Surge Protection and Power Supply Units

6

2013 / 2014

PHOENIX CONTACT
INSPIRING INNOVATIONS

PCB connection technology and electronics housing
- PCB terminal blocks and plug-in connectors
- Electronics housing

Connection technology for field devices
- Plug-in connectors
- Cables and connectors

Modular terminal blocks
- Modular terminal blocks

Sensor/actuator cabling and industrial plug-in connectors
- Sensor/actuator cabling
- Cables and connectors
- Plug-in connectors

Marking systems, tools, and mounting material
- Marking and labeling
- Tools
- Installation and mounting material

Surge protection and power supply units

Interface technology and switching devices
- Electronic switching devices and motor control
- Measurement and control technology • Monitoring
- Relay modules • System cabling for controllers

Control technology, I/O systems and automation infrastructure
- Ethernet networks • Functional safety • HMIs and industrial PCs • I/O systems
- Industrial lighting and signaling • Industrial communication technology
- Fieldbus components and systems • Wireless data communication
- Process infrastructure • Software • Controllers

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PHOENIX CONTACT
LM -S-A/C-3S-ETH
Order-No.: 2800618
Lightning Monitoring System
LNK / ACT
10 / 100
System
Sensor 1
Sensor 2
Sensor 3
1 in out
2 in out
3 in out

LM-S lightning monitoring system

Lightning strikes are a particular hazard for exposed structures such as offshore wind parks, radio masts, leisure facilities or high buildings.

The LM-S lightning current measuring system can detect, evaluate, and remotely monitor lightning strikes in realtime. This means that information about the actual load on the system from lightning strikes is available at all times. The findings obtained regarding the load on a system enable optimized maintenance planning.

Lightning monitoring system

Lightning current measuring system introduction

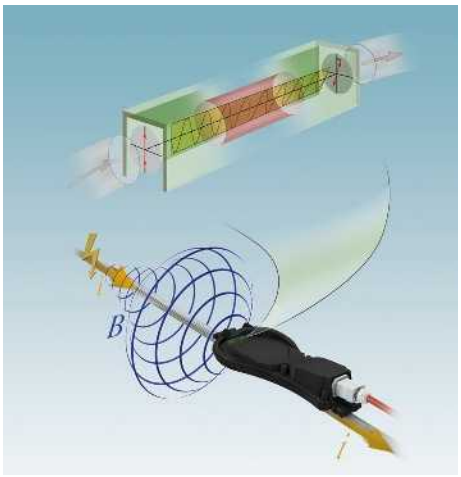
Lightning strikes cause devastating damage to buildings and systems. It is practically impossible for employees to continuously monitor exposed or large-scale systems, which means that damage is detected too late.

Detecting lightning with the lightning monitoring system

The LM-S lightning monitoring system supports continuous monitoring. Lightning events are detected, evaluated, and remotely monitored via network access. This means that information about the actual load on the system from lightning strikes is available at all times. The findings obtained regarding the load on a system enable optimized maintenance planning.

The LM-S lightning current measuring system consists of the following components:

– Sensor
– Connecting cable
– O/E module
– Evaluation unit

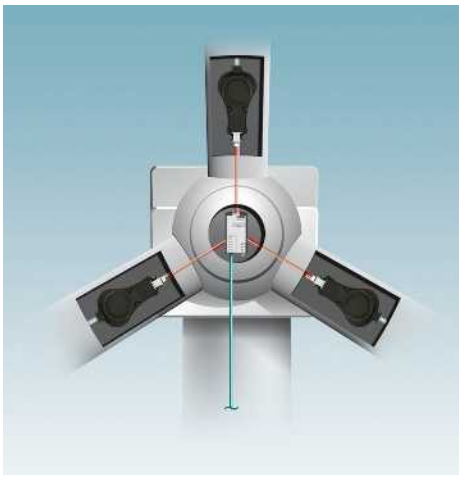


Faraday effect as a reliable measuring method

The internal measuring principle of the LM-S is based on the Faraday effect. Polarized light in a specific medium is rotated through a magnetic field over a defined length and measured.

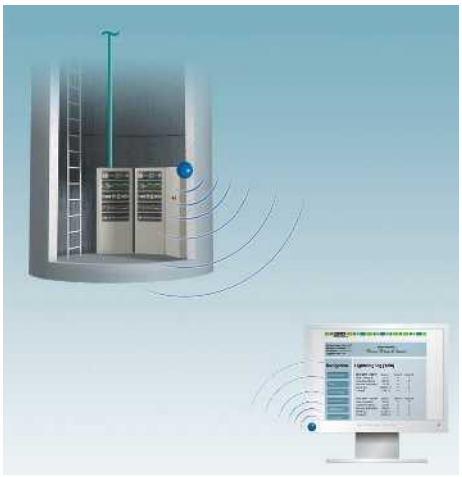
The higher the amperage (i) generated by a lightning strike the greater the magnetic flux density (B) and, therefore, the rotation of the polarized light.

The lightning monitoring system detects this change in the light signal and uses this as the basis for the corresponding measured value results.



Detection and evaluation

The sensors are mounted on the lightning arrester cables. They record the magnetic field that occurs around the conductor due to the lightning surge current. The measured result is transmitted via fiber optics to the O/E module of the evaluation unit, where the optical signal is converted into an electrical signal. Based on the values obtained, the evaluation unit determines the lightning characteristics with their typical parameters, including, for example, the maximum lightning current strength, lightning current rate of rise, charge, and energy. These results can be forwarded to an available management system via the Ethernet interface.



Remote monitoring in realtime

The evaluation unit can be easily integrated into standard network systems via the RJ45 Ethernet interface. An internal web server is used as the basis for accessing recorded data and configuring the system. The web interface is opened via the Internet browser of a PC connected to the system using IP addressing.

Sensor

- Optical lightning sensor for measuring current strength of lightning surge currents
- Subsequent mounting is possible
- Rugged design
- Resistant to vibrations, temperature, and humidity
- Good UV resistance
- Good oil resistance

Sensor

Technical data

Detectable values	
Maximum current strength	250 kA
FO interface	
Connection method	SCRJ socket with push/pull connector, IP67
General data	
Ambient temperature (operation)	-30 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Degree of protection	IP67

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Sensor	**LM-S-LS-H**	**2800616**	1

Connecting cable

- HCS cable for connecting LM-S sensors to the O/E module
- Robust cable for use in harsh environments
- Good UV resistance
- Good oil resistance

Notes:

The specified plug configuration (see ordering example) must be used in order to use the connecting cable in the LM-S lightning monitoring system. Recommended length: 10 to 200 m

Connecting cable for LM-S

Technical data

General data	
Ambient temperature (operation)	-40°C ... 70°C
Ambient temperature (storage/transport)	-40°C ... 70°C
Degree of protection	IP20 (B-FOC)/IP67 (PPCME)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Connecting cable Variable	**FOC-HCS-BFOC/1018B/PPCME/…**	**1408480**	1

Ordering example for LM-S connecting cable with variable cable length:

Assembled connecting cable for the LM-S lightning monitoring system, with a metal push/pull plug-in connector, a B-FOC plug, and a cable length of 10 m.

Order No.		Length [m] Max. 200 m
1408480 / FOC-HCS-BFOC/1018B/PPCME	/	**10.0** **Increments:** 10.0 m ... 200 m = 1.0 m

Evaluation unit

- Complete module including O/E module for connecting up to three LM-S sensors
- Evaluation and storage of amperage, current increase rate, charge, and specific energy
- Realtime analysis and exact time allocation
- Status and diagnostic indicators
- Communication via Ethernet
- Operation and configuration via web interface
- Mounting on a DIN rail

Evaluation unit with O/E module

Technical data

Supply voltage	24 V DC ± 4 V
Ethernet interfaces	
Connection method	RJ45
Transmission speed	10/100 Mbps
FO interface	
Interface	B-FOC (ST®)
Number of ports	3
Sensor interfaces	
Connection method	Rack for plug-in I/O module
Remote indication contact	
Connection method	M12 D-coded
Max. operating voltage	- / 60 V DC
General data	
Ambient temperature (operation)	-30 °C ... 60 °C
Degree of protection	IP20

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Evaluation unit with O/E module	**LM-S-A/C-3S-ETH**	**2800618**	1

Optoelectronic module

- O/E module replacement for evaluation unit
- Connection of up to three LM-S sensors
- Status and diagnostic display via evaluation unit

O/E module

Technical data

FO interface	
Interface	B-FOC (ST®)
Number of ports	3
General data	
Ambient temperature (operation)	-40 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Degree of protection	IP20

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Optoelectronic module	**LM-S-C-3LS**	**2800617**	1


N
N
FLASHTRAB compact
N-PE
L1
L2
L3
PHOENIX CONTACT
FLASHTRAB
FLT-CP
N/PE-350-ST
FLASHTRAB
FLT-CP-PLUS
350-ST
L1
L2
L3
12
11
14
N L
IN
L N
OUT
SFP 1-20/230AC
28 59 98 7
Überspannungsableiter Typ 3
mit integriertem Entstörfilter
T3 III
STATUS
U_N : 230VAC 50/60Hz
U_C : 264VAC
U_T : 400V
U_p : 1kV L-N, L(N)-PE
I_L : 20A
U_{OC} : 10kV
Made in Germany

Surge protection and interference filters

Damage caused by surge voltages

The number of electrical devices damaged or destroyed by surge voltages is increasing year on year. This can prove expensive in terms of repairs and downtimes. In an industrial environment, the hazards are not only restricted to systems and devices. Building technology applications and even residential buildings may be affected.

Interference voltages

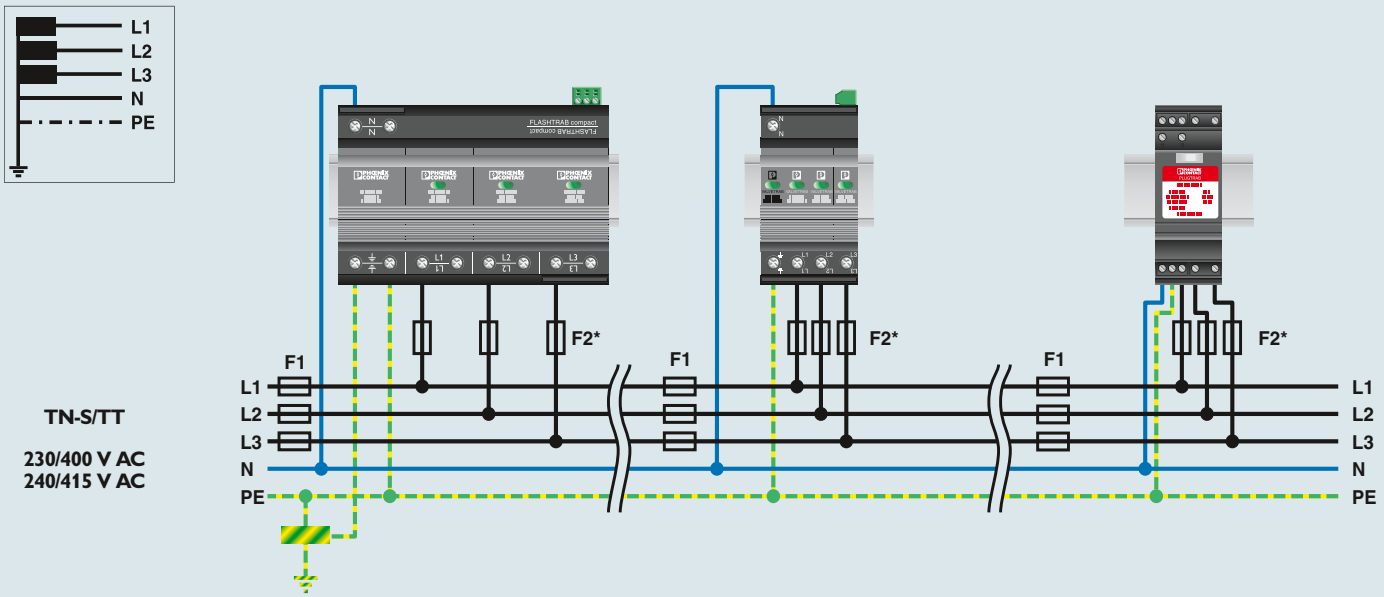
Switching operations triggered mechanically or electronically generate pulse-like and high-frequency interference voltages. These voltages spread in an unimpeded manner across the cable network. All the devices within this cable network are affected. Data errors, uncontrolled functions, and system crashes can result, with electronic and data processing devices at particular risk.

General information on the application drawings below

- The example illustrations are intended to help you select the right surge protection. They make no claim to be complete with regard to the prescribed safety measures.
- The illustrated connection diagrams do not replace standard-compliant planning of a protection concept by an electrical or lightning protection specialist.
- The fixed electrical installation may only be accessed by trained specialist personnel.
- In order to ensure the correct and appropriate use of products, the relevant installation notes must be observed prior to installation or startup.
- All information/notes can be downloaded under the relevant product documentation at www.phoenixcontact.net/products.

Distinguishing features of the protective devices for the power supply					
	Type 1	Type 1+2	Type 1/2	Type 2	Type 3
Lightning protection zone transition	0-1	0-2	0-1/1-2	1-2	2-3
Without detailed calculation of the lightning surge current at the installation location can be used at Lightning Protection Level	I - IV	I - IV	III - IV		
Type 1 and type 2 combined in a single device Can be used universally		☑			

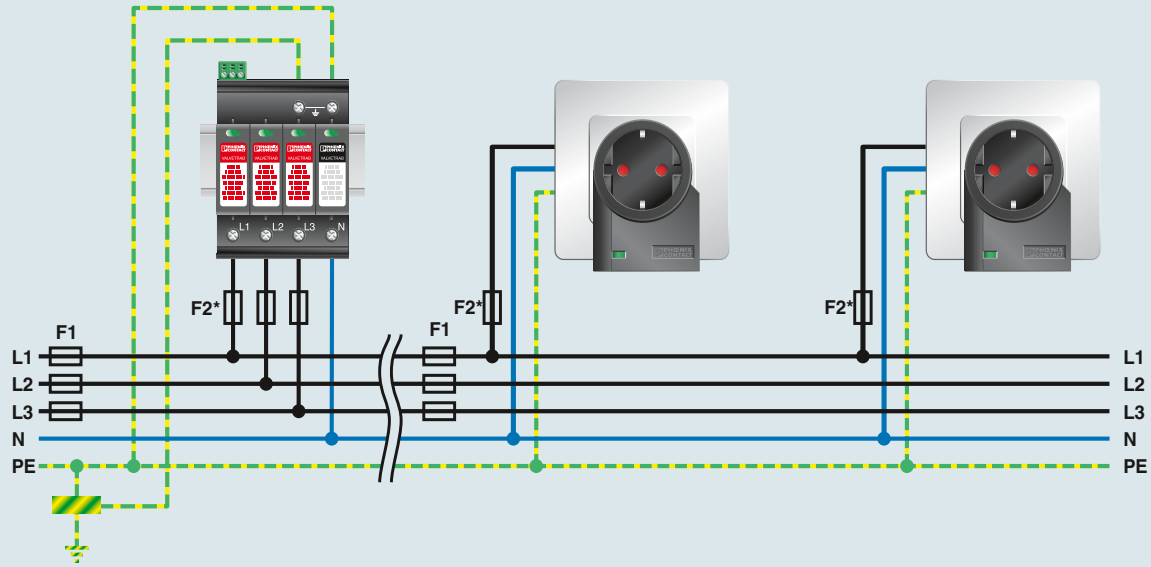
Three-stage protection for the power supply, type 1 and type 2 installed separately + type 3



Type 1	Type 2	Type 3
FLT-CP-PLUS-3S-350	VAL-CP-3S-350	PT 4-PE/S-230AC/FM
2882640	2859521	2882459
Page 28	Page 40	Page 56

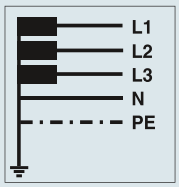
* F2 is not needed if F1 ≤ maximum backup fuse according to IEC

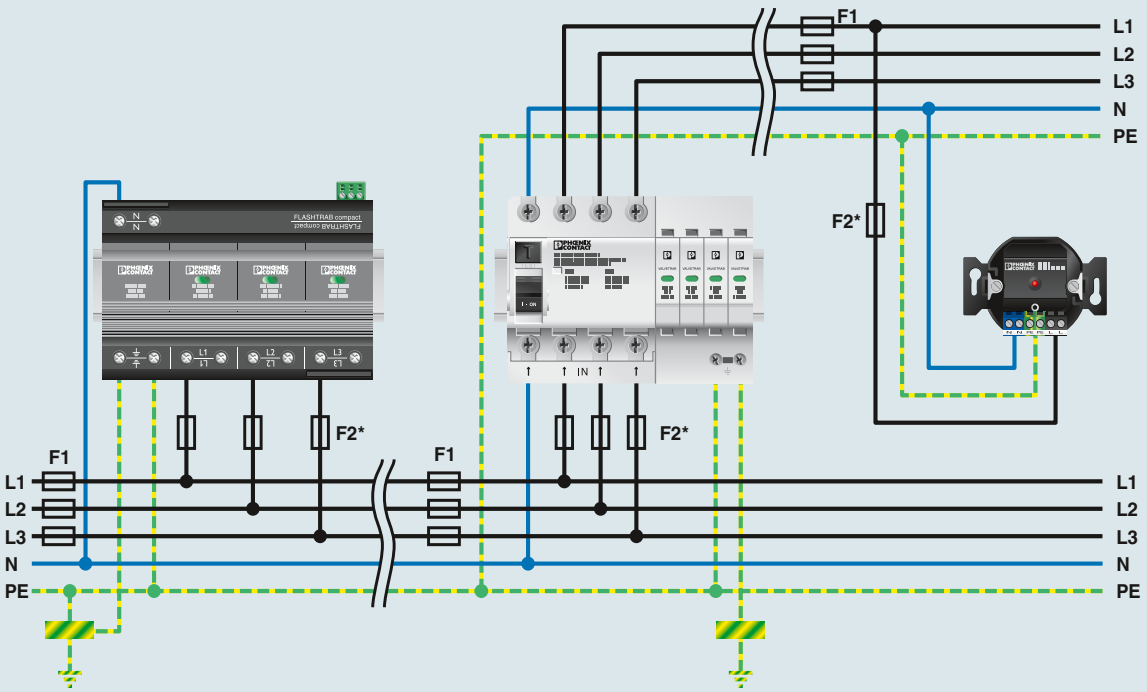
Two-stage protection for the power supply, type 1/2 combination based on varistor + type 3



Type 1/2	Type 3
VAL-MS-T1/T2 335/12.5/3+1-FM	MNT-1 D
2800183	2882200
Page 34	Page 60

Three-stage protection for the power supply, type 1 and type 2 installed separately + type 3

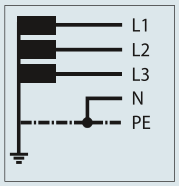




Type 1	Type 2	Type 3
FLT-CP-PLUS-3S-350	VAL-CP-RCD-3S/40/0.3/SEL	PRT-CD-AD1 + PRT-S-230/FM
2882640	2808001	2749673 + 2749686
Page 28	Page 52	Page 58

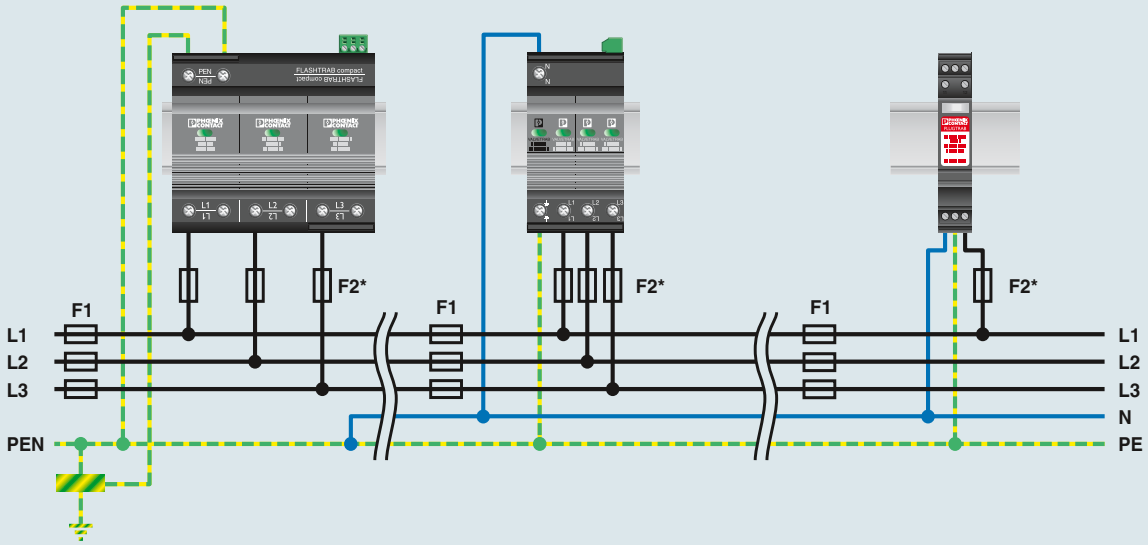
* F2 is not needed if F1 ≤ maximum backup fuse according to IEC

Three-stage protection for the power supply, type 1 and type 2 installed separately + type 3



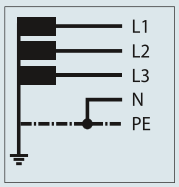
TN-C-S

230/400 V AC
240/415 V AC



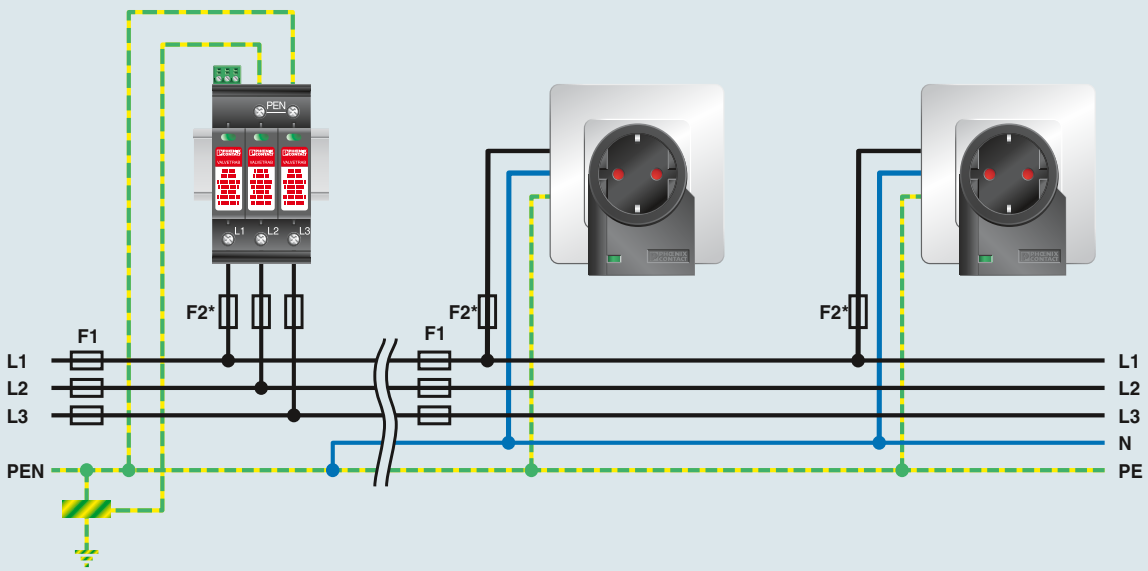
Type 1	Type 2	Type 3
FLT-CP-PLUS-3C-350	VAL-CP-3S-350	PT 2-PE/S-230AC/FM
2882653	2859521	2858357
Page 28	Page 40	Page 56

Two-stage protection for the power supply, type 1/2 combination based on varistor + type 3



TN-C-S

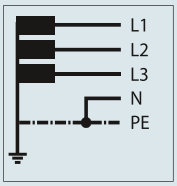
230/400 V AC
240/415 V AC



Type 1/2	Type 3
VAL-MS-T1/T2 335/12.5/3+0-FM	MNT-1 D
2800188	2882200
Page 34	Page 60

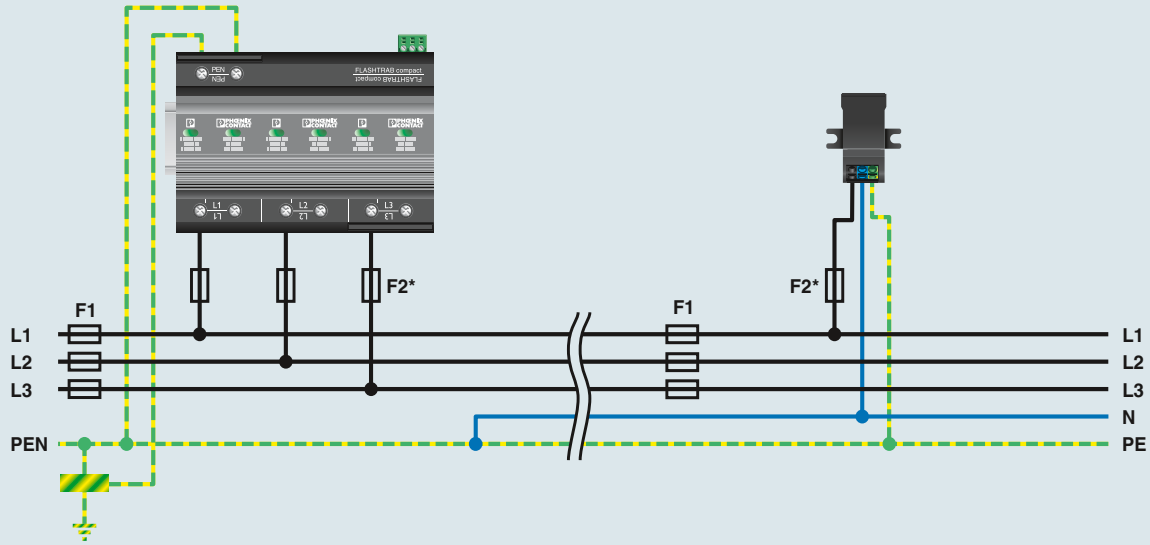
* F2 is not needed if F1 ≤ maximum backup fuse according to IEC

Three-stage protection for the power supply, type 1 and type 2 combined in a single device + type 3



TN-C-S

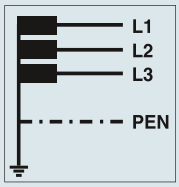
230/400 V AC
240/415 V AC

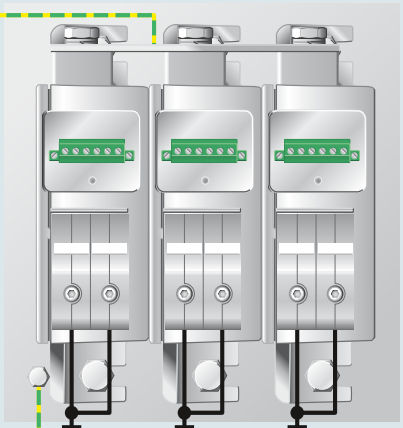


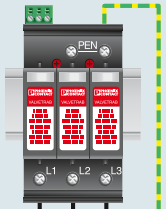
Type 1+2	Type 3
FLT-CP-3C-350	**BT-1S-230AC/A**
2859725	2803409
Page 36	Page 58

* F2 is not needed if F1 ≤ maximum backup fuse according to IEC

Two-stage protection for the power supply, type 1 and type 2 installed separately

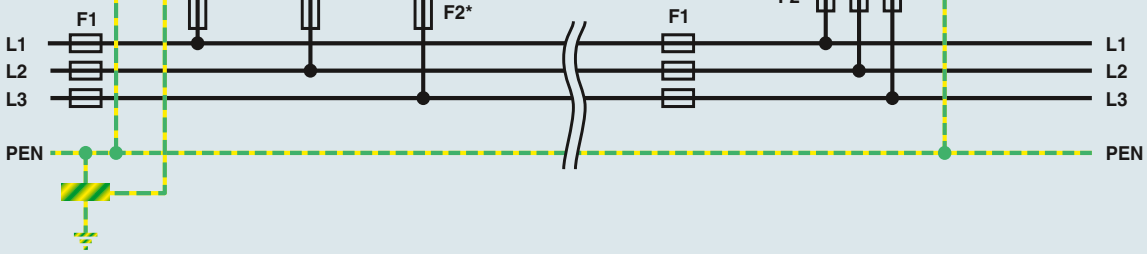






TN-C

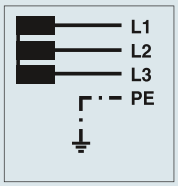
400/690 V AC
554/960 V AC



Type 1	Type 2
PWT 100-800AC-FM	VAL-MS 750/30/3+0-FM
2800531	2920272
Page 32	Page 51

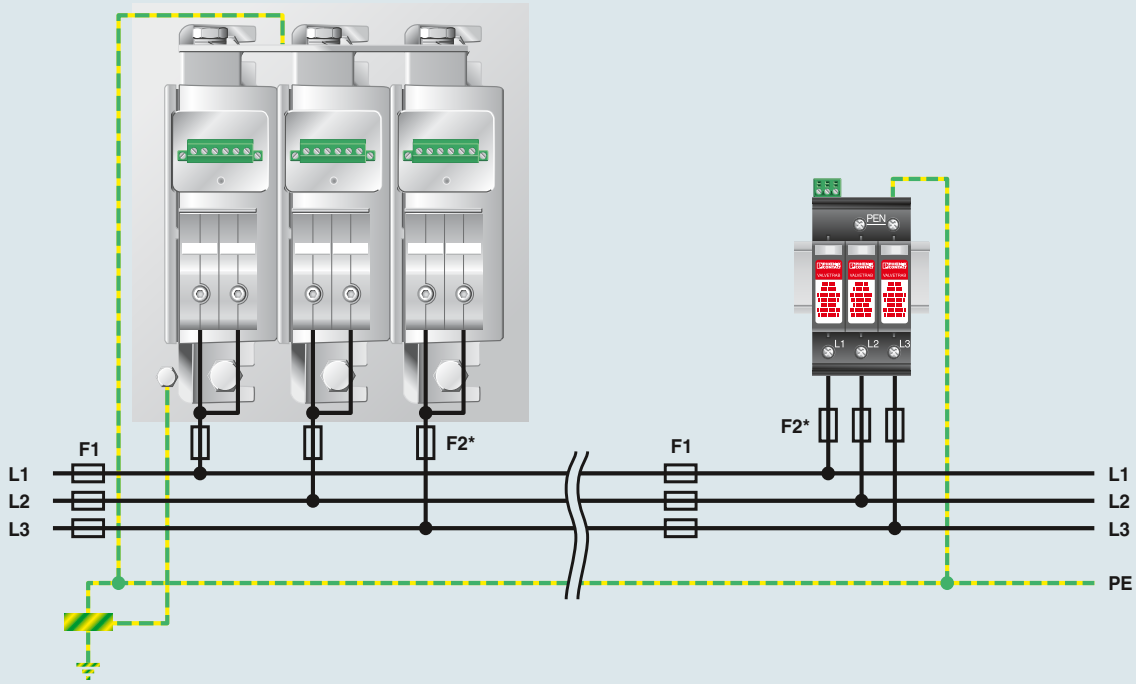
* F2 is not needed if F1 ≤ maximum backup fuse according to IEC

Two-stage protection for the power supply, type 1 and type 2 installed separately



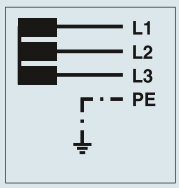
IT

500 V AC



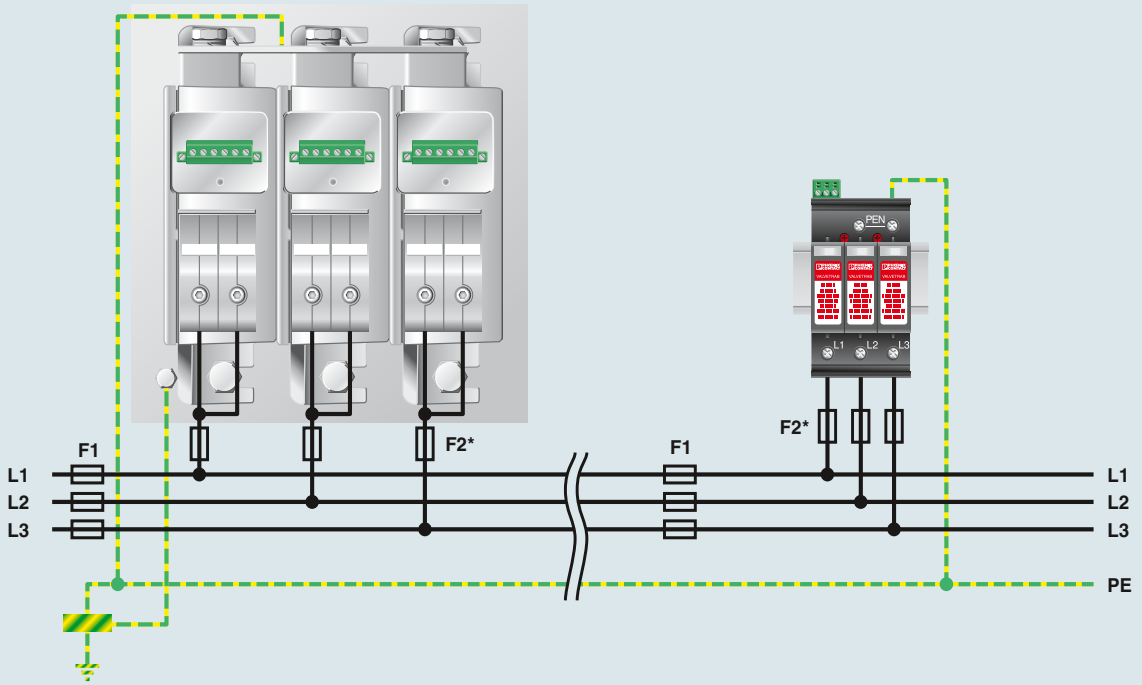
Type 1	Type 2 **
PWT 100-800AC-FM	VAL-MS 580/3+0-FM
2800531	2920447
Page 32	Page 42

Two-stage protection for the power supply, type 1 and type 2 installed separately



IT

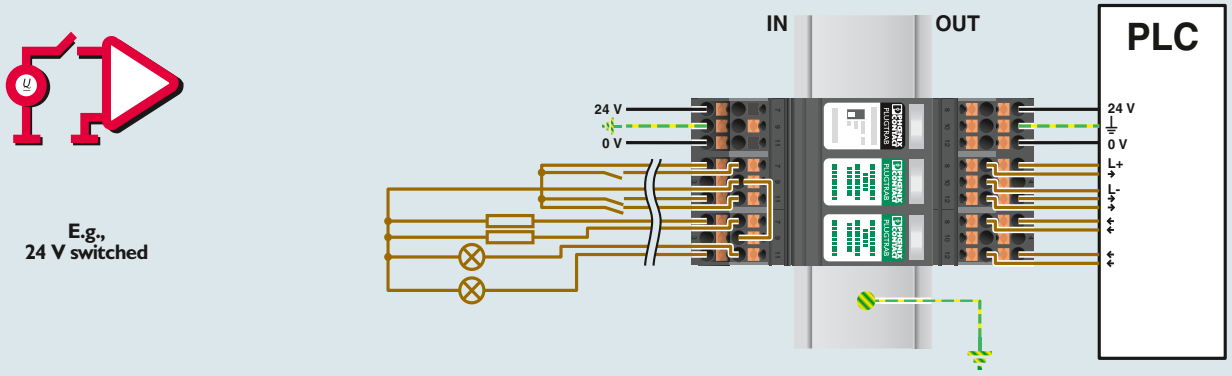
690 V AC



Type 1	Type 2**
PWT 100-800AC-FM	VAL-MS 750/30/3+0-FM
2800531	2920272
Page 32	Page 51

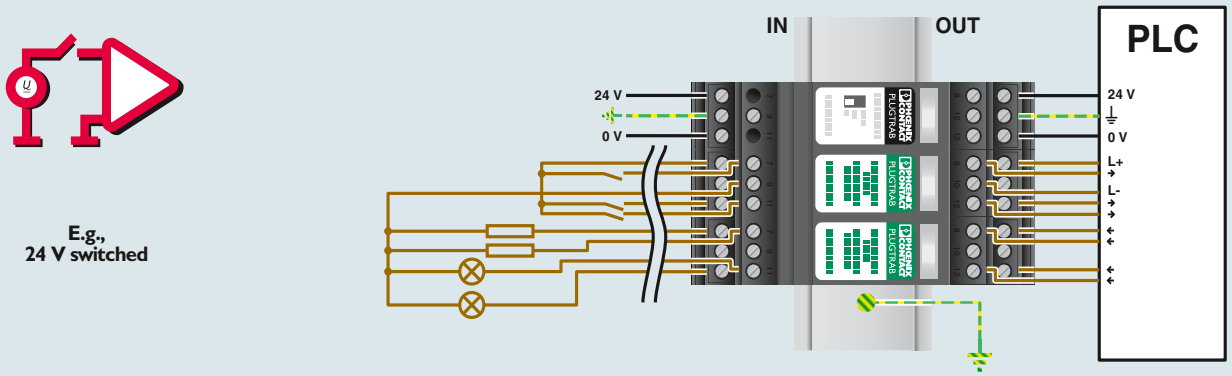
* F2 is not needed if F1 ≤ maximum backup fuse according to IEC
** Application only in IT systems supplied with a low voltage

Protection of a binary signal input with actuator circuit, floating reference potential



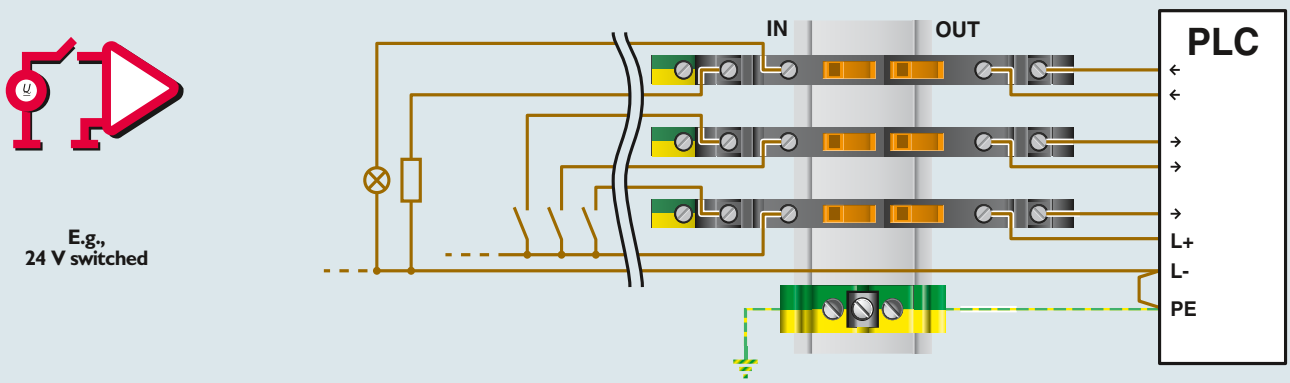
Plug-in	Push-in connection	1 x PT-IQ-PTB-PT + 2 x PT-IQ-4X1+F-24DC-PT 2801296 + 2801272 Page 74	Optional screw connection	1 x PT-IQ-PTB-UT + 2 x PT-IQ-4X1+F-24DC-UT 2800768 + 2800983 Page 72

Protection of a binary signal input with actuator circuit, grounded reference potential



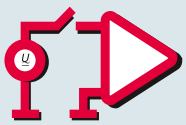
Plug-in	Screw connection	1 x PT-IQ-PTB-UT + 2 x PT-IQ-4X1-24DC-UT 2800768 + 2800982 Page 72	Optional push-in connection	1 x PT-IQ-PTB-PT + 2 x PT-IQ-4X1-24DC-PT 2801296 + 2801271 Page 74

Protection of a binary signal input with actuator circuit, common grounded reference potential (negative pole)

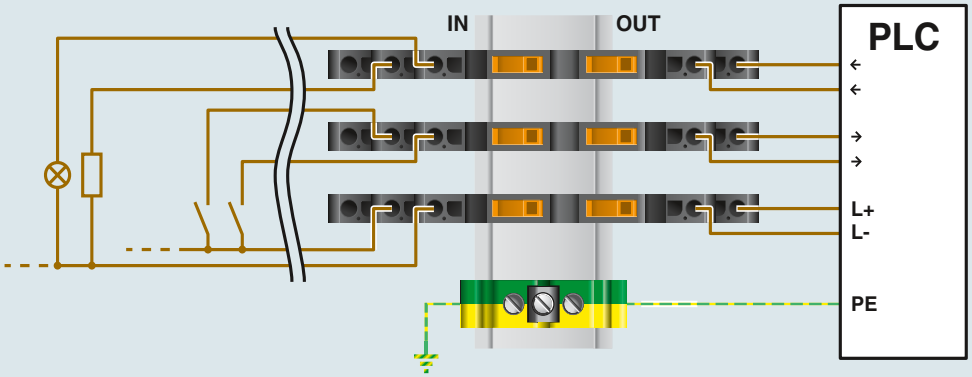


One-piece	Screw connection	TT-2/2-M-24DC 2920722 Page 94	Optional spring-cage connection	TT-ST-M-2/2-24DC 2858917 Page 96

Protection of a binary signal input with actuator circuit, common floating reference potential (negative pole)

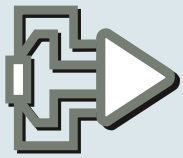


E.g.,
24 V switched

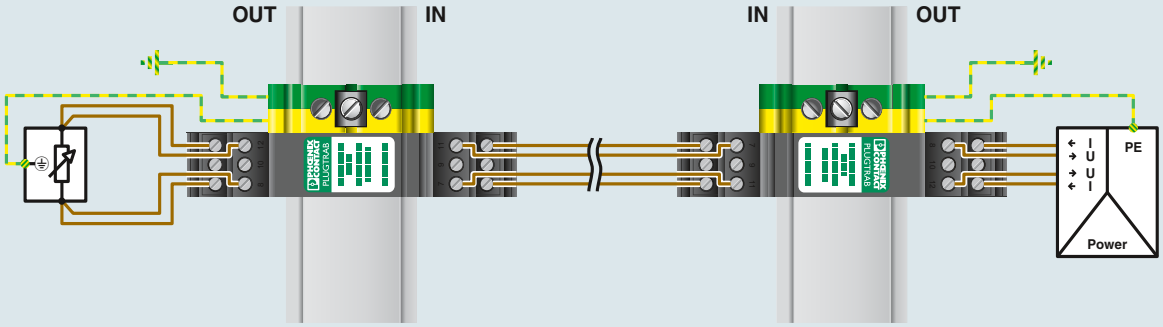


One-piece	Spring-cage connection	TT-ST-M-2/2-24DC 2858917 Page 96		Optional screw connection	TT-2/2-M-24DC 2920722 Page 94

Protection of a four-conductor measurement

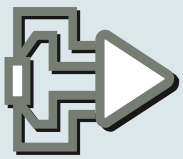


E.g., temperature measurement

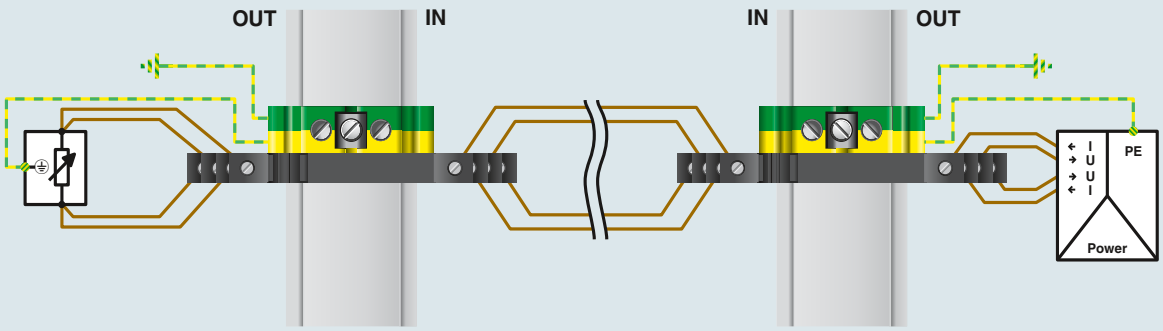


Plug-in	PT 4-24DC-ST + PT 4-BE 2839240 + 2839402 Page 84			PT 4-24DC-ST + PT 4-BE 2839240 + 2839402 Page 84	

Protection of a four-conductor measurement, for Ex and non-Ex applications

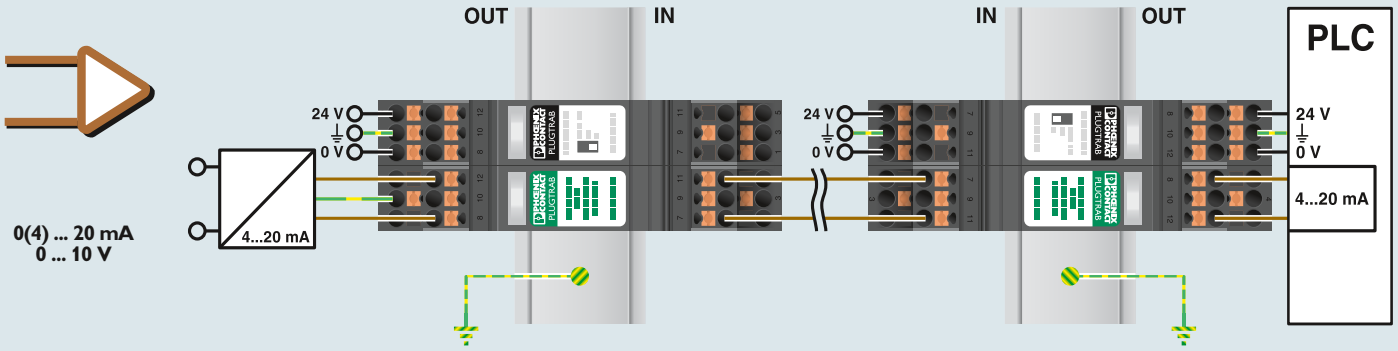


E.g., temperature measurement



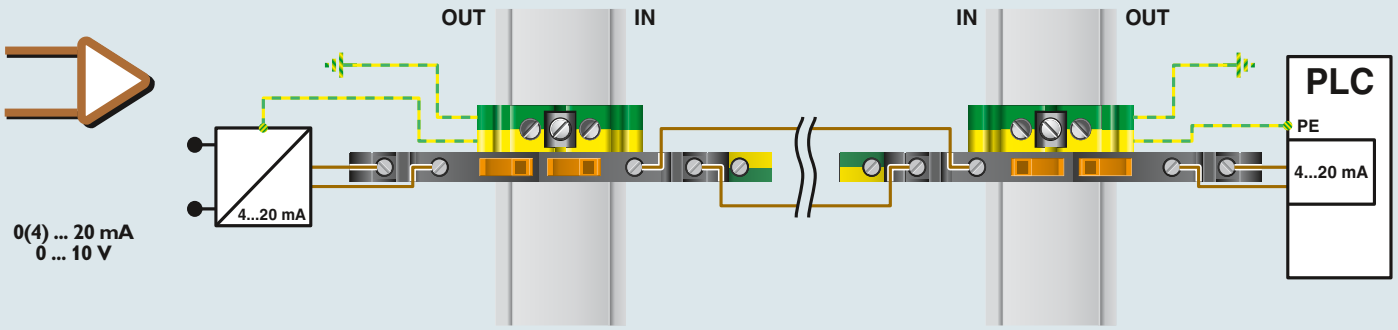
One-piece	LIT 4-24 2804678 Page 92			LIT 4-24 2804678 Page 92	

Protection of an analog measurement



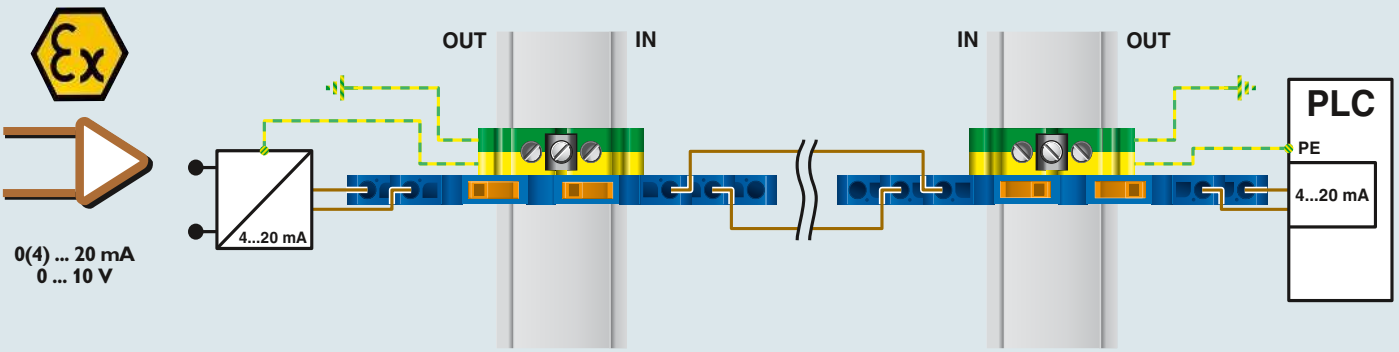
Plug-in	Push-in connection	1 x PT-IQ-PTB-PT + 2 x PT-IQ-1X2-24DC-PT 2801296 + 2801255 Page 74	Optional screw connection	1 x PT-IQ-PTB-UT + 2 x PT-IQ-1X2-24DC-UT 2800768 + 2800976 Page 72

Protection of an analog measurement



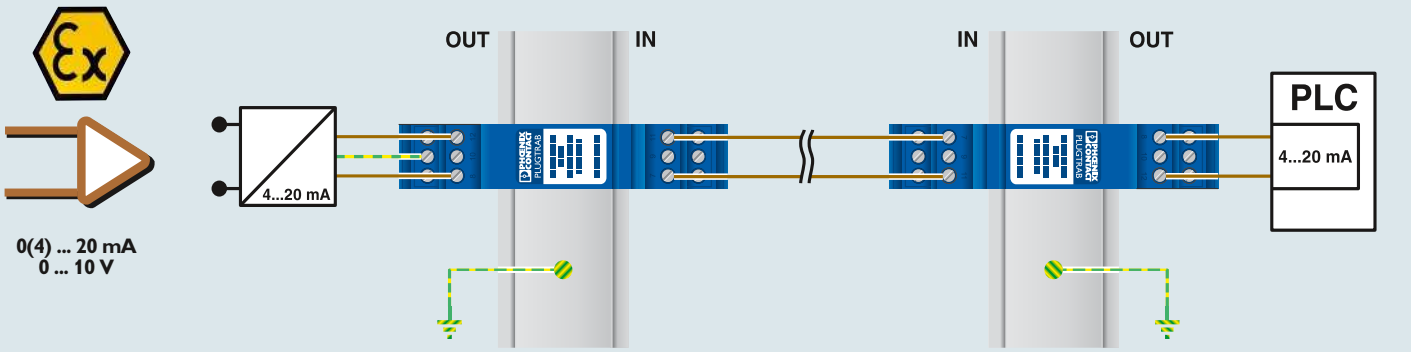
One-piece	Screw connection	TT-2-PE-M-24DC 2920641 Page 94	Optional spring-cage connection	TT-ST-2-PE-24DC 2858904 Page 96

Protection of an analog measurement, intrinsically safe circuits



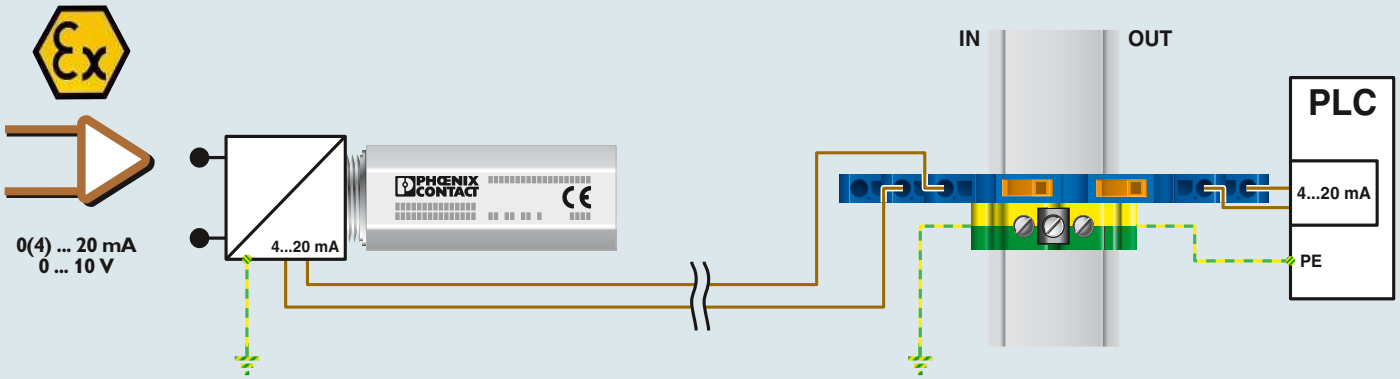
One-piece	Spring-cage connection	TT-ST-M-EX(I)-24DC 2859424 Page 96	Optional screw connection	TT-EX(I)-M-24DC 2803865 Page 94

Protection of an analog measurement, intrinsically safe circuits



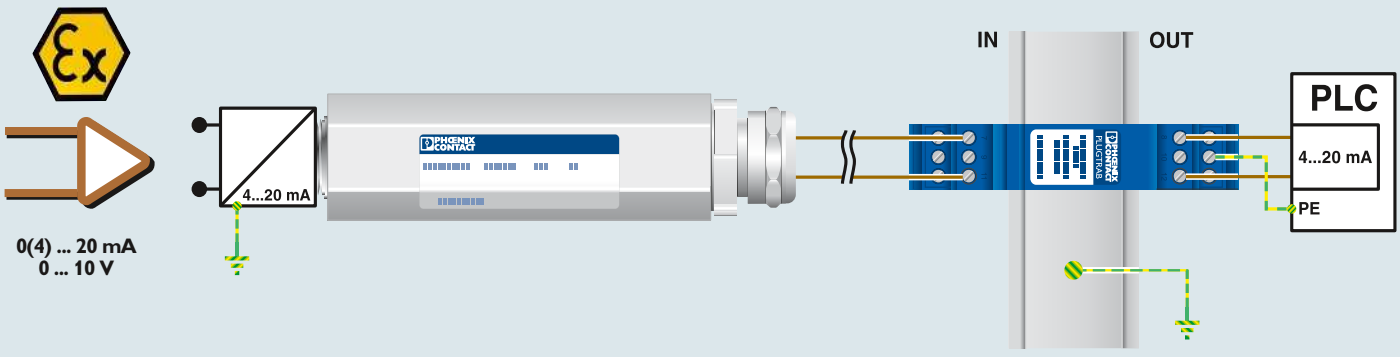
Plug-in	PT 2XEX(I)-24DC-ST + PT 2XEX(I)-BE 2838225 + 2839279 Page 87	PT 2XEX(I)-24DC-ST + PT 2XEX(I)-BE 2838225 + 2839279 Page 87

Protection of an analog measurement, intrinsically safe circuits



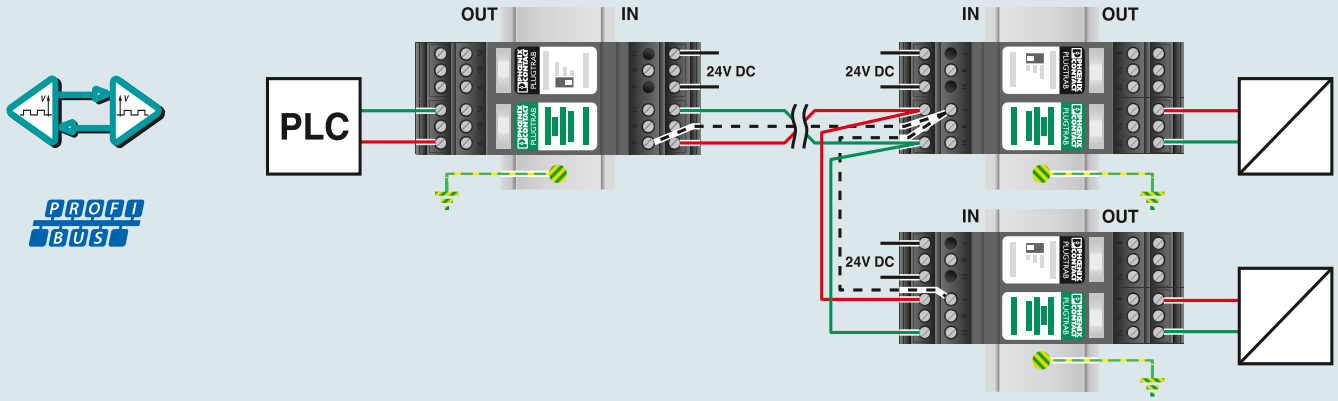
One-piece	S-PT-EX-24DC 2800034 Page 100	TT-ST-M-EX(I)- 24DC 2859424 Page 96

Protection of an analog measurement, intrinsically safe circuits



One-piece	S-PT-EX(I)-24DC 2880671 Page 100	PT 2XEX(I)-24DC-ST + PT 2XEX(I)-BE 2838225 + 2839279 Page 87

Protection of PROFIBUS DP



PT-IQ-PTB-UT + PT-IQ-5HF-12DC-UT

2800768 + 2800799

Page 78

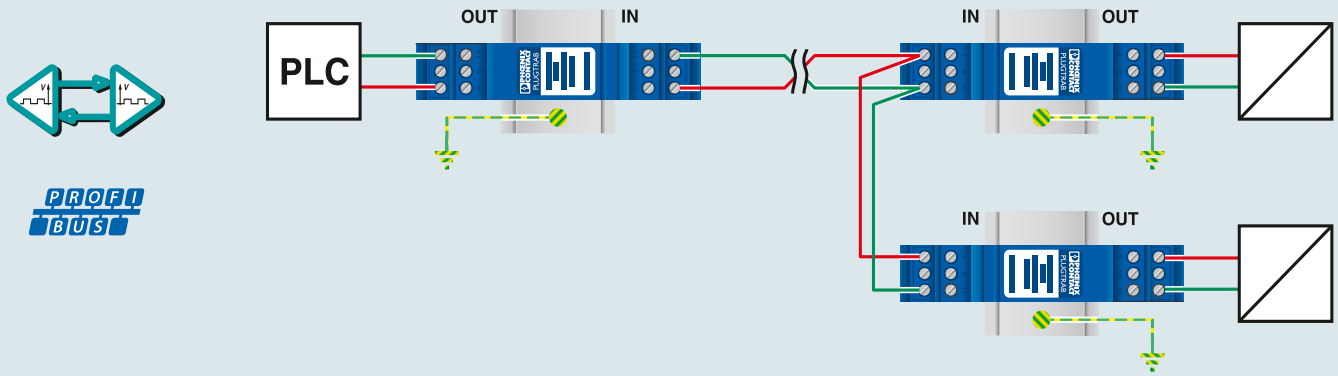
Optional

PT 5-HF-12DC-ST + PT 2X2-BE

2838775 + 2839208

Page 88

Protection of PROFIBUS PA

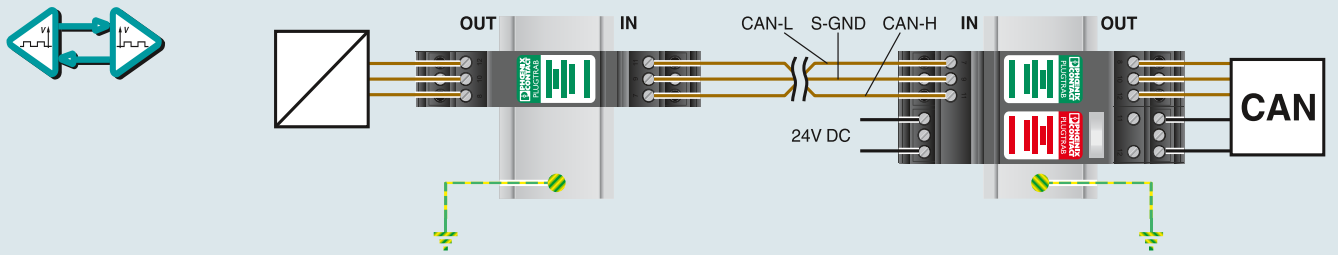


PT 2XEX(I)-24DC + PT 2XEX(I)-BE

2838225 + 2839279

Page 87

Protection of CAN bus/DeviceNet™



PT 5-HF-12DC-ST + PT 2X2-BE

2838775 + 2839208

Page 88

PT 2-PE/S-24AC/FM

2800457

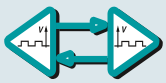
Page 56

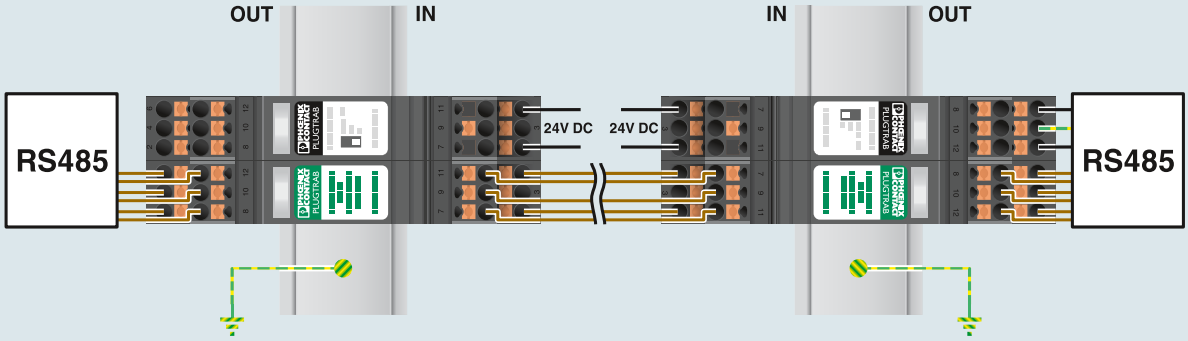
PT 3-HF-12DC-ST + PT 1X2-BE

2858043 + 2856113

Page 88

Protection of an RS-485 interface



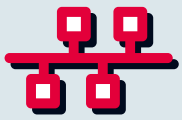


PT-IQ-PTB-PT + PT-IQ-5-HF-12DC-PT
2801296 + 2801293
Page 79

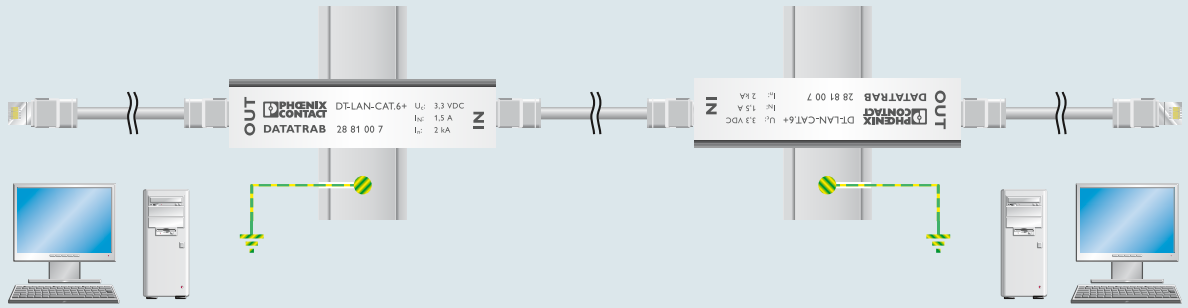
Optional

PT 5-HF-12DC-ST + PT 2X2-BE
2838775 + 2839208
Page 88

Protection of an Ethernet interface (including PoE)

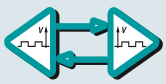


100Base-T
1000Base-T
10GBase-T

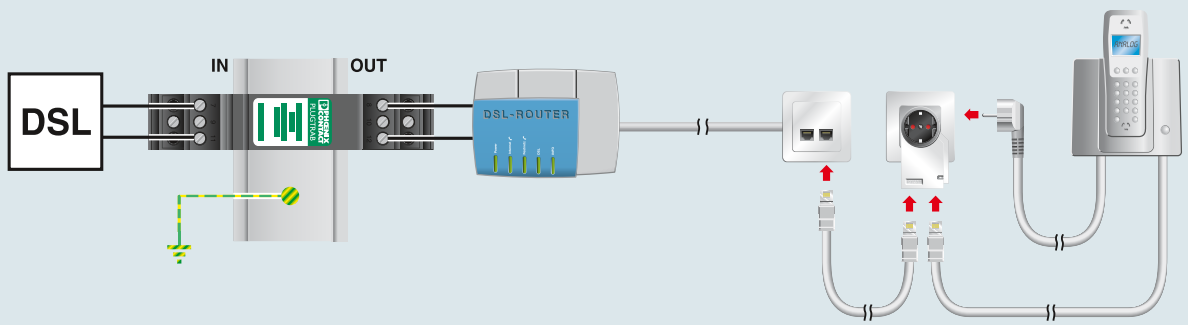


DT-LAN-CAT.6+
2881007
Page 114

Protection of a DSL interface



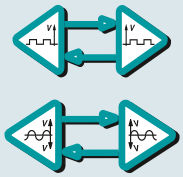
ADSL
HDSL
VDSL

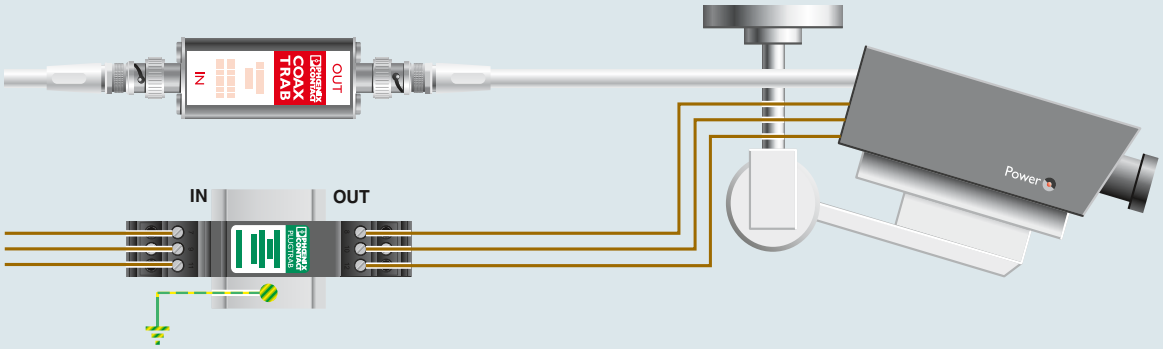


PT 2-TELE
2882828
Page 129

MNT-TAE D/WH
2882394
Page 130

Protection of video signals

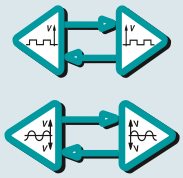


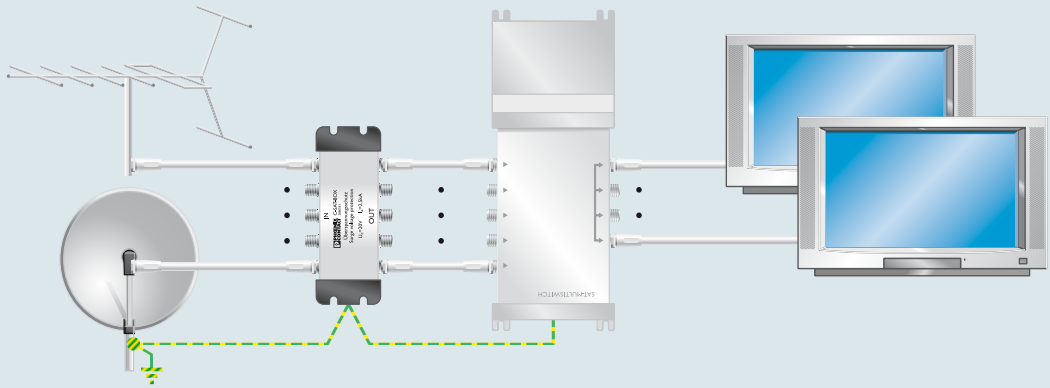


C-UFB 5DC
2797858
Page 140

PT 3-HF-12DC-ST + PT 1X2-BE
2858043 + 2856113
Page 116

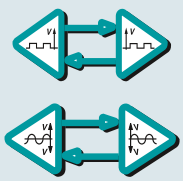
Protection of the SAT antenna connection

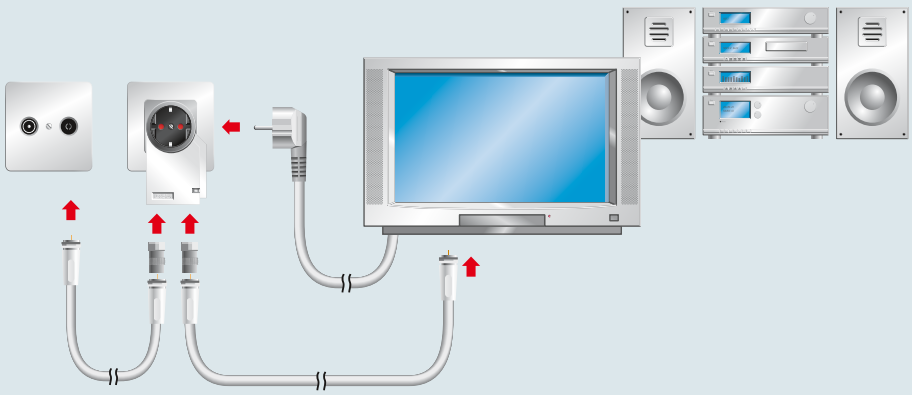




C-SAT-BOX
2880561
Page 142

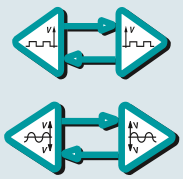
Protection of the cable TV connection



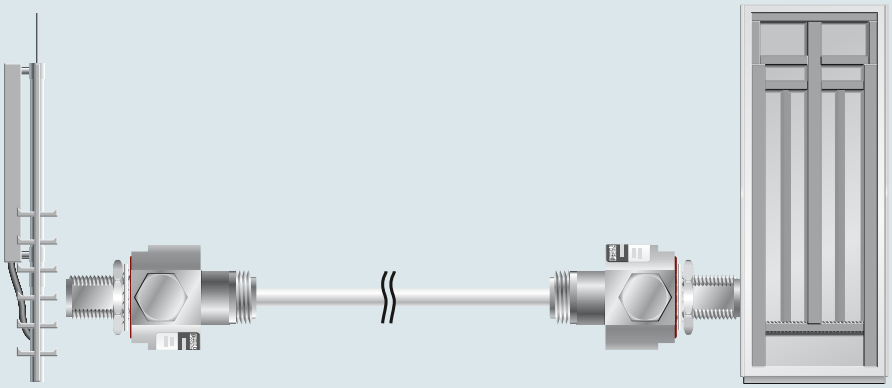


MNT-TV-SAT D
2882284
Page 143

Protection of antenna signals



GPS
GSM
UMTS



CN-UB-280DC-3-BB
2801050
Page 136

Optional

CN-LAMBDA/4-2.25-BB
2801057
Page 138

The complete system

The protective devices in the "compact" range offer a consistent installation concept. Uniform and high-capacity modules are available for virtually all power supply systems. Be it lightning arrester, surge arrester or a combination of the two, the design will persuade you with its consistent and universal application.

Worldwide use

The voltage fluctuations in power supplies vary from country to country. The surge protection also has to deal with these short-term (temporary) voltage fluctuations. Due to the high rated voltage of 350 V AC, the arresters in the "compact" range have no limitations and can be used in systems up to 240/415 V.

FLASHTRAB compact PLUS

High-performance type 1 lightning arresters with low protection level based on spark gap technology for power supply systems up to 240/415 V.

FLASHTRAB compact

Combined lighting and surge arrester for power supply systems up to 240/415 V.

VALVETRAB compact

Space-saving surge arrester for all common power supply systems up to 240/415 V.

Combined solutions

The VALVETRAB compact type 2 surge arresters, which are available as Combi-RCD surge protection with residual current device and Combi-MCB surge protection with coordinated backup fuse, are equipped with further functions.

Device protection in multiple versions

Type 3 device protection is designed to provide protection for highly sensitive devices. Depending on installation location, the following protective devices are available, for example:

– For DIN rail mounting – PLUGTRAB PT
– For cable ducts – BLOCKTRAB
– Socket attachment plugs – MAINTRAB

Plug-in to perfection

Universal plug-in capability ensures a high degree of comfort, e.g., for insulation measurements in the system. Instead of tampering with the installation, just pull out the plug.

The symmetrical plug design facilitates plugging in both directions within the base element. These protective devices can be installed in any control cabinet environment thanks to this flexible installation direction.

Innovative technology

The high breaking capacity of the innovative spark gaps also enables their use in low-voltage high-current installations with short-circuit currents of up to 50 kA. The encapsulated lightning arresters are also able to limit line follow currents so that even small backup fuses are not affected.

Status at a glance

The mechanical status indicator provides information locally at a glance.

Remote signaling

A common floating remote indication contact enables remote signaling without taking up extra space.

Different designs

Arresters in different designs are available for the various areas of application.

Type 1 lightning arresters FLASHTRAB compact PLUS

- Seamless pluggability (even for N/PE spark gap)
- Thermal disconnect device for each individual connector
- Optical, mechanical status indication for the individual arresters
- With floating remote indication contact
- Connectors can be checked with CHECKMASTER
- High continuous voltage of 350 V AC for 230/400 V AC networks with high voltage fluctuations

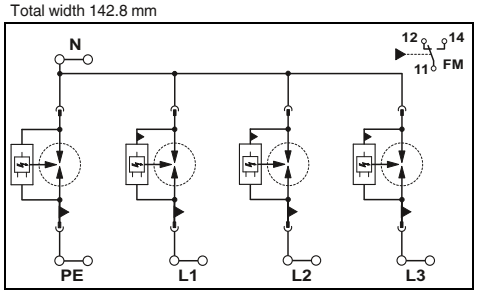
5-conductor system; L1, L2, L3, N, PE

4-conductor system; L1, L2, L3, PEN

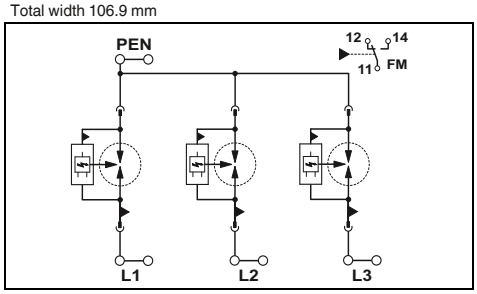
Notes:

For certifications, see page 154

Total width 142.8 mm



Total width 106.9 mm



Technical data

Electrical data			
IEC category / EN type		I / T1	I / T1
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)	240 V AC (230/400 V AC ... 240/415 V AC)
Maximum continuous operating voltage U_C			
	L-N / N-PE / L-PEN	350 V AC / 350 V AC / -	- / - / 350 V AC
Lightning test curr. I_{imp} (10/350) µs			
	Peak value	100 kA	75 kA
	Charge	50 As	37.5 As
	Specific energy	2.50 MJ/Ω	1.40 MJ/Ω
Nominal discharge surge current I_n (8/20) µs			
	L-N / N-PE / L-PEN	25 kA / 100 kA / -	- / - / 75 kA (3L-PEN)
Follow current quenching capacity I_{fi}			
	L-N / N-PE / L-PEN	50 kA (264 V AC) / 100 A / -	- / - / 50 kA (264 V AC)
Protection level U_P			
	L-N / N-PE / L-PEN	≤ 1.5 kV / ≤ 1.5 kV / -	- / - / ≤ 1.5 kV
Response time t_A			
	L-N / N-PE / L-PEN	≤ 100 ns / ≤ 100 ns / -	- / - / ≤ 100 ns
Backup fuse max. in acc. with IEC		315 A (gL/gG)	315 A (gL/gG)
Immunity to short-circuiting (with max. backup fuse) I_P		50 kA	50 kA
General data			
Dimensions W / H / D		142.8 mm / 97 mm / 71.5 mm	106.9 mm / 95.8 mm / 70 mm
Connection data solid / stranded / AWG		2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2	2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2
Temperature range		-40 °C ... 80 °C	-40 °C ... 80 °C
Inflammability class in acc. with UL 94		V0	V0
Test standards		IEC 61643-1 / EN 61643-11 / EN 61643-11/A11 / UL 1449	IEC 61643-1 / EN 61643-11 / EN 61643-11/A11 / UL 1449
Remote indication contact		PDT	PDT
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage		250 V AC / 125 V DC	250 V AC / 125 V DC
Max. operating current		1 A AC / 200 mA DC	1 A AC / 200 mA DC

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FLASHTRAB compact PLUS	**FLT-CP-PLUS-3S-350**	**2882640**	1

Accessories

Replacement connector			
L-N / L-PEN	**FLT-CP-PLUS-350-ST**	**2859913**	10
N-PE	**FLT-CP-N/PE-350-ST**	**2859686**	10
Labeling material	ZBN 18 ..., see page 63		

Ordering data

Type	Order No.	Pcs. / Pkt.
FLT-CP-PLUS-3C-350	**2882653**	1

Accessories

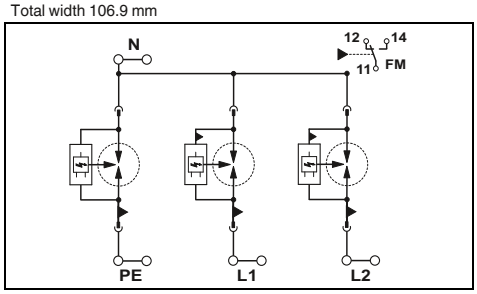
FLT-CP-PLUS-350-ST	**2859913**	10
ZBN 18 ..., see page 63		

4-conductor system; L1, L2, N, PE

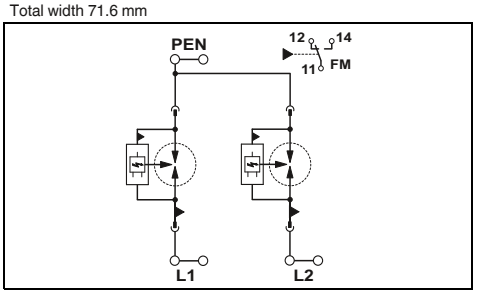
3-conductor system; L1, L2, PEN

3-conductor system; L, N, PE

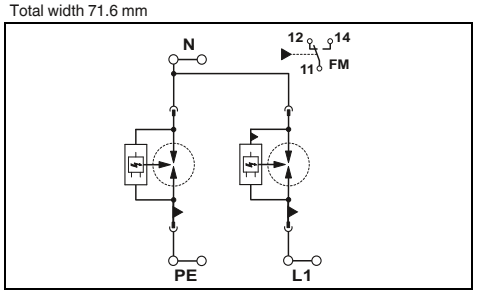
Total width 106.9 mm



Total width 71.6 mm



Total width 71.6 mm



Technical data

I / T1	
240 V AC (230/400 V AC ... 240/415 V AC)	
350 V AC / 350 V AC / -	
75 kA	
37.5 As	
1.40 MJ/Ω	
25 kA / 100 kA / -	
50 kA (264 V AC) / 100 A / -	
≤ 1.5 kV / ≤ 1.5 kV / -	
≤ 100 ns / ≤ 100 ns / -	
315 A (gL/gG)	
50 kA	
106.9 mm / 95.8 mm / 70 mm	
2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11 / EN 61643-11/A11 / UL 1449	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 125 V DC	
1 A AC / 200 mA DC	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLT-CP-PLUS-2S-350	**2882666**	1

Accessories

FLT-CP-PLUS-350-ST	**2859913**	10
FLT-CP-N/PE-350-ST	**2859686**	10

ZBN 18 ..., see page 63

Technical data

I / T1	
240 V AC (230/400 V AC ... 240/415 V AC)	
- / - / 350 V AC	
50 kA	
25 As	
625.00 kJ/Ω	
- / - / 25 kA	
- / - / 50 kA (264 V AC)	
- / - / ≤ 1.5 kV	
- / - / ≤ 100 ns	
315 A (gL/gG)	
50 kA	
71.6 mm / 95.8 mm / 70 mm	
2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11 / EN 61643-11/A11 / UL 1449	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 125 V DC	
1 A AC / 200 mA DC	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLT-CP-PLUS-2C-350	**2882679**	1

Accessories

FLT-CP-PLUS-350-ST	**2859913**	10

ZBN 18 ..., see page 63

Technical data

I / T1	
240 V AC (230/400 V AC ... 240/415 V AC)	
350 V AC / 350 V AC / -	
50 kA	
25 As	
625.00 kJ/Ω	
25 kA / 100 kA / -	
50 kA (264 V AC) / 100 A / -	
≤ 1.5 kV / ≤ 1.5 kV / -	
≤ 100 ns / ≤ 100 ns / -	
315 A (gL/gG)	
50 kA	
71.6 mm / 95.8 mm / 70 mm	
2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11 / EN 61643-11/A11 / UL 1449	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 125 V DC	
1 A AC / 200 mA DC	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLT-CP-PLUS-1S-350	**2882682**	1

Accessories

FLT-CP-PLUS-350-ST	**2859913**	10
FLT-CP-N/PE-350-ST	**2859686**	10

ZBN 18 ..., see page 63

Type 1 lightning arresters
FLASHTRAB compact PLUS

- Seamless pluggability (even for N/PE spark gap)
- Thermal disconnect device for each individual connector
- Optical, mechanical status indication for the individual arresters
- With floating remote indication contact
- Connectors can be checked with CHECKMASTER
- High continuous voltage of 350 V AC for 230/400 V AC networks with high voltage fluctuations

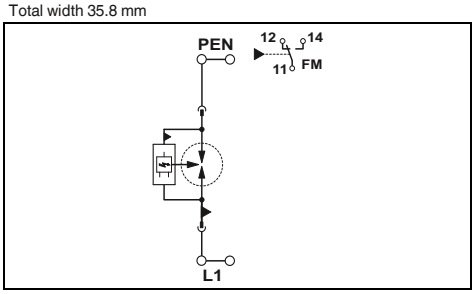
2-conductor system; L, PEN

N-PE spark gap, for Lightning Protection Level 1

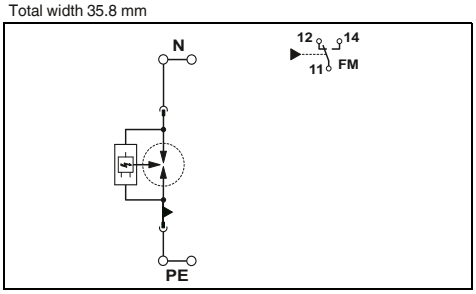
Notes:

For certifications, see page 154

Total width 35.8 mm



Total width 35.8 mm



Technical data

Electrical data			
IEC category / EN type		I / T1	I / T1
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)	240 V AC (N-PE)
Maximum continuous operating voltage U_C			
	L-N / N-PE / L-PEN	350 V AC / - / 350 V AC	- / 350 V AC / -
Lightning test curr. I_{imp} (10/350) µs			
	Peak value	25 kA	100 kA
	Charge	12.5 As	50 As
	Specific energy	160.00 kJ/Ω	2.50 MJ/Ω
Nominal discharge surge current I_n (8/20) µs			
	L-N / N-PE / L-PEN	25 kA / - / 25 kA	- / 100 kA / -
Follow current quenching capacity I_{fi}			
	L-N / N-PE / L-PEN	50 kA (264 V AC) / - / 50 kA (264 V AC)	- / 100 A / -
Protection level U_P			
	L-N / N-PE / L-PEN	≤ 1.5 kV / - / ≤ 1.5 kV	- / ≤ 1.5 kV / -
Response time t_A			
	L-N / N-PE / L-PEN	- / - / ≤ 100 ns	- / ≤ 100 ns / -
Backup fuse max. in acc. with IEC		315 A (gL/gG)	-
Immunity to short-circuiting (with max. backup fuse) I_P		50 kA	25 kA
General data			
Dimensions W / H / D		35.8 mm / 95.8 mm / 70 mm	35.8 mm / 95.8 mm / 70 mm
Connection data solid / stranded / AWG		2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2	2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2
Temperature range		-40 °C ... 80 °C	-40 °C ... 80 °C
Inflammability class in acc. with UL 94		V0	V0
Test standards		IEC 61643-1 / EN 61643-11 / EN 61643-11/A11 / UL 1449	IEC 61643-1 / EN 61643-11 / EN 61643-11/A11 / UL 1449
Remote indication contact		PDT	PDT
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage		250 V AC / 125 V DC	250 V AC / 125 V DC
Max. operating current		1 A AC / 200 mA DC	1 A AC / 200 mA DC

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FLASHTRAB compact PLUS	**FLT-CP-PLUS-1C-350**	**2882695**	1

Accessories

Replacement connector L-N / L-PEN N-PE	**FLT-CP-PLUS-350-ST**	**2859913**	10
Labeling material	ZBN 18 ..., see page 63		

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FLASHTRAB compact	**FLT-CP-N/PE-350**	**2859754**	1

Accessories

Replacement connector L-N / L-PEN N-PE	**FLT-CP-N/PE-350-ST**	**2859686**	10
Labeling material	ZBN 18 ..., see page 63		

Type 1 lightning arresters FLASHTRAB

- 1-channel
- Triggered
- High discharge capacity
- Good follow current quenching capacity with higher rated voltage
- Direct parallel connection with type 2 arresters supported

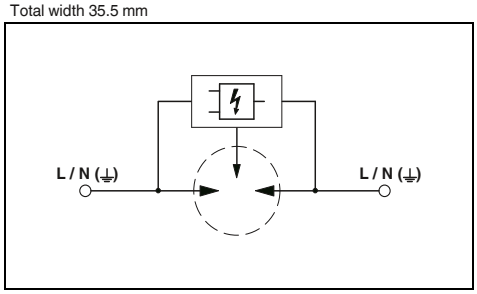
Notes:

For certifications, see page 154

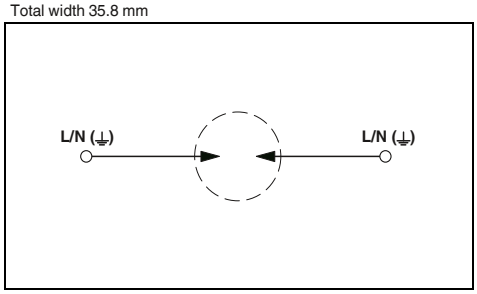
2.5 kV/3 kV protection level

N-PE spark gap, single-channel, plug-in

Total width 35.5 mm



Total width 35.8 mm



Technical data

Electrical data		... 2.5	... 3.0	... 1.5
IEC category / EN type		I / T1	I / T1	I / T1
Nominal voltage U_N		230 V AC (400 V AC)	230 V AC (400 V AC)	230 V AC (N-PE)
Maximum continuous operating voltage U_C				
	L-N / N-PE / L-PEN	440 V AC / - / 440 V AC	440 V AC / - / 440 V AC	- / 260 V AC / -
Lightning test curr. I_{imp} (10/350) µs				
	Peak value	50 kA	50 kA	100 kA
	Charge	25 As	25 As	50 As
	Specific energy	625.00 kJ/Ω	625.00 kJ/Ω	2.50 MJ/Ω (N-PE)
Nominal discharge surge current I_n (8/20) µs				
	L-N / N-PE / L-PEN	50 kA / - / 50 kA	50 kA / - / -	- / 100 kA / -
Protection level U_P				
	L-N / N-PE / L-PEN	≤ 2.5 kV / - / ≤ 2.5 kV	≤ 3 kV / - / ≤ 3 kV	- / ≤ 1.5 kV / -
Response time t_A				
	L-N / N-PE / L-PEN	≤ 100 ns / - / ≤ 100 ns	≤ 100 ns / - / ≤ 100 ns	- / ≤ 100 ns / -
Backup fuse max. in acc. with IEC		500 A (NH-gL)		-
Immunity to short-circuiting (with max. backup fuse) I_P		25 kA (440 V AC)		-

General data		
Dimensions W / H / D	35.5 mm / 150 mm / 80.5 mm	35.8 mm / 95.8 mm / 70 mm
Connection data solid / stranded / AWG	10 ... 50 mm² / 16 ... 35 mm² / 6 - 1	2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2
Temperature range	-40 °C ... 85 °C	-40 °C ... 80 °C
Inflammability class in acc. with UL 94	V0	V0
Test standards	IEC 61643-1 / DIN EN 61643-11 / DIN EN 61643-11/A11	IEC 61643-1 / EN 61643-11 / EN 61643-11/A11

