, calculated from three currents, voltages, and the phase angle, is used for configuration. As it is independent of voltage fluctuations and drive load, the configuration is thus much more precise than when only the current is taken into consideration. If a switching threshold is violated, an emergency shutdown of the motor is initiated immediately or with an adjustable "delay time". In addition, a message is sent via an output.

This state can only be deactivated via a defined reset. If the effective power consumed is determined as being above or below the signaling thresholds, all that occurs is that a check-back is returned for the duration for which the module was addressed.

In addition, signals are generated by the module for the recognition of the direction of rotation. Asymmetry and phase failures are detected and signalized.

Permanent status monitoring with high scanning rates and the fast semiconductor switch enable complete system protection, including motor protection.

Without any extra wiring – and with just a single device – pumps, actuating drives, fans, and tools are monitored for proper functioning, contamination (filter or similar), and wear. The adjustable "inrush suppression" time can be used to mask out the switching operation from the monitoring process.

Interface system

The Interface system (IFS) consists of devices which can be connected to each other via the DIN rail connector. A gateway with up to 32 IFS devices forms the head of the Interface system. The station is managed by the gateway.

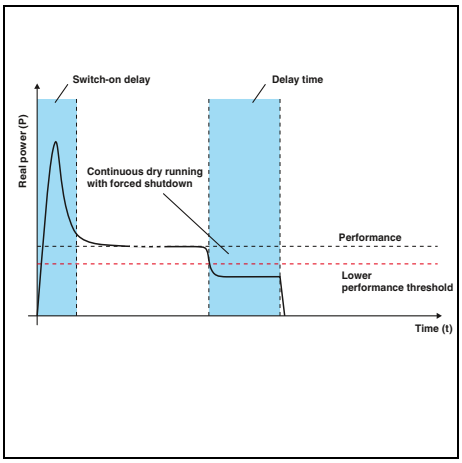
Interface system properties:

– Use of the Interface system via the DIN rail connector for the purpose of configuration, diagnostics and exchange of data
– Compatible with defined IFS accessories
– 24 V supply of the devices (e.g., EMM...IFS, ELR...IFS, EM-GATEWAY-IFS) via the DIN rail connector

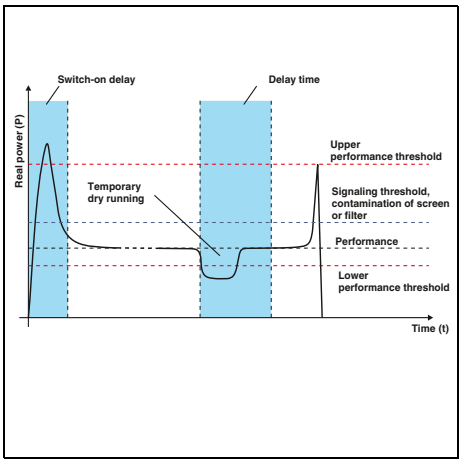
Protection against dry running, blocking, and cavitation, warning thresholds to indicate filter contamination.

Protection against blocking, warning thresholds for bearing wear and other cases that trigger overload.

Protection against blocking and broken tools, warning thresholds for tool and bearing wear.

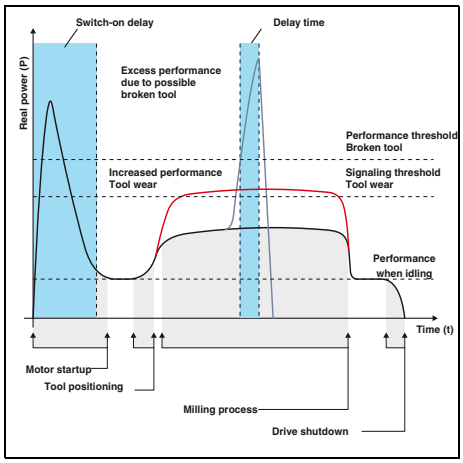


In the case of motor-driven pumps, the lower performance threshold provides reliable protection against hazardous dry running.



Forced shutdown of the drive is delayed by the "delay time".

This prevents forced shutdown in the event of air bubbles.



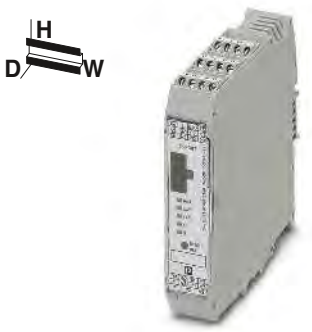
Machine tools are monitored and protected in a similar way when drilling, milling or grinding. If the feed value on a milling machine is set too high, a tool may break in the worst-case scenario. The power threshold, configured accordingly, can be used to resolve this issue.

Additionally, a signaling threshold signals tool wear in advance.

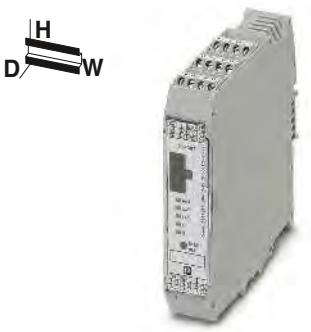
Electronic motor management

EMM motor management (with or without current transformer) for all performance classes monitors and protects 3-phase loads, such as electrical drives.

– Freely configurable signaling or switching thresholds
– Digital outputs control external switching elements
– Optional connection to the Interface system (e.g., IFS gateways) via DIN rail connector

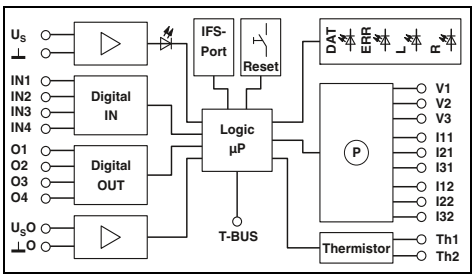


Allows the use of external current transformers

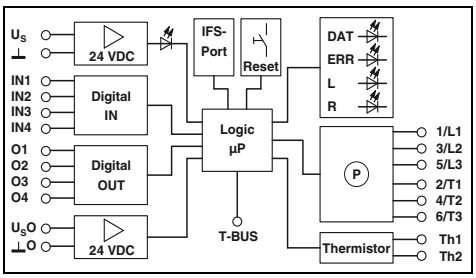


With integrated current transformers

Ex:



Ex:



Technical data

Input data			
Rated control supply voltage U_S	24 V DC	230 V AC	
Control supply voltage range	19.2 V DC ... 30 V DC	92 V AC ... 253 V AC	
Rated control supply current I_S at U_S	25 mA	10 mA	
Input data, digital inputs	EMM 3- 24DC/500AC-IFS	EMM 3-230AC/500AC-IFS	
Number of inputs	4 (IN1 - IN4)	4 (IN1 - IN4)	
Rated actuating voltage U_C	24 V DC	230 V AC	
Rated actuating current I_C	3.3 mA	3.5 mA	
Power measurement			
Voltage measuring input	42 V AC ... 575 V AC	42 V AC ... 575 V AC	
Nominal current, voltage measuring input	<0.5 mA	<0.5 mA	
Current measuring input	5 A (secondary external converter)	5 A (secondary external converter)	
Output data, checkback contacts			
O1 - O4 in the case of 1 signal	24 V DC (semiconductor output) / 500 mA	230 V AC (relay output) / 500 mA	
General data			
Rated insulation voltage	500 V		
Rated surge voltage	6 kV	6 kV	
Ambient temperature (operation)	-25°C ... 70°C		
Standards/regulations	DIN EN 50178 / EN 60947 / EN 60947-4-2		
Degree of protection in accordance with IEC 60529/EN 60529	IP20		
Mounting position	Vertical (horizontal DIN rail)		
Screw connection rigid / flexible / AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14		
Dimensions W / H / D	22.5 mm / 99 mm / 114.5 mm		
EMC note	Class A product, see page 583		

Technical data

Input data			
Rated control supply voltage U_S	24 V DC	230 V AC	
Control supply voltage range	19.2 V DC ... 30 V DC	92 V AC ... 253 V AC	
Rated control supply current I_S at U_S	25 mA	10 mA	
Input data, digital inputs	EMM 3- 24DC/500AC-16-IFS	EMM 3-230AC/500AC-16-IFS	
Number of inputs	4 (IN1 - IN4)	4 (IN1 - IN4)	
Rated actuating voltage U_C	24 V DC	230 V AC	
Rated actuating current I_C	3.3 mA	3.5 mA	
Power measurement			
Voltage measuring input	42 V AC ... 575 V AC	42 V AC ... 575 V AC	
Nominal current, voltage measuring input	<0.5 mA	<0.5 mA	
Current measuring input	max. 16 A	max. 16 A	
Output data, checkback contacts			
O1 - O4 in the case of 1 signal	24 V DC (semiconductor output) / 500 mA	230 V AC (relay output) / 500 mA	
General data			
Rated insulation voltage	500 V		
Rated surge voltage	6 kV	6 kV	
Ambient temperature (operation)	-25°C ... 70°C		
Standards/regulations	DIN EN 50178 / EN 60947 / EN 60947-4-2		
Degree of protection in accordance with IEC 60529/EN 60529	IP20		
Mounting position	Vertical (horizontal DIN rail)		
Screw connection rigid / flexible / AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14		
Dimensions W / H / D	22.5 mm / 99 mm / 114.5 mm		
EMC note	Class A product, see page 583		

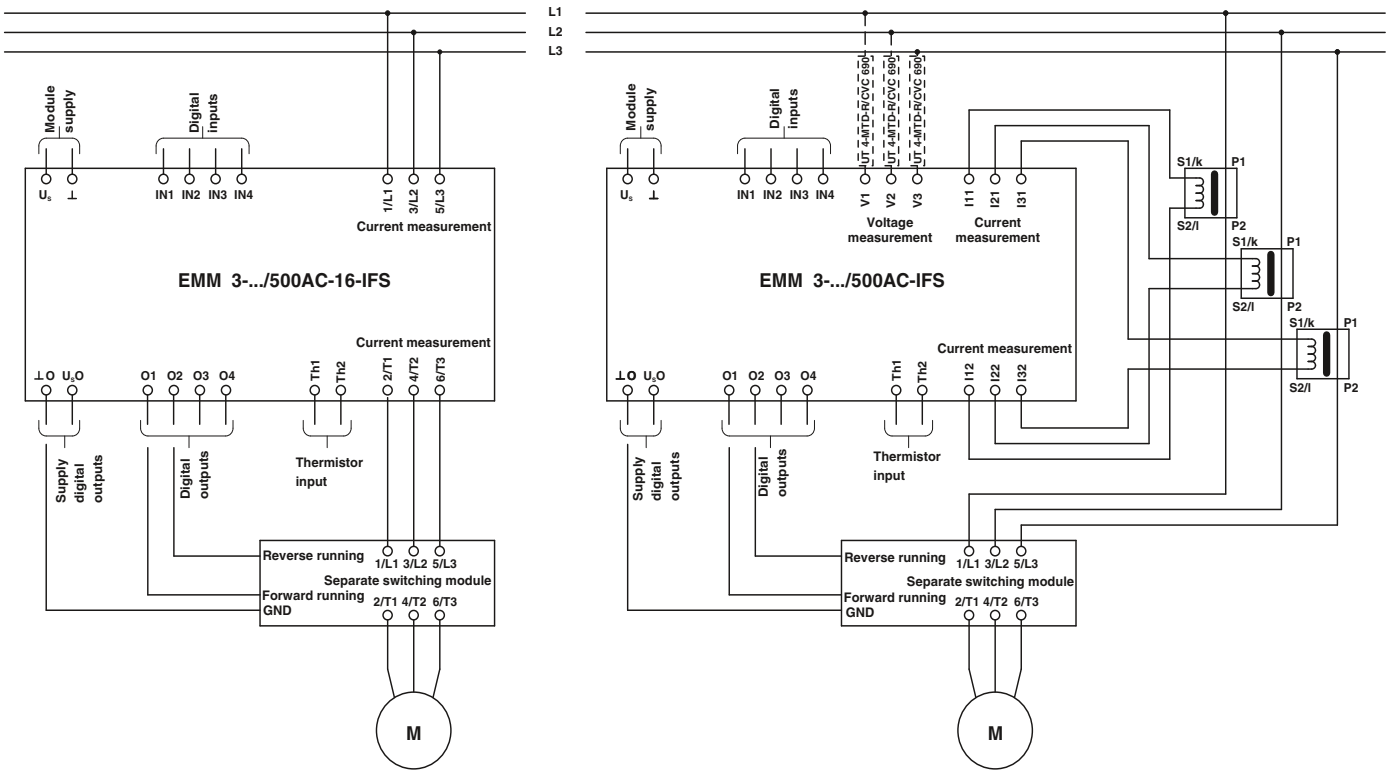
Ordering data

Description	Type	Order No.	Pcs./Pkt.
Electronic motor management			
	EMM 3- 24DC/500AC-IFS	2297497	1
	EMM 3-230AC/500AC-IFS	2297507	1
Accessories			
Configuration package for the EMM...IFS, comprising CONTACTRON-DTM-IFS, USB programming adapter, and user manual on CD	**MM-CONF-SET**	2297992	1
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GY**	2201937	50
Voltage transducer for 690 V, for EMM 3-.../500AC-IFS, comprising 3 modular terminal blocks and cover	**UT 4-MTD-R/CVC 690/SET**	2901667	1
Multi-functional memory block for the Interface system			
- Flat design	**IFS-CONFSTICK**	2986122	1
- Tall design	**IFS-CONFSTICK-L**	2901103	1
MINI COMBICON connectors			
- Female contact	**MC 1,5/ 5-ST-3,81**	1803604	250
- Male contact	**IMC 1,5/ 5-ST-3,81**	1857919	50

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Electronic motor management			
	EMM 3- 24DC/500AC-16-IFS	2297523	1
	EMM 3-230AC/500AC-16-IFS	2297536	1
Accessories			
Configuration package for the EMM...IFS, comprising CONTACTRON-DTM-IFS, USB programming adapter, and user manual on CD	**MM-CONF-SET**	2297992	1
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GY**	2201937	50
Multi-functional memory block for the Interface system			
- Flat design	**IFS-CONFSTICK**	2986122	1
- Tall design	**IFS-CONFSTICK-L**	2901103	1
MINI COMBICON connectors			
- Female contact	**MC 1,5/ 5-ST-3,81**	1803604	250
- Male contact	**IMC 1,5/ 5-ST-3,81**	1857919	50

Electronic motor management



The electronic motor management modules (EMM) offer all the advantages of modern active power monitoring. Every 6.6 ms, the active power consumed by a drive system or another 3-phase load is determined based on three currents, voltages, and the phase angle. Currents up to 16 A are directly acquired and currents >16 A are fed through external converters. Separate mechanical or electronic switching elements, which take care of the actual load switching, are controlled via digital outputs. The EMM is designed to reliably protect connected loads – irrespective of their power consumption – against overload and underload, and to provide continuous status monitoring.

