INTELLIGENT ELECTRONIC CIRCUIT PROTECTOR
ESX300-S plus

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The hot pluggable **ESX300-S plus** electronic circuit protector ensures reliable overcurrent protection by means of electronic current limitation and load disconnection. It reliably prevents the destruction of electronic sub-assemblies or load lines in power supply systems in DC +24 V, DC +48 V and DC +60 V voltage ranges. Thanks to its selective load disconnection, a voltage dip is prevented in the event of a failure and fault-free devices can be further operated. The integral bus interface can transmit the recorded measuring values and status messages to the RCI11 control interface, where they can be used to automatically trigger actions or for data collection and monitoring.

TYPICAL FEATURES

- Rated voltage DC +24 V, DC +48 V, DC +60 V
- Rated current between 2 A and 24 A (optionally, current ratings 16 A, 20 A and 24 A can be connected in parallel to protect loads up to 60 A)
- Integrated BUS interface
- Status LEDs for failure indication on site
- Electronic current limitation

YOUR BENEFITS

- Maximum system protection through electronic current limitation and load disconnection
- Maximum system availability through selective protection
- Risk reduction through active, remotely controlled disconnection of equipment (optionally via RCI11)
- Effective failure indication (overvoltage, low voltage, short circuit, etc.)
- Installation and removal possible during operation, no system downtimes
- 100 % fail-safe through fail-safe element

TYPICAL APPLICATIONS

Telecommunications and datacom, energy providers, industrial switching and control systems, rail engineering, infrastructure

COMPLIANCE

REACH RoHS CE

WEB LINKS

Further information, REACH, RoHS, Contact

TECHNICAL DATA (T_u = +25 °C, U_b = DC -48 V)

ELECTRICAL DATA	
Rated voltage U_n	DC +24 V, DC +48 V, DC +60 V (adjustable via slide switch)
Operating voltage U_b	18...72 V
Current ratings	2 A; 5 A; 8 A; 12 A; 16 A; 20 A; 24 A
Parallel connection of several load outputs	For ***Power-D-Box®* CP** only, with load outputs at the back - 16 A; 20 A; 24 A can be connected in parallel by means of jumpers. This enables load protection up to 60 A.
Power consumption I	Typ. 16 mA
LED for operating condition signalling	**Green/red:** • Status LEDs **Optional:** • ELBus® interface (via RCI11)
Output (load circuit)	Power-MOSFET-switching output (plus switching), no physical isolation
Overcurrent behaviour	Typ. 1.2 I_n - Trip time typ. 30 s in the event of an overcurrent
Short circuit behaviour	Typ. 1.2 I_n - Trip time typ. < 20 ms in the event of a short circuit
Temperature disconnection	Typ. at T_{amb} = 105 °C
Operating voltage monitoring for low voltage	Factory setting: typ. (18 V < U) 24 V typ. (40 V < U) 48 V typ. (54 V < U) 60 V
Operating voltage monitoring for overvoltage	Factory setting: typ. (30 V < U) 24 V typ. (57 V < U) 48 V typ. (72 V < U) 60 V
Switching on the load circuit via ON/OFF momentary switch	Switch on and off
Leakage current in the load circuit in OFF condition	Typ. 1 mA
Capacitive switch-on capacity	Max. 7,000 µF
Free-wheeling circuit	External free-wheeling diode required for inductive load (For further information on the free-wheeling diode, please contact E-T-A)

VOLTAGE DROP, CURRENT LIMITATION, TRIP TIME AND FAIL-SAFE ELEMENT

Rated current I_n [A]	Typical Voltage dip U_{on} at I_n [mV]	Active current limitation typically [I_n]	Fail-safe element	Max. acceptable capacitive load [µF]
2	130	1.2	4	1,500
5	130	1.2	10	2,000
8	200	1.2	10	3,000
12	150	1.2	20	4,000
16	200	1.2	20	5,000
20	160	1.2	30	6,000
24	200	1.2	30	7,000
32 A* (2 x 16 A)	200	1.2	2 x 20	10,000
40 A* (2x 20 A)	160	1.2	2 x 30	12,000
44 A* (2 x 24 A)	200	1.2	2 x 30	14,000
48 A* (3 x 16 A)	200	1.2	3 x 20	15,000
60 A* (3 x 20 A)	160	1.2	3 x 30	18,000
60 A* (3 x 24 A)	200	1.2	3 x 30	21,000