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FLASHTRAB PLUS CTRL			
Without status indicator	**FLT-PLUS CTRL-2.5**	**2800121**	1
	FLT-PLUS CTRL-3.0	**2800168**	1
FLASHTRAB PLUS CTRL			
With status indicator	**FLT-PLUS CTRL-2.5/I**	**2800122**	1
	FLT-PLUS CTRL-3.0/I	**2800170**	1
FLASHTRAB			
	FLT 100 N/PE-1.5	**2800303**	1

Accessories

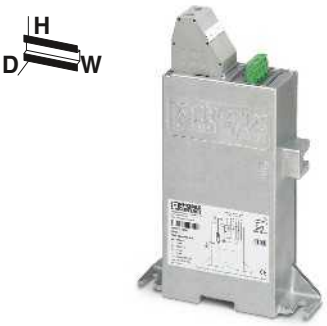
Labeling material	ZBN 18 ..., see page 63
Wiring bridge	MPB ..., see page 61

Type 1 lightning arresters POWERTRAB

- Type 1 arrester based on a varistor
- Meets Lightning Protection Level I
- Universal solution for various network types:
  500 ... 690 V AC IT systems
  554/960 V AC TN-C systems
  400/690 V AC TN-C systems
- Multi-stage status monitoring via remote indication contact
- Local optical status indication
- Encapsulated, non-extinguishing
- Free of leakage current/no line follow current
- Very high TOV resistance
- Meets installation requirements according to CLC/TS 50539-22
- Use in harsh industrial environments

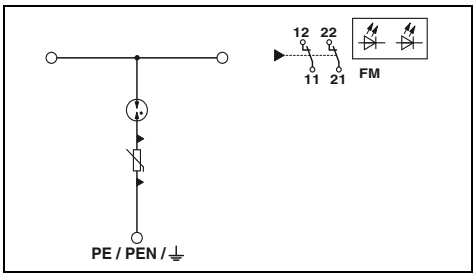
Notes:

For certifications, see page 154



Single-channel

Total width 56 mm

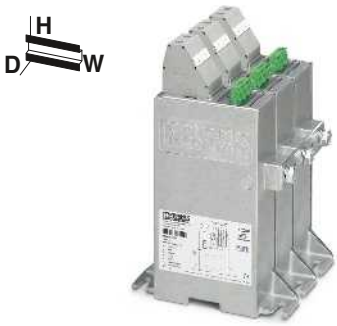


Technical data

Electrical data	
IEC category	I, II / T1, T2
Nominal voltage U_N	690 V AC
Maximum continuous operating voltage U_C	800 V AC
TOV behavior at U_T	1500 V AC (5 sec.)
Nominal load current I_L	150 A (Serial through wiring with 50 mm²)
Nominal discharge surge current I_n (8/20) µs	35 kA
Max. discharge surge current I_{max} (8/20) µs	100 kA
Lightning test current I_{imp} (10/350) µs	
Peak value I_{imp}	35 kA
Protection level U_P	≤ 4.5 kV
Max. required backup fuse with branch wiring	400 A (gG; 2 x 50 mm²) 800 A (aR)
Max. required backup fuse with V-type through wiring	150 A (gG; ≥ 35 mm²)
Short-circuit resistance I_P with max. backup fuse (effective)	50 kA
General data	
Dimensions W / H / D	56 mm / - / 191 mm
Ambient temperature (operation)	-40 °C ... 80 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP20
Housing material	PA / PC
Inflammability class in acc. with UL 94	V-2
Test standards	IEC 61643-11 / EN 61643-11/A11
Conductor	
Connection name	Double terminal point
Connection method	Screw connection
Screw thread	M6
Connection data solid / stranded / AWG	16 ... 50 mm² / 16 ... 50 mm² / 6 - 1/0
Protective conductor connection	
Connection name	PE conductor connection
Connection method	Ring cable lug
Screw thread	M10
Connection data solid / stranded / AWG	16 ... 95 mm² / 16 ... 95 mm² / 6 - 3/0
Remote indication contact	N/C contact 1-pos.
Connection data solid / stranded / AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12
Max. operating voltage	30 V AC / 30 V DC
Max. operating current	1.5 A AC / 1.5 A DC

Ordering data

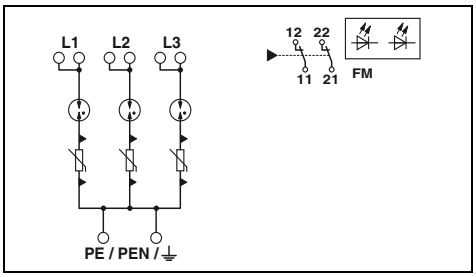
Description	Type	Order No.	Pcs. / Pkt.
POWERTRAB			
	PWT 35-800AC-FM	**2800419**	1
Mounting set, comprising: 1x PE aluminum rail (147.5 x 30 x 3 mm), 3x M10x20 hexagon-head screw, 3x M10 hexagonal nut, 3x M10 washer, 3x M10 spring washer, 1x installation instructions			



4-conductor system; L1, L2, L3, PE/PEN

Mounting set

Total width 176 mm



Technical data

	I, II / T1, T2
	690 V AC
	800 V AC
	1500 V AC (5 sec.)
	150 A (Serial through wiring with 50 mm²)
	35 kA (per position)
	100 kA (per position)
	35 kA (per position)
	≤ 4.5 kV
	400 A (gG; 2 x 50 mm²) 800 A (aR)
	150 A (gG; ≥ 35 mm²)
	50 kA
	176 mm / - / 191 mm
	-40 °C ... 80 °C
	IP20
	PA / PC
	V-2
	IEC 61643-11 / EN 61643-11/A11
	Double terminal point
	Screw connection
	M6
	16 ... 50 mm² / 16 ... 50 mm² / 6 - 1/0
	PE conductor connection
	Ring cable lug
	M10
	16 ... 95 mm² / 16 ... 95 mm² / 6 - 3/0
	N/C contact 1-pos.
	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12
	30 V AC / 30 V DC
	1.5 A AC / 1.5 A DC

Ordering data

Type	Order No.	Pcs. / Pkt.
PWT 100-800AC-FM	**2800531**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PWT CCT-SET	**2800532**	1

Type 1/2 lightning arrester/surge arrester
VAL-MS-T1/T2

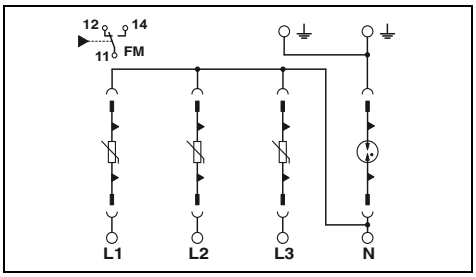
– Seamless pluggability (even for N/PE spark gap)
– Secure hold of connectors in the event of high lightning current loads and strong vibration thanks to new latching
– Thermal disconnect device for each individual connector
– Optical, mechanical status indication for the individual arresters
– With or without floating remote indication contact
– Mechanical keying of all slots
– Connectors can be checked with CHECKMASTER

Notes:
For certifications, see page 154

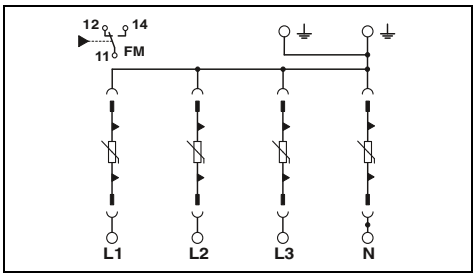
**5-conductor system;
L1, L2, L3, N, PE (3+1 circuit)**

**5-conductor system;
L1, L2, L3, N, PE (4+0 circuit)**

Total width 71.2 mm



Total width 71.2 mm



Technical data

Electrical data	...335	...175	...335
IEC category / EN type	I, II / T1, T2	I, II / T1, T2	I, II / T1, T2
Nominal voltage U_N	240 V AC (230/400 V AC ... 240/415 V AC)	120 V AC	240 V AC (230/400 V AC ... 240/415 V AC)
Maximum continuous operating voltage U_C			
L-N / L-PE / N-PE / L-PEN	335 V AC / - / 264 V AC / -	175 V AC / - / 264 V AC / -	- / 335 V AC / 335 V AC / -
Lightning test curr. I_{imp} (10/350) µs			
Peak value	50 kA	50 kA	50 kA
Charge	25 As	25 As	25 As
Specific energy	625.00 kJ/Ω	625.00 kJ/Ω	625.00 kJ/Ω
Follow current quenching capacity I_{fi}			
L-N / L-PE / N-PE / L-PEN	- / - / 100 A (264 V AC) / -	- / - / 100 A (264 V AC) / -	-
Nominal discharge surge current I_n (8/20) µs			
L-N / L-PE / N-PE / L-PEN	12.5 kA / - / 50 kA / -	12.5 kA / - / 50 kA / -	- / 37.5 kA (3 x L) / 12.5 kA / -
Max. discharge surge current $I_{max.}$ (8/20) µs			
L-N / L-PE / N-PE / L-PEN	50 kA / - / 50 kA / -	50 kA / - / 50 kA / -	- / 150 kA (3 x L) / 50 kA / -
Protection level U_P			
L-N / L-PE / N-PE / L-PEN	≤ 1.2 kV / ≤ 2 kV / ≤ 1.7 kV / -	≤ 0.8 kV / ≤ 2 kV / ≤ 1.7 kV / -	- / ≤ 1.2 kV / ≤ 1.2 kV / -
Backup fuse max. in acc. with IEC	160 A (gL/gG)	160 A (gL/gG)	160 A (gL/gG)
General data			
Dimensions W / H / D	71.2 mm / 99 mm / 77.5 mm		71.2 mm / 99 mm / 77.5 mm
Connection data solid / stranded / AWG	1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2		1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2
Temperature range	-40 °C ... 80 °C		-40 °C ... 80 °C
Inflammability class in acc. with UL 94	V0		V0
Test standards	IEC 61643-1 / EN 61643-11/A11		IEC 61643-1 / EN 61643-11/A11
Remote indication contact	PDT, 1-pos.		PDT, 1-pos.
Connection data solid / stranded / AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage	250 V AC / 30 V DC		250 V AC
Max. operating current	1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)		1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)

Ordering data

Description	U_C	Type	Order No.	Pcs. / Pkt.
VALVETRAB-MS, varistor-based lightning arrester				
with remote indication contact	335 V AC	**VAL-MS-T1/T2 335/12.5/3+1-FM**	**2800183**	1
without remote indication contact	335 V AC	**VAL-MS-T1/T2 335/12.5/3+1**	**2800184**	1
with remote indication contact	175 V AC	**VAL-MS-T1/T2 175/12.5/3+1-FM**	**2800670**	1
without remote indication contact	175 V AC	**VAL-MS-T1/T2 175/12.5/3+1**	**2800671**	1
with remote indication contact	75 V AC			
without remote indication contact	75 V AC			

Accessories

Replacement connector				
	L-N / L-PEN	**VAL-MS-T1/T2 335/12.5 ST**	**2800190**	10
	L-N / L-PEN	**VAL-MS-T1/T2 175/12.5 ST**	**2800676**	10
	L-N / L-PEN			
	N-PE	**F-MS-T1/T2 50 ST**	**2800191**	10
Labeling material		ZBN 18 ..., see page 63		

Technical data

Electrical data	...335
IEC category / EN type	I, II / T1, T2
Nominal voltage U_N	240 V AC (230/400 V AC ... 240/415 V AC)
Maximum continuous operating voltage U_C	
L-N / L-PE / N-PE / L-PEN	- / 335 V AC / 335 V AC / -
Lightning test curr. I_{imp} (10/350) µs	
Peak value	50 kA
Charge	25 As
Specific energy	625.00 kJ/Ω
Follow current quenching capacity I_{fi}	
L-N / L-PE / N-PE / L-PEN	-
Nominal discharge surge current I_n (8/20) µs	
L-N / L-PE / N-PE / L-PEN	- / 37.5 kA (3 x L) / 12.5 kA / -
Max. discharge surge current $I_{max.}$ (8/20) µs	
L-N / L-PE / N-PE / L-PEN	- / 150 kA (3 x L) / 50 kA / -
Protection level U_P	
L-N / L-PE / N-PE / L-PEN	- / ≤ 1.2 kV / ≤ 1.2 kV / -
Backup fuse max. in acc. with IEC	160 A (gL/gG)
General data	
Dimensions W / H / D	71.2 mm / 99 mm / 77.5 mm
Connection data solid / stranded / AWG	1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2
Temperature range	-40 °C ... 80 °C
Inflammability class in acc. with UL 94	V0
Test standards	IEC 61643-1 / EN 61643-11/A11
Remote indication contact	PDT, 1-pos.
Connection data solid / stranded / AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage	250 V AC
Max. operating current	1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)

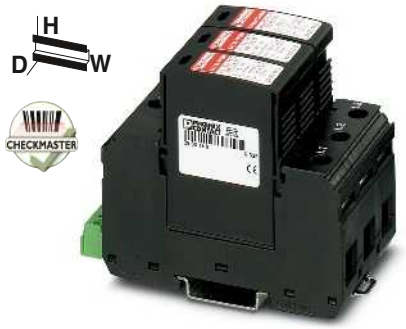
Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS-T1/T2 335/12.5/4+0-FM	**2800644**	1
VAL-MS-T1/T2 335/12.5/4+0	**2800645**	1

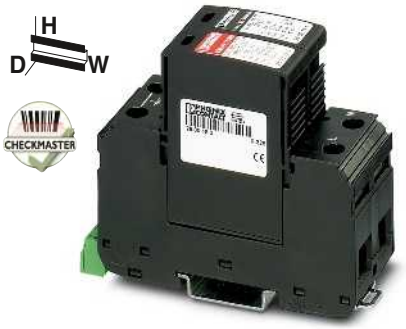
Accessories

VAL-MS-T1/T2 335/12.5 ST	**2800190**	10

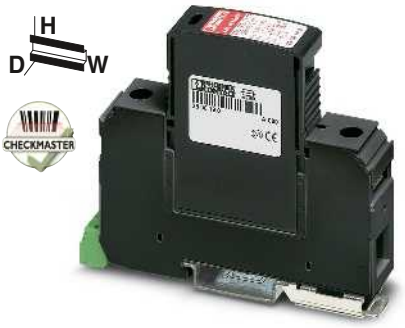
ZBN 18 ..., see page 63



4-conductor system; L1, L2, L3, PEN

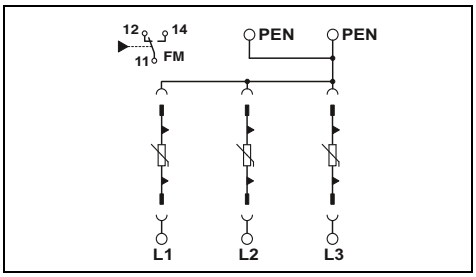


3-conductor system; L, N, PE

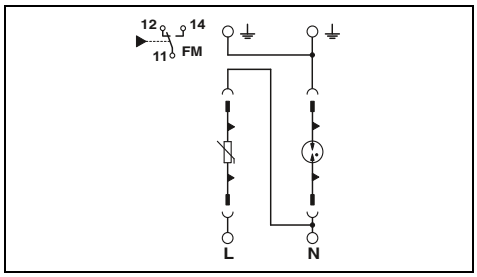


2-conductor system; L, N/PEN

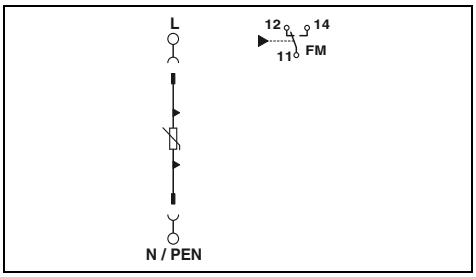
Total width 53.4 mm



Total width 35.6 mm



Total width 17.5 mm



Technical data

...335	...175
I, II / T1, T2	I, II / T1, T2
240 V AC (230/400 V AC ... 240/415 V AC)	120 V AC
- / - / - / 335 V AC	- / - / - / 175 V AC
37.5 kA	37.5 kA
18.75 As	18.75 As
352.00 kJ/Ω	352.00 kJ/Ω
-	-
- / - / - / 37.5 kA (3 x L)	- / - / - / 37.5 kA (3 x L)
- / - / - / 150 kA (3 x L)	- / - / - / 150 kA (3 x L)
- / - / - / ≤ 1.2 kV	- / - / - / ≤ 0.7 kV
160 A (gL/gG)	160 A (gL/gG)
53.4 mm / 99 mm / 77.5 mm	
1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11/A11	
PDT, 1-pos.	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 30 V DC	
1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)	

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS-T1/T2 335/12.5/3+0-FM	2800188	1
VAL-MS-T1/T2 335/12.5/3+0	2800189	1
VAL-MS-T1/T2 175/12.5/3+0-FM	2800672	1
VAL-MS-T1/T2 175/12.5/3+0	2800673	1

Accessories

VAL-MS-T1/T2 335/12.5 ST	2800190	10
VAL-MS-T1/T2 175/12.5 ST	2800676	10

ZBN 18 ..., see page 63

Technical data

...335	...175
I, II / T1, T2	I, II / T1, T2
240 V AC (230 V AC ... 240 V AC)	120 V AC
335 V AC / - / 264 V AC / -	175 V AC / - / 264 V AC / -
25 kA	25 kA
12.5 As	12.5 As
160.00 kJ/Ω	160.00 kJ/Ω
- / - / 100 A (264 V AC) / -	- / - / 100 A (264 V AC) / -
12.5 kA / - / 50 kA / -	12.5 kA / - / 50 kA / -
50 kA / - / 50 kA / -	50 kA / - / 50 kA / -
≤ 1.2 kV / ≤ 2 kV / ≤ 1.7 kV / -	≤ 0.8 kV / ≤ 2 kV / ≤ 1.7 kV / -
160 A (gL/gG)	160 A (gL/gG)
35.6 mm / 99 mm / 77.5 mm	
1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11/A11	
PDT, 1-pos.	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 30 V DC	
1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)	

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS-T1/T2 335/12.5/1+1-FM	2800186	1
VAL-MS-T1/T2 335/12.5/1+1	2800187	1
VAL-MS-T1/T2 175/12.5/1+1-FM	2800674	1
VAL-MS-T1/T2 175/12.5/1+1	2800675	1

Accessories

VAL-MS-T1/T2 335/12.5 ST	2800190	10
VAL-MS-T1/T2 175/12.5 ST	2800676	10
F-MS-T1/T2 50 ST	2800191	10

ZBN 18 ..., see page 63

Technical data

...335	...175	... 48
I, II / T1, T2	I, II / T1, T2	I, II / T1, T2
240 V AC	120 V AC	60 V AC/DC
335 V AC / - / - / -	175 V AC / - / - / -	75 V AC / - / - / -
12.5 kA	12.5 kA	12.5 kA
6.25 As	6.25 As	6.25 As
39.00 kJ/Ω	39.00 kJ/Ω	39.00 kJ/Ω
-	-	-
/ - / - / 12.5 kA	/ - / - / 12.5 kA	- / - / - / 12.5 kA
/ - / - / 50 kA	/ - / - / 50 kA	- / - / - / 30 kA
≤ 1.2 kV / - / - / -	≤ 0.8 kV / - / - / -	≤ 0.4 kV / - / - / -
160 A (gL/gG)	160 A (gL/gG)	160 A (gL/gG)
17.5 mm / 99 mm / 77.5 mm		
1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2		
-40 °C ... 80 °C		
V0		
IEC 61643-1 / EN 61643-11/A11		
PDT, 1-pos.		
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16		
250 V AC		
1.5 A AC / 1.5 A DC (30 V DC)		

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS-T1/T2 335/12.5/1+0-FM	2801042	1
VAL-MS-T1/T2 335/12.5/1+0	2801041	1
VAL-MS-T1/T2 175/12.5/1+0-FM	2801044	1
VAL-MS-T1/T2 175/12.5/1+0	2801043	1
VAL-MS-T1/T2 48/12.5/1+0-FM	2801240	1
VAL-MS-T1/T2 48/12.5/1+0	2801241	1

Accessories

VAL-MS-T1/T2 335/12.5 ST	2800190	10
VAL-MS-T1/T2 175/12.5 ST	2800676	10
VAL-MS-T1/T2 48/12.5 ST	2801242	10

ZBN 18 ..., see page 63

Surge protection for the power supply unit

Type 1+2 lightning/surge arrester combination
FLASHTRAB compact

- Seamless pluggability (even for N/PE spark gap)
- Thermal disconnect device for each individual connector
- Optical, mechanical status indication for the individual arresters
- With floating remote indication contact
- Connectors can be checked with CHECKMASTER
- High continuous voltage of 350 V AC for 230/400 V AC networks with high voltage fluctuations

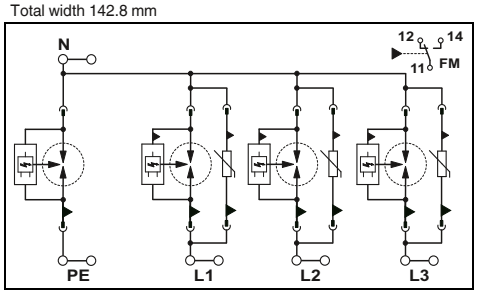
5-conductor system; L1, L2, L3, N, PE

4-conductor system; L1, L2, L3, PEN

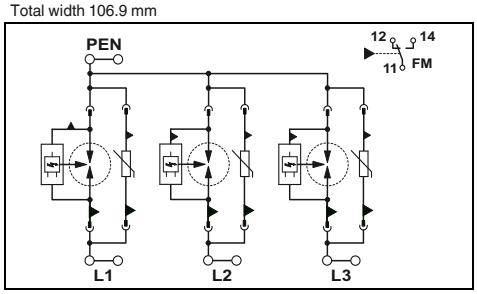
Notes:

For certifications, see page 154

Total width 142.8 mm



Total width 106.9 mm



Technical data

Electrical data			
IEC category / EN type		I + II / T1 + T2	I + II / T1 + T2
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)	240 V AC (230/400 V AC ... 240/415 V AC)
Maximum continuous operating voltage U_C			
	L-N / N-PE / L-PEN	350 V AC / 350 V AC / -	- / - / 350 V AC
Lightning test curr. I_{imp} (10/350) µs			
	Peak value	100 kA	75 kA (3-pos.)
	Charge	50 As	37.5 As
	Specific energy	2.50 MJ/Ω	1.40 MJ/Ω
Nominal discharge surge current I_n (8/20) µs			
	L-N / N-PE / L-PEN	25 kA / 100 kA / -	- / - / 75 kA (all channels)
Follow current quenching capacity I_{fi}			
	L-N / N-PE / L-PEN	25 kA (264 V AC) / 100 A / -	- / - / 25 kA (264 V AC)
Protection level U_P			
	L-N / N-PE / L-PEN	≤ 1.5 kV / ≤ 1.5 kV / -	- / - / ≤ 1.5 kV
Response time t_A			
	L-N / N-PE / L-PEN	≤ 25 ns / ≤ 100 ns / -	- / - / ≤ 25 ns
Backup fuse max. in acc. with IEC		315 A (gL/gG)	315 A (gL / gG)
Immunity to short-circuiting (with max. backup fuse) I_P		25 kA	25 kA
General data			
Dimensions W / H / D		142.8 mm / 95.8 mm / 70 mm	106.9 mm / 95.8 mm / 70 mm
Connection data solid / stranded / AWG		2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2	2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2
Temperature range		-40 °C ... 80 °C	-40 °C ... 80 °C
Inflammability class in acc. with UL 94		V0	V0
Test standards		IEC 61643-1 / EN 61643-11 / UL 1449	IEC 61643-1 / EN 61643-11 / UL 1449
Remote indication contact		PDT	PDT
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage		250 V AC / 125 V DC	250 V AC / 125 V DC
Max. operating current		1 A AC / 200 mA DC	1 A AC / 200 mA DC

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FLASHTRAB compact			
	FLT-CP-3S-350	**2859712**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLT-CP-3C-350	**2859725**	1

Accessories

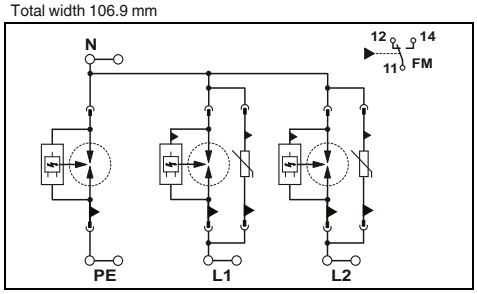
Replacement connector			
L-N / L-PEN	**FLT-CP-350-ST**	**2881887**	10
N-PE	**FLT-CP-N/PE-350-ST**	**2859686**	10
L-N / L-PEN	**VAL-CP-350-ST**	**2859602**	10
Labeling material	ZBN 18 ..., see page 63		

Accessories

FLT-CP-350-ST	**2881887**	10
VAL-CP-350-ST	**2859602**	10
ZBN 18 ..., see page 63		

4-conductor system; L1, L2, N, PE

Total width 106.9 mm



Technical data

I + II / T1 + T2	
240 V AC (230/400 V AC ... 240/415 V AC)	
350 V AC / 350 V AC / -	
75 kA	
37.5 As	
1.40 MJ/Ω	
25 kA / 100 kA / -	
25 kA (264 V AC) / 100 A / -	
≤ 1.5 kV / ≤ 1.5 kV / -	
≤ 25 ns / ≤ 100 ns / -	
315 A (gL/gG)	
25 kA	
106.9 mm / 95.8 mm / 70 mm	
2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11 / UL 1449	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 125 V DC	
1 A AC / 200 mA DC	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLT-CP-2S-350	**2859767**	1

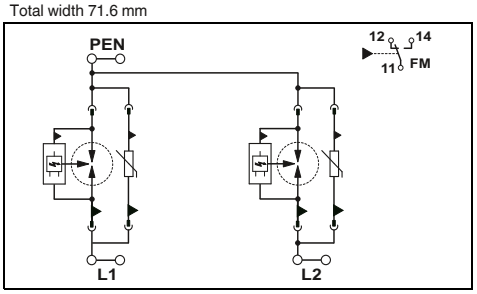
Accessories

FLT-CP-350-ST	**2881887**	10
FLT-CP-N/PE-350-ST	**2859686**	10
VAL-CP-350-ST	**2859602**	10

ZBN 18 ..., see page 63

3-conductor system; L1, L2, PEN

Total width 71.6 mm



Technical data

I + II / T1 + T2	
240 V AC (230/400 V AC ... 240/415 V AC)	
- / - / 350 V AC	
50 kA (2-pos.)	
25 As	
625.00 kJ/Ω	
- / - / 50 kA (all channels)	
- / - / 25 kA (264 V AC)	
- / - / ≤ 1.5 kV	
- / - / ≤ 25 ns	
315 A (gL / gG)	
25 kA	
71.6 mm / 95.8 mm / 70 mm	
2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11 / UL 1449	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 125 V DC	
1 A AC / 200 mA DC	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLT-CP-2C-350	**2859770**	1

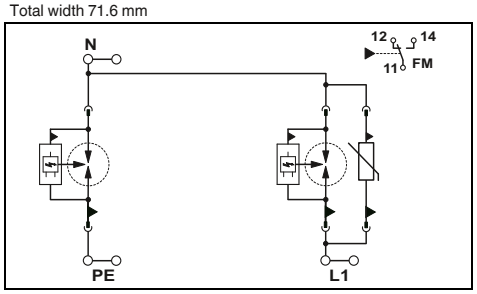
Accessories

FLT-CP-350-ST	**2881887**	10
VAL-CP-350-ST	**2859602**	10

ZBN 18 ..., see page 63

3-conductor system; L, N, PE

Total width 71.6 mm



Technical data

I + II / T1 + T2	
240 V AC (230 V AC ... 240 V AC)	
350 V AC / 350 V AC / -	
50 kA	
25 As	
625.00 kJ/Ω	
25 kA / 100 kA / -	
25 kA (264 V AC) / 100 A / -	
≤ 1.5 kV / ≤ 1.5 kV / -	
≤ 25 ns / ≤ 100 ns / -	
315 A (gL/gG)	
25 kA	
71.6 mm / 95.8 mm / 70 mm	
2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11 / UL 1449	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 125 V DC	
1 A AC / 200 mA DC	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLT-CP-1S-350	**2859738**	1

Accessories

FLT-CP-350-ST	**2881887**	10
FLT-CP-N/PE-350-ST	**2859686**	10
VAL-CP-350-ST	**2859602**	10

ZBN 18 ..., see page 63

Type 1+2 lightning/surge arrester combination
FLASHTRAB compact

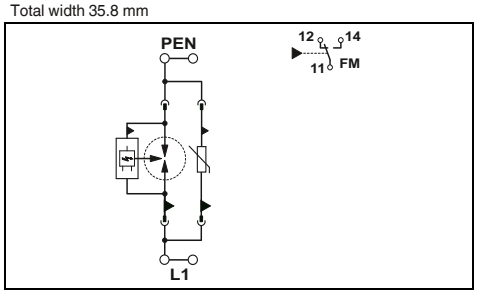
– Seamless pluggability (even for N/PE spark gap)
– Thermal disconnect device for each individual connector
– Optical, mechanical status indication for the individual arresters
– With floating remote indication contact
– Connectors can be checked with CHECKMASTER
– High continuous voltage of 350 V AC for 230/400 V AC networks with high voltage fluctuations

Notes:

For certifications, see page 154

2-conductor system; L, PEN

Total width 35.8 mm



Technical data

Electrical data		
IEC category / EN type		I + II / T1 + T2
Nominal voltage U_N		240 V AC (230 V AC ... 240 V AC)
Maximum continuous operating voltage U_C		
	L-N / N-PE / L-PEN	350 V AC / - / 350 V AC
Lightning test curr. I_{imp} (10/350) µs		
	Peak value	25 kA
	Charge	12.5 As
	Specific energy	160.00 kJ/Ω
Nominal discharge surge current I_n (8/20) µs		
	L-N / N-PE / L-PEN	25 kA / - / 25 kA
Follow current quenching capacity I_{fi}		
	L-N / N-PE / L-PEN	25 kA (264 V AC) / - / 25 kA (264 V AC)
Protection level U_P		
	L-N / N-PE / L-PEN	≤ 1.5 kV / - / ≤ 1.5 kV
Response time t_A		
	L-N / N-PE / L-PEN	≤ 25 ns / - / ≤ 25 ns
Backup fuse max. in acc. with IEC		315 A (gL / gG)
Immunity to short-circuiting (with max. backup fuse) I_P		25 kA
General data		
Dimensions W / H / D		35.8 mm / 95.8 mm / 70 mm
Connection data solid / stranded / AWG		2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2
Temperature range		-40 °C ... 80 °C
Inflammability class in acc. with UL 94		V0
Test standards		IEC 61643-1 / EN 61643-11 / UL 1449
Remote indication contact		PDT
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage		250 V AC / 125 V DC
Max. operating current		1 A AC / 200 mA DC

Ordering data

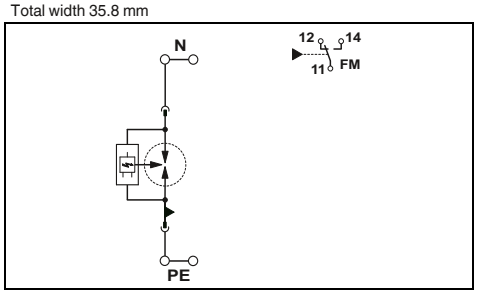
Description	Type	Order No.	Pcs. / Pkt.
FLASHTRAB compact			
1-pos.	**FLT-CP-1C-350**	**2859741**	1

Accessories

Replacement connector			
L-N / L-PEN	**FLT-CP-350-ST**	**2881887**	10
N-PE			
L-N / L-PEN	**VAL-CP-350-ST**	**2859602**	10
Labeling material	ZBN 18 ..., see page 63		

**N-PE spark gap,
for Lightning Protection Level 1**

Total width 35.8 mm



Technical data

	I / T1
	240 V AC (N-PE)
	- / 350 V AC / -
	100 kA
	50 As
	2.50 MJ/Ω
	- / 100 kA / -
	- / 100 A / -
	- / ≤ 1.5 kV / -
	- / ≤ 100 ns / -
	-
	25 kA
	35.8 mm / 95.8 mm / 70 mm
	2.5 ... 35 mm² / 2.5 ... 25 mm² / 13 - 2
	-40 °C ... 80 °C
	V0
	IEC 61643-1 / EN 61643-11 / EN 61643-11/A11 / UL 1449
	PDT
	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
	250 V AC / 125 V DC
	1 A AC / 200 mA DC

Ordering data

Type	Order No.	Pcs. / Pkt.
FLT-CP-N/PE-350	**2859754**	1

Accessories

FLT-CP-N/PE-350-ST	**2859686**	10

ZBN 18 ..., see page 63

Type 2 surge arresters VALVETRAB compact

- Type 2 seamless plug-in surge arrester
- Disconnect device on each individual connector
- Optical, mechanical status indication for the individual arresters
- With or without floating remote indication contact
- Mechanical keying of all slots
- Modular arrester blocks with ultra-slim design
- Use of varistors that are free of leakage current
- Connectors can be checked with CHECKMASTER
- High continuous voltage of 350 V AC for 230/400 V AC networks with high voltage fluctuations

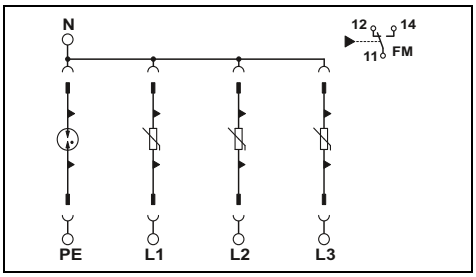
Notes:

For certifications, see page 154

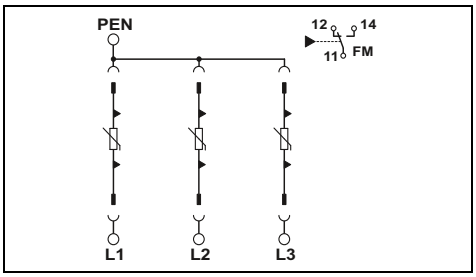
5-conductor system; L1, L2, L3, N, PE

4-conductor system; L1, L2, L3, PEN

Total width 49.2 mm



Total width 37.25 mm



Technical data

Electrical data		... 350	... 175
IEC category / EN type		II / T2	II / T2
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)	120 V AC
Maximum continuous operating voltage U_C	L-N / N-PE / L-PEN	350 V AC / 264 V AC / -	175 V AC / 150 V AC / -
Nominal discharge surge current I_n (8/20) µs	L-N / N-PE / L-PEN	20 kA / 20 kA / -	60 kA (all channels) / 20 kA / -
Max. discharge surge current $I_{max.}$ (8/20) µs	L-N / N-PE / L-PEN	120 kA (all channels) / 40 kA / -	120 kA (all channels) / 40 kA / -
Residual voltage at 5 kA	L-N / N-PE / L-PEN	≤ 1.1 kV / ≤ 0.25 kV / -	≤ 600 V / ≤ 200 V / -
Protection level U_P	L-N / N-PE / L-PEN	≤ 1.4 kV / ≤ 1.5 kV / -	≤ 850 V / ≤ 950 V / -
Response time t_A	L-N / N-PE / L-PEN	≤ 25 ns / ≤ 100 ns / -	≤ 25 ns / ≤ 100 ns / -
Backup fuse max. in acc. with IEC		125 A (gL/gG)	125 A (gL/gG)
General data			
Dimensions W / H / D		49.2 mm / 98.5 mm / 70 mm	
Connection data solid / stranded / AWG		2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4	
Temperature range		-40 °C ... 80 °C	
Inflammability class in acc. with UL 94		V0	
Test standards		IEC 61643-1 / DIN EN 61643-11 / DIN EN 61643-11/A11 / IEEE C62.1 / C62.34 / C62.45 / UL 1449	
Remote indication contact		PDT, 1-pos.	
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
Max. operating voltage		250 V AC / 125 V DC	
Max. operating current		1 A AC (ohmic) / 200 mA DC (ohmic)	

Technical data

Electrical data		... 350	... 175
IEC category / EN type		II / T2	II / T2
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)	120 V AC (3P/PEN)
Maximum continuous operating voltage U_C	L-N / N-PE / L-PEN	- / - / 350 V AC	- / - / 175 V AC
Nominal discharge surge current I_n (8/20) µs	L-N / N-PE / L-PEN	- / - / 60 kA (all channels)	- / - / 60 kA (all channels)
Max. discharge surge current $I_{max.}$ (8/20) µs	L-N / N-PE / L-PEN	- / - / 120 kA (all channels)	- / - / 120 kA (all channels)
Residual voltage at 5 kA	L-N / N-PE / L-PEN	- / - / ≤ 1.1 kV	- / - / ≤ 600 V
Protection level U_P	L-N / N-PE / L-PEN	- / - / ≤ 1.4 kV	- / - / ≤ 850 V (at In)
Response time t_A	L-N / N-PE / L-PEN	- / - / ≤ 25 ns	- / - / ≤ 25 ns
Backup fuse max. in acc. with IEC		125 A (gL/gG)	125 A (gL/gG)
General data			
Dimensions W / H / D		37.25 mm / 98.5 mm / 70 mm	
Connection data solid / stranded / AWG		2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4	
Temperature range		-40 °C ... 80 °C	
Inflammability class in acc. with UL 94		V0	
Test standards		IEC 61643-1 / DIN EN 61643-11 / UL 1449 / IEEE C62.1 / C62.34 / C62.45	
Remote indication contact		PDT	
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
Max. operating voltage		250 V AC / 125 V DC	
Max. operating current		1 A AC (ohmic) / 200 mA DC (ohmic)	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
VALVETRAB compact			
with remote indication contact	**VAL-CP-3S-350**	**2859521**	1
without remote indication contact	**VAL-CP-3S-350/O**	**2881010**	1
with remote indication contact	**VAL-CP-3S-175**	**2859453**	1
Bridge set, for bridging VALVETRAB compact to the r.c.c.b.			
	MPB SET VAL-CP-3S	**2880684**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-CP-3C-350	**2859547**	1
VAL-CP-3C-350/O	**2881023**	1
VAL-CP-3C-175	**2859466**	1

Accessories

Replacement connector			
L-N / L-PEN	**VAL-CP-350-ST**	**2859602**	10
N-PE	**VAL-CP-N/PE-350-ST**	**2859699**	10
L-N / L-PEN	**VAL-CP-175-ST**	**2859628**	10
Labeling material	ZBFM 5 ..., see page 63		

Accessories

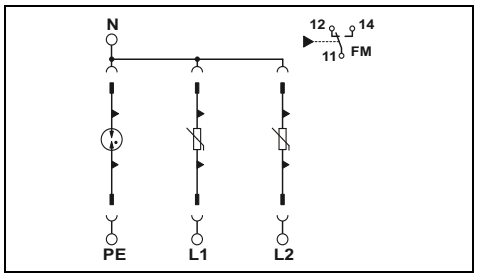
VAL-CP-350-ST	**2859602**	10	
VAL-CP-175-ST	**2859628**	10	
ZBFM 5 ..., see page 63			

4-conductor system; L1, L2, N, PE

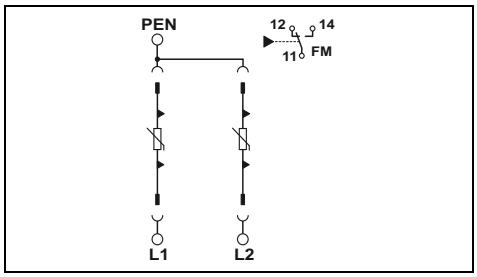
3-conductor system; L1, L2, PEN

3-conductor system; L, N, PE

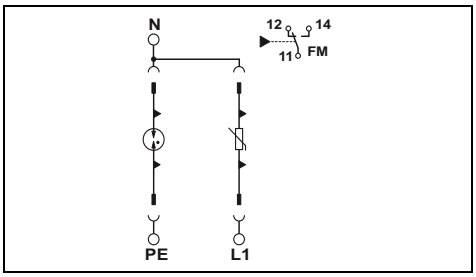
Total width 37.25 mm



Total width 25.3 mm



Total width 25.3 mm



Technical data

... 350	... 175
II / T2	II / T2
240 V AC (230/400 V AC ... 240/415 V AC)	120 V AC
350 V AC / 264 V AC / -	175 V AC / 150 V AC / -
40 kA (all channels) / 20 kA / -	40 kA (all channels) / 20 kA / -
80 kA (all channels) / 40 kA / -	80 kA (all channels) / 40 kA / -
≤ 1.1 kV / ≤ 0.25 kV / -	≤ 600 V / ≤ 200 V / -
≤ 1.4 kV / ≤ 1.5 kV / -	≤ 850 V / ≤ 950 V / -
≤ 25 ns / ≤ 100 ns / -	≤ 25 ns / ≤ 100 ns / -
125 A (gL/gG)	125 A (gL/gG)
37.25 mm / 98.5 mm / 70 mm	
2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / DIN EN 61643-11 / DIN EN 61643-11/A11 / IEEE C62.1 / C62.34 / C62.45 / UL 1449	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 125 V DC	
1 A AC (ohmic) / 200 mA DC (ohmic)	

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-CP-2S-350	**2859505**	1
VAL-CP-2S-350/O	**2881049**	1
VAL-CP-2S-175	**2859495**	1

Accessories

VAL-CP-350-ST	**2859602**	10
VAL-CP-N/PE-350-ST	**2859699**	10
VAL-CP-175-ST	**2859628**	10

ZBFM 5 ..., see page 63

Technical data

... 350	... 175
II / T2	II / T2
240 V AC (230/400 V AC ... 240/415 V AC)	120 V AC (2P/PEN)
- / - / 350 V AC	- / - / 175 V AC
- / - / 40 kA (all channels)	- / - / 40 kA (all channels)
- / - / 80 kA (all channels)	- / - / 80 kA (all channels)
- / - / ≤ 1.1 kV	- / - / ≤ 600 V
- / - / ≤ 1.4 kV	- / - / ≤ 850 V (at In)
- / - / ≤ 25 ns	- / - / ≤ 25 ns
125 A (gL/gG)	125 A (gL/gG)
25.3 mm / 98.5 mm / 70 mm	
2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / DIN EN 61643-11 / UL 1449 / IEEE C62.1 / C62.34 / C62.45	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 125 V DC	
1 A AC (ohmic) / 200 mA DC (ohmic)	

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-CP-2C-350	**2859589**	1
VAL-CP-2C-350/O	**2881052**	1
VAL-CP-2C-175	**2859482**	1

Accessories

VAL-CP-350-ST	**2859602**	10
VAL-CP-175-ST	**2859628**	10

ZBFM 5 ..., see page 63

Technical data

... 350	... 175
II / T2	II / T2
240 V AC (230/400 V AC ... 240/415 V AC)	120 V AC
350 V AC / 264 V AC / -	175 V AC / 150 V AC / -
20 kA / 20 kA / -	20 kA / 20 kA / -
40 kA / 40 kA / -	40 kA / 40 kA / -
≤ 1.1 kV / ≤ 0.25 kV / -	≤ 600 V / ≤ 200 V / -
≤ 1.4 kV / ≤ 1.5 kV / -	≤ 850 V / ≤ 950 V / -
≤ 25 ns / ≤ 100 ns / -	≤ 25 ns / ≤ 100 ns / -
125 A (gL/gG)	125 A (gL/gG)
25.3 mm / 98.5 mm / 70 mm	
2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / DIN EN 61643-11 / DIN EN 61643-11/A11 / IEEE C62.1 / C62.34 / C62.45 / UL 1449	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 125 V DC	
1 A AC (ohmic) / 200 mA DC (ohmic)	

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-CP-1S-350	**2859563**	1
VAL-CP-1S-350/O	**2881036**	1
VAL-CP-1S-175	**2859479**	1

Accessories

VAL-CP-350-ST	**2859602**	10
VAL-CP-N/PE-350-ST	**2859699**	10
VAL-CP-175-ST	**2859628**	10

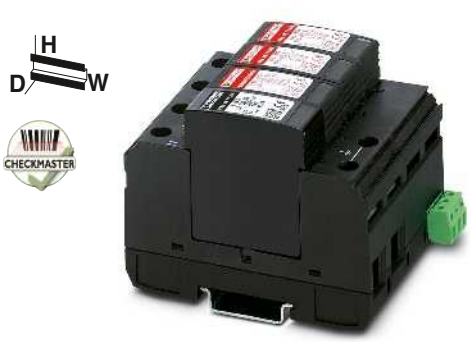
ZBFM 5 ..., see page 63

Type 2 surge arresters
VALVETRAB MS
30/40 kA performance class

– Multi-channel type 2 arrester
– Type 2 seamless plug-in surge arrester
– Disconnect device on each individual connector
– Optical, mechanical status indication for the individual arresters
– With or without floating remote indication contact
– Mechanical keying of all slots

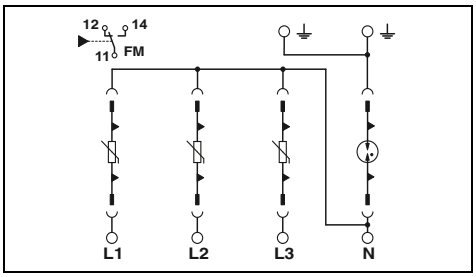
Notes:
For certifications, see page 154

5-conductor system; L1, L2, L3, N, PE, supply line supply from below

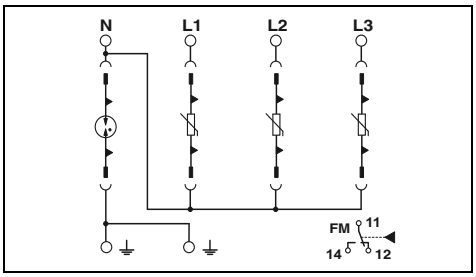


5-conductor system; L1, L2, L3, N, PE, supply line supply from above

Total width 70.8 mm



Total width 70.8 mm



Technical data

Electrical data		VAL-MS 230	VAL-MS 320
IEC category / EN type		II / T2	II / T2
Nominal voltage U_N		230 V AC (400 V AC)	230 V AC (400 V AC)
Maximum continuous operating voltage U_C			
	L-N / N-PE / L-PEN	275 V AC / 260 V AC / -	335 V AC / 260 V AC / -
Nominal discharge surge current I_n (8/20) µs			
	L-N / N-PE / L-PEN	20 kA / 20 kA / -	20 kA / 20 kA / -
Max. discharge surge current $I_{max.}$ (8/20) µs			
	L-N / N-PE / L-PEN	40 kA / 40 kA / -	40 kA / 40 kA / -
Residual voltage at 5 kA	L-N / N-PE / L-PEN	≤ 1.1 kV / ≤ 0.15 kV / -	≤ 1.25 kV / ≤ 0.15 kV / -
Protection level U_P			
	L-N / N-PE / L-PEN	≤ 1.35 kV / ≤ 1.5 kV / -	≤ 1.6 kV / ≤ 1.5 kV / -
Response time t_A			
	L-N / N-PE / L-PEN	≤ 25 ns / ≤ 100 ns / -	≤ 25 ns / ≤ 100 ns / -
Backup fuse max. in acc. with IEC		125 A (gL)	
Immunity to short-circuiting (with max. backup fuse) I_P		25 kA	

General data		
Dimensions W / H / D	70.8 mm / 96.8 mm / 65.5 mm	
Connection data solid / stranded / AWG	0.5 ... 35 mm² / 0.5 ... 25 mm² / 20 - 2	
Temperature range	-40 °C ... 80 °C	
Inflammability class in acc. with UL 94	V0	
Test standards	IEC 61643-1 / EN 61643-11/A11	
Remote indication contact	PDT	
Connection data solid / stranded / AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
Max. operating voltage	250 V AC / 30 V DC	
Max. operating current	0.75 A AC (250 V AC) / 1 A DC (30 V DC)	

Technical data

Electrical data	VAL-MS 320
IEC category / EN type	II / T2
Nominal voltage U_N	230 V AC (400 V AC)
Maximum continuous operating voltage U_C	
L-N / N-PE / L-PEN	335 V AC / 260 V AC / -
Nominal discharge surge current I_n (8/20) µs	
L-N / N-PE / L-PEN	20 kA / 20 kA / -
Max. discharge surge current $I_{max.}$ (8/20) µs	
L-N / N-PE / L-PEN	40 kA / 40 kA / -
Residual voltage at 5 kA	
L-N / N-PE / L-PEN	≤ 1.25 kV / ≤ 0.15 kV / -
Protection level U_P	
L-N / N-PE / L-PEN	≤ 1.6 kV / ≤ 1.5 kV / -
Response time t_A	
L-N / N-PE / L-PEN	≤ 25 ns / ≤ 100 ns / -
Backup fuse max. in acc. with IEC	125 A (gL)
Immunity to short-circuiting (with max. backup fuse) I_P	25 kA

General data	
Dimensions W / H / D	70.8 mm / 96.8 mm / 65.5 mm
Connection data solid / stranded / AWG	0.5 ... 35 mm² / 0.5 ... 25 mm² / 20 - 2
Temperature range	-40 °C ... 80 °C
Inflammability class in acc. with UL 94	V0
Test standards	IEC 61643-1 / EN 61643-11/A11
Remote indication contact	PDT
Connection data solid / stranded / AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage	250 V AC / 30 V DC
Max. operating current	0.75 A AC (250 V AC) / 1 A DC (30 V DC)

Ordering data

Description	I_{max}	U_C	Type	Order No.	Pcs. / Pkt.
VALVETRAB, multi-position surge arrester combination					
without remote indication contact	40 kA	275 V AC	**VAL-MS 230/3+1**	**2838209**	1
with remote indication contact	40 kA	275 V AC	**VAL-MS 230/3+1 FM**	**2838199**	1
without remote indication contact	40 kA	335 V AC	**VAL-MS 320/3+1**	**2859178**	1
with remote indication contact	40 kA	335 V AC	**VAL-MS 320/3+1/FM**	**2859181**	1
VALVETRAB MS					
without remote indication contact	30 kA	580 V AC			
with remote indication contact	30 kA	580 V AC			

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 320/3+1/FM-UD	**2856689**	1

Accessories

Replacement connector				
	1L-N/PE	**VAL-MS 230 ST**	**2798844**	10
	1L-N/PE	**VAL-MS 320 ST**	**2838843**	10
	1L-N/PE			
	N-PE	**F-MS 12 ST**	**2817990**	10
Marking material		ZBN 18 ..., see page 63		

Accessories

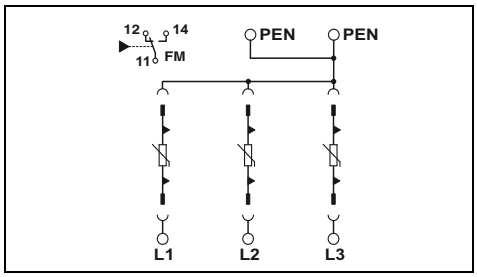
VAL-MS 320-UD ST	**2858315**	10
F-MS 12 ST	**2817990**	10
ZBN 18 ..., see page 63		

4-conductor system; L1, L2, L3, PEN

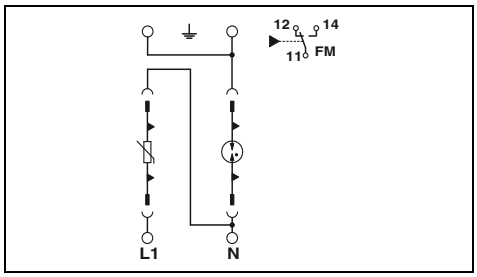
3-conductor system; L, N, PE

3-conductor system; L1, L2, PEN

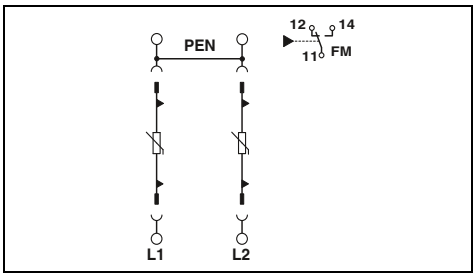
Total width 53.4 mm



Total width 35.6 mm



Total width 35.6 mm



Technical data

VAL-MS 320	VAL-MS 580
II / T2	II / T2
230 V AC (Max. 240/415 V AC)	400 V AC (400/690 V AC TN-C)
- / - / 335 V AC	- / - / 580 V AC
- / - / 60 kA (all channels)	- / - / 45 kA (all channels)
- / - / 120 kA (all channels)	- / - / 90 kA (all channels)
- / - / ≤ 1.2 kV	- / - / ≤ 2.1 kV
- / - / ≤ 1.5 kV	- / - / ≤ 2.5 kV
- / - / ≤ 25 ns	- / - / ≤ 25 ns
125 A (gL / gG)	
25 kA	
53.4 mm / 99 mm / 65.5 mm	
1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 30 V DC	
1.5 A AC (250 V AC) / 1 A DC (30 V DC)	

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 320/3+0	**2920230**	1
VAL-MS 320/3+0-FM	**2920243**	1
VAL-MS 580/3+0	**2920450**	1
VAL-MS 580/3+0-FM	**2920447**	1

Accessories

VAL-MS 320 ST	**2838843**	10
VAL-MS 580-ST	**2920434**	10

ZBN 18 ..., see page 63

Technical data

VAL-MS 230	VAL-MS 320
II / T2	II / T2
230 V AC	230 V AC
275 V AC / 260 V AC / -	335 V AC / 260 V AC / -
20 kA / 20 kA / -	20 kA / 20 kA / -
40 kA / 40 kA / -	40 kA / 40 kA / -
≤ 1.1 kV / ≤ 150 V / -	- 1.2 kV / ≤ 150 V / -
≤ 1.35 kV / ≤ 1.5 kV / -	≤ 1.5 kV / ≤ 1.5 kV / -
≤ 25 ns / ≤ 100 ns / -	≤ 25 ns / ≤ 100 ns / -
125 A (gL/gG)	
25 kA	
35.6 mm / 97 mm / 65.5 mm	
1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11/A11	
PDT, 1-pos.	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 30 V DC	
1.5 A AC (250 V AC) / 1 A DC (30 V DC)	

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 230/1+1	**2804429**	1
VAL-MS 230/1+1-FM	**2804432**	1
VAL-MS 320/1+1	**2804380**	1
VAL-MS 320/1+1-FM	**2804393**	1

Accessories

VAL-MS 230 ST	**2798844**	10
VAL-MS 320 ST	**2838843**	10
F-MS 12 ST	**2817990**	10

ZBN 18 ..., see page 63

Technical data

VAL-MS 230
II / T2
230 V AC (400 V AC)
- / - / 275 V AC
- / - / 40 kA (all channels)
- / - / 80 kA (all channels)
- / - / ≤ 1.1 kV
- / - / ≤ 1.35 kV
- / - / ≤ 25 ns
125 A (gL/gG)
25 kA
35.6 mm / 97 mm / 65.5 mm
1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2
-40 °C ... 80 °C
V0
IEC 61643-1 / EN 61643-11/A11
PDT, 1-pos.
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
250 V AC / 30 V DC
1.5 A AC (250 V AC) / 1 A DC (30 V DC)

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 230/2+0	**2800103**	1
VAL-MS 230/2+0-FM	**2800102**	1

Accessories

VAL-MS 230 ST	**2798844**	10

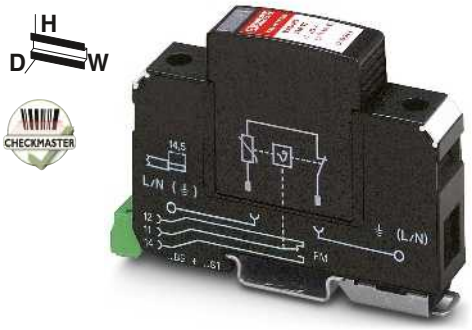
ZBN 18 ..., see page 63

Type 2 surge arresters
VALVETRAB MS

- Single-channel, DIN-rail mountable protective devices
- Comprising base element and connector
- Base element with/without floating remote indication contact
- Disconnect device on each individual connector
- Optical, mechanical status indication for the individual arresters
- Mechanical keying of all slots

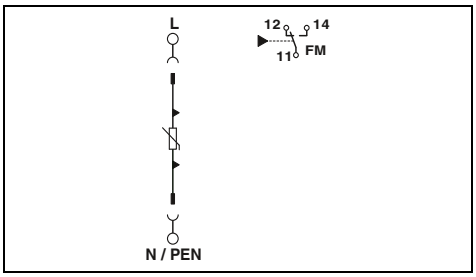
Notes:

For certifications, see page 154



2-conductor system; L, N/PEN

Total width 17.7 mm



Technical data

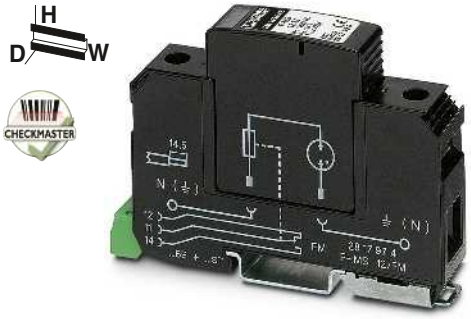
Electrical data		... 60AC	... 230AC
IEC category / EN type		II / T2	II / T2
Nominal voltage U_N		60 V AC/DC	230 V AC
Maximum continuous operating voltage U_C			
	L-N / N-PE / L-PEN	75 V AC / - / 75 V AC	275 V AC / - / 275 V AC
Nominal discharge surge current I_n (8/20) µs			
	L-N / N-PE / L-PEN	15 kA / - / -	20 kA / - / 20 kA
Max. discharge surge current $I_{max.}$ (8/20) µs			
	L-N / N-PE / L-PEN	40 kA / - / 40 kA	40 kA / - / 40 kA
Residual voltage at 5 kA	L-N / N-PE / L-PEN	≤ 325 V / - / ≤ 325 V	≤ 1 kV / - / ≤ 1 kV
Protection level U_P			
	L-N / N-PE / L-PEN	≤ 500 V / - / ≤ 500 V	≤ 1.35 kV / - / ≤ 1.35 kV
Response time t_A			
	L-N / N-PE / L-PEN	≤ 25 ns / - / ≤ 25 ns	≤ 25 ns / - / ≤ 25 ns
Backup fuse max. in acc. with IEC		125 A (gL/gG)	
General data			
Dimensions W / H / D		17.7 mm / - / 96.8 mm	
Connection data solid / stranded / AWG		1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
Temperature range		-40 °C ... 80 °C	
Inflammability class in acc. with UL 94		V0	
Test standards		IEC 61643-1 / EN 61643-11/A11	
Remote indication contact		PDT, 1-pos.	
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
Max. operating voltage		250 V AC / 30 V DC	
Max. operating current		1 A AC / 1 A DC	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
VALVETRAB MS			
with remote indication contact	**VAL-MS 60/FM**	**2868033**	1
without remote indication contact	**VAL-MS 60**	**2868020**	1
with remote indication contact	**VAL-MS 230/FM**	**2839130**	1
without remote indication contact	**VAL-MS 230**	**2839127**	1

Accessories

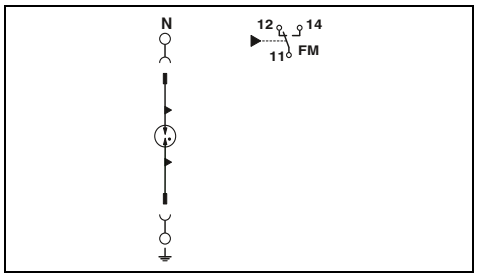
Replacement connector			
1L-N/PE	**VAL-MS 60 ST**	**2807573**	10
1L-N/PE	**VAL-MS 230 ST**	**2798844**	10
VALVETRAB, single-position base element			
with remote indication contact	**VAL-MS BE/FM**	**2817738**	10
without remote indication contact	**VAL-MS BE**	**2817741**	10
Labeling material	ZBN 18 ..., see page 63		



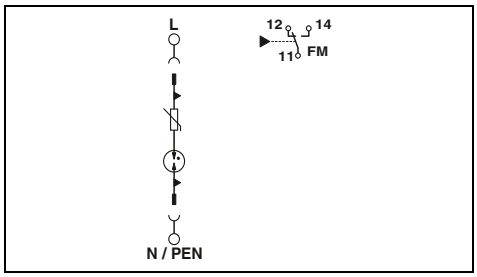
Spark gap, N-PE

2-conductor system; L, N/PEN

Total width 17.7 mm



Total width 17.7 mm



Technical data

F-MS 12	
II / T2	
230 V AC	
- / 260 V AC / -	
- / 20 kA / -	
- / 40 kA / -	
- / ≤ 150 V / -	
- / ≤ 1.5 kV / -	
- / ≤ 100 ns / -	
-	
17.7 mm / - / 96.8 mm	
0.5 ... 35 mm² / 0.5 ... 25 mm² / 20 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11/A11	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 30 V DC	
1 A AC / 1 A DC	

Technical data

VAL-MS 350 VF	
II / T2	
230 V AC	
350 V AC / - / 350 V AC	
10 kA / - / 10 kA	
20 kA / - / 20 kA	
≤ 1 kV / - / ≤ 1 kV	
≤ 1.5 kV / - / ≤ 1.5 kV	
≤ 100 ns / - / ≤ 100 ns	
125 A (gL)	
17.7 mm / - / 96.8 mm	
0.5 ... 35 mm² / 0.5 ... 25 mm² / 20 - 2	
-40 °C ... 80 °C	
-	
IEC 61643-1 / EN 61643-11/A11 / NF C61-740 / UL 1449	
PDT	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 30 V DC	
1 A AC / 1 A DC	

Ordering data

Type	Order No.	Pcs. / Pkt.
F-MS 12/FM	**2817974**	1
F-MS 12	**2817987**	1

Accessories

F-MS 12 ST	**2817990**	10
VAL-MS BE/FM	**2817738**	10
VAL-MS BE	**2817741**	10

ZBN 18 ..., see page 63

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 350 VF/FM	**2856579**	1
VAL-MS 350VF	**2856582**	1

Accessories

VAL-MS 350 VF ST	**2856595**	10
VAL-MS BE/FM	**2817738**	10
VAL-MS BE	**2817741**	10

ZBN 18 ..., see page 63

Type 2 surge protection plug for VAL-MS base elements

- Thermal disconnect device for each individual connector
- Optical, mechanical status indication for all protective connectors
- Connectors can be checked with CHECKMASTER

Notes:

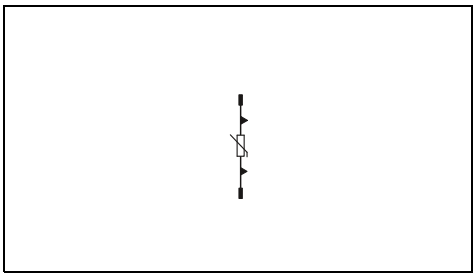
For certifications, see page 154

Please follow the installation instructions. These are provided with the packaging documentation or can be downloaded from the corresponding product page online at www.phoenixcontact.net/products.

You can find a list of all possible combination options and safety notes in the download area for the corresponding replacement plug at www.phoenixcontact.net/products.

Plug, 1-pos., L-N/L-PEN

Total width 17.7 mm



Technical data

Electrical data	... 120 ST	... 230 IT ST	... 400 ST	... 500 ST
IEC category / EN type	II / T2	II / T2	II / T2	II / T2
Nominal voltage U_N	120 V AC	230 V AC	400 V AC	500 V AC
Maximum continuous operating voltage U_C	150 V AC	385 V AC	440 V AC	600 V AC
Nominal discharge surge current I_n (8/20) µs	20 kA	20 kA	20 kA	20 kA
Max. discharge surge current I_{max} (8/20) µs	40 kA	40 kA	40 kA	30 kA
Residual voltage at 5 kA	≤ 550 V	≤ 1.35 kV	≤ 1.5 kV	≤ 2.3 kV
Protection level U_P	≤ 800 V	≤ 1.8 kV	≤ 2.2 kV	≤ 2.7 kV
Response time tA:	≤ 25 ns	≤ 25 ns	≤ 25 ns	≤ 25 ns
Backup fuse max. in acc. with IEC	125 A (gL)			
General data				
Dimensions W / H / D	17.7 mm / 52.4 mm / 54.5 mm			
Temperature range	-40 °C ... 80 °C			
Degree of protection in acc. with IEC 60529/ EN 60529	IP20			
Housing material	PA			
Inflammability class in acc. with UL 94	V0			
Test standards	IEC 61643-1 / EN 61643-11/A11 / UL 1449 / IEEE C62.1 / C62.34 / C62.45			

Ordering data

Description	Nominal voltage U_N	Type	Order No.	Pcs. / Pkt.
VALVETRAB surge protection plug				
	120 V AC	**VAL-MS 120 ST**	**2807586**	10
	230 V AC	**VAL-MS 230 IT ST**	**2807599**	10
	400 V AC	**VAL-MS 400 ST**	**2816399**	10
	500 V AC	**VAL-MS 500 ST**	**2807609**	10

Accessories

VALVETRAB, base element for 4-wire systems, L1, L2, L3, PEN, for individual assembly with VAL-MS...ST				
with remote indication contact	3L-PEN	**VAL-MS/3+0-BE/FM**	**2881803**	1
without remote indication contact	3L-PEN	**VAL-MS/3+0-BE**	**2881816**	1
VALVETRAB, base element for 3-wire systems, L1, L2, PEN, for individual assembly with VAL-MS...ST				
with remote indication contact	2L-GND	**VAL-MS/2+0-BE/FM**	**2805321**	1
without remote indication contact	2L - PEN	**VAL-MS/2+0-BE**	**2804584**	1
VALVETRAB, single-position base element				
with remote indication contact		**VAL-MS BE/FM**	**2817738**	10
without remote indication contact		**VAL-MS BE**	**2817741**	10

Type 2 surge protection plug for VAL-MS base elements

- Specifically for use in American applications
- 1-pos.
- Thermal disconnect device for each individual connector
- Optical, mechanical status indication for all protective connectors
- Connectors can be checked with CHECKMASTER

Notes:

For certifications, see page 154

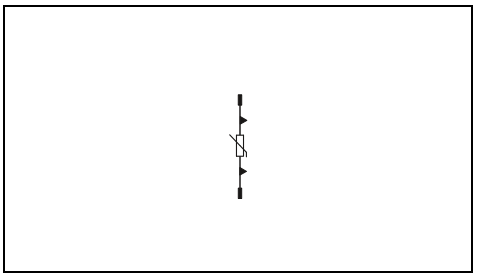
Please follow the installation instructions. These are provided with the packaging documentation or can be downloaded from the corresponding product page online at www.phoenixcontact.net/products.

You can find a list of all possible combination options and safety notes in the download area for the corresponding replacement plug at www.phoenixcontact.net/products.

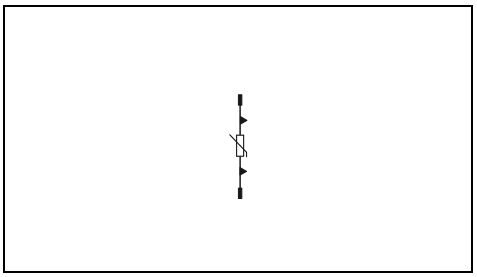
Single-pos.

Single-pos.

Total width 17.7 mm



Total width 17.7 mm



Technical data

Electrical data	... 60 ST	... 120 ST	... 240 ST
IEC category / EN type	II / T2	II / T2	II / T2
Nominal voltage U_N	60 V AC	120 V AC	240 V AC
Maximum continuous operating voltage U_C	75 V AC	150 V AC	275 V AC
Nominal discharge surge current I_n (8/20) µs	10 kA	20 kA	20 kA
Residual voltage at 5 kA	≤ 325 V	≤ 550 V	≤ 1 kV
Protection level U_P	≤ 500 V	≤ 800 V	≤ 1.35 kV
Backup fuse max. in acc. with IEC	125 A (gL (AC))		
General data			
Dimensions W / H / D	17.7 mm / 52.4 mm / 54.5 mm		
Temperature range	-40 °C ... 80 °C		
Degree of protection in acc. with IEC 60529/ EN 60529	IP20		
Housing material	PA 6.6		
Inflammability class in acc. with UL 94	V0		
Test standards	IEC 61643-1 / DIN EN 61643-11 / DIN EN 61643-11/A11 / UL 1449 / IEEE C62.1 / C62.34 / C62.45		

Technical data

Electrical data	... 277 ST	... 347 ST	... 480 ST
IEC category / EN type	II / T2	II / T2	II / T2
Nominal voltage U_N	277 V AC	347 V AC	480 V AC
Maximum continuous operating voltage U_C	385 V AC	440 V AC	580 V AC
Nominal discharge surge current I_n (8/20) µs	20 kA	20 kA	15 kA
Residual voltage at 5 kA	≤ 1.35 kV	≤ 1.5 kV	≤ 2.1 kV
Protection level U_P	≤ 1.8 kV	≤ 2.2 kV	≤ 2.5 kV
Backup fuse max. in acc. with IEC	125 A (gL)		
General data			
Dimensions W / H / D	17.7 mm / 52.4 mm / 54.5 mm		
Temperature range	-40 °C ... 80 °C		
Degree of protection in acc. with IEC 60529/ EN 60529	IP20		
Housing material	PA 6.6		
Inflammability class in acc. with UL 94	V0		
Test standards	IEC 61643-1 / EN 61643-11/A11 / NF C61-740		

Ordering data

Description	Nominal voltage U_N	Type	Order No.	Pcs. / Pkt.
VALVETRAB surge protection plug				
	60 V AC	**VAL-US 60 ST**	**2800738**	10
	120 V AC	**VAL-US 120 ST**	**2800739**	10
	240 V AC	**VAL-US 240 ST**	**2800740**	10
	277 V AC	**VAL-US 277 ST**	**2800741**	10
	347 V AC	**VAL-US 347 ST**	**2800742**	10
	480 V AC	**VAL-US 480 ST**	**2800743**	10

Accessories

VALVETRAB, base element for 4-wire systems, L1, L2, L3, PEN, for individual assembly with VAL-MS...ST				
with remote indication contact	3L-PEN	**VAL-MS/3+0-BE/FM**	**2881803**	1
without remote indication contact	3L-PEN	**VAL-MS/3+0-BE**	**2881816**	1
VALVETRAB, base element for 3-wire systems, L1, L2, PEN, for individual assembly with VAL-MS...ST				
with remote indication contact	2L-GND	**VAL-MS/2+0-BE/FM**	**2805321**	1
without remote indication contact	2L - PEN	**VAL-MS/2+0-BE**	**2804584**	1
VALVETRAB, single-position base element				
with remote indication contact		**VAL-MS BE/FM**	**2817738**	10
without remote indication contact		**VAL-MS BE**	**2817741**	10

Type 2 surge arresters VALVETRAB MS 65/80 kA performance class

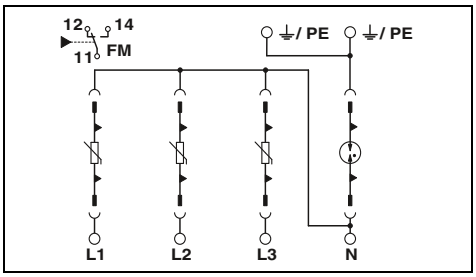
- Multi-channel type 2 arrester
- Type 2 seamless plug-in surge arrester
- Secure hold of connectors in the event of high lightning current loads and strong vibration thanks to new latching
- Disconnect device on each individual connector
- Optical, mechanical status indication for the individual arresters
- With or without floating remote indication contact
- Mechanical keying of all slots
- Connectors can be checked with CHECKMASTER

Notes:

For certifications, see page 154

5-conductor system; L1, L2, L3, N, PE

Total width 71.2 mm



Technical data

Electrical data		.. 385/65	.. 385/80
IEC category / EN type		II / T2	II / T2
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)	240 V AC (230/400 V AC ... 240/415 V AC)
Maximum continuous operating voltage U_C	L-N / N-PE / L-PEN	385 V AC / 264 V AC / -	385 V AC / 264 V AC / -
Nominal discharge surge current I_n (8/20) µs	L-N / N-PE / L-PEN	30 kA / 40 kA / -	40 kA / 40 kA / -
Max. discharge surge current $I_{max.}$ (8/20) µs	L-N / N-PE / L-PEN	65 kA / 80 kA / -	80 kA / 80 kA / -
Residual voltage at 5 kA	L-N / N-PE / L-PEN	≤ 1.25 kV / ≤ 0.5 kV / -	≤ 1.25 kV / ≤ 0.5 kV / -
Protection level U_P	L-N / N-PE / L-PEN	≤ 1.8 kV / ≤ 1.7 kV / -	≤ 2 kV / ≤ 1.7 kV / -
Response time t_A	L-N / N-PE / L-PEN	≤ 25 ns / ≤ 100 ns / -	≤ 25 ns / ≤ 100 ns / -
Backup fuse max. in acc. with IEC		250 A (gL/gG)	
Immunity to short-circuiting (with max. backup fuse) I_P		25 kA	

General data	
Dimensions W / H / D	71.2 mm / 99 mm / 77.5 mm
Connection data solid / stranded / AWG	1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2
Temperature range	-40 °C ... 80 °C
Inflammability class in acc. with UL 94	V0
Test standards	IEC 61643-1 / EN 61643-11/A11
Remote indication contact	PDT, 1-pos.
Connection data solid / stranded / AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage	250 V AC
Max. operating current	1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)
Min. operational current	5 mA (5 V)

Ordering data

Description	I_{max}	U_C	Type	Order No.	Pcs. / Pkt.
VALVETRAB MS					
with remote indication contact	65 kA	385 V AC	**VAL-MS 385/65/3+1-FM**	**2920887**	1
without remote indication contact	65 kA	385 V AC	**VAL-MS 385/65/3+1**	**2920890**	1
VALVETRAB MS					
with remote indication contact	80 kA	385 V AC	**VAL-MS 385/80/3+1-FM**	**2920968**	1
without remote indication contact	80 kA	385 V AC	**VAL-MS 385/80/3+1**	**2920971**	1

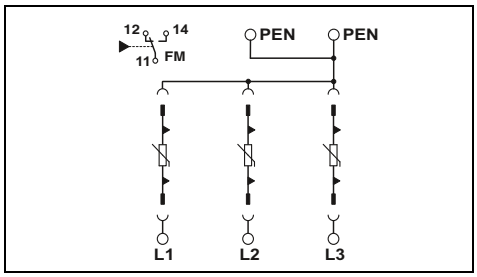
Accessories

Replacement connector				
For VAL-MS 385/65...	1L-N/PE	**VAL-MS 385/65 ST**	**2920308**	10
For VAL-MS 385/80...	1L-N/PE	**VAL-MS 385/80 ST**	**2920353**	10
	N-PE	**F-MS 80 ST**	**2921307**	10
Marking material		ZBN 18 ..., see page 63		

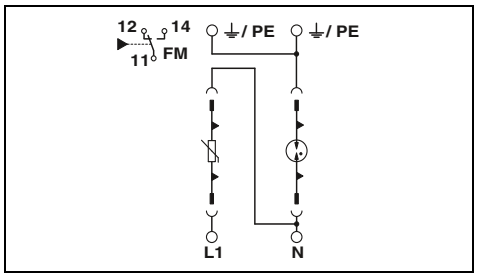
4-conductor system; L1, L2, L3, PEN

3-conductor system; L, N, PE

Total width 53.4 mm



Total width 35.6 mm



Technical data

.. 385/65	.. 385/80
II / T2	II / T2
240 V AC (230/400 V AC ... 240/415 V AC)	240 V AC (230/400 V AC ... 240/415 V AC)
- / - / 385 V AC	- / - / 385 V AC
- / - / 90 kA (all channels)	- / - / 120 kA (all channels)
- / - / 150 kA (all channels)	- / - / 200 kA (all channels)
- / - / ≤ 1.2 kV	- / - / ≤ 1.2 kV
- / - / ≤ 1.8 kV	- / - / ≤ 2 kV
- / - / ≤ 25 ns	- / - / ≤ 25 ns
250 A (gL/gG)	
25 kA	
53.4 mm / 99 mm / 77.5 mm	
1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11/A11	
PDT, 1-pos.	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC	
1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)	
5 mA (5 V)	

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 385/65/3+0-FM	**2921006**	1
VAL-MS 385/65/3+0	**2921019**	1
VAL-MS 385/80/3+0-FM	**2921080**	1
VAL-MS 385/80/3+0	**2921093**	1

Accessories

VAL-MS 385/65 ST	**2920308**	10
VAL-MS 385/80 ST	**2920353**	10

ZBN 18 ..., see page 63

Technical data

.. 385/65	.. 385/80
II / T2	II / T2
240 V AC (230 V AC ... 240 V AC)	240 V AC (230 V AC ... 240 V AC)
385 V AC / 264 V AC / -	385 V AC / 264 V AC / -
30 kA / 40 kA / -	40 kA / 40 kA / -
65 kA / 80 kA / -	80 kA / 80 kA / -
≤ 1.2 kV / ≤ 0.5 kV / -	≤ 1.2 kV / ≤ 0.5 kV / -
≤ 1.8 kV / ≤ 1.7 kV / -	≤ 2 kV / ≤ 1.7 kV / -
≤ 25 ns / ≤ 100 ns / -	≤ 25 ns / ≤ 100 ns / -
250 A (gL/gG)	
25 kA	
35.6 mm / 99 mm / 77.5 mm	
1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / EN 61643-11/A11	
PDT, 1-pos.	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC	
1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)	
5 mA (5 V)	

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 385/65/1+1-FM	**2921242**	1
VAL-MS 385/65/1+1	**2921255**	1
VAL-MS 385/80/1+1-FM	**2921284**	1
VAL-MS 385/80/1+1	**2921297**	1

Accessories

VAL-MS 385/65 ST	**2920308**	10
VAL-MS 385/80 ST	**2920353**	10
F-MS 80 ST	**2921307**	10

ZBN 18 ..., see page 63

Surge protection for special applications

- Universal pluggability
- Also suitable for industry solutions, e.g., in the rail and telecommunications sectors
- Thermal disconnect device for each individual connector
- Optical, mechanical status indication for the individual arresters
- With or without floating remote indication contact
- Mechanical keying of all slots
- Connectors can be checked with CHECKMASTER

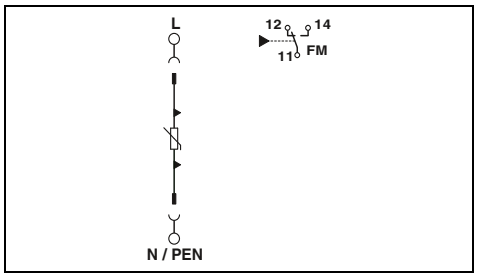
For nominal voltages up to 48 V DC

For nominal voltages up to 48 V AC

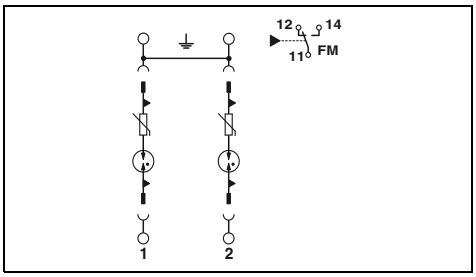
Notes:

For certifications, see page 154

Total width 17.5 mm



Total width 35.6 mm



Technical data

Electrical data			
IEC category / EN type		I, II / T1, T2	
Nominal voltage U_N		60 V AC/DC	
Maximum continuous operating voltage U_C	AC/DC	75 V AC / 100 V DC	
Nominal discharge surge current I_n (8/20) µs		12.5 kA	
Max. discharge surge current $I_{max.}$ (8/20) µs		30 kA	
Residual voltage at 5 kA		≤ 0.3 kV	
Protection level U_P		≤ 0.4 kV	
Response time t_A		≤ 25 ns	
Backup fuse max. in acc. with IEC		160 A (gL/gG)	
General data			
Dimensions W / H / D		17.5 mm / 97 mm / 77.5 mm	
Connection data solid / stranded / AWG		1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
Temperature range		-40 °C ... 80 °C	
Inflammability class in acc. with UL 94		V0	
Test standards		IEC 61643-11 / EN 61643-11/A11	
Remote indication contact		PDT, 1-pos.	
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
Max. operating voltage		250 V AC	
Max. operating current		1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)	

Technical data

Base element	Plug
-	II / T2
240 V AC (415 V AC)	48 V AC (5 V...48 V AC)
-	75 V AC / 100 V DC
-	10 kA
-	20 kA
-	≤ 350 V
-	≤ 1.4 kV
-	≤ 100 ns
63 A (gL / gG)	63 A (gL / gG)
35.6 mm / 97 mm / 51.5 mm	
1 ... 35 mm² / 1 ... 25 mm² / 18 - 2	
-40 °C ... 80 °C	
V0	
IEC 61643-1 / DIN EN 61643-11 / DIN EN 61643-11/A11	
PDT, 1-pos.	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V	
1.5 A AC (250 V AC) / 1 A DC (30 V DC)	

Ordering data

Description	U_C	Type	Order No.	Pcs. / Pkt.
VALVETRAB-MS, varistor-based lightning arrester				
with remote indication contact	75 V AC	**VAL-MS-T1/T2 48/12.5/1+0-FM**	**2801240**	1
without remote indication contact	75 V AC	**VAL-MS-T1/T2 48/12.5/1+0**	**2801241**	1
Protective plug, for inserting in base element				
	75 V AC			
Base element, for individual assembly with protective plugs				
with remote indication contact				

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 75 VF ST	**2805318**	10
VAL-MS/2+0-BE/FM/S2	**2800246**	1

Accessories

Replacement connector			
	L-N / L-PEN	**VAL-MS-T1/T2 48/12.5 ST**	**2801242**	10
Labeling material		ZBN 18 ..., see page 63		

Accessories

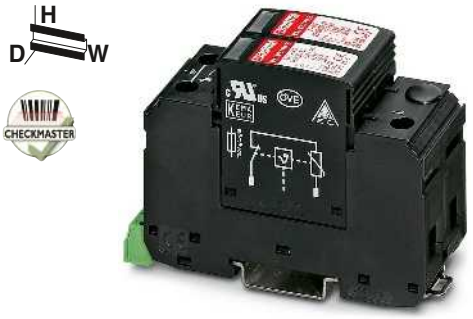
ZBN 18 ..., see page 63		

Surge protection for use in wind power plants

- For power supplies with higher supply voltages
- Other solutions for power supplies $U_N \geq 400$ V available on request
- Universal pluggability
- Thermal disconnect device for each individual connector
- Optical, mechanical status indication for the individual arresters
- With or without floating remote indication contact
- Mechanical keying of all slots
- Connectors can be checked with CHECKMASTER

Notes:

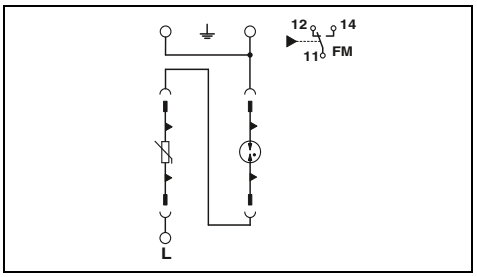
For certifications, see page 154



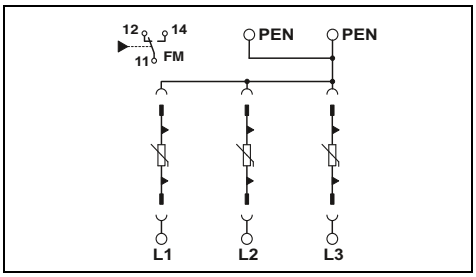
Free of leakage current, for nominal voltages up to 690 V AC, e.g., rotor protection for wind power plants

4-conductor system; L1, L2, L3, PEN (554/960 V TN-C system)

Total width 35.6 mm



Total width 53.4 mm



Technical data

Electrical data			
IEC category / EN type		II / T2	II / T2
Nominal voltage U_N		690 V AC	554 V AC (554/960 V AC TN-C)
Maximum continuous operating voltage U_C		800 V AC	750 V AC
Nominal discharge surge current I_n (8/20) µs		15 kA	-
	L-PEN	-	45 kA (all channels)
Protection level U_P		≤ 5 kV	-
	L-PEN	-	≤ 2.7 kV
Response time t_A		≤ 100 ns	-
	L-PEN	-	≤ 25 ns
General data			
Dimensions W / H / D		35.6 mm / 97 mm / 65.5 mm	53.4 mm / 99 mm / 65.5 mm
Connection data solid / stranded / AWG		1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2
Temperature range		-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	IP20
Test standards		IEC 61643-1 / DIN EN 61643-11 / DIN EN 61643-11/A11	IEC 61643-1 / DIN EN 61643-11 / DIN EN 61643-11/A11
Remote indication contact		PDT, 1-pos.	PDT
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage		250 V AC / 30 V DC	250 V AC / 30 V DC
Max. operating current		1.5 A AC (250 V AC) / 1 A DC (30 V DC)	1.5 A AC (250 V AC) / 1 A DC (30 V DC)

Ordering data

Description		Type	Order No.	Pcs. / Pkt.
VALVETRAB MS, for mounting on NS 35				
with remote indication contact		**VAL-MS 800/30 VF/FM**	**2805402**	1
without remote indication contact				

Accessories

Replacement connector				
	1L-N/PE	**VAL-MS 750/30-ST**	**2920256**	10
		F-MS 2200/30 ST	**2805392**	10
Labeling material		ZBN 18 ..., see page 63		

Technical data

Electrical data		
IEC category / EN type		II / T2
Nominal voltage U_N		554 V AC (554/960 V AC TN-C)
Maximum continuous operating voltage U_C		750 V AC
Nominal discharge surge current I_n (8/20) µs		-
	L-PEN	45 kA (all channels)
Protection level U_P		-
	L-PEN	≤ 2.7 kV
Response time t_A		-
	L-PEN	≤ 25 ns
General data		
Dimensions W / H / D		53.4 mm / 99 mm / 65.5 mm
Connection data solid / stranded / AWG		1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2
Temperature range		-40 °C ... 80 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Test standards		IEC 61643-1 / DIN EN 61643-11 / DIN EN 61643-11/A11
Remote indication contact		PDT
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage		250 V AC / 30 V DC
Max. operating current		1.5 A AC (250 V AC) / 1 A DC (30 V DC)

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 750/30/3+0-FM	**2920272**	1
VAL-MS 750/30/3+0	**2920269**	1

Accessories

VAL-MS 750/30-ST	**2920256**	10
ZBN 18 ..., see page 63		

Type 2 surge arresters with RCD Combi-RCD

- For 5-conductor systems; L1, L2, L3, N, PE
- Combination of type 2 surge arrester and RCD residual current circuit breaker
- Personal protection and device protection in a single device
- Type 2 seamless plug-in surge arrester
- Disconnect device on each individual connector
- Optical, mechanical status indication for all protective connectors
- Residual current circuit breaker is not triggered by magnetic influences caused by discharge currents in the type 2 arrester
- Connectors can be checked with CHECKMASTER

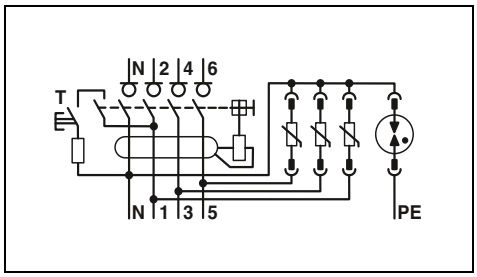
Notes:

For certifications, see page 154

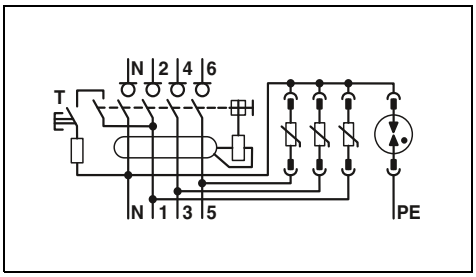
With selective RCD residual current circuit breaker, 300 mA

