

Control module USC710D4-...-HA



Control module USC710D4-...-HA

Control module with single fault tolerance
for load switches or circuit breakers



USC710D4-01-HA – Typical module

Device features

- Complete solution for changeover modules with integrated load switch or circuit breaker (3-pole or 4-pole) of different manufacturers
- Bus technology for easy installation and reduced fire load
- Clear menu structure with LC display allows easy parameter setting
- Internal functional testing including checking the operating times
- Variable changeover period $t < 0.3 \dots 20$ s + operating time of the switching element
- Automatic interlocking funktion (optional)
- Suitable for all common DIN rail systems
- Screwless-type connection technique
- HA version for manual/automatic control
- Additional alarm contacts (optional)
- Power supply for MK2430/MK800
- Special version available for use with generators
- Voluntary testing of the control module by TÜV Süddeutschland

Product description

The factory-made control modules of the USC710D4-HA series are designed to control changeover and monitoring modules with load switches or circuit breakers. Load switches and circuit breakers are used as switching elements. In conjunction with the TMX-HA operator panel, also manual control of the changeover module is possible, e.g. for servicing purposes. Information exchange between the changeover modules and the alarm and operator units is established via bus technology. The module is suitable for mounting onto all common DIN rail systems (equipment racks have to be provided).

Functions in accordance with IEC 60364-7-710 / DIN VDE 0100-710 (VDE 0100-710)

- Voltage monitoring with control function
 - on the preferred supply (Line 1)
 - on the second supply (Line 2)
 - at the output of the changeover module (Line 3)
- Variable changeover period $t < 0.3 \dots 20$ s + operating time of the switching element
- Protection against wrong operation by multiple interlocking
- Control circuit with single fault tolerance
- Automatic return on recovery of the voltage
- Functional testing including checking of the operating times
- N conductor monitoring option

Further measures to increase the electrical safety

- Continuous monitoring of the actuation devices and automatic processes (coil, control contacts, connections).
- Monitoring for short-circuits at the output of the changeover device with pre-defined switching behaviour.

Single fault tolerance

The Control modules continuously monitors the functions and in this way ensures that an individual, foreseeable error cannot lead to a failure of the power supply at the output of the automatic changeover and monitoring module. (DIN VDE 0100-710: 2002-11 para. 710.521.6 control circuits).

Function

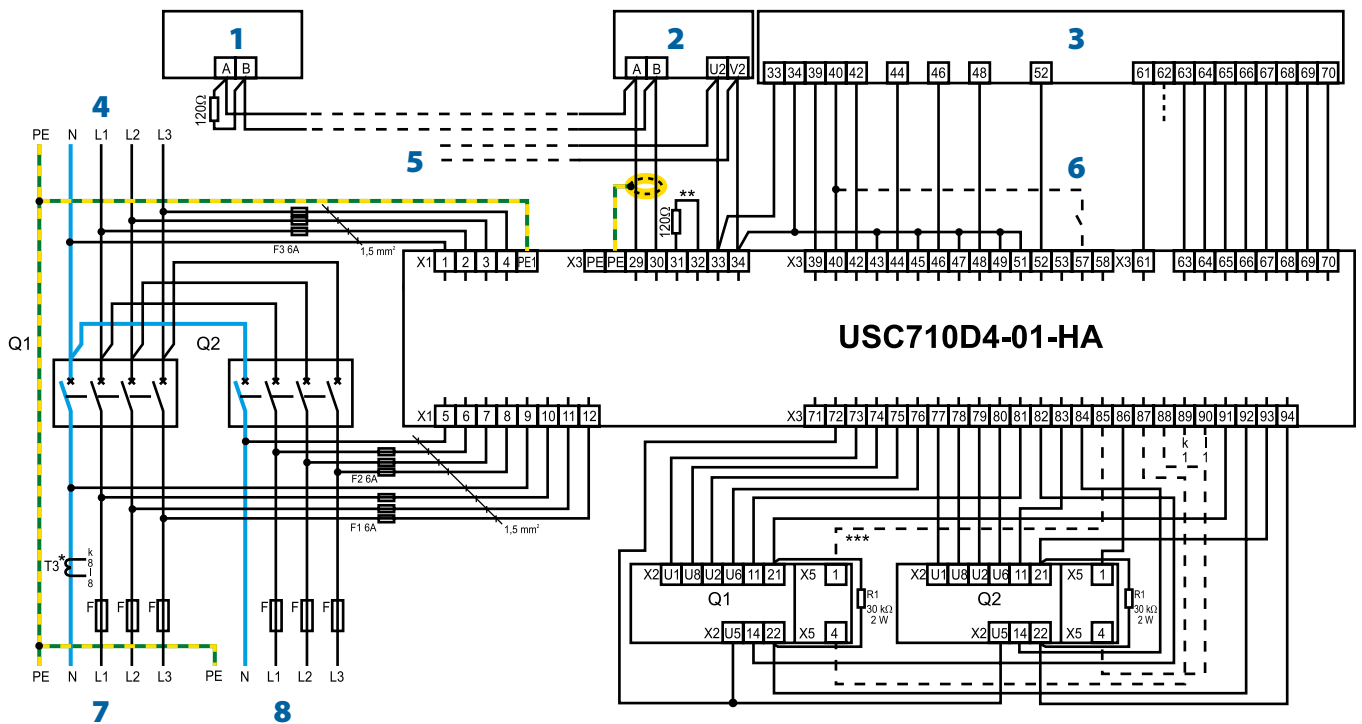
In fault-free condition, the preferred supply line is switched on. If the voltage drops in one or several line conductors below the set response value, changeover to the second supply will automatically take place. The changeover period can be set individually. In order to ensure operational readiness, the second line as well as the output of the changeover module (Line 3) are monitored too. On recovery of the voltage, return to the preferred supply line occurs automatically. Owing to variable delay times (return transfer time or pause time), the USC meets the individual installation-specific requirements (e.g. coordination of several changeover modules, reduction of switching energy). Via the menu, the function of the changeover module can be tested.