MECHANICAL DATA	
Mounting position	Vertical, cooling Convection cooling
Mass	Approx. 50 g

AMBIENT CONDITIONS	
Ambient temperature	-20...+55 °C without condensation cf. EN60204-1

Storage temperature	-20...+70 °C
Damp heat	**Test according to IEC 60068-2-78, 3K6 climate class according to EN 60721** 96 hours at 95 % relative humidity, 40 °C
Vibration	**Test according to IEC 60068-2-6, test Fc** 3 g
Actuating area IP code (standard)	IP20 (when rack is fully populated and SUB-D connectors are plugged in)
Terminal area IP code (standard)	IP00 (DIN 40050)
ESD	4 kV / air 8 kV
EMC requirements (EMC directive, CE logo) emitted interference	EN 61000-6-3
EMC requirements (EMC directive, CE logo) resistance to disturbances	EN 61000-6-2

FURTHER INFORMATION

OPERATING CONDITIONS: LED STATUS INDICATION

Operating condition	Load output	LED green	LED red	Auxiliary contact N/C (optional)
No fault ➡ Device OFF	Locked	Flashing slowly	OFF	Open
Normal operation	Connected	ON	OFF	Open
Low-voltage fault with device in OFF condition (18 V < U) ➡ 24 V (40 V < U) ➡ 48 V (54 V < U) ➡ 60 V	Locked	OFF	ON	Closed
Low-voltage fault with device in OFF condition (30 V > U) ➡ 24 V (57 V > U) ➡ 48 V (72 V > U) ➡ 60 V	Locked	OFF	ON	Closed
Overcurrent fault detected ($I > I_n < 1.2\ I_n$) The overcurrent must be detected for approx. 30 s before tripping is effected.	Connected	ON	Flashing fast	Open
Overcurrent fault or short circuit disconnection	Locked		ON	Closed
Low-voltage fault (18 V < U) ➡ 24 V (40 V < U) ➡ 48 V (54 V < U) ➡ 60 V	Connected	ON	ON	Closed
Overvoltage fault (30 V > U) ➡ 24 V (57 V > U) ➡ 48 V (72 V > U) ➡ 60 V	Connected	ON	ON	Closed
Error, no voltage or internal error	Locked	OFF	OFF	Closed
Error excess temperature	Locked	OFF	Flashing slowly	Closed
Remote disconnection (Ordering option control interface RCI11)	Locked	Flashing fast	OFF	-