With selective RCD residual current circuit breaker, 30 mA

Total width 121 mm



Total width 121 mm



Technical data

Electrical data			
IEC category / EN type		II / T2	II / T2
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)	240 V AC (230/400 V AC ... 240/415 V AC)
Maximum continuous operating voltage U_C			
	L-N / N-PE	350 V AC / 264 V AC	350 V AC / 264 V AC
Nominal discharge surge current I_n (8/20) µs			
	L-N / N-PE	60 kA (all channels) / 20 kA	60 kA (all channels) / 20 kA
Max. discharge surge current $I_{max.}$ (8/20) µs			
	L-N / N-PE	90 kA (all channels) / 30 kA	90 kA (all channels) / 30 kA
Residual voltage at 5 kA	L-N / N-PE	≤ 1.2 kV / ≤ 0.3 kV	≤ 1.2 kV / ≤ 0.3 kV
Protection level U_P			
	L-N / N-PE	≤ 2 kV / ≤ 2 kV	≤ 2 kV / ≤ 2 kV
Response time t_A			
	L-N / N-PE	≤ 25 ns / ≤ 100 ns	≤ 25 ns / ≤ 100 ns
General data			
Dimensions W / H / D		121 mm / 90 mm / 76 mm	121 mm / 90 mm / 76 mm
Connection data solid / stranded / AWG		4 ... 16 mm² / 4 ... 16 mm² / 12 - 4	4 ... 16 mm² / 4 ... 16 mm² / 12 - 4
Temperature range		-25 °C ... 40 °C	-25 °C ... 40 °C
Inflammability class in acc. with UL 94		V0	V0
Test standards		IEC 61643-1 / EN 61643-11 / IEC 61008-1 / IEC 61008-1/A11 / IEC 61008-2-1 / IEC 60947-3	IEC 61643-1 / EN 61643-11 / IEC 61008-1 / IEC 61008-1/A11 / IEC 61008-2-1 / IEC 60947-3
RCD data			
Class		A selective	A
Nominal load current I_L		40 A	40 A
Dimensioning error current		300 mA	30 mA
Rated making and breaking capacity I_m		630 A	1.5 kA
Rated residual making and breaking capacity $I_{\Delta m}$		630 A	2.5 kA
Surge withstand capability		6 kV (1.2/50 µs)	6 kV (1.2/50 µs)
Immunity to short-circuiting I_{nc}		10 kA Back-up fuse: 63 A	10 kA Back-up fuse: 63 A
Tripping time for $I_{\Delta n}$		≤ 300 ms	≤ 300 ms
Tripping time for $5xI_{\Delta n}$		≤ 40 ms	≤ 40 ms
Cycles, max.		20000	20000
Utilization category		AC 23 A	AC 23 A

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
VALVETRAB compact with RCD			
	VAL-CP-RCD-3S/40/0.3/SEL	**2808001**	1

Accessories

Replacement connector			
L-N / L-PEN	**VAL-CP-350-ST-GY**	**2882718**	10
N-PE	**VAL-CP-N/PE-350-ST-GY**	**2882734**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-CP-RCD-3S/40/0.03	**2882802**	1

Accessories

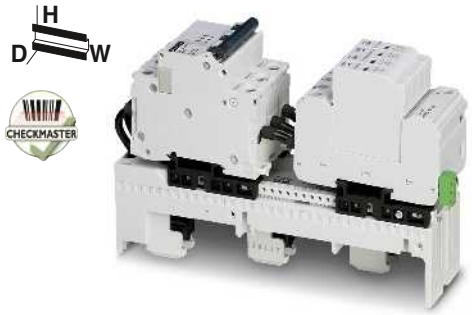
VAL-CP-350-ST-GY	**2882718**	10
VAL-CP-N/PE-350-ST-GY	**2882734**	10

Type 2 surge arresters for 60 mm system technology Combi-MCB

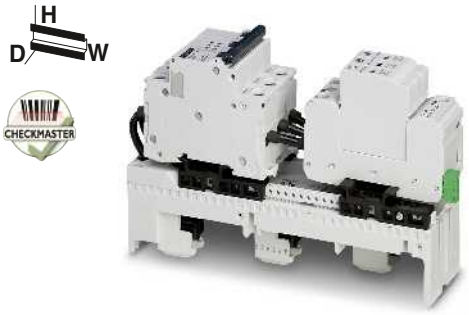
- Combinations of type 2 arresters with integrated arrester backup fuse
- For 60 mm system technology
- Tool-free mounting on 5 and 10 mm busbars
- Signaling to monitoring systems via remote indication contact in the event of an error
- Surge-proof arrester backup fuse tailored to type 2 arresters
- Type 2 seamless plug-in surge arrester
- Disconnect device on each individual connector
- Optical, mechanical status indication for the individual arresters
- Connectors can be checked with CHECKMASTER

Notes:

For certifications, see page 154

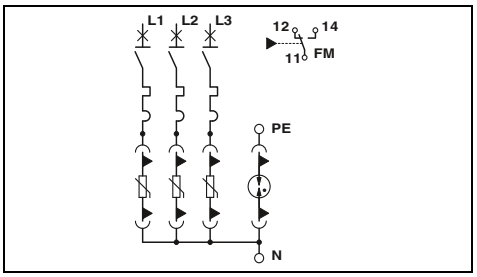


5-conductor system; L1, L2, L3, N, PE

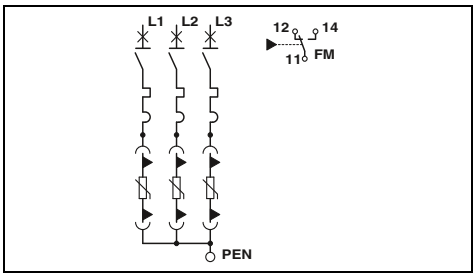


4-conductor system; L1, L2, L3, PEN

Total width 54 mm



Total width 54 mm



Technical data

Electrical data			
IEC category / EN type		II / T2	II / T2
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)	240 V AC (230/400 V AC ... 240/415 V AC)
Maximum continuous operating voltage U_C			
	L-N / N-PE / L-PEN	350 V AC / 264 V AC / -	- / - / 350 V AC
Nominal discharge surge current I_n (8/20) µs			
	L-N / N-PE / L-PEN	60 kA (all channels) / 20 kA / -	- / - / 60 kA (all channels)
Max. discharge surge current $I_{max.}$ (8/20) µs			
	L-N / N-PE / L-PEN	75 kA (all channels) / 40 kA / -	- / - / 75 kA (all channels)
Residual voltage at 5 kA	L-N / N-PE / L-PEN	≤ 1.8 kV / ≤ 0.25 kV / -	- / - / ≤ 1.8 kV
Protection level U_P			
	L-N / N-PE / L-PEN	≤ 2.5 kV / ≤ 1.5 kV / -	- / - / ≤ 2.5 kV
Response time t_A			
	L-N / N-PE / L-PEN	≤ 25 ns / ≤ 100 ns / -	- / - / ≤ 25 ns
Backup fuse max. in acc. with IEC		(Not required)	(Not required)
Immunity to short-circuiting (with max. backup fuse) I_P		25 kA	25 kA
Rated surge current resistance I_{pk}		52 kA	52 kA
General data			
Dimensions W / H / D		54 mm / 220 mm / 110 mm	54 mm / 220 mm / 110 mm
Connection data solid / stranded / AWG		2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4	2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4
Temperature range		-25 °C ... 60 °C	-25 °C ... 60 °C
Inflammability class in acc. with UL 94		V0	V0
Test standards		IEC 61643-1 / EN 61643-11 / EN 61643-11/A11	IEC 61643-1 / EN 61643-11 / EN 61643-11/A11
Remote indication contact		PDT	PDT
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage		250 V AC / 125 V DC	250 V AC / 125 V DC
Max. operating current		1 A AC (ohmic) / 0.2 A DC (ohmic)	1 A AC (ohmic) / 0.2 A DC (ohmic)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
VALVETRAB compact			
	VAL-CP-MOSO 60-3S-FM	**2804403**	1

Accessories

Replacement connector			
L-N / L-PEN	**VAL-CP-350-ST-GY**	**2882718**	10
N-PE	**VAL-CP-N/PE-350-ST-GY**	**2882734**	10
Marking material	ZBF 12 ..., see page 63		

Technical data

Electrical data		
IEC category / EN type		II / T2
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)
Maximum continuous operating voltage U_C		
	L-N / N-PE / L-PEN	- / - / 350 V AC
Nominal discharge surge current I_n (8/20) µs		
	L-N / N-PE / L-PEN	- / - / 60 kA (all channels)
Max. discharge surge current $I_{max.}$ (8/20) µs		
	L-N / N-PE / L-PEN	- / - / 75 kA (all channels)
Residual voltage at 5 kA	L-N / N-PE / L-PEN	- / - / ≤ 1.8 kV
Protection level U_P		
	L-N / N-PE / L-PEN	- / - / ≤ 2.5 kV
Response time t_A		
	L-N / N-PE / L-PEN	- / - / ≤ 25 ns
Backup fuse max. in acc. with IEC		(Not required)
Immunity to short-circuiting (with max. backup fuse) I_P		25 kA
Rated surge current resistance I_{pk}		52 kA
General data		
Dimensions W / H / D		54 mm / 220 mm / 110 mm
Connection data solid / stranded / AWG		2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4
Temperature range		-25 °C ... 60 °C
Inflammability class in acc. with UL 94		V0
Test standards		IEC 61643-1 / EN 61643-11 / EN 61643-11/A11
Remote indication contact		PDT
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage		250 V AC / 125 V DC
Max. operating current		1 A AC (ohmic) / 0.2 A DC (ohmic)

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-CP-MOSO 60-3C-FM	**2804416**	1

Accessories

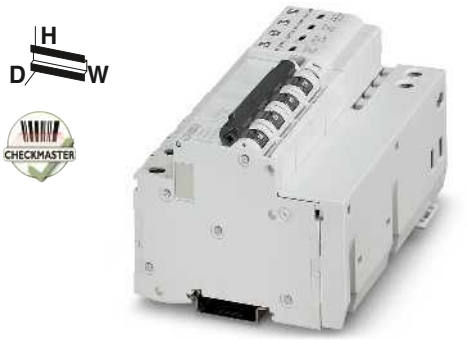
VAL-CP-350-ST-GY	**2882718**	10
ZBF 12 ..., see page 63		

Type 2 surge arresters with integrated backup fuse
Combi-MCB

– Combinations of type 2 arresters with integrated arrester backup fuse
– Overload of the surge protection results in all-pole disconnection from the mains
– Signaling to monitoring systems via remote indication contact in the event of an error
– Surge-proof arrester backup fuse tailored to type 2 arresters
– Type 2 seamless plug-in surge arrester
– Disconnect device on each individual connector
– Optical, mechanical status indication for the individual arresters
– Connectors can be checked with CHECKMASTER

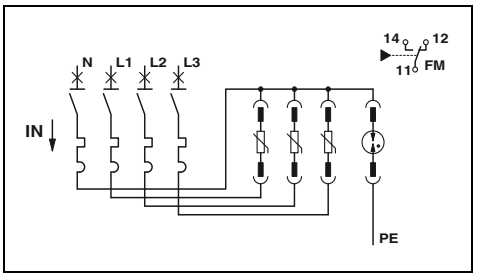
Notes:

For certifications, see page 154



5-conductor system; L1, L2, L3, N, PE

Total width 131.5 mm



Technical data

Electrical data		
IEC category / EN type		II / T2
Nominal voltage U_N		240 V AC (230/400 V AC ... 240/415 V AC)
Maximum continuous operating voltage U_C		
	L-N / N-PE / L-PEN	350 V AC / 264 V AC / -
Nominal discharge surge current I_n (8/20) µs		
	L-N / N-PE / L-PEN	60 kA (all channels) / 20 kA / -
Max. discharge surge current $I_{max.}$ (8/20) µs		
	L-N / N-PE / L-PEN	90 kA (all channels) / 30 kA / -
Residual voltage at 5 kA	L-N / N-PE / L-PEN	≤ 1.3 kV / ≤ 0.5 kV / -
Protection level U_P		
	L-N / N-PE / L-PEN	≤ 2.5 kV / ≤ 1.7 kV / -
Response time t_A		
	L-N / N-PE / L-PEN	≤ 25 ns / ≤ 100 ns / -
Backup fuse max. in acc. with IEC		(Not required)
Immunity to short-circuiting (with max. backup fuse) I_P		25 kA
General data		
Dimensions W / H / D		131.5 mm / 101 mm / 76 mm
Connection data solid / stranded / AWG		2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4
Temperature range		-25 °C ... 60 °C
Inflammability class in acc. with UL 94		V0
Test standards		IEC 61643-1 / EN 61643-11 / IEC 60364-4-443 / IEC 60364-5-534
Remote indication contact		PDT, 1-pos.
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage		250 V AC / 250 V DC
Max. operating current		2 A AC / 50 mA DC

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
VALVETRAB compact, with an arrester backup fuse	**VAL-CP-MCB-3S-350/40/FM**	**2882750**	1

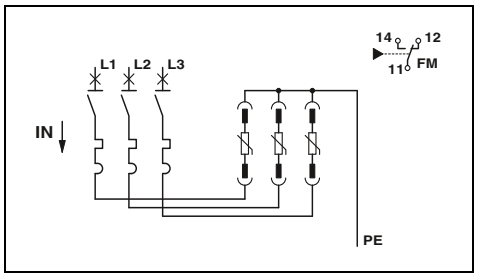
Accessories

Replacement connector			
L-N / L-PEN	**VAL-CP-350-ST-GY**	**2882718**	10
N-PE	**VAL-CP-N/PE-350-ST-GY**	**2882734**	10

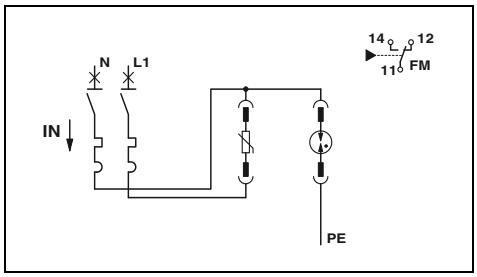
4-conductor system; L1, L2, L3, PEN

3-conductor system; L, N, PE

Total width 114 mm



Total width 72 mm



Technical data

II / T2	II / T2
240 V AC (230/400 V AC ... 240/415 V AC)	240 V AC (230/400 V AC ... 240/415 V AC)
- / - / 350 V AC	350 V AC / 264 V AC / -
- / - / 60 kA (all channels)	20 kA / 20 kA / -
- / - / 90 kA (all channels)	30 kA / 30 kA / -
- / - / ≤ 1.3 kV	≤ 1.3 kV / ≤ 0.5 kV / -
- / - / ≤ 2.5 kV	≤ 2.5 kV / ≤ 1.7 kV / -
- / - / ≤ 25 ns	≤ 25 ns / ≤ 100 ns / -
(Not required)	(Not required)
25 kA	25 kA
114 mm / 101 mm / 76 mm	72 mm / 101 mm / 76 mm
2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4	2.5 ... 25 mm² / 2.5 ... 16 mm² / 12 - 4
-25 °C ... 60 °C	-25 °C ... 60 °C
V0	V0
IEC 61643-1 / EN 61643-11 / IEC 60364-4-443 / IEC 60364-5-534	IEC 61643-1 / EN 61643-11 / IEC 60364-4-443 / IEC 60364-5-534
PDT, 1-pos.	PDT, 1-pos.
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
250 V AC / 250 V DC	250 V AC / 250 V DC
2 A AC / 50 mA DC	2 A AC / 50 mA DC

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-CP-MCB-3C-350/40/FM	**2882776**	1

Accessories

VAL-CP-350-ST-GY	**2882718**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-CP-MCB-1S-350/40/FM	**2882763**	1

Accessories

VAL-CP-350-ST-GY	**2882718**	10
VAL-CP-N/PE-350-ST-GY	**2882734**	10

Type 3 device protection
MAINS-PLUGTRAB

- For single and multi-phase power supply units
- Rail-mountable module
- Comprising base element and connector
- With floating remote indication contact
- Optical signaling of disconnection via LED
- Tool-free connector replacement
- Connectors can be checked with CHECKMASTER

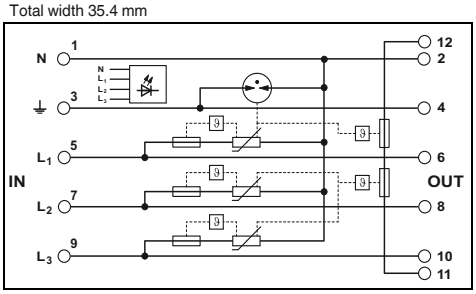
Notes:

For certifications, see page 154

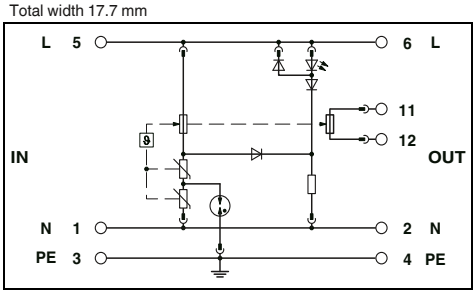
5-conductor system; L1, L2, L3, N, PE

3-conductor system; L, N, PE

Total width 35.4 mm



Total width 17.7 mm



Technical data

Electrical data		... 230AC	
IEC category / EN type		III / T3	
Nominal voltage U_N		230 V AC (max. 240/415 V AC)	
Maximum continuous operating voltage U_C	AC/DC	335 V AC (255 V AC / N-PE) / -	
Nominal load current I_L		26 A (30 °C)	
Nominal discharge surge current I_n (8/20) µs		1.5 kA (per channel)	
Max. discharge surge current $I_{max.}$ (8/20) µs		10 kA (N-PE)	
Combined surge U_{OC}		4 kV	
Protection level U_P	L-N/L(N)-PE	≤ 1.2 kV / ≤ 1.5 kV	
Response time t_A	L-N/L(N)-PE	≤ 25 ns / ≤ 100 ns	
Backup fuse max. in acc. with IEC		25 A (gL)	
General data			
Dimensions W / H / D		35.4 mm / 90 mm / 65.5 mm	
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Temperature range		-40 °C ... 85 °C	
Inflammability class in acc. with UL 94		V0	
Test standards		IEC 61643-1 / EN 61643-11/A11	
		-	
Remote indication contact		N/C contact	
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Max. operating voltage		250 V	
Max. operating current		3 A AC	

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
MAINS-PLUGTRAB, consisting of a plug and base element				
	24 V AC/DC			
	60 V AC			
	120 V AC			
	230 V AC	**PT 4-PE/S-230AC/FM**	**2882459**	5
	48 V DC			
MAINS-PLUGTRAB plug				
	24 V AC			
	60 V AC			
	120 V AC			
	230 V AC	**PT 4-PE/S-230AC-ST**	**2882462**	5
	48 V DC			

Accessories

PLUGTRAB base element, for mounting on NS 35			
Grounding plug			
Marking material	ZBF ..., see page 111		

Technical data

Electrical data	... 24AC	... 60AC	... 120AC	... 230AC
IEC category / EN type	III / T3	III / T3	III / T3	III / T3
Nominal voltage U_N	24 V AC/DC	60 V AC	120 V AC	230 V AC
Maximum continuous operating voltage U_C	34 V AC / 44 V DC	100 V AC / 95 V DC	150 V AC / -	253 V AC / -
Nominal load current I_L	26 A (30 °C)	26 A (30 °C)	26 A (30 °C)	26 A (30 °C)
Nominal discharge surge current I_n (8/20) µs	1 kA	2.5 kA	2.5 kA	3 kA
Max. discharge surge current $I_{max.}$ (8/20) µs		6.5 kA		-
Combined surge U_{OC}	2 kV	4 kV	6 kV	6 kV
Protection level U_P	≤ 180 V / -	≤ 400 V / -	≤ 620 V / ≤ 850 V	≤ 1.1 kV / ≤ 1.5 kV
Response time t_A	≤ 25 ns / ≤ 100 ns	≤ 25 ns / ≤ 100 ns	≤ 25 ns / ≤ 100 ns	≤ 25 ns / ≤ 100 ns
Backup fuse max. in acc. with IEC	25 A (gL)			
General data				
Dimensions W / H / D	17.7 mm / 90 mm / 65.5 mm			
Connection data solid / stranded / AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12			
Temperature range	-40 °C ... 85 °C			
Inflammability class in acc. with UL 94	V0			
Test standards	IEC 61643-1 / EN 61643-11/A11 / UL 1449 ed. 3			
	-			
Remote indication contact	N/C contact			
Connection data solid / stranded / AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12			
Max. operating voltage	250 V			
Max. operating current	3 A AC			

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 2-PE/S-24AC/FM	**2800457**	1
PT 2-PE/S-60AC/FM	**2800961**	10
PT 2-PE/S-120AC/FM	**2856812**	1
PT 2-PE/S-230AC/FM	**2858357**	1

Accessories

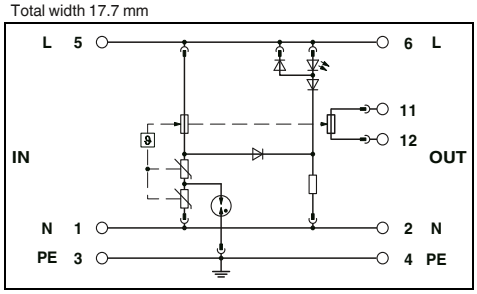
PT-BE/FM	**2839282**	10
PT MAIN-EST	**2880736**	10
ZBF ..., see page 111		

Replacement connector for 3-conductor system; L, N, PE

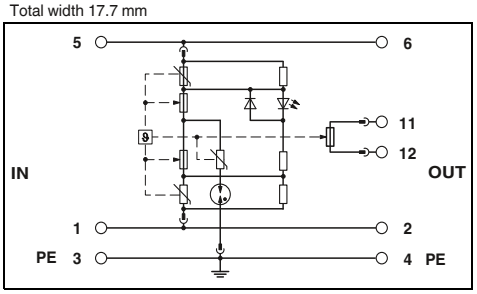
3-conductor system; L, N, PE/L, L, PE (IT system)

3-conductor system, for single-phase DC power supply units

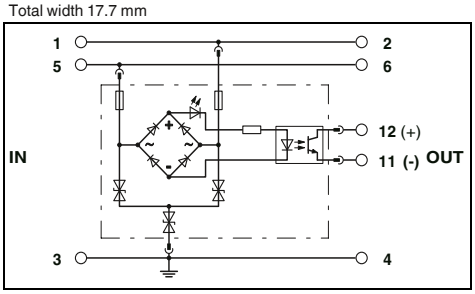
Total width 17.7 mm



Total width 17.7 mm



Total width 17.7 mm



Technical data

... 24AC	... 60AC	... 120AC	... 230AC
III / T3	III / T3	III / T3	III / T3
24 V AC	60 V AC	120 V AC	230 V AC
34 V AC / 44 V DC	100 V AC / 95 V DC	150 V AC / -	253 V AC / -
26 A (30 °C)	26 A (30 °C)	26 A (30 °C)	26 A (30 °C)
1 kA	2.5 kA	2.5 kA	3 kA
2 kV	4 kV	6 kV	6 kV
≤ 180 V / ≤ 550 V	≤ 400 V / ≤ 700 V	≤ 620 V / ≤ 850 V	≤ 1.1 kV / ≤ 1.5 kV
≤ 25 ns / ≤ 100 ns	≤ 25 ns / ≤ 100 ns	≤ 25 ns / ≤ 100 ns	≤ 25 ns / ≤ 100 ns
25 A (gL)			
17.7 mm / 45 mm / 52 mm			
-			
-40 °C ... 85 °C (non-EX)			
V0			
IEC 61643-1 / EN 61643-11/A11 / UL 1449			
-			
-			
-			
-			

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 2-PE/S- 24AC-ST	**2839318**	10
PT 2-PE/S- 60AC-ST	**2839321**	10
PT 2-PE/S-120AC-ST	**2839334**	10
PT 2-PE/S-230AC-ST	**2839347**	10

Accessories

PT-BE/FM	**2839282**	10

ZBF ..., see page 111

Technical data

... 230AC
III / T3
230 V AC
275 V AC / -
26 A (30 °C)
3 kA
8 kA
6 kV
≤ 1.2 kV / ≤ 1.5 kV
≤ 25 ns / ≤ 100 ns
25 A (gL/C)
17.7 mm / 90 mm / 65.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
-40 °C ... 75 °C
V0
IEC 61643-1 / EN 61643-11/A11
-
N/C contact
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
250 V
3 A AC/DC

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 2-IT-230AC/FM	**2805130**	1
PT 2-IT-230AC-ST	**2805127**	10

Accessories

PT-BE/FM	**2839282**	10
PT MAIN-EST	**2880736**	10

ZBF ..., see page 111

Technical data

... 48DC
III / T3
48 V DC
- / 60 V DC -
26 A (30 °C)
500 A
500 A
6 kV (for 12 Ω)
≤ 120 V / ≤ 120 V
≤ 1 ns / ≤ 1 ns
25 A (gL)
17.7 mm / 90 mm / 65.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
-40 °C ... 85 °C
V0
IEC 61643-1 / EN 61643-11/A11 / BS 6651 / ANSI/IEEE C62.41 / EN 50082-2
N/C contact
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
250 V
3 A AC

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 2+1-S-48DC/FM	**2817958**	10
PT 2+1-S-48DC-ST	**2839648**	10

Accessories

PT-BE/FM	**2839282**	10
PT MAIN-EST	**2880736**	10

ZBF ..., see page 111

Type 3 device protection BLOCKTRAB and PRINTRAB

BT-1S-230AC/... is device protection in deep installation boxes (in acc. with DIN 49073), cable ducts, underfloor systems, and termination devices.
– With double spring-cage terminal blocks for tool-free conductor connection
– Side latches for easy fixing
– Optical/acoustic signaling of disconnection

BT-SKT 230/A is device protection for UP sockets.
– Independent of the switch range and pin arrangement
– Is mounted on the socket insert
– For installation boxes as per DIN 49073
– Bridges provided for multiple combination
– Subsequent on-site installation possible
– Thermally monitored protective circuit
– Acoustic signaling of disconnection
– Signal deactivation by pulling the link under the socket cover

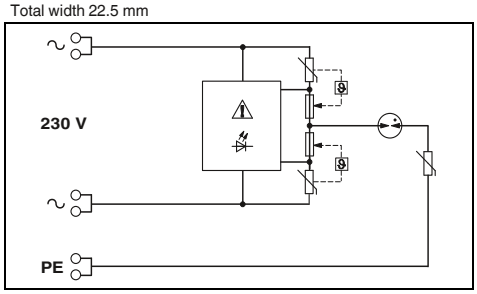
MAINS-PRINTRAB is device protection for installation in cable ducts and installation boxes.
– Two-piece design, consisting of **PRT-S-.../FM** protective connector and **PRT-CD-AD1** flush-type base
– Optical and optical/audible signaling of disconnection
– With floating remote indication contact
– Installation in range of switches with the appropriate central plate possible
– Tool-free connector replacement

Notes:

For certifications, see page 154

For universal mounting, optical signaling

Total width 22.5 mm



Technical data

Electrical data		... 230AC
IEC category / EN type		III / T3
Nominal voltage U_N		240 V AC
Maximum continuous operating voltage U_C	L-N / L-PE	275 V AC / 440 V AC (4-conductor IT system)
Nominal load current I_L		16 A (30 °C)
Nominal discharge surge current I_n (8/20) µs		3 kA
Max. discharge surge current $I_{max.}$ (8/20) µs	L-N / L-PE	8 kA (> 100x 1 kA) / -
Combined surge U_{OC}		6 kV
Protection level U_P	L-N/L(N)-PE	≤ 1.3 kV / -
Response time t_A	L-N/L(N)-PE	≤ 25 ns (L-N) / ≤ 100 ns (L, N-PE)
Backup fuse max. in acc. with IEC		16 A (gL/C/B)
General data		
Dimensions W / H / D		22.5 mm / 43 mm / 26.2 mm
Connection data solid / stranded / AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Temperature range		-30 °C ... 75 °C
Inflammability class in acc. with UL 94		V0
Test standards		EN 61643-11/A11 / IEC 61643-1
Remote indication contact		
Connection data solid / stranded / AWG		-
Max. operating voltage		-
Max. operating current		-

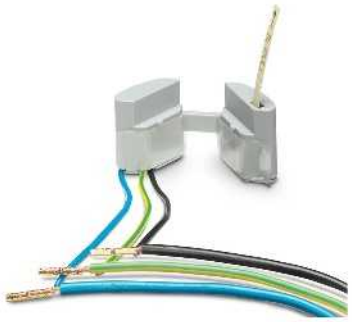
Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
BLOCKTRAB, for universal mounting	240 V AC	**BT-1S-230AC/O**	**2800625**	1
SOCKETTRAB, device protection for installation socket inserts	230 V AC			
MAINS-PRINTRAB, device protection plug with temperature monitoring and optical fault warning, as well as remote indication contact	120 V AC 230 V AC			
MAINS-PRINTRAB, device protection plug with temperature monitoring, optical and acoustic fault warning and remote indicator contact	120 V AC 230 V AC			
MAINS-PRINTRAB, flush-type base for installation in cable ducts and flush-type boxes	230 V AC			

Accessories

Central plate			

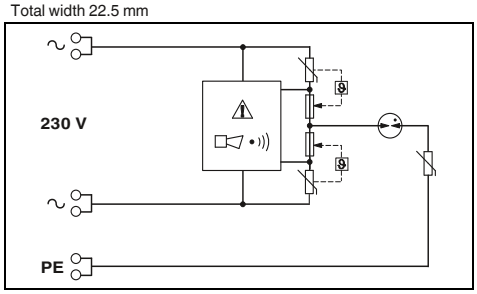
For universal mounting, acoustic signaling

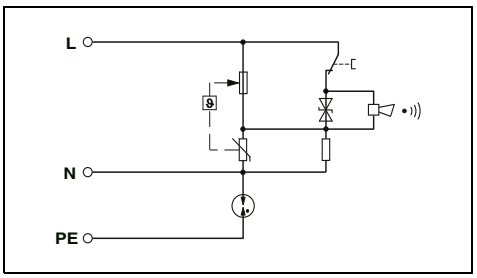


For mounting in flush-type sockets

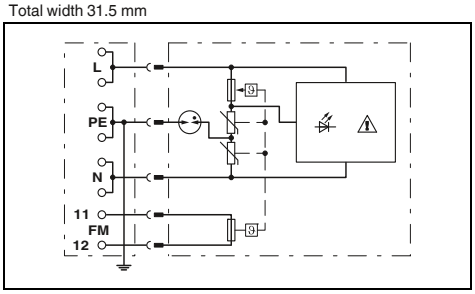
For mounting in cable ducts and installation boxes

Total width 22.5 mm





Total width 31.5 mm



Technical data

... 230AC	
III / T3	
240 V AC	
275 V AC / 440 V AC (4-conductor IT system)	
16 A (30 °C)	
3 kA	
8 kA (> 100x 1 kA) / -	
6 kV	
≤ 1.3 kV / -	
≤ 25 ns (L-N) / ≤ 100 ns (L, N-PE)	
16 A (gL/C/B)	
22.5 mm / 43 mm / 26.2 mm	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
-25 °C ... 75 °C	
V0	
EN 61643-11/A11 / IEC 61643-1	
-	
-	
-	

Technical data

... 230AC	
III / T3	
230 V AC	
335 V AC / -	
16 A (30 °C)	
1.5 kA	
4.5 kA / 4.5 kA	
4 kV	
≤ 1.3 kV / ≤ 1.5 kV	
≤ 25 ns / ≤ 100 ns	
16 A (gL / B)	
-	
- ... - / - ... 1.5 mm² / -	
-25 °C ... 75 °C	
V0	
EN 61643-11/A11 / IEC 61643-1	
-	
-	
-	

Technical data

... 120AC	... 230AC
III / T3	III / T3
120 V AC	230 V AC
150 V AC / 150 V AC	253 V AC / 253 V AC
10 A (CSA)	16 A (45°C)
1.5 kA	1.5 kA
4.5 kA / 4.5 kA	4.5 kA / 4.5 kA
4 kV	4 kV
≤ 600 V / ≤ 800 V	≤ 1.3 kV / ≤ 1.5 kV (at U_{OC})
≤ 25 ns / ≤ 100 ns	≤ 25 ns / ≤ 100 ns
16 A (gL/C)	
31.5 mm / 32.7 mm / 33 mm	
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
-25 °C ... 75 °C	
V0	
IEC 61643-1 / EN 61643-11/A11	
N/C contact	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16	
250 V AC	
3 A	

Ordering data

Type	Order No.	Pcs. / Pkt.
BT-1S-230AC/A	**2803409**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
BT-SKT 230/A	**2859343**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PRT-S-120/FM	**2830618**	10
PRT-S-230/FM	**2749686**	10
PRT-S/A-120/FM	**2830605**	1
PRT-S/A-230/FM	**2830621**	10
PRT-CD-AD1	**2749673**	25

Accessories

Accessories

Accessories

ZP-J/TAE/ST550 WH	**2830362**	10

Type 3 device protection MAINTRAB

– Attachment plug
– For individual termination devices
– With increased touch-proof protection
– Optical signaling of the surge voltage function via LED

Note: More information on other versions of MNT attachment plugs with combined protection for the power supply unit and the interfaces of data/information technology can be found starting on page 126.

Attachment plug

Attachment plug for Powerline transmission

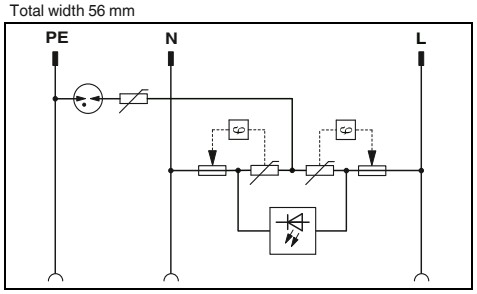
MNT-POWERLINE

– For Powerline transmission systems
– With adapted protective circuit
– Optimized attenuation behavior
– Optical signaling of the surge voltage function via LED

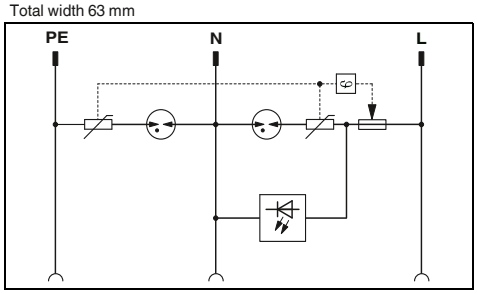
Notes:

For certifications, see page 154

Total width 56 mm



Total width 63 mm



Technical data

Electrical data			
IEC category / EN type		III / T3	III / T3
Nominal voltage U_N		230 V AC	230 V AC
Maximum continuous operating voltage U_C			
	L-N / L-PE	275 V AC / 360 V AC	260 V AC / 260 V AC
Nominal load current I_L		16 A (30 °C)	16 A (30 °C)
Nominal discharge surge current I_n (8/20) µs			
	L-N / L-PE	3 kA / 3 kA	3 kA / 3 kA
Combined surge U_{OC}		4 kV	6 kV
Protection level U_P			
	L-N/N-PE/L-PE	≤ 1.2 kV / ≤ 1.5 kV / ≤ 1.5 kV	≤ 1.1 kV / ≤ 1.5 kV / ≤ 1.5 kV
Response time t_A			
	L-N / L-PE	≤ 25 ns / ≤ 100 ns	≤ 25 ns / ≤ 100 ns
General data			
Dimensions W / H / D		56 mm / 76.3 mm / 78.2 mm	63 mm / 79 mm / 103.5 mm
Temperature range		-25 °C ... 75 °C	-25 °C ... 75 °C
Inflammability class in acc. with UL 94		V0/HB	V0/HB
Test standards		EN 61643-11/A11 / IEC 61643-1 / VDE 0620-1 / SEK SS 428 08 34 / IEC 60884-1 / NEK-HD 195 S6	IEC 61643-1 / EN 61643-11/A11 / IEC 60884-1 / DIN VDE 0620-1

Ordering data

Description	For country-specific use in	Type	Order No.	Pcs. / Pkt.
MAINTRAB, attachment plug with signal lamp for plugging into a socket, for device protection				
Black	D, A, NL	**MNT-1 D**	**2882200**	1
White	D, A, NL	**MNT-1 D/WH**	**2882213**	1
Black	B, F, CZ, SVK, PL	**MNT-NET B/F**	**2882226**	1
Black	E, P	**MNT-1 E**	**2882239**	1
White	S, FIN, N	**MNT-1 S/WH**	**2880862**	1
Black	CH	**MNT-1 CH II**	**2882255**	1
MAINTRAB-POWERLINE, attachment plug with signal lamp for use in Powerline transmission systems				
Black	D, A, NL, E, P	**MNT-POWERLINE**	**2858001**	1

TRABTECH wiring bridges

- For combinations of lightning and surge arresters
- In combination with other devices in the installation distributor, such as residual current circuit breakers and miniature circuit breakers
- Practical wiring of all common applications
- Single, three or four-phase versions with various numbers of positions
- The rated cross section of the MPB bridge metals is 16 mm² per phase
- End covers are used to terminate and insulate individually cut bridges

Ordering data

Description	Nominal current I_N	Type	Order No.	Pcs. / Pkt.
Wiring bridge, for modules with 17.5 mm connecting pitch, 1-phase				
2-pos.	100 A	**MPB 18/1- 2**	**2809209**	10
3-pos.	100 A	**MPB 18/1- 3**	**2809212**	10
4-pos.	100 A	**MPB 18/1- 4**	**2809225**	10
5-pos.	100 A	**MPB 18/1- 5**	**2817864**	10
6-pos.	100 A	**MPB 18/1- 6**	**2748564**	10
7-pos.	100 A	**MPB 18/1- 7 BU**	**2856278**	10
8-pos.	100 A	**MPB 18/1- 8 BU**	**2858470**	10
8-pos.	100 A	**MPB 18/1- 8**	**2748577**	10
9-pos.	100 A	**MPB 18/1- 9**	**2748580**	10
12-pos.	100 A	**MPB 18/1-12**	**2748593**	10
57-pos.	100 A	**MPB 18/1-57**	**2809238**	1
Wiring bridge, for modules with 17.5 mm connecting pitch, 3-phase				
6-pos.	80 A	**MPB 18/3- 6**	**2809241**	10
9-pos.	80 A	**MPB 18/3- 9**	**2809254**	10
Wiring bridge, for modules with 17.5 mm connecting pitch, 4-phase				
8-pos.	80 A	**MPB 18/4- 8**	**2809283**	10
12-pos.	80 A	**MPB 18/4-12**	**2809296**	10
Wiring bridge, flexible, diameter 16 mm², fork-type cable lug on one side				
200 mm	100 A (30 °C)	**MPB F200X16/ 1GS**	**2818339**	1
400 mm	100 A (30 °C)	**MPB F400X16/ 1GS**	**2818342**	1
600 mm	100 A (30 °C)	**MPB F600X16/ 1GS**	**2818355**	1

Feed-through terminal block

- Biconnect feed-through terminal block
- For wiring mixed combinations of lightning and surge arresters
- As a system extension for FLASHTRAB and VALVETRAB applications

Notes:

For certifications, see page 154

Feed-through terminal block

Technical data

Electrical data	
Maximum continuous operating voltage U_C	500 V AC/DC
Nominal current I_N	125 A (30 °C)
Lightning test curr. I_{imp} (10/350) µs	
Peak value	100 kA
General data	
Dimensions W / H / D	17.7 mm / 89.8 mm / 65.5 mm
Connection data solid / stranded / AWG	35 ... 0.5 mm² / 0.5 ... 25 mm² / 20 - 2
Temperature range	-40 °C ... 85 °C
Inflammability class in acc. with UL 94	V0
Test standards	IEC 60947-7-1 / IEC 60947-7-1 / IEC 60947-7-1

Ordering data

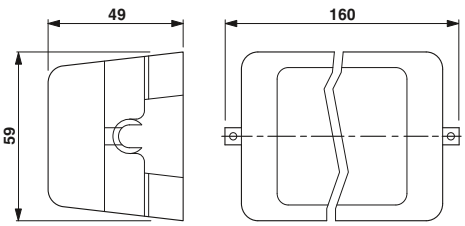
Description	Type	Order No.	Pcs. / Pkt.
Feed-through terminal block	**DK-BIC-35**	**2749880**	1

Accessories

Marking material	ZBN 18 ..., see page 63

Equipotential bonding

- Equipotential bonding strip for main equipotential bonding according to DIN VDE 0100
- As well as for lightning protection equipotential bonding in acc. with DIN EN 62305
- Has a comb-shaped contact bar



Equipotential bonding strip

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Equipotential bonding strip	**PAS-1**	**2765615**	1

Labeling material

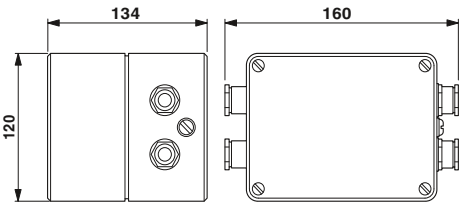
– Flat zack marker strips
– Comprising five individual labels with 17.5 mm pitch.
– Can be labeled with CMS computer marking system or by hand using B-STIFT

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Marking labels			
Can be labeled acc. to customer specifications	**ZBN 18 CUS**	**0825059**	1
unprinted	**ZBN 18:UNBEDRUCKT**	**2809128**	10
L1, L2, L3, N, ⏚	**ZBN 18,LGS:L1-N,ERDE**	**2749576**	10
⏚, ⏚, ⏚, ⏚, ⏚	**ZBN 18,LGS:ERDE**	**2749589**	10
Zack marker sheet, flat, 120-section, can be separated			
Can be labeled acc. to customer specifications	**ZBFM 5 CUS**	**0825037**	1
unprinted	**ZBFM 5/WH:UNBEDRUCKT**	**0803595**	10
Zack marker strip, flat, 5-section, without color print			
5-section	**ZBF 12:UNBEDRUCKT**	**0809735**	10

TRABTECH housing

– For separate installation of surge protective devices
– Use in harsh environmental conditions at the installation location
– Installation outdoors or indoors possible
– Aluminum housing equipped with two cable glands
– Supplied as standard: an NS 35/7.5 DIN rail
– The DIN rail requires five part width sections of 17.5 mm each



IP65 protection class

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
TRABTECH housing, for the isolated mounting of surge arresters			
	TG 40	**2788896**	1

Lightning and surge arresters for PV systems

- Type 1 and type 2 consistent plug-in arresters
- Reliable contact, thanks to integrated rotating latch
- Optical, mechanical status indication for the individual arresters
- With or without floating remote indication contact
- Mechanical keying of all slots

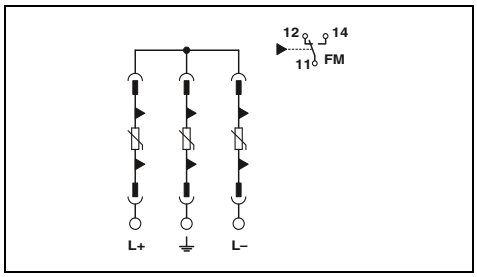
Notes:

For certifications, see page 154

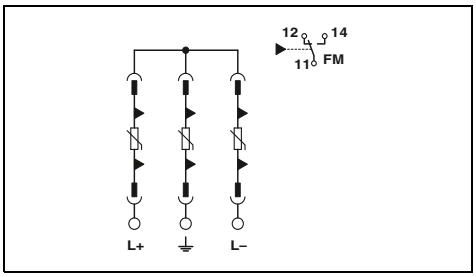
Type 1/2 arrester for insulated and single-sided grounded PV applications

Type 2 arrester for insulated and single-sided grounded PV applications

Total width 53.4 mm



Total width 53.4 mm



Technical data

Electrical data	... 1000 DC	... 600 DC
IEC category / EN type	PV-T1 / PV-T2	PV-T1 / PV-T2
Nominal discharge surge current I_n (8/20) µs	15 kA	15 kA
Max. discharge surge current $I_{max.}$ (8/20) µs	40 kA	40 kA
Protection level U_P		
(L+) - (L-) / (L+/L-) - PE	≤ 3.5 kV / ≤ 3.5 kV	≤ 2.6 kV / ≤ 2.6 kV
Non-load voltage U_{OCSTC}	≤ 875 V DC	≤ 600 V DC
Highest continuous voltage U_{CPV}	1050 V DC	720 V DC
Immunity to short-circuiting I_{SCPV}	300 A	300 A
Response time tA:	≤ 25 ns	≤ 25 ns
General data		
Dimensions W / H / D	53.4 mm / 99 mm / 65.5 mm	
Connection data solid / stranded / AWG	1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
Temperature range	-40 °C ... 80 °C	
Degree of protection in acc. with IEC 60529/ EN 60529	IP20	
Housing material	PBT / PA	
Inflammability class in acc. with UL 94	V0	
Test standards	EN 50539-11	
Remote indication contact	PDT, 1-pos.	
Connection data solid / stranded / AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 30 - 14	
Max. operating voltage	250 V AC / 30 V	
Max. operating current	1.5 A AC (250 V AC) / 1 A DC (30 V DC)	

Technical data

	... 1000 DC	... 600 DC
	PV-T2 /	PV-T2 /
	15 kA	15 kA
	40 kA	40 kA
	≤ 3.7 kV / ≤ 3.7 kV	≤ 2.7 kV / ≤ 2.7 kV
	≤ 970 V DC	≤ 670 V DC
	1170 V DC	800 V DC
	300 A	300 A
	≤ 25 ns	≤ 25 ns
	53.4 mm / 99 mm / 65.5 mm	
	1.5 ... 35 mm² / 1.5 ... 25 mm² / 15 - 2	
	-40 °C ... 80 °C	
	IP20	
	PBT / PA	
	V0	
	EN 50539-11	
	PDT, 1-pos.	
	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 30 - 14	
	250 V AC / 30 V	
	1.5 A AC (250 V AC) / 1 A DC (30 V DC)	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
VALVETRAB-MS			
with remote indication contact	**VAL-MS-T1/T2 1000DC-PV/2+V-FM**	**2801161**	1
without remote indication contact	**VAL-MS-T1/T2 1000DC-PV/2+V**	**2801160**	1
with remote indication contact	**VAL-MS-T1/T2 600DC-PV/2+V-FM**	**2801164**	1
without remote indication contact	**VAL-MS-T1/T2 600DC-PV/2+V**	**2801163**	1

Accessories

Replacement connector			
1000 V DC	**VAL-MS-T1/T2 1000DC-PV-ST**	**2801162**	1
600 V DC	**VAL-MS-T1/T2 600DC-PV-ST**	**2801165**	1
Labeling material	ZBN 18 ..., see page 63		

Ordering data

Type	Order No.	Pcs. / Pkt.
VAL-MS 1000DC-PV/2+V-FM	**2800627**	1
VAL-MS 1000DC-PV/2+V	**2800628**	1
VAL-MS 600DC-PV/2+V-FM	**2800641**	1
VAL-MS 600DC-PV/2+V	**2800642**	1

Accessories

VAL-MS 1000DC-PV-ST	**2800624**	1
VAL-MS 600DC-PV-ST	**2800623**	1
ZBN 18 ..., see page 63		

Set solution for building installation

- Surge protection set for powerful basic protection
- Coordinated protective devices
- VAL-MS-T1/T2 lightning arrester for installation in the distribution
- Three device protection adapters (type 3) for protecting the power supply
- Two of these are equipped with additional signal line protection (TV/SAT or TAE)
- Cables and adapters are supplied as standard

Set solution with surge protection for TAE and TV-SAT

	Ordering data		
Description	**Type**	**Order No.**	Pcs. / Pkt.
Building set, consisting of: 1 x VAL-MS-T1/T2 (surge arrester), 1 x MNT-1D (device protection adapter), 1 x MNT-TV-SAT D (device and TV-SAT protective adapter), 1 x MNT-TAE D (device and TAE protective adapter), 2 x adapter F to TV (IEC) connector, 1 x KBL TV-SAT/150, 1 x KBL TV/150, 1 x KBL TAE/150 (connecting cable)	**GEB-SET-T1/T2 TAE/TV-SAT**	**2801022**	1

Surge protection for photovoltaic systems

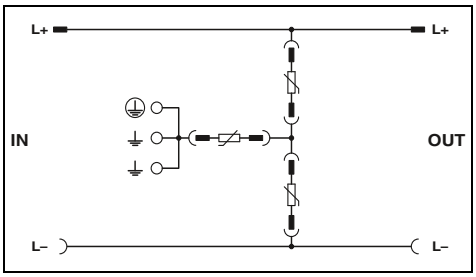
- For insulated or grounded PV applications up to 1000 V DC
- Pre-assembled protection solutions
- Suitable for DC applications such as PV systems
- Type 1/2 universally plug-in capable lightning arresters and surge arresters
- Optical, mechanical status indication for the individual arresters
- Mechanical keying of all slots
- Connectors can be checked with CHECKMASTER

Notes:

For certifications, see page 154

For insulated or grounded PV applications up to 1000 V DC, with SUNCLIX

Total width 125 mm



Technical data

Electrical data	
IEC category / EN type	PV-T1 / PV-T2
Lightning test curr. I_{imp} (10/350) µs	
Peak value	5 kA
Nominal discharge surge current I_n (8/20) µs	15 kA
Max. discharge surge current $I_{max.}$ (8/20) µs	40 kA
Protection level U_P	
(L+) - (L-) / (L+/L-) - PE	≤ 3.5 kV / ≤ 3.5 kV
Highest continuous voltage U_{CPV}	1000 V DC
Immunity to short-circuiting I_{SCPV}	32 A DC
Response time tA:	≤ 25 ns
General data	
Dimensions W / H / D	125 mm / 200 mm / 122 mm
Temperature range	-30 °C ... 55 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP65
Housing material	Polycarbonate, glass-fiber-reinforced
Inflammability class in acc. with UL 94	V2 (housing/cover)
Test standards	IEC 61439-2 / EN 61439-2 / prEN 50539-11
Remote indication contact	PDT, 1-pos.
Connection data solid / stranded / AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Max. operating voltage	250 V AC / 30 V DC
Max. operating current	1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Surge protection in IP65 housing, for photovoltaic systems up to 1000 V DC (L+)-PE & (L-)-PE & (L+)-(L-)	**PV-SET 1ST/1000DC/1MPP-SPD-SC**	**2801529**	1

Accessories

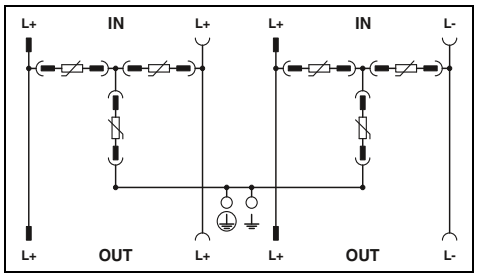
Replacement connector	**VAL-MS-T1/T2 1000DC-PV-ST**	**2801162**	1

For two MPP trackers, up to 1000 V DC, with SUNCLIX

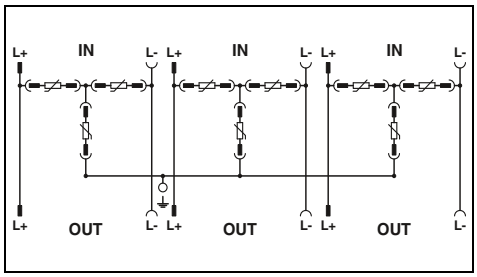
For three MPP trackers, up to 1000 V DC, with SUNCLIX

For two solar strings, including a generator disconnect

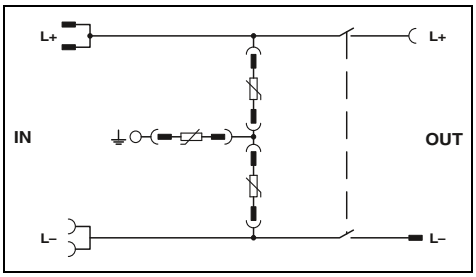
Total width 200 mm



Total width 300 mm



Total width 200 mm



Technical data

PV-T1 / PV-T2	
5 kA	
15 kA	
40 kA	
≤ 3.5 kV / ≤ 3.5 kV	
1000 V DC	
32 A DC (per MPP)	
≤ 25 ns	
200 mm / 200 mm / 122 mm	
-30 °C ... 55 °C	
IP65	
Polycarbonate, glass-fiber-reinforced	
V2 (housing/cover)	
IEC 61439-2 / EN 61439-2 / prEN 50539-11	
PDT, 1-pos.	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 30 V DC	
1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)	

Ordering data

Type	Order No.	Pcs. / Pkt.
PV-SET 2ST/1000DC/2MPP-SPD-SC	2801317	1

Accessories

VAL-MS-T1/T2 1000DC-PV-ST	2801162	1

Technical data

PV-T1 / PV-T2	
5 kA	
15 kA	
40 kA	
≤ 3.5 kV / ≤ 3.5 kV	
1000 V DC	
32 A DC (per MPP)	
≤ 25 ns	
300 mm / 300 mm / 142 mm	
-30 °C ... 55 °C	
IP65	
Polycarbonate, glass-fiber-reinforced	
V2 (housing/cover)	
IEC 61439-2 / EN 61439-2 / prEN 50539-11	
PDT, 1-pos.	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 30 V DC	
1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)	

Ordering data

Type	Order No.	Pcs. / Pkt.
PV-SET 3ST/1000DC/3MPP-SPD-SC	2801531	1

Accessories

VAL-MS-T1/T2 1000DC-PV-ST	2801162	1

Technical data

PV-T1 / PV-T2	
5 kA	
15 kA	
40 kA	
≤ 3.5 kV / ≤ 3.5 kV	
1000 V DC	
32 A DC	
≤ 25 ns	
200 mm / 200 mm / 122 mm	
-20 °C ... 40 °C	
IP65	
Polycarbonate, glass-fiber-reinforced	
V2 (housing/cover)	
prEN 50539-11 / EN 61439-2	
PDT, 1-pos.	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
250 V AC / 30 V DC	
1.5 A AC (250 V AC) / 1.5 A DC (30 V DC)	

Ordering data

Type	Order No.	Pcs. / Pkt.
PV-SET 2ST/1000DC-SPD-SD-SC	2801318	1

Accessories

VAL-MS-T1/T2 1000DC-PV-ST	2801162	1

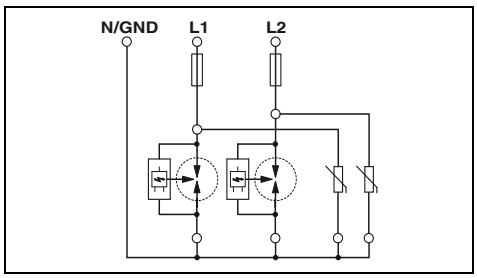
NEMA set solutions

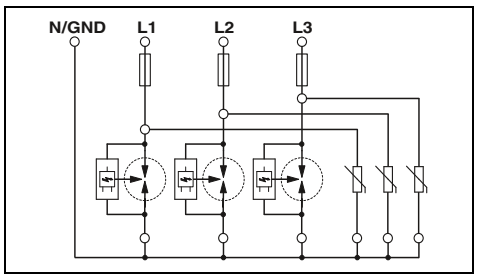
Device protection for components

- Protects AC power mains
- 50 kA direct lightning strike energy
- Combination lightning arrester and TVSS
- Revolutionary Arc Chopping Spark Gap technology
- Extinguishes up to 50 kA of follow current
- Remote status contacts
- Status LED lamps available
- ETL listed to UL 1449, 3rd edition

120/240 V single/split phase system

120/208Y system





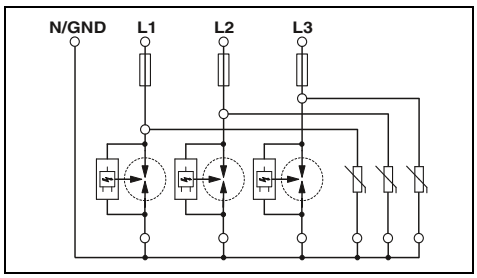
		Technical data	Technical data
MCOV		275 V	275 V
Nominal voltage U_N		< 240 V	< 240 V
Lightning test curr. I_{imp} (10/350) µs		50 kA (per mode)	50 kA (per mode)
Response time t_A		≤ 25 ns	≤ 25 ns
Voltage Protection Rating (VPR)			
	L-L / L-PE	1500 V / 900 V	1500 V / 900 V
Short-circuit current rating (SCCR)		50 kA	50 kA
UL Type		Type 2	Type 2
Connection data solid / stranded / AWG		10 ... 50 mm² / 16 ... 35 mm² / 6 - 1	10 ... 50 mm² / 16 ... 35 mm² / 6 - 1
Error/status indicator		Remote indicator contact	Remote indicator contact
Temperature range		-40 °C ... 80 °C	-40 °C ... 80 °C
Dimensions	W / H / D	400 mm / 500 mm / 210 mm	400 mm / 500 mm / 210 mm
Test standards		UL 1449 3rd edition, Sept. 2009 / IEC 60643-1 / EN 61643-11 CAN/CSA-C22.2 No. 8	UL 1449 3rd edition, Sept. 2009 / IEC 60643-1 / EN 61643-11 CAN/CSA-C22.2 No. 8

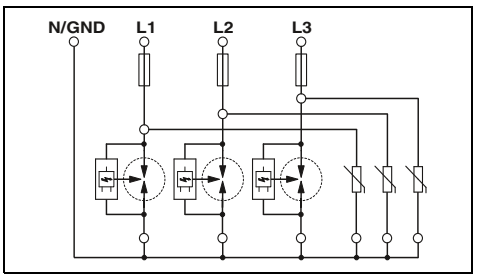
Description	Ordering data Type	Order No.	Pcs. / Pkt.	Ordering data Type	Order No.	Pcs. / Pkt.
SYSTEMTRAB arrester and TVSS system						
IP66 / NEMA 4 cabinet	**SYS N4 120/240S**	**2800705**	1	**SYS N4 120/208Y**	**2800704**	1
IP66 / NEMA 4 cabinet with indicator lamps	**SYS N4/I 120/240S**	**2800710**	1	**SYS N4/I 120/208Y**	**2800709**	1
IP66 / NEMA 4X cabinet	**SYS N4X 120/240S**	**2800715**	1	**SYS N4X 120/208Y**	**2800714**	1
IP66 / NEMA 4X cabinet with indicator lamps	**SYS N4X/I 120/240S**	**2800720**	1	**SYS N4X/I 120/208Y**	**2800719**	1

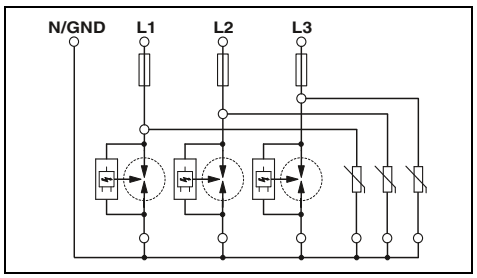
277/480Y system

240 V High-Leg Delta

480 V Delta system







Technical data

- / 600 V (L-L) / 440 V (L-G)
< 277 V
50 kA (per mode)
≤ 25 ns

2500 V / 1500 V
50 kA
Type 2
10 ... 50 mm² / 16 ... 35 mm² / 6 - 1
Remote indicator contact
-40 °C ... 80 °C
400 mm / 500 mm / 210 mm
UL 1449 3rd edition, Sept. 2009 / IEC 60643-1 / EN 61643-11
CAN/CSA-C22.2 No. 8

Ordering data

Type	Order No.	Pcs. / Pkt.
SYS N4 277/480Y	2800703	1
SYS N4/I 277/480Y	2800708	1
SYS N4X 277/480Y	2800713	1
SYS N4X/I 277/480Y	2800718	1

Technical data

275 V
< 240 V
50 kA (per mode)
≤ 25 ns

1500 V / 900 V
50 kA
Type 2
10 ... 50 mm² / 16 ... 35 mm² / 6 - 1
Remote indicator contact
-40 °C ... 80 °C
400 mm / 500 mm / 210 mm
UL 1449 3rd edition, Sept. 2009 / IEC 60643-1 / EN 61643-11 /

CAN/CSA-C22.2 No. 8

Ordering data

Type	Order No.	Pcs. / Pkt.
SYS N4 120/240HLD	2800706	1
SYS N4/I 120/240HLD	2800711	1
SYS N4X 120/240HLD	2800716	1
SYS N4X/I 120/240HLD	2800721	1

Technical data

- / 600 V (L-L) / 480 V (L-G)
< 480 V
50 kA (per mode)
≤ 25 ns

2500 V / 1500 V
50 kA
Type 2
10 ... 50 mm² / 16 ... 35 mm² / 6 - 1
Remote indicator contact
-40 °C ... 80 °C
400 mm / 500 mm / 210 mm
UL 1449 3rd edition, Sept. 2009 / IEC 60643-1 / EN 61643-11 /

CAN/CSA-C22.2 No. 8

Ordering data

Type	Order No.	Pcs. / Pkt.
SYS N4 480D	2800707	1
SYS N4/I 480D	2800712	1
SYS N4X 480D	2800717	1
SYS N4X/I 480D	2800722	1

Intelligent and systematic surge protection – PLUGTRAB PT-IQ

The PLUGTRAB PT-IQ product range is the first to offer predictive function monitoring for surge protective devices in the context of measurement and control technology. Boasting a whole range of additional features, the new surge protection system is a real highlight from Phoenix Contact.

Always know what is happening – predictive monitoring

The individual components of the protective devices are permanently monitored. When the performance limit has been reached as a result of frequent surge voltages, this is indicated by the yellow status symbol. The arrester continues to function and your system is still protected. However, replacement of the protective plug is recommended. This ensures you are informed even earlier and can replace your surge protection before the protective plug is overloaded (red signal). Furthermore, if you use the remote signaling option, you can check how well your system is being protected from anywhere and at any time.

Permanent and error-free installation

The PLUGTRAB PT-IQ minimizes the amount of wiring required. This is made possible by the DIN rail connector (TBUS), which is easily clipped onto the DIN rail. A controller handles the distribution of the power supply and implements remote signaling of all connected surge protective devices via the TBUS. All you have to do then is install the surge protective devices on the TBUS – and you're done! The plug and base element are coded to avoid installation errors during replacement.

Limitless extension

The controller monitors all arresters which are connected to the controller via the TBUS. You can bridge the TBUS across DIN rails to monitor even more protective devices. After 28 protective devices, an additional controller must be installed to supply voltage. Remote signaling can be performed from any controller in the system.

Other surge protective devices

PLUGTRAB PT are plug-in arresters without remote signaling, also with switching variants for intrinsically safe signal circuits.

The multi-stage modular terminal blocks in the TERMITRAB or LINETRAB product ranges have a design width of just 6.2 mm yet are able to offer protection for up to four signal wires.

As they are installed directly on measuring sensors, the SURGETRAB screw connection modules are able to provide reliable protection against transients even in EX-i and Ex-d applications.

The products in the COMTRAB modular range have been designed specifically for use in marshalling distributors.

Group message

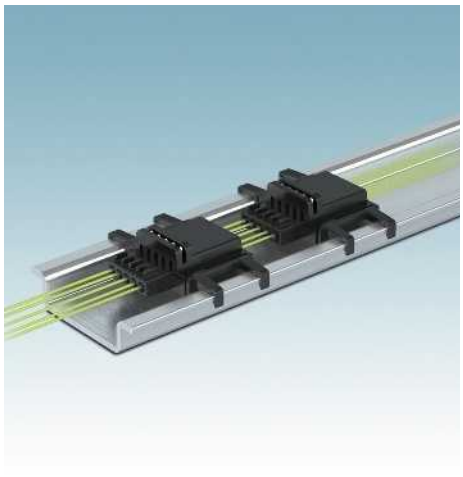
Green: protective device OK

Yellow: performance limit reached, replacement recommended

Red: protective device overloaded, replace

Multi-level remote signaling

Connect the remote signaling to the controller that acts as a supply and remote module (one-off connection operation). The status is output according to the priority as red, yellow or green. This ensures you always know what is happening and can always keep an eye on your system's protection.



TBUS DIN rail connector

The DIN rail connector (TBUS) supplies voltage to the protection modules and forwards the status of each individual arrester to the controller. You benefit from the reduced wiring costs and can implement surge protection quickly without errors.

Narrow arresters

The narrow TERMITRAB modular terminal blocks have a design width of just 6.2 mm. Some offer multi-stage protective circuits for Ex and non-Ex applications.

Special systems

Implement protection in the field directly at the measuring sensor with SURGETRAB screw connection modules.

Versions for terminal strips

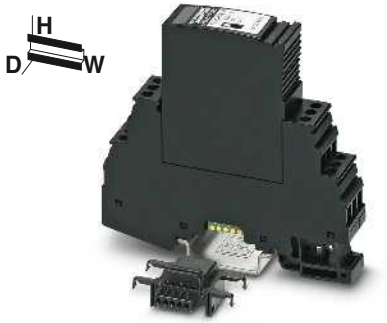
COMTRAB modular type protective devices are used for highly compressed cable networks like those found in marshalling distributors, for example.

PLUGTRAB PT-IQ with screw connection

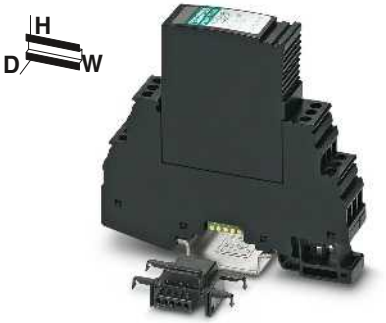
- Surge protection system
- Multi-level state monitoring
- Collective message about supply and remote module
- Multi-level, floating remote signaling
- System supplied via DIN rail bus
- Up to 28 protection modules per supply module
- Maximum ease of maintenance thanks to the two-piece design
- Plugs are coded
- Impedance-neutral disconnection of plug for maintenance purposes
- Base element remains an integral part of the installation
- Base element with screw connection technology

Notes:

For certifications, see page 154

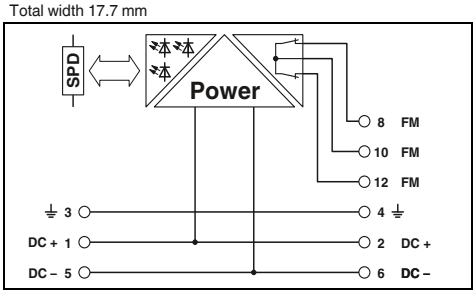


Controller for supply and remote signaling

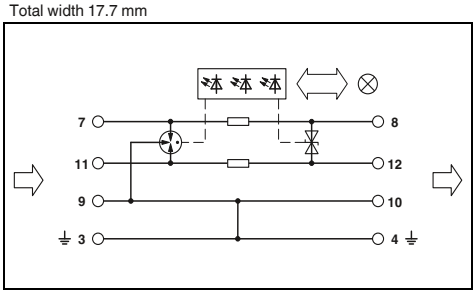


Double conductor (loop), floating, 9/10 connection grounded directly

Total width 17.7 mm



Total width 17.7 mm



Technical data

Electrical data			... 5DC	... 12DC	... 24DC	... 48DC
IEC category / EN type		-	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	-	6 V DC / 4 V AC	15 V DC / 10 V AC	30 V DC / 21 V AC	53 V DC / 37 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	-	2.5 kA	2.5 kA	2.5 kA	2.5 kA
Nominal current I_N		max. 130 mA (24 V DC)	1000 mA (Up to 45°C)	1000 mA (Up to 45°C)	1000 mA (Up to 45°C)	300 mA (Up to 45°C)
Nominal discharge surge current I_n (8/20) µs						
	Core-Core / Core-Ground	-	10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		-	20 kA	20 kA	20 kA	20 kA
Protection level U_P						
	Core-Core	-	≤ 25 V (C3 - 25 A)	≤ 35 V (C3 - 25 A)	≤ 55 V (C3 - 25 A)	≤ 90 V (C3 - 25 A)
	Core-Ground	-	≤ 600 V (C1 - 1 kV/500 A)	≤ 600 V (C1 - 1 kV/500 A)	≤ 600 V (C1 - 1 kV/500 A)	≤ 600 V (C1 - 1 kV/500 A)
Resistance per path		-	1.2 Ω	1.2 Ω	1.2 Ω	1.2 Ω
General data						
Dimensions W / H / D		17.7 mm / 91.1 mm / 77.5 mm	17.7 mm / 91.1 mm / 77.5 mm			
Connection data solid/stranded with ferrule/ AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12			
Temperature range		-40 °C ... 70 °C	-40 °C ... 70 °C			
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	IP20			
Inflammability class in acc. with UL 94		V0	V0			
Test standards		EN 61000-6-2 / EN 61000-6-2/A1 / EN 61000-6-3	EN 61643-21/A1 / IEC 61643-21/A1 / EN 61000-6-2 / EN 61000-6-2/A1 / EN 61000-6-3			
Remote indication contact		2 x N/C contacts	Via TBUS			
Connection data solid/AWG		0.2 ... 4 mm² / 24 - 14	-			
Max. operating voltage		30 V AC (50 - 60 Hz) / 50 V DC	-			
Max. operating current		1 A (up to 50°C) / 200 mA (up to 70°C)	-			

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB supply module, consisting of a plug, base element, and DIN rail bus	24 V DC	**PT-IQ-PTB-UT**	**2800768**	1
MCR-PLUGTRAB, consisting of a plug, base element, and DIN rail bus	5 V DC			
	12 V DC			
	24 V DC			
	48 V DC			

Accessories

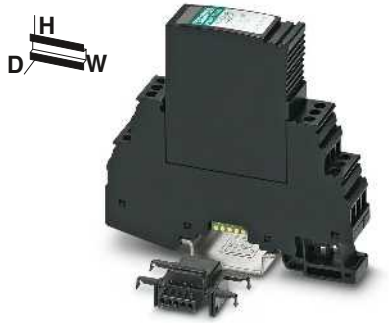
Replacement connector			
5 V DC 12 V DC 24 V DC 48 V DC	**PT-IQ-PTB-P**	**2800989**	1
Marking material	ZB 6, see page 111		

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-1X2-5DC-UT	**2800791**	1
PT-IQ-1X2-12DC-UT	**2800793**	1
PT-IQ-1X2-24DC-UT	**2800976**	1
PT-IQ-1X2-48DC-UT	**2800978**	1

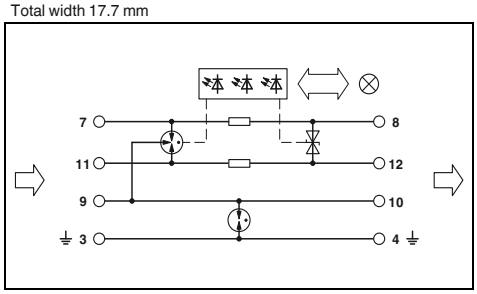
Accessories

PT-IQ-1X2-5DC-P	**2800770**	1
PT-IQ-1X2-12DC-P	**2800771**	1
PT-IQ-1X2-24DC-P	**2800772**	1
PT-IQ-1X2-48DC-P	**2800773**	1
ZB 6, see page 111		



Double conductor (loop), floating, 9/10 connection grounded via gas-filled surge arrester

Total width 17.7 mm



Technical data

... 5DC	... 12DC	... 24DC	... 48DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	15 V DC / 10 V AC	30 V DC / 21 V AC	53 V DC / 37 V AC
2.5 kA	2.5 kA	2.5 kA	2.5 kA
1000 mA (Up to 45°C)	1000 mA (Up to 45°C)	1000 mA (Up to 45°C)	300 mA (Up to 45°C)
10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA
20 kA	20 kA	20 kA	20 kA
≤ 25 V (C3 - 25 A)	≤ 35 V (C3 - 25 A)	≤ 55 V (C3 - 25 A)	≤ 90 V (C3 - 25 A)
≤ 900 V (C1 - 1 kV/500 A)	≤ 900 V (C1 - 1 kV/500 A)	≤ 900 V (C1 - 1 kV/500 A)	≤ 900 V (C1 - 1 kV/500 A)
1.2 Ω	1.2 Ω	1.2 Ω	1.2 Ω

17.7 mm / 91.1 mm / 77.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

-40 °C ... 70 °C
IP20
V0
EN 61643-21/A1 / IEC 61643-21/A1 / EN 61000-6-2 / EN 61000-6-2/A1 / EN 61000-6-3
Via TBUS
-
-
-

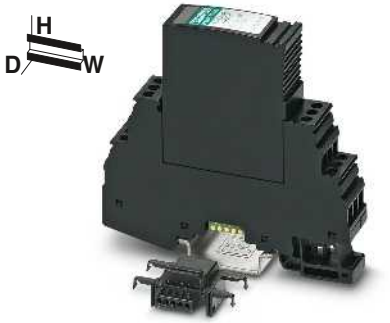
Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-1X2+F-5DC-UT	**2800792**	1
PT-IQ-1X2+F-12DC-UT	**2800975**	1
PT-IQ-1X2+F-24DC-UT	**2800977**	1
PT-IQ-1X2+F-48DC-UT	**2800979**	1

Accessories

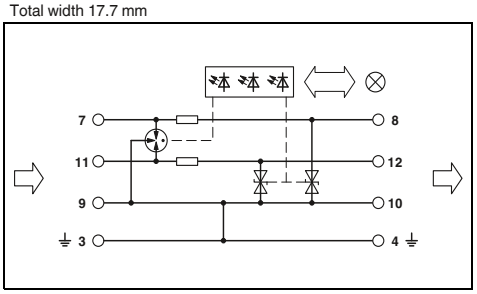
PT-IQ-1X2-5DC-P	**2800770**	1
PT-IQ-1X2-12DC-P	**2800771**	1
PT-IQ-1X2-24DC-P	**2800772**	1
PT-IQ-1X2-48DC-P	**2800773**	1

ZB 6, see page 111



2-wire with common reference potential, 9/10 connection grounded directly

Total width 17.7 mm



Technical data

... 5DC	... 12DC	... 24DC	... 48DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	15 V DC / 4 V AC	30 V DC / 21 V AC	53 V DC / 37 V AC
2.5 kA	2.5 kA	2.5 kA	2.5 kA
1000 mA (Up to 45°C)	1000 mA (Up to 45°C)	1000 mA (Up to 45°C)	300 mA (Up to 45°C)
- / 10 kA	- / 10 kA	- / 10 kA	- / 10 kA
20 kA	20 kA	20 kA	20 kA
≤ 25 V (C3 - 25 A)	≤ 35 V (C3 - 25 A)	≤ 55 V (C3 - 25 A)	≤ 90 V (C3 - 25 A)
1.2 Ω	1.2 Ω	1.2 Ω	1.2 Ω

17.7 mm / 91.1 mm / 77.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

-40 °C ... 70 °C
IP20
V0
EN 61643-21/A1 / IEC 61643-21/A1 / EN 61000-6-2 / EN 61000-6-2/A1 / EN 61000-6-3
Via TBUS
-
-
-

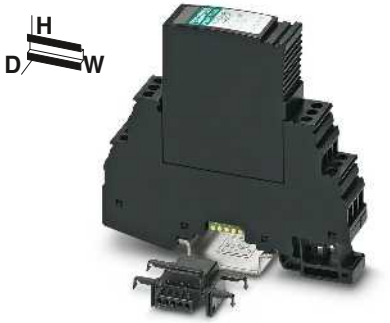
Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-2X1-5DC-UT	**2800778**	1
PT-IQ-2X1-12DC-UT	**2800780**	1
PT-IQ-2X1-24DC-UT	**2800787**	1
PT-IQ-2X1-48DC-UT	**2800789**	1

Accessories

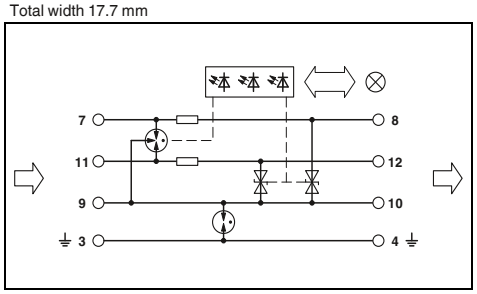
PT-IQ-2X1-5DC-P	**2800774**	1
PT-IQ-2X1-12DC-P	**2800775**	1
PT-IQ-2X1-24DC-P	**2800776**	1
PT-IQ-2X1-48DC-P	**2800777**	1

ZB 6, see page 111



2-wire with common reference potential, 9/10 connection grounded via gas-filled surge arrester

Total width 17.7 mm



Technical data

... 5DC	... 12DC	... 24DC	... 48DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	15 V DC / 10 V AC	30 V DC / 21 V AC	53 V DC / 37 V AC
2.5 kA	2.5 kA	2.5 kA	2.5 kA
1000 mA (Up to 45°C)	1000 mA (Up to 45°C)	1000 mA (Up to 45°C)	300 mA (Up to 45°C)
- / 10 kA	- / 10 kA	- / 10 kA	- / 10 kA
20 kA	20 kA	20 kA	20 kA
≤ 720 V (C1 - 1 kV/500 A)	≤ 750 V (C1 - 1 kV/500 A)	≤ 800 V (C1 - 1 kV/500 A)	≤ 750 V (C1 - 1 kV/500 A)
1.2 Ω	1.2 Ω	1.2 Ω	1.2 Ω

17.7 mm / 91.1 mm / 77.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

-40 °C ... 70 °C
IP20
V0
EN 61643-21/A1 / IEC 61643-21/A1 / EN 61000-6-2 / EN 61000-6-2/A1 / EN 61000-6-3
Via TBUS
-
-
-

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-2X1+F-5DC-UT	**2800779**	1
PT-IQ-2X1+F-12DC-UT	**2800781**	1
PT-IQ-2X1+F-24DC-UT	**2800788**	1
PT-IQ-2X1+F-48DC-UT	**2800790**	1

Accessories

PT-IQ-2X1-5DC-P	**2800774**	1
PT-IQ-2X1-12DC-P	**2800775**	1
PT-IQ-2X1-24DC-P	**2800776**	1
PT-IQ-2X1-48DC-P	**2800777**	1

ZB 6, see page 111

PLUGTRAB PT-IQ with push-in connection technology

- Surge protection system
- Multi-level state monitoring
- Collective message about supply and remote module
- Multi-level, floating remote signaling
- System supplied via DIN rail bus
- Up to 28 protection modules per supply module
- Maximum ease of maintenance thanks to the two-piece design
- Plugs are coded
- Impedance-neutral disconnection of plug for maintenance purposes
- Base element remains an integral part of the installation
- Base element in push-in connection technology

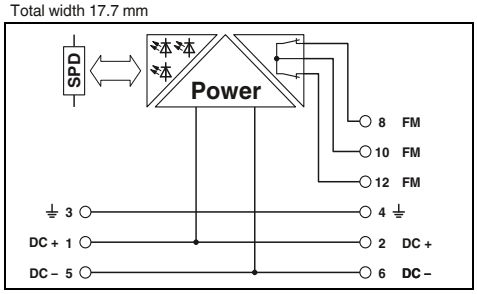
Notes:

For certifications, see page 154

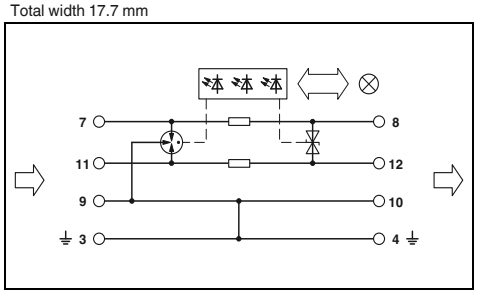
Controller for supply and remote signaling

Double conductor (loop), floating, 9/10 connection grounded directly

Total width 17.7 mm



Total width 17.7 mm



Technical data

Electrical data			
IEC category / EN type		-	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	-	6 V DC / 4 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	-	2.5 kA
Nominal current I_N		max. 130 mA (24 V DC)	1000 mA (up to 40 °C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	-	10 kA / 10 kA
Total surge current (8/20) µs		-	20 kA
Protection level U_P			
	Core-Core	-	≤ 25 V (C3 - 25 A)
	Core-Ground	-	≤ 600 V (C1 - 1 kV/500 A)
Resistance per path		-	1.2 Ω
General data			
Dimensions W / H / D		17.7 mm / 109.3 mm / 77.5 mm	
Connection data solid/stranded with ferrule/ AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Temperature range		-40 °C ... 70 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	
Inflammability class in acc. with UL 94		V0	
Test standards		EN 61000-6-2/A1 / EN 61000-6-3	
Remote indication contact		2 x N/C contacts	
Connection data solid/AWG		0.2 ... 4 mm² / 24 - 12	
Max. operating voltage		35 V AC (50 - 60 Hz) / 50 V DC	
Max. operating current		1 A (up to 50°C) / 200 mA (up to 70°C)	

Technical data

... 5DC	... 12DC	... 24DC	... 48DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
15 V DC / 10 V AC	30 V DC / 21 V AC	53 V DC / 37 V AC	
2.5 kA	2.5 kA	2.5 kA	
1000 mA (up to 40 °C)	1000 mA (up to 40 °C)	300 mA (up to 70°C)	
10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA	
20 kA	20 kA	20 kA	
≤ 35 V (C3 - 25 A)	≤ 55 V (C3 - 25 A)	≤ 90 V (C3 - 25 A)	
≤ 600 V (C1 - 1 kV/500 A)	≤ 600 V (C1 - 1 kV/500 A)	≤ 600 V (C1 - 1 kV/500 A)	
1.2 Ω	1.2 Ω	1.2 Ω	
17.7 mm / 109.3 mm / 77.5 mm			
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12			
-40 °C ... 70 °C			
IP20			
V0			
IEC 61643-21/A2 / EN 61643-21/A1 / EN 61000-6-2/A1 / EN 61000-6-3			
Via TBUS			
-			
-			
-			

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB supply module, consisting of a plug, base element, and DIN rail bus	24 V DC	**PT-IQ-PTB-PT**	**2801296**	1
MCR-PLUGTRAB, consisting of a plug, base element, and DIN rail bus	5 V DC			
	12 V DC			
	24 V DC			
	48 V DC			

Ordering data

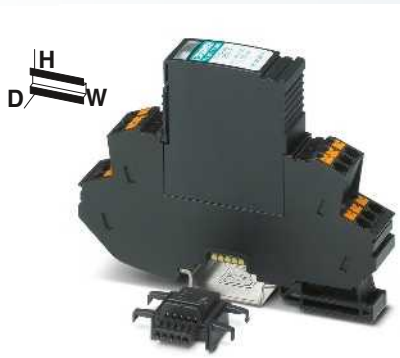
Type	Order No.	Pcs. / Pkt.
PT-IQ-1X2-5DC-PT	**2801251**	1
PT-IQ-1X2-12DC-PT	**2801253**	1
PT-IQ-1X2-24DC-PT	**2801255**	1
PT-IQ-1X2-48DC-PT	**2801257**	1

Accessories

Replacement connector			
5 V DC			
12 V DC			
24 V DC	**PT-IQ-PTB-P**	**2800989**	1
48 V DC			
Marking material	ZB 6, see page 111		

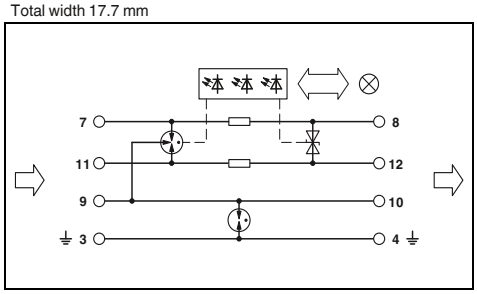
Accessories

PT-IQ-1X2-5DC-P	**2800770**	1
PT-IQ-1X2-12DC-P	**2800771**	1
PT-IQ-1X2-24DC-P	**2800772**	1
PT-IQ-1X2-48DC-P	**2800773**	1
ZB 6, see page 111		



Double conductor (loop), floating, 9/10 connection grounded via gas-filled surge arrester

Total width 17.7 mm



Technical data

... 5DC	... 12DC	... 24DC	... 48DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	15 V DC / 10 V AC	30 V DC / 21 V AC	53 V DC / 37 V AC
2.5 kA	2.5 kA	2.5 kA	2.5 kA
1000 mA (up to 40 °C)	1000 mA (up to 40 °C)	1000 mA (up to 40 °C)	300 mA (up to 70°C)
10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA
20 kA	20 kA	20 kA	20 kA
≤ 25 V (C3 - 25 A)	≤ 35 V (C3 - 25 A)	≤ 55 V (C3 - 25 A)	≤ 90 V (C3 - 25 A)
≤ 900 V (C1 - 1 kV/500 A)	≤ 900 V (C1 - 1 kV/500 A)	≤ 900 V (C1 - 1 kV/500 A)	≤ 900 V (C1 - 1 kV/500 A)
1.2 Ω	1.2 Ω	1.2 Ω	1.2 Ω

17.7 mm / 109.3 mm / 77.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

-40 °C ... 70 °C
IP20
V0
IEC 61643-21/A2 / EN 61643-21/A1 / EN 61000-6-2/A1 / EN 61000-6-3
Via TBUS
-
-
-

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-1X2+F-5DC-PT	2801252	1
PT-IQ-1X2+F-12DC-PT	2801254	1
PT-IQ-1X2+F-24DC-PT	2801256	1
PT-IQ-1X2+F-48DC-PT	2801258	1

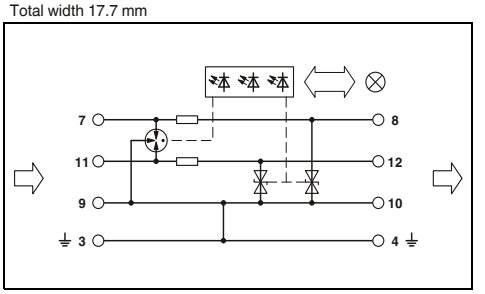
Accessories

PT-IQ-1X2-5DC-P	2800770	1
PT-IQ-1X2-12DC-P	2800771	1
PT-IQ-1X2-24DC-P	2800772	1
PT-IQ-1X2-48DC-P	2800773	1

ZB 6, see page 111

2-wire with common reference potential, 9/10 connection grounded directly

Total width 17.7 mm



Technical data

... 5DC	... 12DC	... 24DC	... 48DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	15 V DC / 4 V AC	30 V DC / 21 V AC	53 V DC / 37 V AC
2.5 kA	2.5 kA	2.5 kA	2.5 kA
1000 mA (up to 40 °C)	1000 mA (up to 40 °C)	1000 mA (up to 40 °C)	300 mA (up to 70°C)
- / 10 kA	- / 10 kA	- / 10 kA	- / 10 kA
20 kA	20 kA	20 kA	20 kA
≤ 25 V (C3 - 25 A)	≤ 35 V (C3 - 25 A)	≤ 55 V (C3 - 25 A)	≤ 90 V (C3 - 25 A)
1.2 Ω	1.2 Ω	1.2 Ω	1.2 Ω

17.7 mm / 109.3 mm / 77.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

-40 °C ... 70 °C
IP20
V0
IEC 61643-21/A2 / EN 61643-21/A1 / EN 61000-6-2/A1 / EN 61000-6-3
Via TBUS
-
-
-

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-2X1-5DC-PT	2801243	1
PT-IQ-2X1-12DC-PT	2801245	1
PT-IQ-2X1-24DC-PT	2801247	1
PT-IQ-2X1-48DC-PT	2801249	1

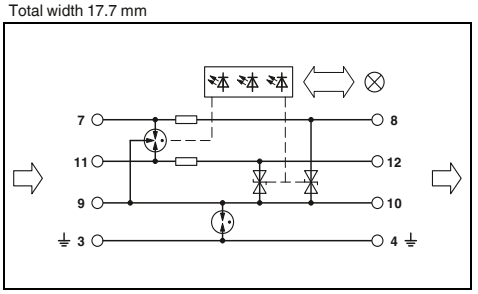
Accessories

PT-IQ-2X1-5DC-P	2800774	1
PT-IQ-2X1-12DC-P	2800775	1
PT-IQ-2X1-24DC-P	2800776	1
PT-IQ-2X1-48DC-P	2800777	1

ZB 6, see page 111

2-wire with common reference potential, 9/10 connection grounded via gas-filled surge arrester

Total width 17.7 mm



Technical data

... 5DC	... 12DC	... 24DC	... 48DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	15 V DC / 10 V AC	30 V DC / 21 V AC	53 V DC / 37 V AC
2.5 kA	2.5 kA	2.5 kA	2.5 kA
1000 mA (up to 40 °C)	1000 mA (up to 40 °C)	1000 mA (up to 40 °C)	300 mA (up to 70°C)
- / 10 kA	- / 10 kA	- / 10 kA	- / 10 kA
20 kA	20 kA	20 kA	20 kA
≤ 720 V (C1 - 1 kV/500 A)	≤ 750 V (C1 - 1 kV/500 A)	≤ 780 V (C3 - 25 A)	≤ 750 V (C1 - 1 kV/500 A)
1.2 Ω	1.2 Ω	1.2 Ω	1.2 Ω

17.7 mm / 109.3 mm / 77.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12

-40 °C ... 70 °C
IP20
V0
IEC 61643-21/A2 / EN 61643-21/A1 / EN 61000-6-2/A1 / EN 61000-6-3
-
-
-
-

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-2X1+F-5DC-PT	2801244	1
PT-IQ-2X1+F-12DC-PT	2801246	1
PT-IQ-2X1+F-24DC-PT	2801248	1
PT-IQ-2X1+F-48DC-PT	2801250	1

Accessories

PT-IQ-2X1-5DC-P	2800774	1
PT-IQ-2X1-12DC-P	2800775	1
PT-IQ-2X1-24DC-P	2800776	1
PT-IQ-2X1-48DC-P	2800777	1

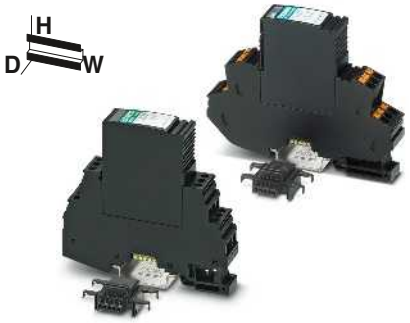
ZB 6, see page 111

PLUGTRAB PT-IQ

- Surge protection system
- Multi-level state monitoring
- Collective message about supply and remote module
- Multi-level, floating remote signaling
- System supplied via DIN rail bus
- Up to 28 protection modules per supply module
- Maximum ease of maintenance thanks to the two-piece design
- Plugs are coded
- Impedance-neutral disconnection of plug for maintenance purposes
- Base element remains an integral part of the installation
- PT-IQ...-UT base element with screw connection technology
- PT-IQ...-PT base element with push-in connection technology