Up to 8 freely configurable switching, signaling thresholds and up to four freely configurable inputs and outputs enable the protection of electrical drives and the system.

The EMM modules can record the following data:

– Apparent, active, and reactive power
– Currents and voltages
– Phase angle
– Switching-cycle and operating-hour meters
– Power meter

Additional functions:

– Adjustable Class 5-40 bimetal function
– Thermistor monitoring
– Recording measured values
– GATEWAY connection via DIN rail connector
– Pre-configured motor feeders such as reversing starters, star-delta starters, etc.

With the EMM modules, complete "driving curves" are recorded, which can be used for the system documentation, for example.

With the forward running, reverse running, reversing, and limit switch (with integrated restart lock) operating modes, actuators and control drives, pumps and similar are switched and monitored for wear.

Current transformer

The external converters should be selected with a secondary nominal current of 5 A. The primary current is determined by the current consumption of the load (refer to connection diagram). Refer to the Interface catalog for suitable current transformers.

DIN rail connectors

The DIN rail connector (Order No. 2201937) is used to supply several EMMs with 24 V DC or to couple up to 32 EMMs to the EM-PROFINET-GATEWAY-IFS, for example.

Switching element

Depending on the requirements for the actual load switching, an electromechanical contactor or a reversing contactor combination or a solid-state contactor/ solid-state reversing contactor is used. These switching elements are controlled via the digital outputs of the EMM modules.

Electronic machine management

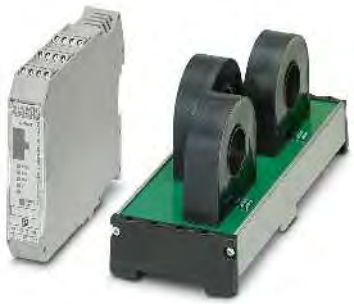
Phoenix Contact's electronic motor and machine management combines precise energy measurement with display and monitoring for important parameters for motors, machines or other 3-phase loads.

– Flexible use in the central control cabinet and in the decentral control box
– Increased system availability, thanks to predictive maintenance based on process data
– Continuous monitoring of mixed loads within an application
– Connects directly via DIN rail connector interfaces to all standard fieldbus systems

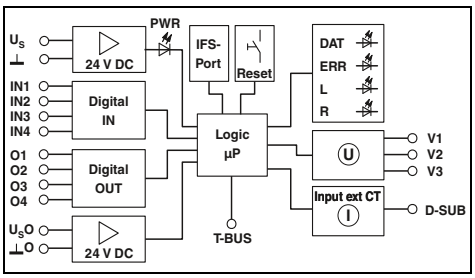
new

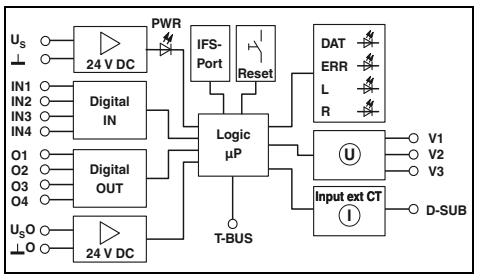
With external current transformers up to 90 A

new



With external current transformers up to 160 A





Technical data

Input data			
Rated control supply voltage U_S		24 V DC	24 V DC
Control supply voltage range		19.2 V DC ... 30 V DC	19.2 V DC ... 30 V DC
Rated control supply current I_S at U_S		33 mA	33 mA
Input data, digital inputs			
Number of inputs		4 (IN1 - IN4)	4 (IN1 - IN4)
Rated actuating voltage U_C		24 V DC	24 V DC
Rated actuating current I_C		3.3 mA	3.3 mA
Power measurement			
Voltage measuring input		-	-
Nominal current, voltage measuring input		-	-
Current measuring input		-	-
Output data, checkback contacts			
O1 - O4 in the case of 1 signal		24 V DC (semiconductor output) / 500 mA	24 V DC (semiconductor output) / 500 mA
General data			
Rated insulation voltage		500 V	500 V
Rated surge voltage		6 kV	6 kV
Ambient temperature (operation)		-25°C ... 50°C	-25°C ... 70°C
Standards/regulations		EN 60947-1 / EN 60947-4-2 / EN 61000-6-2 / EN 61000-6-3	EN 60947-1 / EN 60947-4-2 / EN 61000-6-2 / EN 61000-6-3
Degree of protection in accordance with IEC 60529/EN 60529		IP20	IP20
Mounting position		Any	Any
Screw connection rigid / flexible / AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm	22.5 mm / 99 mm / 114.5 mm

Ordering data

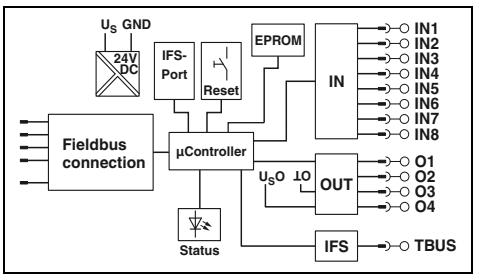
Description	Type	Order No.	Pcs./Pkt.
Electronic motor management			
– With external current transformers (90 A)	**EMM 3-24DC/500AC-90-EXM-IFS**	2908602	1
– With external current transformers (160 A)	**EMM 3-24DC/500AC-160-EXM-IFS**	2908603	1
Accessories			
Configuration package for the EMM...IFS, comprising CONTACTRON-DTM-IFS, USB programming adapter, and user manual on CD	**MM-CONF-SET**	2297992	1
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GY**	2201937	50
Assembled shielded round cable			
- 0.5 m	**CABLE-D 9SUB/B/S/ 50/KONFEK/S**	2299987	1
- 1.0 m	**CABLE-D 9SUB/B/S/100/KONFEK/S**	2299990	1
- 1.5 m	**CABLE-D 9SUB/B/S/150/KONFEK/S**	2300009	1
- 2.0 m	**CABLE-D 9SUB/B/S/200/KONFEK/S**	2302010	1
- 3.0 m	**CABLE-D 9SUB/B/S/300/KONFEK/S**	2302023	1
Multi-functional memory block for the Interface system			
- Flat design	**IFS-CONFSTICK**	2986122	1

IFS gateways for Interface system devices

EM...GATEWAY-IFS for connecting Interface system devices (IFS) to popular bus systems: PROFIBUS DP, Modbus, Modbus/TCP, CANopen®, and PROFINET, EtherNet/IP™.

– Communication via DIN rail connector with up to 32 Interface system devices, such as EMM...IFS- and ELR...IFS modules
– Equipped with freely configurable digital inputs and outputs
– Digital switching outputs for direct control

IFS gateway



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -20% ... +25%
Rated control supply current I_S		85 mA (plus load current of the outputs)
Input circuit		Reverse polarity protection
Digital inputs		
Number of inputs		8
Rated actuating voltage U_C		24 V DC ±20%
Rated actuating current I_C		3 mA
Input circuit		Reverse polarity protection
Digital outputs		
Number of outputs		4
Maximum switching voltage		23 V DC (U_B - $U_{resid.}$ of the output)
Max. switching current		500 mA
Residual voltage		1 V
Output protection		Parallel protection against polarity reversal, note fusing
General data		
Ambient temperature (operation)		-35°C ... 50°C
Nominal operating mode		100% operating factor
Standards/regulations		EN 50178
Degree of protection		IP20
Mounting position/mounting		Any / in rows with zero spacing
Connection data solid/stranded/AWG		0.2 ... 2 mm² / 0.2 ... 2.5 mm² / 12 - 24
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm
EMC note		Class A product, see page 583

Ordering data

Description	Type	Order No.	Pcs./Pkt.
IFS gateway for			
PROFIBUS DP	**EM-PB-GATEWAY-IFS**	2297620	1
Modbus/TCP	**EM-MODBUS-GATEWAY-IFS**	2901528	1
CANopen®	**EM-CAN-GATEWAY-IFS**	2901504	1
PROFINET	**EM-PNET-GATEWAY-IFS**	2904472	1
EtherNet/IP™	**EM-ETH-GATEWAY-IFS**	2901988	1

Accessories

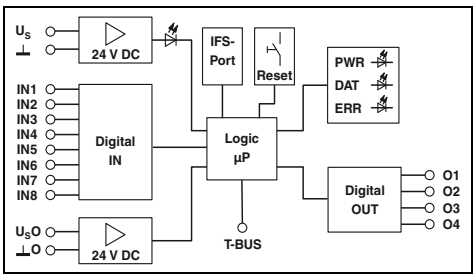
Configuration package for the EMM...IFS, comprising CONTACTRON-DTM-IFS, USB programming adapter, and user manual on CD	**MM-CONF-SET**	2297992	1
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GY**	2201937	50
MINI COMBICON connectors			
- Female contact	**MC 1,5/ 5-ST-3,81**	1803604	250
- Male contact	**IMC 1,5/ 5-ST-3,81**	1857919	50

IFS extension modules for the Interface system

EM-D-8/4... IFS digital extension modules for the Interface system (IFS). For more complex applications, in order to process additional signals in the field.

– Communication with an IFS gateway via DIN rail connector as the slave
– Freely configurable digital inputs and outputs

IFS extension module



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -20% ... +25%
Rated control supply current I_S		85 mA (plus load current of the outputs)
Input circuit		Reverse polarity protection
Digital inputs		
Number of inputs		8
Rated actuating voltage U_C		24 V DC ±20%
Rated actuating current I_C		3 mA
Input circuit		Reverse polarity protection
Digital outputs		
Number of outputs		4
Maximum switching voltage		23 V DC (U_B - $U_{resid.}$ of the output)
Max. switching current		500 mA (per output)
Residual voltage		1 V
Output protection		Parallel protection against polarity reversal, note fusing
General data		
Ambient temperature (operation)		-35°C ... 50°C
Nominal operating mode		100% operating factor
Standards/regulations		EN 61131-2
Degree of protection		IP20
Mounting position/mounting		Any / in rows with zero spacing
Connection data solid/stranded/AWG		0.2 ... 2 mm² / 0.2 ... 2.5 mm² / 12 - 24
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
IFS extension module, with 8 digital inputs and 4 digital outputs	**EM-D-8/4-24DC-IFS**	2904473	1

Accessories

Configuration package for the EMM...IFS, comprising CONTACTRON-DTM-IFS, USB programming adapter, and user manual on CD	**MM-CONF-SET**	2297992	1
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GY**	2201937	50
MINI COMBICON connectors			
- Female contact	**MC 1,5/ 5-ST-3,81**	1803604	250
- Male contact	**IMC 1,5/ 5-ST-3,81**	1857919	50

The CONTACTRON hybrid motor starters combine up to four functions in one device: motor starter, reversing function, motor protection against overload, and emergency stop.

In addition to standard devices for parallel wiring, network-capable versions, which can be integrated into fieldbus environments, are also available.

CONTACTRON hybrid motor starter technology is a microprocessor-controlled combination of wear-free solid-state technology and robust relay technology. The semiconductors execute the wear-prone on and off switching procedures, while the relays only conduct low-loss current. This enables soft switching and considerably reduces the load on the relay contacts.

Switch motors safely and reliably with compact hybrid motor starters.

The devices are used wherever three-phase asynchronous motors, from 50 W to 3 kW, need to be reversed and protected. The product range of hybrid motor starters consists of direct and reversing starters, which are available with various functions such as emergency stop and motor protection.

Hybrid motor starters with up to four functions in one device: forward running, reverse running, motor protection, and emergency stop.

Short-circuit-proof hybrid motor starters with integrated fuses, for mounting on 35 mm DIN rail and 60 mm busbar systems.

Connection of the hybrid motor starters to a bus system via the IFS Interface system. Gateways are available for the most important bus systems: PROFIBUS DP, Modbus/TCP, EtherNet/IP™, CANopen®, PROFINET, etc.

Network-capable hybrid motor starters with reversing function

These 3-phase hybrid motor starters offer up to four functions: forward running, reverse running, motor protection, and emergency stop up to SIL 3 / PL e.