ORDERING NUMBER CODE

E	S	X	3	0	0	-	S	-	3	1	0	-	2	4	A
1							2		3	4	5		6		

1 TYPE NUMBER

ESX300	Electronic circuit protector

2 VERSION	
S	Standard, pluggable (front plate, without enclosure)

3 INTERFACES	
3	ELBus® interface

4 VOLTAGE RANGE	
1	DC Plus 18 V - 72 V

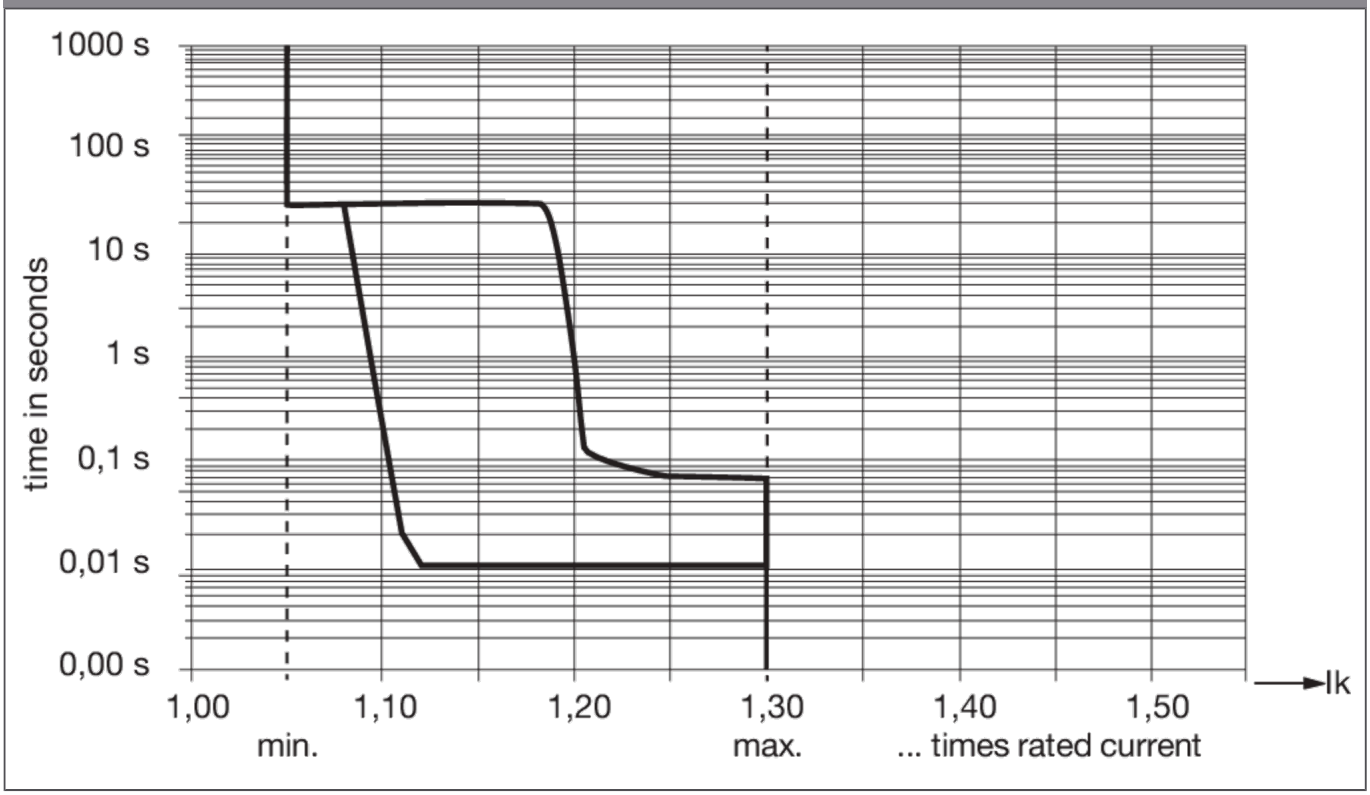
5 ADDITIONAL FUNCTIONS	
0	Without additional functions

6 RATED CURRENT
2 A
5 A
8 A
12 A
16 A
20 A
24 A

COMPLIANCE	
CE	CE according to EMC directive (EN 61000-6-3 & EN 61000-3-2)
Compliance according to	UL2367, EN 60950-1 / UL 60950-1 (when installed in PDB)

TIME-/CURRENT CHARACTERISTICS

TIME/CURRENT CHARACTERISTICS



• The electronic current limitation is activated from typ. 1.2 I_n. This means that under all overload conditions (independent of power supply and load circuit resistance), 1.2 times the rated current typically flows until the disconnection.

