

# 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  $t < 0.3 \dots 20 \text{ s}$  + 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  $t < 0.3 \dots 20 \text{ s}$  + 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

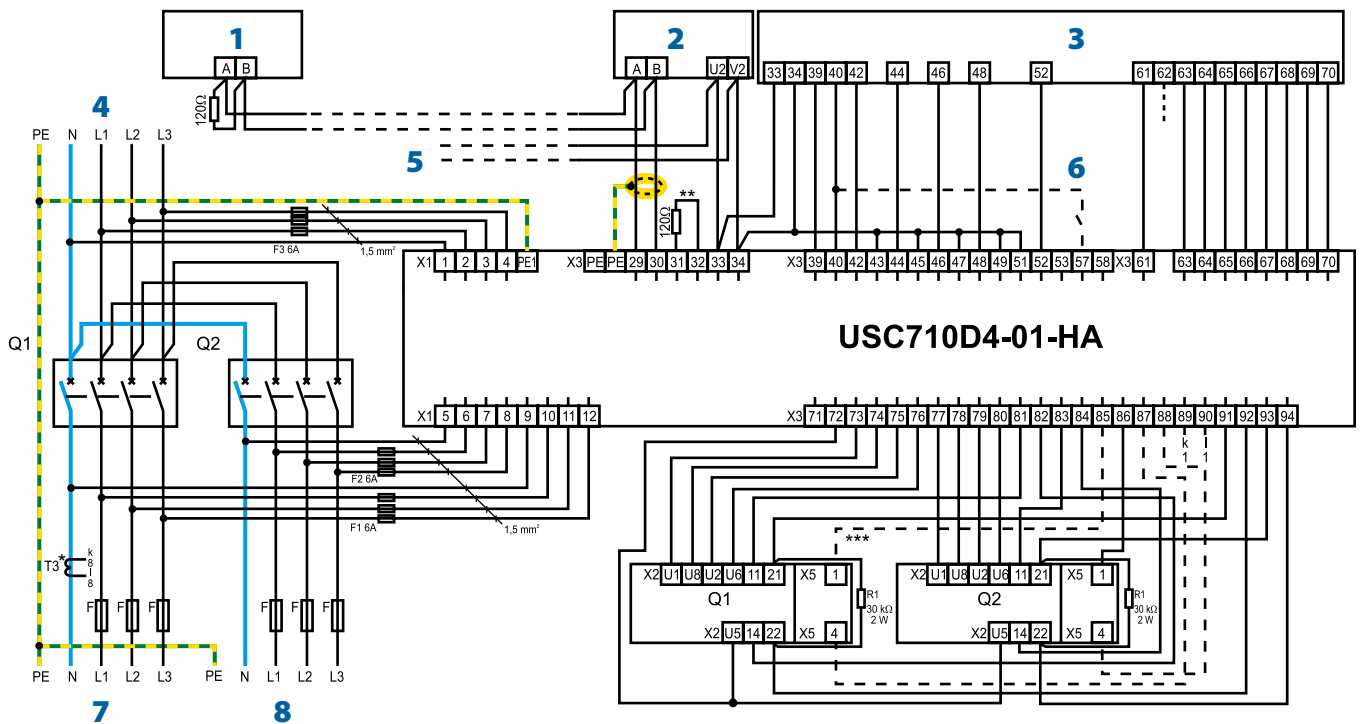
In fault-free condition, the preferred supply line is switched on. If the voltage drops in one or several line conductors below the set response value, changeover to the second supply will automatically take place. The changeover period can be set individually. In order to ensure operational readiness, 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 for motor drive	Special features	Power consumption max.	Type	Art. No.
3(N) AC 400/230 V	< 5 A	< 5 A		30 W*	USC710D4-01-HA	B92057101
	< 2 A	< 2 A		24 W*	USC710D4-02-HA	B92057102
	< 5 A	< 5 A	for generator operator	33 W*	USC710D4-03-HA	B92057103
	< 2 A	< 2 A	for generator operator	27 W*	USC710D4-04-HA	B92057104
			control voltage 60 V	30 W*	USC710D4-05-HA	B92057105
	< 2 A	< 5 A	without open-circuit monitoring	29 W*	USC710D4-07-HA	B92057107
	< 2 A	< 5 A	open-circuit monitoring 24 V	29 W*	USC710D4-08-HA	B92057108

\* 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	B92057120
	AC 230 V	URC-14	B92057121
Measuring current transformer for N conductor monitoring	-	CTAC35	B98110007
		CTAC60	B98110017