Featuring the following advantages:

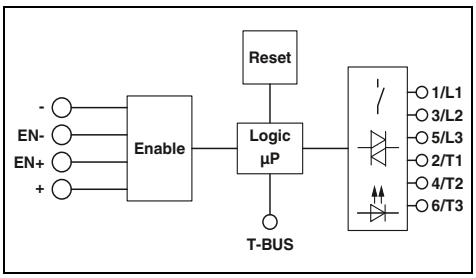
– Bus connection via Interface system (IFS) or via IO-Link
– Diagnostic functions using process data
– Reduced wiring effort
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

Safety level in accordance with:

– IEC 61508-1: SIL 3
– ISO 13849: PL e

Notes:
Type of insulating housing: Polyamide PA non-reinforced, color: gray.
Marking systems and mounting material See Catalog 3

Motor protection, emergency stop and Interface system support



Technical data

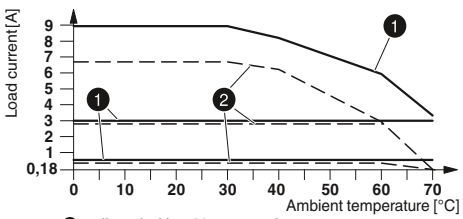
Input data		
Rated control supply voltage U_S		24 V DC
Control supply voltage range		19.2 V DC ... 30 V DC
Rated control supply current I_S at U_S		60 mA
Rated actuating voltage U_C EN+		24 V DC
Actuating voltage range		19.2 V DC ... 30 V DC
Rated actuating current I_C at U_C		7 mA
Input circuit		Surge protection, reverse polarity protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Operating voltage range		42 V AC ... 550 V AC
Output protection		Surge protection
General data		
Rated insulation voltage		550 V
Rated surge voltage		6 kV
Ambient temperature (operation)		-5°C ... 60°C (observe derating)
Standards/regulations		IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
Mounting position		Vertical (horizontal DIN rail, motor output below)
Mounting		Alignable, for spacing see derating
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions	W / H / D	22.5 mm / 106.6 mm / 113.7 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Load current 0.075 A ... 0.6 A			
Screw connection	**ELR H5-IES-SC/500AC-06-IFS**	2905151	1
Push-in connection	**ELR H5-IES-PT/500AC-06-IFS**	2905138	1
Load current 0.18 A ... 3 A			
Screw connection	**ELR H5-IES-SC/500AC-3-IFS**	2905152	1
Push-in connection	**ELR H5-IES-PT/500AC-3-IFS**	2905139	1
Load current 1.5 A ... 9 A			
Screw connection	**ELR H5-IES-SC/500AC-9-IFS**	2905153	1
Push-in connection	**ELR H5-IES-PT/500AC-9-IFS**	2905140	1

Accessories

DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GY**	2201937	50

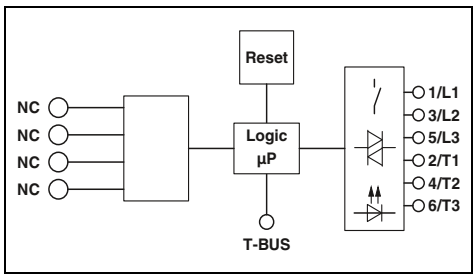


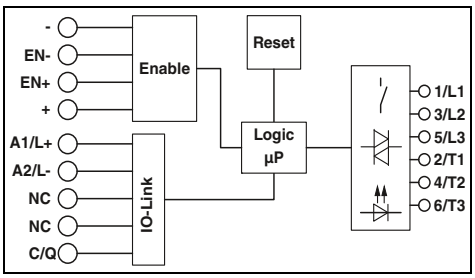
❶ = aligned with > 20 mm spacing
❷ = aligned without spacing

Derating curve

Motor protection and Interface system support

Motor protection, emergency stop and IO-Link support





Technical data

24 V DC	24 V DC
19.2 V DC ... 30 V DC	19.2 V DC ... 30 V DC
60 mA	65 mA
-	24 V DC
-	19.2 V DC ... 30 V DC
-	7 mA
Surge protection, reverse polarity protection	Surge protection, reverse polarity protection
Green LED / Yellow LED / Red LED	Green LED / Yellow LED / Red LED
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	Surge protection
550 V	550 V
6 kV	6 kV
-5°C ... 60°C (observe derating)	-5°C ... 55°C (observe derating)
IEC 60947-1 / EN 60947-4-2	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
Vertical (horizontal DIN rail, motor output below)	Vertical (horizontal DIN rail, motor output below)
Alignable, for spacing see derating	Alignable, for spacing see derating
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
22.5 mm / 106.6 mm / 113.7 mm	22.5 mm / 126.8 mm / 113.7 mm

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H5-I-SC/500AC-06-IFS	2905157	1
ELR H5-I-PT/500AC-06-IFS	2905144	1
ELR H5-I-SC/500AC-3-IFS	2905159	1
ELR H5-I-PT/500AC-3-IFS	2905146	1
ELR H5-I-SC/500AC-9-IFS	2905160	1
ELR H5-I-PT/500AC-9-IFS	2905147	1

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H5-IES-PT/500AC-3-IOL	2908669	1
ELR H5-IES-PT/500AC-9-IOL	2908670	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GY	2201937	50

Accessories

Modular hybrid motor starters with reversing function

In addition to the functions forward running, reverse running, motor protection, and emergency stop up to SIL 3/PL e, these modular 3-phase hybrid motor starters offer additional advantages such as:

– Safe group switch-off
– Modular expansion option
– Wiring and cost savings with DIN rail connector
– Slow tripping characteristic curve Class 10 up to 3 A

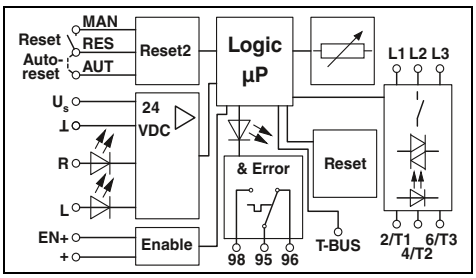
Safety level in accordance with:

– IEC 61508-1: SIL 3
– ISO 13849: PL e

Notes:
Type of insulating housing: Polyamide PA non-reinforced, color: gray.
Marking systems and mounting material See Catalog 3

new

Motor protection, emergency stop



Technical data

Input data		
Rated control supply voltage U_S		24 V DC
Control supply voltage range		19.2 V DC ... 30 V DC
Rated control supply current I_S at U_S		60 mA
Rated actuating voltage U_C EN+		24 V DC
Actuating voltage range		19.2 V DC ... 30 V DC
Rated actuating current I_C at U_C		7 mA
Input circuit		Surge protection, reverse polarity protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Operating voltage range		42 V AC ... 550 V AC
Output protection		Surge protection
General data		
Rated insulation voltage		550 V
Rated surge voltage		6 kV
Ambient temperature (operation)		-25°C ... 70°C (observe derating)
Standards/regulations		EN 60947-1 / EN 60947-4-2 / EN 50495 / EN ISO 13849 / IEC 62061 / IEC 61508
Mounting position		Vertical (horizontal DIN rail, motor output below)
Mounting		Alignable, for spacing see derating
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions	W / H / D	22.5 mm / 107.4 mm / 113.7 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Load current 0.18 A ... 3 A			
Screw connection			
Push-in connection	**ELR H5-IES-PT- 24DC/500AC-3-P**	2909556	1
Load current 1.5 A ... 9 A			
Screw connection			
Push-in connection	**ELR H5-IES-PT- 24DC/500AC-9-P**	2909554	1

Accessories

Extension module			
Screw connection	**EM-2RSC/21AU-R/L-P**	2908701	1
Push-in connection	**EM-2RPT/21AU-R/L-P**	2909573	1
Safety relay with interface for DIN rail connectors			
Screw connection	**PSR-MC38-2NO-1DO-24DC-SC**	1009831	1
Push-in connection	**PSR-MC38-2NO-1DO-24DC-PI**	1009832	1
DIN rail connector			
- For modular hybrid motor starters	**ELR-TBUS-22,5-P**	2203861	10
- For safety relay modules	**PSR-TBUS**	2890425	50

new

Motor protection, emergency stop

Technical data

24 V DC	
19.2 V DC ... 30 V DC	
60 mA	
24 V DC	
19.2 V DC ... 30 V DC	
7 mA	
Surge protection, reverse polarity protection	
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	
-	
550 V	
6 kV	
-25°C ... 70°C (observe derating)	
EN 60947-1 / EN 60947-4-2 / EN ISO 13849 / IEC 62061 / IEC 61508	
Vertical (horizontal DIN rail, motor output below)	
Alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 106.6 mm / 113.7 mm	

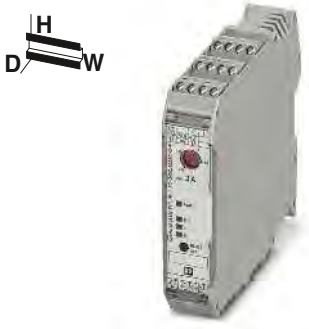
Ordering data

Type	Order No.	Pcs./Pkt.
ELR H5-IS-SC- 24DC/500AC-3-P	2908699	1
ELR H5-IS-PT- 24DC/500AC-3-P	2909569	1
ELR H5-IS-SC- 24DC/500AC-9-P	2908697	1
ELR H5-IS-PT- 24DC/500AC-9-P	2909567	1

Accessories

EM-2RSC/21AU-R/L-P	2908701	1
EM-2RPT/21AU-R/L-P	2909573	1

new



Motor protection

Technical data

24 V DC	
19.2 V DC ... 30 V DC	
60 mA	
24 V DC	
19.2 V DC ... 30 V DC	
7 mA	
Surge protection, reverse polarity protection	
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	
-	
550 V	
6 kV	
-25°C ... 55°C (observe derating)	
IEC 60947-1 / EN 60947-4-2	
Vertical (horizontal DIN rail, motor output below)	
Alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 106.6 mm / 113.7 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H5-I-SC- 24DC/500AC-3-P	2908695	1
ELR H5-I-PT- 24DC/500AC-3-P	2909562	1
ELR H5-I-SC- 24DC/500AC-9-P	2908693	1
ELR H5-I-PT- 24DC/500AC-9-P	2909560	1

Accessories

EM-2RSC/21AU-R/L-P	2908701	1
EM-2RPT/21AU-R/L-P	2909573	1

Hybrid motor starters with reversing function

These 3-phase hybrid motor starters offer up to four functions: forward running, reverse running, motor protection, and emergency stop up to SIL 3 / PL e.

Featuring the following advantages:

– 22.5 mm wide
– Reduced wiring effort
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

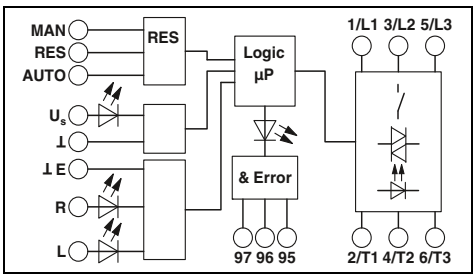
Safety level in accordance with:

– IEC 61508-1: SIL 3
– ISO 13849: PL e

Notes:
Type of insulating housing: Polyamide PA non-reinforced, color: gray.
Marking systems and mounting material See Catalog 3

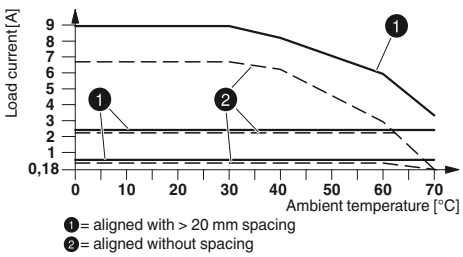
Motor protection and emergency stop

Ex:



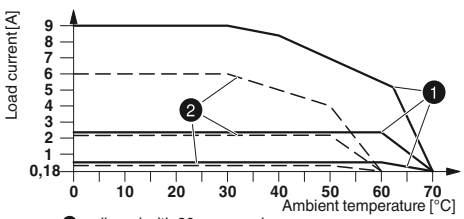
Technical data

Input data		
Rated control supply voltage U_S	24 V DC	230 V AC
Control supply voltage range	19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
Rated control supply current I_S at U_S	40 mA	4 mA
Rated actuating voltage U_C R/L	24 V DC	230 V AC
Actuating voltage range	19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
Rated actuating current I_C at U_C	5 mA (input type 1)	7 mA (input type 1)
Input circuit	Surge protection, reverse polarity protection	Surge protection
Operating voltage / status / error indicator	Green LED / Yellow LED / Red LED	
Output data load side		
Operating voltage range	42 V AC ... 550 V AC	42 V AC ... 550 V AC
Output protection	Surge protection	
General data		
Rated insulation voltage	500 V	
Rated surge voltage	6 kV	4 kV
Ambient temperature (operation)	-25°C ... 70°C (observe derating)	
Standards/regulations	IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
Mounting position	Vertical (horizontal DIN rail, motor output below)	
Mounting	Alignable, for spacing see derating	
Connection data solid/stranded/AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
Dimensions W / H / D	22.5 mm / 106.6 mm / 113.7 mm	



1 = aligned with > 20 mm spacing
2 = aligned without spacing

Derating curve for ELR H5...24DC...



1 = aligned with 20 mm spacing
2 = aligned without spacing

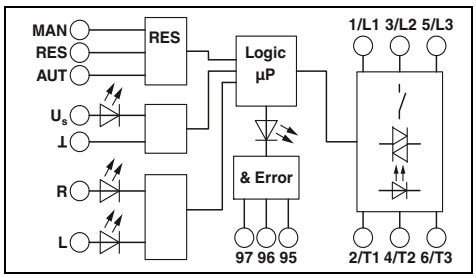
Derating curve for ELR H5...230AC...