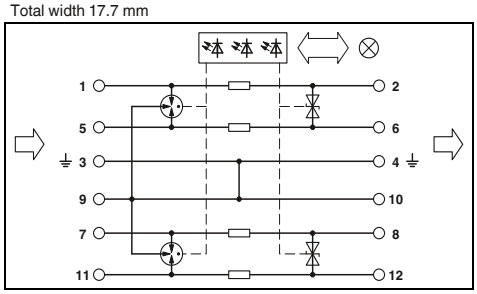
Notes:

For certifications, see page 154



2 double conductors (loops), floating, 9/10 connection grounded directly

Total width 17.7 mm



Technical data

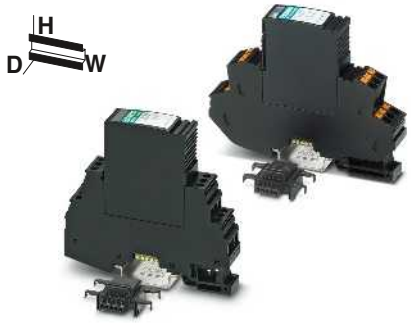
Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	30 V DC / 21 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	2.5 kA
Nominal current I_N		700 mA (Up to 45°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	10 kA / 10 kA
Total surge current (8/20) µs		20 kA
Protection level U_P		
	Core-Core	≤ 55 V (C3 - 25 A)
	Core-Ground	≤ 600 V (C1 - 1 kV/500 A)
PT-IQ...UT dimensions W/H/D		17.7 mm / 91 mm / 77.5 mm
Resistance per path		1.2 Ω
General data		
PT-IQ...PT dimensions W/H/D		17.7 mm / 109.3 mm / 77.5 mm
Connection data solid/stranded with ferrule/ AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Connection data, push-in solid/stranded with ferrule/AWG		0.2 ... 4 mm² / - ... - / 20 - 12
Temperature range		-40 °C ... 70 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Test standards		EN 61643-21/A1 / IEC 61643-21/A1 / EN 61000-6-2 / EN 61000-6-2/A1 / EN 61000-6-3
Remote indication contact		Via TBUS

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
MCR-PLUGTRAB, consisting of a plug, base element, and DIN rail bus, with screw connection technology	24 V	**PT-IQ-2X2-24DC-UT**	**2800980**	1
MCR-PLUGTRAB, consisting of a plug, base element, and DIN rail bus, with push-in connection technology	24 V DC	**PT-IQ-2X2-24DC-PT**	**2801263**	1

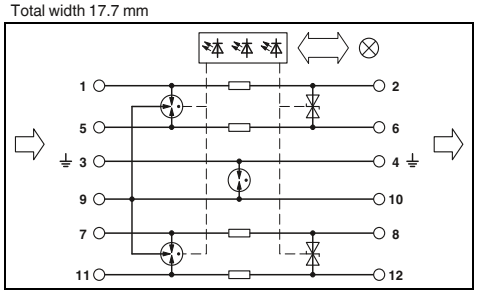
Accessories

Replacement connector 24 V DC	**PT-IQ-2X2-24DC-P**	**2800804**	1
Marking material	ZB 6, see page 111		



2 double conductors (loops), floating, 9/10 connection grounded via gas-filled surge arrester

Total width 17.7 mm



Technical data

	C1 / C2 / C3 / D1
	30 V DC / 21 V AC
	2.5 kA
	700 mA (Up to 45°C)
	10 kA / 10 kA
	20 kA
	≤ 55 V (C3 - 25 A)
	≤ 900 V (C1 - 1 kV/500 A)
	17.7 mm / 91 mm / 77.5 mm
	1.2 Ω
	17.7 mm / 109.3 mm / 77.5 mm
	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
	0.2 ... 4 mm² / - ... - / 20 - 12
	-40 °C ... 70 °C
	IP20
	V0
	EN 61643-21/A1 / IEC 61643-21/A1 / EN 61000-6-2 / EN 61000-6-2/A1 / EN 61000-6-3
	Via TBUS

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-2X2+F-24DC-UT	**2800981**	1
PT-IQ-2X2+F-24DC-PT	**2801264**	1

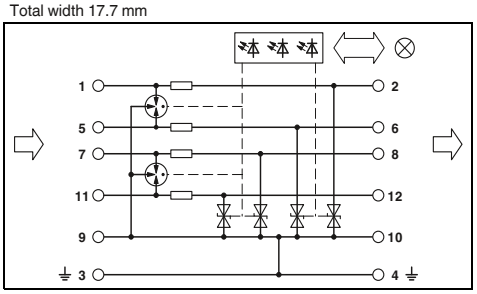
Accessories

PT-IQ-2X2-24DC-P	**2800804**	1

ZB 6, see page 111

4-wire with common reference potential, 9/10 connection grounded directly

Total width 17.7 mm



Technical data

	C1 / C2 / C3 / D1
	30 V DC / 21 V AC
	2.5 kA
	700 mA (Up to 45°C)
	- / 10 kA
	20 kA
	-
	≤ 60 V (C3 - 50 A)
	17.7 mm / 91.1 mm / 77.5 mm
	1.2 Ω
	17.7 mm / 109.3 mm / 77.5 mm
	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
	0.5 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
	-40 °C ... 70 °C
	IP20
	V0
	EN 61643-21/A1 / IEC 61643-21/A1 / EN 61000-6-2 / EN 61000-6-2/A1 / EN 61000-6-3
	Via TBUS

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-4X1-24DC-UT	**2800982**	1
PT-IQ-4X1-24DC-PT	**2801271**	1

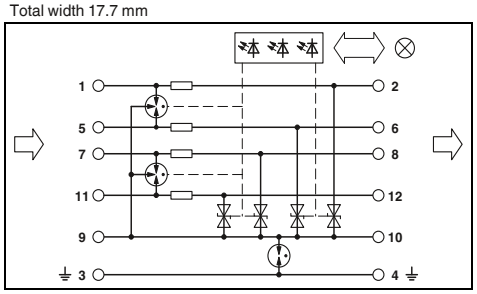
Accessories

PT-IQ-4X1-24DC-P	**2800813**	1

ZB 6, see page 111

4-wire with common reference potential, 9/10 connection grounded via gas-filled surge arrester

Total width 17.7 mm



Technical data

	C1 / C2 / C3 / D1
	30 V DC / 21 V AC
	2.5 kA
	700 mA (Up to 45°C)
	- / 10 kA
	20 kA
	-
	≤ 780 V (C3 - 25 A)
	17.7 mm / 91.1 mm / 77.5 mm
	1.2 Ω
	17.7 mm / 109.3 mm / 77.5 mm
	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
	0.5 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
	-40 °C ... 70 °C
	IP20
	V0
	EN 61643-21/A1 / IEC 61643-21/A1 / EN 61000-6-2 / EN 61000-6-2/A1 / EN 61000-6-3
	Via TBUS

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-4X1+F-24DC-UT	**2800983**	1
PT-IQ-4X1+F-24DC-PT	**2801272**	1

Accessories

PT-IQ-4X1-24DC-P	**2800813**	1

ZB 6, see page 111

PLUGTRAB PT-IQ with screw connection

- Surge protection system
- Multi-level state monitoring
- Collective message about supply and remote module
- Multi-level, floating remote signaling
- System supplied via DIN rail bus
- Up to 28 protection modules per supply module
- Maximum ease of maintenance thanks to the two-piece design
- Plugs are coded
- Impedance-neutral disconnection of plug for maintenance purposes
- Base element remains an integral part of the installation
- Base element with screw connection technology

Notes:

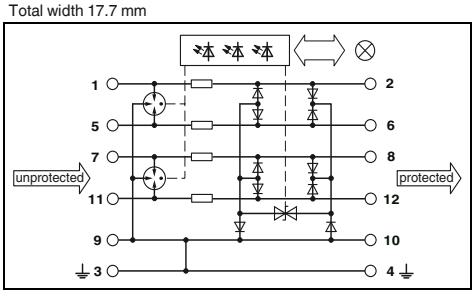
For certifications, see page 154

Attenuation characteristics at www.phoenixcontact.net/products

N

5-wire with common reference potential, 9/10 connection grounded directly

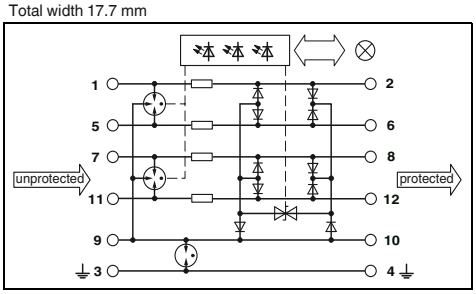
Total width 17.7 mm



N

5-wire with common reference potential, 9/10 connection grounded via gas-filled surge arrester

Total width 17.7 mm



Technical data

Electrical data		... 5DC	... 12DC
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	6 V DC / 4 V AC	15 V DC / 10 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	2.5 kA	2.5 kA
Nominal current I_N		600 mA (up to 40 °C)	600 mA (up to 40 °C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		20 kA	20 kA
Protection level U_P			
	Core-Core	≤ 30 V (C3 - 25 A)	≤ 40 V (C3 - 25 A)
	Core-Ground	≤ 30 V (C3 - 25 A)	≤ 40 V (C3 - 25 A)
Cut-off frequency fg (3 dB)			
	Symmetrical in the 150 Ω system	> 60 MHz	> 60 MHz
General data			
Dimensions W / H / D		17.7 mm / 91 mm / 77.5 mm	
Connection data solid / stranded / AWG		0.2 ... 4 mm² / - ... - / 24 - 12	
Temperature range		-40 °C ... 70 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	
Inflammability class in acc. with UL 94		V0	
Test standards		EN 61643-21/A1 / IEC 61643-21/A2 / EN 61000-6-2/A1 / EN 61000-6-3	

Technical data

Electrical data		... 5DC	... 12DC
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	6 V DC / 4 V AC	15 V DC / 10 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	2.5 kA	2.5 kA
Nominal current I_N		600 mA (up to 40 °C)	600 mA (up to 40 °C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		20 kA	20 kA
Protection level U_P			
	Core-Core	≤ 30 V (C3 - 25 A)	≤ 40 V (C3 - 25 A)
	Core-Ground	≤ 900 V (C3 - 25 A)	≤ 900 V (C3 - 25 A)
Cut-off frequency fg (3 dB)			
	Symmetrical in the 150 Ω system	> 60 MHz	> 60 MHz
General data			
Dimensions W / H / D		17.7 mm / 91 mm / 77.5 mm	
Connection data solid / stranded / AWG		0.2 ... 4 mm² / - ... - / 24 - 12	
Temperature range		-40 °C ... 70 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	
Inflammability class in acc. with UL 94		V0	
Test standards		EN 61643-21/A1 / IEC 61643-21/A2 / EN 61000-6-2/A1 / EN 61000-6-3	

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
MCR-PLUGTRAB, consisting of a plug, base element, and DIN rail bus				
Bridge between 3/4 (⏚) and 9/10	5 V DC	**PT-IQ-5-HF-5DC-UT**	**2800797**	1
Bridge between 3/4 (⏚) and 9/10	24 V DC	**PT-IQ-5-HF-12DC-UT**	**2800799**	1
Gas-filled surge arrester between 3/4 (⏚) and 9/10	5 V DC			
Gas-filled surge arrester between 3/4 (⏚) and 9/10	24 V DC			

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-5-HF+F-5DC-UT	**2800798**	1
PT-IQ-5-HF+F-12DC-UT	**2800801**	1

Accessories

Replacement connector			
	PT-IQ-5-HF-5DC-P	**2800795**	1
	PT-IQ-5-HF-12DC-P	**2800796**	1
Marking material	ZB 6, see page 111		

Accessories

	PT-IQ-5-HF-5DC-P	**2800795**	1
	PT-IQ-5-HF-12DC-P	**2800796**	1
ZB 6, see page 111			

PLUGTRAB PT-IQ with push-in connection technology

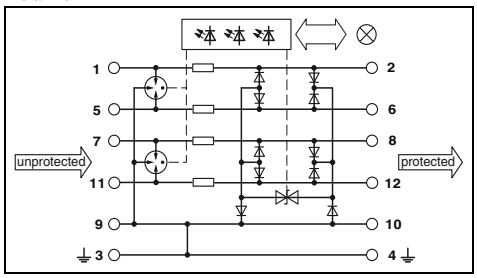
- Surge protection system
- Multi-level state monitoring
- Collective message about supply and remote module
- Multi-level, floating remote signaling
- System supplied via DIN rail bus
- Up to 28 protection modules per supply module
- Maximum ease of maintenance thanks to the two-piece design
- Plugs are coded
- Impedance-neutral disconnection of plug for maintenance purposes
- Base element remains an integral part of the installation
- Base element in push-in connection technology

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

N

5-wire with common reference potential, 9/10 connection grounded directly

Total width 17.7 mm



Technical data

Electrical data		... 5DC	... 12DC
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	6 V DC / 4 V AC	15 V DC / 10 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	2.5 kA	2.5 kA
Nominal current I_N		600 mA (up to 40 °C)	600 mA (up to 40 °C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		20 kA	20 kA
Protection level U_P			
	Core-Core	≤ 30 V (C3 - 25 A)	≤ 40 V (C3 - 25 A)
	Core-Ground	≤ 30 V (C3 - 25 A)	≤ 40 V (C3 - 25 A)
Cut-off frequency fg (3 dB)			
	Symmetrical in the 150 Ω system	> 60 MHz	> 60 MHz
General data			
Dimensions W / H / D		17.7 mm / 109.3 mm / 77.5 mm	
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Temperature range		-40 °C ... 70 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	
Inflammability class in acc. with UL 94		V0	
Test standards		EN 61643-21/A1 / IEC 61643-21/A2 / EN 61000-6-2/A1 / EN 61000-6-3	

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
MCR-PLUGTRAB, consisting of a plug, base element, and DIN rail bus				
Bridge between 3/4 (⏚) and 9/10	5 V DC	**PT-IQ-5-HF-5DC-PT**	**2801291**	1
Bridge between 3/4 (⏚) and 9/10	12 V DC	**PT-IQ-5-HF-12DC-PT**	**2801293**	1
Gas-filled surge arrester between 3/4 (⏚) and 9/10	5 V DC			
Gas-filled surge arrester between 3/4 (⏚) and 9/10	12 V DC			

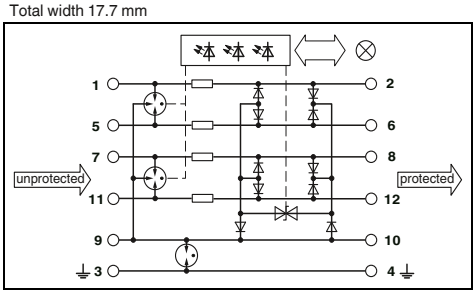
Accessories

	Type	Order No.	Pcs. / Pkt.
Replacement connector			
	PT-IQ-5-HF-5DC-P	**2800795**	1
	PT-IQ-5-HF-12DC-P	**2800796**	1
Marking material	ZB 6, see page 111		

N

5-wire with common reference potential, 9/10 connection grounded via gas-filled surge arrester

Total width 17.7 mm



Technical data

... 5DC	... 12DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	15 V DC / 10 V AC
2.5 kA	2.5 kA
600 mA (up to 40 °C)	600 mA (up to 40 °C)
10 kA / 10 kA	10 kA / 10 kA
20 kA	20 kA
≤ 30 V (C3 - 25 A)	≤ 40 V (C3 - 25 A)
≤ 900 V (C3 - 25 A)	≤ 900 V (C3 - 25 A)
> 60 MHz	> 60 MHz

17.7 mm / 109.3 mm / 77.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
-40 °C ... 70 °C
IP20
V0
EN 61643-21/A1 / IEC 61643-21/A2 / EN 61000-6-2/A1 / EN 61000-6-3

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-5-HF+F-5DC-PT	**2801292**	1
PT-IQ-5-HF+F-12DC-PT	**2801295**	1

Accessories

Type	Order No.	Pcs. / Pkt.
PT-IQ-5-HF-5DC-P	**2800795**	1
PT-IQ-5-HF-12DC-P	**2800796**	1
ZB 6, see page 111		

MCR-PLUGTRAB PT

- Seamless plug-in signal circuit protection
- Maximum ease of maintenance thanks to the two-piece design
- Base element remains an integral part of the installation
- Impedance-neutral disconnection of connector for test and maintenance purposes
- Connectors can be checked with CHECKMASTER

PT 2x2...
- Protection for two separate floating signal circuits
- Installed in conjunction with the PT 2x2...-BE base element

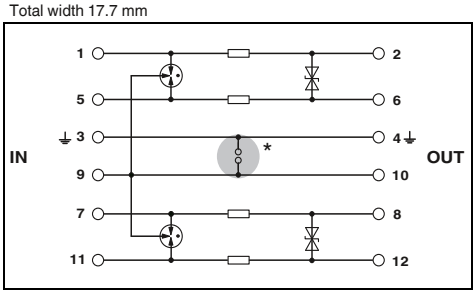
PT 4x1...
- Protection for four wires with common reference potential
- Installed in conjunction with the PT 4x1...-BE base element

*** Note:**
Various grounding options for the base elements:
PT .x.-BE connections 9/10 (GND) directly connected to the mounting foot.
PT .x.+F-BE connection 9/10 (GND) connected to the mounting foot via a gas-filled surge arrester.

Notes:
For certifications, see page 154

2 double wires (loops), floating

Total width 17.7 mm



Technical data

Electrical data		... 5DC	... 12DC	... 24DC
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	6 V DC / 4 V AC	13 V DC / 9 V AC	28 V DC / 20 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	2.5 kA	2.5 kA	2.5 kA
Nominal current I_N		450 mA (45°C)	450 mA (45°C)	450 mA (45°C)
Nominal discharge surge current I_n (8/20) µs				
Core-Core / Core-Ground		10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		20 kA	20 kA	20 kA
Output voltage limitation at 1 kV/µs				
Core-Core		≤ 10 V	≤ 18 V	≤ 40 V
Core-Ground		-	-	-
Cut-off frequency fg (3 dB)				
Symmetrical/asymmetrical in the 50 Ω system		Typ. 1 MHz / -	Typ. 3 MHz / -	Typ. 6 MHz / -
Resistance per path		2.2 Ω	2.2 Ω	2.2 Ω

General data	
Dimensions W / H / D	17.7 mm / 90 mm / 65.5 mm
Connection data solid / stranded / AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Temperature range	-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP20
Inflammability class in acc. with UL 94	V0
Test standards	IEC 61643-21

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB plug, with protection circuit for plugging into base element PT				
	5 V DC	**PT 2X2- 5DC-ST**	**2838241**	10
	12 V DC	**PT 2X2-12DC-ST**	**2838254**	10
	24 V DC	**PT 2X2-24DC-ST**	**2838228**	10
	48 V DC			
	12 V AC			
	24 V AC			
	48 V AC			
PLUGTRAB base element, for mounting on NS 35				
Bridge between 3/4 (⏚) and 9/10		**PT 2X2-BE**	**2839208**	10
Gas-filled surge arrester between 3/4 (⏚) and 9/10		**PT 2X2+F-BE**	**2839224**	10

Accessories

Shield fast connection			
For Ø 3-6 mm	**SSA 3-6**	**2839295**	10
For Ø 5-10 mm	**SSA 5-10**	**2839512**	10

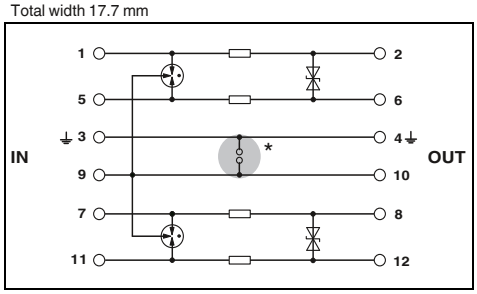
Labeling material	ZBF ..., see page 111

2 double wires (loops), floating

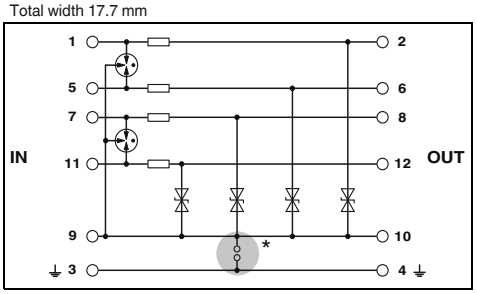
4-wire, with common reference potential

4-wire, with common reference potential

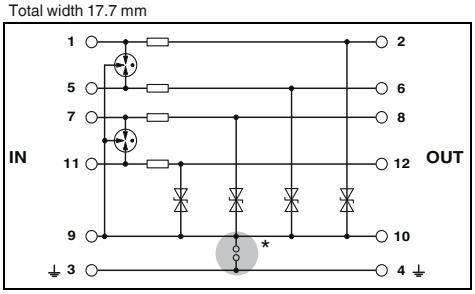
Total width 17.7 mm



Total width 17.7 mm



Total width 17.7 mm



Technical data

... 12AC	... 24AC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
18 V DC / 13 V AC	40 V DC / 28 V AC
2.5 kA	2.5 kA
450 mA (45°C)	450 mA (45°C)
10 kA / 10 kA	10 kA / 10 kA
20 kA	20 kA
≤ 25 V	≤ 55 V
-	-
Typ. 4 MHz / -	Typ. 8 MHz / -
2.2 Ω	2.2 Ω

17.7 mm / 90 mm / 65.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
-40 °C ... 85 °C
IP20
V0
IEC 61643-21

Technical data

... 5DC	... 12DC	... 24DC	... 48DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	13 V DC / 9 V AC	28 V DC / 20 V AC	53 V DC / 37 V AC
2.5 kA	2.5 kA	2.5 kA	2.5 kA
300 mA (45°C)	300 mA (45°C)	300 mA (45°C)	300 mA (45°C)
- / 10 kA	- / 10 kA	- / 10 kA	- / 10 kA
20 kA	20 kA	20 kA	20 kA
-	-	-	-
≤ 10 V	≤ 18 V	≤ 40 V	≤ 70 V
- / Typ. 1 MHz	- / Typ. 3 MHz	- / Typ. 6 MHz	- / Typ. 9 MHz
4.7 Ω	4.7 Ω	4.7 Ω	4.7 Ω

17.7 mm / 90 mm / 65.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
-40 °C ... 85 °C
IP20
V0
IEC 61643-21

Technical data

... 12AC	... 24AC	... 48AC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
18 V DC / 13 V AC	40 V DC / 13 V AC	77 V DC / 55 V AC
2.5 kA	2.5 kA	2.5 kA
300 mA (45°C)	300 mA (45°C)	300 mA (45°C)
- / 10 kA	- / 10 kA	- / 10 kA
20 kA	20 kA	20 kA
-	-	-
≤ 25 V	≤ 55 V	≤ 110 V (BE: 4x1)
- / Typ. 4 MHz	- / Typ. 8 MHz	- / Typ. 10 MHz
4.7 Ω	4.7 Ω	4.7 Ω

17.7 mm / 90 mm / 65.5 mm
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
-40 °C ... 85 °C
IP20
V0
IEC 61643-21

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 2X2-12AC-ST	**2838270**	10
PT 2X2-24AC-ST	**2838283**	10
PT 2X2-BE	**2839208**	10
PT 2X2+F-BE	**2839224**	10

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10

ZBF ..., see page 111

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 4X1- 5DC-ST	**2838306**	10
PT 4X1-12DC-ST	**2838319**	10
PT 4X1-24DC-ST	**2838322**	10
PT 4X1-48DC-ST	**2858014**	10
PT 4X1-BE	**2839363**	10
PT 4X1+F-BE	**2839376**	10

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10

ZBF ..., see page 111

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 4X1-12AC-ST	**2838348**	10
PT 4X1-24AC-ST	**2838351**	10
PT 4X1-48AC-ST	**2804856**	10
PT 4X1-BE	**2839363**	10
PT 4X1+F-BE	**2839376**	10

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10

ZBF ..., see page 111

MCR-PLUGTRAB PT

- Seamless plug-in signal circuit protection
- Maximum ease of maintenance thanks to the two-piece design
- Base element remains an integral part of the installation
- Impedance-neutral disconnection of connector for test and maintenance purposes
- Connectors can be checked with CHECKMASTER

PT 1x2...
- Protection for a floating signal circuit
- Installed in conjunction with the PT 1x2...-BE base element

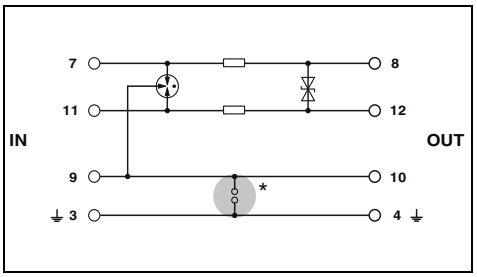
PT 2x1...
- Protection for two wires with common reference potential
- Installed in conjunction with the PT 2x1...-BE base element

*** Note:**
Various grounding options for the base elements:
PT .x.-BE connections 9/10 (GND) directly connected to the mounting foot.
PT .x.+F-BE connection 9/10 (GND) connected to the mounting foot via a gas-filled surge arrester.

Notes:
For certifications, see page 154

Double wire (loop), floating

Total width 17.7 mm



Technical data

Electrical data		... 5DC	... 12DC	... 24DC	... 48DC
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	6 V DC / 4 V AC	13 V DC / 9 V AC	28 V DC / 20 V AC	53 V DC / 37 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	2.5 kA	2.5 kA	2.5 kA	2.5 kA
Nominal current I_N		450 mA (45°C)	450 mA (45°C)	450 mA (45°C)	450 mA (45°C)
Nominal discharge surge current I_n (8/20) µs					
	Core-Core / Core-Ground	10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		20 kA	20 kA	20 kA	20 kA
Output voltage limitation at 1 kV/µs					
	Core-Core	≤ 10 V	≤ 18 V	≤ 40 V	≤ 70 V
	Core-Ground	-	-	-	-
Cut-off frequency fg (3 dB)					
	Symmetrical/asymmetrical in the 50 Ω system	Typ. 1 MHz / -	Typ. 3 MHz / -	Typ. 6 MHz / -	Typ. 10 MHz / -
Resistance per path		2.2 Ω	2.2 Ω	2.2 Ω	2.2 Ω

General data	
Dimensions W / H / D	17.7 mm / 90 mm / 65.5 mm
Connection data solid / stranded / AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Temperature range	-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP20
Inflammability class in acc. with UL 94	V0
Test standards	IEC 61643-21

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB plug, with protection circuit for plugging into base element PT				
	5 V DC	**PT 1X2- 5DC-ST**	**2856016**	10
	12 V DC	**PT 1X2-12DC-ST**	**2856029**	10
	24 V DC	**PT 1X2-24DC-ST**	**2856032**	10
	12 V AC			
	24 V AC			
	48 V DC	**PT 1X2-48DC-ST**	**2803658**	10
PLUGTRAB base element, for mounting on NS 35				
Bridge between 3/4 (⏚) and 9/10		**PT 1X2-BE**	**2856113**	10
Gas-filled surge arrester between 3/4 (⏚) and 9/10		**PT 1X2+F-BE**	**2856126**	10

Accessories

Shield fast connection		
For Ø 3-6 mm	**SSA 3-6**	**2839295**	10
For Ø 5-10 mm	**SSA 5-10**	**2839512**	10

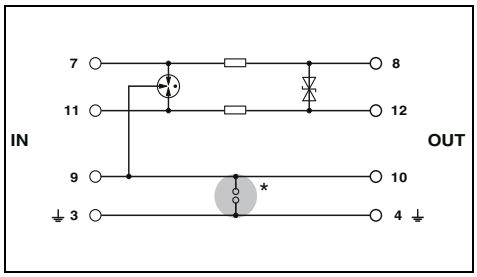
Labeling material	ZBF ..., see page 111

Double wire (loop), floating

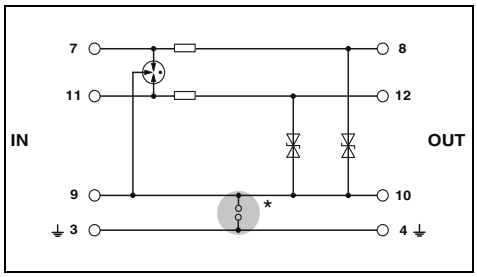
2-wire, with common reference potential

2-wire, with common reference potential

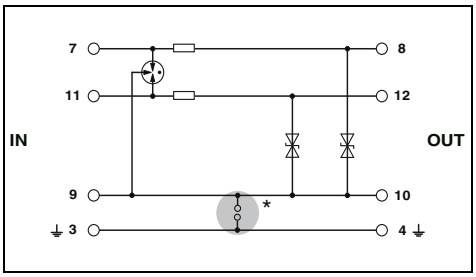
Total width 17.7 mm



Total width 17.7 mm



Total width 17.7 mm



Technical data

... 12AC	... 24AC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
18 V DC / 13 V AC	40 V DC / 28 V AC
2.5 kA	2.5 kA
450 mA (45°C)	450 mA (45°C)
10 kA / 10 kA	10 kA / 10 kA
20 kA	20 kA
≤ 25 V	≤ 55 V
-	-
Typ. 4 MHz / -	Typ. 8 MHz / -
2.2 Ω	2.2 Ω
17.7 mm / 90 mm / 65.5 mm	
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
-40 °C ... 85 °C	
IP20	
V0	
IEC 61643-21	

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 1X2-12AC-ST	**2856045**	10
PT 1X2-24AC-ST	**2856058**	10
PT 1X2-BE	**2856113**	10
PT 1X2+F-BE	**2856126**	10

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10

ZBF ..., see page 111

Technical data

... 5DC	... 12DC	... 24DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	13 V DC / 9 V AC	28 V DC / 20 V AC
2.5 kA	2.5 kA	2.5 kA
300 mA (45°C)	300 mA (45°C)	300 mA (45°C)
- / 10 kA	- / 10 kA	- / 10 kA
20 kA	20 kA	20 kA
-	-	-
≤ 10 V	≤ 18 V	≤ 40 V
- / Typ. 1 MHz	- / Typ. 3 MHz	- / Typ. 6 MHz
4.7 Ω	4.7 Ω	4.7 Ω
17.7 mm / 90 mm / 65.5 mm		
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12		
-40 °C ... 85 °C		
IP20		
V0		
IEC 61643-21		

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 2X1- 5DC-ST	**2856061**	10
PT 2X1-12DC-ST	**2856074**	10
PT 2X1-24DC-ST	**2856087**	10
PT 2X1-BE	**2856139**	10
PT 2X1+F-BE	**2856142**	10

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10

ZBF ..., see page 111

Technical data

... 12AC	... 24AC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
18 V DC / 13 V AC	40 V DC / 28 V AC
2.5 kA	2.5 kA
300 mA (45°C)	300 mA (45°C)
- / 10 kA	- / 10 kA
20 kA	20 kA
-	-
≤ 25 V	≤ 55 V
- / Typ. 4 MHz	- / Typ. 8 MHz
4.7 Ω	4.7 Ω
17.7 mm / 90 mm / 65.5 mm	
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
-40 °C ... 85 °C	
IP20	
V0	
IEC 61643-21	

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 2X1-12AC-ST	**2856090**	10
PT 2X1-24AC-ST	**2856100**	10
PT 2X1-BE	**2856139**	10
PT 2X1+F-BE	**2856142**	10

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10

ZBF ..., see page 111

MCR-PLUGTRAB PT

- Seamless plug-in signal circuit protection
- Maximum ease of maintenance thanks to the two-piece design
- Base element remains an integral part of the installation
- Impedance-neutral disconnection of connector for test and maintenance purposes
- Connectors can be checked with CHECKMASTER

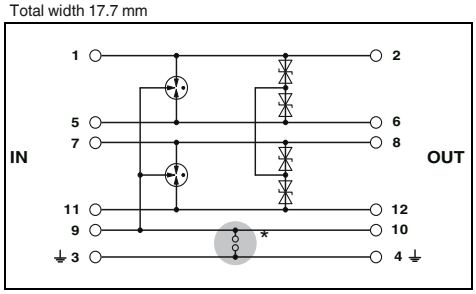
*** Note:**
Various grounding options for the base elements:
PT .x.-BE connections 9/10 (GND) directly connected to the mounting foot.
PT .x.+F-BE connection 9/10 (GND) connected to the mounting foot via a gas-filled surge arrester.

Notes:
For certifications, see page 154

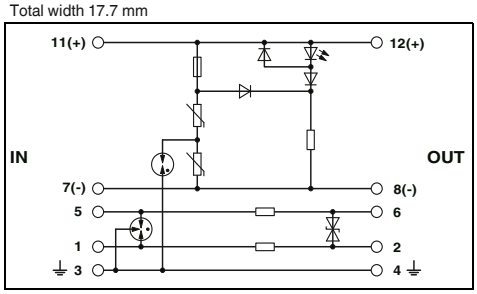
4-wire, floating, impedance-free

Combination of double wire protection (floating) and single-phase power supply

Total width 17.7 mm



Total width 17.7 mm



Technical data

Electrical data		... 5DC	... 12DC	... 24DC	... 24AC
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C		6 V DC / 4 V AC	12.8 V DC / 9 V AC	27 V DC / 19 V AC	40 V DC / 28 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	2.5 kA	2.5 kA	2.5 kA	2.5 kA
Nominal current I_N		2 A (80 °C)	2 A (80 °C)	2 A (80 °C)	2 A AC (80 °C)
Nominal discharge surge current I_n (8/20) µs					
	Core-Core / Core-Ground	720 A / 10 kA	690 A / 10 kA	365 A / 10 kA	187 A / 10 kA
Total surge current (8/20) µs		20 kA	20 kA	20 kA	20 kA
Max. discharge surge current $I_{max.}$ (8/20) µs		10 kA	10 kA	10 kA	10 kA
Output voltage limitation at 1 kV/µs					
	Core-Core	≤ 10 V	≤ 18 V	≤ 40 V	≤ 75 V
	Core-Ground	≤ 450 V	≤ 450 V	≤ 450 V (PT 4-BE)	≤ 450 V (PT 4-BE)
General data					
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm			
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12			
Temperature range		-40 °C ... 85 °C			
Degree of protection in acc. with IEC 60529/ EN 60529		IP20			
Inflammability class in acc. with UL 94		V0			
Test standards		IEC 61643-21 / DIN EN 61643-21 / UL 497B			

Technical data

Mains protection	Data protection
III / T3	C1 / C2 / C3 / D1
44 V DC / 34 V AC	40 V DC / 28 V AC
-	2.5 kA
6 A (30 °C)	450 mA (45°C)
700 A / 700 A	10 kA / 10 kA
-	20 kA
2 kA	10 kA
-	≤ 55 V
-	450 V
17.7 mm / 90 mm / 65.5 mm	
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
-40 °C ... 85 °C	
IP20	
V0	
IEC 61643-1 / EN 61643-11	IEC 61643-21

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB plug, with protection circuit for plugging into base element PT				
	5 V DC	**PT 4- 5DC-ST**	**2839211**	10
	12 V DC	**PT 4-12DC-ST**	**2839237**	10
	24 V DC	**PT 4-24DC-ST**	**2839240**	10
	24 V AC	**PT 4-24AC-ST**	**2800078**	1
PLUGTRAB base element, for mounting on NS 35				
Bridge between 3/4 (⏚) and 9/10		**PT 4-BE**	**2839402**	10
Gas-filled surge arrester between 3/4 (⏚) and 9/10		**PT 4+F-BE**	**2839415**	10
PLUGTRAB base element, for mounting on NS 35				

Ordering data

Type	Order No.	Pcs. / Pkt.
PT PE/S+1X2-24-ST	**2819008**	10
PT PE/S+1X2-BE	**2856265**	10

Accessories

Shield fast connection			
For Ø 3-6 mm	**SSA 3-6**	**2839295**	10
For Ø 5-10 mm	**SSA 5-10**	**2839512**	10
Labeling material	ZBF ..., see page 111		

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10
ZBF ..., see page 111		

MCR-PLUGTRAB PT

- Protective devices for use in telecommunications and signaling networks according to IEC 61643-21
- Seamless plug-in signal circuit protection
- Maximum ease of maintenance thanks to the two-piece design
- Base element remains an integral part of the installation
- Impedance-neutral disconnection of connector for test and maintenance purposes
- Connectors can be checked with CHECKMASTER

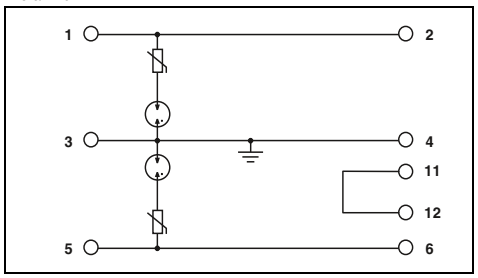
2-wire, floating, free of leakage current

2-wire, with common reference potential, remote signaling

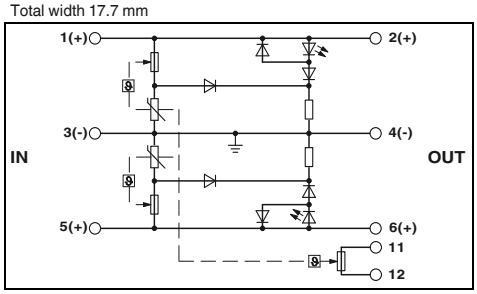
Notes:

For certifications, see page 154

Total width 17.7 mm



Total width 17.7 mm



Technical data

Electrical data		... 120AC	... 230AC
IEC category / EN type		C1 / C2 / C3	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	- / 175 V AC	- / 250 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	300 A	500 A
Nominal current I_N		6 A	6 A
Nominal discharge surge current I_n (8/20) µs			
	Core-Ground	3 kA	3 kA
Total surge current (8/20) µs		8 kA	8 kA
Output voltage limitation at 1 kV/µs			
	Core-Ground	≤ 800 V	≤ 1.4 kV
General data			
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm	
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Temperature range		-40 °C ... 80 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	
Inflammability class in acc. with UL 94		V0	
Test standards		EN 61643-21	

Technical data

Electrical data		... 60AC	... 120AC	... 230AC
IEC category / EN type		C2	C2	C2
Maximum continuous operating voltage U_C	DC/AC	100 V DC / 75 V AC	200 V DC / 150 V AC	350 V DC / 275 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	-	-	-
Nominal current I_N		26 A (30 °C)	26 A (30 °C)	26 A (30 °C)
Nominal discharge surge current I_n (8/20) µs				
	Core-Ground	2 kA (C2 - 4 kV/2 kA)	2.5 kA (C2 - 5 kV/2.5 kA)	2.5 kA (C2 - 5 kV/2.5 kA)
Total surge current (8/20) µs		4 kA	5 kA	5 kA
Output voltage limitation at 1 kV/µs				
	Core-Ground	≤ 200 V	≤ 380 V	≤ 650 V
General data				
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm		
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12		
Temperature range		-40 °C ... 85 °C		
Degree of protection in acc. with IEC 60529/ EN 60529		IP20		
Inflammability class in acc. with UL 94		V0		
Test standards		IEC 616431 / DIN EN 61643-21		

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
MAINS-PLUGTRAB, consisting of a connector and a base element				
	120 V AC	**PT 2X1-VF-120AC**	**2859327**	10
	230 V AC	**PT 2X1-VF-230AC**	**2805460**	10
PLUGTRAB plug, with protection circuit for plugging into base element PT				
	120 V AC	**PT 2X1-VF-120AC-ST**	**2856799**	10
	230 V AC	**PT 2X1-VF-230AC-ST**	**2921365**	10
PLUGTRAB base element, for mounting on NS 35				
		PT-BE/FM	**2839282**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 2X1VA- 60AC-ST	**2839172**	10
PT 2X1VA-120AC-ST	**2839185**	10
PT 2X1VA-230AC-ST	**2839198**	10
PT-BE/FM	**2839282**	10

Accessories

Shield fast connection			
For Ø 3-6 mm	**SSA 3-6**	**2839295**	10
For Ø 5-10 mm	**SSA 5-10**	**2839512**	10
Labeling material	ZBF ..., see page 111		

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10
ZBF ..., see page 111		

MCR-PLUGTRAB PT
Coarse surge protection

- For systems with high dielectric strength or fine protection installed
- Installation location - directly where the MCR cable enters the building
- Seamless plug-in signal circuit protection
- Maximum ease of maintenance thanks to the two-piece design
- Base element remains an integral part of the installation
- Impedance-neutral disconnection of connector for test and maintenance purposes
- Connectors can be checked with CHECKMASTER

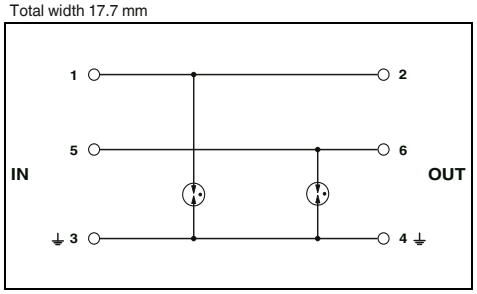
2-wire, coarse protection

4-wire, coarse protection

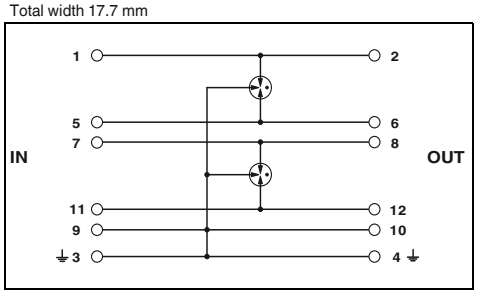
Notes:

For certifications, see page 154

Total width 17.7 mm



Total width 17.7 mm



Technical data

Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	68 V DC / 48 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	5 kA
Nominal current I_N		2 A (80 °C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	- / 20 kA
Total surge current (8/20) µs		40 kA
Protection level U_P		
	Core-Ground	≤ 600 V
Output voltage limitation at 1 kV/µs		
	Core-Ground	≤ 600 V
General data		
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Test standards		IEC 61643-21

Technical data

Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	170 V DC / 120 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	2.5 kA
Nominal current I_N		2 A (80 °C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	10 kA / 10 kA
Total surge current (8/20) µs		20 kA
Protection level U_P		
	Core-Ground	≤ 450 V
Output voltage limitation at 1 kV/µs		
	Core-Ground	≤ 450 V
General data		
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Test standards		IEC 61643-21

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB plug, with protection circuit for plugging into base element PT				
	48 V AC 110 V AC	**PT 2-F-ST**	**2859000**	10
PLUGTRAB base element, for mounting on NS 35				
Bridge between 3/4 (⏚) and 9/10		**PT-BE/FM**	**2839282**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 4-F-ST	**2858441**	10
PT 4-BE	**2839402**	10

Accessories

Shield fast connection			
For Ø 3-6 mm	**SSA 3-6**	**2839295**	10
For Ø 5-10 mm	**SSA 5-10**	**2839512**	10
Labeling material	ZBF ..., see page 111		

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10
ZBF ..., see page 111		

MCR-PLUGTRAB PT
For Ex-i circuits

- Tailored to the special requirements of intrinsically safe circuits
- Seamless plug-in signal circuit protection
- Maximum ease of maintenance thanks to the two-piece design
- Base element remains an integral part of the installation
- Impedance-neutral disconnection of connector for test and maintenance purposes
- Connectors can be checked with CHECKMASTER

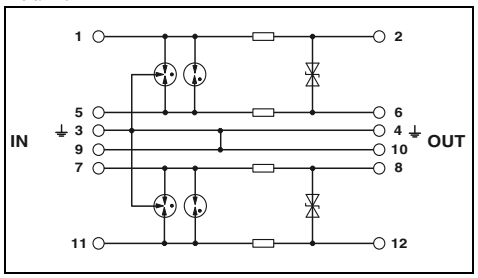
2 double wires (loops), intrinsically safe

4-wire, intrinsically safe, impedance-free

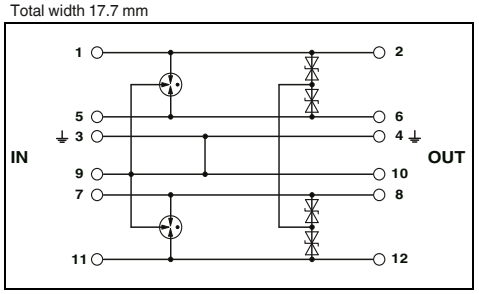
Notes:

For certifications, see page 154

Total width 17.7 mm



Total width 17.7 mm



Technical data

Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	30 V DC / 21 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	1 kA
Nominal current I_N		325 mA (40°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	10 kA / 10 kA
Total surge current (8/20) µs		20 kA
Protection level U_P		
	Core-Core	≤ 50 V (C3 - 25 A)
	Core-Ground	≤ 1 kV (C2 - 10 kV / 5 kA)
Output voltage limitation at 1 kV/µs		
	Core-Core / Core-Ground	≤ 45 V / ≤ 1 kV
Cut-off frequency fg (3 dB)		
	Symmetrical in the 50 Ω system	Typ. 4.5 MHz
Resistance per path		2.2 Ω
General data		
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Test standards		EN 61643-21 / EN 60079-0 / EN 60079-11 / EN 60079-26 / EN 61241-0 / EN 61241-11
Safety data		
EC-type examination certificate according to ATEX		KEMA 00ATEX1099 X
Identification according to ATEX		Ⓔx II 1G Ex ia IIC T4...T6 Ga Ⓔx II 1D Ex ia IIIC T135°C...T85°C Da
Maximum inner capacity C_i		1.3 nF
Maximum inner inductance L_i		1 µH
Maximum input current I_i		325 mA (T4 / ≤ 80°C)
Maximum input voltage U_i		30 V DC
Maximum input power P_i		3 W

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB plug, with protection circuit for plugging into base element PT	24 V DC	**PT 2XEX(I)-24DC-ST**	**2838225**	10
PLUGTRAB base element, for mounting on NS 35		**PT 2XEX(I)-BE**	**2839279**	10

Accessories

Shield fast connection			
For Ø 3-6 mm	**SSA 3-6**	**2839295**	10
For Ø 5-10 mm	**SSA 5-10**	**2839512**	10
Labeling material	ZBF ..., see page 111		

Technical data

Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	30 V DC / 21 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	1 kA
Nominal current I_N		500 mA (40°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	308 A / 10 kA
Total surge current (8/20) µs		20 kA
Protection level U_P		
	Core-Core	≤ 50 V (C3 - 25 A)
	Core-Ground	≤ 1 kV (C2 - 10 kV / 5 kA)
Output voltage limitation at 1 kV/µs		
	Core-Core / Core-Ground	≤ 45 V / ≤ 1 kV
Cut-off frequency fg (3 dB)		
	Symmetrical in the 50 Ω system	Typ. 7 MHz
Resistance per path		-
General data		
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Test standards		EN 61643-21 / EN 60079-0 / EN 60079-11 / EN 60079-26 / EN 61241-0 / EN 61241-11
Safety data		
EC-type examination certificate according to ATEX		KEMA 00ATEX1099 X
Identification according to ATEX		Ⓔx II 1G Ex ia IIC T4...T6 Ga Ⓔx II 1D Ex ia IIIC T135°C...T85°C Da
Maximum inner capacity C_i		1.1 nF
Maximum inner inductance L_i		1 µH
Maximum input current I_i		500 mA (T4 / ≤ 80°C)
Maximum input voltage U_i		30 V DC
Maximum input power P_i		850 mW (T4 / ≤ 80°C)

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 4-EX(I)-24DC-ST	**2839253**	10
PT 4-EX(I)-BE	**2839486**	10

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10
ZBF ..., see page 111		

MCR-PLUGTRAB PT

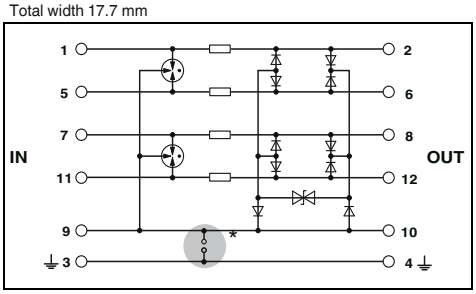
- Protection for fieldbus systems, PROFIBUS, and signal circuits with 3 to 5-wire technology
- Cable shield connection using SSA... shield fast connection
- Grounding plug (PT MCR-EST) to short circuit and ground the potentials in PLUGTRAB-PT base elements
- Seamless plug-in signal circuit protection
- Maximum ease of maintenance thanks to the two-piece design
- Base element remains an integral part of the installation
- Impedance-neutral disconnection of connector for test and maintenance purposes
- Connectors can be checked with CHECKMASTER

*** Note:**
Various grounding options for the base elements:
PT .x.-BE connections 9/10 (GND) directly connected to the mounting foot.
PT .x.+F-BE connection 9/10 (GND) connected to the mounting foot via a gas-filled surge arrester.

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

5-wire, with common reference potential

Total width 17.7 mm



Technical data

Electrical data		... 5DC	... 12DC
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	5.2 V DC / 3.6 V AC	14 V DC / 9.8 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	2.5 kA	2.5 kA
Nominal current I_N		450 mA (45°C)	450 mA (45°C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		20 kA	20 kA
Output voltage limitation at 1 kV/µs			
	Core-Core	≤ 15 V	≤ 25 V
	Core-Ground	≤ 15 V	≤ 25 V
Cut-off frequency fg (3 dB)			
	Symmetrical in the 100 Ω system	Typ. 70 MHz	Typ. 70 MHz
Resistance per path		2.2 Ω	2.2 Ω

General data	
Dimensions W / H / D	17.7 mm / 90 mm / 65.5 mm
Connection data solid / stranded / AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Temperature range	-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP20
Inflammability class in acc. with UL 94	V0
Test standards	IEC 61643-21/A1 / EN 61643-21/A1

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB plug, with protection circuit for plugging into base element PT				
Protection for 2 signal conductors	5 V DC	**PT 5-HF- 5 DC-ST**	**2838762**	10
	12 V DC	**PT 5-HF-12 DC-ST**	**2838775**	10
	24 V DC			
Grounding plug, for MCR-PLUGTRAB base elements				
PLUGTRAB base element, for mounting on NS 35				
Bridge between 3/4 (⏚) and 9/10		**PT 2X2-BE**	**2839208**	10
Gas-filled surge arrester between 3/4 (⏚) and 9/10		**PT 2X2+F-BE**	**2839224**	10

Accessories

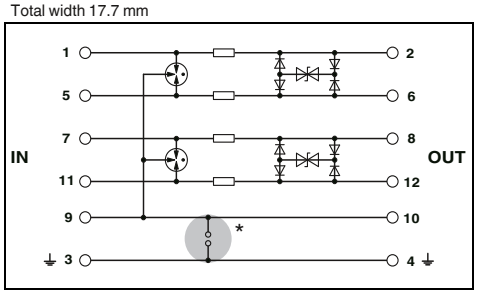
Shield fast connection			
For Ø 3-6 mm	**SSA 3-6**	**2839295**	10
For Ø 5-10 mm	**SSA 5-10**	**2839512**	10
Labeling material	ZBF ..., see page 111		

2 x 2 conductor, floating

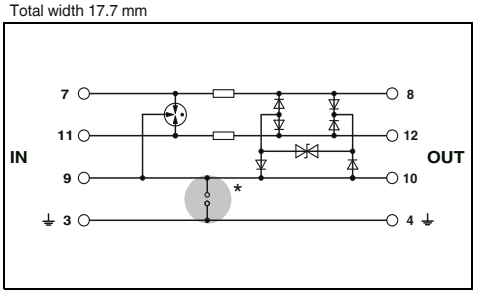
3-wire, PROFIBUS (up to 12 MHz)

Grounding plug for MCR-PLUGTRAB

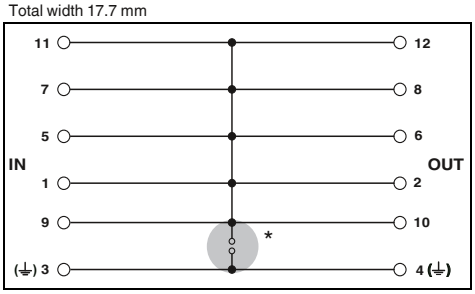
Total width 17.7 mm



Total width 17.7 mm



Total width 17.7 mm



Technical data

... 5DC	... 12DC	... 24DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
5.2 V DC / 3.6 V AC	13 V DC / 9 V AC	28 V DC / 19.8 V AC
2.5 kA	2.5 kA	2.5 kA
450 mA (45°C)	450 mA (45°C)	450 mA (45°C)
10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA
20 kA	20 kA	20 kA
≤ 15 V	≤ 25 V	≤ 45 V
-	-	-
Typ. 70 MHz	Typ. 70 MHz	Typ. 70 MHz
2.2 Ω	2.2 Ω	2.2 Ω
17.7 mm / 45 mm / 52 mm		
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12		
-40 °C ... 85 °C		
IP20		
V0		
IEC 61643-21		

Technical data

... 3-PB	... 3-HF
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
5.2 V DC / 3.6 V AC	14 V DC / 9.8 V AC
2.5 kA	2.5 kA
450 mA (45°C)	450 mA (45°C)
10 kA / 10 kA	10 kA / 10 kA
20 kA	20 kA
≤ 15 V	≤ 25 V
≤ 15 V	≤ 25 V
Typ. 70 MHz	Typ. 70 MHz
2.2 Ω	2.2 Ω
17.7 mm / 90 mm / 65.5 mm	
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
-40 °C ... 85 °C	
IP20	
V0	
IEC 61643-21/A1 / EN 61643-21/A1	

Technical data

-	
-	
-	
2 A (at 40 °C)	
-	
-	
-	
-	
17.7 mm / 90 mm / 65.5 mm	
-	
-40 °C ... 85 °C	
IP20	
V0	
-	

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 2X2-HF- 5 DC-ST	**2839567**	10
PT 2X2-HF-12 DC-ST	**2839570**	10
PT 2X2-HF-24 DC-ST	**2839729**	10
PT 2X2-BE	**2839208**	10
PT 2X2+F-BE	**2839224**	10

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10

ZBF ..., see page 111

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 3-PB-ST	**2858030**	10
PT 3-HF-12DC-ST	**2858043**	10
PT 1X2-BE	**2856113**	10
PT 1X2+F-BE	**2856126**	10

Accessories

SSA 3-6	**2839295**	10
SSA 5-10	**2839512**	10

ZBF ..., see page 111

Ordering data

Type	Order No.	Pcs. / Pkt.
PT MCR-EST	**2880749**	10

Accessories

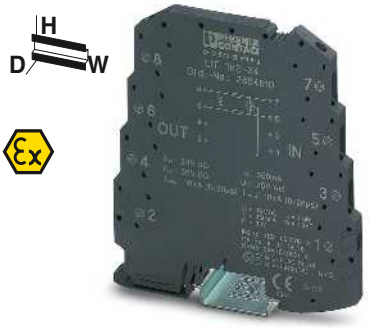
ZBF ..., see page 111

LINETRAB LIT

– Protection of up to four signal wires with a design width of 6.2 mm
– Can be used in binary, analog, and intrinsically safe circuits

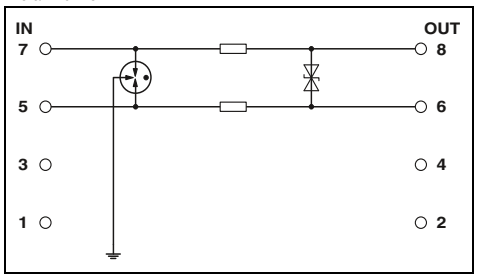
The latest information on approvals and use in intrinsically safe circuits can be found at www.phoenixcontact.net/products.

Notes:
For certifications, see page 154
For additional safety data, visit www.phoenixcontact.com



Double wire (loop), floating

Total width 6.2 mm



Technical data

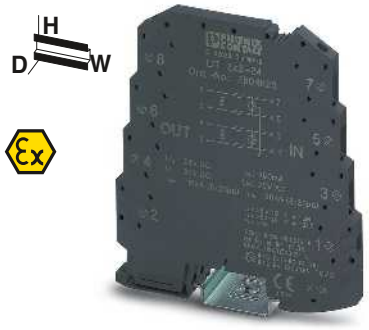
Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	36 V DC / 25 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	500 A
Nominal current I_N		350 mA (40°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	5 kA / 5 kA
Total surge current (8/20) µs		20 kA
Protection level U_P		
	Core-Core / Core-Ground	≤ 50 V (C3 - 10 A) / ≤ 650 V (C1 - 500 V / 250 A)
Cut-off frequency fg (3 dB)		
	Symmetrical in the 50 Ω system	Typ. 6 MHz
Resistance per path		3.3 Ω
General data		
Dimensions W / H / D		6.2 mm / 93 mm / 102.5 mm
Connection data solid / stranded / AWG		0.14 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12
Temperature range		-40 °C ... 80 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Test standards		IEC 61643-21 / DIN EN 61643-21 / EN 60079-0 / EN 60079-11 / EN 60079-26 / EN 61241-0
Safety data		
EC-type examination certificate according to ATEX		KEMA 09ATEX0051 X
Identification according to ATEX		Ex II 1 G Ex ia IIC T4...T6 Ex II 1 D Ex iaD 20 T85°C...135°C
Maximum inner capacity C_i		1.3 nF
Maximum inner inductance L_i		< 1 µH
Maximum input current I_i		350 mA (T4 / ≤ 80°C)
Maximum input voltage U_i		36 V DC
Maximum input power P_i		3 W

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
LINETRAB				
	24 V DC	**LIT 1X2-24**	**2804610**	10

Accessories

System adapter, for MINI Analog modules with screw connection			
	MINI MCR-SL-V8-FLK 16-A	**2811268**	1
VARIOFACE system cable for connecting LIT and MINI Analog via system adapter			
Cable length: 2 m	**VIP-CAB-FLK16/FR/FR/0,14/2,0M**	**2900156**	1
Cable length: 1 m	**VIP-CAB-FLK16/FR/FR/0,14/1,0M**	**2900155**	1
Cable length: 0.5 m	**VIP-CAB-FLK16/FR/FR/0,14/0,5M**	**2900154**	1
UniCard sheets, for marker groove	**UC-TM 6 (see page 111)**		

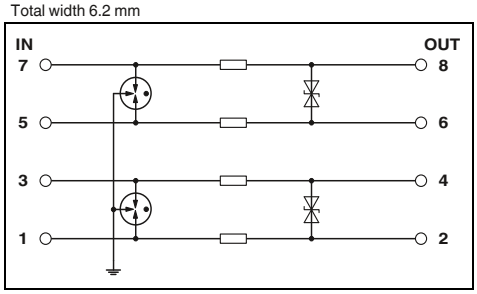


2 double wires (loops), floating

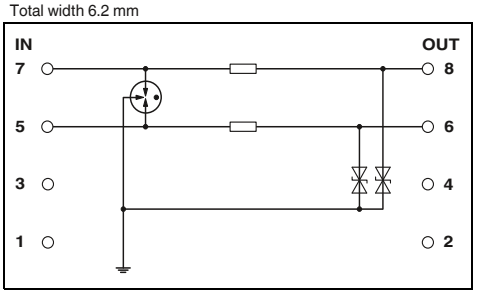
2-wire, with common reference potential

4-wire, with common reference potential

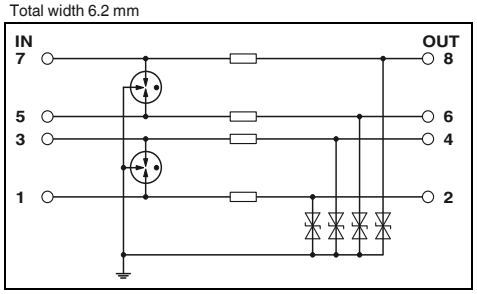
Total width 6.2 mm



Total width 6.2 mm



Total width 6.2 mm



Technical data

C1 / C2 / C3 / D1	
36 V DC / 25 V AC	
500 A	
350 mA (40°C)	
5 kA / 5 kA	
20 kA	
≤ 50 V (C3 - 10 A) / ≤ 650 V (C1 - 500 V / 250 A)	
Typ. 6 MHz	
3.3 Ω	
6.2 mm / 93 mm / 102.5 mm	
0.14 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12	
-40 °C ... 80 °C	
IP20	
V0	
IEC 61643-21 / DIN EN 61643-21 / EN 60079-0 / EN 60079-11 / EN 60079-26 / EN 61241-0	
KEMA 09ATEX0051 X	
Ex II 1 G Ex ia IIC T4...T6	
Ex II 1 D Ex iaD 20 T85°C...135°C	
1.3 nF	
< 1 µH	
350 mA (T4 / ≤ 80°C)	
36 V DC	
3 W	

Technical data

C1 / C2 / C3 / D1	
36 V DC / 25 V AC	
500 A	
350 mA (40°C)	
- / 5 kA	
20 kA	
- / ≤ 60 V (C1 - 500 V / 250 A)	
-	
3.3 Ω	
6.2 mm / 93 mm / 102.5 mm	
0.14 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12	
-40 °C ... 80 °C	
IP20	
V0	
IEC 61643-21 / DIN EN 61643-21	
-	
-	
-	
-	
-	
-	
-	
-	

Technical data

C1 / C2 / C3 / D1	
36 V DC / 25 V AC	
500 A	
350 mA (40°C)	
- / 5 kA	
20 kA	
- / ≤ 60 V (C1 - 500 V / 250 A)	
-	
3.3 Ω	
6.2 mm / 93 mm / 102.5 mm	
0.14 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12	
-40 °C ... 80 °C	
IP20	
V0	
IEC 61643-21 / DIN EN 61643-21	
-	
-	
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-	
-	
-	

Ordering data

Type	Order No.	Pcs. / Pkt.
LIT 2X2-24	**2804623**	10

Accessories

UC-TM 6 (see page 111)

Ordering data

Type	Order No.	Pcs. / Pkt.
LIT 2X1-24	**2804636**	10

Accessories

UC-TM 6 (see page 111)

Ordering data

Type	Order No.	Pcs. / Pkt.
LIT 4X1-24	**2804649**	10

Accessories

UC-TM 6 (see page 111)

LINETRAB LIT

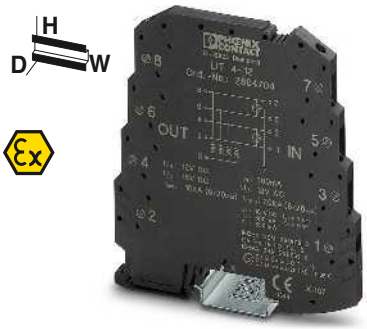
- Protection for up to four signal wires
- Cross-arrester bridging of the reference potential with ME 6,2 TBUS
- Protection of up to four signal wires with a design width of 6.2 mm
- Complete normal mode voltage protection between all wires

Notes:

For certifications, see page 154

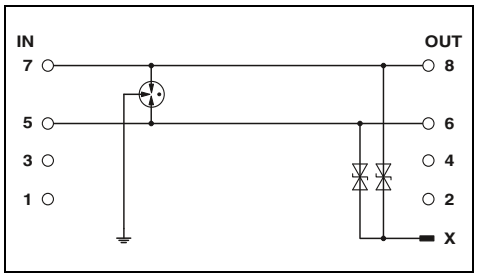
For additional safety data, visit www.phoenixcontact.com

2-wire, floating, impedance-free

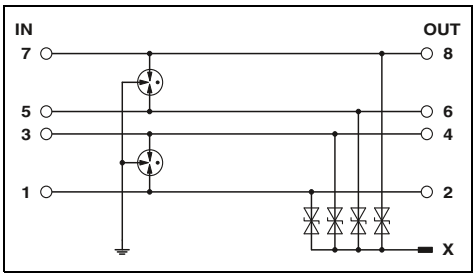


4-wire, floating, impedance-free

Total width 6.2 mm



Total width 6.2 mm



Technical data

Electrical data		... 12	... 24
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	18 V DC / 13 V AC	36 V DC / 25 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	500 A	500 A
Nominal current I_N		500 mA (40°C)	500 mA (40°C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	350 A / 5 kA	250 A / 5 kA
Total surge current (8/20) µs		20 kA	20 kA
Protection level U_P			
	Core-Core	≤ 50 V (C3 - 10 A)	≤ 60 V (C3 - 10 A)
	Core-Ground	≤ 650 V (C2 - 10 kV / 5 kA)	≤ 650 V (C2 - 10 kV / 5 kA)
Cut-off frequency fg (3 dB)			
	Asymmetrical in the 50 Ω system	Typ. 5 MHz	Typ. 7.5 MHz
Resistance per path		0 Ω	0 Ω
General data			
Dimensions W / H / D		6.2 mm / 93 mm / 102.5 mm	
Connection data solid / stranded / AWG		0.14 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12	
Temperature range		-40 °C ... 80 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	
Inflammability class in acc. with UL 94		V0	
Test standards		IEC 61643-21 / DIN EN 61643-21 / EN 60079-0 /	
Safety data			
EC-type examination certificate according to ATEX		KEMA 09ATEX0051 X	KEMA 09ATEX0051 X
Identification according to ATEX		Ex II 1 G Ex ia IIC T4...T6 Ex II 1 D Ex iaD 20 T85°C...135°C	Ex II 1 G Ex ia IIC T4...T6 Ex II 1 D Ex iaD 20 T85°C...135°C
Maximum inner capacity C_i		3 nF	1.3 nF
Maximum inner inductance L_i		< 1 µH	< 1 µH
Maximum input current I_i		500 mA (T4 / -40...+80°C)	500 mA (T4 / -40...+80°C)
Maximum input voltage U_i		18 V DC	36 V DC
Maximum input power P_i		635 mW	635 mW

Technical data

Electrical data		... 12	... 24
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	18 V DC / 13 V AC	36 V DC / 25 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	500 A	500 A
Nominal current I_N		500 mA (40°C)	500 mA (40°C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	350 A / 5 kA	250 A / 5 kA
Total surge current (8/20) µs		20 kA	20 kA
Protection level U_P			
	Core-Core	≤ 50 V (C3 - 10 A)	≤ 60 V (C3 - 10 A)
	Core-Ground	≤ 650 V (C2 - 10 kV / 5 kA)	≤ 650 V (C2 - 10 kV / 5 kA)
Cut-off frequency fg (3 dB)			
	Asymmetrical in the 50 Ω system	Typ. 5 MHz	Typ. 7.5 MHz
Resistance per path		0 Ω	0 Ω
General data			
Dimensions W / H / D		6.2 mm / 93 mm / 102.5 mm	
Connection data solid / stranded / AWG		0.14 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 12	
Temperature range		-40 °C ... 80 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	
Inflammability class in acc. with UL 94		V0	
Test standards		IEC 61643-21 / DIN EN 61643-21 / EN 60079-0 /	
Safety data			
EC-type examination certificate according to ATEX		KEMA 09ATEX0051 X	KEMA 09ATEX0051 X
Identification according to ATEX		Ex II 1 G Ex ia IIC T4...T6 Ex II 1 D Ex iaD 20 T85°C...135°C	Ex II 1 G Ex ia IIC T4...T6 Ex II 1 D Ex iaD 20 T85°C...135°C
Maximum inner capacity C_i		6 nF	2.5 nF
Maximum inner inductance L_i		< 1 µH	< 1 µH
Maximum input current I_i		500 mA (T4 / -40...+80°C)	500 mA (T4 / -40...+80°C)
Maximum input voltage U_i		18 V DC	36 V DC
Maximum input power P_i		550 mW	550 mW

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
LINETRAB, with integrated surge protection, for mounting on NS 35				
	12 V DC	**LIT 2-12**	**2804694**	10
	24 V DC	**LIT 2-24**	**2804665**	10

Accessories

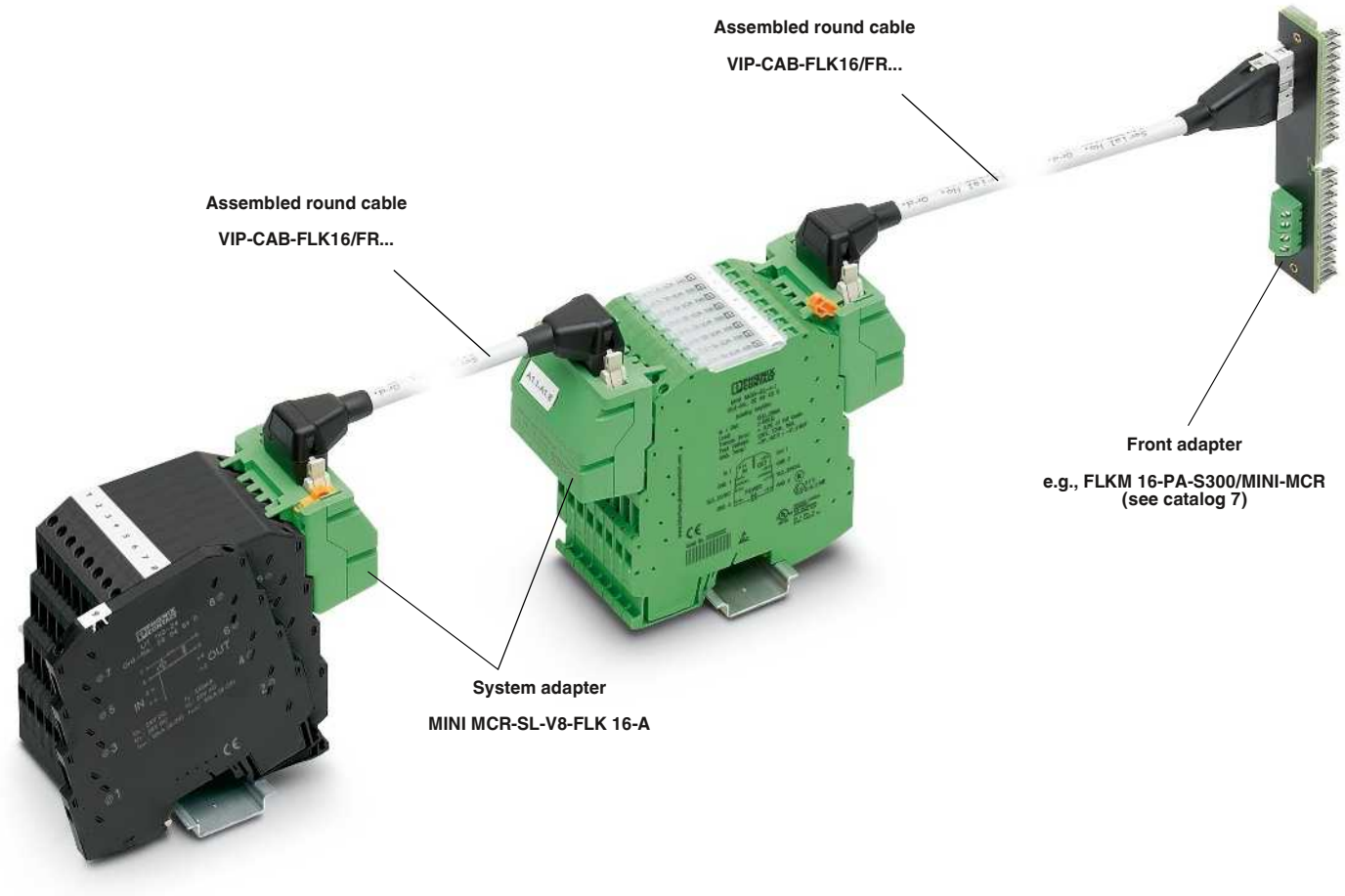
System adapter, for MINI Analog modules with screw connection			
	MINI MCR-SL-V8-FLK 16-A	**2811268**	1
DIN rail connector			
	ME 6,2 TBUS-2 1,5/5-ST-3,81KMGY	**2969401**	10
UniCard sheets, for marker groove	**UC-TM 6 (see page 111)**		

Ordering data

Type	Order No.	Pcs. / Pkt.
LIT 4-12	**2804704**	10
LIT 4-24	**2804678**	10

Accessories

ME 6,2 TBUS-2 1,5/5-ST-3,81KMGY	**2969401**	10
UC-TM 6 (see page 111)		



Configuration aid for LINETRAB - MINI Analog

Since LINETRAB and MINI Analog housing is the same shape, the advantages of system cabling can be utilized. You can create a perfectly coordinated, protected signal string from the sensor through to the controller.
The table below lists possible combinations with the system adapter (8 modules each). The complete configuration aid is available in the Download Center under LINETRAB. More detailed information about MINI Analog can be found in the catalog 7.

TRABTECH - LINETRAB		INTERFACE - MINI Analog	
Order No.	**Type**	**Order No.**	**Type**
		2864383	MINI MCR-SL-UI-UI
		2864150	MINI MCR-SL-UI-UI-NC
		2865007	MINI MCR-SL-U-UI-NC
		2813512	MINI MCR-SL-U-I-0
		2813525	MINI MCR-SL-U-I-4
		2813541	MINI MCR-SL-I-U-0
		2813538	MINI MCR-SL-I-U-4
		2864406	MINI MCR-SL-I-I
2804610	LIT 1X2-24	2864684	MINI MCR-SL-U-U
		2864794	MINI MCR-SL-UI-2I
		2864176	MINI MCR-SL-UI-2I-NC
		2864419	MINI MCR-SL-1CP-I-I
		2864082	MINI MCR-SL-UI-F
		2864105	MINI MCR-SL-NAM-2RNO
		2864480	MINI MCR-SL-UI-REL
		2810780	MINI MCR-SL-SHUNT-UI-NC
		2810858	MINI MCR-SL-SHUNT-UI

Modular terminal blocks with multiple stage surge protection TERMITRAB

– Multi-stage modular terminal blocks with screw connection method
– Versions with and without disconnect knife
– Disconnection of signal circuits by disconnect knife

TT-2-PE-…

– Protection of a floating double wire
– E.g., 0 - 20 mA or 0 - 10 V signals

TT-2-PE/S1…

– Protection of a floating double wire in which the introduction of additional resistors for decoupling the protection stages leads to problems
– E.g., for two-wire temperature measurement, PT 100

TT-2/2…

– Protection of two signal wires with common reference potential
– E.g., binary signals of position encoders

TT-EX(I)-…

– Protection of a floating double wire in intrinsically safe circuits
– Use in Ex protection zones 1 and 2

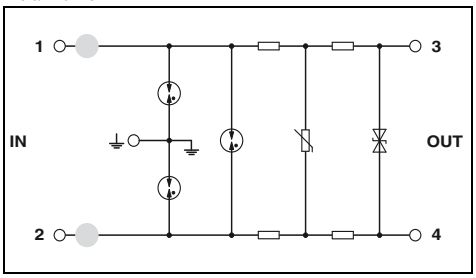
– Wires can be led through to Ex protection zone 0
– To terminate a row of TERMITRAB TT... devices, covers are available in the corresponding colors
– Other voltage levels available on request

Notes:

For certifications, see page 154

Double wire (loop), floating

Total width 6.2 mm



Technical data

Electrical data		... M-24DC	... 24DC	... 110AC
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	30 V DC / 21 V AC	30 V DC / -	- / 120 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	500 A	500 A	500 A
Nominal load current I_L		300 mA (40°C)	300 mA (40°C)	300 mA (30 °C)
Nominal discharge surge current I_n (8/20) µs				
	Core-Core / Core-Ground	5 kA / 5 kA	5 kA / 5 kA	5 kA / 5 kA
Total surge current (8/20) µs		10 kA	10 kA	10 kA
Output voltage limitation at 1 kV/µs				
	Core-Core / Core-Ground	≤ 45 V / ≤ 650 V	≤ 45 V / ≤ 650 V	≤ 250 V / ≤ 650 V
Cut-off frequency fg (3 dB)				
Symmetrical/asymmetrical in the 50 Ω system		Typ. 6 MHz / -	Typ. 3.2 MHz / -	Typ. 15 MHz / -
Resistance per path		3.3 Ω	3.7 Ω	9.4 Ω
General data				
Dimensions W/H/D (with disconnect knife)		6.2 mm / 92 mm / 66.45 mm		
Dimensions W/H/D (without disconnect knife)		6.2 mm / 79.6 mm / 54.6 mm		
Connection data solid / stranded / AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14		
Temperature range		-40 °C ... 80 °C		
Degree of protection in acc. with IEC 60529/ EN 60529		IP20		
Inflammability class in acc. with UL 94		V2		
Test standards		-		
Safety data				
EC-type examination certificate according to ATEX		-	-	-
Identification according to ATEX		-	-	-
Approvals according to IECEx		-	-	-
Maximum inner capacity C_i		-	-	-
Maximum inner inductance L_i		-	-	-
Maximum input current I_i		-	-	-
Maximum input voltage U_i		-	-	-
Maximum input power P_i		-	-	-

Ordering data

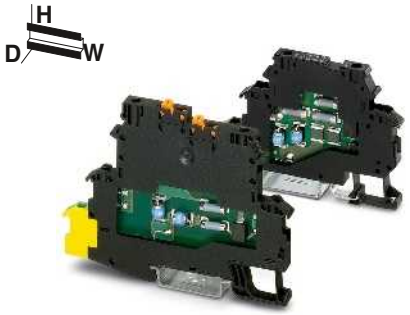
Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
TERMITRAB, modular terminal block with integrated surge protection, for mounting on NS 35				
With disconnect knife	24 V DC	**TT-2-PE-M-24DC**	**2920641**	14
Without disconnect knife	24 V DC	**TT-2-PE- 24DC**	**2838186**	10
Without disconnect knife	110 V AC	**TT-2-PE-110AC**	**2858483**	10

Accessories

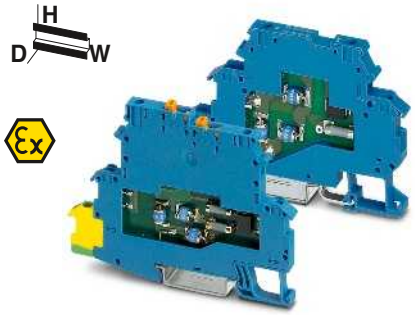
Cover, for terminating a row of terminal blocks			
For terminal blocks with disconnect knife	**TT-D-2-PE-M-BK**	**2920654**	50
For terminal blocks without disconnect knife	**D-DEK 1,5 BK**	**2838995**	50

Labeling material	ZB 6, see page 111

Double wire (loop), floating

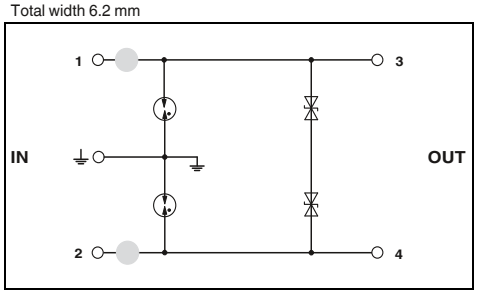


2-wire, with common reference potential

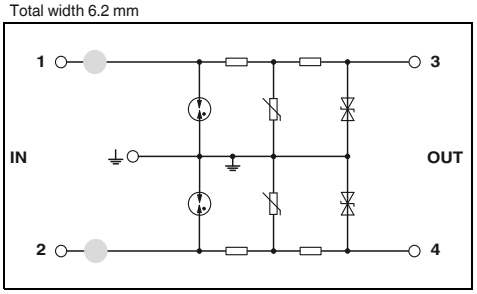


Double wire (loop), intrinsically safe

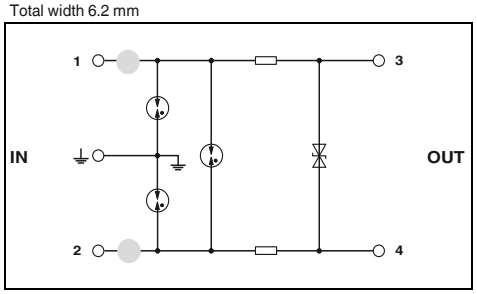
Total width 6.2 mm



Total width 6.2 mm



Total width 6.2 mm



Technical data

... M-24DC	... 24DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
30 V DC / 21 V AC	30 V DC / 21 V AC
500 A 10 A (40°C)	500 A 10 A (40°C)
300 A / 5 kA 10 kA	300 A / 5 kA 10 kA
≤ 45 V / ≤ 650 V	≤ 45 V / ≤ 700 V
Typ. 7 MHz / - -	Typ. 6 MHz / - -
6.2 mm / 92 mm / 66.45 mm 6.2 mm / 79.6 mm / 54.6 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 -40 °C ... 80 °C IP20 V2 DIN EN 61643-21	
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

Technical data

... M-24DC	... 24DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
30 V DC / 21 V AC	30 V DC / -
500 A 300 mA (40°C)	500 A 300 mA (40°C)
5 kA / 5 kA 10 kA	- / 5 kA 10 kA
- / ≤ 45 V	- / ≤ 50 V
- / Typ. 6 MHz 4.7 Ω	- / Typ. 1.5 MHz 6.6 Ω
6.2 mm / 92 mm / 66.45 mm 6.2 mm / 79.6 mm / 54.6 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 -40 °C ... 80 °C IP20 V2 IEC 61643-21	
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

Technical data

... M-24DC	... 24DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
30 V DC / 21 V AC	30 V DC / -
500 A 250 mA (T_A < 40 °C)	500 A 250 mA (40°C)
5 kA / 5 kA 10 kA	5 kA / 5 kA 10 kA
≤ 44 V / ≤ 1.5 kV	≤ 50 V / ≤ 1.7 kV
Typ. 6 MHz / - 4.7 Ω	Typ. 6 MHz / - 4.7 Ω
6.2 mm / 92 mm / 66.45 mm 6.2 mm / 79.6 mm / 54.6 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 -40 °C ... 80 °C IP20 V2 IEC 61643-21 / EN 60079-0 / EN 60079-11 /	
KEMA 99ATEX5687 X Ⓔx II 1G Ex ia IIC T4...T6 Ga Ⓔx II 1D Ex ia IIIC T135°C...T85°C Da	KEMA 99ATEX5687 X Ⓔx II 1G Ex ia IIC T4...T6 Ga Ⓔx II 1D Ex ia IIIC T135°C...T85°C Da
Ex ia IIC T4...T6 Ga Ex ia IIIC T135°C...T85°C Da	Ex ia IIC T4...T6 Ga Ex ia IIIC T135°C...T85°C Da
2 nF	2 nF
1 µH	1 µH
250 mA	250 mA (T_A < 40 °C)
30 V	30 V
0.75 W	0.75 W

Ordering data

Type	Order No.	Pcs. / Pkt.
TT-2-PE/S1-M-24DC	**2920638**	14
TT-2-PE/S1- 24DC	**2839538**	10

Accessories

TT-D-2-PE-M-BK	**2920654**	50
D-DEK 1,5 BK	**2838995**	50

ZB 6, see page 111

Ordering data

Type	Order No.	Pcs. / Pkt.
TT-2/2-M-24DC	**2920722**	14
TT-2/2- 24DC	**2838173**	10

Accessories

TT-D-2-PE-M-BK	**2920654**	50
D-DEK 1,5 BK	**2838995**	50

ZB 6, see page 111

Ordering data

Type	Order No.	Pcs. / Pkt.
TT-EX(I)-M-24DC	**2803865**	14
TT-EX(I)- 24DC	**2832124**	10

Accessories

TT-D-2-PE-M-BU	**2803878**	50
D-DEK 1,5 BU	**2838982**	50

ZB 6, see page 111

Modular terminal blocks with multiple stage surge protection TERMITRAB

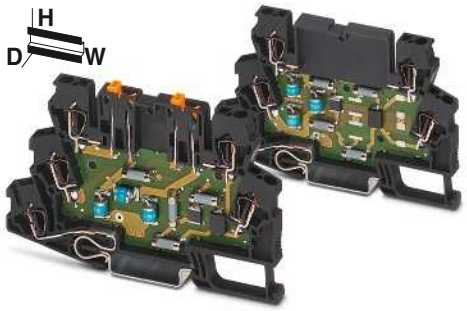
– Multi-stage modular terminal blocks with spring-cage connection
– Versions with and without disconnect knife
– Disconnection of signal circuits by disconnect knife

TT-ST-M-EX(I)-24D

– Can be used in Ex protection zones 1 and 2
– Wires can be led through to Ex protection zone 0

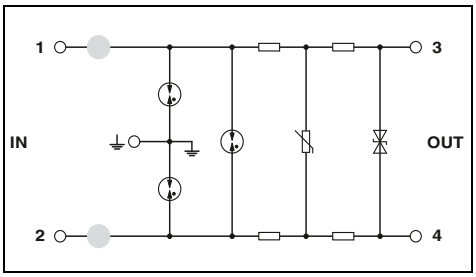
Notes:

For certifications, see page 154



Double wire (loop), floating

Total width 6.2 mm



Technical data

Electrical data		... M...24AC	... M...24DC	... 24DC
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	45 V DC / 31 V AC	30 V DC / 21 V AC	30 V DC / 21 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	1 kA	1 kA	1 kA
Nominal load current I_L		350 mA (45°C)	350 mA (45°C)	350 mA (45°C)
Nominal discharge surge current I_n (8/20) µs				
	Core-Core / Core-Ground	5 kA / 5 kA	5 kA / 5 kA	5 kA / 5 kA
Total surge current (8/20) µs		10 kA	10 kA	10 kA
Output voltage limitation at 1 kV/µs				
	Core-Core / Core-Ground	≤ 55 V / ≤ 600 V	≤ 40 V / ≤ 600 V	≤ 40 V / ≤ 600 V
Cut-off frequency fg (3 dB)				
	Symmetrical/asymmetrical in the 50 Ω system	3.5 MHz / -	Typ. 3 MHz / -	3 MHz / -
Resistance per path		6.6 Ω	6.6 Ω	6.6 Ω
Capacity per path		2 pF	2 pF	2 pF
General data				
Dimensions W/H/D (with disconnect knife)		6.2 mm / 100 mm / 63.5 mm		
Dimensions W/H/D (without disconnect knife)		6.2 mm / 100 mm / 63.5 mm		
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12		
Temperature range		-40 °C ... 85 °C		
Degree of protection in acc. with IEC 60529/ EN 60529		IP20		
Inflammability class in acc. with UL 94		V2		
Test standards		IEC 61643-21/A1 / EN 61643-21/A1		
Safety data				
EC-type examination certificate according to ATEX		-	-	-
Identification according to ATEX		-	-	-
Approvals according to IECEx		-	-	-
Maximum inner capacity C_i		-	-	-
Maximum inner inductance L_i		-	-	-
Maximum input current I_i		-	-	-
Maximum input voltage U_i		-	-	-
Maximum input power P_i		-	-	-

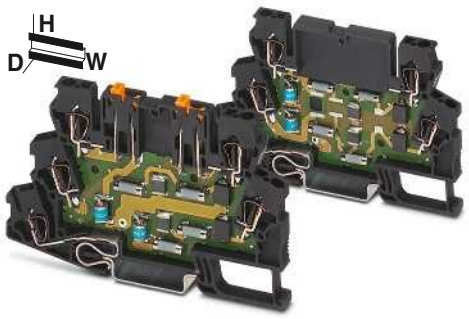
Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
TERMITRAB, spring-cage modular terminal block with integrated surge protection disconnect knives, for mounting on NS 35				
With disconnect knife	24 V AC	**TT-ST-M-2-PE-24AC**	**2858920**	10
With disconnect knife	24 V DC	**TT-ST-M-2-PE-24DC**	**2858904**	10
Without disconnect knife	24 V DC	**TT-ST-2-PE-24DC**	**2858878**	10

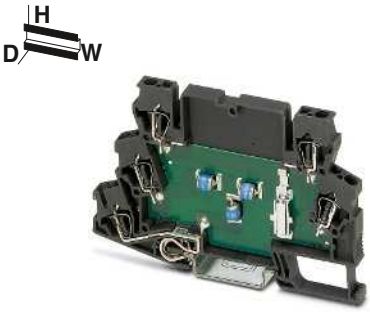
Accessories

Cover, for terminating a row of terminal blocks	**TT-D-STTCO-BK**	**2858894**	50
Labeling material	ZB 6, see page 111		