When the safety power supply source is supplied by a generator, the control module must provide a start-up signal in case of failure of the preferred supply. These versions provide an input for generator test functions.

Indications/messages

- Plain text messages display for all essential operating, fault and alarm messages
- Information exchange between alarm indicator and operator units via BMS bus
- Common alarm contact with protective separation in accordance with EN 50178
- Alarm contacts for failure/operation of line 1, line 2, switching state of the switching elements

Wiring diagram USC710D4-01-HA with TMX-HA



- 1 - Other alarm, measuring or monitoring devices
- 2 - Alarm indicator and test combination MK2430-12
- 3 - Manual/automatic TMX-HA operator panel
- 4 - Distribution 3 AC 400 V/N/PE 50 Hz
- 5 - Other MK...
- 6 - Automatic interlocking function
- 7 - Preferred supply 3 AC 400 V/N/PE 50 Hz
- 8 - Second supply 3 AC 400 V/N/PE 50 Hz

- * T3 is not required for 3-pole circuit breakers and 4-pole changeover modules without N conductor monitoring. In this case, the function of the N conductor monitoring has to be deactivated in the "Setup" menu of the PRC487. T3 is not included in the scope of delivery of USC710D4-HA.
- ** Remove the terminating resistor, if additional bus devices are connected here.
- *** In circumstances where changeover is not required in case of tripping of the circuit-breaker, the terminals X3: 85...88 have to be wired. Otherwise, the free connections (X3: 85 and 87 oder X3: 86 and 88) can be used to activate the automatic interlocking function by means of a switch.

Ordering information

U_n	Control current for circuit breakers	Operating current	Special features for motor drive	Power consumption max.	Type
3(N) AC 400/230 V	< 5 A	< 5 A		21 W*	USC710D4-01-HA
	< 2 A	< 2 A		15 W*	USC710D4-02-HA
	< 5 A	< 5 A	for generator operator	21 W*	USC710D4-03-HA
	< 2 A	< 2 A	for generator operator	15 W*	USC710D4-04-HA
	< 16 A	< 16 A	control voltage 60 V	21 W*	USC710D4-05-HA
	< 2 A	< 5 A		15 W*	USC710D4-06-HA
	< 2 A	< 5 A	open-circuit monitoring 24 V	15 W*	USC710D4-08-HA

* plus power dissipation of the circuit-breaker

Accessories

Function	U_n	Type	Art. No.
Relay module for alarm contact extension (option)	AC 24 V	URC-11	B 9205 7120
	AC 230 V	URC-14	B 9205 7121
Measuring current transformer for N conductor monitoring	-	W1-S35	B 911 731
		W2-S70	B 911 732
		W35	B 9808 0010
		W60	B 9808 0018

Dimension and weights

Type	Fields/Rows	Dimensions in mm			Weight
		Width	Hight	Depth	
USC710D4-01-HA	2/3	500	450	130	7.5 kg
USC710D4-02-HA	2/3	500	450	130	7 kg
USC710D4-03-HA	2/4	500	600	130	8.5 kg
USC710D4-04-HA	2/3	500	450	130	8 kg

Technical data
Insulation coordination acc. to IEC 60664-1

Rated insulation voltage	AC 400 V
Rated impulse voltage/pollution degree	4 kV/3

Power unit/ switching elements

Switching elements	see manufacturer's information
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Voltage ranges – Supply voltage devices

Supply voltage U_S	AC 230 V
Operating range of U_S	0.8...1.15 x U_S
Frequency range of U_S	50...60 Hz
Power consumption (without circuit-breaker)	see ordering information

Control and indicating device PRC487

Display, characters	LCD, illuminated, 2 x 16 characters
Control inputs	≤ DC 5 V

Voltage monitoring

Rated operational voltage U_e	3/N AC 400/230 V
Operating range U_e	0.7...1.3 x U_e
Frequency f_e	50...60 Hz
Response value undervoltage, adjustable	0.7...0.9 x U_e
Response value overvoltage	1.15 x U_e
Response time t_{an}	50...250 ms
Response time t_{off} adjustable (50 ms steps)	0...9950 ms
Return transfer time t_{on} adjustable (1 s steps)	0...249 s
Pause time, adjustable (50 ms steps)	0...9950 ms