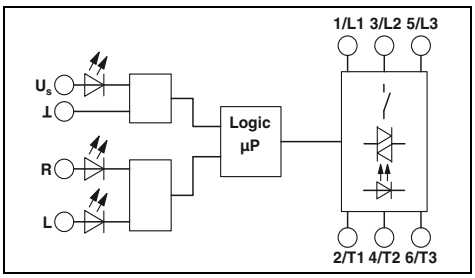
Ordering data

Description	Type	Order No.	Pcs./Pkt.
Load current 0.075 A ... 0.6 A			
Screw connection	**ELR H5-IES-SC- 24DC/500AC-0,6**	2900582	1
Push-in connection	**ELR H5-IES-PT- 24DC/500AC-0,6**	2903902	1
Load current 0.18 A ... 2.4 A			
Screw connection	**ELR H5-IES-SC- 24DC/500AC-2**	2900414	1
Push-in connection	**ELR H5-IES-PT- 24DC/500AC-2**	2903904	1
Screw connection	**ELR H5-IES-SC-230AC/500AC-2**	2900420	1
Load current 1.5 A ... 9 A			
Screw connection	**ELR H5-IES-SC- 24DC/500AC-9**	2900421	1
Push-in connection	**ELR H5-IES-PT- 24DC/500AC-9**	2903906	1
Screw connection	**ELR H5-IES-SC-230AC/500AC-9**	2900422	1
Load current 0 A ... 9 A			
Screw connection			
Screw connection			

Motor protection

Reversing function only





Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
40 mA	4 mA
24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
5 mA (input type 1)	7 mA (input type 1)
Surge protection, reverse polarity protection	Surge protection
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	
500 V	
6 kV	4 kV
-25°C ... 70°C (observe derating)	
IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
Vertical (horizontal DIN rail, motor output below)	
Alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 106.6 mm / 113.7 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H5-I-SC- 24DC/500AC-0,6	2900573	1
ELR H5-I-PT- 24DC/500AC-0,6	2903908	1
ELR H5-I-SC- 24DC/500AC-2	2900574	1
ELR H5-I-PT- 24DC/500AC-2	2903910	1
ELR H5-I-SC-230AC/500AC-2	2900575	1
ELR H5-I-SC- 24DC/500AC-9	2900576	1
ELR H5-I-PT- 24DC/500AC-9	2903912	1
ELR H5-I-SC-230AC/500AC-9	2900578	1

Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
40 mA	4 mA
24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
5 mA (input type 1)	7 mA (input type 1)
Surge protection, reverse polarity protection	Surge protection
Green LED / Yellow LED / -	
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	
500 V	
6 kV	4 kV
-25°C ... 70°C (observe derating)	
IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
Vertical (horizontal DIN rail, motor output below)	
Alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 106.6 mm / 113.7 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H5-SC- 24DC/500AC-9	2900538	1
ELR H5-SC-230AC/500AC-9	2900539	1

Network-capable hybrid motor starters with direct start function

These 3-phase hybrid motor starters offer up to three functions: forward running, motor protection, and emergency stop up to SIL 3 / PL e.

Featuring the following advantages:

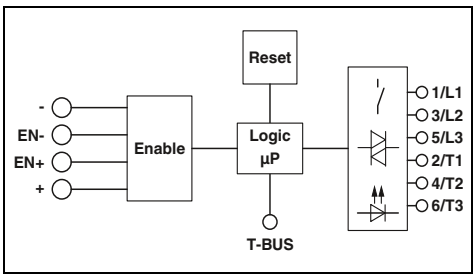
– Bus connection via Interface system (IFS) or via IO-Link
– Diagnostic functions using process data
– Reduced wiring effort
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

Safety level in accordance with:

– IEC 61508-1: SIL 3
– ISO 13849: PL e

Notes:
Type of insulating housing: Polyamide PA non-reinforced, color: gray.
Marking systems and mounting material See Catalog 3

Motor protection, emergency stop and Interface system support



Technical data

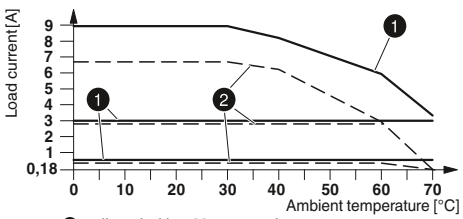
Input data		
Rated control supply voltage U_S		24 V DC
Control supply voltage range		19.2 V DC ... 30 V DC
Rated control supply current I_S at U_S		60 mA
Rated actuating voltage U_C EN+		24 V DC
Actuating voltage range		19.2 V DC ... 30 V DC
Rated actuating current I_C at U_C		7 mA
Input circuit		Surge protection, reverse polarity protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Operating voltage range		42 V AC ... 550 V AC
Output protection		Surge protection
General data		
Rated insulation voltage		550 V
Rated surge voltage		6 kV
Ambient temperature (operation)		-5°C ... 60°C (observe derating)
Standards/regulations		IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
Mounting position		Vertical (horizontal DIN rail, motor output below)
Mounting		Alignable, for spacing see derating
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions	W / H / D	22.5 mm / 106.6 mm / 113.7 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Load current 0.075 A ... 0.6 A			
Screw connection	**ELR H3-IES-SC/500AC-06-IFS**	2905154	1
Push-in connection	**ELR H3-IES-PT/500AC-06-IFS**	2905141	1
Load current 0.18 A ... 3 A			
Screw connection	**ELR H3-IES-SC/500AC-3-IFS**	2905155	1
Push-in connection	**ELR H3-IES-PT/500AC-3-IFS**	2905142	1
Load current 1.5 A ... 9 A			
Screw connection	**ELR H3-IES-SC/500AC-9-IFS**	2905156	1
Push-in connection	**ELR H3-IES-PT/500AC-9-IFS**	2905143	1

Accessories

DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GY**	2201937	50

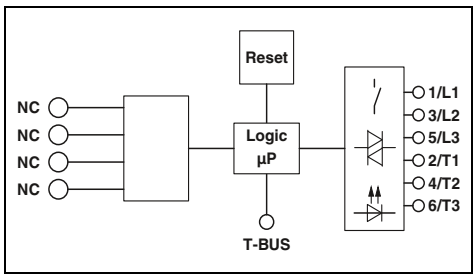


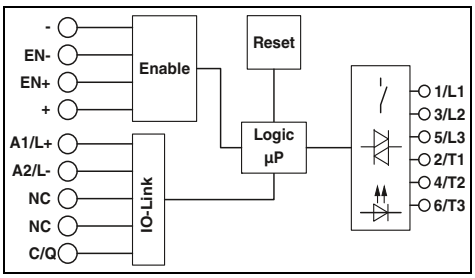
❶ = aligned with > 20 mm spacing
❷ = aligned without spacing

Derating curve

Motor protection and Interface system support

Motor protection, emergency stop and IO-Link support





Technical data

24 V DC	24 V DC
19.2 V DC ... 30 V DC	19.2 V DC ... 30 V DC
60 mA	65 mA
-	24 V DC
-	19.2 V DC ... 30 V DC
-	7 mA
Surge protection, reverse polarity protection	Surge protection, reverse polarity protection
Green LED / Yellow LED / Red LED	Green LED / Yellow LED / Red LED
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	Surge protection
550 V	550 V
6 kV	6 kV
-5°C ... 60°C (observe derating)	-5°C ... 55°C (observe derating)
IEC 60947-1 / EN 60947-4-2	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
Vertical (horizontal DIN rail, motor output below)	Vertical (horizontal DIN rail, motor output below)
Alignable, for spacing see derating	Alignable, for spacing see derating
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
22.5 mm / 106.6 mm / 113.7 mm	22.5 mm / 126.8 mm / 113.7 mm

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H3-I-SC/500AC-06-IFS	2905162	1
ELR H3-I-PT/500AC-06-IFS	2905148	1
ELR H3-I-SC/500AC-3-IFS	2905163	1
ELR H3-I-PT/500AC-3-IFS	2905149	1
ELR H3-I-SC/500AC-9-IFS	2905164	1
ELR H3-I-PT/500AC-9-IFS	2905150	1

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H3-IES-PT/500AC-3-IOL	2908671	1
ELR H3-IES-PT/500AC-9-IOL	2908672	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GY	2201937	50

Accessories

Modular hybrid motor starters with direct start function

In addition to the functions forward running, motor protection, and emergency stop up to SIL 3/PL e, these modular 3-phase hybrid motor starters offer additional advantages such as:

– Safe group switch-off
– Modular expansion option
– Wiring and cost savings with DIN rail connector
– Slow tripping characteristic curve Class 10 up to 3 A

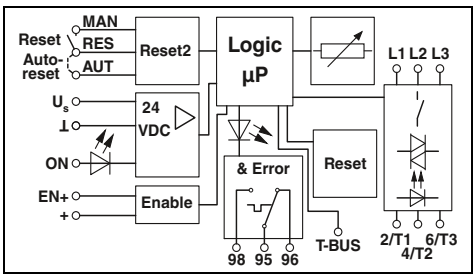
Safety level in accordance with:

– IEC 61508-1: SIL 3
– ISO 13849: PL e

Notes:
Type of insulating housing: Polyamide PA non-reinforced, color: gray.
Marking systems and mounting material See Catalog 3

new

Motor protection, emergency stop



Technical data

Input data		
Rated control supply voltage U_S		24 V DC
Control supply voltage range		19.2 V DC ... 30 V DC
Rated control supply current I_S at U_S		60 mA
Rated actuating voltage U_C EN+		24 V DC
Actuating voltage range		19.2 V DC ... 30 V DC
Rated actuating current I_C at U_C		7 mA
Input circuit		Surge protection, reverse polarity protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Operating voltage range		42 V AC ... 550 V AC
Output protection		Surge protection
General data		
Rated insulation voltage		550 V
Rated surge voltage		6 kV
Ambient temperature (operation)		-25°C ... 70°C (observe derating)
Standards/regulations		EN 60947-1 / EN 60947-4-2 / EN 50495 / EN ISO 13849 / IEC 62061 / IEC 61508
Mounting position		Vertical (horizontal DIN rail, motor output below)
Mounting		Alignable, for spacing see derating
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions	W / H / D	22.5 mm / 107.4 mm / 113.7 mm

Ordering data

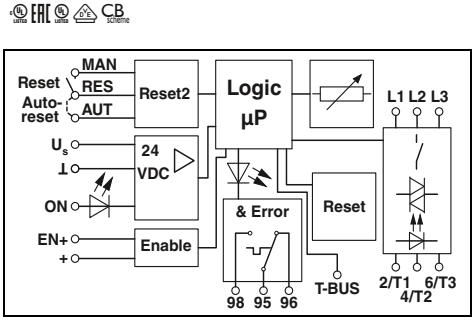
Description	Type	Order No.	Pcs./Pkt.
Load current 0.18 A ... 3 A			
Screw connection			
Push-in connection	**ELR H3-IES-PT- 24DC/500AC-3-P**	2909557	1
Load current 1.5 A ... 9 A			
Screw connection			
Push-in connection	**ELR H3-IES-PT- 24DC/500AC-9-P**	2909555	1

Accessories

Extension module			
Screw connection	**EM-2RSC/21AU-R/L-P**	2908701	1
Push-in connection	**EM-2RPT/21AU-R/L-P**	2909573	1
Safety relay with interface for DIN rail connectors			
Screw connection	**PSR-MC38-2NO-1DO-24DC-SC**	1009831	1
Push-in connection	**PSR-MC38-2NO-1DO-24DC-PI**	1009832	1
DIN rail connector			
- For modular hybrid motor starters	**ELR-TBUS-22,5-P**	2203861	10
- For safety relay modules	**PSR-TBUS**	2890425	50

new

Motor protection, emergency stop



Technical data

24 V DC	
19.2 V DC ... 30 V DC	
60 mA	
24 V DC	
19.2 V DC ... 30 V DC	
7 mA	
Surge protection, reverse polarity protection	
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	
-	
550 V	
6 kV	
-25°C ... 70°C (observe derating)	
EN 60947-1 / EN 60947-4-2 / EN ISO 13849 / IEC 62061 / IEC 61508	
Vertical (horizontal DIN rail, motor output below)	
Alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 106.6 mm / 113.7 mm	

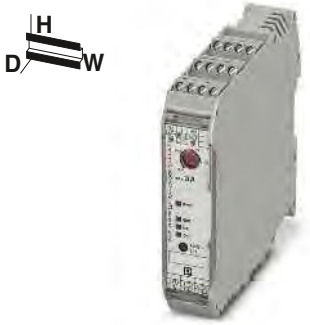
Ordering data

Type	Order No.	Pcs./Pkt.
ELR H3-IS-SC- 24DC/500AC-3-P	2908700	1
ELR H3-IS-PT- 24DC/500AC-3-P	2909570	1
ELR H3-IS-SC- 24DC/500AC-9-P	2908698	1
ELR H3-IS-PT- 24DC/500AC-9-P	2909568	1

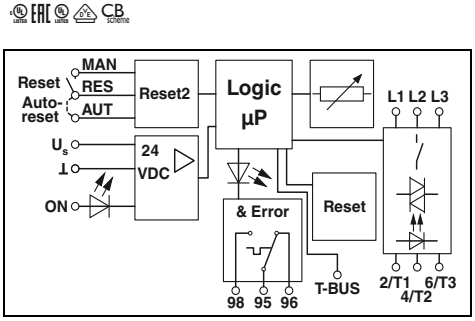
Accessories

EM-2RSC/21AU-R/L-P	2908701	1
EM-2RPT/21AU-R/L-P	2909573	1

new



Motor protection



Technical data

24 V DC	
19.2 V DC ... 30 V DC	
60 mA	
24 V DC	
19.2 V DC ... 30 V DC	
7 mA	
Surge protection, reverse polarity protection	
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	
-	
550 V	
6 kV	
-25°C ... 70°C (observe derating)	
EN 60947-1 / EN 60947-4-2	
Vertical (horizontal DIN rail, motor output below)	
Alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 106.6 mm / 113.7 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H3-I-SC- 24DC/500AC-3-P	2908696	1
ELR H3-I-PT- 24DC/500AC-3-P	2909563	1
ELR H3-I-SC- 24DC/500AC-9-P	2908694	1
ELR H3-I-PT- 24DC/500AC-9-P	2909561	1

Accessories

EM-2RSC/21AU-R/L-P	2908701	1
EM-2RPT/21AU-R/L-P	2909573	1

Hybrid motor starters with direct start function

These 3-phase hybrid motor starters offer up to three functions: forward running, motor protection, and emergency stop up to SIL 3 / PL e.