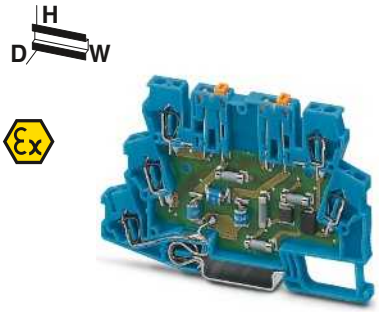
N



2-wire, with common reference potential

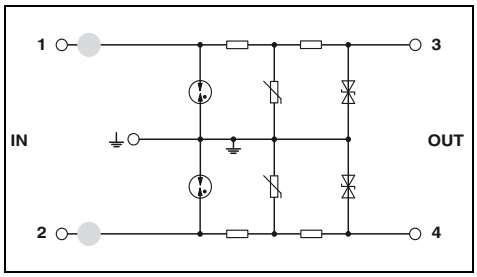


Double wire (loop), floating

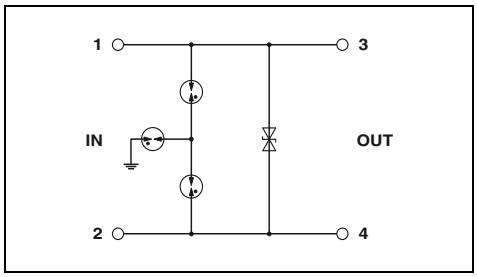


Double wire (loop), intrinsically safe

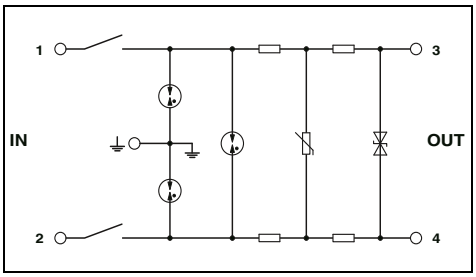
Total width 6.2 mm



Total width 6.2 mm



Total width 6.2 mm



Technical data

... M...24AC	... M...24DC	... 24DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
45 V DC / 31 V AC	30 V DC / 21 V AC	30 V DC / 21 V AC
1 kA	1 kA	1 kA
300 mA (45°C)	300 mA (45°C)	300 mA (45°C)
- / 5 kA	- / 5 kA	- / 5 kA
10 kA	10 kA	10 kA
- / ≤ 55 V	- / ≤ 40 V	- / ≤ 40 V
- / Typ. 3.5 MHz	- / Typ. 3 MHz	- / Typ. 3 MHz
9.4 Ω	9.4 Ω	9.4 Ω
2 nF	2 nF	2 nF
6.2 mm / 100 mm / 63.5 mm		
6.2 mm / 100 mm / 63.5 mm		
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12		
-40 °C ... 85 °C		
IP20		
V2		
IEC 61643-21/A1 / EN 61643-21/A1		
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Ordering data

Type	Order No.	Pcs. / Pkt.
TT-ST-M-2/2-24AC	**2858933**	10
TT-ST-M-2/2-24DC	**2858917**	10
TT-ST-2/2-24DC	**2858881**	10

Accessories

TT-D-STTCO-BK	**2858894**	50

ZB 6, see page 111

Technical data

C1 / C2 / C3 / D1	
30 V DC / 21 V AC	
500 A	
6 A (40°C)	
300 A / 5 kA	
5 kA	
≤ 45 V / ≤ 800 V	
Typ. 3.3 MHz / -	
-	
-	
-	
6.2 mm / 100 mm / 63.5 mm	
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
-40 °C ... 80 °C	
IP20	
V0	
IEC 61643-21/A1 / EN 61643-21/A1	
-	
-	
-	
-	
-	
-	
-	

Ordering data

Type	Order No.	Pcs. / Pkt.
TT-ST-2-PE/S2-24DC	**2801458**	10

Accessories

TT-D-STTCO-BK	**2858894**	50

ZB 6, see page 111

Technical data

C1 / C2 / C3 / D1	
30 V DC / -	
1 kA	
200 mA (T_A < 40 °C)	
5 kA / 5 kA	
10 kA	
≤ 40 V / ≤ 1.5 kV	
Typ. 3 MHz / -	
6.6 Ω	
-	
6.2 mm / 100 mm / 63.5 mm	
-	
0.5 ... 4 mm² / 0.5 ... 2.5 mm² / 24 - 12	
-40 °C ... 80 °C	
IP20	
V2	
DIN EN 61643-21 / EN 60079-0 / EN 60079-11 /	
KEMA 04ATEX1059 X	
Ex II 1G Ex ia IIC T4...T6 Ga	
Ex II 1D Ex ia IIIC T135°C...T85°C Da	
Ex ia IIC T4...T6 Ga	
Ex ia IIIC T135°C...T85°C Da	
4 nF	
1 µH	
200 mA (T4/≤ 85°C)	
30 V	
1.6 W	

Ordering data

Type	Order No.	Pcs. / Pkt.
TT-ST-M-EX(I)-24DC	**2859424**	10

Accessories

TT-D-ST-BU	**2856773**	10

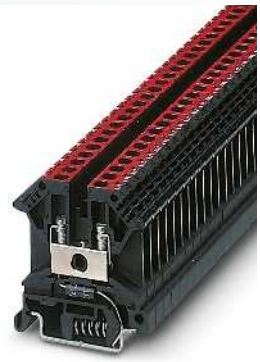
ZB 6, see page 111

TERMITRAB modular terminal block with single-level surge protection

– Modular terminal blocks with screw connection method
– Can be used as fine protection/medium protection in the signal circuits of electronic controllers

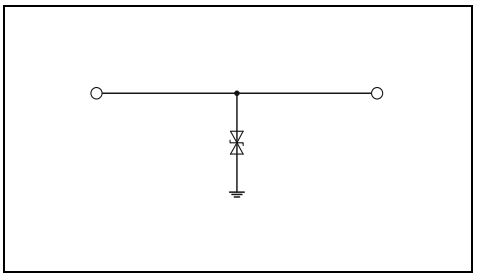
Notes:

For certifications, see page 154



With suppressor diode, direction of action: core-ground

Total width 6.2 mm



Technical data

Electrical data		... 12DC	... 24DC	... 48DC
IEC category / EN type		C1 / C3	C3	C3
Maximum continuous operating voltage U_C	DC/AC	13 V DC / 9 V AC	28 V DC / 20 V AC	53 V DC / 37 V AC
Nominal current I_N		32 A (50°C)	32 A (50°C)	32 A (50°C)
Nominal discharge surge current I_n (8/20) µs				
	Core-Core / Core-Ground	- / 346 A	- / 169 A	- / 90 A
Total surge current (8/20) µs		346 A	169 A	90 A
Output voltage limitation at 1 kV/µs				
	Core-Core / Core-Ground	- / ≤ 19 V	- / ≤ 40 V	- / ≤ 80 V

General data	
Dimensions W / H / D	6.2 mm / 42.5 mm / 47 mm
Connection data solid / stranded / AWG	0.2 ... 4 mm² / 0.2 ... 4 mm² / 24 - 12
Temperature range	-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP20
Inflammability class in acc. with UL 94	V2
Test standards	IEC 61643-21

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
TERMITRAB, modular terminal block with integrated surge protection, for mounting on NS 35				
	12 V DC	**TT-UK5/ 12DC**	**2794686**	50
	24 V DC	**TT-UK5/ 24DC**	**2794699**	50
	48 V DC	**TT-UK5/ 48DC**	**2794709**	50
	60 V DC			

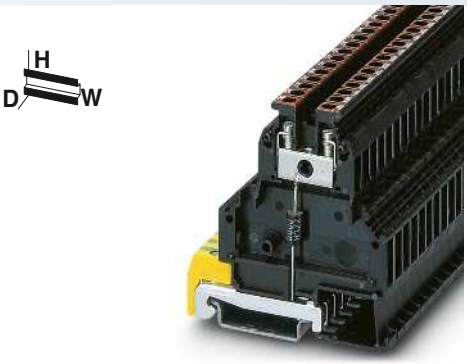
Accessories

Spacer plate, compensates for level offsets when normal terminal blocks are aligned, 2.5 mm thick			
Black			
Cover, for terminating a row of terminal blocks			
Black	**D-TERMITRAB-UK 5**	**2794990**	50

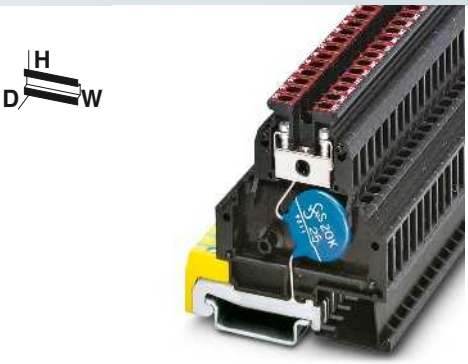
Labeling material

ZB 6, see page 111

With suppressor diode, disconnect knife, direction of action: core-core

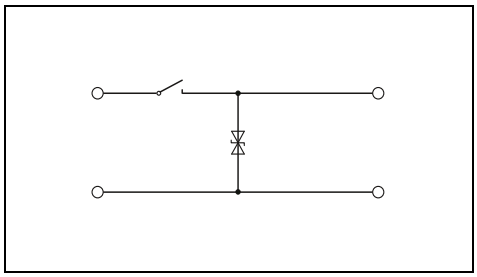


With suppressor diode, direction of action: core-ground

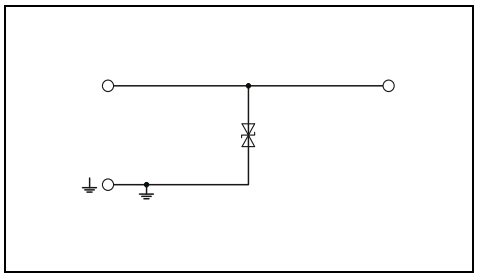


With varistor, direction of action: core-ground

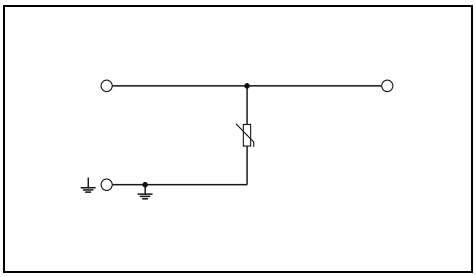
Total width 6.2 mm



Total width 6.2 mm



Total width 6.2 mm



Technical data

... 24DC	... 48DC	... 60DC
C3	C3	C3
28 V DC / 20 V AC	53 V DC / 37 V AC	70 V DC / 49 V AC
12 A (45°C)	12 A (45°C)	12 A (45°C)
169 A / -	90 A / -	69 A / -
169 A	90 A	69 A
≤ 40 V / -	≤ 80 V / -	≤ 100 V / -

6.2 mm / 80 mm / 68 mm
0.2 ... 4 mm² / 0.2 ... 4 mm² / 24 - 12
-40 °C ... 85 °C
IP20
V2
IEC 61643-21 / DIN EN 61643-21

Technical data

... 12DC	... 24DC	... 48DC
C1 / C3	C3	C3
13.6 V DC / 9.5 V AC	28.2 V DC / 20 V AC	53 V DC / 37 V AC
32 A (50°C)	32 A (50°C)	32 A (50°C)
- / 346 A	- / 169 A	- / 90 A
346 A	169 A	90 A
- / ≤ 19 V	- / ≤ 41 V	- / ≤ 79 V

6.2 mm / 66.5 mm / 69.5 mm
0.2 ... 4 mm² / 0.2 ... 4 mm² / 24 - 12
-40 °C ... 85 °C
IP20
V2
IEC 61643-21

Technical data

... 12DC	... 24DC	... 48DC
C1 / C2 / C3	C1 / C2 / C3	C1 / C2 / C3
14 V DC / 11 V AC	31 V DC / 11 V AC	65 V DC / 50 V AC
32 A (50°C)	32 A (50°C)	32 A (50°C)
- / 700 A	- / 700 A	- / 2 kA
2 kA	2 kA	6.5 kA
- / ≤ 45 V	- / ≤ 80 V	- / ≤ 125 V

6.2 mm / 66.5 mm / 69.5 mm
0.2 ... 4 mm² / 0.2 ... 4 mm² / 24 - 12
-40 °C ... 85 °C
IP20
V2
IEC 61643-21

Ordering data

Type	Order No.	Pcs. / Pkt.
TT-UKK5-M/ 24DC	**2795960**	50
TT-UKK5-M/ 48DC	**2795973**	50
TT-UKK5-M/ 60DC	**2795986**	50

Accessories

ZB 6, see page 111

Ordering data

Type	Order No.	Pcs. / Pkt.
TT-SLKK5-S- 12DC	**2809597**	50
TT-SLKK5-S- 24DC	**2809607**	50
TT-SLKK5-S- 48DC	**2809610**	50

Accessories

DP-UKK 3/5 BK	**2770833**	50
D-UKK 3/5 BK	**2770228**	50

ZB 6, see page 111

Ordering data

Type	Order No.	Pcs. / Pkt.
TT-SLKK5/ 12DC	**2794893**	50
TT-SLKK5/ 24DC	**2794903**	50
TT-SLKK5/ 48DC	**2794916**	50

Accessories

DP-UKK 3/5 BK	**2770833**	50
D-UKK 3/5 BK	**2770228**	50

ZB 6, see page 111

Surge protection direct at the sensor head
SURGETRAB

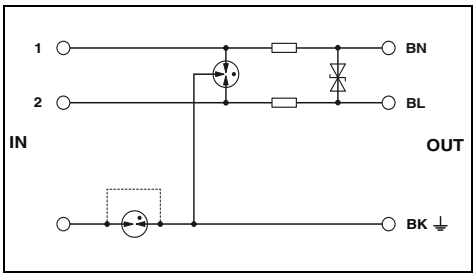
– Arresters in hexagonal tube with various outer threads
– **S-PT-1x2…** and **S-PT-EX(I)…** installation in signal path feed-through
– **S-PT-EX, S-PT-2xEX...,** and **S-PT-4-EX** installation in a separate cable gland parallel to the signal cables
– S-PT-EX... devices are approved for Ex-i and Ex-d measuring probes

Notes:
For certifications, see page 154
For more information about EX approvals, visit www.phoenixcontact.com
For additional safety data, visit www.phoenixcontact.com

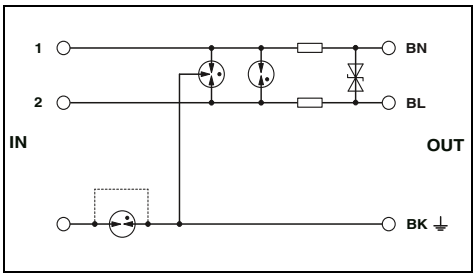
Double wire (loop), floating

Double wire (loop), intrinsically safe

Total width 34 mm



Total width 34 mm



Technical data

Electrical data		
Maximum continuous operating voltage U_C	DC/AC	40 V DC / 28 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	1 kA
Nominal current I_N		450 mA (55°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	10 kA / 10 kA
Maximum permitted short-circuit current at installation location		1 A
Total surge current (8/20) µs		20 kA
Protection level U_P		
	Core-Core	≤ 80 V (C2 -5 kA)
	Core-Ground	
Output voltage limitation at 1 kV/µs		
	Core-Core / Core-Ground	≤ 55 V / ≤ 450 V (Direct grounding)
Resistance per path		2.2 Ω
General data		
Dimensions W / H / D		34 mm / 34 mm / 137 mm
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP67
Test standards		IEC 61643-21
		-
Safety data		
EC-type examination certificate according to ATEX		-
Identification according to ATEX		-
Maximum inner capacity C_i		-
Maximum inner inductance L_i		-
Maximum input current I_i		-
Maximum input voltage U_i		-
Maximum input power P_i		-

Technical data

Electrical data		
Maximum continuous operating voltage U_C	DC/AC	30 V DC / 21 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	1 kA
Nominal current I_N		350 mA (50°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	10 kA / 10 kA
Maximum permitted short-circuit current at installation location		350 mA
Total surge current (8/20) µs		
Protection level U_P		
	Core-Core	≤ 50 V (C3 - 25 A)
	Core-Ground	≤ 1.4 kV (C3 - 100 A)
Output voltage limitation at 1 kV/µs		
	Core-Core / Core-Ground	≤ 50 V / ≤ 1.4 kV (Direct grounding)
Resistance per path		2.2 Ω
General data		
Dimensions W / H / D		34 mm / 34 mm / 137 mm
Temperature range		-40 °C ... 50 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP67
Test standards		DIN EN 61643-21 / EN 60079-0 / EN 60079-11 / EN 60079-26
Safety data		
EC-type examination certificate according to ATEX		KEMA 06ATEX0002
Identification according to ATEX		Ex II 1G Ex ia IIC T4...T6 Ga
Maximum inner capacity C_i		2 nF
Maximum inner inductance L_i		1 µH
Maximum input current I_i		350 mA (T4,T5,T6/≤ 50°C)
Maximum input voltage U_i		30 V
Maximum input power P_i		3 W

Ordering data

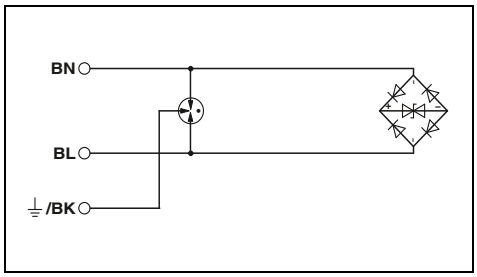
Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
SURGETRAB, protective adapter for installation on measuring sensors				
Outer thread: M20 x 1.5	24 V DC	**S-PT-1X2-24DC**	**2880668**	1
Outer thread: 1/2" 14 NPT	24 V DC	**S-PT-1X2-24DC-1/2"**	**2882569**	1
Outer thread: 3/4" 14 NPT	24 V DC	**S-PT-1X2-24DC-3/4"**	**2882598**	1
SURGETRAB protective adapter for installation on measuring sensors for Ex protection zones				
Outer thread: M20 x 1.5	24 V DC			
Outer thread: 1/2" 14 NPT	24 V DC			
Outer thread: 3/4" 14 NPT	24 V DC			
Outer thread: M20 x 1.5	48 V DC			
Outer thread: 1/2" 14 NPT	48 V DC			

Ordering data

Type	Order No.	Pcs. / Pkt.
S-PT-EX(I)-24DC	**2880671**	1
S-PT-EX(I)-24DC-1/2"	**2882572**	1
S-PT-EX(I)-24DC-3/4"	**2882585**	1

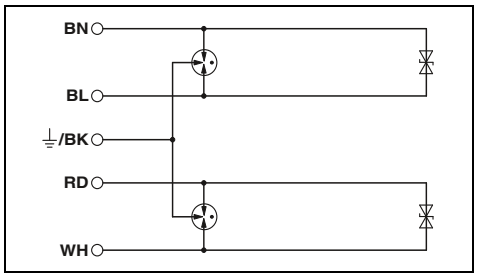
Double conductor (loop), floating, intrinsically safe, encapsulated, without decoupling resistance

Total width 28 mm



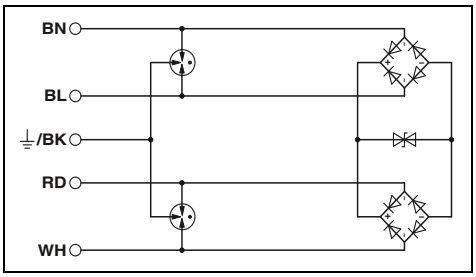
2 double conductors (loops), floating, intrinsically safe, encapsulated, without decoupling resistance

Total width 28 mm



4-wire with common reference potential, intrinsically safe, encapsulated, without decoupling resistance

Total width 28 mm



Technical data

... 24DC	... 48DC	
36 V DC / 25 V AC	53 V DC / 37 V AC	36 V DC / 25 V AC
1 kA	1 kA	1 kA
-	-	-
260 A / 10 kA	170 A / 10 kA	260 A / 10 kA
1 A (non-EX)	1 A (non-EX)	1 A (non-EX)
20 kA	20 kA	20 kA
≤ 65 V (C3 - 10 A)	≤ 90 V (C3 - 10 A)	≤ 65 V (C3 - 10 A)
≤ 1.1 kV (C3 - 100 A)	≤ 1.1 kV (C3 - 100 A)	≤ 1.1 kV (C3 - 100 A)
≤ 60 V / -	≤ 80 V / -	≤ 60 V / -
-	-	-
28 mm / 28 mm / 79 mm		
-25 °C ... 80 °C (non-EX)		
IP67		
EN 61643-21 / EN 60079-0 / EN 60079-1 / EN 60079-11 / EN 60079-26 / EN 61241-0		
KEMA 09ATEX0028 X	KEMA 09ATEX0028 X	KEMA 09ATEX0028 X
II 1 G Ex ia IIC T4...T6	II 1 G Ex ia IIC T4...T6	II 1 G Ex ia IIC T4...T6
II 2 G Ex d IIC T4...T6	II 2 G Ex d IIC T4...T6	II 2 G Ex d IIC T4...T6
1.65 nF	1.14 nF	1.65 nF
1 µH	1 µH	1 µH
500 mA	500 mA	500 mA
36 V DC	53 V DC	36 V DC
3 W	3 W	3 W

Technical data

... 24DC	... 48DC	
36 V DC / 25 V AC	53 V DC / 37 V AC	
1 kA	1 kA	
-	-	
260 A / 10 kA	170 A / 10 kA	
1 A (non-EX)	1 A (non-EX)	
20 kA	20 kA	
≤ 50 V (C3 - 10 A)	≤ 80 V (C3 - 10 A)	
≤ 1.1 kV (C3 - 100 A)	≤ 1.1 kV (C3 - 100 A)	
≤ 50 V / -	≤ 80 V / -	
-	-	
28 mm / 28 mm / 79 mm		
-25 °C ... 80 °C (non-EX)		
IP67		
EN 61643-21 / EN 60079-0 / EN 60079-1 / EN 60079-11 / EN 60079-26 / EN 61241-0		
KEMA 09ATEX0028 X	KEMA 09ATEX0028 X	
II 1 G Ex ia IIC T4...T6	II 1 G Ex ia IIC T4...T6	
II 2 G Ex d IIC T4...T6	II 2 G Ex d IIC T4...T6	
1.65 nF	1.14 nF	
1 µH	1 µH	
500 mA	500 mA	
36 V DC	53 V DC	
3 W	3 W	

Technical data

36 V DC / 25 V AC
1 kA
-
260 A / 10 kA
1 A (non-EX)
20 kA
≤ 65 V (C3 - 10 A)
≤ 1.1 kV (C3 - 100 A)
≤ 60 V / -
-
28 mm / 28 mm / 79 mm
-25 °C ... 80 °C (non-EX)
IP67
EN 61643-21 / EN 60079-0 / EN 60079-1 / EN 60079-11 / EN 60079-26 / EN 61241-0
KEMA 09ATEX0028 X
II 1 G Ex ia IIC T4...T6
II 2 G Ex d IIC T4...T6
1.65 nF
1 µH
500 mA
36 V DC
3 W

Ordering data

Type	Order No.	Pcs. / Pkt.
S-PT-EX-24DC	**2800034**	1
S-PT-EX-24DC-1/2"	**2800035**	1
S-PT-EX-48DC	**2800053**	1
S-PT-EX-48DC-1/2"	**2800054**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
S-PT-2XEX-24DC	**2800040**	1
S-PT-2XEX-24DC-1/2"	**2800041**	1
S-PT-2XEX-48DC	**2800038**	1
S-PT-2XEX-48DC-1/2"	**2800039**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
S-PT-4-EX-24DC	**2800036**	1
S-PT-4-EX-24DC-1/2"	**2800037**	1

COMTRAB modular

- Modular compact protection for high-density networks
- Space-saving LSA-PLUS connection technology
- Surge protection connectors for 1 - 10 double wires or 2 - 20 individual wires
- Typical installation locations include marshalling distributors
- Can be used in LSA-PLUS disconnect and control strips or CT-TERMIBLOCK
- The CTM 10-MAG surge protection card cage can be mounted with any of the different protective connectors

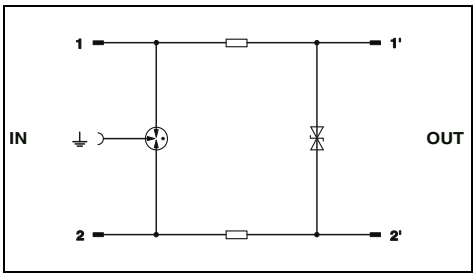
Double wire (loop), floating

2-wire, with common reference potential

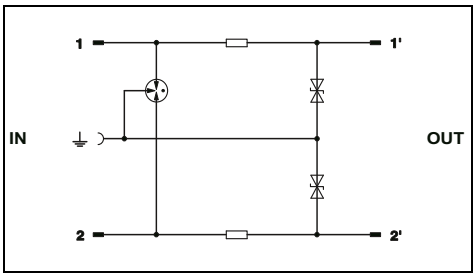
Notes:

For certifications, see page 154

Total width 9.5 mm



Total width 9.5 mm



Technical data

Electrical data		... 12DC	... 24DC	... 60DC	... 110AC
IEC category / EN type		B2 / C1 / C2 / C3 / D1	B2 / C1 / C2 / C3 / D1	B2 / C1 / C2 / C3 / D1	B2 / C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	± 15 V DC / 10 V AC	± 30 V DC / 21 V AC	± 65 V DC / 50 V AC	± 180 V DC / -
Lightning test curr. I_{imp} (10/350) µs	Per path	1 kA	1 kA	1 kA	1 kA
Nominal current I_N		380 mA (25°C)	380 mA (25°C)	380 mA (25°C)	380 mA (25°C)
Nominal discharge surge current I_n (8/20) µs					
	Core-Core / Core-Ground	5 kA / 5 kA	5 kA / 5 kA	5 kA / 5 kA	5 kA / 5 kA
Total surge current (8/20) µs		10 kA	10 kA	10 kA	10 kA
Output voltage limitation at 1 kV/µs					
	Core-Core	≤ 25 V	≤ 70 V	≤ 160 V	≤ 260 V
	Core-Ground	≤ 700 V	≤ 700 V	≤ 700 V	≤ 800 V
Cut-off frequency fg (3 dB)					
	Symmetrical/asymmetrical in the 100 Ω system	1.2 MHz / -	2.7 MHz / -	2 MHz / -	20 MHz / -
Resistance per path		3.3 Ω	3.3 Ω	3.3 Ω	3.3 Ω
General data					
Dimensions W / H / D		9.5 mm / 21 mm / 53.5 mm			
Temperature range		-25 °C ... 75 °C			
Degree of protection in acc. with IEC 60529/ EN 60529		IP20			
Inflammability class in acc. with UL 94		V0			
Test standards		IEC 61643-21			

Technical data

Electrical data		... 5DC	... 12DC	... 24DC	... 60DC
IEC category / EN type		B2 / C1 / C2 / C3 / D1	B2 / C1 / C2 / C3 / D1	B2 / C1 / C2 / C3 / D1	B2 / C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	± 6 V DC / 5 V AC	± 15 V DC / 10 V AC	± 30 V DC / 21 V AC	± 65 V DC / 50 V AC
Lightning test curr. I_{imp} (10/350) µs	Per path	1 kA	1 kA	1 kA	1 kA
Nominal current I_N		380 mA (25°C)	380 mA (25°C)	380 mA (25°C)	380 mA (25°C)
Nominal discharge surge current I_n (8/20) µs					
	Core-Core / Core-Ground	- / 5 kA	- / 5 kA	- / 5 kA	- / 5 kA
Total surge current (8/20) µs		10 kA	10 kA	10 kA	10 kA
Output voltage limitation at 1 kV/µs					
	Core-Core	-	-	-	-
	Core-Ground	≤ 12 V	≤ 22 V	≤ 45 V	≤ 160 V
Cut-off frequency fg (3 dB)					
	Symmetrical/asymmetrical in the 100 Ω system	- / 700 kHz	- / 1.5 MHz	- / 2.7 MHz	- / 2 MHz
Resistance per path		3.3 Ω	3.3 Ω	3.3 Ω	3.3 Ω
General data					
Dimensions W / H / D		9.5 mm / 21 mm / 53.5 mm			
Temperature range		-25 °C ... 75 °C			
Degree of protection in acc. with IEC 60529/ EN 60529		IP20			
Inflammability class in acc. with UL 94		V0			
Test standards		IEC 61643-21			

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
COMTRAB modular, surge protection for a double wire with coarse and fine protection and ohmic decoupling, DSL-compatible				
	5 V DC			
	12 V DC	**CTM 1X2- 12DC**	**2838597**	10
	24 V DC	**CTM 1X2- 24DC**	**2838513**	10
	60 V DC	**CTM 1X2- 60DC**	**2838568**	10
	110 V AC	**CTM 1X2-110AC**	**2838539**	10
	180 V DC			

Ordering data

Type	Order No.	Pcs. / Pkt.
CTM 2X1- 5DC	**2838571**	10
CTM 2X1- 12DC	**2838584**	10
CTM 2X1- 24DC	**2838500**	10
CTM 2X1- 60DC	**2838542**	10

Accessories

	Type	Order No.	Pcs. / Pkt.
Magazine, with grounding rail for accommodating up to 10 LSA-PLUS protective connectors (CTM...), for insertion in CT-TERMIBLOCK or LSA-PLUS disconnect strip			
	CTM 10-MAG	**2838610**	5

Accessories

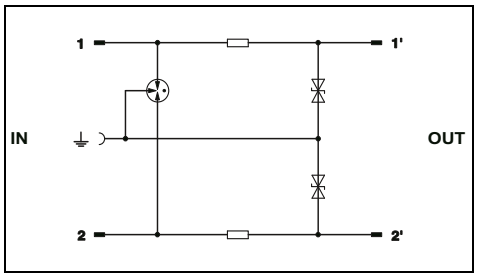
Type	Order No.	Pcs. / Pkt.
CTM 10-MAG	**2838610**	5

2-wire, with common reference potential

2-wire, coarse protection, with failsafe contact

2-wire, coarse protection, with failsafe contact and current protection (Powercross)

Total width 9.5 mm



Technical data

	B2 / C1 / C2 / C3 / D1
	± 180 V DC / -
	1 kA 380 mA (25°C)
	- / 5 kA 10 kA
	- ≤ 15 V
	- / Typ. 20 MHz 3.3 Ω
	9.5 mm / 21 mm / 53.5 mm -25 °C ... 75 °C IP20 V0 IEC 61643-21

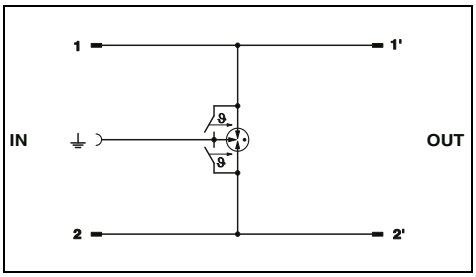
Ordering data

Type	Order No.	Pcs. / Pkt.
CTM 2X1-110AC	**2838526**	10

Accessories

CTM 10-MAG	**2838610**	5

Total width 9.5 mm



Technical data

	A2 / B1 / B2 / B3 / C1 / C2 / C3 / D1 / D2
	± 180 V DC / -
	1 kA 1.5 A (25°C)
	- / 5 kA 10 kA
	- ≤ 800 V
	- / > 100 MHz -
	9.5 mm / 21 mm / 53.5 mm -40 °C ... 85 °C IP20 V0 IEC 61643-21

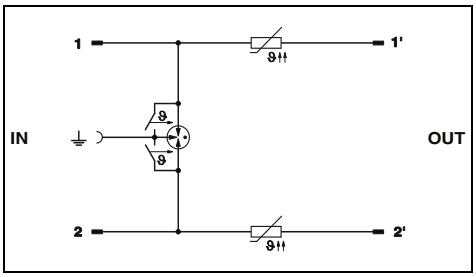
Ordering data

Type	Order No.	Pcs. / Pkt.
CTM 2X1-180DC-GS	**2838636**	10

Accessories

CTM 10-MAG	**2838610**	5

Total width 9.5 mm



Technical data

	A2 / B1 / B2 / B3 / C1 / C2 / C3 / D1 / D2
	± 180 V DC / -
	1 kA 120 mA (25 °C)
	- / 5 kA 10 kA
	- ≤ 800 V
	- / > 100 MHz 5.5 Ω
	9.5 mm / 21 mm / 53.5 mm -40 °C ... 85 °C IP20 V0 IEC 61643-21

Ordering data

Type	Order No.	Pcs. / Pkt.
CTM 2X1-180DC-GS-P	**2838623**	10

Accessories

CTM 10-MAG	**2838610**	5

COMTRAB modular

CTM ISDN

– Tailored to the ISDN bus with basic and primary multiplex connections
– Two protective connectors are required to protect the ISDN bus

CTM EST

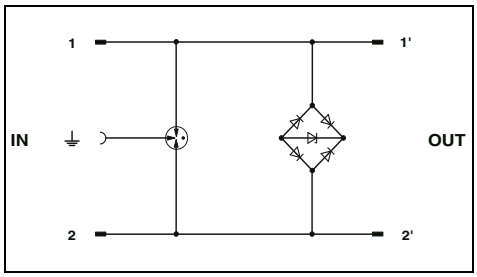
– Grounding plug to short circuit and ground the wires

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

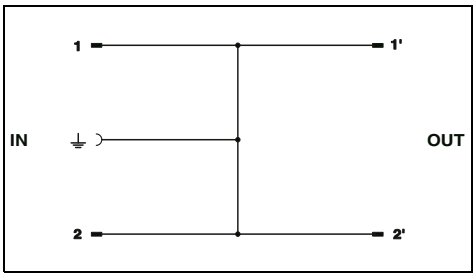
Double wire (loop), ISDN S_0 (2 connectors are required for one bus)

LSA-PLUS grounding plug

Total width 9.5 mm



Total width 9.5 mm



Technical data

Electrical data		
IEC category / EN type	B2 / C2 / C3 / D1 / C1	-
Maximum continuous operating voltage U_C	± 6 V DC	-
Lightning test curr. I_{imp} (10/350) µs Per path	1 kA	-
Nominal current I_N	1.5 A (25 °C)	1.5 A (25 °C)
Nominal discharge surge current I_n (8/20) µs		
Core-Core / Core-Ground	350 A / 5 kA	- / -
Total surge current (8/20) µs	10 kA	10 kA
Output voltage limitation at 1 kV/µs		
Core-Core / Core-Ground	≤ 15 V / ≤ 700 V	-
Cut-off frequency fg (3 dB)		
Symmetrical in the 100 Ω system	≥ 100 MHz	-
General data		
Dimensions W / H / D	9.5 mm / 21 mm / 53.5 mm	9.5 mm / 21 mm / 53.5 mm
Temperature range	-25 °C ... 75 °C	-25 °C ... 75 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP20	IP20
Inflammability class in acc. with UL 94	V0	V0
Test standards	IEC 61643-21	-

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
COMTRAB modular, surge protection for the ISDN-S_0 interface	6 V DC	**CTM ISDN**	**2838555**	10
COMTRAB modular, LSA-PLUS grounding plug to short-circuit and ground potentials in CT-TERMIBLOCK... and disconnect strip CT 10...		**CTM EST**	**2838649**	10

COMTRAB

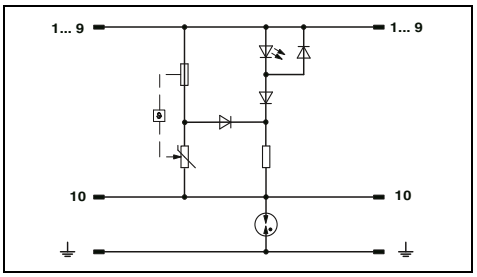
- Multi-position, plug-in modular design
- For use with CT-TERMIBLOCK and with LSA-PLUS and LSA-PROFIL disconnect and control strips
- Specially designed for higher signal voltages of 120 V and 230 V
- For controllers with a large number of signal inputs and outputs, such as those used in remote control technology or traffic light systems
- Protection modules must be inserted in the correct direction

For 9 wires with common reference potential

Notes:

For certifications, see page 154

Total width 111 mm



Technical data

Electrical data		
IEC category / EN type		C1 / C3
Maximum continuous operating voltage U_C	DC/AC	275 V DC / 275 V AC
Nominal current I_N		1.5 A
Nominal discharge surge current I_n (8/20) µs		
	GND-Ground / Core-GND	5 kA / 1.5 kA
Total surge current (8/20) µs		5 kA
General data		
Dimensions W / H / D		111 mm / 22 mm / 68.5 mm
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V2

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
COMTRAB, LSA-PLUS plug with surge protection incl. optical fault warning for nine signal circuits	230 V AC	**CT 10-9VA-230AC**	**2830498**	1

Accessories

Screw terminal block, with disconnect contacts for accommodating the CT and CTM protective connectors, design: 10 double wires	**CT-TERMIBLOCK 10 DA**	**0441711**	10

COMTRAB

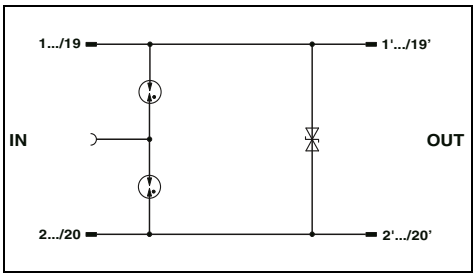
- Multi-position, plug-in modular design
- For use with CT-TERMIBLOCK and with LSA-PLUS and LSA-PROFIL disconnect and control strips
- Applications include systems with higher signal voltages
- Combined protective circuits
- Protection modules must be inserted in the correct direction

Notes:

For certifications, see page 154

For 10 double conductors, floating, without decoupling resistance

Total width 111 mm



Technical data

Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C	DC/AC	40 V DC / 28 V AC
Nominal current I_N		1.5 A (75°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	119 A (25°C) / 5 kA
Total surge current (8/20) µs		10 kA
Output voltage limitation at 1 kV/µs		
	Core-Core / Core-Ground	≤ 60 V / ≤ 650 V
Resistance per path		-
General data		
Dimensions W / H / D		111 mm / 22 mm / 68.5 mm
Temperature range		-25 °C ... 75 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Test standards		IEC 61643-21

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
COMTRAB, surge arrester modules for use in CT-TERMIBLOCK and LSA-PLUS or LSA-PROFIL disconnect and control strips				
Without decoupling	24 V DC	**CT 10-2PE/FS-24**	**2807955**	1
With decoupling	24 V DC			

Accessories

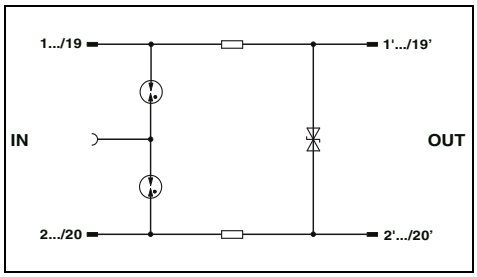
Screw terminal block, with disconnect contacts for accommodating the CT and CTM protective connectors, design: 10 double wires	**CT-TERMIBLOCK 10 DA**	**0441711**	10

For 10 double wires, floating, with decoupling

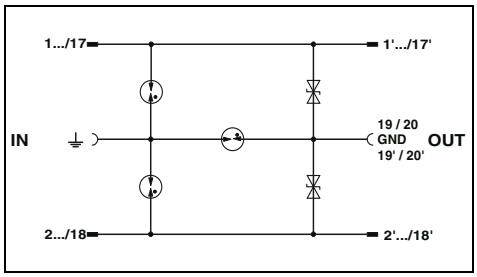
For 18 conductors with common reference potential, without decoupling resistance

For 18 conductors with common reference potential, with decoupling

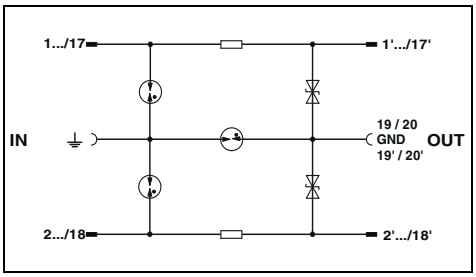
Total width 111 mm



Total width 111 mm



Total width 111 mm



Technical data

	C1 / C2 / C3 / D1
	40 V DC / 28 V AC
	200 mA (25°C)
	5 kA / 5 kA
	10 kA
	≤ 60 V / ≤ 650 V
	10 Ω
	111 mm / 22 mm / 68.5 mm
	-25 °C ... 75 °C
	IP20
	V0
	IEC 61643-21

Technical data

	C1 / C2 / C3 / D1
	40 V DC / 28 V AC
	1.5 A (75°C)
	214 A (25°C) / 5 kA
	10 kA
	- / ≤ 650 V
	-
	111 mm / 22 mm / 68.5 mm
	-25 °C ... 75 °C
	IP20
	V0
	IEC 61643-21

Technical data

	C1 / C2 / C3 / D1
	40 V DC / 28 V AC
	140 mA (25°C)
	5 kA / 5 kA
	10 kA
	- / ≤ 650 V
	22 Ω
	111 mm / 22 mm / 68.5 mm
	-25 °C ... 75 °C
	IP20
	V0
	IEC 61643-21

Ordering data

Type	Order No.	Pcs. / Pkt.
CT 10-2PE/FSR-24	2807968	1

Accessories

CT-TERMIBLOCK 10 DA	0441711	10

Ordering data

Type	Order No.	Pcs. / Pkt.
CT 10-18FS+F/PE-24	2807926	1

Accessories

CT-TERMIBLOCK 10 DA	0441711	10

Ordering data

Type	Order No.	Pcs. / Pkt.
CT 10-18FSR+F/PE-24	2807939	1

Accessories

CT-TERMIBLOCK 10 DA	0441711	10

LSA-PLUS coarse protection magazine

– For use in CT-TERMIBLOCK or in LSA-PLUS and LSA-PROFIL disconnect and terminal strips

CT 10-2/2-GS

– For fitting with 20 two-electrode arresters filled with inert gas
– Common mode voltage coarse protection for 20 signal wires

CT ...-2/2-GS/3E

– Fitted with up to 10 three-electrode arresters filled with inert gas
– When the gas-filled arrester is triggered, the potentials of the three connections a-b-⏚ are equalized
– Coarse protection both in the normal mode voltage branch and the common mode voltage branch for 10 double wires

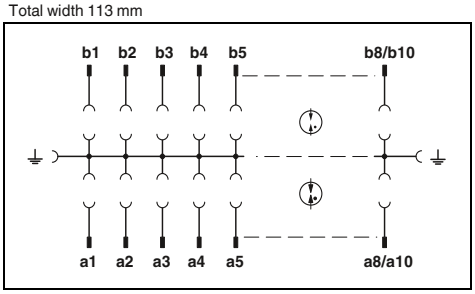
Notes:

For dimensional drawings, see www.phoenixcontact.net/products

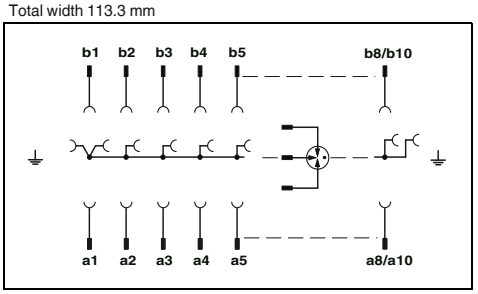
For 10 double wires (loops) and 20 two-electrode GDTs

For 10 double wires (loops) and 10 three-electrode GDTs

Total width 113 mm



Total width 113.3 mm



Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
Coarse protection magazine, to accommodate 20 two-electrode gas-filled surge arresters, design H, bare, model: 10 double conductors		**CT 10-2/2-GS**	**2765398**	5
Coarse protection card cage, for 10 double conductors				
unassembled, for accommodating 10 three-electrode gas-filled surge arresters				
assembled, with 10 three-electrode gas-filled surge arresters	110 V AC			

Ordering data

Type	Order No.	Pcs. / Pkt.
CT 10-2/2-GS/3E	**2765408**	5
CT 10-2/2-GS/3E-110AC	**2920829**	10

Accessories

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
2-electrode gas-filled surge arrester filled with inert gas, type H, for use in CT 10-2/2-GS coarse protection magazine				
	48 V AC	**SVP 2E- 48AC**	**2788919**	10
	110 V AC	**SVP 2E-110AC**	**2765534**	10
3-electrode gas-filled surge arrester filled with inert gas, for use in CT 10-2/2-GS/3E coarse protection magazine				
	110 V AC	**SVP 3E-110AC**	**2765521**	10

CT-TERMIBLOCK

- Screw terminal block
- For COMTRAB protective connectors
- Automatically closing feed-through/disconnect contacts
- Ground terminal blocks on both sides with plug-in connection for the protective connectors used
- Mounting on DIN rails according to EN 60715

Notes:

For dimensional drawings, see www.phoenixcontact.net/products

For accommodating the CT and CTM protective connectors, with screw connection

Technical data

General data	
Dimensions W / H / D	118 mm / 43 mm / 40.9 mm
Connection data solid / stranded / AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Temperature range	-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP20
Inflammability class in acc. with UL 94	V2

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Screw termination block with disconnect contacts for accommodating the protective plugs CT and CTM, model: 10 double conductors	**CT-TERMIBLOCK 10 DA**	**0441711**	10

Accessories

Marker strips, self-adhesive, color: white, can be labeled according to customer specifications	**SK CUS**	**0828492**	1

COMTRAB modular magazine

- For accommodating up to 10 protective connectors
- Integrated grounded rail for connecting the CTM connectors to equipotential bonding

Notes:

For dimensional drawings, see www.phoenixcontact.net/products

Magazine for 10 CTM

Technical data

General data	
Dimensions W / H / D	112.5 mm / 21.8 mm / 44 mm
Temperature range	-25 °C ... 75 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP20
Inflammability class in acc. with UL 94	V0

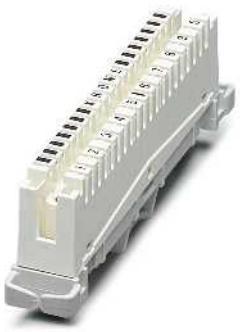
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Magazine, with a grounding rail to accommodate up to 10 LSA-PLUS protective plugs (CTM...), to insert in CT-TERMIBLOCK or LSA-PLUS disconnect strip	**CTM 10-MAG**	**2838610**	5

COMTRAB disconnect strip

– LSA-PLUS disconnect strip
– For COMTRAB protective connectors
– For up to 10 CTM connectors

Notes:
For dimensional drawings, see www.phoenixcontact.net/products



For accommodating the CT and CTM protective connectors, with LSA-PLUS connection

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
LSA-PLUS disconnect strip to hold the CTM and CT 10 protection modules, model: 10 double conductors	**CT 10-TL**	**2765356**	5

COMTRAB grounding rails and mounting clips

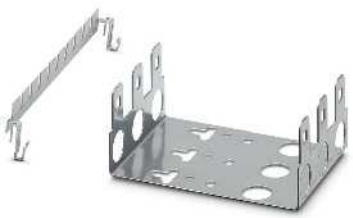
CT 1-10-ES

– For grounding up to 10 x 1DA CTM protective connectors

CT 10-MB...

– For accommodating 3 or 10 x LSA-PLUS disconnect or ground wire strips

Notes:
For dimensional drawings, see www.phoenixcontact.net/products



Grounded rail/mounting clip

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ground rail for CTM protective plug when used in combination with LSA-PLUS disconnect strip, model: 10 double conductors	**CT 1-10-ES**	**2765547**	10
Mounting clip, for holding 3 disconnect or ground wire strips, model: 10 double conductors	**CT 10-MB/ 3**	**2765372**	2
Mounting clip, for holding 10 disconnect or ground wire strips, model: 10 double conductors	**CT 10-MB/10**	**2765385**	2
Cable feed-through sleeve for assembly troughs, for protection of the lines guided through the laminated frame	**CT-KDT**	**2765518**	10

Shield fast connection and labeling material

SSA

– For connecting cable shielding to cable terminal points
– Can be connected to PLUGTRAB PT
– Easy assembly

ZB...

– For clear and logical identification
– The multi-section ZB strips can be easily separated
– Individual labeling of unlabeled ZB strips

Shield fast connection

Labeling material

Total width 6 mm

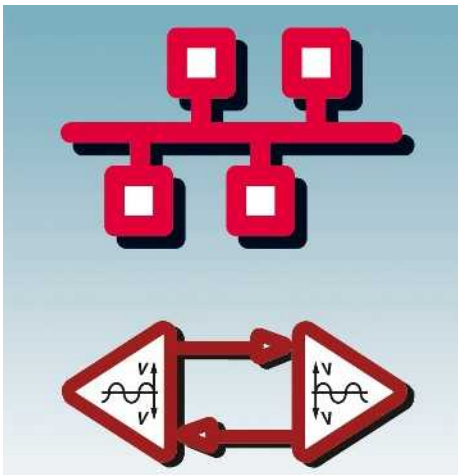
Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Shield fast connection						
For Ø 3 - 6 mm	**SSA 3-6**	**2839295**	10			
For Ø 5 - 10 mm	**SSA 5-10**	**2839512**	10			
UniCard sheets, for 6.2 mm terminal block width, 80-section, can be labeled with BLUEMARK						
White				**UC-TM 6**	**0818085**	10
Orange				**UC-TM 6 OG**	**0818328**	10
Yellow				**UC-TM 6 YE**	**0818331**	10
Blue				**UC-TM 6 BU**	**0818344**	10
Red				**UC-TM 6 RD**	**0818357**	10
Green				**UC-TM 6 GN**	**0818360**	10
UniCard sheets, for 12 mm terminal block width, 40-section, can be labeled with BLUEMARK						
White				**UC-TM 12**	**0819194**	10
Orange				**UC-TM 12 OG**	**0817691**	10
Yellow				**UC-TM 12 YE**	**0819204**	10
Blue				**UC-TM 12 BU**	**0817785**	10
Red				**UC-TM 12 RD**	**0817701**	10
Green				**UC-TM 12 GN**	**0817808**	10
Zack marker strip, 10-section, unprinted						
White				**ZB 5 :UNBEDRUCKT**	**1050004**	10
White				**ZB 6:UNBEDRUCKT**	**1051003**	10
White				**ZB 12:UNPRINTED**	**0812120**	10
Zack marker strip, printed horizontally, 10-section, with consecutive numbers, e.g. 1-10, 11-20, etc. up to 91-100						
White				**ZB 5,LGS:FORTL.ZAHLEN**	**1050017**	10
White				**ZB 6,LGS:FORTL.ZAHLEN**	**1051016**	10
Zack marker strip, 10-section, printed horizontally: With L1, L2, L3, N, PE						
White				**ZB 5,LGS:L1-N,PE**	**1050415**	10
White				**ZB 6,LGS:L1-N,PE**	**1051414**	10
White				**ZB 12,LGS:L1-N,PE**	**0812146**	10
Zack marker strip, flat, 10-section, without color print						
White				**ZBF 5:UNBEDRUCKT**	**0808642**	10
White				**ZBF 6:UNBEDRUCKT**	**0808710**	10
White				**ZBF 12:UNBEDRUCKT**	**0809735**	10
White				**ZBF 15:UNBEDRUCKT**	**0811202**	10
Zack marker strip, 10-section, printed horizontally: with consecutive numbers, e.g., 1 - 10, 11 - 20 and so on up to 91 - 100						
White				**ZBF 5,LGS:FORTL.ZAHLEN**	**0808671**	10
White				**ZBF 6,LGS:FORTL.ZAHLEN**	**0808749**	10

Low signal levels at high frequencies require special protective circuits in data processing and telecommunications. The arresters must guarantee short reaction times to quickly limit the surge voltages to safe values, without impairing signal quality. In addition, the protective devices support system-specific connections, such as RJ45 or D-SUB connectors, and all types of network topology.

DATATRAB DT - The all-round solution for protecting data interfaces

DATATRAB DT reliably protects high-speed networks against damage caused by surge voltages. DT-LAN-CAT.6+ supports various data protocols at very high transmission speeds, such as Ethernet, Power over Ethernet (PoE), ISDN, token ring, and DS1, in a single device.

The housing has a ground connection snap-on foot into which the ground connection cover with equipotential bonding cable is inserted. DATATRAB can be therefore used either as an adapter or a DIN rail module after removing the ground connection cover.



Use

Protective devices suitable for all common applications including Ethernet, token ring, CDDI, ISDN, DS1, DSL, analog telecommunications, RS-485, RS-232, V.11, etc. are available.

The circuit breakers also support Power over Ethernet (PoE) in Mode A and B versions.

Speed

Used in EDP systems with a transmission speed of up to 10 Gbps (CAT.6/CLASS E_a) and in telecommunications networks with 16 Mbps (ADSL2+).

Versatile

The DATATRAB product range can offer a suitable protective device for many and varied applications. The protective devices are simply installed between the signal paths with interfaces for RJ11/12, RJ45, D-SUB, or screw connection.

Other designs

Other application-specific protective devices include:

– Two-part plug-in protective devices in the PLUGTRAB product range
– Combined adapters for the power supply and MAINTRAB interfaces
– Narrow plug-in arresters for COMTRAB modular marshalling distributors

Surge protection for Ethernet/ PROFINET networks with twisted pair cabling

DT-LAN-CAT.6+

– Suitable for category 6 high-speed data networks
– Reliable transmission rates up to 10 Gbps
– Protective adapter for eight signal paths via RJ45 connector
– Can be installed in a control cabinet by removing a ground connection adapter

D-LAN-CAT.5-FP

– Suitable for category 5 data networks
– Reliable transmission speeds up to 1 Gbps
– Protective adapter for eight signal paths via RJ45 connector

D-LAN-19“

– 19" rack for installation in storey distributors
– Up to 24 ports with RJ45 connection
– Reliable transmission speeds up to 1 Gbps
– Protection of all eight signal wires of the data cable
– Indirect grounding via a gas-filled surge arrester in the housing
– Direct grounding via a connection on the housing

DATA-PLUGTRAB PT 5-HF

– Protection for up to five signal wires
– For high transmission speeds
– High discharge capacity
– Connectors can be checked with CHECKMASTER

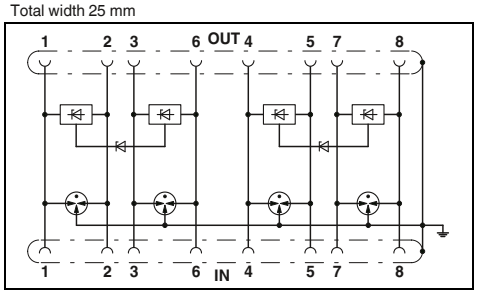
*** Note: PT .x.-BE** connections 9/10 (GND) are linked directly to the mounting foot.

Notes:

For certifications, see page 154

For LAN interfaces (Class E_A/CAT 6) including PoE and ISDN S0 protection

Total width 25 mm



Technical data

Electrical data		
IEC category / EN type		B2 / C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C		≤ 3.3 V DC (± 60 V DC/PoE+)
Nominal current I_N		≤ 1.5 A (25°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	100 A / 2 kA (per signal pair)
Total surge current (8/20) µs		10 kA
Protection level U_P		
	Core-Core / Core-Ground	≤ 9 V (B2 - 1 kV/25 A) / ≤ 700 V (C2 - 4 kV/2 kA)
Output voltage limitation at 1 kV/µs		
	Core-Core / Core-Ground	≤ 9 V / ≤ 700 V
Cut-off frequency fg (3 dB)		
In a 100 Ω system	Symmetrical	> 500 MHz
General data		
Dimensions W / H / D		25 mm / 103 mm / 63 mm
Temperature range		-40 °C ... 70 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		-
Connection method		RJ45
Test standards		IEC 61643-21 / EN 50173-1 / ISO/IEC 11801-Am.1

Ordering data

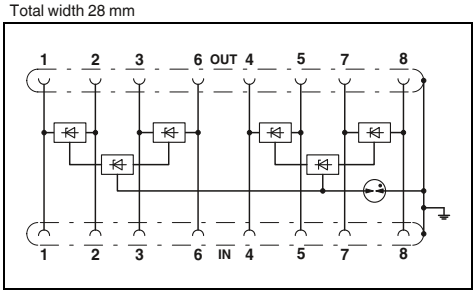
Description	Type	Order No.	Pcs. / Pkt.
DATATRAB adapter, protective adapter to be inserted into the data line	**DT-LAN-CAT.6+**	**2881007**	1
DATATRAB, for use in Ethernet, token ring, FDDI/CDDI in acc. with Cat.D/CAT5e EN 50173 (1000Base-T)			
24 ports			
20 ports			
16 ports			
12 ports			
8 ports			
4 ports			
Surge protection PCB as replacement or for retrofitting in D-LAN-19"... products incl. RJ45 sockets			
4 ports			
Patch cable, CAT6, preassembled	**FL CAT6 PATCH 1,0**	**2891385**	10
PLUGTRAB plug, with protection circuit for plugging into base element PT			
PLUGTRAB base element, for mounting on NS 35			
Bridge between 3/4 (⏚) and 9/10			

For LAN interfaces (Class D/CAT 5) including PoE and ISDN S0 protection

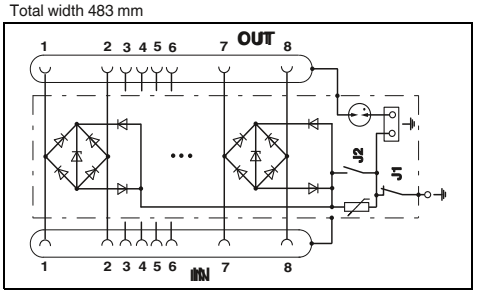
For data interfaces, with RJ45 connection Class D/CAT5e

Plug-in arrester with screw connection, for five conductors, with common reference potential

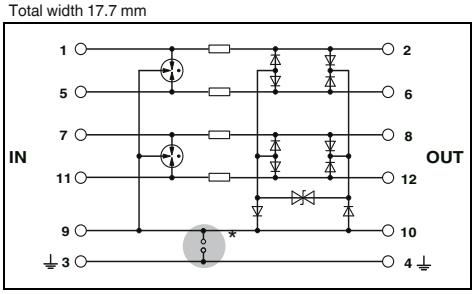
Total width 28 mm



Total width 483 mm



Total width 17.7 mm



Technical data

B2 / C1	
≤ 5 V DC (±57 V DC/PoE)	
≤ 1.5 A (25°C)	
350 A / 350 A	
-	
≤ 35 V (C1 - 700 V/350 A) ≤ 110 V (C1 - 700 V/350 A - PoE) / -	
≤ 25 V / ≤ 750 V	
> 100 MHz	
28 mm / 110 mm / 60 mm	
-40 °C ... 85 °C	
IP20	
V0	
RJ45	
IEC 61643-21/A1 / GB/T 18802.21 / EN 61643-21/A1	

Technical data

C1 / C2 / C3 / B3	
6 V DC	
1.5 A (25°C)	
350 A / 350 A	
10 kA	
≤ 50 V (C1, 500 V/250 A) / ≤ 40 V (C1, 500 V/250 A (J2 ON))	
≤ 20 V / ≤ 30 V (J2 plugged)	
> 100 MHz	
483 mm / 44 mm / 160 mm	
-40 °C ... 80 °C	
IP20	
-	
RJ45	
IEC 61643-21	

Technical data

C1 / C2 / C3 / D1	
5.2 V DC / 3.6 V AC	
450 mA (45°C)	
10 kA / 10 kA	
20 kA	
≤ 34 V (C3 - 25 A) / ≤ 34 V (C3 - 25 A)	
≤ 15 V / ≤ 15 V	
Typ. 70 MHz	
17.7 mm / 90 mm / 65.5 mm	
-40 °C ... 85 °C	
IP20	
V0	
Screw connection (in connection with the base element)	
IEC 61643-21/A1 / EN 61643-21/A1	

Ordering data

Type	Order No.	Pcs. / Pkt.
D-LAN-CAT.5-FP	**2800723**	1
FL CAT6 PATCH 1,0	**2891385**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
D-LAN-19"-24	**2838791**	1
D-LAN-19"-20	**2880134**	1
D-LAN-19"-16	**2880147**	1
D-LAN-19"-12	**2880150**	1
D-LAN-19"-8	**2880163**	1
D-LAN-19"-4	**2880176**	1
D-LAN-19"-D-P	**2880192**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 5-HF- 5 DC-ST	**2838762**	10
PT 2X2-BE	**2839208**	10

Protection for RS-232 interfaces

DT-UFB-V24/S
– Connection: 9-pos. D-SUB and 25-pos. D-SUB
– For data and handshake cables

PLUGTRAB PT 3-HF-12DC
– Connection: Screw terminal blocks
– For high transmission speeds
– High discharge capacity
– Connectors can be checked with CHECKMASTER

Pin assignment DT-UFB-V24/S-9-SB
– 1,2,3,4,6,7,8,9 Data lines
– 5 Signal ground (Ground)

Pin assignment DT-UFB-V24/S-SB-SET
– 2,3,4,5,6,8,20,22 data lines
– 7 Signal ground (Ground)

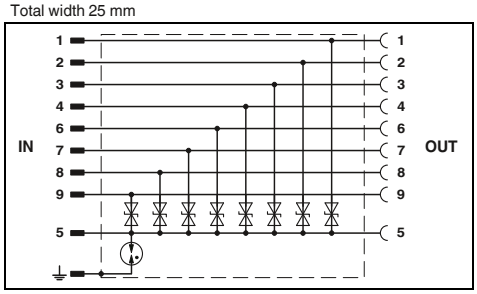
Pin assignment PT 3-HF-12DC:
– 7.11 Data lines
– 9 Signal ground (Ground)
– 3 ⏚

* **Note: PT .x.+F-BE** connections 9/10 (GND) are linked to the mounting foot via a gas-filled surge arrester.

Notes:
For certifications, see page 154

Protective adapter with 9-pos. D-SUB

Total width 25 mm



Technical data

Electrical data		
IEC category / EN type		B2 / C1 / C2 / C3
Maximum continuous operating voltage U_C		15 V DC / 10 V AC
Nominal current I_N		≤ 1 A (25°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Earth/Core-GND	≤ 250 A / ≤ 250 A
Total surge current (8/20) µs		5 kA
Protection level U_P		
	Core-Core / Core-Ground	≤ 55 V (C1 - 250 A) / ≤ 450 V (C1 - 250 A)
Cut-off frequency fg (3 dB)		
In a 100 Ω system	Symmetrical / Asymmetrical	Typ. 2.5 MHz / Typ. 1.3 MHz
General data		
Dimensions W / H / D		25 mm / 110 mm / 63 mm
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		-
Connection method		D-SUB-9
Test standards		DIN EN 61643-21 / IEC 61643-21

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
DATATRAB-Adapter, protective adapter for inserting into the data line for protecting the RS-232 interface with D-SUB-9 connector	**DT-UFB-V24/S-9-SB**	**2803069**	1
DATATRAB-Adapter, protective adapter for inserting into the data line for protecting the RS-232 interface with D-SUB-25 adapter cable			
PLUGTRAB plug, with protection circuit for plugging into base element PT			
PLUGTRAB base element, for mounting on NS 35			
with a gas-filled surge arrester between the 3/4 (⏚) and the 9/10 connections			

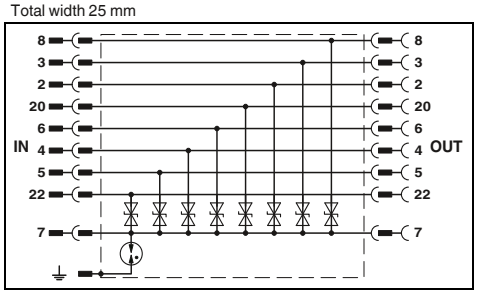
Accessories

Labeling material

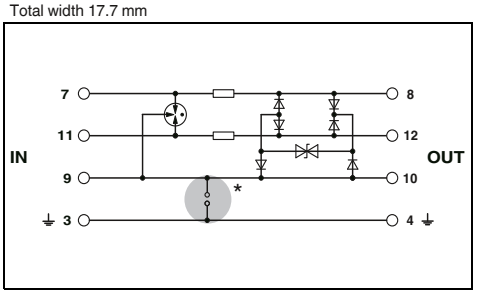
Protective adapter with 9-pos. D-SUB and adapter cable with 25-pos. D-SUB

Plug-in arrester with screw connection, for three conductors, with common reference potential

Total width 25 mm



Total width 17.7 mm



Technical data

B2 / C1 / C2 / C3	
15 V DC / 10 V AC	
≤ 1 A (25°C)	
≤ 250 A / ≤ 250 A	
5 kA	
≤ 55 V (C1 - 250 A) / ≤ 450 V (C1 - 250 A)	
Typ. 2.5 MHz / Typ. 1.3 MHz	
25 mm / 110 mm / 63 mm	
-40 °C ... 85 °C	
IP20	
-	
D-SUB-25	
DIN EN 61643-21 / IEC 61643-21	

Technical data

C1 / C2 / C3 / D1	
14 V DC / 9.8 V AC	
450 mA (45°C)	
10 kA / 10 kA	
20 kA	
≤ 45 V (C3 - 25 A) / ≤ 45 V (C3 - 25 A)	
Typ. 70 MHz / -	
17.7 mm / 90 mm / 65.5 mm	
-40 °C ... 85 °C	
IP20	
V0	
Screw connection (in connection with the base element)	
IEC 61643-21/A1 / EN 61643-21/A1	

Ordering data

Type	Order No.	Pcs. / Pkt.
DT-UFB-V24/S-SB-SET	**2803072**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 3-HF-12DC-ST	**2858043**	10
PT 1X2+F-BE	**2856126**	10

Accessories

Accessories

ZBF ..., see page 111

Surge protection for V.11/RS-422 interfaces

– For floating signal circuits or signal cables
– For high data transmission rates
– Connectors can be checked with CHECKMASTER

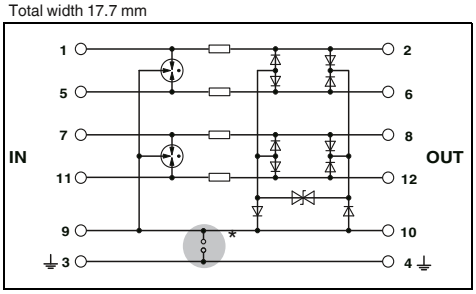
Pin assignment PT 5-HF-12DC:
– 1,5 Data line pair 1: T(A), T(B)
– 7,11 Data line pair 2: R(A), R(B)
– 9 Signal ground (Ground)
– 3 ⏚

*** Note: PT .x.+F-BE** connections 9/10 (GND) are linked to the mounting foot via a gas-filled surge arrester.

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

Plug-in arrester with screw connection, for five conductors, with common reference potential

Total width 17.7 mm



Technical data

Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C		14 V DC / 9.8 V AC
Nominal current I_N		450 mA (45°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	10 kA / 10 kA
Total surge current (8/20) µs		20 kA
Protection level U_P		
	Core-Core / Core-Ground	≤ 45 V (C3 - 25 A) / ≤ 45 V (C3 - 25 A)
Cut-off frequency fg (3 dB)		
In a 100 Ω system	Symmetrical	Typ. 70 MHz
General data		
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Test standards		IEC 61643-21/A1 / EN 61643-21/A1

Ordering data

Description	Nominal voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB connector, with protective circuit for inserting in PT base element	12 V DC	**PT 5-HF-12 DC-ST**	**2838775**	10
PLUGTRAB base element, for mounting on NS 35	Gas-filled surge arrester between 3/4 (⏚) and 9/10	**PT 2X2+F-BE**	**2839224**	10

Accessories

Labeling material	ZBF ..., see page 111

Surge protection for TTY interfaces

- For floating signal circuits or signal cables
- Low voltage limitation
- Fast response
- High discharge capacity
- Connectors can be checked with CHECKMASTER

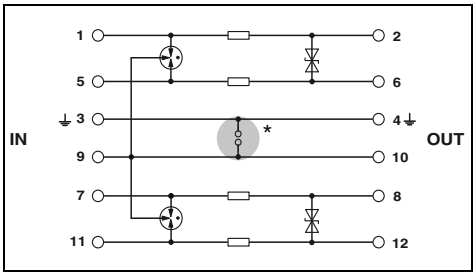
Pin configuration PT 2x2-24DC...:
- 1/5 data line pair A
- 7/11 data line pair B
- 3 ⏚

*** Note:**
Various grounding options for the base elements:
PT .x.-BE connections 9/10 (GND) directly connected to the mounting foot.
PT .x.+F-BE connection 9/10 (GND) connected to the mounting foot via a gas-filled surge arrester.

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

Two double wires (loops), floating, for 20 mA current loops

Total width 17.7 mm



Technical data

Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C		28 V DC / 20 V AC
Nominal current I_N		450 mA (45°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	10 kA / 10 kA
Total surge current (8/20) µs		20 kA
Protection level U_P		
	Core-Core / Core-Ground	≤ 50 V (C3 - 25 A) / -
Cut-off frequency fg (3 dB)		
In a 50 Ω system	Symmetrical	Typ. 6 MHz
General data		
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Test standards		IEC 61643-21 / DIN EN 61643-21 / UL 497B

Ordering data

Description	Nominal voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB connector, with protective circuit for inserting in PT base element	24 V DC	**PT 2X2-24DC-ST**	**2838228**	10
PLUGTRAB base element, for mounting on NS 35	Bridge between 3/4 (⏚) and 9/10	**PT 2X2-BE**	**2839208**	10
	Gas-filled surge arrester between 3/4 (⏚) and 9/10	**PT 2X2+F-BE**	**2839224**	10

Accessories

Shield fast connection			
For Ø 3-6 mm	**SSA 3-6**	**2839295**	10
For Ø 5-10 mm	**SSA 5-10**	**2839512**	10
Labeling material	ZBF ..., see page 111		

Surge protection for RS-485 interfaces

PLUGTRAB PT 5-HF

– High transmission speed
– Fast response time
– High discharge capacity
– Connectors can be checked with CHECKMASTER

PLUGTRAB PT-IQ 5-HF

– Surge protection system
– Collective message about supply and remote module
– Multi-level, floating remote signaling
– System supplied via DIN rail bus
– PT-IQ...-UT base element with screw connection technology
– PT-IQ...-PT base element with push-in connection technology

Pin assignment PT 5-HF...:

– 1,5 Data line pair 1T(A)/T(B)
– 7,11 Data line pair 2 R(A)/R(B)
– 9 Signal ground (Ground)
– 3 ⏚

DATATRAB DT-UFB-485

– Adapter type
– 9-pos. D-SUB connection
– DIN rail mounting possible by removing the cap

Pin assignment DT-UFB-485:

– 3,8 Data line pair 1 T(A)/T(B)
– 4,9 Data line pair 2 R(A)/R(B)
– 2,7 Signal ground (Ground)
– ⏚ ⏚

*** Note:**

Various grounding options for the base elements:
PT .x.-BE connections 9/10 (GND) directly connected to the mounting foot.
PT .x.+F-BE connection 9/10 (GND) connected to the mounting foot via a gas-filled surge arrester.

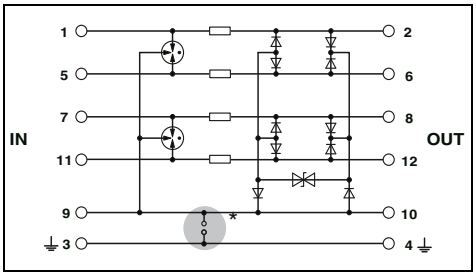
Notes:

For certifications, see page 154

Attenuation characteristics at www.phoenixcontact.net/products

Plug-in arrester with screw connection, for five conductors, with common reference potential

Total width 17.7 mm



Technical data

		... 5DC	... 12DC
Electrical data			
IEC category / EN type		C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C		5.2 V DC / 3.6 V AC	14 V DC / 9.8 V AC
Nominal current I_N		450 mA (45°C)	450 mA (45°C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		20 kA	20 kA
Protection level U_P			
	Core-Core / Core-Ground	≤ 34 V (C3 - 25 A) / -	≤ 45 V (C3 - 25 A) / ≤ 45 V (C3 - 25 A)
Cut-off frequency fg (3 dB)			
In a 100 Ω system	Symmetrical	Typ. 70 MHz	Typ. 70 MHz
In a 150 Ω system	Symmetrical	-	-
General data			
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm	
PT-IQ...UT dimensions W/H/D		-	
PT-IQ...PT dimensions W/H/D		-	
Temperature range		-40 °C ... 85 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	
Inflammability class in acc. with UL 94		V0	
Connection method		Screw connection (in connection with the base element)	
Test standards		IEC 61643-21/A1 / EN 61643-21/A1	

Ordering data

Description	Nominal voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB connector, with protective circuit for inserting in PT base element				
	5 V DC	**PT 5-HF- 5 DC-ST**	**2838762**	10
	12 V DC	**PT 5-HF-12 DC-ST**	**2838775**	10
PLUGTRAB base element, for mounting on NS 35				
Bridge between 3/4 (⏚) and 9/10		**PT 2X2-BE**	**2839208**	10
Gas-filled surge arrester between 3/4 (⏚) and 9/10		**PT 2X2+F-BE**	**2839224**	10
MCR-PLUGTRAB, consisting of a plug, base element, and DIN rail bus, with screw connection technology				
Bridge between 3/4 (⏚) and 9/10				
Bridge between 3/4 (⏚) and 9/10				
MCR-PLUGTRAB, consisting of a plug, base element, and DIN rail bus, with push-in connection technology				
Bridge between 3/4 (⏚) and 9/10				
Bridge between 3/4 (⏚) and 9/10				
DATATRAB-Adapter, Protective adapter to be inserted in the data line for the protection of the RS-485 interfaces				

Accessories

Marking material

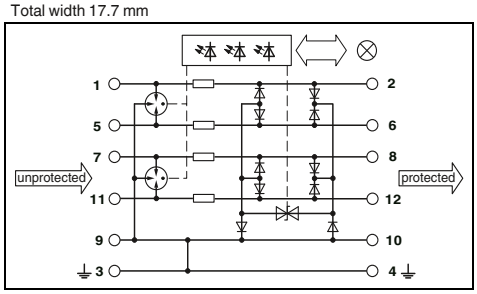
ZBF ..., see page 111

5-wire with common reference potential, 9/10 connection grounded directly

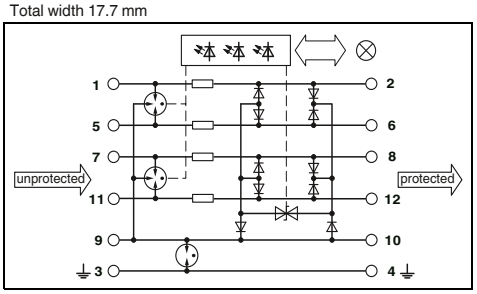
5-wire with common reference potential, 9/10 connection grounded via gas-filled surge arrester

Protective adapter with 9-pos. D-SUB

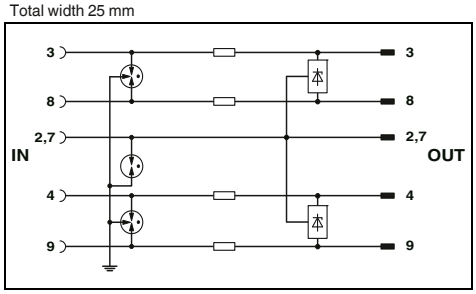
Total width 17.7 mm



Total width 17.7 mm



Total width 25 mm



Technical data

... 5DC	... 12DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	15 V DC / 10 V AC
600 mA (up to 40 °C)	600 mA (up to 40 °C)
10 kA / 10 kA	10 kA / 10 kA
20 kA	20 kA
≤ 30 V (C3 - 25 A) / -	≤ 40 V (C3 - 25 A) / -
-	-
> 60 MHz	> 60 MHz
17.7 mm / 91 mm / 77.5 mm	
17.7 mm / 91 mm / 77.5 mm	
17.7 mm / 109.3 mm / 77.5 mm	
-40 °C ... 70 °C	
IP20	
V0	
Screw connection / Push-in connection	

EN 61643-21/A1 / IEC 61643-21/A2 / EN 61000-6-2/A1 /

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-5-HF-5DC-UT	**2800797**	1
PT-IQ-5-HF-12DC-UT	**2800799**	1
PT-IQ-5-HF-5DC-PT	**2801291**	1
PT-IQ-5-HF-12DC-PT	**2801293**	1

Accessories

ZBF ..., see page 111

Technical data

... 5DC	... 12DC
C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
6 V DC / 4 V AC	15 V DC / 10 V AC
600 mA (up to 40 °C)	600 mA (up to 40 °C)
10 kA / 10 kA	10 kA / 10 kA
20 kA	20 kA
≤ 30 V (C3 - 25 A) / -	≤ 40 V (C3 - 25 A) / -
-	-
> 60 MHz	> 60 MHz
17.7 mm / 91 mm / 77.5 mm	
17.7 mm / 91 mm / 77.5 mm	
17.7 mm / 109.3 mm / 77.5 mm	
-40 °C ... 70 °C	
IP20	
V0	
Screw connection / Push-in connection	

EN 61643-21/A1 / IEC 61643-21/A2 / EN 61000-6-2/A1 /

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-5-HF+F-5DC-UT	**2800798**	1
PT-IQ-5-HF+F-12DC-UT	**2800801**	1
PT-IQ-5-HF+F-5DC-PT	**2801292**	1
PT-IQ-5-HF+F-12DC-PT	**2801295**	1

Accessories

ZBF ..., see page 111

Technical data

B2 / C1 / C2 / C3 / D1
12 V DC / -
≤ 380 mA (25°C)
≤ 5 kA / ≤ 5 kA
10 kA
≤ 30 V (C1 - 500 A) / ≤ 700 V (C1 - 500 A)
Typ. 50 MHz
-
25 mm / 110 mm / 63 mm
-
-
-40 °C ... 85 °C
IP20
-
D-SUB-9

DIN EN 61643-21

Ordering data

Type	Order No.	Pcs. / Pkt.
DT-UFB-485/BS	**2920612**	1

Accessories

Surge protection for the INTERBUS remote bus

DATATRABDT-UFB-IB-RBI/ -RBO

– Adapter type
– 9-pos. D-SUB connection
– For remote bus modules
– DIN rail mounting possible by removing the cap
– D-SUB cable included

PLUGTRAB PT 5-HF

– High transmission speed
– Fast response time
– High discharge capacity
– Connectors can be checked with CHECKMASTER

*** Note: PT .x.+F-BE** connections 9/10 (GND) are linked to the mounting foot via a gas-filled surge arrester.

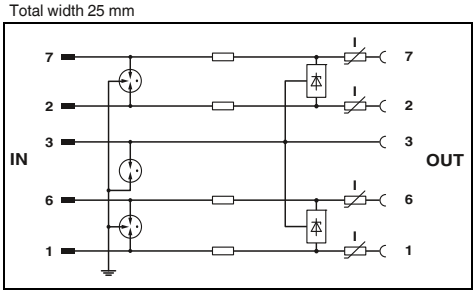
PLUGTRAB PT-IQ 5-HF

– Surge protection system
– Collective message about supply and remote module
– Multi-level, floating remote signaling
– System supplied via DIN rail bus
– Base element with screw connection technology

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

Protective adapters for 5-wire remote bus input

Total width 25 mm



Technical data

Electrical data		
IEC category / EN type		B2 / C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C		5.8 V DC / -
Nominal current I_N		≤ 180 mA (25°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	≤ 5 kA / ≤ 5 kA
Total surge current (8/20) µs		10 kA
Protection level U_P		
	Core-Core / Core-Ground	≤ 20 V (C1 - 500 A) / ≤ 700 V (C1 - 500 A)
Cut-off frequency fg (3 dB)		
In a 100 Ω system	Symmetrical	≥ 100 MHz
In a 150 Ω system	Symmetrical	≥ 100 MHz
General data		
Dimensions W / H / D		25 mm / 110 mm / 63 mm
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		-
Connection method		D-SUB-9
Test standards		DIN EN 61643-21 / IEC 61643-21

Ordering data

Description	Nominal voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB connector, with protective circuit for inserting in PT base element	5 V DC			
PLUGTRAB base element, for mounting on NS 35	Gas-filled surge arrester between 3/4 (⏚) and 9/10			
DATATRAB adapter, protective adapters for inserting into the data line		**DT-UFB-IB-RBI**	**2800055**	1
MCR-PLUGTRAB, consisting of a plug, base element, and DIN rail bus	Gas-filled surge arrester between 3/4 (⏚) and 9/10			
TERMITRAB, modular terminal block with integrated surge protection, for mounting on NS 35				

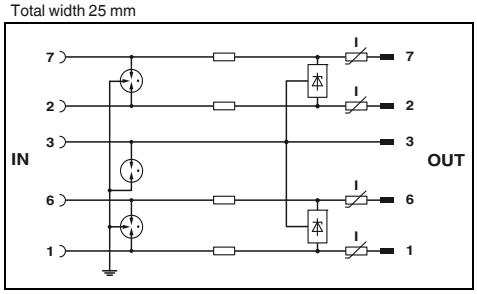
N

Protective adapters for 5-wire remote bus output

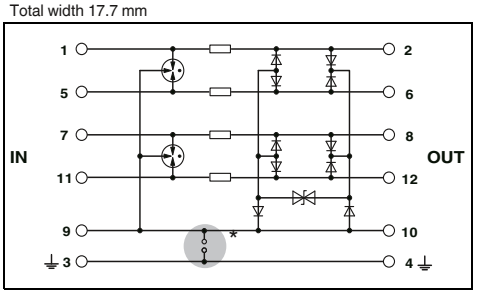
Plug-in arrester with screw connection, for five conductors, with common reference potential

Plug-in arrester with screw connection, for five conductors, with common reference potential

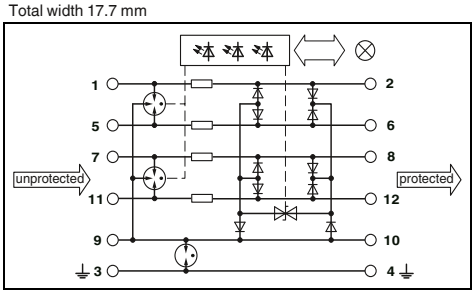
Total width 25 mm



Total width 17.7 mm



Total width 17.7 mm



Technical data

B2 / C1 / C2 / C3 / D1	
5.8 V DC / -	
≤ 180 mA (25°C)	
≤ 5 kA / ≤ 5 kA	
10 kA	
≤ 20 V (C1 - 500 A) / ≤ 700 V (C1 - 500 A)	
≥ 100 MHz	
≥ 100 MHz	
25 mm / 110 mm / 63 mm	
-40 °C ... 85 °C	
IP20	
-	
D-SUB-9	
DIN EN 61643-21 / IEC 61643-21	

Technical data

C1 / C2 / C3 / D1	
5.2 V DC / 3.6 V AC	
450 mA (45°C)	
10 kA / 10 kA	
20 kA	
≤ 34 V (C3 - 25 A) / ≤ 34 V (C3 - 25 A)	
Typ. 70 MHz	
-	
17.7 mm / 90 mm / 65.5 mm	
-40 °C ... 85 °C	
IP20	
V0	
Screw connection (in connection with the base element)	
IEC 61643-21/A1 / EN 61643-21/A1	

Technical data

C1 / C2 / C3 / D1	
6 V DC / 4 V AC	
600 mA (up to 40 °C)	
10 kA / 10 kA	
20 kA	
≤ 30 V (C3 - 25 A) / ≤ 900 V (C3 - 25 A)	
-	
> 60 MHz	
17.7 mm / 91 mm / 77.5 mm	
-40 °C ... 70 °C	
IP20	
V0	
Screw connection	
EN 61643-21/A1 / IEC 61643-21/A2 / EN 61000-6-2/A1 /	

Ordering data

Type	Order No.	Pcs. / Pkt.
DT-UFB-IB-RB0	2800056	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PT 5-HF- 5 DC-ST	2838762	10
PT 2X2+F-BE	2839224	10
TT-SLKK5-F/110AC	2765602	50

Ordering data

Type	Order No.	Pcs. / Pkt.
PT-IQ-5-HF+F-5DC-UT	2800798	1

Surge protection for PROFIBUS

PT 3-PB
- Protection for two signal wires with common reference potential
- Data transmission rate up to 12 Mbps
- For INTERBUS/PROFIBUS systems
- For field multiplexers
- Connectors can be checked with CHECKMASTER

Pin assignment PT 3-PB:
- 7,11 data cable pair
- 9 Signal ground (Ground)

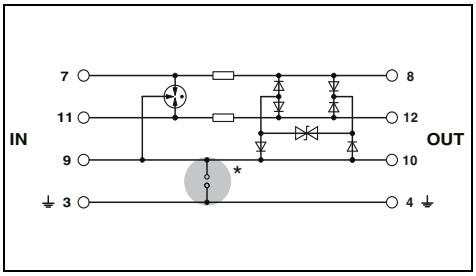
D-UFB-PB
- Direct use at the interface
- Data transmission rate up to 12 Mbps
- Integrated termination resistor

*** Note: PT .x.-BE** connections 9/10 (GND) are linked directly to the mounting foot.

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

Plug-in arrester with screw connection, for five conductors, with common reference potential

Total width 17.7 mm



Technical data

Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1
Maximum continuous operating voltage U_C		5.2 V DC / 3.6 V AC
Nominal current I_N		450 mA (45°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	10 kA / 10 kA
Total surge current (8/20) µs		20 kA
Protection level U_P		
	Core-Core / Core-Ground	≤ 34 V (C3 - 25 A) / ≤ 34 V (C3 - 25 A)
Output voltage limitation at 1 kV/µs		
	Core-Core / Core-Ground	≤ 15 V / ≤ 15 V
Cut-off frequency fg (3 dB)		
In a 100 Ω system	Symmetrical	Typ. 70 MHz
General data		
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Connection method		Screw connection (in connection with the base element)
Test standards		IEC 61643-21/A1 / EN 61643-21/A1

Ordering data

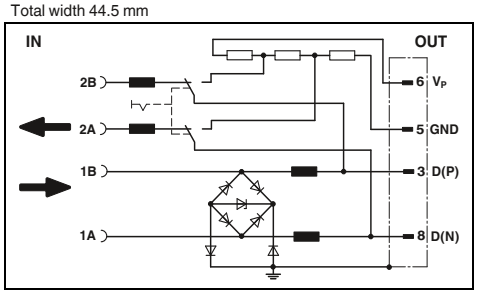
Description	Nominal voltage U_N	Type	Order No.	Pcs. / Pkt.
PLUGTRAB connector, with protective circuit for inserting in PT base element	5 V DC	**PT 3-PB-ST**	**2858030**	10
PLUGTRAB base element, for mounting on NS 35	Bridge between 3/4 (⏚) and 9/10	**PT 1X2-BE**	**2856113**	10
DATATRAB, Protective device for PROFIBUS-DP applications with up to 12 Mbps				

Accessories

Shield fast connection			
For Ø 3-6 mm	**SSA 3-6**	**2839295**	10
For Ø 5-10 mm	**SSA 5-10**	**2839512**	10
Labeling material	ZBF ..., see page 111		

Fine protection with 9-pos. D-SUB

Total width 44.5 mm



Technical data

C1 / C3 / B2
5.2 V DC / -
250 mA (25°C)

350 A / 350 A
350 A

≤ 25 V (C1 (500 V/250 A)) / ≤ 25 V (C1 (500 V/250 A))

≤ 14 V / ≤ 14 V

Typ. 70 MHz

44.5 mm / 58 mm / 16.6 mm
-20 °C ... 75 °C
IP40
-
Screw connection & D-SUB-9

IEC 61643-21

Ordering data

Type	Order No.	Pcs. / Pkt.
D-UFB-PB	**2880642**	1

Accessories

For power supply and ISDN-S_0 interface

MNT-ISDN

– Compact protection for termination devices
– Easy operation
– Combined power supply and ISDN protection
– Connection to telecommunications socket using separate cable
– Thermal monitoring of the protective circuit
– Green LED - operating indicator for the power supply

DT-LAN-CAT.6+

– Protective adapter for eight signal paths via RJ45 connector
– Can be installed in a control cabinet by removing a ground connection adapter

WT-RJ 45-S/ISDN 1/K AP

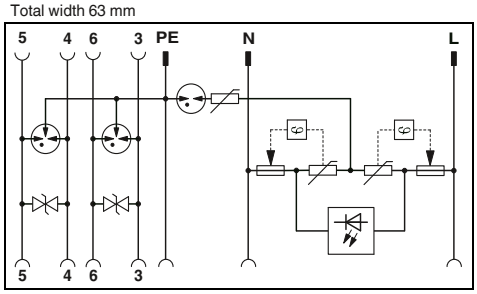
– Surface-mounted socket
– With RJ45 socket as IAE
– Optimum in-house protection for sensitive interfaces

Notes:

For certifications, see page 154

For network and ISDN/RDSI systems/termination devices, with RJ45 connection

Total width 63 mm



Technical data

Electrical data		Mains protection	Data protection
IEC category / EN type		III / T3	C2 / C3 / D1 / C1
Nominal voltage U_N		230 V AC	-
Maximum continuous operating voltage U_C		360 V AC (L/N-PE)	6 V DC
Nominal current I_N		16 A (30 °C)	1.5 A (25°C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	3 kA / 3 kA	650 A / 2.5 kA
Combined surge U_{OC}		4 kV	-
Protection level U_P			
	Core-Core / Core-Ground	≤ 1.2 kV / ≤ 1.5 kV	≤ 65 V (C1 - 1 kV/500 A) / ≤ 900 V (C2 - 4 kV/2 kA)
Total surge current (8/20) µs		-	10 kA
Output voltage limitation at 1 kV/µs			
	Core-Core / Core-Ground	-	≤ 10 V / ≤ 900 V
Cut-off frequency fg (3 dB)			
In a 100 Ω system	Core-Core	-	Typ. 300 kHz
General data			
Dimensions W / H / D		63 mm / 79 mm / 103.5 mm	
Temperature range		-25 °C ... 75 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20 (child-proof)	
Inflammability class in acc. with UL 94		V0/HB	
Connection method		RJ45	
Test standards		IEC 61643-1	IEC 61643-21

Ordering data

Description	Can be used as typical for the country	Type	Order No.	Pcs. / Pkt.
MAINTRAB, surge protection attachment plug for plugging into a socket for equipment and data interface protection, incl. 1.5 m coaxial cable.				
Black	D, A, NL	**MNT-ISDN D**	**2882336**	1
White	D, A, NL	**MNT-ISDN D/WH**	**2882349**	1
White	S, FIN, N	**MNT-ISDN S/WH**	**2880891**	1
DATATRAB adapter, protective adapters for inserting into the data line				
WESTERNTRAB, RJ45 outlet box, surface-type with surge protection for ISDN S_0 bus interface				

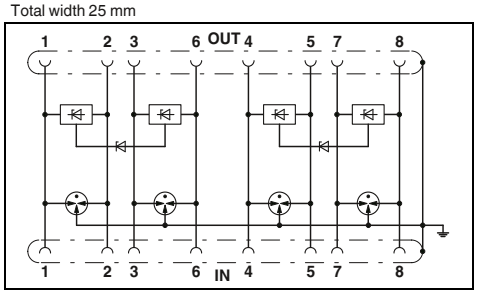
Accessories

Patch cable, CAT6, pre-assembled				

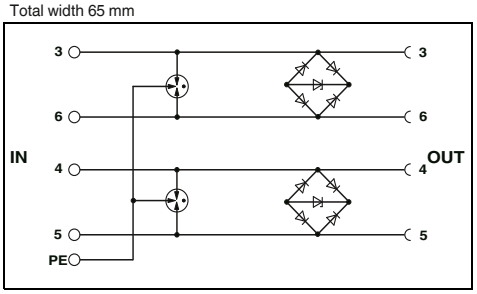
For LAN interfaces (Class E_A/CAT 6) including PoE and ISDN S0 protection

Surface-mounted flush-type socket with RJ45 connection

Total width 25 mm



Total width 65 mm



Technical data

B2 / C1 / C2 / C3 / D1	C2 / C3 / D1
-	50 V DC (S_0 phantom power supply)
≤ 3.3 V DC (± 60 V DC/PoE+)	6.2 V DC
≤ 1.5 A (25°C)	1.5 A (25°C)
100 A / 2 kA (per signal pair)	350 A / 5 kA
-	-
≤ 9 V (B2 - 1 kV/25 A) / ≤ 700 V (C2 - 4 kV/2 kA)	≤ 70 V (C1 - 1 kV/500 A) / ≤ 460 V (C1 - 1 kV/500 A)
10 kA	10 kA
≤ 9 V / ≤ 700 V	≤ 12 V / ≤ 460 V
> 500 MHz	Typ. 80 MHz
25 mm / 103 mm / 63 mm	65 mm / 30 mm / 80 mm
-40 °C ... 70 °C	-40 °C ... 60 °C
IP20	IP20
-	-
RJ45	Screw connection & RJ45
IEC 61643-21	IEC 61643-21

Ordering data

Type	Order No.	Pcs. / Pkt.
DT-LAN-CAT.6+	**2881007**	1

Accessories

FL CAT6 PATCH 1,5	**2891482**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
WT-RJ 45-S/ISDN1/K AP	**2809830**	1

Accessories

Surge protection for the ISDN-S_0 interface

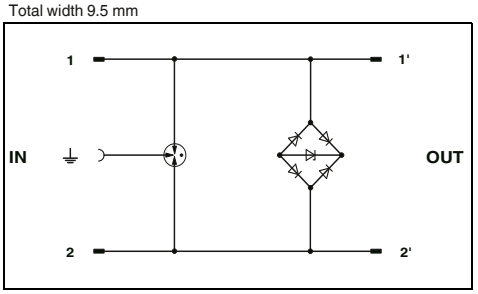
COMTRAB modular

– Plug-in module
– Can be used in LSA-PLUS disconnect and control strips or CT-TERMIBLOCK
– High transmission bandwidth
– Use of two CTM ISDN for one ISDN connection
– Connectors can be checked with CHECKMASTER

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

For a double wire

Total width 9.5 mm



Technical data

Electrical data		
IEC category / EN type		B2 / C2 / C3 / D1 / C1
Maximum continuous operating voltage U_C		± 6 V DC
Nominal current I_N		1.5 A (25 °C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	350 A / 5 kA
Total surge current (8/20) µs		10 kA
Protection level U_P		
	Core-Core / Core-Ground	≤ 35 V (C1, 700 V/350 A) / ≤ 700 V (C3, 7.5 kV/100 A, spike)
Output voltage limitation at 1 kV/µs		
	Core-Core / Core-Ground	≤ 15 V / ≤ 700 V
Cut-off frequency fg (3 dB)		
In a 100 Ω system	Symmetrical	≥ 100 MHz
General data		
Dimensions W / H / D		9.5 mm / 21 mm / 53.5 mm
Temperature range		-25 °C ... 75 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Connection method		can be plugged into COMTRAB-TERMIBLOCK and LSA-PLUS disconnect and switching strips
Test standards		IEC 61643-21

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
COMTRAB modular, surge protection for the ISDN S_0 interface	**CTM ISDN**	**2838555**	10

Accessories

Magazine, with grounding rail for accommodating up to 10 LSA-PLUS protective connectors (CTM...), for insertion in CT-TERMIBLOCK or LSA-PLUS disconnect strip	**CTM 10-MAG**	**2838610**	5
Screw terminal block, with disconnect contacts for accommodating the CT and CTM protective connectors, design: 10 double wires	**CT-TERMIBLOCK 10 DA**	**0441711**	10

Surge protection for ISDN-U_{k0} interfaces and T1/DS1 systems

PT 2-TELE

– For ISDN U_{k0} and DSL applications
– Broadband protection for telecommunications lines
– Connection: 7.11 for a/b wire pair

D-DS1-A/RJ45-BB

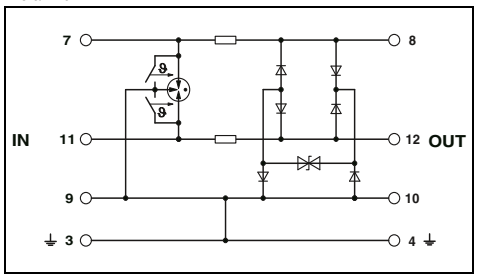
– For applications with T1 (DS1) or E1 data transmission protocol
– Connection via a keyed RJ45 (RJ48) female connector
– High transmission bandwidth

Plug-in arrester with screw connection, for three conductors, with common reference potential

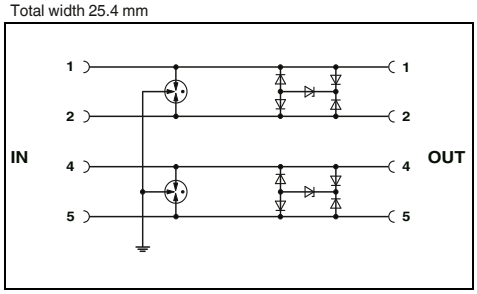
RJ45 attachment plug for two double wires

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

Total width 17.7 mm



Total width 25.4 mm



Technical data

Electrical data			
IEC category / EN type		C1 / C2 / C3 / D1 / B2	C2 / C3 / D1
Maximum continuous operating voltage U_C		185 V DC / 130 V AC	7 V DC / -
Nominal current I_N		450 mA (45°C)	1.5 A (25°C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	10 kA / 10 kA	350 A / 2.5 kA
Total surge current (8/20) µs		20 kA	10 kA
Protection level U_P			
	Core-Core / Core-Ground	≤ 270 V (C1 - 1 kV/500 A) / ≤ 300 V (C2 - 2 kV / 1 kA)	≤ 50 V / ≤ 600 V
Output voltage limitation at 1 kV/µs			
	Core-Core / Core-Ground	≤ 300 V / ≤ 300 V	≤ 20 V / ≤ 450 V
Cut-off frequency fg (3 dB)			
In a 100 Ω system	Symmetrical	Typ. 20 MHz	≥ 100 MHz
General data			
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm	25.4 mm / 25.4 mm / 102 mm
Temperature range		-40 °C ... 85 °C	-40 °C ... 80 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	IP20
Inflammability class in acc. with UL 94		V0	-
Connection method		Screw connection	RJ45
Connection data solid / stranded / AWG		0.2 mm² - 4 mm² / 0.2 mm² - 2.5 mm² / 24 - 12	-
Test standards		IEC 61643-21 / DIN EN 61643-21	IEC 61643-21

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
DATA-PLUGTRAB, consisting of plug and base element	**PT 2-TELE**	**2882828**	10
DATATRAB, attachment connector with surge protection for T1/E1 systems.	**D-DS1-A/RJ45-BB**	**2838050**	1

Accessories

Replacement plug	**PT 2-TELE-ST**	**2838733**	10
Patch cable, CAT6, pre-assembled	**FL CAT6 PATCH 1,0**	**2891385**	10
Labeling material	ZBF ..., see page 111		

For analog and DSL telecommunications systems

MNT ...