Interface

Interface/protocol	RS-485/BMS
Baud rate	9.6 kbit/s
Cable length	≤ 1200 m
Cable (shielded, shield connected to PE on one side)	recommended: min. J-Y(St)Y 2x0.6
Terminating resistor	120 Ω (0.25 W)
Device address, BMS bus	2...90
Factory setting, device address	4

Switching elements (alarm contacts)

Number of changeover contacts	1 changeover contact
Operating principle	N/C operation

Contact data acc. to IEC 60947-5-1

Rated operational voltage U_e	AC 230 V/DC 220 V
Rated operational current I_e	AC 5 A/DC 0.2 A
Utilization category	AC 14/DC 12
Electrical service life, number of cycles	10.000
Minimum contact load	1 mA at AC/DC > 10 V

Environment/EMC

EMC immunity	acc. to EN 61000-6-2
EMC emission	acc. to EN 61000-6-4
Classification of climatic conditions acc. to IEC 60721	
Stationary use	3K5
Transport	2K3
Storage	1K4
Operating temperature	-10 °C...+55 °C
Classification of mechanical conditions acc. to IEC 60721	
Stationary use	3M4
Transport	2M1
Long-time storage	1M3

Connection
Control unit

Connection	cage clamp spring terminal
Connection properties rigid/flexible/conductor sizes	0.08...2.5 mm ² /AWG 28-12
Stripping length	8...9 mm

Voltage monitoring unit

Connection	cage clamp spring terminal
Connection properties rigid/flexible/conductor sizes	0.2...16 mm ² /AWG 24-6
Stripping length	16...17 mm

Other

Operating mode	continuous operation
Mounting position	vertical
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP20
Mounting into standard distribution panels	see table "Dimensions and weights"
Flammability class	UL94V-0
Product standards	IEC 60364-7-710/DIN VDE 0100-700 (VDE 0100-710)
Weight	table "Dimensions and weights"

Control module/switching elements assignment

Manufacturer	Type	Nominal current	USC710D4...						
			-01-HA	-02-HA	-03-HA	-04-HA	-05-HA	-06-HA	-08-HA
ABB	ISOmax S1, S2	125...160 A	■		■		■		
ABB	ISOmax S3 to S5	160...630 A	■		■				
ABB	ISOmax S6, S7	400...1600 A	■		■		■		
ABB	Tmax T1 to T3	160...250 A							■
ABB	Tmax T4, T5	250...630 A		■		■	■		
ABB	Emax E1 to E6	800...3200 A			■		■	■	
ABB	Megamax F1 to F6	1250...6300 A			■			■	
ABB	Novomax G 30	800...1600		■		■			
GE AEG	Record Plus FG	400...630 A			■			■	
GE AEG	Record Plus FK	800...1600 A			■			■	
GE AEG	Spectra E160...250	160...250 A	■		■				
GE AEG	Spectra MC168, MC258	160...250 A	■		■				
GE AEG	Spectra ME07	630...6400 A			■		■	■	
GE AEG	M-PACT	400...4000 A			■			■	
GE AEG	Tele MP	63 A		■		■			
Merlin Gerin	NS100...630N	100...630 A	■		■				
Merlin Gerin	NS630B...1600B	630...1600 A		■		■			
Merlin Gerin	Masterpack NT630...1600	630...1600 A		■		■	■		
Merlin Gerin	Masterpack NW800...6300	800...6300 A		■		■	■		
Mitsubischi	NF	400...800 A							■
Moeller	NZM2...4	100...1600 A		■		■	■		
Moeller	NZM7 to NZM14	100...1250 A		■		■	■		
Moeller	IZM	630...6300 A		■		■	■		
OEZ	BD	250 A		■		■			
OEZ	BH	630 A		■		■			
Siemens	Sentron 3VL	160...800 A	■		■		■		
Siemens	Sentron	1250...1600 A	■		■		■		
Siemens	Sentron 3VF3 to 3VF6	80...630 A		■		■	■		
Siemens	Sentron 3VF7 to 3VF8	800...1600 A	■		■		■		
Siemens	Sentron 3WL	630...6300 A		■		■	■		
Siemens	Sentron 3WN6	630...3200 A		■		■	■		
Weber	BS	50...250 A		■		■			
Weber	BS	400 A		■		■			
Weber	BS	630...1600 A		■		■			



Bender GmbH & Co. KG

P.O. Box 1161 • 35301 Gruenberg • Germany
 Londorfer Strasse 65 • 35305 Gruenberg • Germany
 Tel.: +49 6401 807-0 • Fax: +49 6401 807-259
 E-Mail: info@bender.de • www.bender.de



BENDER Group