Featuring the following advantages:

– 22.5 mm wide
– Reduced wiring effort
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

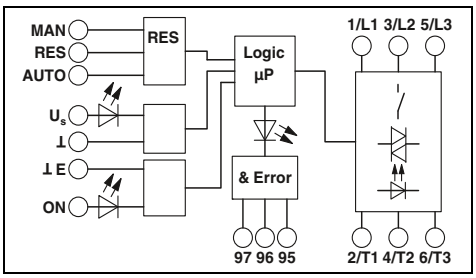
Safety level in accordance with:

– IEC 61508-1: SIL 3
– ISO 13849: PL e

Notes:
Type of insulating housing: Polyamide PA non-reinforced, color: gray.
Marking systems and mounting material See Catalog 3

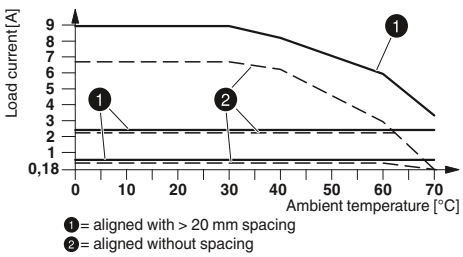
Motor protection and emergency stop

Ex:



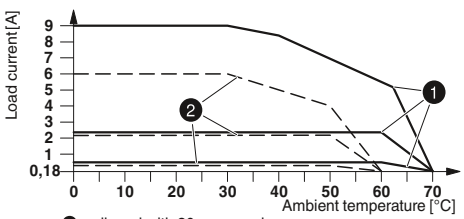
Technical data

Input data		
Rated control supply voltage U_S	24 V DC	230 V AC
Control supply voltage range	19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
Rated control supply current I_S at U_S	40 mA	4 mA
Rated actuation voltage U_C ON	24 V DC	230 V AC
Actuating voltage range	19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
Rated actuating current I_C at U_C	5 mA (input type 1)	7 mA (input type 1)
Input circuit	Surge protection, reverse polarity protection	Surge protection
Operating voltage / status / error indicator	Green LED / Yellow LED / Red LED	
Output data load side		
Operating voltage range	42 V AC ... 550 V AC	42 V AC ... 550 V AC
Output protection	Surge protection	
General data		
Rated insulation voltage	500 V	
Rated surge voltage	6 kV	4 kV
Ambient temperature (operation)	-25°C ... 70°C (observe derating)	
Standards/regulations	IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
Mounting position	Vertical (horizontal DIN rail, motor output below)	
Mounting	Alignable, for spacing see derating	
Connection data solid/stranded/AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
Dimensions W / H / D	22.5 mm / 106.6 mm / 113.7 mm	



❶ = aligned with > 20 mm spacing
❷ = aligned without spacing

Derating curve for ELR H3...24DC...



❶ = aligned with 20 mm spacing
❷ = aligned without spacing

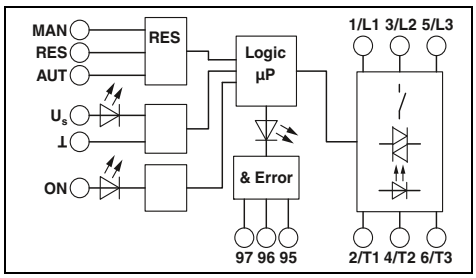
Derating curve for ELR H3...230AC...

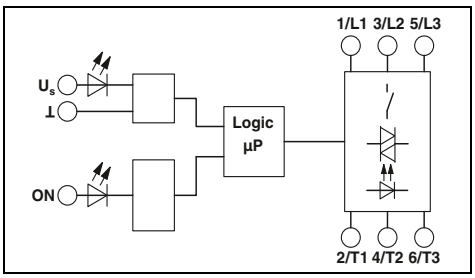
Ordering data

Description	Type	Order No.	Pcs./Pkt.
Load current 0.075 A ... 0.6 A			
Screw connection	**ELR H3-IES-SC- 24DC/500AC-0,6**	2900566	1
Push-in connection	**ELR H3-IES-PT- 24DC/500AC-0,6**	2903914	1
Load current 0.18 A ... 2.4 A			
Screw connection	**ELR H3-IES-SC- 24DC/500AC-2**	2900567	1
Push-in connection	**ELR H3-IES-PT- 24DC/500AC-2**	2903916	1
Screw connection	**ELR H3-IES-SC-230AC/500AC-2**	2900568	1
Load current 1.5 A ... 9 A			
Screw connection	**ELR H3-IES-SC- 24DC/500AC-9**	2900569	1
Push-in connection	**ELR H3-IES-PT- 24DC/500AC-9**	2903918	1
Screw connection	**ELR H3-IES-SC-230AC/500AC-9**	2900570	1
Load current 0 A ... 9 A			
Screw connection			
Screw connection			

Motor protection

Direct start function only





Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
40 mA	4 mA
24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
5 mA (input type 1)	7 mA (input type 1)
Surge protection, reverse polarity protection	Surge protection
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	
500 V	
6 kV	4 kV
-25°C ... 70°C (observe derating)	
IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
Vertical (horizontal DIN rail, motor output below)	
Alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 106.6 mm / 113.7 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H3-I-SC- 24DC/500AC-0,6	2900542	1
ELR H3-I-PT- 24DC/500AC-0,6	2903920	1
ELR H3-I-SC- 24DC/500AC-2	2900543	1
ELR H3-I-PT- 24DC/500AC-2	2903922	1
ELR H3-I-SC-230AC/500AC-2	2900544	1
ELR H3-I-SC- 24DC/500AC-9	2900545	1
ELR H3-I-PT- 24DC/500AC-9	2903924	1
ELR H3-I-SC-230AC/500AC-9	2900546	1

Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
40 mA	4 mA
24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
5 mA (input type 1)	7 mA (input type 1)
Surge protection, reverse polarity protection	Surge protection
Green LED / Yellow LED / -	
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	
500 V	
6 kV	4 kV
-25°C ... 70°C (observe derating)	
IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
Vertical (horizontal DIN rail, motor output below)	
Alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 106.6 mm / 113.7 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H3-SC- 24DC/500AC-9	2900530	1
ELR H3-SC-230AC/500AC-9	2900531	1

Hybrid motor starters with short-circuit protection

These short-circuit-proof 3-phase hybrid motor starters for mounting on 35 mm DIN rails, the CrossPowerSystem energy distribution board, or 60 mm power busbars combine four functions in one device: forward running, reverse running, motor protection, and emergency stop up to SIL 3/PL e.

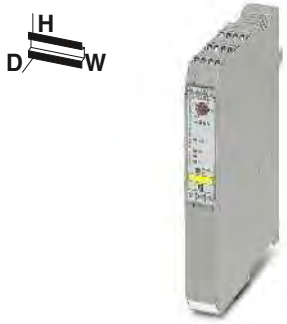
Featuring the following advantages:

– 22.5 mm wide
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– Reduced wiring effort
– 3-phase loop bridging
– Plug-in motor output terminal block
– Coordination type 2 in accordance with IEC/EN 60947-4-2
– IEC 61508-1: SIL 3
– ISO 13849: PL e

Input data	
Rated control supply voltage U_S	
Control supply voltage range	
Rated control supply current I_S at U_S	
Rated actuating voltage U_C R/L	
Actuating voltage range	
Rated actuating current I_C at U_C	
Input circuit	
Operating voltage / status / error indicator	
Output data load side	
Operating voltage range	
Load current range	
Output protection	
General data	
Rated insulation voltage	
Rated surge voltage	
Ambient temperature (operation)	
Standards/regulations	
Mounting position	
Mounting	
Screw connection rigid / flexible / AWG	
Dimensions	W / H / D

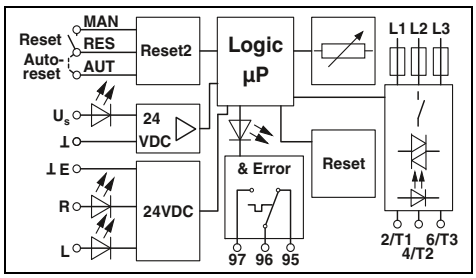
Description
Short-circuit-proof hybrid motor starters
Hybrid motor starter
DIN rail adapter
Busbar adapter, 160 mm
Busbar adapter, 200 mm
Set consisting of short-circuit-proof hybrid motor starter and adapter
- with DIN rail adapter
- with busbar adapter, 160 mm
- with busbar adapter, 200 mm

Fuse
Coordination type 2 to 10 kA/500 V
Coordination type 2 to 5 kA/400 V
Coordination type 1 to 30 kA/500 V



For reversing 3~ AC motors up to 550 V AC/3 x 0.6 A

Ex:



Technical data

	24 V DC
	19.2 V DC ... 30 V DC
	40 mA
	24 V DC
	19.2 V DC ... 30 V DC
	5 mA
	Surge protection, reverse polarity protection
	Green LED / Yellow LED / Red LED
	42 V AC ... 550 V AC
	75 mA ... 600 mA (see derating)
	Surge protection, short-circuit protection
	500 V
	6 kV
	-25°C ... 70°C (observe derating)
	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
	Vertical (horizontal DIN rail, motor output below)
	Alignable, for spacing see derating
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
	22.5 mm / 160 mm / 114.5 mm

Ordering data

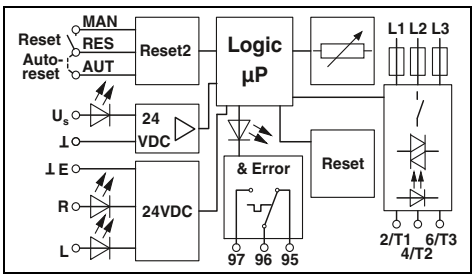
Type	Order No.	Pcs./Pkt.
ELR H51-IESSC-24DC500AC-06	2902746	1
EM RD-ADAPTER	2902747	1
EM RI-ADAPTER COMPACT	2902748	1
EM RI-ADAPTER CLASSIC	2902831	1
ELR H51-0.6-DIN-RAIL-SET	2902952	1
ELR-H51-0,6-BUSBAR-COMPACT-SET	2904333	1
ELR-H51-0,6-BUSBAR-CLASSIC-SET	2904334	1

Accessories

FUSE-10X38-16A-GR	2903126	10
FUSE-10X38-20A-GR	2903384	10
FUSE-10X38-30A-MR	2903119	10

For reversing 3~ AC motors up to 550 V AC/3 x 2.4 A

Ex:



Technical data

	24 V DC
	19.2 V DC ... 30 V DC
	40 mA
	24 V DC
	19.2 V DC ... 30 V DC
	5 mA
	Surge protection, reverse polarity protection
	Green LED / Yellow LED / Red LED
	42 V AC ... 550 V AC
	180 mA ... 2.4 A (see derating)
	Surge protection, short-circuit protection
	500 V
	6 kV
	-25°C ... 70°C (observe derating)
	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
	Vertical (horizontal DIN rail, motor output below)
	Alignable, for spacing see derating
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
	22.5 mm / 160 mm / 114.5 mm

Ordering data

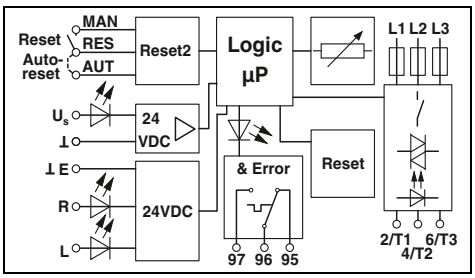
Type	Order No.	Pcs./Pkt.
ELR H51-IESSC-24DC500AC-2	2902744	1
EM RD-ADAPTER	2902747	1
EM RI-ADAPTER COMPACT	2902748	1
EM RI-ADAPTER CLASSIC	2902831	1
ELR H51-2.4-DIN-RAIL-SET	2902953	1
ELR-H51-2,4-BUSBAR-COMPACT-SET	2904335	1
ELR-H51-2,4-BUSBAR-CLASSIC-SET	2904336	1

Accessories

FUSE-10X38-16A-GR	2903126	10
FUSE-10X38-20A-GR	2903384	10
FUSE-10X38-30A-MR	2903119	10

For reversing 3~ AC motors up to 550 V AC/3 x 9 A

Ex:



Technical data

	24 V DC
	19.2 V DC ... 30 V DC
	40 mA
	24 V DC
	19.2 V DC ... 30 V DC
	5 mA
	Surge protection, reverse polarity protection
	Green LED / Yellow LED / Red LED
	42 V AC ... 550 V AC
	1.5 A ... 9 A (see derating)
	Surge protection, short-circuit protection
	500 V
	6 kV
	-25°C ... 70°C (observe derating)
	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
	Vertical (horizontal DIN rail, motor output below)
	Alignable, for spacing see derating
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
	22.5 mm / 160 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs./Pkt.
ELR H51-IESSC-24DC500AC-9	2902745	1
EM RD-ADAPTER	2902747	1
EM RI-ADAPTER COMPACT	2902748	1
EM RI-ADAPTER CLASSIC	2902831	1
ELR H51-9-DIN-RAIL-SET	2902954	1
ELR-H51-9-BUSBAR-COMPACT-SET	2904337	1
ELR-H51-9-BUSBAR-CLASSIC-SET	2904338	1

Accessories

FUSE-10X38-16A-GR	2903126	10
FUSE-10X38-20A-GR	2903384	10
FUSE-10X38-30A-MR	2903119	10

Loop bridges for hybrid motor starters

The flexible CONTACTRON loop bridge (BRIDGE-...) simplifies the supply and looping through of phases L1, L2, and L3. It is available in 2- to 10-bridge versions for modules in the CONTACTRON family with 22.5 mm housing width.