- Compact protection for termination devices
- Easy operation
- Thermal monitoring of the protective circuit
- Green LED - operating indicator for the power supply
- MNT-TAE, with TAE connection for DSL (ADSL2+) and in the ISDN network before the NTBA
- MNT-TELE, with RJ12/RJ45 sockets, for telephone, modem, and answering machine with a max. operating voltage of 185 V

TAE-TRAB FM-NFN

- For surface mounting
- Three TAE6 slots
- For two N-encoded and one F-encoded termination device
- Suitable for DSL (ADSL2+)
- Main areas of application: phone terminals, answering machines, modems, and fax machines

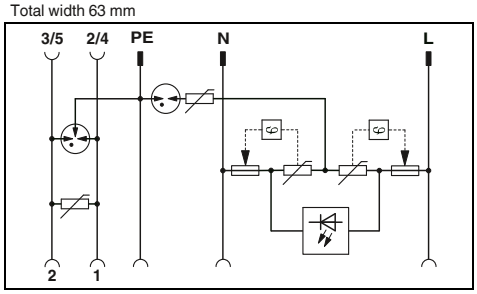
WT-RJ12

- Surface-mounted socket
- With 6-pos. RJ12 Western socket
- Also accommodates RJ11 plug
- Angled RJ12 take-up

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

For telecommunications systems with TAE connection

Total width 63 mm



Technical data

Electrical data		Mains protection	Data protection
IEC category / EN type		III / T3	C1 / C2 / C3 / D1
Nominal voltage U_N		230 V AC	-
Maximum continuous operating voltage U_C		360 V AC (L/N-PE)	200 V DC
Nominal current I_N		16 A (30 °C)	1.5 A (25°C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Core / Core-Ground	3 kA / 3 kA	1 kA / 2.5 kA
Combined surge U_{OC}		4 kV	-
Protection level U_P			
	Core-Core / Core-Ground	≤ 1.2 kV / ≤ 1.5 kV	≤ 460 V (C2 - 1 kA) / ≤ 900 V (C2 - 2 kA)
Total surge current (8/20) µs		-	5 kA
Output voltage limitation at 1 kV/µs			
	Core-Core / Core-Ground	- / -	≤ 360 V / -
Cut-off frequency fg (3 dB)			
In a 600 Ω system	Core-Core	-	-
General data			
Dimensions W / H / D		63 mm / 79 mm / 103.5 mm	
Temperature range		-25 °C ... 75 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20 (child-proof)	
Inflammability class in acc. with UL 94		V0/HB	
Connection method		RJ12/TAE 6	
Test standards		IEC 61643-1	IEC 61643-21

Ordering data

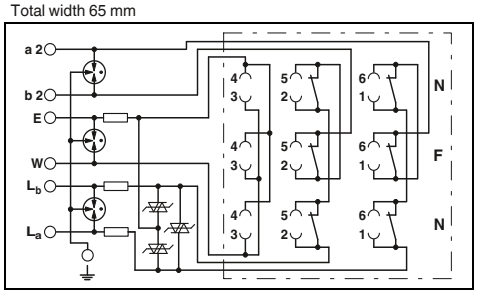
Description	Can be used as typical for the country	Type	Order No.	Pcs. / Pkt.
MAINTRAB, combination surge protection adapter for plugging into a socket, for equipment and TAE protection				
Black	D	**MNT-TAE D**	**2882381**	1
White	D	**MNT-TAE D/WH**	**2882394**	1
TAE outlet box (NFN) with surge protection for analog telecommunications interfaces				
Surface-mounted socket	D			
MAINTRAB, combined surge protection adapter for plugging into a socket, for device and TEL/TELE protection.				
Black	B, F, CZ, SVK, PL			
Black	E, P, I, NL, LUX			
White	S, FIN			
White	N			
WESTERNTRAB, RJ12 connection socket with surge protection for analog telecommunication interfaces				
Surface-mounted socket, 1 socket				

TAE outlet box (NFN)

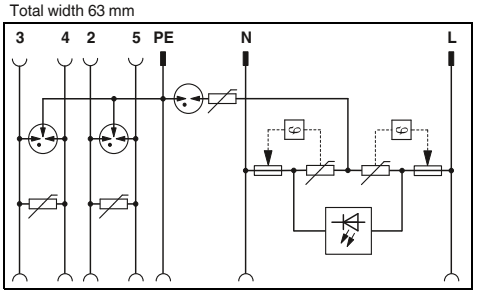
For telecommunications systems with RJ12/RJ45 connection

Surface-mounted socket with RJ12 connection

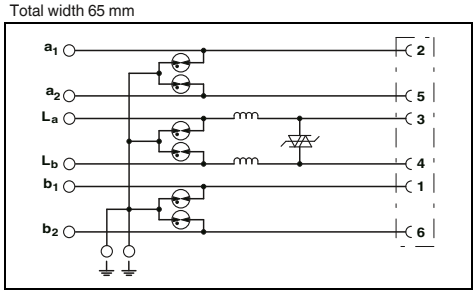
Total width 65 mm



Total width 63 mm



Total width 65 mm



Technical data

B2 / C1 / C2 / C3 / D1	
60 V DC	
185 V DC	
450 mA (≤ 40°C)	
5 kA / 5 kA	
-	
≤ 250 V (C2 - 10 kV / 5 kA) / ≤ 500 V (C2 - 10 kV / 5 kA)	
10 kA	
≤ 250 V / ≤ 450 V	
Typ. 2 MHz	
65 mm / 27 mm / 80 mm	
-40 °C ... 80 °C	
IP20	
-	
Screw connection & TAE 6	
DIN EN 61643-21	

Technical data

Mains protection	Data protection
III / T3	C1 / C2 / C3 / D1
230 V AC	-
360 V AC (L/N-PE)	200 V DC
16 A (30 °C)	1.5 A (25°C)
3 kA / 3 kA	1 kA / 2.5 kA
4 kV	-
≤ 1.2 kV / ≤ 1.5 kV	≤ 460 V (C2 - 1 kA) / ≤ 900 V (C2 - 2 kA)
-	10 kA
- / -	≤ 360 V / -
-	-
63 mm / 79 mm / 103.5 mm	
-25 °C ... 75 °C	
IP20 (child-proof)	
V0/HB	
RJ12	
EN 61643-11/A11	EN 61643-11/A11

Technical data

C1 / C2 / C3 / D1	
-	
185 V DC	
150 mA (25°C)	
2.5 kA / 2.5 kA	
-	
≤ 240 V / ≤ 700 V	
10 kA	
≤ 220 V / ≤ 700 V	
Typ. 1.7 MHz	
65 mm / 39 mm / 80 mm	
-40 °C ... 80 °C	
IP20	
-	
Screw connection & RJ12	
IEC 61643-21	

Ordering data

Type	Order No.	Pcs. / Pkt.
TAE-TRAB FM-NFN-AP	**2749628**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
MNT-TEL B/F	**2882404**	1
MNT-TELE E	**2882417**	1
MNT-TELE S/WH	**2880901**	1
MNT-TELE N/WH	**2881764**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
WT-RJ 12-S/FM A/K AP	**2809186**	1

Surge protection for analog and DSL telecommunication systems

PT 2-TELE

– For analog telecommunications
– Two-piece, plug-in
– Universal use
– High discharge capacity
– Connectors can be checked with CHECKMASTER

DT-TELE-RJ45

– For analog and digital (DSL) telecommunications interface
– Connection: RJ45 socket and/or plug-in screw terminal blocks
– The adapter included enables conversion from RJ45 to RJ11 and RJ12 (for contacting, see circuit diagram)
– International use thanks to multiple assignment
– DIN rail mounting possible by removing the cap

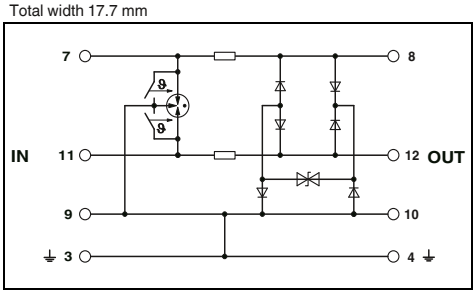
CTM...

– For analog telecommunications
– Plug-in module
– Can be used in LSA-PLUS disconnect/control strips or CT-TERMIBLOCK
– Connectors can be checked with CHECKMASTER

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

Plug-in arrester with screw connection, for three conductors, with common reference potential

Total width 17.7 mm



Technical data

Electrical data		
IEC category / EN type		C1 / C2 / C3 / D1 / B2
Maximum continuous operating voltage U_C		185 V DC / 130 V AC
Nominal current I_N		450 mA (45°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Core / Core-Ground	10 kA / 10 kA
Total surge current (8/20) µs		20 kA
Output voltage limitation at 1 kV/µs		
	Core-Core / Core-Ground	≤ 300 V / ≤ 300 V
Cut-off frequency fg (3 dB)		
In a 100 Ω system	Symmetrical / Asymmetrical	Typ. 20 MHz / -
General data		
Dimensions W / H / D		17.7 mm / 90 mm / 65.5 mm
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V0
Connection method		Screw connection
Connection data solid / stranded / AWG		0.2 mm² - 4 mm² / 0.2 mm² - 2.5 mm² / 24 - 12
Test standards		IEC 61643-21 / DIN EN 61643-21

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
DATA-PLUGTRAB, consisting of plug and base element	**PT 2-TELE**	**2882828**	10
DATATRAB, surge protection for two signal pairs of the analog and digital (DSL) telecommunication interface			
COMTRAB modular			

Accessories

Replacement connector	**PT 2-TELE-ST**	**2838733**	10
Magazine, with grounding rail for accommodating up to 10 LSA-PLUS protective connectors (CTM...), for insertion in CT-TERMIBLOCK or LSA-PLUS disconnect strip			
Screw terminal block, with disconnect contacts for accommodating the CT and CTM protective connectors, design: 10 double wires			

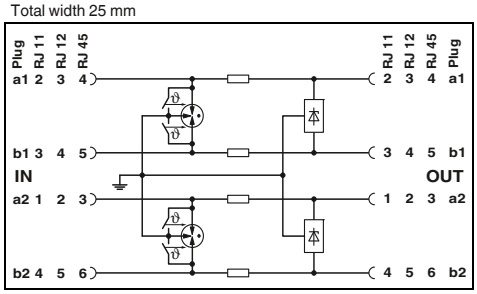
Labeling material	ZBF ..., see page 111

RJ45 attachment plug for two double wires

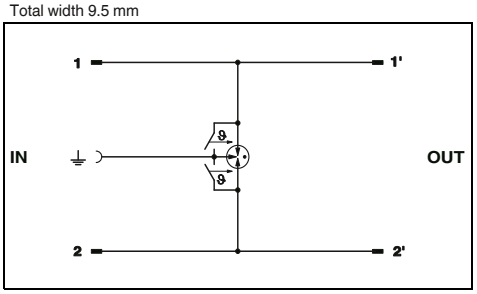
2-wire coarse protection, with failsafe contact

Double wire (loop), floating

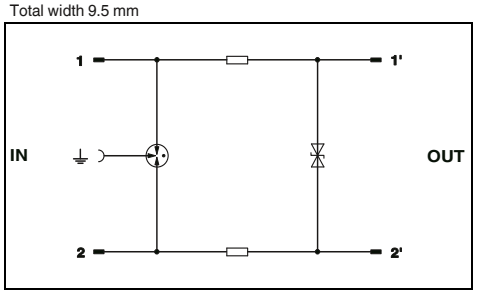
Total width 25 mm



Total width 9.5 mm



Total width 9.5 mm



Technical data

	B2 / C1 / C2 / C3 / D1
	185 V DC / 130 V AC
	≤ 380 mA (25°C)
	≤ 5 kA / ≤ 5 kA
	10 kA
	≤ 250 V / ≤ 250 V
	Typ. 50 MHz / -
	25 mm / 103 mm / 63 mm
	-40 °C ... 85 °C
	IP20
	-
	RJ45 / Combicon
	-
	IEC 61643-21

Technical data

	A2 / B1 / B2 / B3 / C1 / C2 / C3 / D1 / D2
	± 180 V DC / -
	1.5 A (25°C)
	- / 5 kA
	10 kA
	- / ≤ 800 V
	- / > 100 MHz
	9.5 mm / 21 mm / 53.5 mm
	-40 °C ... 85 °C
	IP20
	V0
	can be plugged into COMTRAB-TERMIBLOCK and LSA-PLUS disconnect and switching strips
	-
	IEC 61643-21

Technical data

	B2 / C1 / C2 / C3 / D1
	± 180 V DC / -
	380 mA (25°C)
	5 kA / 5 kA
	10 kA
	≤ 260 V / ≤ 800 V
	20 MHz / -
	9.5 mm / 21 mm / 53.5 mm
	-25 °C ... 75 °C
	IP20
	V0
	can be plugged into COMTRAB-TERMIBLOCK and LSA-PLUS disconnect and switching strips
	-
	IEC 61643-21

Ordering data

Type	Order No.	Pcs. / Pkt.
DT-TELE-RJ45	**2882925**	1

Accessories

CTM 10-MAG	**2838610**	5
CT-TERMIBLOCK 10 DA	**0441711**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
CTM 2X1-180DC-GS	**2838636**	10

Accessories

CTM 10-MAG	**2838610**	5
CT-TERMIBLOCK 10 DA	**0441711**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
CTM 1X2-110AC	**2838539**	10

Accessories

CTM 10-MAG	**2838610**	5
CT-TERMIBLOCK 10 DA	**0441711**	10

You won't lose reception with COAXTRAB

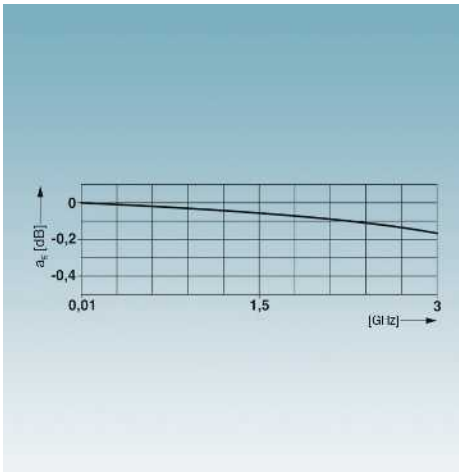
Transceiver systems are generally considered to be particularly susceptible to surge voltages. Antenna cables which extend beyond a building and are usually very long, plus the antennas themselves, are directly exposed to atmospherical discharge.

Cables with a coaxial structure and therefore favorable EMC properties are primarily used in antenna systems. However, the risk of surge voltage coupling in antenna cables and potential transfer through to the sensitive interfaces of transceiver systems is not eliminated.

Thanks to interface-optimized surge protective devices, the COAXTRAB product range significantly increases safety for transceiver equipment. The aim of such safety measures is to increase the availability and operability of the devices affected.

Shielding

Good shielding properties are vital for a clean transmission. The rugged metal housings provide ideal shielding properties and are also suitable for use in harsh industrial environments.



Customized products

Appropriate protective devices are available for all applications including SAT receiver systems, mobile phones, and video monitoring.

The very low attenuation values ensure that data transmission is clean.

Performance classes

The protective devices conform to standards in all performance classes. This applies for coarse protection in accordance with Category D1, 10/350 µs and for fine protection in accordance with Category C1, 8/20 µs.

Connection technology

The right connection technology to suit the application: F connector, TV connector, type N, 7/16, UHF, BNC, SMA.

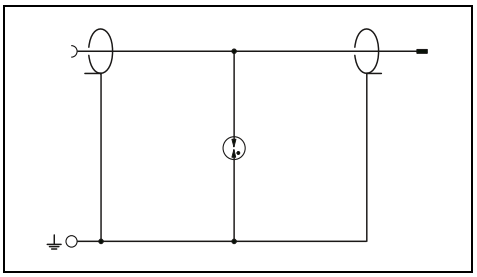
Protective adapters with coaxial connection
COAXTRAB

– For antennas with N and BNC connection
– High transmission capacities even for frequencies up to 6 GHz
– Mounting plate enables fixed mounting, e.g., in a control cabinet
– The protective adapters can also be used in a 75 Ω system with 50 Ω BNC connectors

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

For GSM systems (3 GHz), grounded shield, connection: N type

Total width 31 mm



Technical data

Electrical data	
IEC category / EN type	C2 / C3 / D1
Maximum continuous operating voltage U_C	280 V DC / -
Nominal current I_N	5 A (25°C)
Nominal discharge surge current I_n (8/20) µs	
Core-Shield / Core-Ground	20 kA / 20 kA
Total surge current (8/20) µs	20 kA
Protection level U_P	
Core-Shield / Core-Ground	≤ 900 V (C1 - 1 kV/500 A) / ≤ 900 V (C1 - 1 kV/500 A)
Frequency range	0 Hz ... 3 GHz
Standing wave ratio SWR in a 50 Ω system	Typ. 1.15 (≤ 3 GHz)
Permissible. RF power P_{max}	700 W (VSWR = 1.1)
General data	
Dimensions W / H / D	31 mm / 57.8 mm / 33.5 mm
Temperature range	-40 °C ... 80 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP55
Connection method	N connector 50 Ω
Test standards	IEC 61643-21/A1 / EN 61643-21/A1

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
COAXTRAB, protective adapter for antenna connections			
Female/female	**CN-UB-280DC-3-BB**	**2801050**	1
Male/female	**CN-UB-280DC-3-SB**	**2801051**	1

Accessories

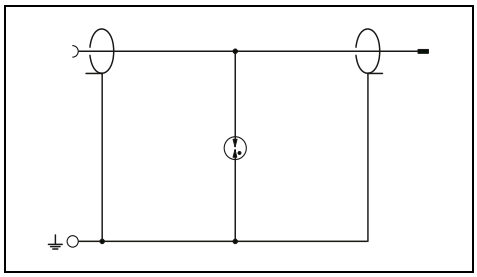
Mounting plate, for individual attachment to housing panels			
straight	**CN-UB/MP**	**2818135**	10
angled	**CN-UB/MP-90DEG-50**	**2803137**	1
BNC connector, single-level, for mounting on NS 32 or NS 35/7.5			
50 Ω wave impedance			
Adapter, insertion loss <0.3 dB at 2.4 GHz			
N (male) -> SMA (female)			
Adapter cable, pigtail, insertion loss 1.5 dB at 2.4 GHz; impedance 50 Ω; 50 cm long, MCX (male) -> N (male)			

With N connector (0 - 6 GHz), grounded shield

With N connector, floating shield

With BNC connector, floating shield

Total width 24 mm



Technical data

C2 / C3 / D1	
70 V DC / 50 V AC	
10 A	
5 kA / 5 kA	
5 kA	
- / ≤ 800 V (C2 (4 kV/2 kA))	
0 Hz ... 6 GHz	
Typ. 1.15 (6 GHz)	
30 W (VSWR = 1.15)	
24 mm / 24 mm / 50 mm	
-40 °C ... 90 °C	
IP68	
N connector 50 Ω	
IEC 61643-21	

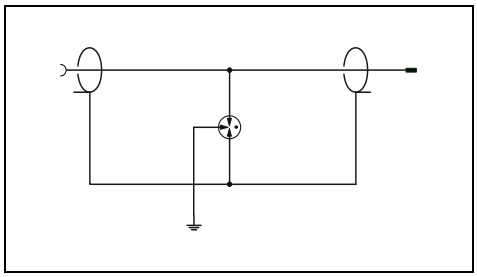
Ordering data

Type	Order No.	Pcs. / Pkt.
CN-UB-70DC-6-BB	**2803166**	1
CN-UB-70DC-6-SB	**2803153**	1

Accessories

CN-UB/MP	**2818135**	10
CN-UB/MP-90DEG-50	**2803137**	1
RAD-ADP-N/M-SMA/F	**2917036**	1
RAD-PIG-EF316-MCX-N	**2867681**	1

Total width 25.4 mm



Technical data

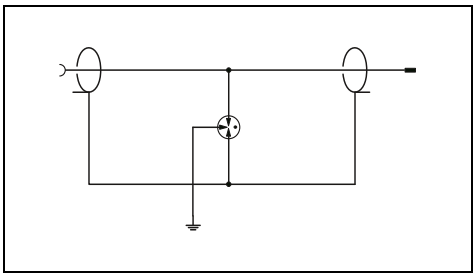
C2 / C3 / D1	
180 V DC / 130 V AC	
5 A (25°C)	
5 kA / 5 kA	
10 kA	
- / ≤ 500 V (C2, 10 kV/5 kA)	
-	
≤ 1.2 (≤ 200 MHz)	
300 W (VSWR = 1.1)	
25.4 mm / 83 mm / 25.4 mm	
-40 °C ... 80 °C	
IP20	
N connector 50 Ω	
-	

Ordering data

Type	Order No.	Pcs. / Pkt.
CN-UB/E-BB	**2817686**	1
CN-UB/E	**2763691**	1
BNC-V 50	**2805041**	10

Accessories

Total width 25.4 mm



Technical data

C2 / C3 / D1	
180 V DC / 130 V AC	
3.5 A (25°C)	
5 kA / 5 kA	
10 kA	
- / ≤ 500 V (C2 - 10 kV / 5 kA)	
-	
Typ. 1.3 (≤ 150 MHz)	
300 W (VSWR = 1.1)	
25.4 mm / 2.54 mm / 80 mm	
-40 °C ... 80 °C	
IP20	
BNC 50 Ω	
IEC 61643-21 / DIN EN 61643-21	

Ordering data

Type	Order No.	Pcs. / Pkt.
C-UB/E	**2763701**	10
BNC-V 50	**2805041**	10

Accessories

Protection for mobile phone antennas

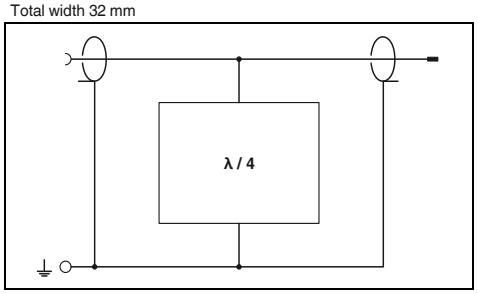
- For antennas with N, 7/16, and SMA connection
- High transmission capacities even for frequencies up to 6 GHz
- Maintenance-free surge protection with Lambda/4 technology
- Low protection level

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

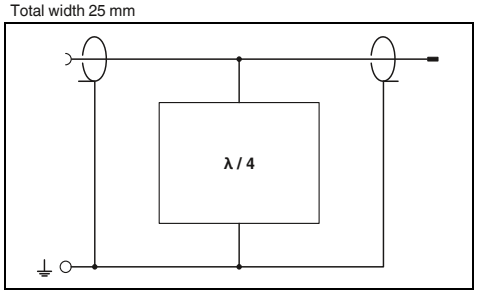
For TETRA systems (380 MHz - 470 MHz), grounded shield

For GSM systems (0.8 GHz-2.25 GHz), grounded shield, connection: N type

Total width 32 mm



Total width 25 mm



Technical data

Electrical data	
IEC category / EN type	C2 / C3 / D1
Nominal current I_N	5 A (25 °C)
Nominal discharge surge current I_n (8/20) µs	
Core-Shield / Core-Ground	20 kA / 20 kA
Total surge current (8/20) µs	30 kA
Protection level U_P	
Core-Shield / Core-Ground	≤ 95 V (C2 - 10 kV / 5 kA) / ≤ 95 V (C2 - 10 kV / 5 kA)
Frequency range	380 MHz ... 470 MHz
Standing wave ratio SWR in a 50 Ω system	Typ. 1.05 (≤ 1,15)
Permissible. RF power P_{max}	≤ 800 W
General data	
Dimensions W / H / D	32 mm / 32 mm / 83 mm
Temperature range	-40 °C ... 90 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP68
Connection method	N connector
Test standards	IEC 61643-21

Technical data

Electrical data	
IEC category / EN type	C2 / C3 / D1
Nominal current I_N	5 A (25 °C)
Nominal discharge surge current I_n (8/20) µs	
Core-Shield / Core-Ground	50 kA / 50 kA
Total surge current (8/20) µs	60 kA
Protection level U_P	
Core-Shield / Core-Ground	- / ≤ 5 V (C1 - 1 kV/500 A)
Frequency range	0.8 GHz ... 2.25 GHz
Standing wave ratio SWR in a 50 Ω system	Typ. 1.2
Permissible. RF power P_{max}	≤ 500 W
General data	
Dimensions W / H / D	25 mm / 78.7 mm / 77.5 mm
Temperature range	-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529	IP68
Connection method	N connector 50 Ω
Test standards	IEC 61643-21/A1 / EN 61643-21/A1

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
COAXTRAB, protective adapter for antenna connections with Lambda/4 technology			
Female/female	**CN-LAMBDA/4-0.47-BB**	**2800021**	1
Male/female	**CN-LAMBDA/4-0.47-SB**	**2800022**	1
Surge protection for UMTS and quad-band GSM antenna, with SMA connector and SMA coupling			

Ordering data

Type	Order No.	Pcs. / Pkt.
CN-LAMBDA/4-2.25-BB	**2801057**	1
CN-LAMBDA/4-2.25-SB	**2801056**	1

Accessories

Mounting plate, for individual attachment to housing panels			
straight			
angled	**CN-UB/MP-90DEG-50**	**2803137**	1
Adapter, insertion loss <0.3 dB at 2.4 GHz			
N (male) -> SMA (female)	**RAD-ADP-N/M-SMA/F**	**2917036**	1
Adapter cable, pigtail, insertion loss 1.5 dB at 2.4 GHz; impedance 50 Ω;			
50 cm long, MCX (male) -> N (male)	**RAD-PIG-EF316-MCX-N**	**2867681**	1

Accessories

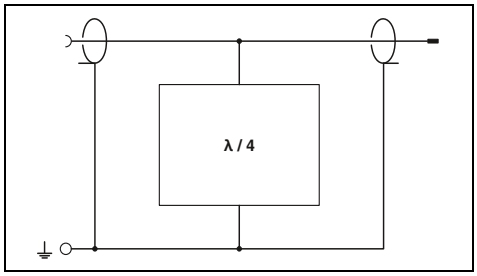
CN-UB/MP	**2818135**	10
CN-UB/MP-90DEG-50	**2803137**	1

For GSM systems (0.8 GHz-2.25 GHz), grounded shield, connection: 7/16

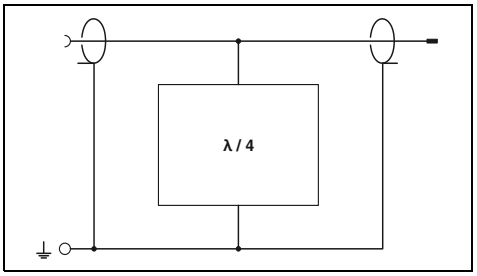
Protective adapter set with SMA connection, grounded shield

For GSM and WiMAX systems (2.4 GHz - 5.9 GHz), grounded shield

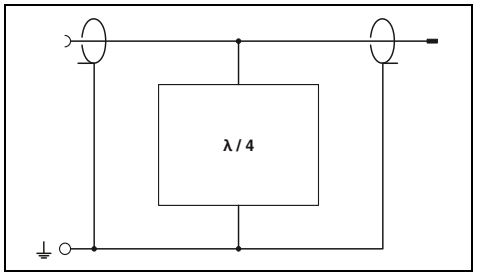
Total width 39 mm



Total width 46.5 mm



Total width 26.1 mm



Technical data

C2 / C3 / D1	
5 A (25 °C)	
50 kA / 50 kA	
60 kA	
- / ≤ 5 V (C1 - 1 kV/500 A)	
0.8 GHz ... 2.25 GHz	
Typ. 1.2	
≤ 500 W	
39 mm / 83.5 mm / 82 mm	
-40 °C ... 85 °C	
IP68	
7/16 connector	
IEC 61643-21/A1 / EN 61643-21/A1	

Technical data

C2 / C3 / D1	
2 A (25°C)	
6 kA / 6 kA	
6 kA	
- / ≤ 5 V (C1 (1 kV/500 A))	
0.8 GHz ... 2.25 GHz	
≤ 1.2 (0.8 GHz ... 2.25 GHz)	
≤ 110 W (VSWR = 1.0)	
46.5 mm / 25 mm / 70 mm	
-40 °C ... 70 °C	
IP55	
SMA connector	
IEC 61643-21/A1 / EN 61643-21/A1	

Technical data

C2 / C3 / D1	
5 A (25°C)	
50 kA / 50 kA	
60 kA	
- / ≤ 11 V (6 kV/3 kA)	
2.4 GHz ... 5.9 GHz	
Typ. 1.1 (≤ 1.20 (2.4 GHz...5.9 GHz))	
≤ 500 W	
26.1 mm / 38 mm / 60 mm	
-40 °C ... 90 °C	
IP68	
N connector	
IEC 61643-21	

Ordering data

Type	Order No.	Pcs. / Pkt.
C7/16-LAMBDA/4-2.25-BB	**2801060**	1
C7/16-LAMBDA/4-2.25-SB	**2801059**	1

Accessories

CN-UB/MP	**2818135**	10
CN-UB/MP-90DEG-50	**2803137**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
CSMA-LAMBDA/4-2.0-BS-SET	**2800491**	1

Accessories

CN-UB/MP	**2818135**	10
CN-UB/MP-90DEG-50	**2803137**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
CN-LAMBDA/4-5.9-BB	**2838490**	1
CN-LAMBDA/4-5.9-SB	**2800023**	1

Accessories

CN-UB/MP-90DEG-50	**2803137**	1
RAD-ADP-N/M-SMA/F	**2917036**	1
RAD-PIG-EF316-MCX-N	**2867681**	1

Protective adapters with BNC connection
COAXTRAB

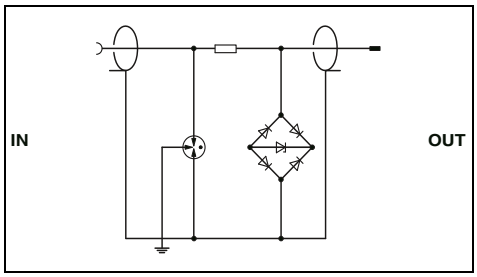
– For insertion in the cable
– Ground connection via separately led cable

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

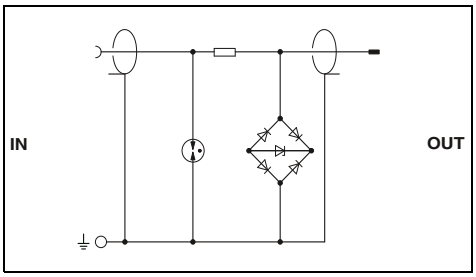
For floating communication systems

For non-floating communication systems

Total width 25.4 mm



Total width 25.4 mm



Technical data

Electrical data		... 5DC/E	... 24DC/E	... 5DC/E 75
IEC category / EN type		C2 / C3 / D1	C2 / C3 / D1	C2 / C3 / D1
Maximum continuous operating voltage U_C		5 V DC	30 V DC	5 V DC
Nominal current I_N		185 mA (25°C)	185 mA (25°C)	-
Nominal discharge surge current I_n (8/20) µs				
	Core-Shield / Core-Ground	10 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		20 kA	20 kA	20 kA
Output voltage limitation at 1 kV/µs				
	Core-Shield / Core-Ground	≤ 15 V / -	≤ 45 V / -	≤ 15 V / -
Cut-off frequency fg (3 dB)				
In a 50 Ω system	Asymmetrical	Typ. 90 MHz	Typ. 90 MHz	Typ. 80 MHz
General data				
Temperature range		-40 °C ... 80 °C		
Degree of protection in acc. with IEC 60529/ EN 60529		IP20		
Connection method		BNC 50 Ω	BNC 50 Ω	BNC 75 Ω
Test standards		IEC 61643-21		

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
COAXTRAB, as surge protection for coaxial cables, connection via plug and socket			
BNC 50 Ω	**C-UFB- 5DC/E**	**2782300**	10
BNC 50 Ω	**C-UFB-24DC/E**	**2782313**	10
BNC 75 Ω	**C-UFB- 5DC/E 75**	**2763604**	10

Accessories

BNC connector, single-level, for mounting on NS 32 or NS 35/7.5			
50 Ω wave impedance	**BNC-V 50**	**2805041**	10
75 Ω wave impedance	**BNC-V 75**	**2805070**	10
BNC connector, double-level, for mounting on NS 32 or NS 35/7.5			
50 Ω wave impedance	**BNC-DV 50**	**2805038**	10
75 Ω wave impedance	**BNC-DV 75**	**2805083**	10

Technical data

Electrical data		... 5DC	... 24DC
IEC category / EN type		C2 / C3 / D1	C2 / C3 / D1
Maximum continuous operating voltage U_C		5 V DC	30 V DC
Nominal current I_N		185 mA (25°C)	185 mA (25°C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Shield / Core-Ground	10 kA / 10 kA	10 kA / 10 kA
Total surge current (8/20) µs		10 kA	10 kA
Output voltage limitation at 1 kV/µs			
	Core-Shield / Core-Ground	≤ 15 V / ≤ 15 V	≤ 45 V / ≤ 45 V
Cut-off frequency fg (3 dB)			
In a 50 Ω system	Asymmetrical	Typ. 90 MHz	Typ. 90 MHz
General data			
Temperature range		-40 °C ... 80 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20	
Connection method		BNC 50 Ω	BNC 50 Ω
Test standards		IEC 61643-21	

Ordering data

Type	Order No.	Pcs. / Pkt.
C-UFB- 5DC	**2797858**	10
C-UFB-24DC	**2797861**	10

Accessories

BNC-V 50	**2805041**	10
BNC-DV 50	**2805038**	10

BNC connectors

– For coaxial cables
– DIN rail-mountable and can be aligned
– Single or double-level
– Can be labeled individually
– With isolated structure on the DIN rail

BNC connector, single-level

BNC connector, double-level

Total width 22 mm

Technical data

General data	BNC-V 50	BNC-V 75
Temperature range	125 °C	
Degree of protection in acc. with IEC 60529/ EN 60529	IP20	
Connection method	BNC 50 Ω	BNC 75 Ω

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
BNC connector, single-level, for mounting on NS 32 or NS 35/7.5			
50 Ω wave impedance	**BNC-V 50**	**2805041**	10
75 Ω wave impedance	**BNC-V 75**	**2805070**	10
BNC connector, double-level, for mounting on NS 32 or NS 35/7.5			
50 Ω wave impedance			
75 Ω wave impedance			

Accessories

Terminal marking, can be labeled according to customer specifications 4-section	**ZB 22 CUS**	**0824949**	1

Total width 22 mm

Technical data

General data	BNC-DV 50	BNC-DV 75
Temperature range	125 °C	
Degree of protection in acc. with IEC 60529/ EN 60529	IP20	
Connection method	BNC 50 Ω	BNC 75 Ω

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
BNC connector, single-level, for mounting on NS 32 or NS 35/7.5			
50 Ω wave impedance			
75 Ω wave impedance			
BNC connector, double-level, for mounting on NS 32 or NS 35/7.5			
50 Ω wave impedance	**BNC-DV 50**	**2805038**	10
75 Ω wave impedance	**BNC-DV 75**	**2805083**	10

Accessories

Terminal marking, can be labeled according to customer specifications 4-section	**ZB 22 CUS**	**0824949**	1

Protection for antenna inputs of radio and television equipment

C-SAT-BOX

– Protection for antenna inputs in satellite receiver technology
– Use before antenna distributor or multi-switch
– Analog and digital SAT signals
– Terrestrial antenna signals
– Direct wall mounting supported

C-TV-SAT and C-TV/HIFI

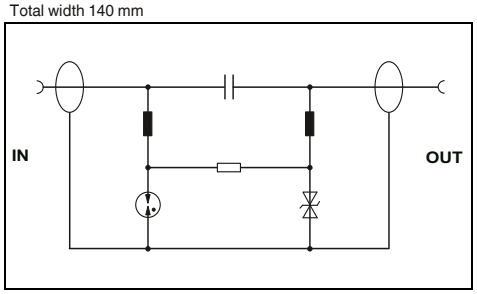
– Protective adapter for antenna connections
– Use on broadband cable or SAT connection
– TV or F connector

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

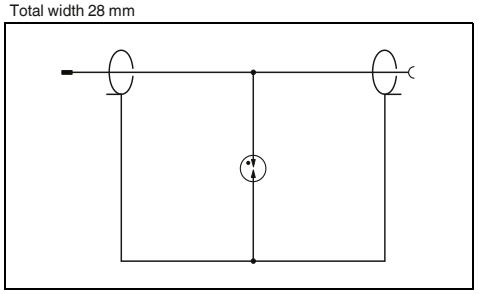
For antenna distributor or multi-switch

Adapter with F and IEC connector

Total width 140 mm



Total width 28 mm



Technical data

Electrical data		
IEC category / EN type	B2 / C2 / C3 / D1 / C1	
Maximum continuous operating voltage U_C	20 V DC / -	
Nominal current I_N	400 mA (25°C)	
Nominal discharge surge current I_n (8/20) µs		
Core-Shield / Core-Ground	2.5 kA / 2.5 kA	
Total surge current (8/20) µs	10 kA	
Output voltage limitation at 1 kV/µs		
Core-Shield / Core-Ground	≤ 70 V / ≤ 70 V	
Cut-off frequency fg (3 dB)		
In a 75 Ω system Symmetrical / Asymmetrical	- / > 2.5 GHz	
General data		
Dimensions W / H / D	140 mm / 74 mm / 35 mm	
Temperature range	-40 °C ... 80 °C	
Degree of protection in acc. with IEC 60529/ EN 60529	IP40	
Inflammability class in acc. with UL 94	-	
Connection method	F connector	
Test standards	IEC 61643-21 / EN 50083 - CLASS A	

Technical data

	F-connector	TV connector
	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
	180 V DC / 130 V AC	180 V DC / 130 V AC
	1.5 A (25°C)	1.5 A (25°C)
	2.5 kA / -	2.5 kA / -
	2.5 kA	2.5 kA
	≤ 600 V / -	≤ 600 V / -
	- / > 3 GHz	- / > 1 GHz
	28 mm / 66 mm / 44 mm	
	-25 °C ... 75 °C	
	IP20	
	V0	
	F connector	PAL-TV (IEC 169-2)
	IEC 61643-21 / EN 50083 - CLASS A	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
COAXTRAB, protective device for antenna distributors/multi-switches for insertion in the antenna line	**C-SAT-BOX**	**2880561**	1
COAXTRAB, surge protection adapter			
F connector	**C-TV-SAT**	**2856993**	1
TV connector	**C-TV/HIFI**	**2857002**	1

Accessories

Adapter, to connect the C-SAT-BOX with antenna distributors with a pitch of 20 mm (e.g. ASTRO, SPAUN)	**ADAPTER KOAX TYP F**	**2880972**	5
Connection cable, to connect the C-SAT-BOX with the antenna distributor, length: 0.2 m	**KBL-SAT/20**	**2880985**	5

For power supply and antenna inputs

- For termination devices
- Easy operation
- Connection to antenna junction box using separate cable
- Thermal monitoring of the protective circuit
- Green LED - operating indicator for the power supply

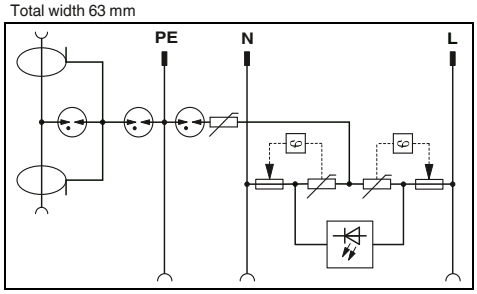
Notes:

For certifications, see page 154

Attenuation characteristics at www.phoenixcontact.net/products

For network and TV antennas/cables and SAT systems, with F connector and IEC adapter

Total width 63 mm



Technical data

Electrical data		Mains protection	Data protection
IEC category / EN type		III / T3	C2 / C3 / D1
Nominal voltage U_N		230 V AC	-
Maximum continuous operating voltage U_C		360 V AC (L/N-PE)	50 V AC / 72 V DC
Nominal current I_N		16 A (30 °C)	1.5 A (25°C)
Nominal discharge surge current I_n (8/20) µs			
	Core-Shield / Core-Ground	3 kA / 3 kA	2.5 kA / 2.5 kA
Combined surge U_{OC}		4 kV	-
Protection level U_P			
	Core-Shield / Core-Ground	≤ 1.2 kV / ≤ 1.5 kV	≤ 700 V (C2 - 2 kA) / -
Output voltage limitation at 1 kV/µs			
	Core-Ground / Core-Shield / Shield-Ground	- / -	- / ≤ 700 V / ≤ 1 kV
Cut-off frequency fg (3 dB)			
In a 75 Ω system	Core/Shield	-	> 2.5 GHz
General data			
Dimensions W / H / D		63 mm / 79 mm / 106.5 mm	
Temperature range		-25 °C ... 75 °C	
Degree of protection in acc. with IEC 60529/ EN 60529		IP20 (child-proof)	
Inflammability class in acc. with UL 94		V0/HB	
Connection method		F connector	
Test standards		IEC 61643-1	IEC 61643-21

Ordering data

Description	Can be used as typical for the country	Type	Order No.	Pcs. / Pkt.
MAINTRAB, surge protection attachment plug for plugging into a socket for equipment and data interface protection, incl. 1.5 m coaxial cable.				
Black	D, A, NL	**MNT-TV-SAT D**	**2882284**	1
White	D, A, NL	**MNT-TV-SAT D/WH**	**2882297**	1
Black	B, F, CZ, SVK, PL	**MNT-TV-SAT B/F**	**2882307**	1
White	S, FIN, N	**MNT-TV-SAT S/WH**	**2880888**	1

SFP-TRAB

Reliable signals with mains interference filter

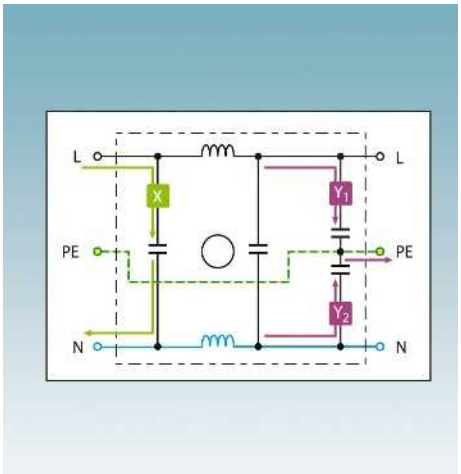
Switching operations triggered mechanically or electronically generate pulse-like and high-frequency interference voltages. These voltages spread in an unimpeded manner across the cable network. All the devices within this cable network are affected. Data errors, uncontrolled functions, and system crashes can result, with data processing devices at particular risk.

Interference voltage filters for power supply units

Interference filters limit conducted high-frequency interference voltages. Devices used in data processing or automation particularly benefit from a clean power supply. The end result is safe operation and reliable measured results.

Interference filters with type 3 surge protection

Interference filters with integrated type 3 surge protection have two tasks: they absorb surge voltages and also limit high-frequency interference voltages.



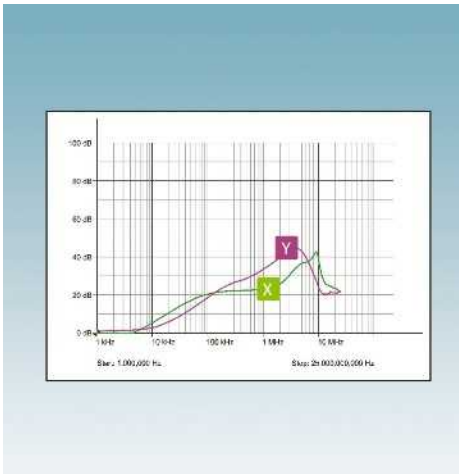
Mains interference filters - operating principle and range

Filtering of symmetrical disturbance variables

X - Interference voltages between the phase and neutral conductor are filtered.

Filtering of asymmetrical disturbance variables

Y_1,Y_2 - The opposite grounded interference voltages from phase to PE and from the neutral conductor to PE are filtered.



Operating range of filters

An attenuation curve diagram illustrates the effective operating range of mains interference filters. The relevant frequency-dependent attenuation can be read according to the symmetrical or asymmetrical filter circuit.

DIN-rail-mountable device protection with SFP-TRAB interference filter

- Combined protective circuit for absorbing transient surge voltages and high-frequency interference voltages
- Thermal monitoring of the protective circuit
- Disconnection status signaled via floating remote indication contact
- Can be installed in industrial environments

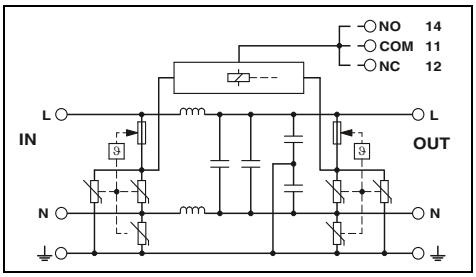
Notes:

For certifications, see page 154

Attenuation characteristics at www.phoenixcontact.net/products

20 A nominal current

Total width 112 mm



Technical data

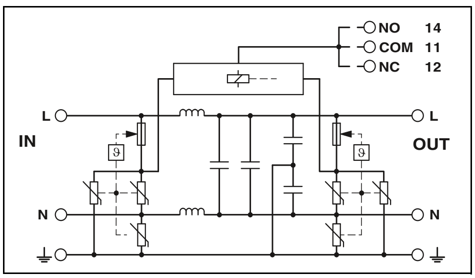
Electrical data		... 230AC	... 120AC
IEC category / EN type		III / T3	III / T3
Nominal voltage U_N		230 V AC	120 V AC
Maximum continuous operating voltage U_C	DC/AC	- / 264 V AC	- / 150 V AC
Nominal load current I_L		20 A (40°C)	20 A (40°C)
Nominal discharge surge current I_n (8/20) µs	L-N / L-PE	5 kA / 5 kA	3 kA / 3 kA
Max. discharge surge current $I_{max.}$ (8/20) µs	L-N / L-PE	10 kA / 10 kA	10 kA / 10 kA
Combined surge U_{OC}		10 kV	6 kV (3 kA)
Protection level U_P	L-N/L(N)-PE	≤ 1 kV / ≤ 1 kV	≤ 450 V / ≤ 450 V
Response time t_A	L-N/L(N)-PE	≤ 25 ns / ≤ 25 ns	≤ 25 ns / ≤ 25 ns
Backup fuse max. in acc. with IEC		20 A (gL / gG)	20 A (gL / gG)
Input attenuation a_l			
	Symmetrical	20 dB (≥ 100 kHz / 50 Ω)	Typ. 40 dB (≥ 500 kHz / 50 Ω)
	Asymmetrical	30 dB (≥ 1 MHz / 50 Ω)	Typ. 30 dB (≥ 1 MHz / 50 Ω)
Inductivity		2x 1 mH ±30 % (with current compensation)	2x 1 mH ±30 % (with current compensation)
General data			
Dimensions W / H / D		112 mm / 93 mm / 79 mm	
Connection data solid / stranded / AWG		4 ... 6 mm² / 4 ... 4 mm² / 12 - 10	
Temperature range		-40 °C ... 70 °C	-25 °C ... 40 °C
Inflammability class in acc. with UL 94		V0	
Test standards		IEC 61643-1 / DIN EN 61643-11 / EN 61643-11/A11 / UL 1449 / UL 1283	
Remote indication contact		PDT, 1-pos.	
Connection data solid / stranded / AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16	
Max. operating voltage		250 V AC / -	
Max. operating current		1 A (250 V AC) / 0.25 A (250 V DC) / 1 A (48 V DC)	

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
SFP-TRAB, DIN rail-mountable device protection with integrated mains interference filter and optical signaling				
Nominal current: 20 A	230 V AC	**SFP 1-20/230AC**	**2859987**	1
Nominal current: 20 A	120 V AC	**SFP 1-20/120AC**	**2856702**	1
SFP-TRAB, DIN rail-mountable device protection with integrated mains interference filter and optical signaling				
Nominal current: 5 A	120 V AC			
Nominal current: 10 A	120 V AC			
Nominal current: 15 A	120 V AC			

5 A nominal current

Total width 112 mm



Technical data

III / T3
120 V AC
- / 150 V AC
5 A (72°C)
3 kA / 3 kA
10 kA / 10 kA
6 kV (3 kA)
≤ 450 V / ≤ 450 V
≤ 25 ns / ≤ 25 ns
20 A (gL / gG)

Typ. 40 dB (≥ 500 kHz / 50 Ω)
Typ. 30 dB (≥ 1 MHz / 50 Ω)
2x 1 mH ±30 % (with current compensation)

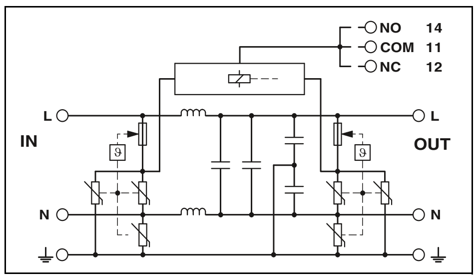
112 mm / 93 mm / 79 mm
4 ... 6 mm² / 4 ... 4 mm² / 12 - 10
-25 °C ... 70 °C
V0
IEC 61643-1 / EN 61643-11/A11 / UL 1449 / UL 1283
PDT, 1-pos.
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
250 V AC / -
1 A (250 V AC) / 0.25 A (250 V DC) / 1 A (48 V DC)

Ordering data

Type	Order No.	Pcs. / Pkt.
SFP 1-5/120AC	**2920667**	1

10 A nominal current

Total width 112 mm



Technical data

III / T3
120 V AC
- / 150 V AC
10 A (62°C)
3 kA / 3 kA
10 kA / 10 kA
6 kV (3 kA)
≤ 450 V / ≤ 450 V
≤ 25 ns / ≤ 25 ns
20 A (gL / gG)

Typ. 40 dB (≥ 500 kHz / 50 Ω)
Typ. 30 dB (≥ 1 MHz / 50 Ω)
2x 1 mH ±30 % (with current compensation)

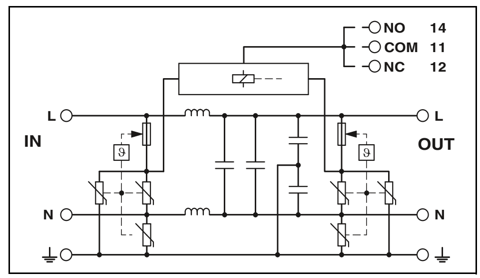
112 mm / 93 mm / 79 mm
4 ... 6 mm² / 4 ... 4 mm² / 12 - 10
-25 °C ... 60 °C
V0
IEC 61643-1 / EN 61643-11/A11 / UL 1449 / UL 1283
PDT
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
250 V AC / -
1 A (250 V AC) / 0.25 A (250 V DC) / 1 A (48 V DC)

Ordering data

Type	Order No.	Pcs. / Pkt.
SFP 1-10/120AC	**2920670**	1

15 A nominal current

Total width 112 mm



Technical data

III / T3
120 V AC
- / 150 V AC
15 A (52 °C)
3 kA / 3 kA
10 kA / 10 kA
6 kV (3 kA)
≤ 450 V / ≤ 450 V
≤ 25 ns / ≤ 25 ns
20 A (gL / gG)

Typ. 40 dB (≥ 500 kHz / 50 Ω)
Typ. 30 dB (≥ 1 MHz / 50 Ω)
2x 1 mH ±30 % (with current compensation)

112 mm / 93 mm / 79 mm
4 ... 6 mm² / 4 ... 4 mm² / 12 - 10
-25 °C ... 50 °C
V0
IEC 61643-1 / EN 61643-11/A11 / UL 1449 / UL 1283
PDT
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
250 V AC / -
1 A (250 V AC) / 0.25 A (250 V DC) / 1 A (48 V DC)

Ordering data

Type	Order No.	Pcs. / Pkt.
SFP 1-15/120AC	**2920683**	1

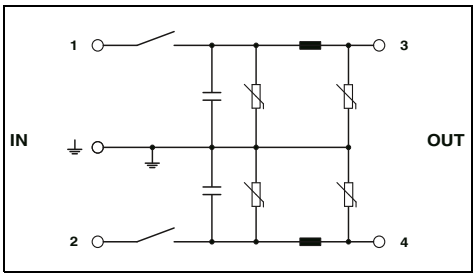
TERMITRAB

- Combined protective circuit for absorbing transient surge voltages and high-frequency interference voltages
- With spring-cage connection
- Disconnection of signal circuits by disconnect knife

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

Protection for two conductors with a common reference potential

Total width 6.2 mm



Technical data

Electrical data		
IEC category / EN type		C1 / C3
Maximum continuous operating voltage U_C	DC/AC	38 V DC / 30 V AC
Nominal load current I_L		0.5 A (55°C)
Nominal discharge surge current I_n (8/20) µs		
	Core-Ground	350 A
Total surge current (8/20) µs		700 A
Output voltage limitation at 1 kV/µs		
	Core-Ground	≤ 70 V
Cut-off frequency fg (3 dB)		
	Asymmetrical in the 50 Ω system	Typ. 60 kHz
Resistance per path		0.5 Ω
Inductance per path		100 µH (per path)
Capacitance per path		130 nF
General data		
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Temperature range		-40 °C ... 85 °C
Degree of protection in acc. with IEC 60529/ EN 60529		IP20
Inflammability class in acc. with UL 94		V2
Test standards		IEC 61643-21/A1 / EN 61643-21/A1

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
TERMITRAB, spring-cage modular terminal block with integrated surge protection as a filter circuit and disconnect knives, for mounting on NS 35	24 V AC	**TT-ST-M-SFP-24AC**	**2858946**	10

Accessories

Cover, for terminating a row of terminal blocks	**TT-D-STTCO-BK**	**2858894**	50
Zack marker strip, 10-section, white	ZB 6, see page 111		

FILTRAB

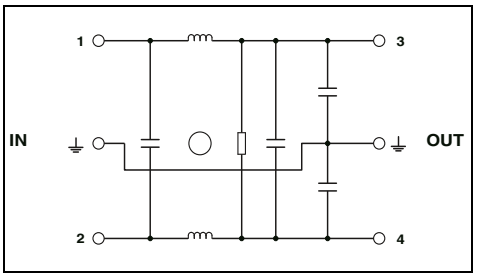
- Low pass filters for nominal currents of 1 to 10 A
- For single-phase circuits
- Rail-mountable module

Notes:
For certifications, see page 154
Attenuation characteristics at www.phoenixcontact.net/products

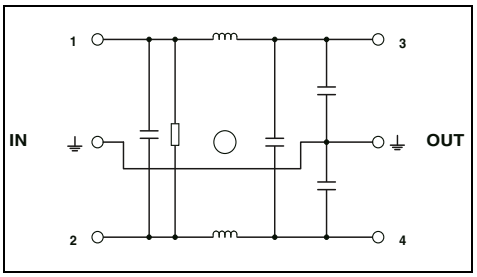
1 A / 3 A nominal current

6 A / 10 A nominal current

Total width 25 mm



Total width 40 mm



Technical data

Electrical data		NEF 1- 1	NEF 1- 3
Nominal voltage U_N		240 V AC	240 V AC
Maximum continuous operating voltage U_C	L - N	264 V AC	264 V AC
Nominal load current I_L		1 A (40°C)	3 A (40°C)
Backup fuse max. in acc. with IEC		1 A (gL)	3 A (gL)
Inductivity		2x 10 mH	2x 2.7 mH
Input attenuation a_i			
	Symmetrical	≥ 65 dB (50 Ω/ 1 MHz)	≥ 55 dB (50 Ω/ 1 MHz)
	Asymmetrical	≥ 45 dB (50 Ω/ 1 MHz)	≥ 35 dB (50 Ω/ 1 MHz)
General data			
Dimensions W / H / D		25 mm / 79.4 mm / 84.15 mm	
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Temperature range		-25 °C ... 100 °C (HMF)	
Inflammability class in acc. with UL 94		V2	
Test standards		IEC 60939-2 / DIN EN 60939-2	

Ordering data

Description	Nominal load current I_L	Type	Order No.	Pcs. / Pkt.
FILTRAB, interference filter for single-phase current circuits, for mounting on NS 32 or NS 35...				
	1 A	**NEF 1- 1**	**2794123**	10
	3 A	**NEF 1- 3**	**2794110**	10

Accessories

Labeling material
For ZB 5..., see page 111

Technical data

Electrical data		NEF 1- 6	NEF 1-10
Nominal voltage U_N		240 V AC	240 V AC
Maximum continuous operating voltage U_C	L - N	264 V AC	264 V AC
Nominal load current I_L		6 A (40°C)	10 A (40°C)
Backup fuse max. in acc. with IEC		6.3 A (gL/C)	10 A (gL)
Inductivity		2x 2.7 mH	2x 1.8 mH
Input attenuation a_i			
	Symmetrical	> 80 dB (50 Ω/ 1 MHz)	> 80 dB (50 Ω/ 1 MHz)
	Asymmetrical	> 40 dB (50 Ω/ 1 MHz)	> 40 dB (50 Ω/ 1 MHz)
General data			
Dimensions W / H / D		40 mm / 79.4 mm / 84.1 mm	
Connection data solid / stranded / AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Temperature range		-25 °C ... 100 °C (HMF)	
Inflammability class in acc. with UL 94		V2	
Test standards		IEC 60939-2 / DIN EN 60939-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
NEF 1- 6	**2783082**	5
NEF 1-10	**2788977**	5

Accessories

For ZB 5..., see page 111

CHECKMASTER – the arrester test system

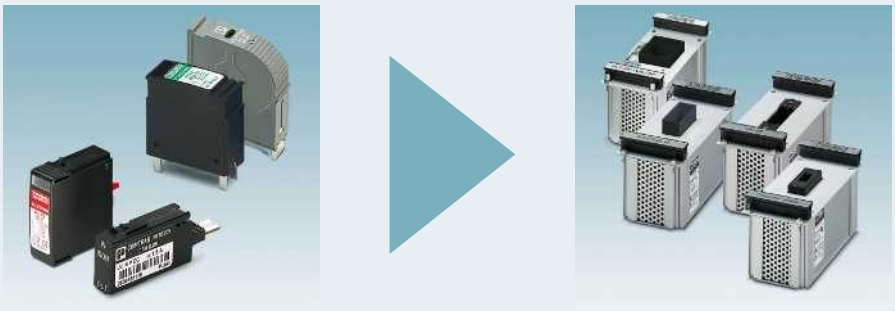
Lightning protection systems must be regularly tested in accordance with the requirements of IEC 62305-3 and official regulations. A basic visual check is not enough to identify surge protective devices that were previously damaged. Only an electrical check using the CHECKMASTER produces meaningful results. The test device checks all the relevant components of an arrester. The nominal data of protective elements, such as spark gaps, varistors, gas-filled surge arresters, and suppressor diodes, is tested in a single test cycle.

The CHECKMASTER offers real advantages for safety in all sectors where a high level of system availability is crucial.

User-friendly and reliable testing of plug-in arresters in just four steps

1. Easy selection

The CHECKMASTER has a modular design. Various test sockets are compatible with the various plugs. Further information about the test sockets required can be found on the next page.



2. User-friendly scanning

The barcodes on the surge protective devices present a fast and error-free solution for entering items. System-specific abbreviations or user-defined IDs can be entered via the operator interface or read in from the individually created barcode labels.

3. Safe testing

When started, an automatic test process is run which checks the arresters with regard to their specific electrical properties. The results are visualized via the display and via two signal lamps.

Status: OK

The protective plug is OK and can be used.

Status: Tolerance limit reached

The protective plug has been damaged – replacement is recommended.

Status: Faulty

The protective plug is faulty and must be replaced.

4. Fast logging

The tests are documented according to IEC 62305-3. In addition to the immediate processing of all test values, the CHECKMASTER also allows the contents of the internal memory to be exported directly to an Excel worksheet, for example.

CHECKMASTER

- Modular test device for virtually all plug-in surge arresters from Phoenix Contact
- Corresponding test sockets are available for the arrester connectors
- Test sockets can be easily changed
- Easy operation thanks to barcode scanner or keypad
- Optional entry of system-specific name for protective devices
- Documentation of test results

The test socket for PLUGTRAB PT is included in the scope of supply of the CHECKMASTER.

Case for transporting test sockets PA-CASE

- Six padded compartments
- Sufficient space for all connecting cables
- The test adapters are not supplied as standard with the PA-CASE.

CM-KBL-RS232/USB

- Adapter cable
- For connection of the test device to a laptop/PC

CM-KBL-PROG

- Necessary for updating CHECKMASTER firmware

Free software for updating CHECKMASTER can be found at the Download Center on Phoenix Contact's homepage.

The operation of the CHECKMASTER and that of the CM-PA sockets do not meet the general protection requirements for residential areas. Please take the appropriate precautions.

Notes:
Dimensional drawing at: www.phoenixcontact.net/products
The programming cable has a special pin assignment. It can be used only to update the CHECKMASTER software!
1) EMC: Class A product, see page 287

Arrester test device

Total width 450 mm

Technical data

Nominal voltage U_N	230 V AC (100 V AC ... 240 V AC)
Ambient temperature (operation)	5 °C ... 35 °C
Degree of protection	IP20
Interface	RS-232

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Test device, for the function test of TRABTECH protective devices, incl. CM-PA-PT for PLUGTRAB PT	**CHECKMASTER[1])**	**2838924**	1
Transport case, to accommodate 6 TRABTECH test adapters CM-PA...			
TRABTECH test adapter, for testing the function of: FLASHTRAB compact and VALVETRAB compact COMTRAB CTM COMTRAB CT 10 PLUGTRAB PT PLUGTRAB UFBK, UAK TF-TRAB VALVETRAB			
USB RS232 converter, D-SUB, 9-pos. to USB, type A, 4-pos. D-SUB adapter, 25-pos. to D-SUB, 9-pos.			
Update cable, for CHECKMASTER firmware updates			

Transport case for test sockets

Test sockets

Data cable

Ordering data

Type	Order No.	Pcs. / Pkt.
PA-CASE	2858988	1

Ordering data

Type	Order No.	Pcs. / Pkt.
CM-PA-FLT/VAL-CP[1])	2880392	1
CM-PA-CTM[1])	2816962	1
CM-PA-CT10[1])	2816959	1
CM-PA-PT[1])	2882844	1
CM-PA-PT/A[1])	2816933	1
CM-PA-TF[1])	2816975	1
CM-PA-VAL-MS[1])	2800104	1

Ordering data

Type	Order No.	Pcs. / Pkt.
CM-KBL-RS232/USB	2881078	1
CM-KBL-PROG	2881557	1

Approvals

Type	Order No.	Certification
B		
BNC-DV 50	2805038	
BNC-DV 75	2805083	
BNC-V 50	2805041	
BNC-V 75	2805070	
BT-1S-230AC/A	2803409	
BT-1S-230AC/O	2800625	
BT-SKT 230/A	2859343	
C		
CHECKMASTER	2838924	
CM-KBL-PROG	2881557	
CM-KBL-RS232/USB	2881078	
CM-PA-CT10	2816959	
CM-PA-CTM	2816962	
CM-PA-FLT/VAL-CP	2880392	
CM-PA-PT	2882844	
CM-PA-PT/A	2816933	
CM-PA-TF	2816975	
CN-LAMBDA/4-0.47-BB	2800021	
CN-LAMBDA/4-0.47-SB	2800022	
CN-LAMBDA/4-5.9-BB	2838490	
CN-LAMBDA/4-5.9-SB	2800023	
CN-UB/E	2763691	
CN-UB/E-BB	2817686	
CN-UB/MP	2818135	
CN-UB/MP-90DEG-50	2803137	
CN-UB-70DC-6-BB	2803166	
CN-UB-70DC-6-SB	2803153	
C-SAT-BOX	2880561	
CT 1-10-ES	2765547	
CT 10-18FS+F/PE-24	2807926	
CT 10-18FSR+F/PE-24	2807939	
CT 10-2/2-GS	2765398	
CT 10-2/2-GS/3E	2765408	
CT 10-2/2-GS/3E-110AC	2920829	
CT 10-2PE/FS-24	2807955	
CT 10-2PE/FSR-24	2807968	
CT 10-9VA-230AC	2830498	
CT 10-MB/ 3	2765372	
CT 10-MB/10	2765385	
CT 10-TL	2765356	
CTM 10-MAG	2838610	
CTM 1X2- 12DC	2838597	
CTM 1X2- 24DC	2838513	
CTM 1X2- 60DC	2838568	
CTM 1X2-110AC	2838539	
CTM 2X1- 12DC	2838584	
CTM 2X1- 24DC	2838500	
CTM 2X1- 5DC	2838571	
CTM 2X1- 60DC	2838542	
CTM 2X1-110AC	2838526	
CTM 2X1-180DC-GS	2838636	
CTM 2X1-180DC-GS-P	2838623	
CTM EST	2838649	
CTM ISDN	2838555	
CT-TERMIBLOCK 10 DA	0441711	
C-TV/HIFI	2857002	
C-TV-SAT	2856993	
C-UB/E	2763701	
C-UFB- 5DC	2797858	
C-UFB- 5DC/E	2782300	
C-UFB- 5DC/E 75	2763604	
C-UFB-24DC	2797861	
C-UFB-24DC/E	2782313	
D		
D-DEK 1,5 BK	2838995	
D-DEK 1,5 BU	2838982	
D-DS1-A/RJ45-BB	2838050	
DK-BIC-35	2749880	
D-LAN-19"-12	2880150	
D-LAN-19"-16	2880147	
D-LAN-19"-20	2880134	
D-LAN-19"-24	2838791	
D-LAN-19"-4	2880176	
D-LAN-19"-8	2880163	
D-LAN-19"-D-P	2880192	
D-LAN-CAT.5-FP	2800723	
DP-UKK 3/5 BK	2770833	
D-TERMITRAB-UK 5	2794990	
DT-LAN-CAT.6+	2881007	
DT-TELE-RJ45	2882925	
DT-UFB-485/BS	2920612	
DT-UFB-IB-RB0	2800056	
DT-UFB-IB-RBI	2800055	
DT-UFB-V24/S-9-SB	2803069	
DT-UFB-V24/S-SB-SET	2803072	
D-UFB-PB	2880642	
D-UKK 3/5 BK	2770228	
F		
FLT 100 N/PE-1.5	2800303	
FLT 100 N/PE-1.5	2800303	
FLT-CP-1C-350	2859741	
FLT-CP-1S-350	2859738	
FLT-CP-2C-350	2859770	
FLT-CP-2S-350	2859767	
FLT-CP-350-ST	2881887	
FLT-CP-3C-350	2859725	
FLT-CP-3S-350	2859712	
FLT-CP-N/PE-350	2859754	
FLT-CP-N/PE-350-ST	2859686	
FLT-CP-PLUS-1C-350	2882695	
FLT-CP-PLUS-1S-350	2882682	
FLT-CP-PLUS-2C-350	2882679	
FLT-CP-PLUS-2S-350	2882666	
FLT-CP-PLUS-350-ST	2859913	

Type	Order No.	Certification
FLT-CP-PLUS-3C-350	2882653	
FLT-CP-PLUS-3S-350	2882640	
FLT-PLUS CTRL-2.5	2800121	
FLT-PLUS CTRL-2.5/I	2800122	
FLT-PLUS CTRL-3.0	2800168	
FLT-PLUS CTRL-3.0/I	2800170	
F-MS 12	2817987	
F-MS 12 ST	2817990	
F-MS 12/FM	2817974	
F-MS 2200/30 ST	2805392	
F-MS 80 ST	2921307	
F-MS-T1/T2 50 ST	2800191	
K		
KBL-SAT/20	2880985	
L		
LIT 1X2-24	2804610	Ex:
LIT 2-12	2804694	Ex:
LIT 2-24	2804665	Ex:
LIT 2X1-24	2804636	
LIT 2X2-24	2804623	Ex:
LIT 4-12	2804704	Ex:
LIT 4-24	2804678	Ex:
LIT 4X1-24	2804649	
M		
ME 6,2 TBUS-2 1,5/5-ST-3,81KMGY	2969401	
MINI MCR-SL-V8-FLK 16-A	2811268	Ex:
MNT-1 CH II	2882255	
MNT-1 D	2882200	
MNT-1 D/WH	2882213	
MNT-1 E	2882239	
MNT-1 S/WH	2880862	
MNT-ISDN D	2882336	
MNT-ISDN D/WH	2882349	
MNT-ISDN S/WH	2880891	
MNT-NET B/F	2882226	
MNT-POWERLINE	2858001	
MNT-TAE D	2882381	
MNT-TAE D/WH	2882394	
MNT-TEL B/F	2882404	
MNT-TELE E	2882417	
MNT-TELE N/WH	2881764	
MNT-TELE S/WH	2880901	
MNT-TV-SAT B/F	2882307	
MNT-TV-SAT D	2882284	
MNT-TV-SAT D/WH	2882297	
MNT-TV-SAT S/WH	2880888	
N		
NEF 1- 1	2794123	
NEF 1- 3	2794110	
NEF 1- 6	2783082	
NEF 1-10	2788977	
P		
PAS-1	2765615	

Type	Order No.	Certification
PRT-CD-AD1	2749673	
PT 1X2- 5DC-ST	2856016	Ex:
PT 1X2+F-BE	2856126	Ex:
PT 1X2-12AC-ST	2856045	Ex:
PT 1X2-12DC-ST	2856029	Ex:
PT 1X2-24AC-ST	2856058	Ex:
PT 1X2-24DC-ST	2856032	Ex:
PT 1X2-48DC-ST	2803658	
PT 1X2-BE	2856113	Ex:
PT 2+1-S-48DC/FM	2817958	
PT 2+1-S-48DC-ST	2839648	
PT 2-F-ST	2859000	
PT 2-IT-230AC/FM	2805130	
PT 2-IT-230AC-ST	2805127	
PT 2-PE/S- 24AC-ST	2839318	CCA Ex:
PT 2-PE/S- 60AC-ST	2839321	CCA Ex:
PT 2-PE/S-120AC/FM	2856812	CCA Ex:
PT 2-PE/S-120AC-ST	2839334	CCA Ex:
PT 2-PE/S-230AC/FM	2858357	CCA Ex:
PT 2-PE/S-230AC-ST	2839347	CCA Ex:
PT 2-PE/S-24AC/FM	2800457	
PT 2-TELE	2882828	
PT 2-TELE-ST	2838733	
PT 2X1- 5DC-ST	2856061	Ex:
PT 2X1+F-BE	2856142	Ex:
PT 2X1-12AC-ST	2856090	Ex:
PT 2X1-12DC-ST	2856074	Ex:
PT 2X1-24AC-ST	2856100	Ex:
PT 2X1-24DC-ST	2856087	Ex:
PT 2X1-BE	2856139	Ex:
PT 2X1VA- 60AC-ST	2839172	
PT 2X1VA-120AC-ST	2839185	
PT 2X1VA-230AC-ST	2839198	
PT 2X1-VF-120AC	2859327	
PT 2X1-VF-120AC-ST	2856799	
PT 2X1-VF-230AC	2805460	
PT 2X1-VF-230AC-ST	2921365	
PT 2X2- 5DC-ST	2838241	Ex:
PT 2X2+F-BE	2839224	Ex:
PT 2X2-12AC-ST	2838270	Ex:
PT 2X2-12DC-ST	2838254	Ex:
PT 2X2-24AC-ST	2838283	Ex:
PT 2X2-24DC-ST	2838228	Ex:
PT 2X2-BE	2839208	Ex:
PT 2X2-HF- 5 DC-ST	2839567	Ex:
PT 2X2-HF-12 DC-ST	2839570	Ex:
PT 2X2-HF-24 DC-ST	2839729	Ex:
PT 2XEX(I)-24DC-ST	2838225	Ex:
PT 2XEX(I)-BE	2839279	Ex:
PT 3-HF-12DC-ST	2858043	
PT 3-PB-ST	2858030	
PT 4- 5DC-ST	2839211	Ex:
PT 4+F-BE	2839415	Ex:
PT 4-12DC-ST	2839237	Ex:

Approvals

Type	Order No.	Certification
PT 4-12DC-ST	2839237	Ex:
PT 4-24DC-ST	2839240	Ex:
PT 4-BE	2839402	Ex:
PT 4-EX(I)-24DC-ST	2839253	Ex:
PT 4-EX(I)-BE	2839486	Ex:
PT 4-F-ST	2858441	
PT 4-PE/S-230AC/FM	2882459	
PT 4-PE/S-230AC-ST	2882462	
PT 4X1- 5DC-ST	2838306	Ex:
PT 4X1+F-BE	2839376	Ex:
PT 4X1-12AC-ST	2838348	Ex:
PT 4X1-12DC-ST	2838319	Ex:
PT 4X1-24AC-ST	2838351	Ex:
PT 4X1-24DC-ST	2838322	Ex:
PT 4X1-48AC-ST	2804856	
PT 4X1-48DC-ST	2858014	
PT 4X1-BE	2839363	Ex:
PT 5-HF- 5 DC-ST	2838762	Ex:
PT 5-HF-12 DC-ST	2838775	Ex:
PT MAIN-EST	2880736	
PT MCR-EST	2880749	
PT PE/S+1X2-24-ST	2819008	
PT PE/S+1X2-BE	2856265	
PT-BE/FM	2839282	CCA Ex:
S		
SFP 1-10/120AC	2920670	
SFP 1-15/120AC	2920683	
SFP 1-20/120AC	2856702	
SFP 1-20/230AC	2859987	
SFP 1-5/120AC	2920667	
S-PT-1X2-24DC	2880668	
S-PT-1X2-24DC-1/2"	2882569	
S-PT-1X2-24DC-3/4"	2882598	
S-PT-2XEX-24DC	2800040	Ex:
S-PT-2XEX-48DC	2800038	Ex:
S-PT-4-EX-24DC	2800036	Ex:
S-PT-EX(I)-24DC	2880671	Ex:
S-PT-EX(I)-24DC-1/2"	2882572	Ex:
S-PT-EX(I)-24DC-3/4"	2882585	Ex:
S-PT-EX-24DC	2800034	Ex:
S-PT-EX-48DC	2800053	Ex:
SVP 2E- 48AC	2788919	
SVP 2E-110AC	2765534	
SVP 3E-110AC	2765521	
SYS N4 120/208Y	2800704	
SYS N4 120/240HLD	2800706	
SYS N4 120/240S	2800705	
SYS N4 277/480Y	2800703	
SYS N4 480D	2800707	
SYS N4X 120/240HLD	2800716	
SYS N4X 120/240S	2800715	
SYS N4X 277/480Y	2800713	

Type	Order No.	Certification
T		
TAE-TRAB FM-NFN-AP	2749628	
TT-2/2- 24DC	2838173	Ex:
TT-2/2-M-24DC	2920722	
TT-2-PE- 24DC	2838186	Ex:
TT-2-PE/S1- 24DC	2839538	
TT-2-PE/S1-M-24DC	2920638	
TT-2-PE-110AC	2858483	
TT-2-PE-M-24DC	2920641	
TT-D-2-PE-M-BK	2920654	
TT-D-2-PE-M-BU	2803878	
TT-D-ST-BU	2856773	
TT-D-STTCO-BK	2858894	
TT-EX(I)- 24DC	2832124	Ex:
TT-EX(I)-M-24DC	2803865	Ex:
TT-SLKK5/ 12DC	2794893	
TT-SLKK5/ 24DC	2794903	
TT-SLKK5/ 48DC	2794916	
TT-SLKK5-F/110AC	2765602	
TT-SLKK5-S- 12DC	2809597	
TT-SLKK5-S- 24DC	2809607	
TT-SLKK5-S- 48DC	2809610	
TT-ST-2/2-24DC	2858881	
TT-ST-2-PE-24DC	2858878	
TT-ST-M-2/2-24AC	2858933	
TT-ST-M-2/2-24DC	2858917	
TT-ST-M-2-PE-24AC	2858920	
TT-ST-M-2-PE-24DC	2858904	
TT-ST-M-EX(I)-24DC	2859424	Ex:
TT-ST-M-SFP-24AC	2858946	
TT-UK5/ 12DC	2794686	
TT-UK5/ 24DC	2794699	
TT-UK5/ 48DC	2794709	
TT-UKK5-M/ 24DC	2795960	
TT-UKK5-M/ 48DC	2795973	
TT-UKK5-M/ 60DC	2795986	
V		
VAL-CP-175-ST	2859628	
VAL-CP-1S-175	2859479	
VAL-CP-1S-350	2859563	
VAL-CP-1S-350/O	2881036	
VAL-CP-2C-175	2859482	
VAL-CP-2C-350	2859589	
VAL-CP-2C-350/O	2881052	
VAL-CP-2S-175	2859495	
VAL-CP-2S-350	2859505	
VAL-CP-2S-350/O	2881049	
VAL-CP-350-ST	2859602	
VAL-CP-350-ST-GY	2882718	
VAL-CP-3C-175	2859466	
VAL-CP-3C-350	2859547	
VAL-CP-3C-350/O	2881023	
VAL-CP-3S-175	2859453	

Type	Order No.	Certification
VAL-CP-3S-350	2859521	
VAL-CP-3S-350/O	2881010	
VAL-CP-MCB-1S-350/40/FM	2882763	
VAL-CP-MCB-3C-350/40/FM	2882776	
VAL-CP-MCB-3S-350/40/FM	2882750	
VAL-CP-MOSO 60-3C-FM	2804416	
VAL-CP-MOSO 60-3S-FM	2804403	
VAL-CP-N/PE-350-ST	2859699	
VAL-CP-N/PE-350-ST-GY	2882734	
VAL-CP-RCD-3S/40/0.03	2882802	
VAL-CP-RCD-3S/40/0.3/SEL	2808001	
VAL-MS 60 ST	2807573	
VAL-MS 1000PV ST	2805185	
VAL-MS 120 ST	2807586	
VAL-MS 230	2839127	
VAL-MS 230 IT ST	2807599	
VAL-MS 230 ST	2798844	
VAL-MS 230/1+1	2804429	
VAL-MS 230/1+1-FM	2804432	
VAL-MS 230/2+0	2800103	
VAL-MS 230/2+0-FM	2800102	
VAL-MS 230/3+1	2838209	
VAL-MS 230/3+1 FM	2838199	
VAL-MS 230/FM	2839130	
VAL-MS 320 ST	2838843	
VAL-MS 320/1+1	2804380	
VAL-MS 320/1+1-FM	2804393	
VAL-MS 320/3+0	2920230	
VAL-MS 320/3+0-FM	2920243	
VAL-MS 320/3+1	2859178	
VAL-MS 320/3+1/FM	2859181	
VAL-MS 320/3+1/FM-UD	2856689	
VAL-MS 320-UD ST	2858315	
VAL-MS 350 VF ST	2856595	
VAL-MS 350 VF/FM	2856579	
VAL-MS 350VF	2856582	
VAL-MS 385/65 ST	2920308	
VAL-MS 385/65/1+1	2921255	
VAL-MS 385/65/1+1-FM	2921242	
VAL-MS 385/65/3+0	2921019	
VAL-MS 385/65/3+0-FM	2921006	
VAL-MS 385/65/3+1	2920890	
VAL-MS 385/65/3+1-FM	2920887	
VAL-MS 385/80 ST	2920353	
VAL-MS 385/80/1+1	2921297	
VAL-MS 385/80/1+1-FM	2921284	
VAL-MS 385/80/3+0	2921093	
VAL-MS 385/80/3+0-FM	2921080	
VAL-MS 385/80/3+1	2920971	
VAL-MS 385/80/3+1-FM	2920968	
VAL-MS 400 ST	2816399	
VAL-MS 500 ST	2807609	
VAL-MS 580/3+0	2920450	
VAL-MS 580/3+0-FM	2920447	
VAL-MS 580-ST	2920434	
VAL-MS 60	2868020	
VAL-MS 60/FM	2868033	
VAL-MS 75 VF ST	2805318	
VAL-MS 750/30/3+0	2920269	
VAL-MS 750/30/3+0-FM	2920272	
VAL-MS 750/30-ST	2920256	
VAL-MS 800/30 VF/FM	2805402	
VAL-MS BE	2817741	
VAL-MS BE/FM	2817738	
VAL-MS/2+0-BE	2804584	
VAL-MS/2+0-BE/FM	2805321	
VAL-MS/3+0-BE	2881816	
VAL-MS/3+0-BE/FM	2881803	
VAL-MS-T1/T2 175/12.5 ST	2800676	
VAL-MS-T1/T2 175/12.5/1+1	2800675	
VAL-MS-T1/T2 175/12.5/1+1-FM	2800674	
VAL-MS-T1/T2 175/12.5/3+0	2800673	
VAL-MS-T1/T2 175/12.5/3+0-FM	2800672	
VAL-MS-T1/T2 175/12.5/3+1	2800671	
VAL-MS-T1/T2 175/12.5/3+1-FM	2800670	
VAL-MS-T1/T2 335/12.5 ST	2800190	
VAL-MS-T1/T2 335/12.5/1+1	2800187	
VAL-MS-T1/T2 335/12.5/1+1-FM	2800186	
VAL-MS-T1/T2 335/12.5/3+0	2800189	
VAL-MS-T1/T2 335/12.5/3+0-FM	2800188	
VAL-MS-T1/T2 335/12.5/3+1	2800184	
VAL-MS-T1/T2 335/12.5/3+1-FM	2800183	
VAL-MS-T1/T2 335/12.5/4+0	2800645	
VAL-MS-T1/T2 335/12.5/4+0-FM	2800644	
VAL-US 120 ST	2800739	
VAL-US 240 ST	2800740	
VAL-US 277 ST	2800741	
VAL-US 347 ST	2800742	
VAL-US 480 ST	2800743	
VAL-US 60 ST	2800738	
W		
WT-RJ 12-S/FM A/K AP	2809186	
WT-RJ 45-S/ISDN1/K AP	2809830	


Output DC 24 V 10 A
13 14
Boost
DC OK
18-29.5 V
QUINT POWER
Input AC 100-240 V
L N
QUINT DC-UPS
Battery
Data
Stick
Stick
UPS
UPS
Press > 2 sec.
DC
24V
10A
Battery
Input
Output
UPS BATTERY 1.3Ah
Battery
T 15A
32V

Power supply units and UPS

For maximum system availability

Power supply units

Thanks to high-quality products featuring leading technology, our QUINT, TRIO, MINI, UNO, and STEP POWER product ranges optimally equip you for international competition.