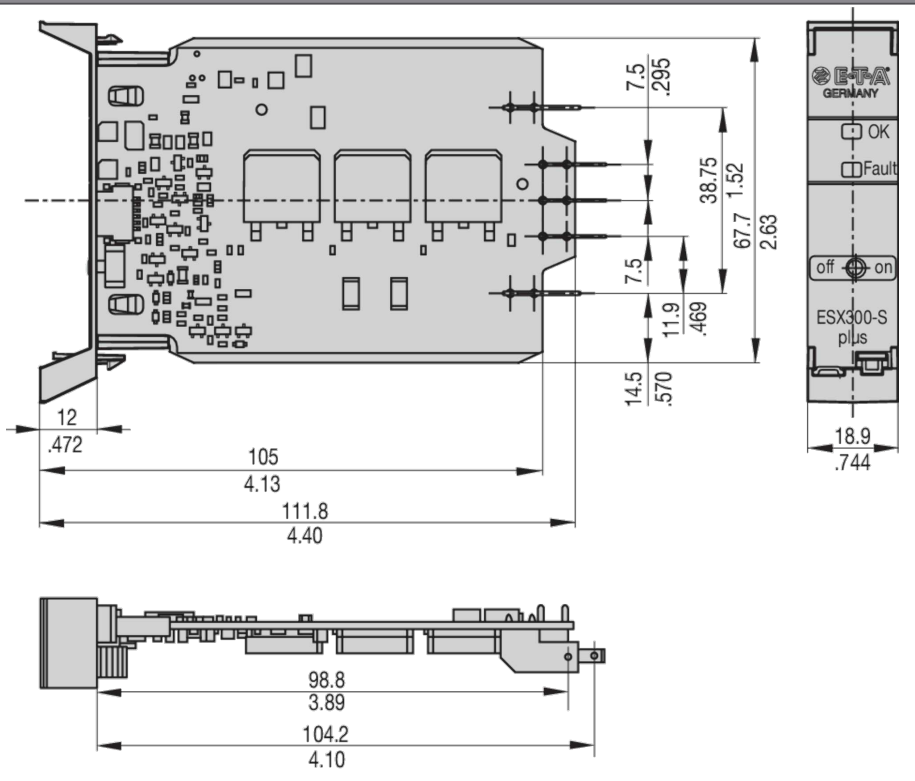
• Without the current limitation activated at typically 1.2 I_n there would be a much higher overcurrent in the event of an overload or short circuit.

DERATING TABLE		
Rated current I_n [A]	Max. load current at 100 % ED [A]	
-	T_a = 40 °C	T_a = >40 °C
2	2	1.6
5	5	4
8	8	6.4
12	12	9.6
16	16	12.8
20	20	16
24	24	19.2
32 A* (2 x 16 A)	32	25.6
40 A* (2x 20 A)	40	32
44 A* (2 x 24 A)	44	35.2
48 A* (3 x 16 A)	48	38.4
60 A* (3 x 20 A)	60	48
60 A* (3 x 24 A)	60	48

Note: The total rated current of neighbouring devices must not exceed 44 A.