Features of the 3-phase loop bridge:

– Significant reductions in wiring effort
– Suitable for CONTACTRON series
  - ELR H3...
  - ELR H5...
  - EMM...IFS
– Bridging of 2 to 10 devices with maximum module spacing of 22.5 mm
– Up to 575 V AC/3 x 25 A
– Additional bridge versions available on request

0.3 m connecting cable for hybrid motor starters, with screw connection

EAC

Technical data

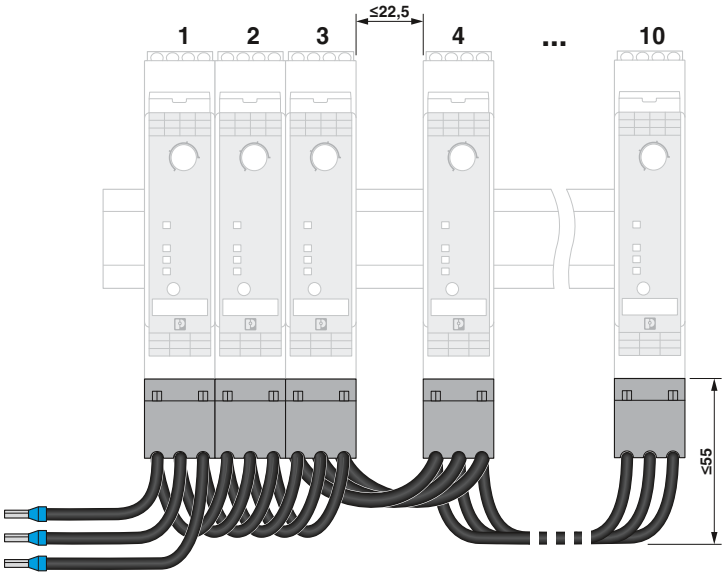
General data	
Nominal voltage U_N	42 V AC ... 575 V AC
Nominal current at U_N	≤25 A
Cross section	2.5 mm²

Ordering data

Description	Type	Order No.	Pcs./Pkt.
3-phase loop bridge			
2-bridge	**BRIDGE- 2**	2900746	1
3-bridge	**BRIDGE- 3**	2900747	1
4-bridge	**BRIDGE- 4**	2900748	1
5-bridge	**BRIDGE- 5**	2900749	1
6-bridge	**BRIDGE- 6**	2900750	1
7-bridge	**BRIDGE- 7**	2900751	1
8-bridge	**BRIDGE- 8**	2900752	1
9-bridge	**BRIDGE- 9**	2900753	1
10-bridge	**BRIDGE-10**	2900754	1

Accessories

Covering hood for unused connectors	**BRIDGE COVER**	2906240	10



3 m connecting cable for hybrid motor starters, with screw connection

3 m connecting cable for hybrid motor starters, with Push-in connection

EAC

Technical data
42 V AC ... 575 V AC
≤25 A
2.5 mm²

Ordering data

Type	Order No.	Pcs./Pkt.
BRIDGE- 2-3M	2901543	1
BRIDGE- 3-3M	2901656	1
BRIDGE- 4-3M	2901659	1
BRIDGE- 5-3M	2901545	1
BRIDGE- 6-3M	2901697	1
BRIDGE- 7-3M	2901698	1
BRIDGE- 8-3M	2901700	1
BRIDGE- 9-3M	2901701	1
BRIDGE-10-3M	2901702	1

Accessories

BRIDGE COVER	2906240	10

EAC

Technical data
42 V AC ... 575 V AC
≤25 A
2.5 mm²

Ordering data

Type	Order No.	Pcs./Pkt.
BRIDGE-PT 2	2904490	1
BRIDGE-PT 3	2904491	1
BRIDGE-PT 4	2904492	1
BRIDGE-PT 5	2904493	1
BRIDGE-PT 6	2904494	1
BRIDGE-PT 7	2904495	1
BRIDGE-PT 8	2904496	1
BRIDGE-PT 9	2904497	1
BRIDGE-PT 10	2904498	1

Accessories

BRIDGE COVER	2906240	10

Three-phase solid-state reversing contactors

The 3-phase solid-state reversing contactors with integrated locking circuit and load wiring are ideally suited for applications such as:
– Control valves
– Slides
– Switches
– Ship steering gear

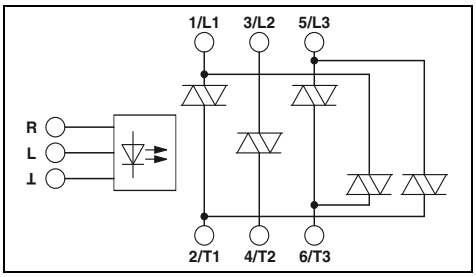
The power spectrum ranges from 575 V AC/3 x 2 A to 575 V AC/3 x 37 A. This corresponds to 1 kW to 18.5 kW.

Advantages of the three-phase solid-state reversing contactors:
– Noise-free and wear-free switching
– Integrated protective circuit
– Stable and short switching times
– Long service life
– High switching frequency
– Integrated locking and load wiring
– Thermal fuse optional

Notes:
Type of insulating housing: **ELR W 3...2, ELR W 3...9** Polyamide PA non-reinforced, color: gray **ELR W 3...37** Polyester PBT non-reinforced, color: gray
Marking systems and mounting material See Catalog 3

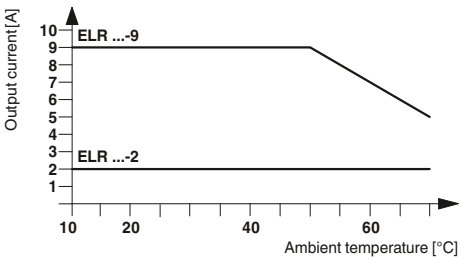
For reversing 3~ AC motors up to 575 V AC/3 x 2 A

cULus EAC DNV GL

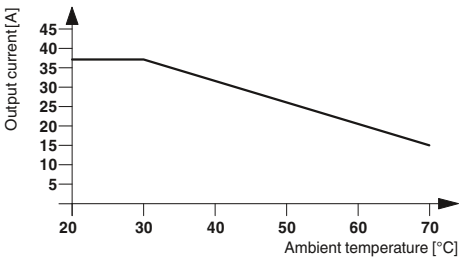


Technical data

Input data		
Rated actuating voltage U_C R/L	24 V DC	230 V AC
Actuating voltage range	19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
Rated actuating current I_C at U_C	12.7 mA	11.2 mA
Input circuit	Reverse polarity protection, surge protection	Surge protection
Operating voltage / status / error indicator	- / Yellow LED / Red LED	
Output data load side		
Operating voltage range	48 V AC ... 575 V AC	48 V AC ... 575 V AC
Periodic peak reverse voltage	1200 V	1200 V
Load current range	100 mA ... 2 A (see derating)	100 mA ... 2 A (see derating)
Residual voltage	<1.5 V	<1.5 V
Leakage current	6 mA	6 mA
Max. load value I^2 x t (t = 10 ms)	250 A^2s	250 A^2s
Output protection	RCV circuit	
General data		
Rated insulation voltage	500 V	
Rated surge voltage	6 kV	6 kV
Insulation	Basic insulation	
Reversing frequency	≤10 Hz	≤2 Hz
Switching frequency	max. 5 Hz	max. 1 Hz
Ambient temperature (operation)	-25°C ... 70°C	
Standards/regulations	DIN EN 50178 / EN 60947	
Degree of protection in accordance with IEC 60529/EN 60529	IP20	
Mounting position	Vertical (horizontal DIN rail)	
Mounting	Can be aligned with spacing = 20 mm	
Screw connection rigid / flexible / AWG		
- Control side	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
- Load side	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
Dimensions W / H / D	40 mm / 99 mm / 114.5 mm	



Load current as a function of the ambient temperature
Operating time: 100% operating factor



Load current as a function of the ambient temperature
Operating time: 100% operating factor

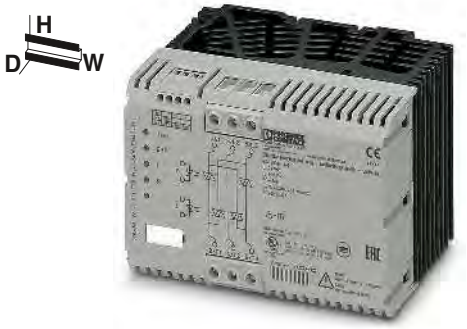
Ordering data

Description	Type	Order No.	Pcs./Pkt.
3-phase solid-state reversing contactor			
	ELR W3- 24DC/500AC- 2	2297293	1
	ELR W3-230AC/500AC- 2	2297303	1

Accessories

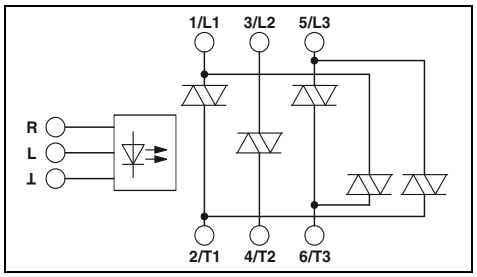
Thermal fuse	**THERMAL FUSE TF104**	2900796	1

For reversing 3~ AC motors up to 575 V AC/3 x 9 A

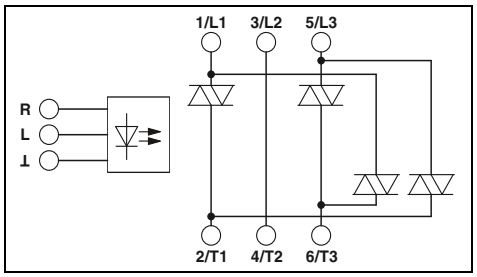


For reversing 3~ AC motors up to 575 V AC/3 x 37 A

DNV GL



DNV GL



Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
12.7 mA	11.2 mA
Reverse polarity protection, surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
100 mA ... 9 A (see derating)	100 mA ... 9 A (see derating)
<1.5 V	<1.5 V
6 mA	6 mA
580 A²s	580 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤10 Hz	≤2 Hz
max. 5 Hz	max. 1 Hz
-25°C ... 70°C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 20 mm	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
67.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR W3- 24DC/500AC- 9	2297316	1
ELR W3-230AC/500AC- 9	2297329	1

Accessories

THERMAL FUSE TF104	2900796	1

Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
12.7 mA	11.2 mA
Reverse polarity protection, surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
200 mA ... 37 A (see derating)	200 mA ... 37 A (see derating)
<1.5 V	<1.5 V
6 mA	6 mA
9,000 A²s	9,000 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤10 Hz	≤2 Hz
max. 5 Hz	max. 1 Hz
-25°C ... 70°C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 40 mm	
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	
0.5 - 16 mm² / 0.5 - 16 mm² / 20 - 6	
147.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR W2+1- 24DC/500AC-37	2297374	1
ELR W2+1-230AC/500AC-37	2297387	1

Accessories

THERMAL FUSE TF104	2900796	1

Three-phase semiconductor contactors

The 3-phase solid-state contactors are ideally suited for applications such as:
– Mixers
– Machine tools
– Conveying systems
– Pumps
– Fans

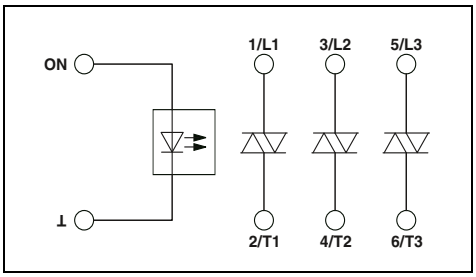
The power spectrum ranges from 575 V AC/3 x 2 A to 575 V AC/3 x 37 A. This corresponds to 1 kW to 18.5 kW.