DC/DC converter

Change the voltage level, regenerate the voltage at the end of long cables or enable the creation of independent supply systems with the QUINT and MINI DC/DC converters.

Redundancy modules

A redundant power supply system is the result of the parallel connection of two power supply units. Optimize this solution with the QUINT ORING redundancy modules and the QUINT, TRIO, and STEP diodes for maximum system availability.

Uninterruptible power supply (UPS) units for control cabinets

IQ technology is the key to an intelligent power supply solution. The UPS monitors and optimizes the power storage device. Avoid interruptions when working with the intelligent UPS for non-stop power.

Uninterruptible power supply (UPS) for 19" racks/towers

Protect all connected loads against any faults on the mains side with the single-phase VFI-SS-111 UPS devices.

Power supply units and UPS

QUINT POWER 1~

24 DC / 3.5 A
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24 DC / 10 A
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12 DC / 15 A
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48 DC / 5 A
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24 DC / 40 A
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48 DC / 20 A
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QUINT POWER 3~

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Page 168

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Page 168

24 DC / 20 A
Page 168

24 DC / 40 A
Page 168

48 DC / 20 A
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TRIO POWER 1~

24 DC / 2.5 A
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Page 178

24 DC / 5 A
Page 174

12 DC / 10 A
Page 178

24 DC / 10 A
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48 DC / 5 A
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24 DC / 20 A
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48 DC / 10 A
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TRIO POWER 3~

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24 DC / 10 A
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24 DC / 20 A
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24 DC / 40 A
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MINI POWER 1~

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5 DC / 3 A
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24 DC / 1.5 A
Page 180

24 DC / 2 A
Page 180

10 - 15 DC / 2 A
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±15 DC / 1 A
Page 182

24 DC / 4 A
Page 180

24 DC / 100 W
Page 180

10 - 15 DC / 8 A
Page 182

1 AC / 24 DC / 1.5 A EX
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UNO POWER 1~

24 DC / 30 W
Page 184
12 DC / 30 W
Page 184

24 DC / 60 W
Page 184
12 DC / 55 W
Page 184

24 DC / 100 W
Page 184

STEP POWER 1~

24 DC / 0.5 A
Page 186
48 AC / 24 DC / 0.5 A
Page 186
12 DC / 1 A
Page 192
5 DC / 2 A
Page 190

24 DC / 0.75 A / FL
Page 186
12 DC / 1.5 A / FL
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24 DC / 0.75 A
Page 186
12 DC / 1.5 A
Page 192

24 DC / 1.75 A
Page 188
12 DC / 3 A
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24 DC / 2.5 A
Page 188
5 DC / 6.5 A
Page 190
12 DC / 5 A
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15 DC / 4 A
Page 190

24 DC / 4.2 A
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24 DC / 100 W
Page 2868667
48 DC / 2 A
Page 190

QUINT POWER, dip-coated 1~, 3~ power supply units

1 AC / 24 DC / 5 A CO
Page 194

1 AC / 24 DC / 10 A CO
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1 AC / 24 DC / 20 A CO
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3 AC / 24 DC / 20 A CO
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QUINT DC/DC converters

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Page 200

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Page 200

QUINT DC/DC converters

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24 DC / 12 DC / 8 A
Page 198
48 DC / 24 DC / 5 A
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12 DC / 24 DC / 5 A
Page 200

24 DC / 24 DC / 10 A
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24 DC / 48 DC / 5 A
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24 DC / 24 DC / 20 A
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MINI DC/DC converters

12 - 24 DC/24 DC/1 A
Page 202
48 - 60 DC/24 DC/1 A
Page 202
12 - 24 DC/5 - 15 DC/2 A
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AC power module
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TRIO POWER 600 V

600 DC / 24 DC / 20 A
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Redundancy modules - QUINT

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24 DC / 2x20 A
Page 206

24 DC / 2x40
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Page 210
48 DC / 2x20 A
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- TRIO

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48 DC / 2x10 A
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- STEP

5 - 24 DC / 2x5 A
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Selection guide

QUINT DC-UPS

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24 DC / 10 A
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24 DC / 20 A
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24 DC / 40 A
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12 DC / 5 / 24 DC / 10
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QUINT AC-UPS

1 AC / 1 AC / 500 VA
Page 221

UPS-CAP

24 DC / 10 A / 10 KJ
Page 222

24 DC / 20 A / 20 KJ
Page 222

UPS-BAT/LI-ION

24 DC / 120 WH
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UPS-BAT/VRLA-WTR

24 DC / 13 AH
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24 DC / 26 AH
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UPS-BAT/VRLA

24DC / 1.3AH
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24DC / 3.4AH
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24 DC / 7.2 AH
Page 224

24 DC / 12 AH
Page 224

24 DC / 38 AH
Page 224

UPS with integrated QUINT, STEP power storage

24DC / 5 / 1.3AH
Page 230

24DC /10 / 3.4AH AH
Page 230

24 DC / 3
Page 232

12 DC / 4
Page 232

QUINT-BUFFER

24 DC / 40
Page 231

UPS with integrated power supply unit

1AC / 24 DC / 2
Page 235

1AC / 12 DC / 4
Page 235

1 AC / 24 DC / 5
Page 234

Power storage for TRIO UPS

24 DC / 1.3 AH
Page 236

24 DC / 3.4 AH
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24 DC / 7.2 AH
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24 DC / 12 AH
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- MINI UPS

24 DC / 1.3 AH
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12 DC / 2.6 AH
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24 DC / 0.8 AH
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12 DC / 1.6 AH
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USV-CP

1 kVA / 240 AC
Page 244

2 kVA / 240 AC
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3 kVA / 240 AC
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4.5 kVA / 240 AC
Page 244

6 kVA / 240 AC
Page 244

Power storage for USV-CP

1 kVA / 19 minutes
Page 246
For UPS-CP-1KVA

1 kVA / 36 minutes
Page 246
For UPS-CP-1KVA

2/3 kVA / 8 minutes
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For UPS-CP-2KVA

2/3 kVA / 5 minutes
Page 246
For UPS-CP-3KVA

2/3 kVA / 19 minutes
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For UPS-CP-2KVA

2/3 kVA / 12 minutes
Page 246
For UPS-CP-3KVA

4.5/6 kVA / 10 minutes
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For UPS-CP-4.5KVA

2/3 kVA / 8 minutes
Page 246
For UPS-CP-6KVA

Leading technology and high quality - power supply units ensure your system is always reliably supplied with power.

Thanks to high-quality products featuring leading technology, with our power supply solutions from the QUINT, TRIO, MINI, and STEP product ranges, you are optimally equipped to handle competitors on an international scale.

Functionality, performance class, and design are tailored to the demands of various different sectors and always offer the ideal solution. Choose from our wide range of power supply units and DC/DC converters.

QUINT POWER for maximum system availability

Cost-effective selective fuse protection with SFB technology:

In order to trip standard circuit breakers magnetically and quickly, power supply units must be able to supply several times the nominal current for a short period. With SFB (Selective Fuse Breaking) technology, which supplies up to 6 times the nominal current for 12 ms, a dynamic power reserve is available. Faulty current paths are selectively switched off, the fault is isolated, and important system components remain operational.

Preventive function monitoring:

Comprehensive diagnostics are provided through constant monitoring of the output voltage and output current. This preventive function monitoring visualizes critical operating states, before errors can occur. The remote monitoring takes place by means of active switching outputs and floating relay contacts.

POWER BOOST power reserve:

The static power reserve offers up to 1.5 times the nominal current permanently. At ambient temperatures of up to +40°C the POWER BOOST is continuously available and at higher temperatures, it is available for a few minutes. This ensures that both high inrush currents of capacitive loads, as well as loads with DC/DC converters in the primary circuit, can be reliably supplied.

Power supply units - a comparison of the advantages

Choose the range of power supply units that best suits your requirements based on ① functionality and ② power.

QUINT POWER – power supply units for maximum system availability

The unique SFB technology and preventive function monitoring maximize the availability of your application.

– Quick tripping of the standard power circuit breakers
– Preventive function monitoring
– Reliable starting of heavy loads

TRIO POWER - basic functionality at the highest level

Basic functionality combined with high quality and reliability - this makes the power supply units ideal for use in standard machine production.

– Robust design
– Minimize installation costs
– High operational reliability

UNO POWER - compact basic functionality

The UNO POWER power supply units offer extremely compact basic functionality.

– Save energy thanks to high efficiency and low idling losses
– Wide-range input
– Wide temperature range

MINI POWER - for measurement and control technology

The MINI POWER comes into its own in fields where modular electronics housing has become the standard.

– Service-friendly connection technology: encoded COMBICON plug-in connectors
– Active function monitoring with switching output for remote monitoring of the output voltage

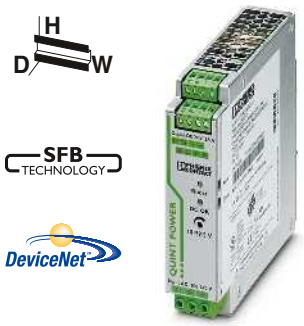
STEP POWER - for installation distributors and flat control panels

The low idling losses and high efficiency make the STEP POWER the most energy efficient in its class.

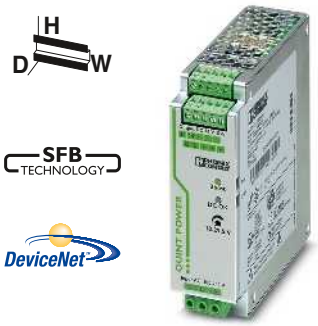
– Flexible: snap onto the DIN rail or screw onto a level surface
– Energy savings: maximum energy efficiency and incredibly low idling losses

QUINT POWER power supply units – for maximum system availability

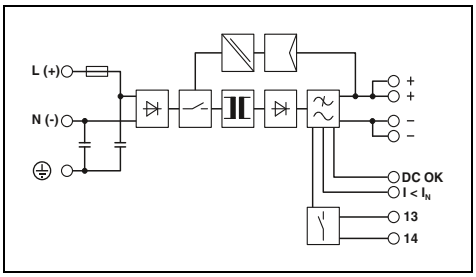
- Quick tripping of standard circuit breakers thanks to the dynamic power reserve SFB (selective fuse breaking) technology with up to 6x the nominal current for 12 ms
- Reliable starting of heavy loads with the static POWER BOOST power reserve with permanently up to 1.5 times the nominal current
- Preventive function monitoring warns against critical operating states before errors occur
- Approved according to SEMI F47: all 24 V DC

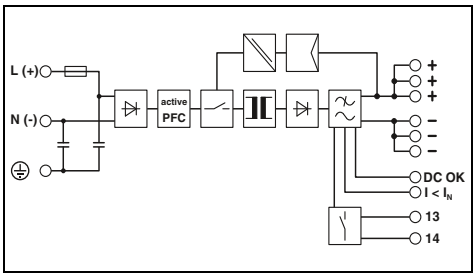


Power supply, 1 AC, 24 V DC, 3.5 A



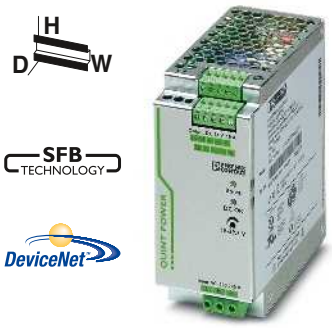
Power supply, 1 AC, 24 V DC, 5 A





	Technical data	Technical data
Input data		
Nominal input voltage range	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 90 V DC ... 350 V DC	85 V AC ... 264 V AC / 90 V DC ... 350 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	1.4 A (120 V AC) / 0.8 A (230 V AC)	1.2 A (120 V AC) / 0.6 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 20 A / < 2 A^2s	< 15 A / < 1 A^2s
Mains buffering (I_N, typ.)	> 20 ms (120 V AC) / > 80 ms (230 V AC)	> 30 ms (120 V AC) / > 30 ms (230 V AC)
Output data		
Nominal output voltage	24 V DC ±1%	24 V DC ±1%
Setting range of the output voltage	18 V DC ... 29.5 V DC (> 24 V constant capacity)	18 V DC ... 29.5 V DC (> 24 V constant capacity)
Output current / POWER BOOST / SFB (12 ms)	3.5 A / 4 A / 15 A	5 A / 7.5 A / 30 A
Magnetic fuse tripping	B2	B2 , B4 , C2
Can be connected in parallel / series	Yes / Yes	Yes / Yes
Max. power dissipation (no load / nominal load)	3.5 W / 11 W	3 W / 15 W
Efficiency (typ.)	> 88 % (for 230 V AC and nominal values)	> 90 % (for 230 V AC and nominal values)
Residual ripple	< 50 mV_{PP}	< 40 mV_{PP}
Signaling		
Signaling DC OK	LED, active switching output, relay contact	LED, active switching output, relay contact
Boost signaling	LED, active switching output	LED, active switching output
General data		
Weight / Dimensions W x H x D	0.5 kg / 32 x 130 x 125 mm	0.7 kg / 40 x 130 x 125 mm
Spacing when mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Plug-in screw connection	Plug-in screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12
Degree of protection / Protection class	IP20 / I	IP20 / I
MTBF (EN 29500, 40°C)	> 820000 h	> 635000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)
Standards/regulations		
Insulation voltage input/output	2 kV AC (routine test) / 4 kV AC (type test)	2 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010	DIN VDE 0100-410 , DIN VDE 0106-1010
Medical standard	IEC 60601	IEC 60601
UL approvals	UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
Limitation of harmonic line currents	EN 61000-3-2	EN 61000-3-2

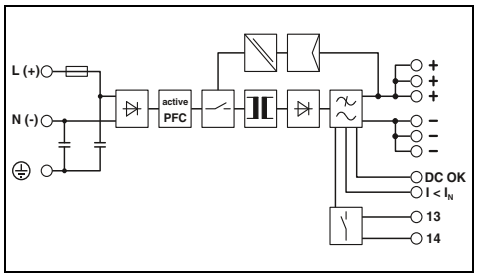
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**QUINT-PS/ 1AC/24DC/ 3.5**	**2866747**	1	**QUINT-PS/ 1AC/24DC/ 5**	**2866750**	1

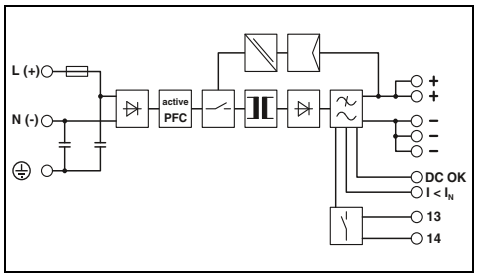


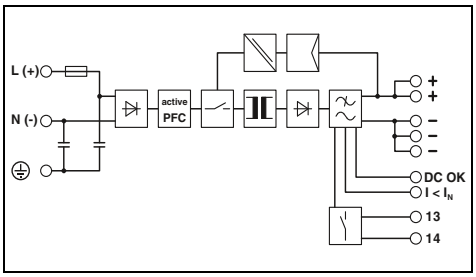
Power supply,
1 AC, 24 V DC, 10 A

Power supply,
1 AC, 24 V DC, 20 A

Power supply,
1 AC, 24 V DC, 40 A







Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC / 90 V DC ... 350 V DC 45 Hz ... 65 Hz / 0 Hz 2.24 A (120 V AC) / 1.33 A (230 V AC) < 15 A / < 1.5 A^2s > 32 ms (120 V AC) / > 36 ms (230 V AC)	
24 V DC ±1% 18 V DC ... 29.5 V DC (> 24 V constant capacity)	
10 A / 15 A / 60 A B2 , B4 , B6 , C2 , C4	
Yes / Yes 9.1 W / 22 W > 92.5 % (for 230 V AC and nominal values) < 50 mV_{PP}	
LED, active switching output, relay contact LED, active switching output	
1.1 kg / 60 x 130 x 125 mm Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically Plug-in screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12 IP20 / I > 535000 h -25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)	
2 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 IEC 60601 UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 1AC/24DC/10	**2866763**	1

100 V AC ... 240 V AC 85 V AC ... 264 V AC / 90 V DC ... 350 V DC 45 Hz ... 65 Hz / 0 Hz 5.1 A (120 V AC) / 2.3 A (230 V AC) < 20 A / < 3.2 A^2s > 20 ms (120 V AC) / > 20 ms (230 V AC)	
24 V DC ±1% 18 V DC ... 29.5 V DC (> 24 V constant capacity)	
20 A / 26 A / 120 A B2 , B4 , B6 , B10 , B16 , C2 , C4 , C6	
Yes / Yes 8 W / 40 W > 93 % (for 230 V AC and nominal values) < 30 mV_{PP}	
LED, active switching output, relay contact LED, active switching output	
1.7 kg / 90 x 130 x 125 mm Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically Screw connection 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 12 - 10 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10 IP20 / I > 520000 h -25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)	
2 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 IEC 60601 UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 1AC/24DC/20	**2866776**	1

100 V AC ... 240 V AC 85 V AC ... 264 V AC / 90 V DC ... 300 V DC 45 Hz ... 65 Hz / 0 Hz 8.8 A (120 V AC) / 4.6 A (230 V AC) < 15 A / < 1.7 A^2s > 20 ms (120 V AC) / > 20 ms (230 V AC)	
24 V DC ±1% 18 V DC ... 29.5 V DC (> 24 V constant capacity)	
40 A / 45 A / 215 A B2 , B4 , B6 , B10 , B16 , B25 , C2 , C4 , C6 , C13	
Yes / Yes 14 W / 80 W > 92 % (for 230 V AC and nominal values) < 30 mV_{PP}	
LED, active switching output, relay contact LED, active switching output	
3.3 kg / 180 x 130 x 125 mm Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically Screw connection 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 14 - 10 0.5 - 16 mm^2 / 0.5 - 16 mm^2 / 8 - 6 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 24 - 10 IP20 / I > 530000 h -25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)	
2 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-101 - UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2	

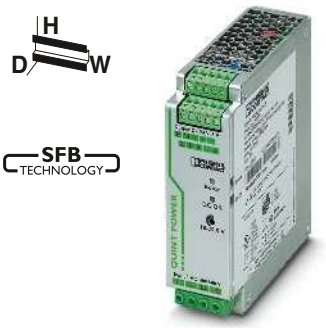
Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 1AC/24DC/40	**2866789**	1

QUINT POWER power supply units – for maximum system availability

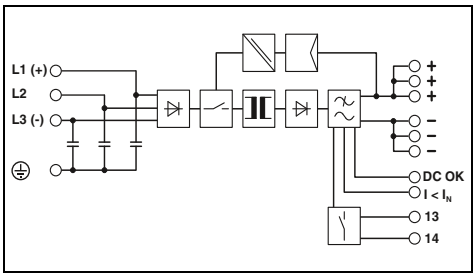
QUINT POWER, 3 AC, 24 V DC

– High system availability even in the event of a permanent phase failure
– High surge strength of up to 6 kV thanks to integrated gas-filled arresters
– Quick tripping of standard circuit breakers thanks to the dynamic power reserve SFB (selective fuse breaking) technology with up to 6x the nominal current for 12 ms
– Reliable starting of heavy loads with the static POWER BOOST power reserve with permanently up to 1.5 times the nominal current
– Preventive function monitoring warns against critical operating states before errors occur
– Approved according to SEMI F47: all 24 V DC



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

Ex:

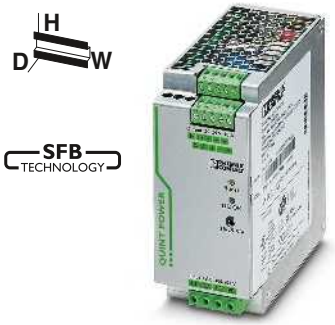


Technical data

Input data	
Nominal input voltage range	3x 400 V AC ... 500 V AC
Input voltage range AC/DC	320 V AC ... 575 V AC / 450 V DC ... 800 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	3x 0.8 A (400 V AC) / 3x 0.7 A (500 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / < 1 A^2s
Mains buffering (I_N, typ.)	> 20 ms (400 V AC) / > 30 ms (500 V AC)
Output data	
Nominal output voltage	24 V DC ±1%
Setting range of the output voltage	18 V DC ... 29.5 V DC (> 24 V constant capacity)
Output current / POWER BOOST / SFB (12 ms)	5 A / 7.5 A / 30 A
Magnetic fuse tripping	B2 , B4 , C2
Can be connected in parallel / series	Yes / Yes
Max. power dissipation (no load / nominal load)	4 W / 14 W
Efficiency (typ.)	> 89 % (at 400 V AC and nominal values)
Residual ripple	< 20 mV_{PP}
Signaling	
Signaling DC OK	LED, active switching output, relay contact
Boost signaling	LED, active switching output
General data	
Weight / Dimensions W x H x D	0.7 kg / 40 x 130 x 125 mm
Spacing when mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Plug-in screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12
Degree of protection / Protection class	IP20 / I
MTBF (EN 29500, 40°C)	> 635000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)
Standards/regulations	
Insulation voltage input/output	2 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL Listed UL 508 , UL/C-UL Recognized UL 60950 (3-wire + PE, star net) , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
Limitation of harmonic line currents	EN 61000-3-2

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**QUINT-PS/ 3AC/24DC/ 5**	**2866734**	1

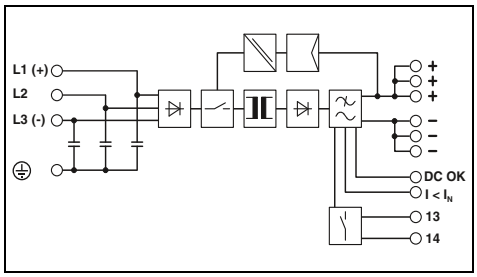


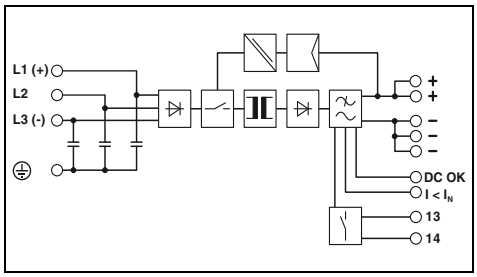
**Power supply,
3 AC, 24 V DC, 10 A**

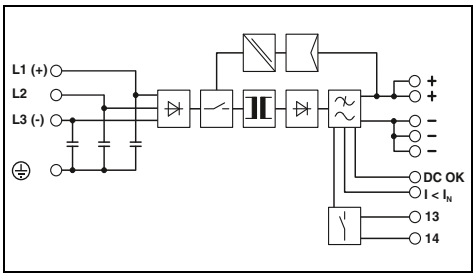
**Power supply,
3 AC, 24 V DC, 20 A**

**Power supply,
3 AC, 24 V DC, 40 A**

Ex:







Technical data

Input	3x 400 V AC ... 500 V AC 320 V AC ... 575 V AC / 450 V DC ... 800 V DC 45 Hz ... 65 Hz / 0 Hz 3x 1.2 A (400 V AC) / 3x 1 A (500 V AC) < 15 A / < 1.5 A^2s > 20 ms (400 V AC) / > 30 ms (500 V AC)
Output	24 V DC ±1% 18 V DC ... 29.5 V DC (> 24 V constant capacity) 10 A / 15 A / 60 A B2 , B4 , B6 , C2 , C4 Yes / Yes 7 W / 19 W > 93 % (at 400 V AC and nominal values) < 20 mV_{PP}
Interface	LED, active switching output, relay contact LED, active switching output
General data	1.1 kg / 60 x 130 x 125 mm Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically Plug-in screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12 IP20 / I > 633000 h -25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)
Standards	2 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL Listed UL 508 , UL/C-UL Recognized UL 60950 (3-wire + PE, star net) , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 3AC/24DC/10	**2866705**	1

Technical data

Input	3x 400 V AC ... 500 V AC 320 V AC ... 575 V AC / 450 V DC ... 800 V DC 45 Hz ... 65 Hz / 0 Hz 3x 1.6 A (400 V AC) / 3x 1.3 A (500 V AC) < 20 A / < 3.2 A^2s > 20 ms (400 V AC) / > 30 ms (500 V AC)
Output	24 V DC ±1% 18 V DC ... 29.5 V DC (> 24 V constant capacity) 20 A / 26 A / 120 A B2 , B4 , B6 , B10 , B16 , C2 , C4 , C6 Yes / Yes 11 W / 40 W > 93 % (at 400 V AC and nominal values) < 40 mV_{PP}
Interface	LED, active switching output, relay contact LED, active switching output
General data	1.5 kg / 69 x 130 x 125 mm Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically Screw connection 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 12 - 10 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10 IP20 / I > 534000 h -25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)
Standards	2 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL Listed UL 508 , UL/C-UL Recognized UL 60950 (3-wire + PE, star net) , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 3AC/24DC/20	**2866792**	1

Technical data

Input	3x 400 V AC ... 500 V AC 320 V AC ... 575 V AC / 450 V DC ... 800 V DC 45 Hz ... 65 Hz / 0 Hz 3x 2.1 A (400 V AC) / 3x 1.7 A (500 V AC) < 20 A / < 1 A^2s > 25 ms (400 V AC) / > 35 ms (500 V AC)
Output	24 V DC ±1% 18 V DC ... 29.5 V DC (> 24 V constant capacity) 40 A / 45 A / 215 A B2 , B4 , B6 , B10 , B16 , B25 , C2 , C4 , C6 , C13 Yes / Yes 18 W / 63 W > 94 % (at 400 V AC and nominal values) < 40 mV_{PP}
Interface	LED, active switching output, relay contact LED, active switching output
General data	2.5 kg / 96 x 130 x 176 mm Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically Screw connection 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10 0.5 - 16 mm^2 / 0.5 - 16 mm^2 / 8 - 6 0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10 IP20 / I > 501000 h -25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)
Standards	2 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-101 UL Listed UL 508 , UL/C-UL Recognized UL 60950 (3-wire + PE, star net) , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2

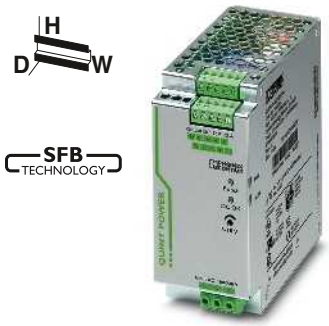
Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 3AC/24DC/40	**2866802**	1

QUINT POWER power supply units – for maximum system availability

QUINT POWER, 1 AC, 12 and 48 V DC

- Quick tripping of the standard power circuit breakers
- Reliable starting of heavy loads
- Preventive function monitoring
- Approved according to SEMI F47: 12 V DC, 15 A A and 20 A, 48 V DC, 5 A and 10 A
- Adjustable output voltage of 5 to 18 V DC, or 30 to 56 V DC



Power supply, 1 AC, 12 V DC, 15 A

Power supply, 1 AC, 12 V DC, 20 A

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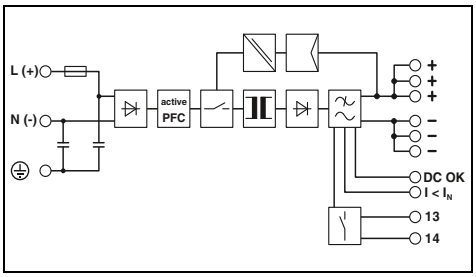

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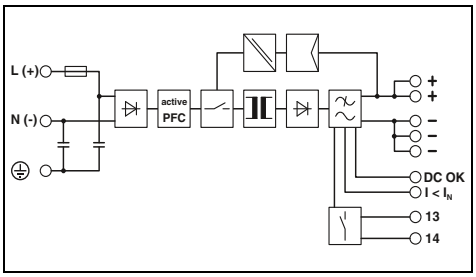
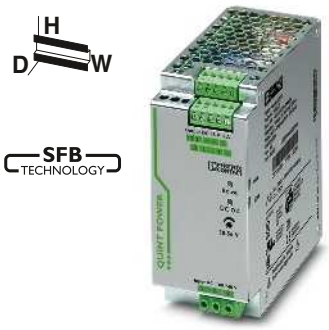


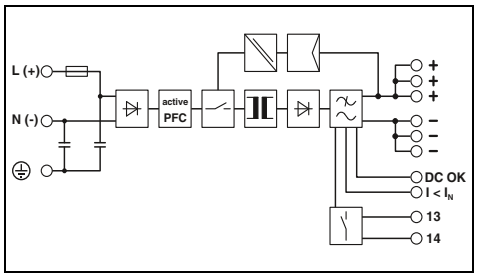
	Technical data	Technical data
Input data		
Nominal input voltage range	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 90 V DC ... 350 V DC	85 V AC ... 264 V AC / 90 V DC ... 350 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	1.9 A (120 V AC) / 0.9 A (230 V AC)	2.4 A (120 V AC) / 1.4 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / < 1.5 A^2s	< 20 A / < 3.2 A^2s
Mains buffering (I_N, typ.)	> 65 ms (120 V AC) / > 65 ms (230 V AC)	> 40 ms (120 V AC) / > 40 ms (230 V AC)
Output data		
Nominal output voltage	12 V DC ±1%	12 V DC ±1%
Setting range of the output voltage	5 V DC ... 18 V DC (> 12 V constant capacity)	5 V DC ... 18 V DC (> 12 V constant capacity)
Output current / POWER BOOST / SFB (12 ms)	15 A / 16 A / 60 A	20 A / 26 A / 120 A
Magnetic fuse tripping	B2 , B4 , B6 , C2 , C4	B2 , B4 , B6 , B10 , C2 , C4 , C6
Can be connected in parallel / series	Yes / Yes	Yes / Yes
Max. power dissipation (no load / nominal load)	5 W / 21 W	6 W / 29 W
Efficiency (typ.)	> 89 % (for 230 V AC and nominal values)	> 90 % (for 230 V AC and nominal values)
Residual ripple	< 10 mV_{PP}	< 50 mV_{PP}
Signaling		
Signaling DC OK	LED, active switching output, relay contact	LED, active switching output, relay contact
Boost signaling	LED, active switching output	LED, active switching output
General data		
Weight / Dimensions W x H x D	1.1 kg / 60 x 130 x 125 mm	1.5 kg / 90 x 130 x 125 mm
Spacing when mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Plug-in screw connection	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 12 - 10
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10
Degree of protection / Protection class	IP20 / I	IP20 / I
MTBF (EN 29500, 40°C)	> 570000 h	> 600000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)	-25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)
Standards/regulations		
Insulation voltage input/output	2 kV AC (routine test) / 4 kV AC (type test)	2 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010	DIN VDE 0100-410 , DIN VDE 0106-1010
Medical standard	IEC 60601	IEC 60601
UL approvals	UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
Limitation of harmonic line currents	EN 61000-3-2	EN 61000-3-2

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched						
	QUINT-PS/ 1AC/12DC/15	**2866718**	1	**QUINT-PS/ 1AC/12DC/20**	**2866721**	1



**Power supply,
1 AC, 48 V DC, 5 A**

Ex:



Technical data

100 V AC ... 240 V AC
85 V AC ... 264 V AC / 90 V DC ... 350 V DC
45 Hz ... 65 Hz / 0 Hz
2.8 A (120 V AC) / 1.2 A (230 V AC)
< 15 A / < 1.5 A^2s
> 40 ms (120 V AC) / > 40 ms (230 V AC)

48 V DC ±1%
30 V DC ... 56 V DC (> 48 V constant capacity)

5 A / 7.5 A / 30 A
B2 , B4 , C2
Yes / Yes
7 W / 21 W
> 92.5 % (for 230 V AC and nominal values)
< 50 mV_{PP}

LED, active switching output, relay contact
LED, active switching output

1.1 kg / 60 x 130 x 125 mm
Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Plug-in screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12
IP20 / I
> 535000 h
-25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)

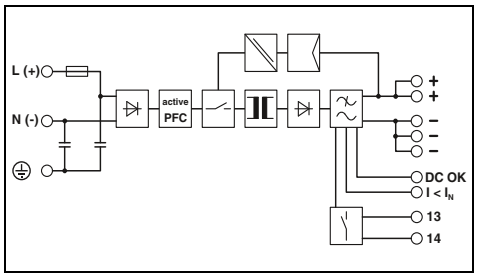
2 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC
IEC 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
IEC 60601
UL Listed UL 508 , UL/C-UL Recognized UL 60950 ,
UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 1AC/48DC/ 5	**2866679**	1

**Power supply,
1 AC, 48 V DC, 10 A**

Ex:



Technical data

100 V AC ... 240 V AC
85 V AC ... 264 V AC / 90 V DC ... 350 V DC
45 Hz ... 65 Hz / 0 Hz
5.1 A (120 V AC) / 2.3 A (230 V AC)
< 20 A / < 3.2 A^2s
> 20 ms (120 V AC) / > 20 ms (230 V AC)

48 V DC ±1%
30 V DC ... 56 V DC (> 48 V constant capacity)

10 A / 13 A / 60 A
B2 , B4 , B6 , C2 , C4
Yes / Yes
16 W / 41 W
> 93 % (for 230 V AC and nominal values)
< 80 mV_{PP}

LED, active switching output, relay contact
LED, active switching output

1.7 kg / 90 x 130 x 125 mm
Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Screw connection
0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10
0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 12 - 10
0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10
IP20 / I
> 630000 h
-25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)

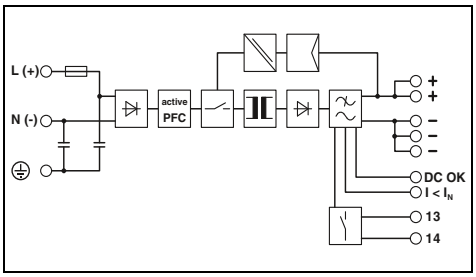
2 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC
IEC 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
IEC 60601
UL Listed UL 508 , UL/C-UL Recognized UL 60950 ,
UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 1AC/48DC/10	**2866682**	1

**Power supply,
1 AC, 48 V DC, 20 A**

Ex:



Technical data

100 V AC ... 240 V AC
85 V AC ... 264 V AC / 90 V DC ... 300 V DC
45 Hz ... 65 Hz / 0 Hz
8.7 A (120 V AC) / 4.5 A (230 V AC)
< 15 A / < 1.6 A^2s
> 22 ms (120 V AC) / > 25 ms (230 V AC)

48 V DC ±1%
30 V DC ... 56 V DC (> 48 V constant capacity)

20 A / 22.5 A / 100 A
B2 , B4 , B6 , B10 , C2 , C4 , C6
Yes / Yes
12 W / 74 W
> 93 % (for 230 V AC and nominal values)
< 50 mV_{PP}

LED, active switching output, relay contact
LED, active switching output

3.3 kg / 180 x 130 x 125 mm
Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Screw connection
0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 14 - 10
0.5 - 16 mm^2 / 0.5 - 16 mm^2 / 8 - 6
0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 24 - 10
IP20 / I
> 523000 h
-25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)

2 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC
IEC 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
-
UL Listed UL 508 , UL/C-UL Recognized UL 60950 ,
UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 1AC/48DC/20	**2866695**	1

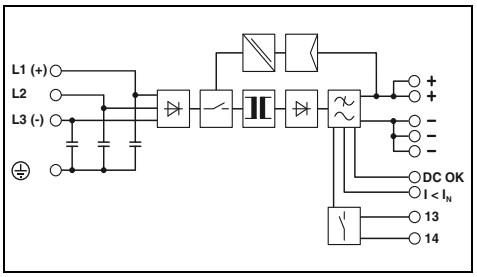
QUINT POWER power supply units – for maximum system availability

QUINT POWER, 3 AC, 48 V DC

– Quick tripping of standard circuit breakers thanks to the dynamic power reserve SFB (selective fuse breaking) technology with up to 6x the nominal current for 12 ms
– Reliable starting of heavy loads with the static POWER BOOST power reserve with permanently up to 1.5 times the nominal current
– Preventive function monitoring warns against critical operating states before errors occur
– Adjustable output voltage of 30 to 56 V DC

Power supply, 3 AC, 48 V DC, 20 A

Ex:



Technical data

Input data	
Nominal input voltage range	3x 400 V AC ... 500 V AC
Input voltage range AC/DC	320 V AC ... 575 V AC / 450 V DC ... 800 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	3x 2.1 A (400 V AC) / 3x 1.7 A (500 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 20 A / < 1 A^2s
Mains buffering (I_N, typ.)	> 25 ms (400 V AC) / > 35 ms (500 V AC)
Output data	
Nominal output voltage	48 V DC ±1%
Setting range of the output voltage	30 V DC ... 56 V DC (> 48 V constant capacity)
Output current / POWER BOOST / SFB (12 ms)	20 A / 22.5 A / 100 A
Magnetic fuse tripping	B2 , B4 , B4 , B10 , C2 , C4 , C6
Can be connected in parallel / series	Yes / Yes
Max. power dissipation (no load / nominal load)	24 W / 70 W
Efficiency (typ.)	> 93 % (at 400 V AC and nominal values)
Residual ripple	< 50 mV_{PP}
Signaling	
Signaling DC OK	LED, active switching output, relay contact
Boost signaling	LED, active switching output
General data	
Weight / Dimensions W x H x D	2.5 kg / 96 x 130 x 176 mm
Spacing when mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10
Output connection data (solid/stranded/AWG)	0.5 - 16 mm^2 / 0.5 - 16 mm^2 / 8 - 6
Signal connection data (solid/stranded/AWG)	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10
Degree of protection / Protection class	IP20 / I
MTBF (EN 29500, 40°C)	> 509000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60°C derating, startup at -40°C type-tested)
Standards/regulations	
Insulation voltage input/output	2 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
Limitation of harmonic line currents	EN 61000-3-2

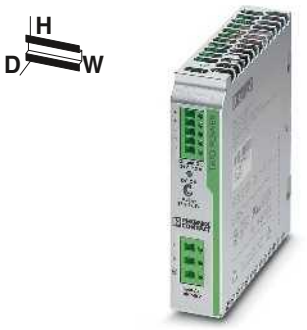
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**QUINT-PS/ 3AC/48DC/20**	**2320827**	1

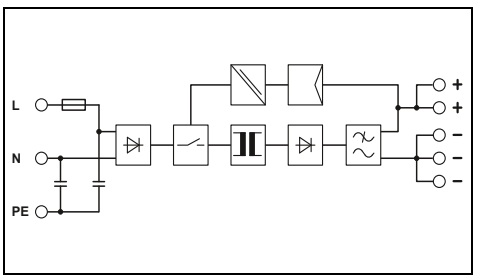
TRIO POWER power supply units – basic functionality at the highest level

TRIO POWER, 1 AC, 24 V DC

– Rugged design with metal housing and wide temperature range of -25 to +70°C
– Third negative terminal block for grounding on the secondary side
– Maximum availability thanks to high MTBF (Mean Time Between Failures) of more than 500,000 hours and high dielectric strength of up to 300 V AC
– Compensation of voltage drops by means of output voltage of 22.5 to 29.5 V DC that can be adjusted on the front



Power supply, 1 AC, 24 V DC, 2.5 A

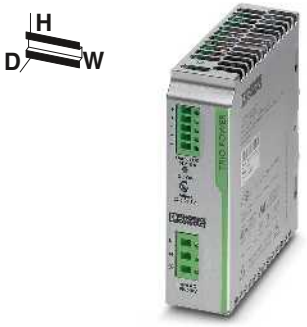


Technical data

Input data	
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range AC	85 V AC ... 264 V AC
Frequency range	45 Hz ... 65 Hz
Current consumption (nominal load)	0.95 A (120 V AC) / 0.5 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / 0.5 A^2s
Mains buffering (I_N, typ.)	> 20 ms (120 V AC) / > 100 ms (230 V AC)
Output data	
Nominal output voltage	24 V DC ±1%
Setting range of the output voltage	22.5 V DC ... 29.5 V DC (> 24 V constant capacity)
Output current	2.5 A
Can be connected in parallel / series	Yes / Yes
Max. power dissipation (no load / nominal load)	0.8 W / 10 W
Efficiency (typ.)	> 86 % (for 230 V AC and nominal values)
Residual ripple	< 30 mV_{PP}
Signaling	
Signaling DC OK	LED
General data	
Weight / Dimensions W x H x D	0.5 kg / 32 x 130 x 115 mm
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Degree of protection / Protection class	IP20 / I, with PE connection
MTBF (EN 29500, 40°C)	> 2054000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations	
Insulation voltage input/output	2 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950
Limitation of harmonic line currents	EN 61000-3-2

Ordering data

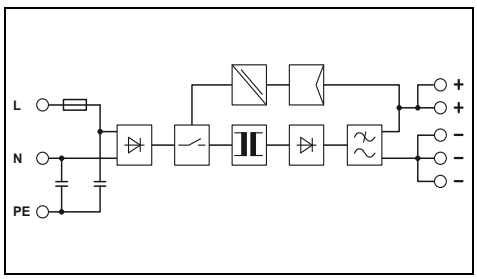
Description	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**TRIO-PS/ 1AC/24DC/ 2.5**	**2866268**	1

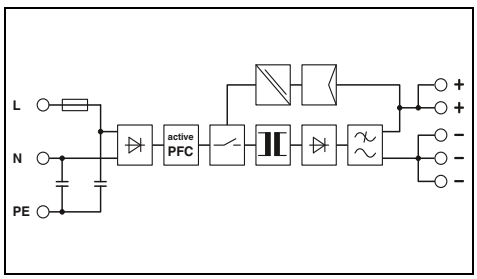


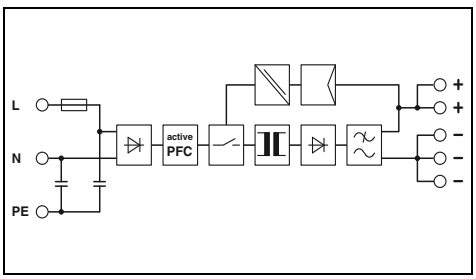
Power supply,
1 AC, 24 V DC, 5 A

Power supply,
1 AC, 24 V DC, 10 A

Power supply,
1 AC, 24 V DC, 20 A







Technical data

100 V AC ... 240 V AC	
85 V AC ... 264 V AC	
45 Hz ... 65 Hz	
1.65 A (120 V AC) / 0.9 A (230 V AC)	
< 15 A / 1.1 A^2s	
> 20 ms (120 V AC) / > 110 ms (230 V AC)	
24 V DC ±1%	
22.5 V DC ... 29.5 V DC (> 24 V constant capacity)	
5 A	
Yes / Yes	
1.1 W / 18 W	
> 89 % (for 230 V AC and nominal values)	
< 20 mV_{PP}	
LED	
0.6 kg / 40 x 130 x 115 mm	
Can be aligned: Horizontally 0 mm, vertically 50 mm	
Screw connection	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
IP20 / I, with PE connection	
> 2031000 h	
-25 °C ... 70 °C (> 55° C derating)	
2 kV AC (routine test) / 4 kV AC (type test)	
Conformance with EMC Directive 2004/108/EC	
EN 60950-1/VDE 0805 (SELV)	
EN 50178/VDE 0160 (PELV)	
DIN VDE 0100-410 , DIN VDE 0106-1010	
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	
EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
TRIO-PS/ 1AC/24DC/ 5	**2866310**	1

Technical data

100 V AC ... 240 V AC	
85 V AC ... 264 V AC	
45 Hz ... 65 Hz	
3 A (100 V AC) / 1.5 A (240 V AC)	
< 15 A / 0.7 A^2s	
> 24 ms (120 V AC) / > 24 ms (230 V AC)	
24 V DC ±1%	
22.5 V DC ... 29.5 V DC (> 24 V constant capacity)	
10 A	
Yes / Yes	
6.7 W / 30 W	
> 89 % (for 230 V AC and nominal values)	
< 10 mV_{PP}	
LED	
1.4 kg / 60 x 130 x 152.5 mm	
Can be aligned: Horizontally 0 mm, vertically 50 mm	
Screw connection	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
IP20 / I, with PE connection	
> 981000 h	
-25 °C ... 70 °C (> 55° C derating)	
2 kV AC (routine test) / 4 kV AC (type test)	
Conformance with EMC Directive 2004/108/EC	
EN 60950-1/VDE 0805 (SELV)	
EN 50178/VDE 0160 (PELV)	
DIN VDE 0100-410 , DIN VDE 0106-1010	
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	
EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
TRIO-PS/ 1AC/24DC/10	**2866323**	1

Technical data

100 V AC ... 240 V AC	
85 V AC ... 264 V AC	
45 Hz ... 65 Hz	
4.6 A (120 V AC) / 2.4 A (230 V AC)	
< 15 A / 1.4 A^2s	
> 13 ms (120 V AC) / > 13 ms (230 V AC)	
24 V DC ±1%	
22.5 V DC ... 29.5 V DC (> 24 V constant capacity)	
20 A	
Yes / Yes	
4 W / 46 W	
> 91 % (for 230 V AC and nominal values)	
< 10 mV_{PP}	
LED	
2.2 kg / 115 x 130 x 152.5 mm	
Can be aligned: Horizontally 0 mm, vertically 50 mm	
Screw connection	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
0.5 - 6 mm^2 / 0.5 - 4 mm^2 / 20 - 10	
IP20 / I, with PE connection	
> 915000 h	
-25 °C ... 70 °C (> 55° C derating)	
2 kV AC (routine test) / 4 kV AC (type test)	
Conformance with EMC Directive 2004/108/EC	
EN 60950-1/VDE 0805 (SELV)	
EN 50178/VDE 0160 (PELV)	
DIN VDE 0100-410 , DIN VDE 0106-1010	
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	
EN 61000-3-2	

Ordering data

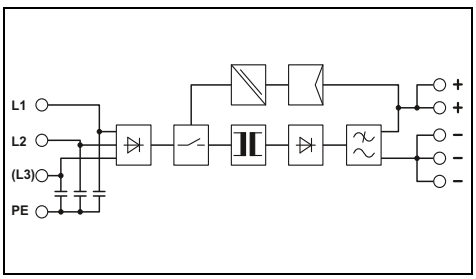
Type	Order No.	Pcs. / Pkt.
TRIO-PS/ 1AC/24DC/20	**2866381**	1

TRIO POWER power supply units – basic functionality at the highest level

TRIO POWER, 3 AC, 24 V DC

– Rugged design with metal housing and wide temperature range of -25 to +70°C
– Third negative terminal block for grounding on the secondary side
– Maximum availability thanks to high MTBF (Mean Time Between Failures) of more than 500,000 hours
– Compensation of voltage drops by means of output voltage of 22.5 to 29.5 V DC that can be adjusted on the front

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



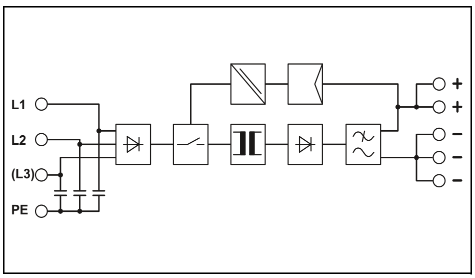
Technical data

Input data	
Nominal input voltage range	2x / 3x 400 V AC ... 500 V AC
Input voltage range AC	320 V AC ... 575 V AC
Frequency range	45 Hz ... 65 Hz
Current consumption (nominal load)	3x 0.3 A (400 V AC) / 3x 0.25 A (500 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / 0.2 A^2s
Mains buffering (I_N, typ.)	> 20 ms (400 V AC) / > 30 ms (480 V AC)
Output data	
Nominal output voltage	24 V DC ±1%
Setting range of the output voltage	22.5 V DC ... 29.5 V DC (> 24 V constant capacity)
Output current	5 A
Can be connected in parallel / series	Yes / Yes
Max. power dissipation (no load / nominal load)	4 W / 15 W
Efficiency (typ.)	> 89 % (at 400 V AC and nominal values)
Residual ripple	< 30 mV_{PP}
Signaling	
Signaling DC OK	LED
General data	
Weight / Dimensions W x H x D	0.6 kg / 40 x 130 x 115 mm
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12
Degree of protection / Protection class	IP20 / I, with PE connection
MTBF (EN 29500, 40°C)	> 1474000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations	
Insulation voltage input/output	2 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950
Limitation of harmonic line currents	EN 61000-3-2

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**TRIO-PS/ 3AC/24DC/ 5**	**2866462**	1

**Power supply,
3 AC, 24 V DC, 10 A**



Technical data

2x / 3x 400 V AC ... 500 V AC
320 V AC ... 575 V AC
45 Hz ... 65 Hz
3x 0.6 A (400 V AC) / 3x 0.5 A (480 V AC)
< 15 A / 0.2 A^2s
> 20 ms (400 V AC) / > 25 ms (480 V AC)

24 V DC ±1%
22.5 V DC ... 29.5 V DC (> 24 V constant capacity)

10 A
Yes / Yes
6 W / 28 W
> 89 % (at 400 V AC and nominal values)
< 10 mV_{PP}

LED

1.3 kg / 60 x 130 x 152.5 mm
Can be aligned: Horizontally 0 mm, vertically 50 mm
Screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12
IP20 / I, with PE connection
> 1156000 h
-25 °C ... 70 °C (> 55° C derating)

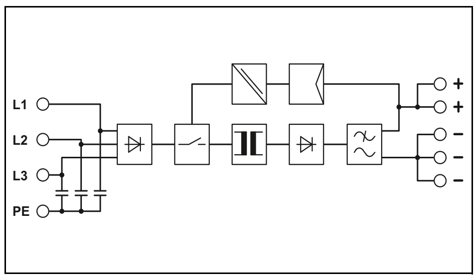
2 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC
EN 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
TRIO-PS/ 3AC/24DC/10	2866459	1

**Power supply,
3 AC, 24 V DC, 20 A**



Technical data

3x 400 V AC ... 500 V AC
320 V AC ... 575 V AC
45 Hz ... 65 Hz
3x 1.1 A (400 V AC) / 3x 0.8 A (480 V AC)
< 15 A / 0.5 A^2s
> 17 ms (400 V AC) / > 20 ms (480 V AC)

24 V DC ±1%
22.5 V DC ... 29.5 V DC (> 24 V constant capacity)

20 A
Yes / Yes
< 6 W / < 48 W
> 91 % (at 400 V AC and nominal values)
< 10 mV_{PP}

LED

2 kg / 115 x 130 x 152.5 mm
Can be aligned: Horizontally 0 mm, vertically 50 mm
Screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
0.5 - 6 mm^2 / 0.5 - 4 mm^2 / 12 - 10
IP20 / I, with PE connection
> 1190000 h
-25 °C ... 70 °C (> 55° C derating)

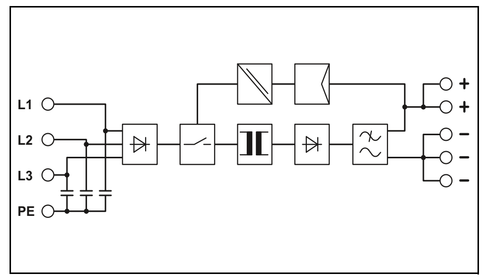
2 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC
EN 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
TRIO-PS/ 3AC/24DC/20	2866394	1

**Power supply unit,
3 AC, 24 V DC, 40 A**



Technical data

3x 400 V AC ... 500 V AC
320 V AC ... 575 V AC
45 Hz ... 65 Hz
3x 2 A (400 V AC) / 3x 1.6 A (480 V AC)
< 20 A / 1.3 A^2s
> 16 ms (400 V AC) / > 20 ms (480 V AC)

24 V DC ±1%
22.5 V DC ... 29.5 V DC (> 24 V constant capacity)

40 A
Yes / Yes
16 W / 91 W
> 91.5 % (at 400 V AC and nominal values)
< 20 mV_{PP}

LED

2.9 kg / 139 x 130 x 190 mm
Can be aligned: Horizontally 0 mm, vertically 50 mm
Screw connection
0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 22 - 10
0.5 - 16 mm^2 / 0.5 - 10 mm^2 / 8 - 6
IP20 / I, with PE connection
> 930000 h
-25 °C ... 70 °C (> 55° C derating)

2 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC
EN 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
TRIO-PS/ 3AC/24DC/40	2866404	1

TRIO POWER power supply units – basic functionality at the highest level

TRIO POWER, 600 V DC, 24 V DC

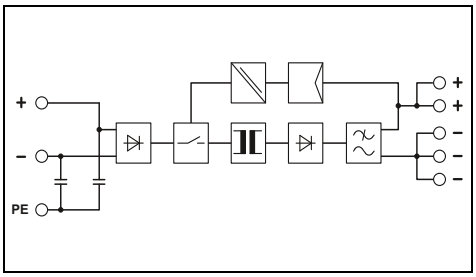
– Connection to 600 V DC intermediate circuits of frequency inverters: in the event of a line supply failure, 24 V loads are supplied using the kinetic energy of the motor. In this way, the motor acts as a generator and supplies energy to the intermediate circuits (e.g., in plastic injection molding machines).

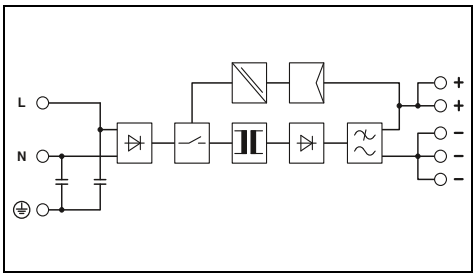
TRIO POWER, 1 AC, 12 V DC and 48 V DC

– Adjustable output voltage of 10 to 18 V DC, or 30 to 56 V DC

Power supply, 600 V DC, 24 V DC, 20 A

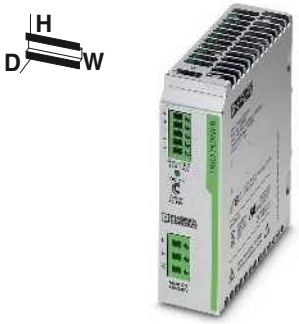
Power supply, 1 AC, 12 V DC, 5 A



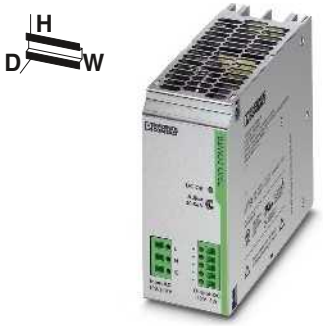


	Technical data	Technical data
Input data		
Nominal input voltage range	600 V DC	100 V AC ... 240 V AC
Input voltage range AC/DC	- / 450 V DC ... 840 V DC	85 V AC ... 264 V AC
Frequency range	- / 0 Hz	45 Hz ... 65 Hz
Current consumption (nominal load)	0.9 A (600 V DC)	1.1 A (100 V AC) / 0.5 A (240 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 26 A / 0.8 A^2s	< 15 A / < 0.5 A^2s
Mains buffering (I_N, typ.)	> 15 ms (600 V DC)	> 26 ms (120 V AC) / > 100 ms (230 V AC)
Output data		
Nominal output voltage	24 V DC ±1%	12 V DC ±1%
Setting range of the output voltage	22.5 V DC ... 29.5 V DC (U_{IN} > 475 V DC) 22.5 V DC ... 28 V DC (U_{IN} ≤ 475 V DC)	10 V DC ... 18 V DC (> 12 V constant capacity)
Output current	20 A	5 A
Can be connected in parallel / series	Yes / Yes	Yes / Yes
Max. power dissipation (no load / nominal load)	3.8 W / 45 W	0.9 W / 11 W
Efficiency (typ.)	> 91 % (With 600 V DC and nominal values)	> 83 % (for 230 V AC and nominal values)
Residual ripple	< 40 mV_{PP}	< 20 mV_{PP}
Signaling		
Signaling DC OK	LED	LED
General data		
Weight / Dimensions W x H x D	2 kg / 115 x 130 x 152.5 mm	0.5 kg / 32 x 130 x 115 mm
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Screw connection	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Output connection data (solid/stranded/AWG)	0.5 - 6 mm^2 / 0.5 - 4 mm^2 / 12 - 10	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Degree of protection / Protection class	IP20 / I, with PE connection	IP20 / I, with PE connection
MTBF (EN 29500, 40°C)	> 701147 h	> 1853000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations		
Insulation voltage input/output	2 kV AC (routine test) / 4 kV AC (type test)	2 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950
Limitation of harmonic line currents	EN 61000-3-2	EN 61000-3-2

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched						
	TRIO-PS/600DC/24DC/20	**2866530**	1	**TRIO-PS/ 1AC/12DC/ 5**	**2866475**	1

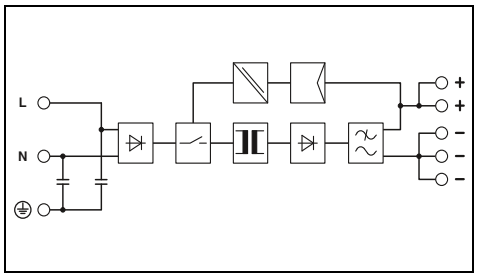


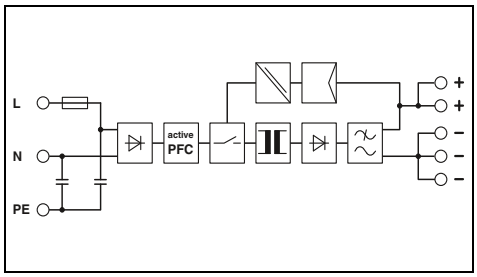
**Power supply,
1 AC, 12 V DC, 10 A**

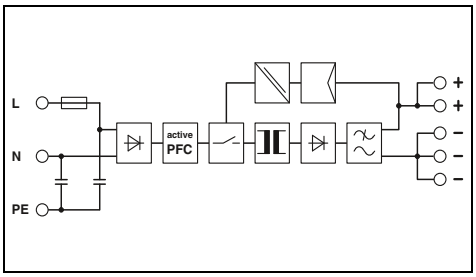


**Power supply,
1 AC, 48 V DC, 5 A**

**Power supply,
1 AC, 48 V DC, 10 A**







Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC 45 Hz ... 65 Hz 1.7 A (120 V AC) / 0.9 A (230 V AC) < 15 A / < 1.1 A^2s > 20 ms (120 V AC) / > 86 ms (230 V AC)	
12 V DC ±1% 10 V DC ... 18 V DC (> 12 V constant capacity)	
10 A Yes / Yes 1.1 W / 18 W > 86 % (for 230 V AC and nominal values) < 20 mV_{PP}	
LED	
0.6 kg / 40 x 130 x 115 mm Can be aligned: Horizontally 0 mm, vertically 50 mm Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14 IP20 / I, with PE connection > 1871000 h -25 °C ... 70 °C (> 55° C derating)	
2 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC EN 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	
EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
TRIO-PS/ 1AC/12DC/10	**2866488**	1

Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC 45 Hz ... 65 Hz 2.5 A (120 V AC) / 1.3 A (230 V AC) < 15 A / < 0.7 A^2s > 15 ms (120 V AC) / > 16 ms (230 V AC)	
48 V DC ±1% 30 V DC ... 56 V DC (> 48 V constant capacity)	
5 A Yes / Yes 7 W / 28 W > 89 % (for 230 V AC and nominal values) < 50 mV_{PP}	
LED	
1.4 kg / 60 x 130 x 152.5 mm Can be aligned: Horizontally 0 mm, vertically 50 mm Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14 IP20 / I, with PE connection > 1337000 h -25 °C ... 70 °C (> 55° C derating)	
2 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC EN 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	
EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
TRIO-PS/ 1AC/48DC/ 5	**2866491**	1

Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC 45 Hz ... 65 Hz 4.6 A (120 V AC) / 2.4 A (230 V AC) < 15 A / < 1.4 A^2s > 13 ms (120 V AC) / > 18 ms (230 V AC)	
48 V DC ±1% 30 V DC ... 56 V DC (> 48 V constant capacity)	
10 A Yes / Yes 8 W / 49 W > 91 % (for 230 V AC and nominal values) < 50 mV_{PP}	
LED	
1.9 kg / 115 x 130 x 152.5 mm Can be aligned: Horizontally 0 mm, vertically 50 mm Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14 0.5 - 6 mm^2 / 0.5 - 4 mm^2 / 20 - 10 IP20 / I, with PE connection > 1168000 h -25 °C ... 70 °C (> 55° C derating)	
2 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC EN 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL Listed UL 508 , UL/C-UL Recognized UL 60950	
EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
TRIO-PS/ 1AC/48DC/10	**2866501**	1

MINI POWER power supply units - for measurement and control technology

MINI POWER, 1 AC, 24 V DC

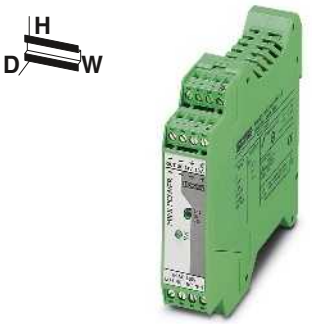
– Easy-to-maintain connection method thanks to keyed COMBICON connector
– Remote monitoring of output voltage via switching output

MINI POWER, 1.5 A

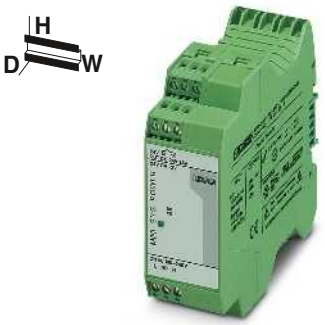
– Flat power supply units with a depth of just 95 mm
– Optional: DIN rail connector for supplying other modules
Per power supply:
2 x ME 17,5 TBUS 1,5/5-ST-3,82 GN
(Order No.: 2709561)

MINI POWER, 100 W

– Output power limited to 100 W: specifically for applications that require certification according to UL 1310/508 Listed Class 2



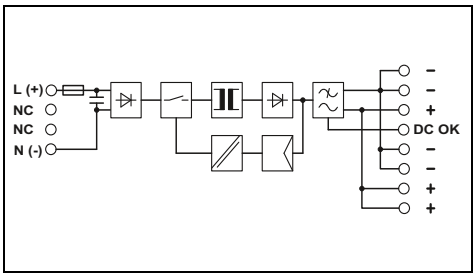
**Power supply,
1 AC, 24 V DC, 1.3 A**

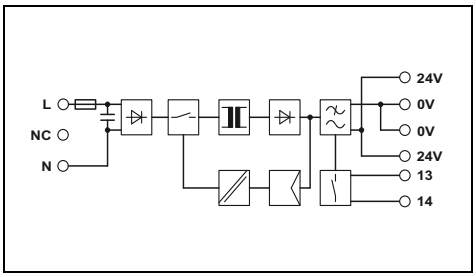


**Power supply unit, 1 AC, 24 V DC, 1.5 A,
flat design, optional DIN rail connector**

Ex:

Ex:





	Technical data	Technical data
Input data		
Nominal input voltage range	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 90 V DC ... 350 V DC	85 V AC ... 264 V AC
Frequency range	45 Hz ... 65 Hz / 0 Hz	45 Hz ... 65 Hz
Current consumption (nominal load)	0.65 A (120 V AC) / 0.25 A (230 V AC)	0.75 A (120 V AC) / 0.45 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / 0.6 A^2s	< 15 A / 0.6 A^2s
Mains buffering (I_N, typ.)	> 20 ms (120 V AC) / > 110 ms (230 V AC)	> 35 ms (120 V AC) / > 150 ms (230 V AC)
Output data		
Nominal output voltage	24 V DC ±1%	24 V DC ±1%
Setting range of the output voltage	22.5 V DC ... 28.5 V DC (> 24 V constant capacity)	-
Output current / POWER BOOST	1.3 A / 1.6 A	1.5 A / 2 A
Can be connected in parallel / series	Yes / Yes	Yes / No
Max. power dissipation (no load / nominal load)	0.9 W / 4.5 W	1.5 W / 6.5 W
Efficiency (typ.)	> 85 % (for 230 V AC and nominal values)	> 84 % (for 230 V AC and nominal values)
Residual ripple	< 20 mV_{PP}	< 40 mV_{PP}
Signaling		
Signaling DC OK	LED, active switching output	LED, relay contact
General data		
Weight / Dimensions W x H x D	0.2 kg / 22.5 x 99 x 107 mm	0.25 kg / 35 x 99 x 95 mm
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Plug-in screw connection	Plug-in screw connection
Connection data solid / stranded / AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Degree of protection / Protection class	IP20 / II (in an enclosed control cabinet)	IP20 / II (in an enclosed control cabinet)
MTBF (EN 29500, 40°C)	> 1104000 h	> 2789000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60 °C derating)
Standards/regulations		
Insulation voltage input/output	3 kV (Routine test) / 4 kV (type test)	3 kV (Routine test) / 4 kV (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) , NEC Class 2 as per UL 1310	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
Limitation of harmonic line currents	EN 61000-3-2	EN 61000-3-2

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**MINI-PS-100-240AC/24DC/1.3**	**2866446**	1

Accessories

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device			

Ordering data

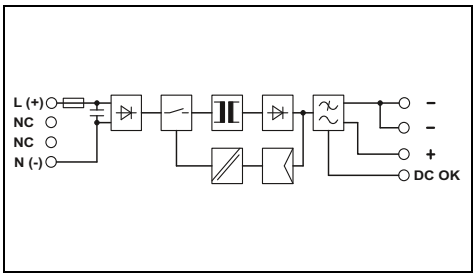
Type	Order No.	Pcs. / Pkt.
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10

**Power supply,
1 AC, 24 V DC, 2 A**

Ex:



Technical data

100 V AC ... 240 V AC
85 V AC ... 264 V AC / 90 V DC ... 350 V DC
45 Hz ... 65 Hz / 0 Hz
0.7 A (120 V AC) / 0.4 A (230 V AC)
< 15 A / 4.1 A^2s
> 35 ms (120 V AC) / > 170 ms (230 V AC)

24 V DC ±1%
22.5 V DC ... 28.5 V DC (> 24 V constant capacity)

2 A / 2.9 A
Yes / Yes
2 W / 7 W
> 88 % (for 230 V AC and nominal values)
< 20 mV_{PP}

LED, active switching output

0.25 kg / 45 x 99 x 107 mm
Can be aligned: Horizontally 0 mm, vertically 50 mm
Plug-in screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
IP20 / II (in an enclosed control cabinet)
> 507981 h
-25 °C ... 70 °C (> 60 °C derating)

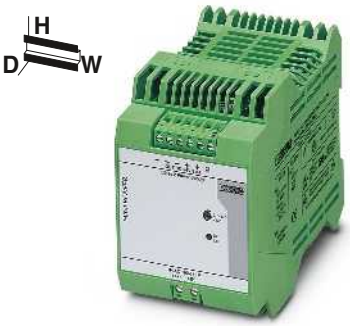
3 kV (Routine test) / 4 kV (type test)
Conformance with EMC Directive 2004/108/EC
EN 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) , NEC Class 2 as per UL 1310

EN 61000-3-2

Ordering data

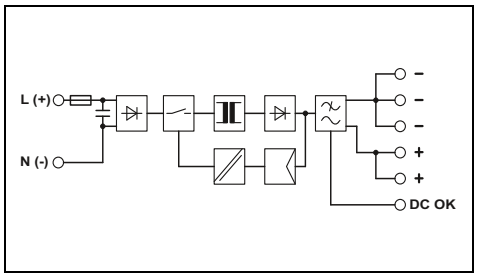
Type	Order No.	Pcs. / Pkt.
MINI-PS-100-240AC/24DC/2	**2938730**	1

Accessories



**Power supply,
1 AC, 24 V DC, 100 W
NEC Class 2**

Ex:



Technical data

100 V AC ... 240 V AC
85 V AC ... 264 V AC / 90 V DC ... 350 V DC
45 Hz ... 65 Hz / 0 Hz
1.3 A (120 V AC) / 0.8 A (230 V AC)
< 15 A / 2.1 A^2s
> 20 ms (120 V AC) / > 100 ms (230 V AC)

24 V DC ±1%
22.5 V DC ... 26 V DC (> 24 V constant capacity)

3.8 A
Yes / Yes
2.5 W / 12 W
> 88 % (for 230 V AC and nominal values)
< 40 mV_{PP}

LED, active switching output

0.4 kg / 67.5 x 99 x 107 mm
Can be aligned: Horizontally 0 mm, vertically 50 mm
Plug-in screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
IP20 / II (in an enclosed control cabinet)
> 815000 h
-25 °C ... 70 °C (> 60 °C derating)

3 kV (Routine test) / 3 kV (type test)
Conformance with EMC Directive 2004/108/EC
EN 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) , NEC Class 2 as per UL 1310

EN 61000-3-2

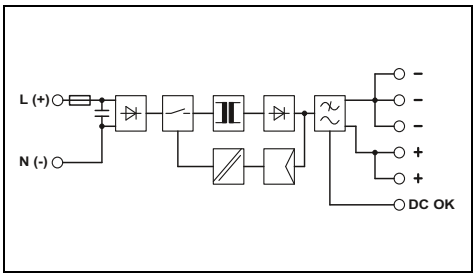
Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-PS-100-240AC/24DC/C2LPS	**2866336**	1

Accessories

**Power supply,
1 AC, 24 V DC, 4 A**

Ex:



Technical data

100 V AC ... 240 V AC
85 V AC ... 264 V AC / 90 V DC ... 350 V DC
45 Hz ... 65 Hz / 0 Hz
1.3 A (120 V AC) / 0.8 A (230 V AC)
< 15 A / 2.1 A^2s
> 20 ms (120 V AC) / > 100 ms (230 V AC)

24 V DC ±1%
22.5 V DC ... 28.5 V DC (> 24 V constant capacity)

4 A / 5 A
Yes / Yes
2.5 W / 12 W
> 88 % (for 230 V AC and nominal values)
< 20 mV_{PP}

LED, active switching output

0.4 kg / 67.5 x 99 x 107 mm
Can be aligned: Horizontally 0 mm, vertically 50 mm
Plug-in screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
IP20 / II (in an enclosed control cabinet)
> 815000 h
-25 °C ... 70 °C (> 60 °C derating)

3 kV (Routine test) / 3 kV (type test)
Conformance with EMC Directive 2004/108/EC
EN 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-PS-100-240AC/24DC/4	**2938837**	1

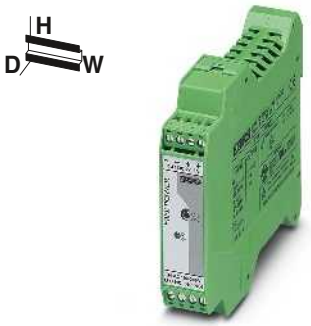
Accessories

MINI POWER power supply units - for measurement and control technology

MINI POWER, 1 AC, 5 to 15 V DC
– Easy-to-maintain connection method thanks to keyed COMBICON connector
– Remote monitoring of output voltage via switching output

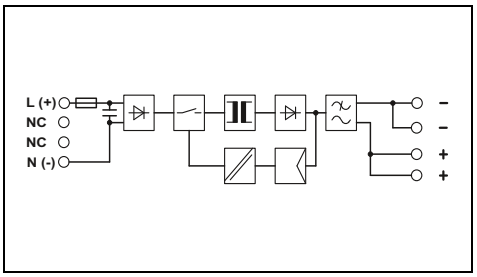
MINI POWER, 5 and 10 - 15 V DC
– Adjustable output voltage of 4.5 to 5.5 V DC, or of 10 to 15 V DC

MINI POWER, ±15 V DC
– For supplying operational amplifiers



Power supply, 1 AC, 5 V DC, 3 A

Ex:

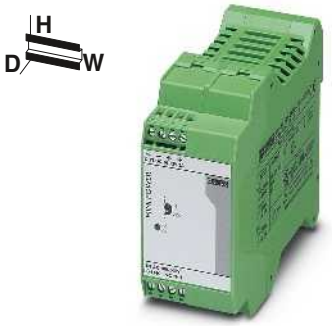


Technical data

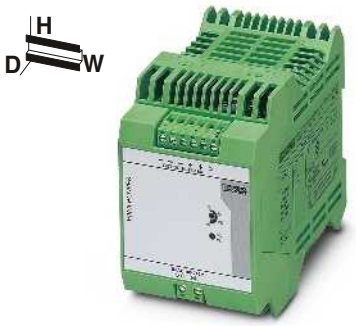
Input data	
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 90 V DC ... 350 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	0.4 A (120 V AC) / 0.2 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / 1.5 A^2s
Mains buffering (I_N, typ.)	> 30 ms (120 V AC) / > 140 ms (230 V AC)
Output data	
Nominal output voltage	5 V DC ±1%
Setting range of the output voltage	4.5 V DC ... 5.5 V DC (> 5 V constant capacity)
Output current / POWER BOOST	3 A / 5 A
Can be connected in parallel / series	Yes / Yes
Max. power dissipation (no load / nominal load)	1 W / 5 W
Efficiency (typ.)	> 73 % (for 230 V AC and nominal values)
Residual ripple	< 40 mV_{PP}
Signaling	
Signaling DC OK	LED
General data	
Weight / Dimensions W x H x D	0.17 kg / 22.5 x 99 x 107 mm
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Plug-in screw connection
Connection data solid / stranded / AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Degree of protection / Protection class	IP20 / II (in an enclosed control cabinet)
MTBF (EN 29500, 40°C)	> 500000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)
Standards/regulations	
Insulation voltage input/output	3 kV (Routine test) / 4 kV (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
Limitation of harmonic line currents	EN 61000-3-2

Ordering data

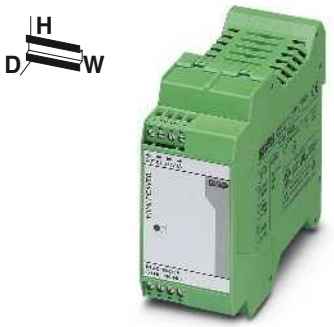
Description	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**MINI-PS-100-240AC/ 5DC/3**	**2938714**	1



Power supply,
1 AC, 10 - 15 V DC, 2 A

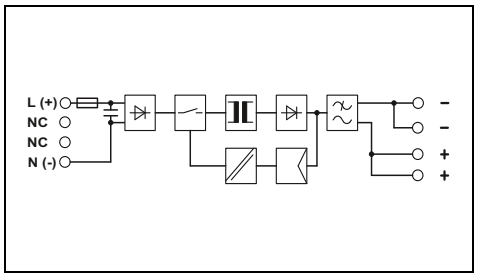


Power supply,
1 AC, 10 - 15 V DC, 8 A



Power supply,
1 AC, ±15 V DC, 1 A

Ex:



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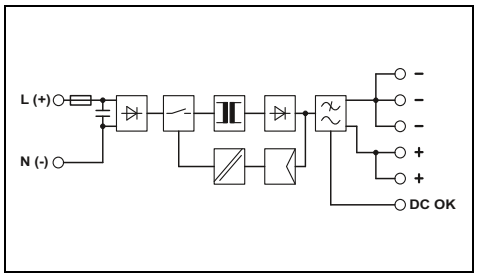

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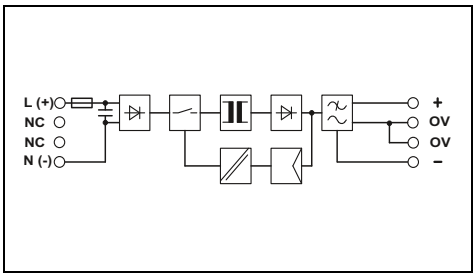


Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC / 90 V DC ... 350 V DC 45 Hz ... 65 Hz / 0 Hz 0.4 A (120 V AC) / 0.2 A (230 V AC) < 15 A / 1.7 A^2s > 20 ms (120 V AC) / > 120 ms (230 V AC)	
12 V DC ±1% 10 V DC ... 15 V DC (> 12 V constant capacity)	
2 A / 2.3 A Yes / Yes < 1 W / < 7 W > 86 % (for 230 V AC and nominal values) < 20 mV_{PP}	
LED	
0.25 kg / 45 x 99 x 107 mm Can be aligned: Horizontally 0 mm, vertically 50 mm Plug-in screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 507000 h -25 °C ... 70 °C (> 60 °C derating)	
3 kV (Routine test) / 4 kV (type test) Conformance with EMC Directive 2004/108/EC EN 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	
EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-PS-100-240AC/10-15DC/2	**2938756**	1

Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC / 90 V DC ... 350 V DC 45 Hz ... 65 Hz / 0 Hz 1.3 A (120 V AC) / 0.8 A (230 V AC) < 15 A / 2.1 A^2s > 20 ms (120 V AC) / > 20 ms (230 V AC)	
12 V DC ±1% 10 V DC ... 15 V DC (> 12 V constant capacity)	
8 A / 6.6 A Yes / Yes < 2.5 W / < 12 W > 88 % (for 230 V AC and nominal values) < 40 mV_{PP}	
LED, active switching output	
0.4 kg / 67.5 x 99 x 107 mm Can be aligned: Horizontally 0 mm, vertically 50 mm Plug-in screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 984000 h -25 °C ... 70 °C (> 60 °C derating)	
3 kV (Routine test) / 3 kV (type test) Conformance with EMC Directive 2004/108/EC EN 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	
EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-PS-100-240AC/10-15DC/8	**2866297**	1

Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC / 90 V DC ... 350 V DC 45 Hz ... 65 Hz / 0 Hz 0.6 A (120 V AC) / 0.4 A (230 V AC) < 35 A / 4 A^2s > 30 ms (120 V AC) / > 150 ms (230 V AC)	
± 15 V DC ±1% -	
1 A / 1.5 A Yes / Yes 2 W / 8 W > 80 % (for 230 V AC and nominal values) < 30 mV_{PP}	
LED	
0.25 kg / 45 x 99 x 107 mm Can be aligned: Horizontally 0 mm, vertically 50 mm Plug-in screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 500000 h -25 °C ... 70 °C (> 60 °C derating)	
3 kV (Routine test) / 4 kV (type test) Conformance with EMC Directive 2004/108/EC EN 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) , NEC Class 2 as per UL 1310	
EN 61000-3-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-PS-100-240AC/2X15DC/1	**2938743**	1

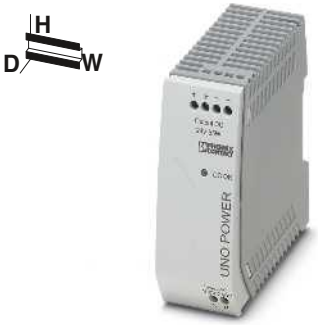
UNO POWER power supply units - compact basic functionality

– More space in the control cabinet with up to 20% higher power density
– Height of housing is just 84 mm, suitable for all 120 mm control cabinets
– Maximum energy efficiency: energy savings with over 90% efficiency and extremely low idling losses under 0.3 W

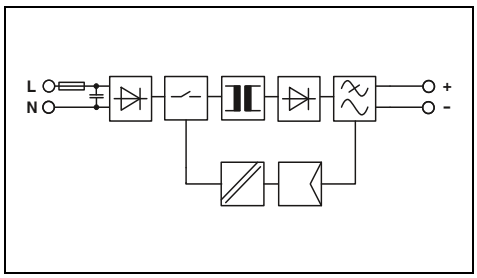
N

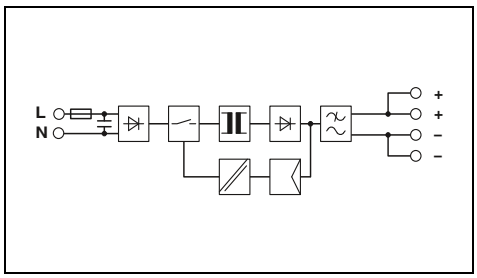
Power supply, 1 AC, 24 DC, 30 W

N



Power supply, 1 AC, 24 DC, 60 W





	Technical data	Technical data
Input data		
Nominal input voltage range	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC	85 V AC ... 264 V AC
Frequency range	45 Hz ... 65 Hz	45 Hz ... 65 Hz
Current consumption (nominal load)	0.5 A (120 V AC) / 0.3 A (230 V AC)	1 A (120 V AC) / 0.6 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 20 A / < 0.4 A^2s	< 30 A / < 0.5 A^2s
Mains buffering (I_N, typ.)	> 35 ms (120 V AC) / > 140 ms (230 V AC)	> 20 ms (120 V AC) / > 85 ms (230 V AC)
Output data		
Nominal output voltage	24 V DC ±1%	24 V DC ±1%
Output current	1.25 A	2.5 A
Can be connected in parallel / series	yes, with redundancy module / Yes	yes, with redundancy module / Yes
Max. power dissipation (no load / nominal load)	< 0.3 W / < 5 W	< 0.3 W / < 7 W
Efficiency (typ.)	> 88 %	> 90 %
Residual ripple	< 60 mV_{PP}	< 30 mV_{PP}
Signaling		
Signaling DC OK	LED	LED
General data		
Weight / Dimensions W x H x D	0.15 kg / 22.5 x 90 x 84 mm	0.2 kg / 35 x 90 x 84 mm
Spacing when mounting	Alignable: 0 mm horizontally, 30 mm vertically	Alignable: 0 mm horizontally, 30 mm vertically
Connection method	Screw connection	Screw connection
Connection data solid / stranded / AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Degree of protection / Protection class	IP20 / II (in an enclosed control cabinet)	IP20 / II (in an enclosed control cabinet)
MTBF (EN 29500, 40°C)	> 500000 h	> 500000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations		
Insulation voltage input/output	3 kV AC (routine test) / 4 kV AC (type test)	3 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310	UL applied for
Limitation of harmonic line currents	EN 61000-3-2	EN 61000-3-2

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched, 1-phase						
	UNO-PS/1AC/24DC/30W	**2902991**	1	**UNO-PS/1AC/24DC/60W**	**2902992**	1

N

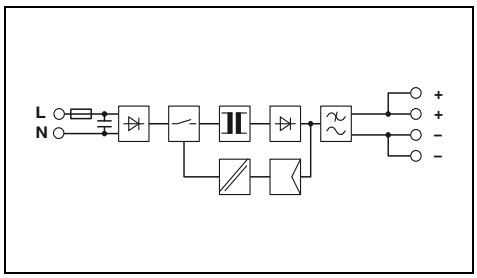
Power supply, 1 AC, 24 DC, 100 W

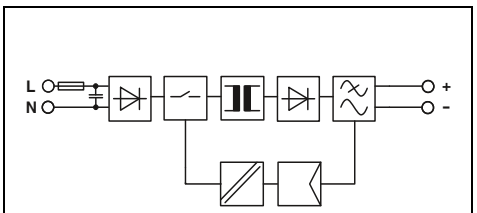
N

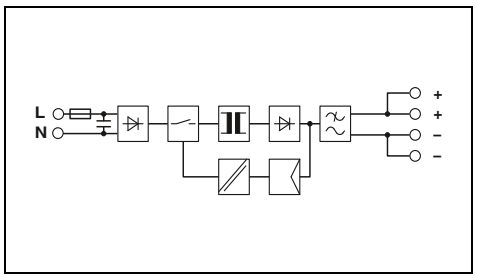
Power supply, 1 AC, 12 DC, 30 W

N

Power supply, 1 AC, 12 DC, 55 W







Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC 45 Hz ... 65 Hz 1.7 A (120 V AC) / 1 A (230 V AC) < 40 A / < 1.5 A^2s > 20 ms (120 V AC) / > 90 ms (230 V AC)	100 V AC ... 240 V AC 85 V AC ... 264 V AC 45 Hz ... 65 Hz 0.5 A (120 V AC) / 0.3 A (230 V AC) < 30 A / < 0.6 A^2s > 20 ms (120 V AC) / > 120 ms (230 V AC)	100 V AC ... 240 V AC 85 V AC ... 264 V AC 45 Hz ... 65 Hz 1 A (120 V AC) / 0.6 A (230 V AC) < 30 A / < 0.5 A^2s > 25 ms (120 V AC) / > 125 ms (230 V AC)
24 V DC ±1% 4.2 A yes, with redundancy module / Yes < 0.5 W / < 11 W > 90 % < 30 mV_{PP}	12 V DC ±1% 2.5 A yes, with redundancy module / Yes < 0.3 W / < 5.6 W > 87 % < 30 mV_{PP}	12 V DC ±1% 4.6 A yes, with redundancy module / Yes < 0.3 W / < 8 W > 90 % < 30 mV_{PP}
LED	LED	LED
0.34 kg / 55 x 90 x 84 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 500000 h -25 °C ... 70 °C (> 55° C derating)	0.15 kg / 22.5 x 90 x 84 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 500000 h -25 °C ... 70 °C (> 55° C derating)	0.2 kg / 35 x 90 x 84 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14 IP20 / II (in an enclosed control cabinet) > 500000 h -25 °C ... 70 °C (> 55° C derating)
3 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL applied for EN 61000-3-2	3 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL applied for EN 61000-3-2	3 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL applied for EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
UNO-PS/1AC/24DC/100W	**2902993**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
UNO-PS/1AC/12DC/30W	**2902998**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
UNO-PS/1AC/12DC/55W	**2902999**	1

STEP POWER - power supply units for distributor boards and flat control panels

STEP POWER, 1 AC, 24 V DC

– Flexible assembly by simply snapping the product onto the DIN rail or screwing it onto an even surface
– Energy savings thanks to maximum energy efficiency and incredibly low no-load losses
– Wide temperature range from -25°C to +70°C
– Reliable power supply thanks to the high MTBF (mean time between failures) of more than 500,000 hours and the UI characteristic curve

STEP POWER, 24 V DC, 0.5 A

– Slim design with a design width of just 18 mm (1 pitch)

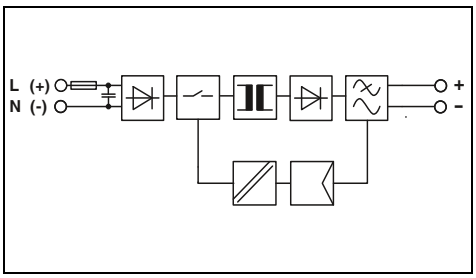
STEP POWER, 24 V DC, 0.75 A

– Flat design with a depth of just 43 mm

STEP POWER, 48 V AC, 0.5 A

– Connection to 48 V AC operating networks
– Slim design with a design width of just 18 mm (1 pitch)

Power supply,
1 AC, 24 V DC, 0.5 A



Technical data

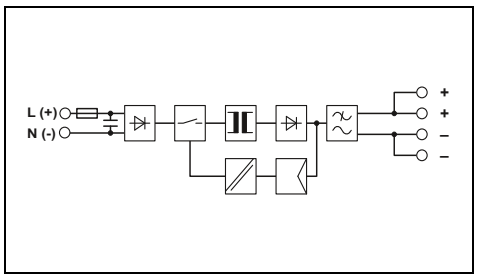
Input data	
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 95 V DC ... 250 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	0.28 A (120 V AC) / 0.13 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / < 0.1 A^2s
Mains buffering (I_N, typ.)	> 15 ms (120 V AC) / > 90 ms (230 V AC)
Output data	
Nominal output voltage	24 V DC ±1%
Output current	0.5 A
Can be connected in parallel / series	Yes / Yes
Max. power dissipation (no load / nominal load)	< 0.3 W / < 2.2 W
Efficiency (typ.)	> 84 % (for 230 V AC and nominal values)
Residual ripple	< 20 mV_{PP}
Signaling	
Signaling DC OK	LED
General data	
Weight / Dimensions W x H x D	0.07 kg / 18 x 90 x 61 mm
Spacing when mounting	Alignable: 0 mm horizontally, 30 mm vertically
Connection method	Screw connection
Connection data solid / stranded / AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Degree of protection / Protection class	IP20 / II (in an enclosed control cabinet)
MTBF (EN 29500, 40°C)	> 1567000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations	
Insulation voltage input/output	3.75 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310
Limitation of harmonic line currents	EN 61000-3-2