### Dimension and weights

Type	Fields/Rows	Dimensions in mm			Weight
		Width	Hight	Depth	
USC710D4-01-HA	2/3	500	450	190	7,5 kg
USC710D4-02-HA	2/3	500	450	190	7 kg
USC710D4-03-HA	2/3	500	450	190	8,5 kg
USC710D4-04-HA	2/3	500	450	190	8 kg
USC710D4-05-HA	2/3	500	450	190	7,5 kg
USC710D4-07-HA	2/3	500	450	190	6 kg
USC710D4-08-HA	2/3	500	450	190	6 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 (twisted pair, shielded, shield connected to PE on one side) recommended: J-Y(St)Y min. n x 2 x 0,8	
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**

<b>Control unit</b>	
Connection	cage clamp spring terminal
Connection properties rigid/flexible/conductor sizes	0.08...2.5 mm <sup>2</sup> /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 <sup>2</sup> /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	see table "Dimensions and weights"

## Zuordnung Steuermodul/Schaltglieder

Manufacturer	Type	Description	Nominal current	USC710D4...						
				-01-HA <5A	-02-HA <2A	-03-HA Gen.	-04-HA Gen.	-05-HA 60VDC	-07-HA o. Draht	-08-HA 24VDC
ABB	ISOmax	S1, S2	125...160 A	■		■		■		
		S3 to S5	160...630 A	■		■				
		S6, S7	400...1600 A	■		■		■		
	Tmax	T1 to T3	160...250 A							■
		T4 to T7	250...1600 A		■		■	■		
		XT1/3 with MOD motor drive	160/250	■		■				
		XT2/4 with MOE motor drive	160/250		■		■			
	Emax (2)	X1, E1 to E6	800...3200 A		■		■	■		
Megamax F	F1 to F6	1250...6300 A		■		■				
Novomax G 30	G 30	800...1600		■		■				
GE AEG	Record Plus	FD	63...160 A							■
		FE	160...250 A							■
		FG	400...630 A							■
		FK	800...1600 A			■				
	Spectra	E160...250	160...250 A	■		■				
		E400...1250	400...1250 A							■
	MC	MC128	100...125 A							■
		MC168, MC258	160...250 A	■		■				
		MC408 to MC1258	400...1250 A							■
	ME	ME07	630...6400 A			■		■		
	M-PACT		400...4000 A			■				
EntelliGuard	GG04...GG20	400...2000 A		■		■				
	GG25...GG64	2500...6400 A			■					
Tele MP		63 A		■		■				
Hager H series	x250	HXB042H	100...250 A							
	h250	HXC042H	40...250 A							
	h630	HXD042H	250...630 A							■
	h1000	HXE042H	800...1000 A							■
	TemPower2	HX332E		■	■		■			
HCD401H			■							
Merlin Gerin	NS	NS(X)100...630N	100...630 A	■		■				■
		NS630b...1600	630...1600 A		■		■			
	Masterpack	NT630...1600	630...1600 A		■		■	■		
		NW800...6300	800...6300 A		■		■	■		■
Moeller (in EATON Group)	NZM, N	NZM2...4, XR	100...1600 A		■		■	■		
		NZM2...4, XRD	100...1600 A	■		■		■		
		NZM7 to NZM14*	100...1250 A		■		■	■		
	IZM		630...6300 A		■		■	■		
	IZMX	IZMX16, 40	630...6300 A		■		■	■		
EATON	Magnum	MWI	800...6300 A						■	

Manufacturer	Type	Description	Nominal current	USC710D4...						
				-01-HA <5A	-02-HA <2A	-03-HA Gen.	-04-HA Gen.	-05-HA 60VDC	-07-HA o. Draht	-08-HA 24VDC
Siemens  from OEZ	Sentron	3VL (only for 3MQ00) with motor 3M.E10	160...800 A	■		■		■		■
			160...800 A						■	
			1250...1600 A	■		■		■		
		3VF3 to 3VF6	80...630 A		■		■	■		
		3VF7 to 3VF8	800...1600 A	■		■		■		
		3WL	630...6300 A		■		■	■		
		3WN6	630...3200 A		■		■	■	■	■
		3VT2...3VT3	250...630 A		■		■	■		
		3VA2	400...630 A						■	
	3VA2	16-								
Weber	BS	XMB	160...250 A		■		■	■		
		XMC	400 A		■		■	■		
		XMD	630...1600 A		■		■	■		
		UNIPOWER	1250...4000		■		■			
Mitsubishi		NF	125...250 A							■
			400...800 A	■		■				
OEZ Siemens 3VT...		BD	250 A		■		■	■		
		BH	630 A		■		■	■		

## Control module/switching elements assignment

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