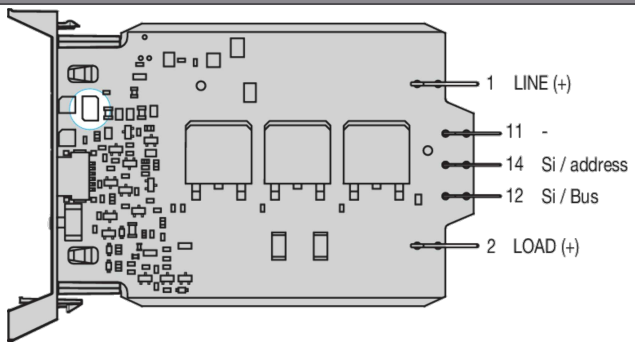
DIMENSIONS

DIMENSIONS



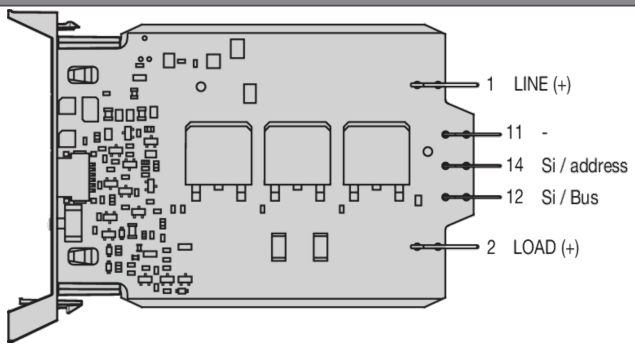
SCHEMATIC DIAGRAMS

VOLTAGE RANGE CONFIGURATION



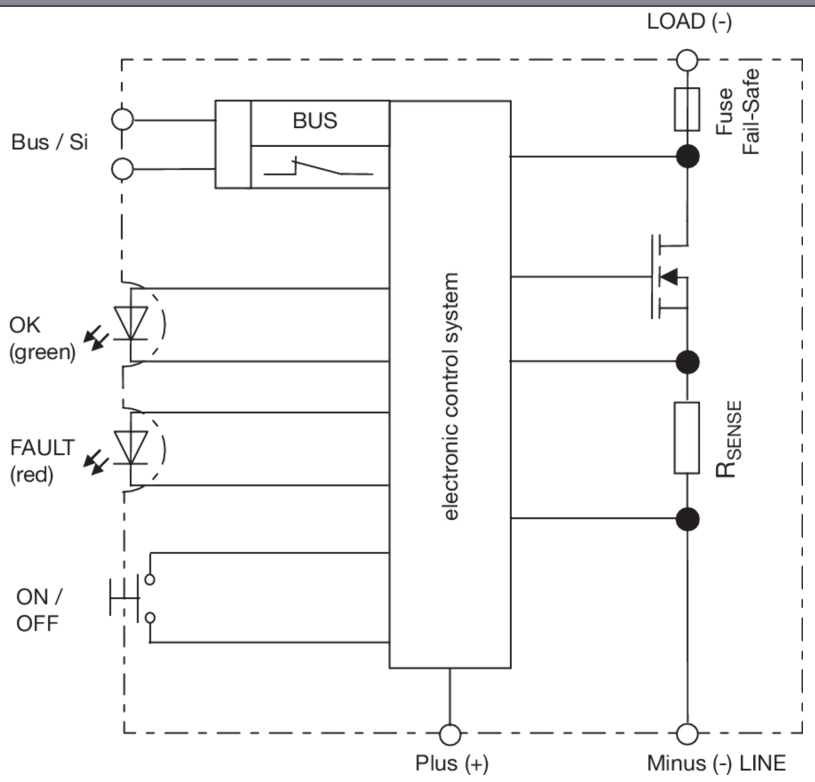
- The configuration of the voltage area is done via the slide switch on the PCB:
- 24 V (voltage range 20 V to 30 V)
- 48 V (voltage range 40 V to 57 V)
- 60 V (voltage range 54 V to 72 V)
- Depending on the configured voltage range, the voltage specification for low voltage or overvoltage detection will change as well. Condition as delivered of the ESX300-S plus is 48 V.
- For further information please refer to the ***ControlPlex***® rack installation instruction.

PIN ASSIGNMENT



SCHEMATIC DIAGRAMS

SCHEMATIC DIAGRAM



ACCESSORIES

REQUIRED ACCESSORIES FROM

CP Power-D-Box® for ControlPlex® Rack	The ***Power-D-Box®* CP** is a modular power distribution system. Depending on the respective application, the compact 2 HU enclosure can accommodate these system components: ESX300-S, RSI10, RCI11 oder EAI300. User friendliness is of top priority in the event of a system extension with the system live without causing downtimes. All sub-assemblies are hot-swappable without affecting neighbouring components. Depending on the application, termination can be placed both on the front or on the rear. Major application areas of the ***ControlPlex®* Rack** system are communication technology equipment both in the negative (DC -48 V or DC -60 V) and in the positive voltage range (DC 24 V, 48 V, 60 V).	