Advantages of three-phase semiconductor contactors:
– Noise-free and wear-free switching
– Integrated protective circuit
– Stable and short switching times
– Long service life
– High switching frequency
– Thermal fuse optional

Notes:
Type of insulating housing: **ELR W 3...2, ELR W 3...9** Polyamide PA non-reinforced, color: gray **ELR W 3...37** Polyester PBT non-reinforced, color: gray
Marking systems and mounting material See Catalog 3

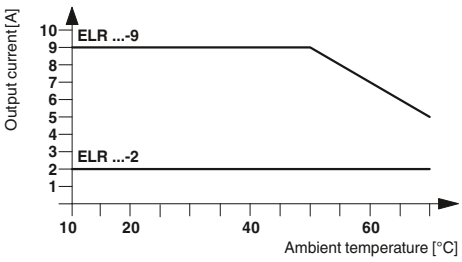
For switching 3~ AC motors up to 575 V AC/3 x 2 A

cULus EAC DNV GL

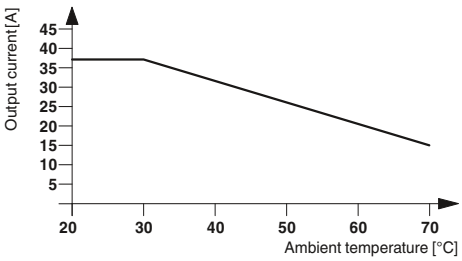


Technical data

Input data		
Rated actuation voltage U_C ON	24 V DC	230 V AC
Actuating voltage range	19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
Rated actuating current I_C at U_C	8.3 mA	12.5 mA
Input circuit	Reverse polarity protection, surge protection	Surge protection
Operating voltage / status / error indicator	- / Yellow LED / Red LED	
Output data load side		
Operating voltage range	48 V AC ... 575 V AC	48 V AC ... 575 V AC
Periodic peak reverse voltage	1200 V	1200 V
Load current range	100 mA ... 2 A (see derating)	100 mA ... 2 A (see derating)
Residual voltage	<1.5 V	<1.5 V
Leakage current	6 mA	6 mA
Max. load value I^2 x t (t = 10 ms)	250 A^2s	250 A^2s
Output protection	RCV circuit	
General data		
Rated insulation voltage	500 V	
Rated surge voltage	6 kV	6 kV
Insulation	Basic insulation	
Switching frequency	≤10 Hz	≤1 Hz
Ambient temperature (operation)	-25°C ... 70°C	
Standards/regulations	DIN EN 50178 / EN 60947	
Degree of protection in accordance with IEC 60529/EN 60529	IP20	
Mounting position	Vertical (horizontal DIN rail)	
Mounting	Can be aligned with spacing = 20 mm	
Screw connection rigid / flexible / AWG		
- Control side	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
- Load side	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
Dimensions W / H / D	40 mm / 99 mm / 114.5 mm	



Load current as a function of the ambient temperature
Operating time: 100% operating factor



Load current as a function of the ambient temperature
Operating time: 100% operating factor

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Three-phase semiconductor contactor			
	ELR 3- 24DC/500AC- 2	2297196	1
	ELR 3-230AC/500AC- 2	2297206	1

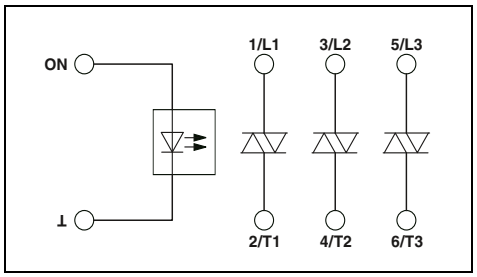
Accessories

Thermal fuse	**THERMAL FUSE TF104**	2900796	1

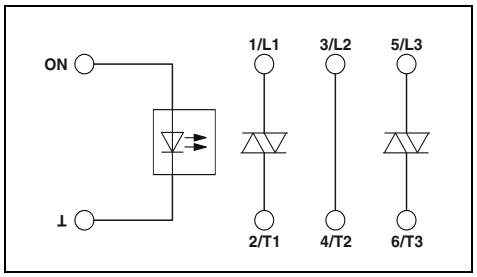
For switching 3~ AC motors up to 575 V AC/3 x 9 A

For switching 3~ AC motors up to 575 V AC/3 x 37 A

DNV GL



DNV GL



Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
8.3 mA	12.5 mA
Reverse polarity protection, surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
100 mA ... 9 A (see derating)	100 mA ... 9 A (see derating)
<1.5 V	<1.5 V
6 mA	6 mA
580 A²s	580 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤10 Hz	≤1 Hz
-25°C ... 70°C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 20 mm	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
67.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR 3- 24DC/500AC- 9	**2297219**	1
ELR 3-230AC/500AC- 9	**2297222**	1

Accessories

THERMAL FUSE TF104	**2900796**	1

Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
8.3 mA	12.5 mA
Reverse polarity protection, surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
200 mA ... 37 A (see derating)	200 mA ... 37 A (see derating)
<1.5 V	<1.5 V
6 mA	6 mA
9,000 A²s	9,000 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤10 Hz	≤1 Hz
-25°C ... 70°C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 40 mm	
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	
0.5 - 16 mm² / 0.5 - 16 mm² / 20 - 6	
147.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR 2+1- 24DC/500AC-37	**2297277**	1
ELR 2+1-230AC/500AC-37	**2297280**	1

Accessories

THERMAL FUSE TF104	**2900796**	1

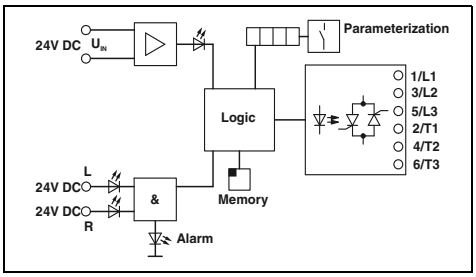
Semiconductor reversing contactors with soft starter

With the ELR W 3/9-400 S soft switch, you can extend the service life of a 3-phase asynchronous motor.

– Configuration takes place via display and keyboard directly on the device
– Friction time
– Torque, start
– Start up time
– Stop time
– Torque stop
– Braking time
– Braking torque
– Drive can be controlled locally via keyboard

Notes:
Type of housing: Polycarbonate PC, color: green.
Marking systems and mounting material See Catalog 3

Solid-state reversing contactor with soft starter

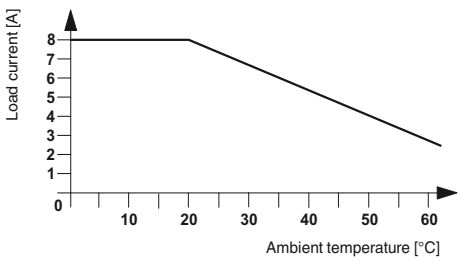


Technical data

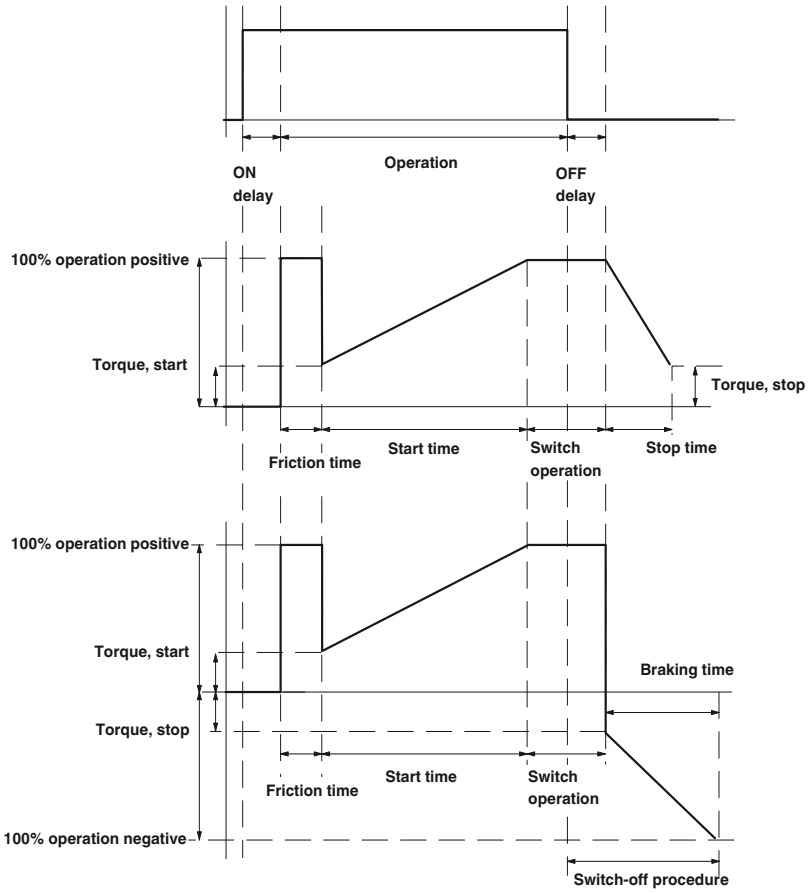
Input data		
Supply nominal voltage U_{VN}		24 V DC
Supply voltage range with reference to U_{VN}		0.8 ... 1.2
Quiescent current		85 mA
Control voltage U_{ST} right/left		24 V DC
Control voltage range in reference to U_{ST}		0.8 ... 1.2
Typ. input current at U_N		5 mA
Input circuit		Reverse polarity protection, surge protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Max. switching voltage		440 V AC (L1/T1) 440 V AC (L2/T2) 440 V AC (L3/T3)
Operating voltage range		110 V AC ... 433 V AC
Periodic peak reverse voltage		1,000 V
Load current range		150 mA ... 8 A (at 20°C Tu, see derating)
Residual voltage		Typically 1.5 V (for IL)
Leakage current		5 mA (IL1, in switched-off state)
Output protection		RC element, surge protection
General data		
Test voltage input/output		2.5 kV
Ambient temperature (operation)		-20°C ... 60°C
Standards/regulations		DIN EN 50178
Degree of protection in accordance with IEC 60529/EN 60529		IP20
Mounting position		Vertical (horizontal DIN rail)
Mounting		Can be aligned with >20 mm spacing
Screw connection rigid / flexible / AWG		0.2 - 6 mm² / 0.2 - 4 mm² / 24 - 10
Dimensions	W / H / D	62 mm / 94 mm / 122 mm
EMC note		Class A product, see page 583

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Solid-state reversing contactor, with integrated soft switch			
	ELR W3/ 9-400 S	2963569	1



Load current as a function of the ambient temperature
Operating time: 100% operating factor



The figure shows the control of the reversing load relay with a soft starter and the operation of a three-phase current load.

Electronic reversing load relays for DC motors

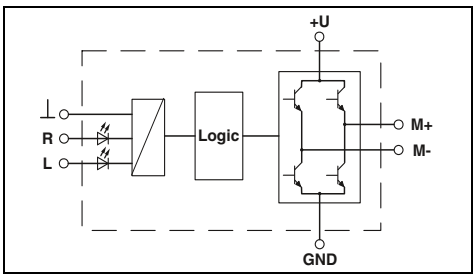
The ELR-DC electronic reversing load relays allow mechanically commutated DC motors to be switched. They reverse and reduce the speed of DC motors up to 24 V/6 A in a wear-free manner. A short-circuit, surge-voltage, and overload-proof output guarantees reliable use in the plant.

When a 24 V DC signal is applied at the "left" input, the output supplies the motor with voltage. When the "right" output is activated, the polarity of the voltage at the output is reversed. If the signal is applied at both inputs, i.e., "right" and "left", the motor is short-circuited internally via the ELR-DC and reduces the speed.

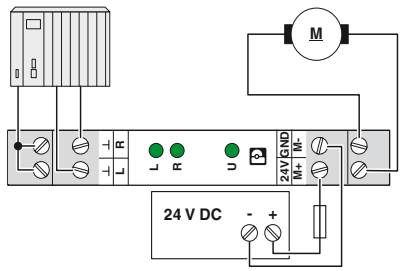
Thanks to the internal interlocking circuit and load wiring, wiring effort is reduced to a minimum.

Notes:
Type of housing: Polycarbonate PC, color: gray.
Marking systems and mounting material See Catalog 3
PWM = Pulse Width Modulation

Electronic reversing load relay for DC motors



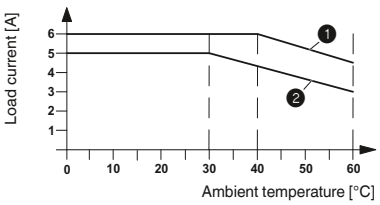
Application example



Status table

Input		Output	
Right	Left	M +	M –
0	0	High resistance	High resistance
1	0	+24 V	GND
0	1	GND	+24 V
1	1	GND	GND

Load current depending on ambient temperature
Operating time: 100% (ED)



❶ Stand-alone device
❷ Aligned without spacing

Technical data

Input data		
Control voltage U_{ST} right/left	24 V DC	24 V DC
Control voltage range in reference to U_{ST}	0.8 ... 1.2	0.8 ... 1.2
Typical input current at U_N	3 mA	3 mA
Input circuit	Reverse polarity protection, surge protection	
Operating voltage / status / error indicator	Green LED / Yellow LED / -	
Output data load side		
Operating voltage range	10 V DC ... 30 V DC	10 V DC ... 30 V DC
Load current	2 A (mounted in rows with zero spacing)	6 A (see derating)
Quiescent current	Approx. 7 mA (when switched off)	Approx. 7 mA (when switched off)
Current limitation at short-circuits	15 A	20 A
Output protection	Reverse polarity protection, surge protection	
Operating voltage / status / error indicator	Green LED / - / -	
General data		
Test voltage input/output	2.5 kV_{rms}	
Ambient temperature (operation)	-20°C ... 60°C	
Nominal operating mode	100% operating factor	
Standards/regulations	EN 50178	
Degree of protection in accordance with IEC 60529/EN 60529	IP20	
Mounting position	Vertical (horizontal DIN rail, motor output below)	
Screw connection rigid / flexible / AWG	0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
Dimensions W / H / D	12.5 mm / 99 mm / 114.5 mm	
EMC note	Class A product, see page 583	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Electronic reversing load relay, for controlling DC motors			
	ELR W1/ 2-24DC	2963598	1
	ELR W1/ 6-24DC	2982090	1

Single-phase solid-state contactors

Single-phase solid-state contactors are used in AC voltage networks where silent switching, high switching frequencies, and practically unlimited service lives are required.

The robust power semiconductors switch to zero voltage crossing. In doing so, they do not generate any additional high-frequency interfering impulses. The modules are resistant to shock and vibration, they can even be used without problem in aggressive environments containing harmful substances.