OPTIONAL ACCESSORIES

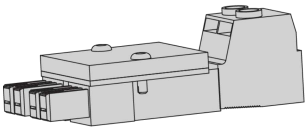
X22387411	Two ESX300-S connected in parallel Consisting of: 1 front bridge 1 load output bridge	
X22387401	Three ESX300-S connected in parallel Consisting of: 1 front bridge 1 load output bridge	
X22385301	ESX300-S removing bracket Consisting of: 1 removing bracket 1 mounting bracket	

FURTHER INFORMATION ABOUT ACCESSORIES (DRAWINGS)

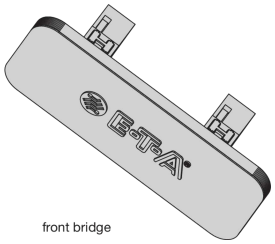
ACCESSORIES

Parallel connection of several ESX300-S
for two ESX300-S (part no. X22387411)
for three ESX300-S (part no. X22387401)

consisting of:
1 front bridge
1 load output bridge



load output bridge

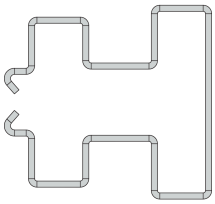


front bridge

ACCESSORIES

Extracting tool ESS300-S
(part no. X22385301)

consisting of:
1 extracting tool
1 mounting clip



extracting tool

FURTHER PRODUCTS

RELATED PRODUCTS

RCI11	The **RCI11** Remote Control Interface allows remote control and monitoring of the system and its connected loads, reducing maintenance costs and providing maximum transparency. It helps integrate the ***ControlPlex***® **Rack** system into the network surroundings and into the centralised corporate management system. The RCI11 provides access to all installed ESX300-S circuit protectors via the internal bus system and can enquire or store individual measuring data, status conditions and fault indications and forward them to the superordinate control unit or execute commands from the control unit for controlling purposes. The RCI11 Remote Control Interface can be extended during operation “Hot Plug & Play“.	
RSI10	The **RSI10** Remote Signalling Interface ensures reliable and early detection of critical system conditions. It can communicate with all circuit protectors installed in the ***ControlPlex***® **Rack** via internal BUS connection. When one of the circuit protectors is disconnected from the related load due to an overcurrent etc., the RSI10 will externally indicate this status via a potential-free group signal, e.g. to a monitoring system. It is the perfect way to minimise downtimes and reduce operational and maintenance costs.	
EAI300	Combined with the RCI11, the **EAI300** External Alarm Interface allows recording of external sensor data and alarm signalling in the management system. It includes e.g. additional monitoring and indication of door contacts or temperature sensors in the technical room. This provides high system transparency and fast intervention in the event of alarms. Thanks to programmable logical links, operating conditions of the ESX300-S can be linked to external encoder signals that enable automatic switching operations. Instead of the ESX300-S electronic circuit protector, the EAI300 can be easily plugged into an empty slot of the ***ControlPlex***® **Rack** system without shutting down the connected loads. This allows connection of external signalling devices in the control cabinets without requiring additional space.	

ESX300-S minus	The hot pluggable **ESX300-S minus** electronic circuit protector ensures reliable overcurrent protection by means of electronic current limitation and load disconnection. It reliably prevents the destruction of electronic sub-assemblies or load lines in power supply systems in a voltage range of DC -48 V and DC -60 V. Thanks to a selective load disconnection, a voltage dip is prevented in the event of a failure and other faultless devices in the circuit remain working. The integral bus interface can transmit the recorded measuring values and status messages to the RCI11 control interface, where they can be used to automatically trigger actions or for data collection and monitoring.	

All information and data given on our products are accurate and reliable to the best of our knowledge, but E-T-A does not accept any responsibility for the use in applications which are not in accordance with the present specification. E-T-A reserves the right to change specifications at any time in the interest of technical improvement. Dimensions are subject to change without notice. Please enquire for the latest dimensional drawing with tolerances if required. All dimensions, data, pictures and descriptions are for information only and are not binding. Amendments, errors and omissions excepted. Ordering part numbers may differ from the device marking.