They offer the following advantages:

– High switching frequency
– Wear-free and output-free
– Input voltage versions 24 V DC and 230 V AC

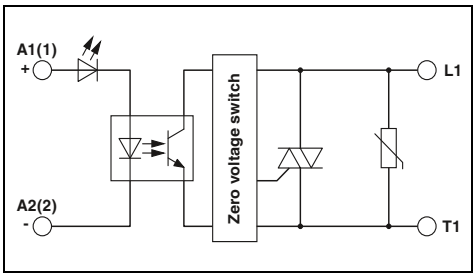
The areas of application are:

– Production machines
– Temperature controllers
– Conveyor equipment
– Lights and lighting systems

Notes:
Type of insulating housing: Polyamide PA non-reinforced, color: gray.
Marking systems and mounting material See Catalog 3

new

For switching 1~ AC motors up to 660 V AC/20 A



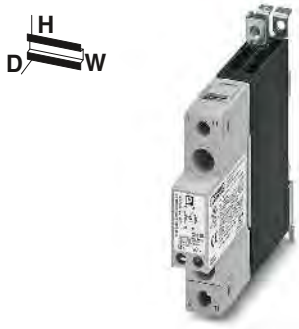
Technical data

Input data			
Actuating voltage range		4 V DC ... 32 V DC	24 V AC ... 275 V AC
Rated actuating current I_C at U_C		12 mA	17 mA
Switching level	1 signal (“H”)	≥4 V DC (“1” signal)	≥20 V AC/DC (“1” signal)
	0 signal (“L”)	≤1 V DC (“0” signal)	≤5 V AC/DC (“0” signal)
Transmission frequency f_{limit}		25 Hz	6 Hz
Operating voltage / status / error indicator		Green LED / - / -	
Output data load side			
Operating voltage range		42 V AC ... 660 V AC	42 V AC ... 660 V AC
Periodic peak reverse voltage		1200 V	1200 V
Load current range		150 mA ... 20 A (see derating)	150 mA ... 20 A (see derating)
Residual voltage		<1.6 V	<1.6 V
Leakage current		<3 mA (in off state)	<3 mA (in off state)
Phase angle (cos ϕ)		0.5	0.5
Max. load value I^2 x t (t = 10 ms)		525 A^2s	525 A^2s
Output protection		Varistor	
General data			
Test voltage input/output		-	
Insulation		Basic insulation	
Ambient temperature (operation)		-30°C ... 70°C	
Standards/regulations		EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 / EN 55011	
Mounting position		Vertical (horizontal DIN rail)	
Mounting		Can be aligned with ≥22.5 mm spacing	
Screw connection rigid / flexible / AWG			
- Control side		0.5 - 2.5 mm^2 / 0.5 - 2.5 mm^2 / 18 - 12	
- Load side		2.5 - 6 mm^2 / 1 - 4 mm^2 / 14 - 10	
Dimensions	W / H / D	17.8 mm / 110 mm / 103 mm	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Single-phase electronic load relay			
	ELR 1-SC-24DC/600AC-20	**1032919**	1
	ELR 1-SC-230AC/600AC-20	**1032920**	1

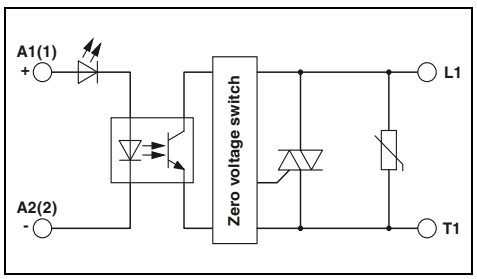
new

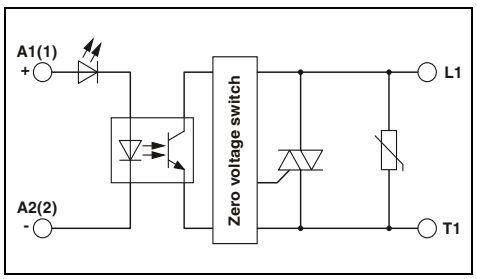


For switching 1~ AC motors up to 660 V AC/30 A

new

For switching 1~ AC motors up to 660 V AC/50 A





Technical data

4 V DC ... 32 V DC	24 V AC ... 275 V AC
12 mA	17 mA
≥4 V DC (“1” signal)	≥20 V AC/DC (“1” signal)
≤1 V DC (“0” signal)	≤5 V AC/DC (“0” signal)
25 Hz	6 Hz
Green LED / - / -	
42 V AC ... 660 V AC	42 V AC ... 660 V AC
1200 V	1200 V
250 mA ... 25 A (see derating)	250 mA ... 25 A (see derating)
<1.6 V	<1.6 V
<3 mA (in off state)	<3 mA (in off state)
0.5	0.5
1800 A²s	1800 A²s
Varistor	
-	
Basic insulation	
-30°C ... 70°C	
EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 / EN 55011	
Vertical (horizontal DIN rail)	
Can be aligned with ≥22.5 mm spacing	
0.5 - 2.5 mm² / 0.5 - 2.5 mm² / 18 - 12	
2.5 - 6 mm² / 1 - 4 mm² / 14 - 10	
17.8 mm / 110 mm / 103 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR 1-SC-24DC/600AC-30	1032921	1
ELR 1-SC-230AC/600AC-30	1032922	1

Technical data

4 V DC ... 32 V DC	24 V AC ... 275 V AC
12 mA	17 mA
≥4 V DC (“1” signal)	≥20 V AC/DC (“1” signal)
≤1 V DC (“0” signal)	≤5 V AC/DC (“0” signal)
25 Hz	6 Hz
Green LED / - / -	
42 V AC ... 660 V AC	42 V AC ... 660 V AC
1200 V	1200 V
500 mA ... 43 A (see derating)	500 mA ... 43 A (see derating)
<1.6 V	<1.6 V
<3 mA (in off state)	<3 mA (in off state)
0.5	0.5
18,000 A²s	18,000 A²s
Varistor	
-	
Basic insulation	
-30°C ... 70°C	
EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 / EN 55011	
Vertical (horizontal DIN rail)	
Can be aligned with ≥22.5 mm spacing	
0.5 - 2.5 mm² / 0.5 - 2.5 mm² / 18 - 12	
2.5 - 6 mm² / 1 - 4 mm² / 14 - 10	
35 mm / 110 mm / 141 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
ELR 1-SC-24DC/600AC-50	1032926	1
ELR 1-SC-230AC/600AC-50	1032927	1

The 3-phase CrossPowerSystem power distribution board is the new platform for modular and functional control cabinets. With just one click, the devices are mounted on the board without tools and a safe electrical connection to the three phases is established simultaneously – all in just one step.

The new CrossPowerSystem power distribution board now enables you to start up and monitor your motors more easily in your control cabinet. The CrossPowerSystem enables you to realize modular and functional solutions. Wherever necessary, simple modifications can be made or extensions can be added to adapt to new requirements.

The new 5 A power supply further reduces your wiring costs. It can be used to supply power to all hybrid motor starters on the board. Furthermore, to generate motor-relevant data for system monitoring, you can simply use the network-capable solution alongside the classic motor starter via IO-Link.

The TRIO POWER power supply features standard functionality, high quality, and reliability. It can be mounted directly on the power distribution board.

Short-circuit-proof hybrid motor starters with integrated fuses can be mounted directly on the power distribution board.

Device adapter with fuse holder for 16 A fuse (10x38/Class CC), CrossLink® interface and fixed DIN rail for IO-Link motor starters and direct starters.

Adapters for contactors and contactor combinations for loads with currents up to 45 A.

Power distribution boards

Modular power distribution boards with CrossLink® interface, 125 A, 3-pos., protected against contact and polarity reversal, width: 225 mm and 405 mm.

new

Power distribution board, 225 mm

new

Power distribution board, 405 mm

Description	Color	Ordering data: Type	Order No.	Pcs./Pkt.	Ordering data: Type	Order No.	Pcs./Pkt.
Power distribution boards with CrossLink® interface							
		EM-CPS-225	1002634	1	**EM-CPS-405**	1002635	1

Connection modules

3-pos. connection modules for maximum 63 A or 125 A.

new

63 A connection module

new

125 A connection module

Description	Color	Ordering data: Type	Order No.	Pcs./Pkt.	Ordering data: Type	Order No.	Pcs./Pkt.
Connection module with integrated spring-loaded terminals for cables from 1.5 to 16 mm², 3-pos., maximum 63 A		**EM-CPS-TB3/63A**	1002633	4			
Box terminal connection module for cables from 6 to 50 mm², maximum 125 A					**EM-CPS-TB3/125A**	1070299	4

Device adapters

Device adapter with CrossLink® interface for hybrid motor starters and miniature circuit breakers.

new

Device adapter

new

Adapter for miniature circuit breakers

Description	Color	Ordering data: Type	Order No.	Pcs./Pkt.	Ordering data: Type	Order No.	Pcs./Pkt.
Device adapter with fuse holder for 16 A fuse (10x38/Class CC), CrossLink® interface and fixed DIN rail							
		EM-CPS-DA-22,5F/16A	1002668	1			
Single-position adapters with CrossLink® interface for connecting miniature circuit breakers							
16 A, phase L1					**EM-CPS-DA-18S/16A-L1**	1089439	6
16 A, phase L2					**EM-CPS-DA-18S/16A-L2**	1089440	6
16 A, phase L3					**EM-CPS-DA-18S/16A-L3**	1089441	6
63 A, phase L1					**EM-CPS-DA-18S/63A-L1**	1089356	6
63 A, phase L2					**EM-CPS-DA-18S/63A-L2**	1089442	6
63 A, phase L3					**EM-CPS-DA-18S/63A-L3**	1089446	6

Device adapters

Device adapters with CrossLink® interface for contactors.

new

Standard device adapter

new

Comfort device adapter

Description	Color	Ordering data: Type	Order No.	Pcs./Pkt.	Ordering data: Type	Order No.	Pcs./Pkt.
Standard device adapter with CrossLink® interface and fixed DIN rail							
Rated current: 16 A		**EM-CPS-DA-45S/16A**	1003291	4			
Rated current: 32 A		**EM-CPS-DA-45S/32A**	1003292	4			
Comfort device adapter with CrossLink® interface and moveable DIN rail							
Rated current: 16 A					**EM-CPS-DA-45C/16A**	1002666	4
Rated current: 25 A					**EM-CPS-DA-45C/25A**	1002665	4
Rated current: 32 A					**EM-CPS-DA-45C/32A**	1002664	4
Rated current: 45 A					**EM-CPS-DA-45C/45A**	1003289	4
Comfort DIN rail, additional DIN rail for Comfort device adapter							
					EM-CPS-TS-45	1003295	1

Accessories – Device adapters

Accessories for height and side extensions for 45 mm device adapter and contactor holder.

new

Extension

new

Device holder

Description	Color	Ordering data			Ordering data		
		Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Height extension for Comfort device adapter, width: 45 mm		EM-CPS-DAE-45	1003293	8			
Lateral extension of the height extension for Comfort device adapter, width: 45 mm		EM-CPS-DAES-45	1003294	1			
Siemens device mount, positioning element for Siemens S0 and S00 switching devices					EM-CPS-DHS-45	1003296	1
Eaton device mount, positioning element for Eaton PKZ switching devices					EM-CPS-DHE-45	1002663	1

Power supplies

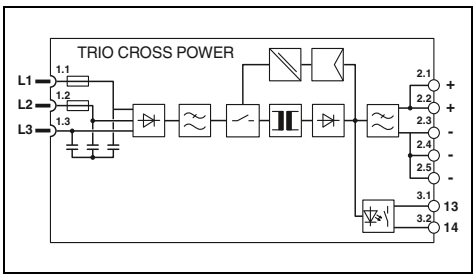
new

The new TRIO CROSS POWER power supply for the CrossPowerSystem power distribution board is perfectly adapted for use in machine building. All functions and the space-saving design are tailored to the stringent demands in this area. The Push-in connection enables quick and easy connection of a 24 V DC control voltage.

Additional features:

– Rapid startup: tool-free mounting and automatic contacting in one easy step
– Push-in connection enables quick and easy 24 V DC control voltage connection
– Reliable starting of high loads with dynamic boost

Power supply, 3 AC, 24 V DC, 5 A



Technical data

Input data	
Nominal input voltage range	3x 400 V AC ... 500 V AC 2x 400 V AC ... 500 V AC
Input voltage range	3x 400 V AC ... 500 V AC -20% ....+15% 2x 400 V AC ... 500 V AC -10% ... +15%
Frequency range	50 Hz ... 60 Hz
Current consumption (nominal load)	3x 0.4 A (400 V AC) / 3x 0.3 A (500 V AC) 2x 0.6 A (400 V AC) / 2x 0.5 A (500 V AC)
Inrush current limitation at 25°C / I^2t	≤22 A / ≤0.25 A^2s
Mains buffering (I_N)	Typically 20 ms (400 V AC) / typically 20 ms (500 V AC)
Output data	
Nominal output voltage	24 V DC ±1%
Setting range of the output voltage (U_{Set})	24 V DC ... 28 V DC (>24 V DC, constant capacity restricted)
Output current / dynamic boost	5 A / 7.5 A (5 s)
Can be connected in parallel/series	Yes, with redundancy module / Yes
Max. power dissipation (no load/nominal load)	<1 W (400 V AC) / <12 W (480 V AC)
Efficiency	Typically 91% (400 V AC)
Residual ripple	≤20 mV_{PP}
Signaling	
Signaling DC OK	LED, floating signal contact
General data	
Weight / dimensions W x H x D	0.7 kg / 36 x 160 x 159 mm
Connection	Cross Power System
Connection method	Snap-on connection
Input connection data (solid/stranded/AWG)	- mm^2 / - mm^2 / -
Output connection data (solid/stranded/AWG)	0.2 - 4 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Degree of protection / protection class	IP20 / II
MTBF (IEC 61709, SN 29500)	>1,300,000 h (40°C)
Ambient temperature (operation)	-25°C ... 70°C (>60°C derating: 2.5%/K)
Standards/regulations	
Insulation voltage input/output	1.5 kV AC (routine test) / 3 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Electrical safety	IEC 61010-1 (SELV)
Electronic equipment for electrical power installations	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410
UL approvals	UL Listed UL 61010-2-201
Limitation of harmonic line currents	EN 61000-3-2

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Power supply unit, primary-switched	**EM-CPS-PS/3AC/24DC/5**	1064922	1