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**STEP-PS/ 1AC/24DC/0.5**	**2868596**	1

**Power supply,
1 AC, 24 V DC, 0.75 A,
flat design**

Ex:



Technical data

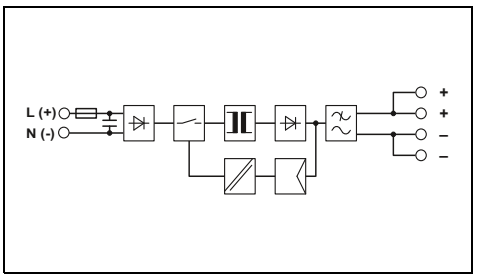
100 V AC ... 240 V AC 85 V AC ... 264 V AC / 95 V DC ... 250 V DC 45 Hz ... 65 Hz / 0 Hz 0.3 A (120 V AC) / 0.25 A (230 V AC) < 15 A / < 0.1 A^2s > 15 ms (120 V AC) / > 70 ms (230 V AC)
24 V DC ±1% 0.75 A Yes / Yes < 0.5 W / < 3.6 W > 84 % (for 230 V AC and nominal values) < 75 mV_{PP}
LED
0.11 kg / 36 x 90 x 43 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 926000 h -25 °C ... 70 °C (> 55° C derating)
3.75 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/24DC/0.75/FL	**2868622**	1

**Power supply,
1 AC, 24 V DC, 0.75 A**

Ex:



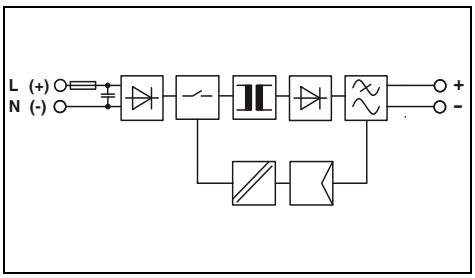
Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC / 95 V DC ... 250 V DC 45 Hz ... 65 Hz / 0 Hz 0.3 A (120 V AC) / 0.2 A (230 V AC) < 15 A / < 0.1 A^2s > 15 ms (120 V AC) / > 70 ms (230 V AC)
24 V DC ±1% 0.75 A Yes / Yes < 0.5 W / 3.6 W > 84 % (for 230 V AC and nominal values) < 75 mV_{PP}
LED
0.11 kg / 36 x 90 x 61 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 926000 h -25 °C ... 70 °C (> 55° C derating)
3.75 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/24DC/0.75	**2868635**	1

**Power supply,
48 V AC, 24 V DC, 0.5 A**



Technical data

48 V AC 43 V AC ... 52 V AC / 60 V DC ... 80 V DC 45 Hz ... 65 Hz / 0 Hz 0.5 A (43 V AC) / 0.45 A (48 V AC) < 10 A / < 0.1 A^2s > 15 ms (48 V AC) / > 20 ms (52 V AC)
24 V DC ±1% 0.5 A Yes / Yes < 0.3 W / < 3.4 W > 81 % (for 48 V AC and nominal values) < 30 mV_{PP}
LED
0.07 kg / 18 x 90 x 61 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 1860000 h -25 °C ... 70 °C (> 55° C derating)
3.75 kV AC (routine test) / 4 kV AC (type test) Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310 EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/48AC/24DC/0.5	**2868716**	1

STEP POWER - power supply units for distributor boards and flat control panels

STEP POWER, 1 AC, 24 V DC

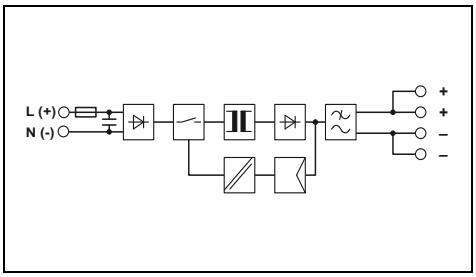
– Flexible assembly by simply snapping the product onto the DIN rail or screwing it onto an even surface
– Energy savings thanks to maximum energy efficiency and incredibly low no-load losses
– Wide temperature range from -25°C to +70°C
– Reliable power supply thanks to the high MTBF (mean time between failures) of more than 500,000 hours and the UI characteristic curve
– Adjustable output voltage of 22.5 to 29.5 V DC

STEP POWER, 100 W

– Output power limited to 100 W: specifically for applications that require certification according to UL 1310/508 Listed Class 2
– Approved for DeviceNet™

Power supply,
1 AC, 24 V DC, 1.75 A

BSH ClassNK CB
Ex:



Technical data

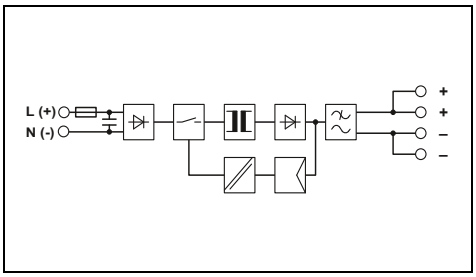
Input data	
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 95 V DC ... 250 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	0.6 A (120 V AC) / 0.3 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / < 0.6 A^2s
Mains buffering (I_N, typ.)	> 25 ms (120 V AC) / > 150 ms (230 V AC)
Output data	
Nominal output voltage	24 V DC ±1%
Setting range of the output voltage	22.5 V DC ... 29.5 V DC (> 24 V constant capacity)
Output current	1.75 A
Can be connected in parallel / series	Yes / Yes
Max. power dissipation (no load / nominal load)	< 0.7 W / 5 W
Efficiency (typ.)	> 89 % (for 230 V AC and nominal values)
Residual ripple	< 60 mV_{PP}
Signaling	
Signaling DC OK	LED
General data	
Weight / Dimensions W x H x D	0.19 kg / 54 x 90 x 61 mm
Spacing when mounting	Alignable: 0 mm horizontally, 30 mm vertically
Connection method	Screw connection
Connection data solid / stranded / AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Degree of protection / Protection class	IP20 / II (in an enclosed control cabinet)
MTBF (EN 29500, 40°C)	> 1569000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations	
Insulation voltage input/output	3.75 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
Limitation of harmonic line currents	EN 61000-3-2

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**STEP-PS/ 1AC/24DC/1.75**	**2868648**	1

Power supply,
1 AC, 24 V DC, 2.5 A

Ex:



Technical data

100 V AC ... 240 V AC
85 V AC ... 264 V AC / 95 V DC ... 250 V DC
45 Hz ... 65 Hz / 0 Hz
0.8 A (120 V AC) / 0.4 A (230 V AC)
< 15 A / < 0.6 A^2s
> 20 ms (120 V AC) / > 100 ms (230 V AC)

24 V DC ±1%
22.5 V DC ... 29.5 V DC (> 24 V constant capacity)

2.5 A
Yes / Yes
< 0.7 W / 9.9 W
> 86 % (for 230 V AC and nominal values)
< 80 mV_{PP}

LED

0.27 kg / 72 x 90 x 61 mm
Alignable: 0 mm horizontally, 30 mm vertically
Screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
IP20 / II (in an enclosed control cabinet)
> 1061000 h
-25 °C ... 70 °C (> 55° C derating)

3.75 kV AC (routine test) / 4 kV AC (type test)

Conformance with EMC Directive 2004/108/EC
IEC 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

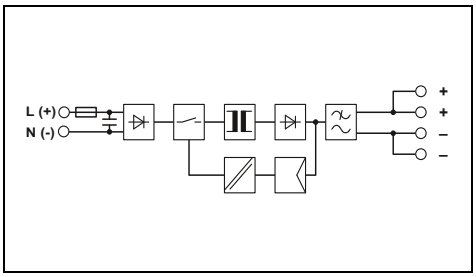
EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/24DC/2.5	**2868651**	1

Power supply,
1 AC, 24 V DC, 100 W
NEC Class 2

Ex:



Technical data

100 V AC ... 240 V AC
85 V AC ... 264 V AC / 95 V DC ... 250 V DC
45 Hz ... 65 Hz / 0 Hz
1.3 A (120 V AC) / 0.8 A (230 V AC)
< 15 A / < 1 A^2s
> 25 ms (120 V AC) / > 120 ms (230 V AC)

24 V DC ±1%
22.5 V DC ... 25 V DC (> 24 V constant capacity)

3.8 A
No / No
< 0.7 W / 11.8 W
> 88 % (for 230 V AC and nominal values)
< 80 mV_{PP}

LED

0.33 kg / 90 x 90 x 61 mm
Alignable: 0 mm horizontally, 30 mm vertically
Screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
IP20 / II (in an enclosed control cabinet)
> 897000 h
-25 °C ... 70 °C (> 55° C derating)

3.75 kV AC (routine test) / 4 kV AC (type test)

Conformance with EMC Directive 2004/108/EC
IEC 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

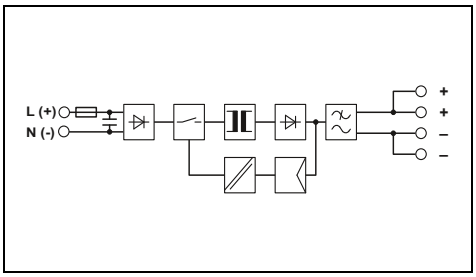
EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/24DC/3.8/C2LPS	**2868677**	1

Power supply,
1 AC, 24 V DC, 4.2 A

Ex:



Technical data

100 V AC ... 240 V AC
85 V AC ... 264 V AC / 95 V DC ... 250 V DC
45 Hz ... 65 Hz / 0 Hz
1.3 A (120 V AC) / 0.8 A (230 V AC)
< 15 A / < 1 A^2s
> 20 ms (120 V AC) / > 100 ms (230 V AC)

24 V DC ±1%
22.5 V DC ... 29.5 V DC (> 24 V constant capacity)

4.2 A
Yes / Yes
< 0.7 W / 13.2 W
> 88 % (for 230 V AC and nominal values)
< 40 mV_{PP}

LED

0.33 kg / 90 x 90 x 61 mm
Alignable: 0 mm horizontally, 30 mm vertically
Screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
IP20 / II (in an enclosed control cabinet)
> 897498 h
-25 °C ... 70 °C (> 55° C derating)

3.75 kV AC (routine test) / 4 kV AC (type test)

Conformance with EMC Directive 2004/108/EC
IEC 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/24DC/4.2	**2868664**	1

STEP POWER - power supply units for distributor boards and flat control panels

STEP POWER, 1 AC, 5 to 48 V DC

– Flexible assembly by simply snapping the product onto the DIN rail or screwing it onto an even surface
– Energy savings thanks to maximum energy efficiency and incredibly low no-load losses
– Wide temperature range from -25°C to +70°C
– Reliable power supply thanks to the high MTBF (mean time between failures) of more than 500,000 hours and the UI characteristic curve

STEP POWER, 5 V DC, 2 A

– Slim design with a design width of just 18 mm (1 pitch)

STEP POWER, 5 V DC, 6.5 A

– Adjustable output voltage of 4 to 6.5 V DC

STEP POWER, 15 V DC, 4 A

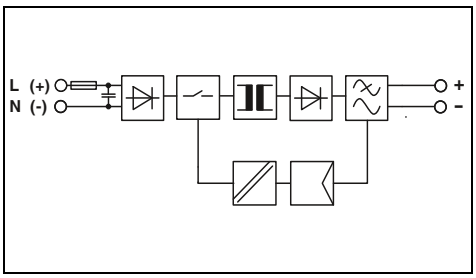
– Adjustable output voltage of 10 to 16.5 V DC

STEP POWER, 48 V DC, 2 A

– Adjustable output voltage of 30 to 56 V DC

N

Power supply, 1 AC, 5 V DC, 2 A



Technical data

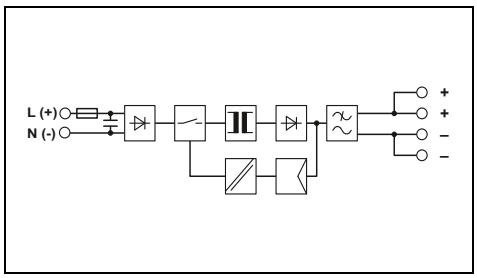
Input data	
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 95 V DC ... 250 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	0.2 A (120 V AC) / 0.13 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / < 0.1 A^2s
Mains buffering (I_N, typ.)	> 20 ms (120 V AC) / > 100 ms (230 V AC)
Output data	
Nominal output voltage	5 V DC ±1%
Setting range of the output voltage	-
Output current	2 A
Can be connected in parallel / series	Yes / Yes
Max. power dissipation (no load / nominal load)	< 0.4 W / < 2.7 W
Efficiency (typ.)	> 80 % (for 230 V AC and nominal values)
Residual ripple	< 20 mV_{PP}
Signaling	
Signaling DC OK	LED
General data	
Weight / Dimensions W x H x D	0.07 kg / 18 x 90 x 61 mm
Spacing when mounting	Alignable: 0 mm horizontally, 30 mm vertically
Connection method	Screw connection
Connection data solid / stranded / AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Degree of protection / Protection class	IP20 / II (in an enclosed control cabinet)
MTBF (EN 29500, 40°C)	> 500000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations	
Insulation voltage input/output	3.75 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310
Limitation of harmonic line currents	EN 61000-3-2

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched, 1-phase			
	STEP-PS/ 1AC/5DC/2	**2320513**	1

Power supply,
1 AC, 5 V DC, 6.5 A

Ex:



Technical data

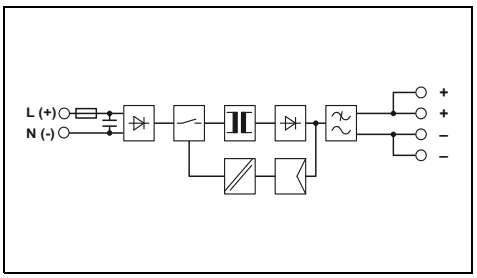
100 V AC ... 240 V AC 85 V AC ... 264 V AC / 95 V DC ... 250 V DC 45 Hz ... 65 Hz / 0 Hz 0.5 A (120 V AC) / 0.3 A (230 V AC) < 15 A / < 0.6 A^2s > 25 ms (120 V AC) / > 140 ms (230 V AC)
5 V DC ±1% 4 V DC ... 6.5 V DC (> 5 V constant capacity)
6.5 A Yes / Yes < 0.4 W / 8.1 W > 80 % (for 230 V AC and nominal values) < 50 mV_{PP}
LED
0.27 kg / 72 x 90 x 61 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 1111000 h -25 °C ... 70 °C (> 55° C derating)
3.75 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/ 5DC/6.5	**2868541**	1

Power supply,
1 AC, 15 V DC, 4 A

Ex:



Technical data

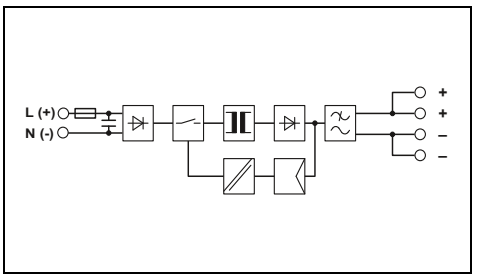
100 V AC ... 240 V AC 85 V AC ... 264 V AC / 95 V DC ... 250 V DC 45 Hz ... 65 Hz / 0 Hz 0.8 A (120 V AC) / 0.5 A (230 V AC) < 15 A / < 0.6 A^2s > 27 ms (120 V AC) / > 120 ms (230 V AC)
15 V DC ±1% 10 V DC ... 16.5 V DC (> 15 V constant capacity)
4 A Yes / Yes < 0.5 W / 8.6 W > 87 % (for 230 V AC and nominal values) < 55 mV_{PP}
LED
0.27 kg / 72 x 90 x 61 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 1134000 h -25 °C ... 70 °C (> 55° C derating)
3.75 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/15DC/4	**2868619**	1

Power supply,
1 AC, 48 V DC, 2 A

Ex:



Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC / 95 V DC ... 250 V DC 45 Hz ... 65 Hz / 0 Hz 1.3 A (120 V AC) / 0.8 A (230 V AC) < 15 A / < 1.4 A^2s > 20 ms (120 V AC) / > 120 ms (230 V AC)
48 V DC ±1% 30 V DC ... 56 V DC (> 48 V constant capacity)
2 A Yes / Yes < 0.9 W / 9.6 W > 90 % (for 230 V AC and nominal values) < 30 mV_{PP}
LED
0.33 kg / 90 x 90 x 61 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 1048000 h -25 °C ... 70 °C (> 55° C derating)
3.75 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) EN 61000-3-2

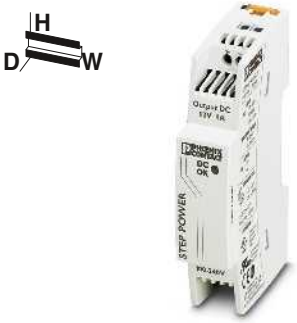
Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/48DC/2	**2868680**	1

STEP POWER - power supply units for distributor boards and flat control panels

STEP POWER, 1 AC, 12 V DC

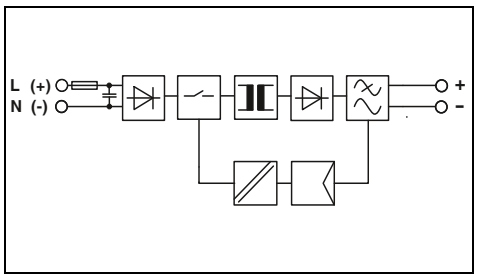
– Flexible assembly by simply snapping the product onto the DIN rail or screwing it onto an even surface
– Energy savings thanks to maximum energy efficiency and incredibly low no-load losses
– Wide temperature range from -25°C to +70°C
– Reliable power supply thanks to the high MTBF (mean time between failures) of more than 500,000 hours and the UI characteristic curve

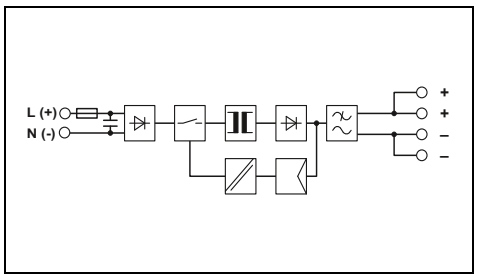


Power supply, 1 AC, 12 V DC, 1 A

Power supply, 1 AC, 12 V DC, 1.5 A, flat design

Ex:



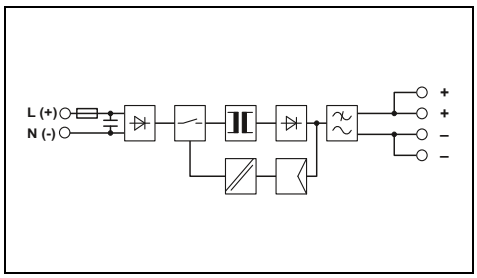


	Technical data	Technical data
Input data		
Nominal input voltage range	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 95 V DC ... 250 V DC	85 V AC ... 264 V AC / 95 V DC ... 250 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	0.26 A (120 V AC) / 0.13 A (230 V AC)	0.33 A (120 V AC) / 0.18 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / < 0.1 A^2s	< 15 A / < 0.1 A^2s
Mains buffering (I_N, typ.)	> 15 ms (120 V AC) / > 90 ms (230 V AC)	> 15 ms (120 V AC) / > 70 ms (230 V AC)
Output data		
Nominal output voltage	12 V DC ±1%	12 V DC ±1%
Setting range of the output voltage	-	-
Output current	1 A	1.5 A
Can be connected in parallel / series	Yes / Yes	Yes / Yes
Max. power dissipation (no load / nominal load)	< 0.4 W / < 2.8 W	< 0.4 W / < 3.2 W
Efficiency (typ.)	> 83 % (for 230 V AC and nominal values)	> 84 % (for 230 V AC and nominal values)
Residual ripple	< 20 mV_{PP}	< 75 mV_{PP}
Signaling		
Signaling DC OK	LED	LED
General data		
Weight / Dimensions W x H x D	0.07 kg / 18 x 90 x 61 mm	0.07 kg / 36 x 90 x 43 mm
Spacing when mounting	Alignable: 0 mm horizontally, 30 mm vertically	Alignable: 0 mm horizontally, 30 mm vertically
Connection method	Screw connection	Screw connection
Connection data solid / stranded / AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Degree of protection / Protection class	IP20 / II (in an enclosed control cabinet)	IP20 / II (in an enclosed control cabinet)
MTBF (EN 29500, 40°C)	> 1478000 h	> 1800000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations		
Insulation voltage input/output	3.75 kV AC (routine test) / 4 kV AC (type test)	3.75 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010	DIN VDE 0100-410 , DIN VDE 0106-1010
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
Limitation of harmonic line currents	EN 61000-3-2	EN 61000-3-2

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**STEP-PS/ 1AC/12DC/1**	**2868538**	1	**STEP-PS/ 1AC/12DC/1.5/FL**	**2868554**	1

**Power supply,
1 AC, 12 V DC, 1.5 A**

Ex:



Technical data

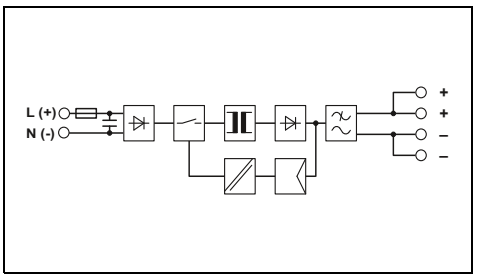
100 V AC ... 240 V AC 85 V AC ... 264 V AC / 95 V DC ... 250 V DC 45 Hz ... 65 Hz / 0 Hz 0.3 A (120 V AC) / 0.2 A (230 V AC) < 15 A / < 0.1 A^2s > 15 ms (120 V AC) / > 70 ms (230 V AC)
12 V DC ±1% -
1.5 A Yes / Yes < 0.4 W / < 3.2 W > 84 % (for 230 V AC and nominal values) < 75 mV_{PP}
LED
0.11 kg / 36 x 90 x 61 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 1800000 h -25 °C ... 70 °C (> 55° C derating)
3.75 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/12DC/1.5	**2868567**	1

**Power supply,
1 AC, 12 V DC, 3 A**

Ex:



Technical data

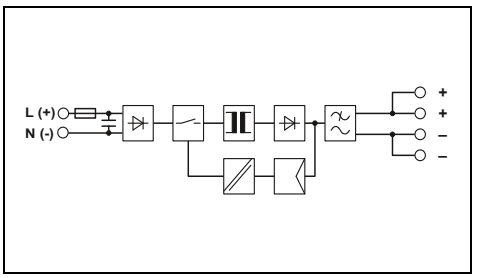
100 V AC ... 240 V AC 85 V AC ... 264 V AC / 95 V DC ... 250 V DC 45 Hz ... 65 Hz / 0 Hz 0.6 A (120 V AC) / 0.3 A (230 V AC) < 15 A / < 0.6 A^2s > 26 ms (120 V AC) / > 160 ms (230 V AC)
12 V DC ±1% 10 V DC ... 16.5 V DC (> 12 V constant capacity)
3 A Yes / Yes < 0.5 W / 6.4 W > 85 % (for 230 V AC and nominal values) < 40 mV_{PP}
LED
0.19 kg / 54 x 90 x 61 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 1689000 h -25 °C ... 70 °C (> 55° C derating)
3.75 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , NEC Class 2 as per UL 1310 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/12DC/3	**2868570**	1

**Power supply,
1 AC, 12 V DC, 5 A**

Ex:



Technical data

100 V AC ... 240 V AC 85 V AC ... 264 V AC / 95 V DC ... 250 V DC 45 Hz ... 65 Hz / 0 Hz 0.8 A (120 V AC) / 0.5 A (230 V AC) < 15 A / < 0.6 A^2s > 27 ms (120 V AC) / > 120 ms (230 V AC)
12 V DC ±1% 10 V DC ... 16.5 V DC (> 12 V constant capacity)
5 A Yes / Yes < 0.5 W / 8.6 W > 87 % (for 230 V AC and nominal values) < 55 mV_{PP}
LED
0.27 kg / 72 x 90 x 61 mm Alignable: 0 mm horizontally, 30 mm vertically Screw connection 0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12 IP20 / II (in an enclosed control cabinet) > 1134000 h -25 °C ... 70 °C (> 55° C derating)
3.75 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC IEC 60950-1/VDE 0805 (SELV) EN 50178/VDE 0160 (PELV) DIN VDE 0100-410 , DIN VDE 0106-1010 UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-PS/ 1AC/12DC/5	**2868583**	1

Power supply units for extreme ambient conditions

QUINT POWER, dip-coated

With ATEX approval for maximum system availability under extreme ambient conditions, such as dust, dirt, corrosive gases, and 100% humidity

– Complies with standard EN 60079-15 and may be installed in a potentially explosive area.
– They are suitable for use in Class I, Division 2, Groups A, B, C, D

MINI POWER EX

Corresponds to standard EN 60079-15

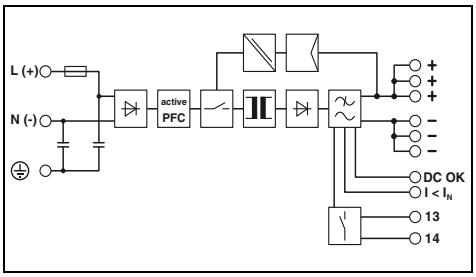
– Installation within potentially explosive area in which category 3G items are necessary

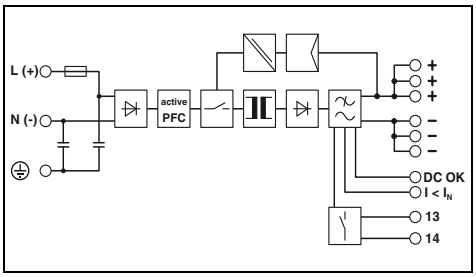
Notes:

MINI-PS...: DIN rail connector (optional), for routing through the supply voltage and data signal, two required per device (ME 17,5 TBUS 1,5/5-ST-3,81 GN, 2709561).

Power supply, dip-coated, 1 AC, 24 V DC, 5 A

Power supply, dip-coated, 1 AC, 24 V DC, 10 A

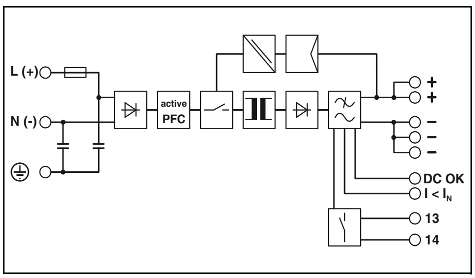




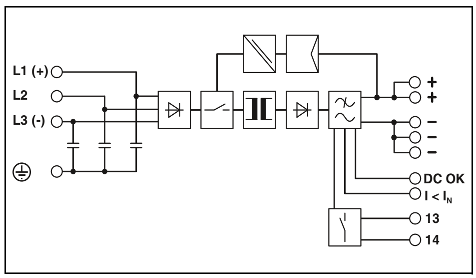
	Technical data	Technical data
Input data		
Nominal input voltage range	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 90 V DC ... 430 V DC	85 V AC ... 264 V AC / 90 V DC ... 430 V DC
Frequency range	45 Hz ... 65 Hz / 0 Hz	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	1.2 A (120 V AC) / 0.6 A (230 V AC)	2.24 A (120 V AC) / 1.33 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / < 1 A^2s	< 15 A / < 1.5 A^2s
Mains buffering (I_N, typ.)	> 25 ms (120 V AC) / > 25 ms (230 V AC)	> 27 ms (120 V AC) / > 31 ms (230 V AC)
Output data		
Nominal output voltage	24 V DC ±1%	24 V DC ±1%
Setting range of the output voltage	18 V DC ... 29.5 V DC (> 24 V constant capacity)	18 V DC ... 29.5 V DC (> 24 V constant capacity)
Output current / POWER BOOST / SFB (12 ms)	5 A / 7.5 A / 30 A	10 A / 15 A / 60 A
Magnetic fuse tripping	B2 , B4 , C2	B2 , B4 , B6 , C2 , C4
Can be connected in parallel / series	Yes / Yes	Yes / Yes
Max. power dissipation (no load / nominal load)	3 W / 15 W	9.1 W / 22 W
Efficiency (typ.)	> 90 % (for 230 V AC and nominal values)	> 92.5 % (for 230 V AC and nominal values)
Residual ripple	< 40 mV_{PP}	< 50 mV_{PP}
Signaling		
Signaling DC OK	LED, active switching output, relay contact	LED, active switching output, relay contact
Boost signaling	LED, active switching output	LED, active switching output
General data		
Weight / Dimensions W x H x D	0.7 kg / 40 x 130 x 125 mm	1.1 kg / 60 x 130 x 125 mm
Spacing when mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Plug-in screw connection	Plug-in screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 20 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12
Degree of protection / Protection class	IP20 / I	IP20 / I
MTBF (EN 29500, 40°C)	> 635000 h	> 535000 h
Ambient temperature (operation)	-40 °C ... 70 °C (ATEX/IECEx: -25°C ... +60°C)	-40 °C ... 70 °C (ATEX/IECEx: -25°C ... +60°C)
Standards/regulations		
Insulation voltage input/output	2 kV AC (routine test) / 4 kV AC (type test)	2 kV AC (routine test) / 4 kV AC (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	IEC 60950-1/VDE 0805 (SELV)	IEC 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-1010	DIN VDE 0100-410 , DIN VDE 0106-1010
Rail applications	EN 50121-4 / EN 50155	EN 50121-4 / EN 50155
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
Limitation of harmonic line currents	EN 61000-3-2	EN 61000-3-2

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched						
	QUINT-PS/ 1AC/24DC/ 5/CO	**2320908**	1	**QUINT-PS/ 1AC/24DC/10/CO**	**2320911**	1

Power supply, dip-coated, 1 AC, 24 V DC, 20 A

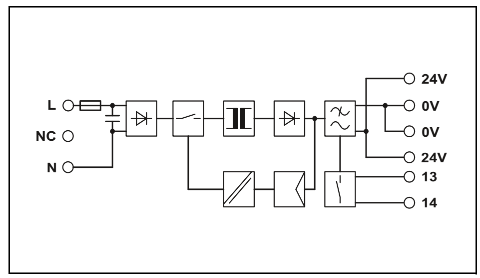


Power supply, dip-coated, 3 AC, 24 V DC, 20 A



Power supply 1 AC, 24 DC, 1.5 A DIN rail connector optional

Ex:



Technical data

100 V AC ... 240 V AC	3x 400 V AC ... 500 V AC	100 V AC ... 240 V AC
85 V AC ... 264 V AC / 90 V DC ... 350 V DC	320 V AC ... 575 V AC / 450 V DC ... 800 V DC	85 V AC ... 264 V AC
45 Hz ... 65 Hz / 0 Hz	45 Hz ... 65 Hz / 0 Hz	45 Hz ... 65 Hz
5.1 A (120 V AC) / 2.3 A (230 V AC)	3x 1.6 A (400 V AC) / 3x 1.3 A (500 V AC)	0.75 A (120 V AC) / 0.45 A (230 V AC)
< 20 A / < 3.2 A^2s	< 20 A / < 3.2 A^2s	< 15 A / 0.6 A^2s
> 20 ms (120 V AC) / > 20 ms (230 V AC)	> 15 ms (400 V AC) / > 25 ms (500 V AC)	> 20 ms (120 V AC) / > 100 ms (230 V AC)
24 V DC ±1%	24 V DC ±1%	24 V DC ±1%
18 V DC ... 29.5 V DC (> 24 V constant capacity)	18 V DC ... 29.5 V DC (> 24 V constant capacity)	-
20 A / 26 A / 120 A	20 A / 26 A / 120 A	1.5 A / 2 A
B2 , B4 , B6 , B10 , B16 , C2 , C4 , C6	B2 , B4 , B6 , B10 , B16 , C2 , C4 , C6	-
Yes / Yes	Yes / Yes	Yes / Yes
8 W / 40 W	11 W / 40 W	2.5 W / 12 W
> 93 % (for 230 V AC and nominal values)	> 93 % (at 400 V AC and nominal values)	> 84 % (for 230 V AC and nominal values)
< 30 mV_{PP}	< 40 mV_{PP}	< 40 mV_{PP}
LED, active switching output, relay contact	LED, active switching output, relay contact	LED, relay contact
LED, active switching output	LED, active switching output	-
1.7 kg / 90 x 130 x 125 mm	1.5 kg / 69 x 130 x 125 mm	0.25 kg / 35 x 99 x 95 mm
Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Can be aligned: Horizontally 0 mm, vertically 50 mm
Screw connection	Screw connection	Plug-in screw connection
0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 12 - 10	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 12 - 10	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 18 - 10	0.5 - 16 mm^2 / 0.5 - 10 mm^2 / 20 - 6
IP20 / I	IP20 / I	IP20 / II (in an enclosed control cabinet)
> 520000 h	> 534000 h	> 2789000 h
-25 °C ... 70 °C (> 60 °C derating)	-40 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60 °C derating)
2 kV AC (routine test) / 4 kV AC (type test)	2 kV AC (routine test) / 4 kV AC (type test)	3 kV AC (routine test) / 4 kV AC (type test)
Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
IEC 60950-1/VDE 0805 (SELV)	IEC 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410 , DIN VDE 0106-1010	DIN VDE 0100-410 , DIN VDE 0106-1010	DIN VDE 0100-410 , DIN VDE 0106-1010
EN 50121-4 / EN 50155	EN 50121-4 / EN 50155	-
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950
EN 61000-3-2	EN 61000-3-2	EN 61000-3-2

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-PS/ 1AC/24DC/20/CO	2320898	1
QUINT-PS/ 3AC/24DC/20/CO	2320924	1
MINI-PS-100-240AC/24DC/1.5/EX	2866653	1

QUINT and MINI DC/DC converters alter the voltage level, regenerate the voltage at the end of long cables, or enable the creation of independent supply systems by means of electrical isolation.

There are numerous fields of application for DC/DC converters. As the name suggests, they convert voltages in order to match different voltage levels to one another. On long supply lines, they raise the voltage to compensate for voltage drops.

DC/DC converters separate circuits from each other using electrical isolation and protect the sensitive loads by decoupling them. The primary-switched switching devices have an internal intermediate circuit. This acts as a filter. This means, for example, that grounded and ungrounded circuits can be kept separate. A further advantage is the protection of critical loads from damaging voltage fluctuations: if, for example, a motor is switched on that requires a higher current for the starting torque, there is a short voltage dip. The same occurs when loads with high input capacities are switched on. Troubleshooting these temporary faults is often difficult and time-consuming.

DC/DC converters are also ideal in battery-supported power supply networks or solutions with unregulated transformers, when sensitive loads require a stable DC.

QUINT POWER for maximum system availability

Cost-effective selective fuse protection with SFB technology:

In order to trip standard circuit breakers magnetically and quickly, power supply units must be able to supply several times the nominal current for a short period. With SFB (Selective Fuse Breaking) technology, which supplies up to 6 times the nominal current for 12 ms, a dynamic power reserve is available. Faulty current paths are selectively switched off, the fault is isolated, and important system components remain operational.

Preventive function monitoring:

Comprehensive diagnostics are provided through constant monitoring of the output voltage and current. This constant, preventive monitoring of input voltage, output voltage, and output current visualizes critical operating states before errors can occur. Remote monitoring is provided by means of active switching outputs and floating relay contacts.

POWER BOOST power reserve:

The static power reserve offers up to 1.25 times the nominal current permanently. At ambient temperatures of up to +40°C the POWER BOOST is continuously available and at higher temperatures, it is available for a few minutes. This ensures that both high inrush currents of capacitive loads, as well as loads with DC/DC converters in the primary circuit, can be reliably supplied.

For maximum system availability

The unique SFB technology and preventive function monitoring maximize the availability of your application.

– Quick tripping of the standard power circuit breakers
– Preventive function monitoring
– Reliable starting of heavy loads

Maximum system availability with SFB technology

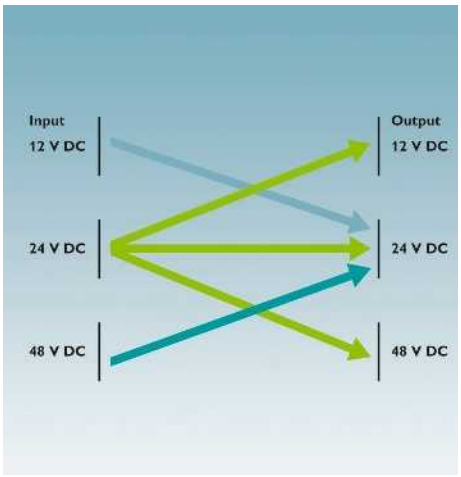
SFB technology using a frayed display cable as an example:

– The fuse triggers immediately, the lower lever display is dark.
– The controller, sensors, and actuators continue to operate without interruption.
– Production continues.

MINI DC/DC converter - for control technology

MINI DC/DC converters come into their own in fields where modular electronics housing has become the standard.

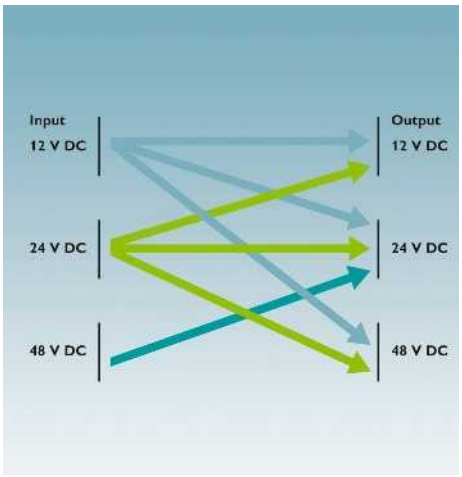
– Service-friendly connection technology with COMBICON encoded plug-in connectors
– Active function monitoring with switching output for remote monitoring of the output voltage



Voltage levels of QUINT DC/DC converters

The QUINT DC/DC converters alter the voltage level:

– Input voltages: 12 V DC, 24 V DC, 48 V DC
– Output voltages: 12 V DC, 24 V DC, 48 V DC



Voltage levels of MINI DC/DC converters

The MINI DC/DC converters alter the voltage level:

– Input voltages: 12 V DC, 24 V DC, 48 V DC
– Output voltages: 5...15 V DC, 24 V DC, 48 V DC

TRIO for frequency inverters

– Direct connection to the 600 V DC intermediate circuit of a frequency inverter
– Mains failure: 24 V loads continue to be supplied using the kinetic energy of the motor. In this case, the motors act as generators and supply energy to the intermediate circuit.

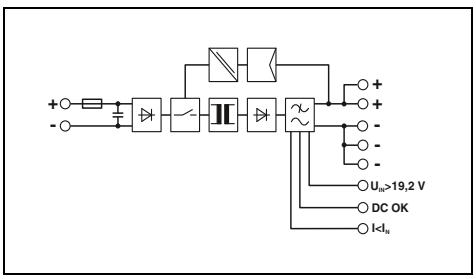
Details about this product can be found on page 178

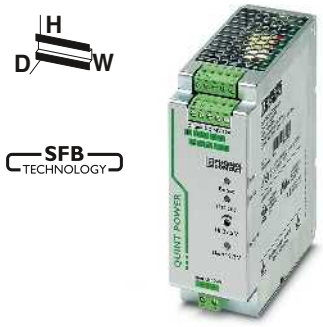
QUINT DC/DC converters, 24 V DC

- Support conversion to various voltage levels
- Constant voltage: output voltage regenerated even at the end of long cables
- Electrical isolation: for setting up independent supply systems
- SFB technology: fast tripping of standard circuit breakers, thanks to the dynamic power reserve with up to 6 times the nominal current for 12 ms
- Reliable starting of heavy loads thanks to the static POWER BOOST power reserve with permanently up to 125% of the nominal current
- Preventive function monitoring warns against critical operating states before errors occur

DC/DC converter,
24 V DC / 24 V DC, 5 A

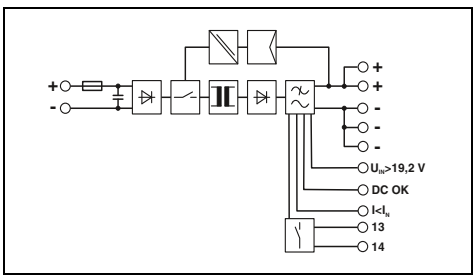
Ex:





DC/DC converter,
24 V DC / 24 V DC, 10 A

Ex:

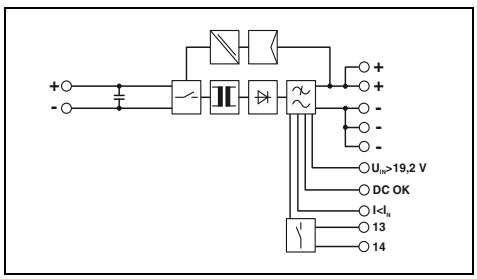


	Technical data	Technical data
Input data		
Nominal input voltage	24 V DC	24 V DC
DC input voltage range	18 V DC ... 32 V DC	18 V DC ... 32 V DC
Current consumption (POWER BOOST)	7 A (24 V DC)	14 A (24 V DC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / < 0.5 A^2s	< 15 A / < 2.7 A^2s
Mains buffering (I_N, typ.)	> 10 ms (24 V DC)	> 12 ms (24 V DC)
Output data		
Nominal output voltage	24 V DC ±1%	24 V DC ±1%
Setting range of the output voltage	18 V DC ... 29.5 V DC (> 24 V constant capacity)	18 V DC ... 29.5 V DC (> 24 V constant capacity)
Output current / POWER BOOST / SFB (12 ms)	5 A / 6.25 A / 30 A	10 A / 12.5 A / 60 A
Magnetic fuse tripping	B2 , B4 , C2	B2 , B4 , B6 , C2 , C4
Can be connected in parallel / series	Yes / Yes	Yes / Yes
Max. power dissipation (no load / nominal load)	2.4 W / 11.4 W	1.6 W / 24 W
Efficiency (typ.)	> 92 %	> 92 %
Residual ripple	< 20 mV_{PP}	< 20 mV_{PP}
Signaling		
Signaling DC OK	LED, active switching output	LED, active switching output, relay contact
Boost signaling	LED, active switching output	LED, active switching output
U_{IN} signaling	LED, active switching output	LED, active switching output
General data		
Weight / Dimensions W x H x D	0.7 kg / 32 x 130 x 125 mm	0.9 kg / 48 x 130 x 125 mm
Spacing when mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Plug-in screw connection	Plug-in screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Degree of protection / Protection class	IP20 / III	IP20 / III
MTBF (EN 29500, 40°C)	> 890000 h	> 763000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60 °C derating)
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, no condensation)	≤ 95 % (at 25 °C, no condensation)
Standards/regulations		
Insulation voltage input/output	1 kV (routine test) / 1.5 kV (type test)	1 kV (routine test) / 1.5 kV (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410	DIN VDE 0100-410
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
DC/DC converter, primary switched mode	**QUINT-PS/24DC/24DC/ 5**	**2320034**	1	**QUINT-PS/24DC/24DC/10**	**2320092**	1

DC/DC converter,
24 V DC / 24 V DC, 20 A

Ex:



Technical data	
Input	24 V DC
Input voltage range	18 V DC ... 32 V DC
Input current	28 A (24 V DC)
Inrush current	< 26 A / < 11 A²s
Power failure bridging	> 10 ms (24 V DC)
Output	24 V DC ±1%
Adjustment range	18 V DC ... 29.5 V DC (> 24 V constant capacity)
Rated output current	20 A / 25 A / 120 A
Characteristic curve	B2 , B4 , B6 , B10 , B16 , C2 , C4 , C6
Parallel connection for increased power	Yes / Yes
Power dissipation	2.2 W / 39 W
Efficiency	> 93 %
Residual ripple	< 20 mV_{PP}
Status indication	LED, active switching output, relay contact
Status indication	LED, active switching output
Status indication	LED, active switching output
Mechanical data	1.7 kg / 82 x 130 x 125 mm
Mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Screw connection
Connection data	0.5 - 16 mm² / 0.5 - 16 mm² / 8 - 6
Connection data	0.2 - 6 mm² / 0.2 - 4 mm² / 12 - 10
Connection data	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Degree of protection	IP20 / III
MTBF	> 554000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)
Ambient temperature (storage)	≤ 95 % (at 25 °C, no condensation)
Surge protection	1 kV (routine test) / 1.5 kV (type test)
Conformance	Conformance with EMC Directive 2004/108/EC
Conformance	EN 60950-1/VDE 0805 (SELV)
Conformance	EN 50178/VDE 0160 (PELV)
Conformance	DIN VDE 0100-410
Approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

Ordering data		
Type	Order No.	Pcs. / Pkt.
QUINT-PS/24DC/24DC/20	**2320102**	1

DC/DC converter,
24 V DC / 12 V DC, 8 A

Ex:

Technical data	
Input	24 V DC
Input voltage range	18 V DC ... 32 V DC
Input current	6 A (24 V DC)
Inrush current	< 15 A / < 0.5 A²s
Power failure bridging	> 10 ms (24 V DC)
Output	12 V DC ±1%
Adjustment range	5 V DC ... 18 V DC (> 12 V constant capacity)
Rated output current	8 A / 10 A / 48 A
Characteristic curve	B2 , B4 , C2
Parallel connection for increased power	Yes / Yes
Power dissipation	2 W / 10.5 W
Efficiency	> 90 %
Residual ripple	< 20 mV_{PP}
Status indication	LED, active switching output
Status indication	LED, active switching output
Status indication	LED, active switching output
Mechanical data	0.7 kg / 32 x 130 x 125 mm
Mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Plug-in screw connection
Connection data	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Connection data	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Connection data	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Degree of protection	IP20 / III
MTBF	> 843000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)
Ambient temperature (storage)	≤ 95 % (at 25 °C, no condensation)
Surge protection	1 kV (routine test) / 1.5 kV (type test)
Conformance	Conformance with EMC Directive 2004/108/EC
Conformance	EN 60950-1/VDE 0805 (SELV)
Conformance	EN 50178/VDE 0160 (PELV)
Conformance	DIN VDE 0100-410
Approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

Ordering data		
Type	Order No.	Pcs. / Pkt.
QUINT-PS/24DC/12DC/ 8	**2320115**	1

DC/DC converter,
24 V DC / 48 V DC, 5 A

Ex:

Technical data	
Input	24 V DC
Input voltage range	18 V DC ... 32 V DC
Input current	14 A (24 V DC)
Inrush current	< 15 A / 3 A²s
Power failure bridging	> 12 ms (24 V DC)
Output	48 V DC ±1%
Adjustment range	30 V DC ... 56 V DC (> 48 V constant capacity)
Rated output current	5 A / 6.25 A / 30 A
Characteristic curve	B2 , B4 , C2
Parallel connection for increased power	Yes / Yes
Power dissipation	5.2 W / 21 W
Efficiency	> 92.5 %
Residual ripple	< 20 mV_{PP}
Status indication	LED, active switching output, relay contact
Status indication	LED, active switching output
Status indication	LED, active switching output
Mechanical data	0.9 kg / 48 x 130 x 125 mm
Mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Plug-in screw connection
Connection data	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Connection data	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Connection data	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Degree of protection	IP20 / III
MTBF	> 461000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)
Ambient temperature (storage)	≤ 95 % (at 25 °C, no condensation)
Surge protection	1 kV (routine test) / 1.5 kV (type test)
Conformance	Conformance with EMC Directive 2004/108/EC
Conformance	EN 60950-1/VDE 0805 (SELV)
Conformance	EN 50178/VDE 0160 (PELV)
Conformance	DIN VDE 0100-410
Approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

Ordering data		
Type	Order No.	Pcs. / Pkt.
QUINT-PS/24DC/48DC/ 5	**2320128**	1

QUINT DC/DC converters

QUINT DC/DC converter, 12 and 48 V DC

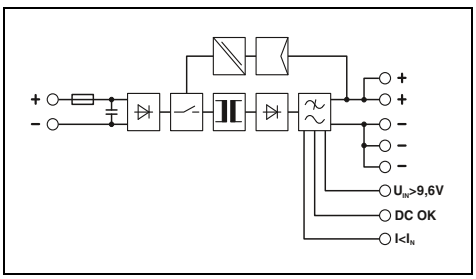
– SFB technology: quick tripping of standard circuit breakers
– Reliably start difficult loads, thanks to the static POWER BOOST power reserve
– Preventive function monitoring

QUINT DC/DC converter, 24 V DC, dip-coated

– For maximum system availability under extreme ambient conditions, such as dust, dirt, corrosive gases, and 100% humidity
– They are suitable for use in Class I, Division 2, Groups A, B, C, D

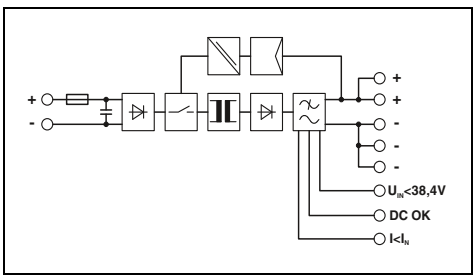
DC/DC converter,
12 V DC / 24 V DC, 5 A

Ex:



DC/DC converter,
48 V DC / 24 V DC, 5 A

Ex:



	Technical data	Technical data
Input data		
Nominal input voltage	12 V DC	48 V DC
DC input voltage range	9 V DC ... 18 V DC	30 V DC ... 60 V DC
Current consumption (POWER BOOST)	15 A (12 V DC)	3.5 A (48 V DC)
Inrush current limitation at 25°C (typ.) / I^2t	< 12 A / < 0.3 A^2s	< 5 A / < 0.2 A^2s
Mains buffering (I_N, typ.)	> 3 ms (12 V DC)	> 14 ms (48 V DC)
Output data		
Nominal output voltage	24 V DC ±1%	24 V DC ±1%
Setting range of the output voltage	18 V DC ... 29.5 V DC (> 24 V constant capacity)	18 V DC ... 29.5 V DC (> 24 V constant capacity)
Output current / POWER BOOST / SFB (12 ms)	5 A / 6.25 A / 30 A	5 A / 6.25 A / 30 A
Magnetic fuse tripping	B2 , B4 , C2	B2 , B4 , C2
Can be connected in parallel / series	Yes / Yes	Yes / Yes
Max. power dissipation (no load / nominal load)	2 W / 13.5 W	2.7 W / 11 W
Efficiency (typ.)	> 90 %	> 91.5 %
Residual ripple	< 75 mV_{PP}	< 25 mV_{PP}
Signaling		
Signaling DC OK	LED, active switching output	LED, active switching output
Boost signaling	LED, active switching output	LED, active switching output
U_{IN} signaling	LED, active switching output	LED, active switching output
General data		
Weight / Dimensions W x H x D	0.7 kg / 32 x 130 x 125 mm	0.7 kg / 32 x 130 x 125 mm
Spacing when mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Plug-in screw connection	Plug-in screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 18 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 18 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 18 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 18 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 18 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 18 - 12
Degree of protection / Protection class	IP20 / III	IP20 / III
MTBF (EN 29500, 40°C)	> 1005000 h	> 995000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60 °C derating)
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, no condensation)	≤ 95 % (at 25 °C, no condensation)
Standards/regulations		
Insulation voltage input/output	1 kV (routine test) / 1.5 kV (type test)	1 kV (routine test) / 1.5 kV (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410	DIN VDE 0100-410
Rail applications	-	-
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

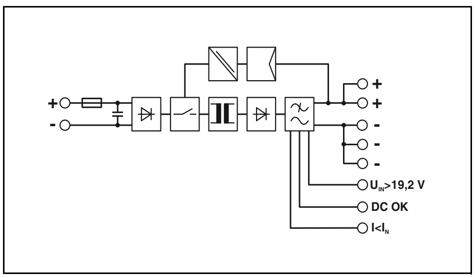
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
DC/DC converter, primary switched mode	**QUINT-PS/12DC/24DC/5**	**2320131**	1	**QUINT-PS/48DC/24DC/5**	**2320144**	1

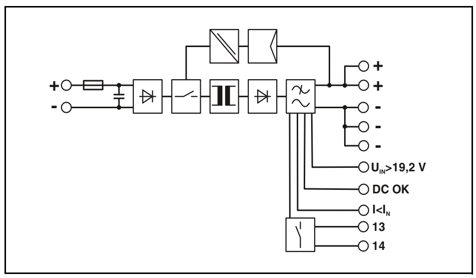
DC/DC converter, dip-coated, 24 V DC/24 V DC, 5 A	DC/DC converter, dip-coated, 24 V DC/24 V DC, 10 A	DC/DC converter, dip-coated, 24 V DC/24 V DC, 20 A
N	N	N

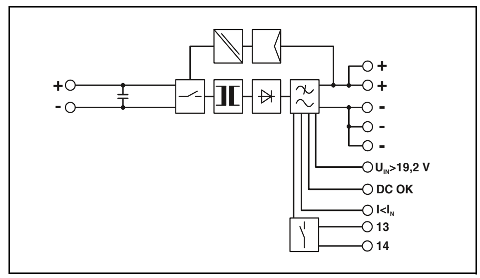
DC/DC converter, dip-coated, 24 V DC/24 V DC, 5 A

DC/DC converter, dip-coated, 24 V DC/24 V DC, 10 A

DC/DC converter, dip-coated, 24 V DC/24 V DC, 20 A







Technical data

5 A	10 A	20 A
24 V DC	24 V DC	24 V DC
18 V DC ... 32 V DC	18 V DC ... 32 V DC	18 V DC ... 32 V DC
7 A (24 V DC)	14 A (24 V DC)	28 A (24 V DC)
< 15 A / < 0.5 A^{2}s	< 15 A / < 2.7 A^{2}s	< 26 A / < 11 A^{2}s
> 10 ms (24 V DC)	> 12 ms (24 V DC)	> 10 ms (24 V DC)
24 V DC ±1%	24 V DC ±1%	24 V DC ±1%
18 V DC ... 29.5 V DC (> 24 V constant capacity)	18 V DC ... 29.5 V DC (> 24 V constant capacity)	18 V DC ... 29.5 V DC (> 24 V constant capacity)
5 A / 6.25 A / 30 A	10 A / 12.5 A / 60 A	20 A / 25 A / 120 A
B2 , B4 , C2	B2 , B4 , B6 , C2 , C4	B2 , B4 , B6 , B10 , B16 , C2 , C4 , C6
Yes / Yes	Yes / Yes	Yes / Yes
2.4 W / 11.4 W	1.6 W / 24 W	2.2 W / 39 W
> 92 %	> 92 %	> 93 %
< 20 mV$_{PP}$	< 20 mV$_{PP}$	< 20 mV$_{PP}$
LED, active switching output	LED, active switching output, relay contact	LED, active switching output, relay contact
LED, active switching output	LED, active switching output	LED, active switching output
LED, active switching output	LED, active switching output	LED, active switching output
0.7 kg / 32 x 130 x 125 mm	0.9 kg / 60 x 130 x 125 mm	1.7 kg / 82 x 130 x 125 mm
Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Plug-in screw connection	Plug-in screw connection	Screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.5 - 16 mm^2 / 0.5 - 16 mm^2 / 8 - 6
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 12 - 10
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
IP20 / III	IP20 / III	IP20 / III
> 890000 h	> 763000 h	> 554000 h
-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60 °C derating)
100 % (at 25 °C, no condensation)	100 % (at 25 °C, no condensation)	100 % (at 25 °C, no condensation)
1 kV (routine test) / 1.5 kV (type test)	1 kV (routine test) / 1.5 kV (type test)	1 kV (routine test) / 1.5 kV (type test)
Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
DIN VDE 0100-410	DIN VDE 0100-410	DIN VDE 0100-410
EN 50121-4 / EN 50155	EN 50121-4 / EN 50155	EN 50121-4 / EN 50155
UL applied for	UL applied for	UL applied for

Ordering data

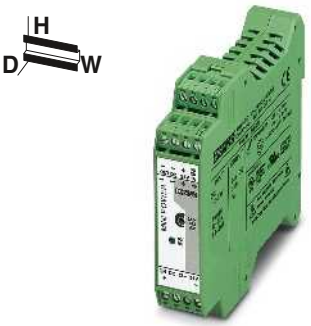
Type	Order No.	Pcs. / Pkt.
QUINT-PS/24DC/24DC/5/CO	**2320542**	1
QUINT-PS/24DC/24DC/10/CO	**2320555**	1
QUINT-PS/24DC/24DC/20/CO	**2320568**	1

MINI DC/DC converters

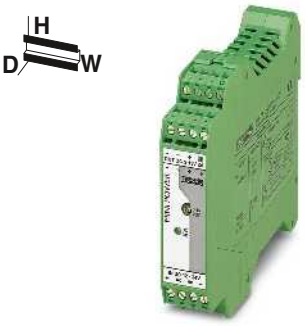
- Support conversion to various voltage levels
- Constant voltage: output voltage regenerated even at the end of long cables
- Electrical isolation: for setting up independent supply systems

MINI AC power terminal block

- For supplying MINI DC/DC converters from unregulated AC networks
- A transformer's AC voltage is rectified and filtered

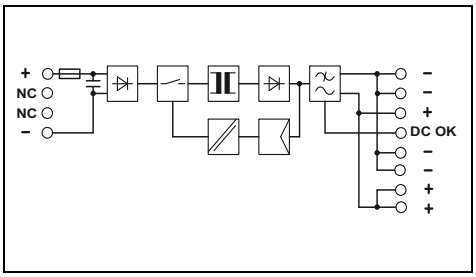


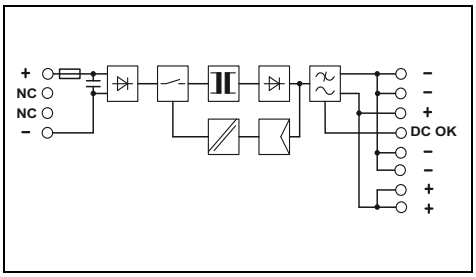
DC/DC converter,
12 - 24 V DC / 24 V DC, 1 A



DC/DC converter,
12 - 24 V DC / 5 - 15 V DC, 2 A

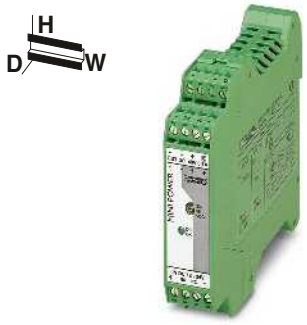
Ex:



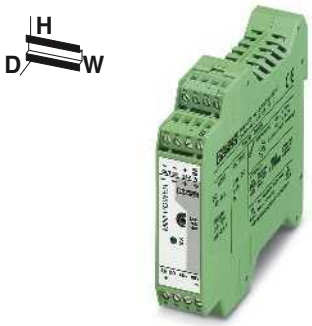


	Technical data	Technical data
Input data		
Nominal input voltage range	12 V DC ... 24 V DC	12 V DC ... 24 V DC
Input voltage range AC/DC	- / 10 V DC ... 32 V DC	- / 10 V DC ... 32 V DC
Current consumption (nominal load)	2.6 A (12 V DC) / 1.3 A (24 V DC)	2.3 A (12 V DC) / 1.1 A (24 V DC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / 1.8 A^2s	< 10 A / 0.2 A^2s
Output data		
Nominal output voltage	24 V DC ±1%	12 V DC ±1%
Setting range of the output voltage	22.5 V DC ... 28.5 V DC (> 24 V constant capacity)	5 V DC ... 15 V DC
Output current	1 A	2 A
Can be connected in parallel / series	Yes / Yes	Yes / Yes
Max. power dissipation (no load / nominal load)	< 1.2 W / < 5 W	< 1 W / < 4.2 W
Efficiency (typ.)	> 83 % (at 24 V DC and nominal values)	> 88 % (at 24 V DC and nominal values)
Residual ripple	< 30 mV_{PP}	< 20 mV_{PP}
Signaling		
Signaling DC OK	LED, active switching output	LED, active switching output
General data		
Weight / Dimensions W x H x D	0.2 kg / 22.5 x 99 x 107 mm	0.2 kg / 22.5 x 99 x 107 mm
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Plug-in screw connection	Plug-in screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Degree of protection / Protection class	IP20 / III	IP20 / III
MTBF (EN 29500, 40°C)	> 2569000 h	> 2072000 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> +60°C derating)
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, no condensation)	≤ 95 % (At +25°C, no condensation)
Standards/regulations		
Insulation voltage input/output	1 kV (routine test) / 1.5 kV (type test)	1 kV (routine test) / 1.5 kV (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
Safe isolation	DIN VDE 0100-410 , DIN VDE 0106-101	DIN VDE 0100-410 , DIN VDE 0106-101
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

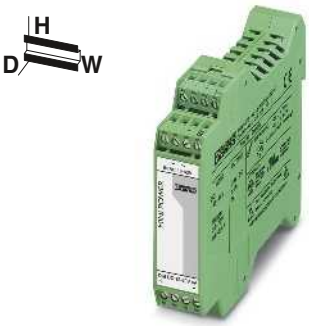
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
DC/DC converter, primary switched mode						
	MINI-PS- 12- 24DC/24DC/1	**2866284**	1	**MINI-PS- 12- 24DC/ 5-15DC/2**	**2320018**	1



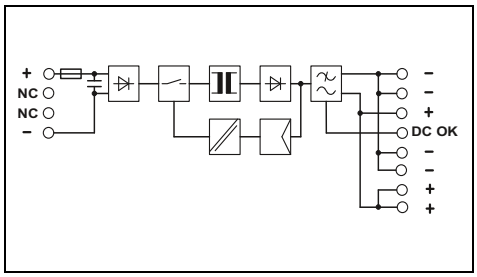
**DC/DC converter,
12 - 24 V DC / 48 V DC, 0.7 A**

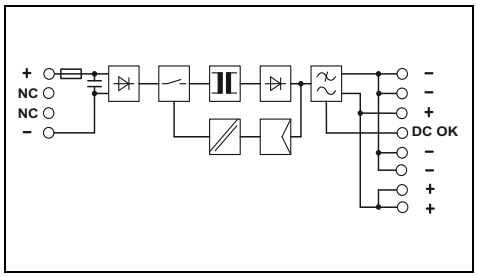


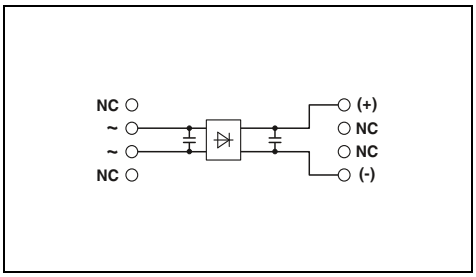
**DC/DC converter,
48 - 60 V DC / 24 V DC, 1 A**



**AC power terminal for
MINI DC/DC converter**







Technical data

12 V DC ... 24 V DC	
- / 10 V DC ... 32 V DC	
3.2 A (12 V DC) / 1.6 A (24 V DC)	
< 10 A / 0.3 A²s	
48 V DC ±1%	
30 V DC ... 56 V DC (> 48 V constant capacity)	
0.7 A	
Yes / Yes	
< 1.5 W / < 4.5 W	
> 87 % (at 24 V DC and nominal values)	
< 20 mV_{PP}	
LED, active switching output	
0.2 kg / 22.5 x 99 x 107 mm	
Can be aligned: Horizontally 0 mm, vertically 50 mm	
Plug-in screw connection	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
IP20 / III	
> 1993000 h	
-25 °C ... 70 °C (> +60°C derating)	
≤ 95 % (At +25°C, no condensation)	
1 kV (routine test) / 1.5 kV (type test)	
Conformance with EMC Directive 2004/108/EC	
EN 60950-1/VDE 0805 (SELV)	
EN 50178/VDE 0160 (PELV)	
DIN VDE 0100-410 , DIN VDE 0106-101	
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-PS- 12- 24DC/48DC/0.7	**2320021**	1

Technical data

48 V DC ... 60 V DC	
- / 36 V DC ... 75 V DC	
0.6 A (48 V DC) / 0.5 A (60 V DC)	
< 15 A / 1.8 A²s	
24 V DC ±1%	
22.5 V DC ... 28.5 V DC (> 24 V constant capacity)	
1 A	
Yes / Yes	
< 1.2 W / < 5 W	
> 85 % (at 60 V DC and nominal values)	
< 40 mV_{PP}	
LED, active switching output	
0.2 kg / 22.5 x 99 x 107 mm	
Can be aligned: Horizontally 0 mm, vertically 50 mm	
Plug-in screw connection	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
IP20 / II	
> 1147000 h	
-25 °C ... 70 °C (> 60 °C derating)	
≤ 95 % (at 25 °C, no condensation)	
1 kV (routine test) / 1.5 kV (type test)	
Conformance with EMC Directive 2004/108/EC	
EN 60950-1/VDE 0805 (SELV)	
EN 50178/VDE 0160 (PELV)	
DIN VDE 0100-410 , DIN VDE 0106-101	
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-PS- 48- 60DC/24DC/1	**2866271**	1

Technical data

10 V AC ... 42 V AC	
0 V AC ... 42 V AC	
6.5 A	
< 45 A / 8 A²s	
24 V DC ±1%	
-	
3 A	
Yes / No	
< 0.04 W / < 6.9 W	
> 95.7 % (For 42 V AC and nominal values)	
< 3.6 V_{PP}	
-	
0.16 kg / 22.5 x 99 x 107 mm	
Can be aligned: Horizontally 0 mm, vertically 50 mm	
Plug-in screw connection	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	
- / - / -	
IP20 / III	
> 18175000 h	
-25 °C ... 70 °C (> 60 °C derating)	
≤ 95 % (at 25 °C, no condensation)	
1 kV (routine test) / 1.5 kV (type test)	
Conformance with EMC Directive 2004/108/EC	
EN 60950-1/VDE 0805 (SELV)	
EN 50178/VDE 0160 (PELV)	
-	
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-PS- 10- 42AC/15-60DC/3	**2320199**	1

Maximum availability due to redundancy modules

To prevent the effects of errors on the load in a redundant system and increase the operational reliability, power supply units should be decoupled from one another with a redundancy module. Only by doing this, is it possible to ensure that an incorrectly connected power supply unit or a short circuit does not have an effect on the load.

Simple decoupling with STEP and QUINT DIODE redundancy modules

If the power supply units are decoupled, a short circuit at the output of one of the power supply units or in the supply line from the power supply unit to the diode no longer has any effect on the load.

Decoupling and monitoring with TRIO DIODE redundancy modules

The redundancy modules check the output voltages of the power supply units, as well as the wiring up to the redundancy module itself. Should one of these pathways short circuit, the load will continue to be supplied. Cable breaks are also detected and reported.

Decoupling, monitoring, and closed-loop control by means of the QUINT ORING active redundancy modules

The QUINT ORING active redundancy modules monitor the entire redundancy solution. They detect critical operating states and inform the user in good time. For example, faulty wiring or defective cables are reported.

QUINT ORING redundancy module for maximum system availability

Constant monitoring of input voltage, output current, and decoupling section
– ACB technology doubles the service life
– Energy savings of 70% by using MOSFETs over diodes
– Two positive output terminals

ACB technology doubles the service life

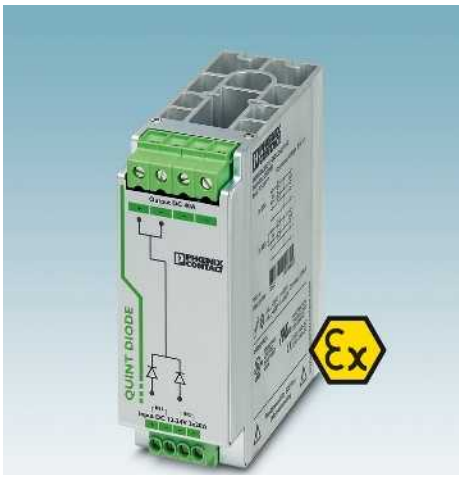
The ACB (Auto Current Balancing) technology provides symmetrical loading of the power supply units, thereby reducing the operating temperature. This means up to double the service life of the redundant system.

Continuous monitoring

QUINT ORING detects critical operating states within the entire supply path and notifies the operator in good time.

Monitoring
– Power supply unit voltages
– Wiring
– Decoupling section
– Load current

TRIO DIODE redundancy module
– Permanent redundancy monitoring
– Consistent redundancy up to the load
– Flexible: nominal voltages of 12 V DC to 48 V DC



Redundancy module QUINT DIODE
– Rugged design for currents of up to 60 A
– Consistent redundancy up to the load
– Flexible: nominal voltages of 12 V DC to 48 V DC

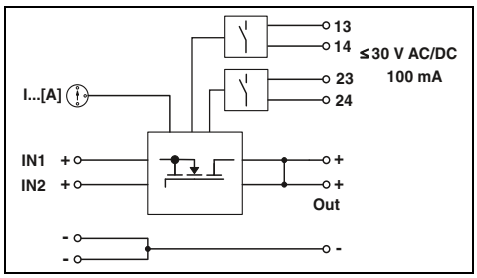
STEP DIODE redundancy module
– Space-saving: design width of just 18 mm
– Consistent redundancy up to the load
– Flexible: nominal voltages of 5 V DC to 24 V DC

QUINT ORING, 24 V DC

- Preventive function monitoring: permanent monitoring of the input voltage, output current, and decoupling section
- Continuous redundancy right through to the load: the use of two Plus output terminal blocks makes it possible to devise a redundant wiring concept that runs right through to the load
- Double the service life of the redundant solution thanks to even load distribution: the ACB (Auto Current Balancing) technology automatically and symmetrically distributes the load current to two power supply units operating in parallel
- Save energy: decoupling is achieved with MOSFETs and results in energy savings of up to 70% compared with conventional diodes
- OVP (Over Voltage Protection): surge voltages are limited to 30 V

Active redundancy module
24 V DC, 2x 10 A, 1x 20 A

Ex:



Technical data

Input data	
Nominal input voltage range	24 V DC
DC input voltage range	18 V DC ... 28 V DC
Nominal current	2x 10 A (-25 °C ... 60 °C) 1x 20 A (-25 °C ... 60 °C)
Maximum current	2x 15 A (-25°C ... 40°C) 1x 30 A (-25°C ... 40°C)
Transient surge protection	Varistor
Voltage drop, input/output	0.1 V (I_{OUT} = 20 A)
Max. power dissipation (nominal load)	2 W (I_{OUT} = 20 A)
General data	
Weight / Dimensions W x H x D	0.4 kg / 32 x 130 x 125 mm
Spacing when mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 4 mm² / 0.2 - 2.5 mm² / 14 - 12
Output connection data (solid/stranded/AWG)	0.2 - 6 mm² / 0.2 - 4 mm² / 10 - 10
Degree of protection / Protection class	IP20 / III
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)
Standards/regulations	
Insulation voltage: input, output/housing	500 V
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

Ordering data

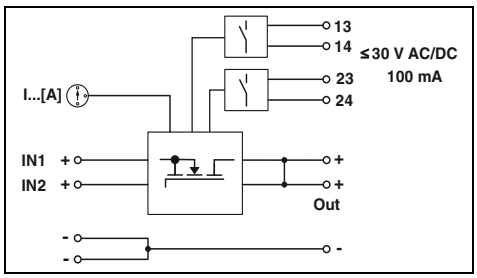
Description	Type	Order No.	Pcs. / Pkt.
Active redundancy module	**QUINT-ORING/24DC/2X10/1X20**	**2320173**	1

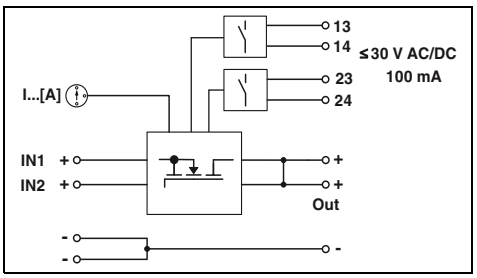
N

Active redundancy module
24 V DC, 2x 20 A, 1x 40 A

Active redundancy module
24 V DC, 2 x 40 A, 1 x 80 A

Ex:





Technical data

24 V DC	24 V DC
18 V DC ... 28 V DC	18 V DC ... 28 V DC
2x 20 A (-25 °C ... 60 °C)	2x 40 A (-25 °C ... 60 °C)
1x 40 A (-25 °C ... 60 °C)	1x 80 A (-25 °C ... 60 °C)
2x 26 A (-25°C ... 40°C)	2x 45 A (-25°C ... 40°C)
1x 52 A (-25°C ... 40°C)	1x 90 A (-25°C ... 40°C)
Varistor	Varistor
0.2 V (I_{OUT} = 40 A)	0.2 V (I_{OUT} = 80 A)
8 W (I_{OUT} = 40 A)	16 W (I_{OUT} = 80 A)
0.6 kg / 38 x 130 x 125 mm	0.9 kg / 66 x 130 x 125 mm
Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Screw connection	Screw connection
0.2 - 6 mm² / 0.2 - 4 mm² / 10 - 10	0.5 - 16 mm² / 0.5 - 16 mm² / 6 - 6
0.5 - 16 mm² / 0.5 - 16 mm² / 6 - 6	0.5 - 35 mm² / 0.5 - 35 mm² / 2 - 2
IP20 / III	IP20 / III
-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60 °C derating)
500 V	500 V
Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL applied for

Ordering data

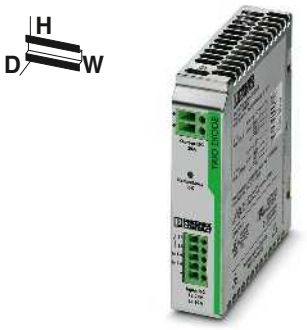
Type	Order No.	Pcs. / Pkt.
QUINT-ORING/24DC/2X20/1X40	**2320186**	1

Ordering data

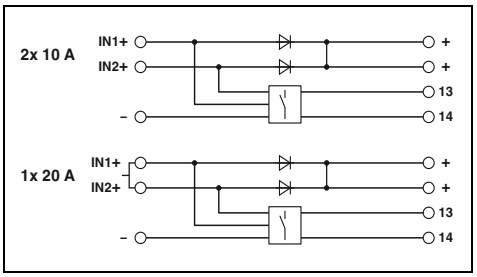
Type	Order No.	Pcs. / Pkt.
QUINT-ORING/24DC/2X40/1X80	**2902879**	1

TRIO DIODE, 12 - 24 and 48 V DC

- Permanent redundancy monitoring: checking of output voltages of parallel-connected power supplies and of wiring running to the redundancy module
- Continuous redundancy right through to the load: the use of two Plus output terminal blocks makes it possible to devise a redundant wiring concept that runs right through to the load
- Flexible: nominal voltages of 12 V DC to 48 V DC



Redundancy module,
12 - 24 V DC, 2 x 10 A, 1 x 20 A



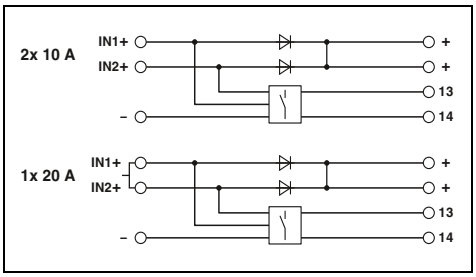
Technical data

Input data	
Nominal input voltage range	12 V DC ... 24 V DC
DC input voltage range	10 V DC ... 30 V DC
Nominal current	2x 10 A (-25°C ... 55°C) 1x 20 A (-25°C ... 55°C)
Maximum current	2x 15 A (-25°C ... 40°C) 1x 30 A (-25°C ... 40°C)
Transient surge protection	Varistor
Voltage drop, input/output	Approx. 0.5 V
Max. power dissipation (nominal load)	7 W (I_{OUT} = 10 A)
General data	
Weight / Dimensions W x H x D	0.37 kg / 32 x 130 x 115 mm
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Output connection data (solid/stranded/AWG)	0.5 - 6 mm² / 0.5 - 4 mm² / 20 - 10
Degree of protection / Protection class	IP20 / III
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations	
Insulation voltage: input, output/housing	500 V
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety, safety transformer	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Redundancy module	**TRIO-DIODE/12-24DC/2X10/1X20**	**2866514**	1

Redundancy module
48 V DC, 2x 10 A, 1x 20 A



Technical data

	48 V DC
	30 V AC ... 56 V AC
	2x 10 A (-25°C ... 55°C)
	1x 20 A (-25°C ... 55°C)
	2x 15 A (-25°C ... 40°C)
	1x 30 A (-25°C ... 40°C)
	Varistor
	Approx. 0.65 V
	14 W (I_{OUT} = 20 A)
	0.37 kg / 32 x 130 x 115 mm
	Can be aligned: Horizontally 0 mm, vertically 50 mm
	Screw connection
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
	0.5 - 6 mm² / 0.5 - 4 mm² / 20 - 10
	IP20 / III
	-25 °C ... 70 °C (> 55° C derating)
	500 V
	Conformance with EMC Directive 2004/108/EC
	EN 60950-1/VDE 0805 (SELV)
	EN 50178/VDE 0160 (PELV)
	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

Ordering data

Type	Order No.	Pcs. / Pkt.
TRIO-DIODE/48DC/2X10/1X20	**2866527**	1

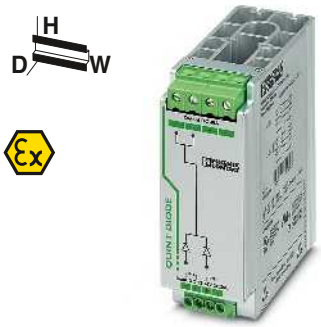
QUINT DIODE and STEP DIODE diode modules

QUINT DIODE, 12 - 24 V and 48 V DC

– Rugged design for currents of up to 60 A
– Continuous redundancy right through to the load: the use of two Plus output terminal blocks makes it possible to devise a redundant wiring concept that runs right through to the load
– Flexible: nominal voltages of 12 V DC to 48 V DC
– Complies with standard EN 60079-15 and may be installed in a potentially explosive area

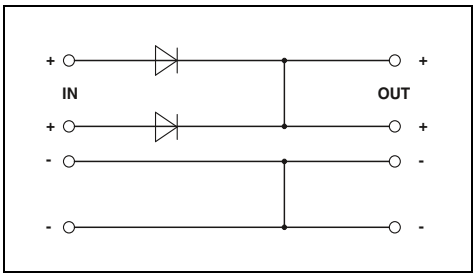
STEP DIODE

– Space-saving: design width of just 18 mm
– Continuous redundancy right through to the load: the use of two Plus output terminal blocks makes it possible to devise a redundant wiring concept that runs right through to the load
– Flexible: nominal voltages of 5 V DC to 24 V DC



Diode module
12 - 24 V DC, 2x 20 A, 1x 40 A

Ex:



Technical data

Input data	
Nominal input voltage range	12 V DC ... 24 V DC
DC input voltage range	10 V DC ... 30 V DC
Nominal current	2x 20 A (-25 °C ... 60 °C) 1x 40 A (-25 °C ... 60 °C)
Maximum current	2x 30 A (-25°C ... 40°C) 1x 60 A (-25°C ... 40°C)
Transient surge protection	Varistor
Voltage drop, input/output	0.5 V
Max. power dissipation (nominal load)	10 W (I_{OUT} = 20 A)
General data	
Weight / Dimensions W x H x D	0.75 kg / 50 x 130 x 125 mm
Spacing when mounting	Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically
Connection method	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 6 mm² / 0.2 - 4 mm² / 12 - 10
Output connection data (solid/stranded/AWG)	0.5 - 16 mm² / 0.5 - 16 mm² / 10 - 6
Degree of protection / Protection class	IP20 / III
Ambient temperature (operation)	-40 °C ... 70 °C (> 60 °C derating)
Standards/regulations	
Insulation voltage: input, output/housing	500 V
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety, safety transformer	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

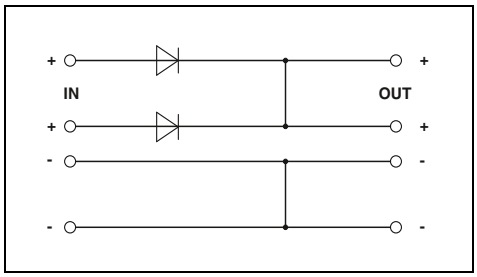
Ordering data

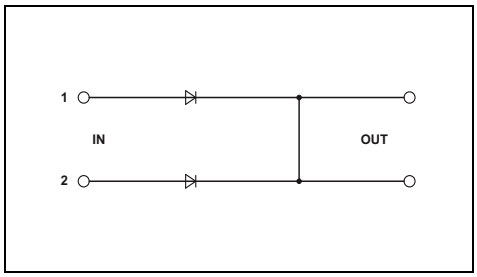
Description	Type	Order No.	Pcs. / Pkt.
Diode module	**QUINT-DIODE/12-24DC/2X20/1X40**	**2320157**	1

Diode module
48 V DC, 2x 20 A, 1x 40 A

Diode module
5 - 24 V DC, 2x 5 A, 1x 10 A

Ex:





Technical data

48 V DC	5 V DC ... 24 V DC
30 V DC ... 56 V DC	4.5 V DC ... 30 V DC
2x 20 A (-25 °C ... 60 °C)	2x 5 A (-25°C ... 55°C)
1x 40 A (-25 °C ... 60 °C)	1x 10 A (-25°C ... 55°C)
2x 30 A (-25°C ... 40°C)	-
1x 60 A (-25°C ... 40°C)	-
Varistor	Transil diode
0.7 V	0.5 V
14 W (I_{OUT} = 20 A)	2.5 W (I_{OUT} = 5 A)
0.75 kg / 50 x 130 x 125 mm	0.1 kg / 18 x 90 x 61 mm
Alignable: 5 mm horizontally, 15 mm next to active components, 50 mm vertically	Alignable: 0 mm horizontally, 30 mm vertically
Screw connection	Screw connection
0.2 - 6 mm² / 0.2 - 4 mm² / 12 - 10	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
0.5 - 16 mm² / 0.5 - 16 mm² / 10 - 6	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
IP20 / III	IP20 / III
-40 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 55° C derating)
500 V	500 V
Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
EN 60950-1/VDE 0805 (SELV)	IEC 60950-1/VDE 0805 (SELV)
EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-DIODE/48DC/2X20/1X40	**2320160**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
STEP-DIODE/5-24DC/2X5/1X10	**2868606**	1

Mounting on S7-300 rail

To supply a SIMATIC® S7-300 control unit, QUINT POWER 2.5 A, 5 A, and 10 A are mounted on the S7 rail using a QUINT-PS-ADAPTER-S7.

No further accessories are required for fastening.

	Technical data	Technical data
Dimensions W x H x D	74 / 130 / 11 mm	104 / 130 / 11 mm
Material	Aluminum	Aluminum

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Adapter for S7-300 rail mounting, for: QUINT-PS/1AC/24DC/3.5 QUINT-PS/1AC/24DC/5 QUINT-PS/3AC/24DC/5	**QUINT-PS-ADAPTERS7/1**	**2938196**	1			
Adapter for S7-300 rail mounting, for: QUINT-PS/1AC/24DC/10 QUINT-PS/3AC/24DC/10 QUINT-PS/3AC/24DC/20				**QUINT-PS-ADAPTERS7/2**	**2938206**	1

Fans

With the standard power supply mounting position, the temperature range increases by 10 K (max. ambient temperature of 70°C), when the mounting position is rotated, position-dependent derating no longer applies.

– assembly without tools

	Technical data
Dimensions W x H x D	41 / 27 / 42.2 mm
Material	V0 (UL 94)

	Ordering data		
Description	Type	Order No.	Pcs. / Pkt.
Fan for QUINT POWER SFB, 24 V DC	**QUINT-PS/FAN/4**	**2320076**	1

Universal wall adapter

Adapter for mounting on even surfaces

	Technical data	Technical data
Dimensions W x H x D	52 / 182 / 9 mm	25 / 130 / 17 mm
Material	Steel, powder-coated	Steel, powder-coated

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Universal panel adapter, for direct panel mounting of the TRIO-PS (from 10 A), QUINT-PS, QUINT-DC-UPS, QUINT-BUFFER power supply units	**UWA 182/52**	**2938235**	1			
Universal wall adapter, for direct panel mounting of the QUINT-PS/1AC/24DC/40 and QUINT-UPS/1AC/1AC/500VA power supply units				**UWA 130**	**2901664**	1

Plug-in thermomagnetic circuit breakers

- Device circuit breakers for protecting against overcurrents and short circuits
- SFB characteristic curve enables longer cables and release times < 10 ms
- Maximum ease of maintenance thanks to the two-piece design
- Further circuit breakers can be found from page 259 onwards

Can be plugged in, SFB characteristic curve

	Technical data
Dimensions W / H / D	12.3 mm / 90 mm / 77.3 mm
Degree of protection	IP30 (Actuation area)

		Ordering data		
Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Thermomagnetic circuit breaker, plug-in, 1-pos., signal contact 1 PDT				
	0.5 A	**CB TM1 0.5A SFB P**	**2800835**	1
	1 A	**CB TM1 1A SFB P**	**2800836**	1
	2 A	**CB TM1 2A SFB P**	**2800837**	1
	3 A	**CB TM1 3A SFB P**	**2800838**	1
	4 A	**CB TM1 4A SFB P**	**2800839**	1
	5 A	**CB TM1 5A SFB P**	**2800840**	1
	6 A	**CB TM1 6A SFB P**	**2800841**	1

	Accessories		
Base element, for accommodating CB TM.../CB E... device circuit breakers			
With push-in connection technology	**CB 1/6-2/4 PT-BE**	**2800929**	10
With screw connection technology	**CB 1/10-1/10 UT-BE**	**2801305**	10

The intelligent UPS system ensures maximum system availability

Uninterruptible power supply (UPS) units continue to deliver power even if the supply network goes down. An uninterruptible solution consists of the three function units shown:

– Power supply
– UPS module
– Power storage

QUINT UPS-IQ

IQ technology is the key to an intelligent power supply solution. The uninterruptible power supply unit monitors and optimizes the power storage. Avoid interruptions when working with the intelligent UPS for non-stop power.

– **SOC (state of charge)** keeps you informed of the charging state and remaining runtime of your battery at all times
– **SOH (state of health)** reports remaining life expectancy of the power storage device, warns of failure at an early stage
– **SOF (state of function)** determines the current performance capability of the power storage device.

Practical example

An industrial PC must be continuously supplied with 24 V DC.

Previous solution:

The UPS with 3.4 Ah buffers 24 V DC/5 A for 20 minutes under optimum conditions.

Can the power storage device actually bridge this time?

Charging state, performance, and remaining runtime of the power storage device are unknown.

The solution is the QUINT UPS-IQ:

The intelligent UPS determines all relevant power storage device states. This ensures the crucial transparency required to guarantee the stability of the supply and optimum use of the power storage device at all times.

The intelligent battery management detects the current charging state of the connected power storage device and uses this to calculate the remaining runtime.

The QUINT UPS-IQ also indicates whether the buffer time is actually 20 minutes. As soon as an adjustable threshold value is reached, a warning message is sent via the floating relay contact, the software or directly to higher-level controllers. The IPC continues working for as long as possible and is shut down before the battery voltage runs out.

IQ technology

The IQ technology is intuitive and provides you with information as soon as it is required.

– Intelligent battery management with SOC, SOH, and SOF
– Intelligent battery control
– Intelligent charging
– Data port

Signaling and configuration

The UPS-CONF configuration and management software allows you to monitor and configure your UPS system. The software can be downloaded free of charge at: www.phoenixcontact.net/products.

– Flexible adaptation of QUINT UPS-IQ behavior to individual requirements
– Monitoring and data recorder

Communication

The data cables allow you to integrate the UPS module into your application. You can therefore benefit from all the advantages of IQ technology and be kept informed of the state of your UPS solution. The information provided by QUINT UPS-IQ can, for example, be forwarded to higher-level controllers via Ethernet or be implemented directly in control solutions from Phoenix Contact.

Modular solution

1. Choose your power supply unit, e.g., QUINT POWER
2. Choose your UPS module QUINT UPS-IQ
3. Choose your power storage device:

– UPS-CAP for maximum service life
– UPS-BAT/LI-ION for long service life with long buffer times
– UPS-BAT/VRLA and VRLA-WTR for maximum buffer times

UPS with integrated power storage

Particularly space-saving and easy to retrofit, the UPS module and power storage device are combined in the same housing.

– QUINT UPS: power storage device with lead AGM technology
– STEP UPS: LiPo-based power storage device
– QUINT BUFFER buffer module: capacitor-based power storage device

UPS with integrated power supply unit

The UPS module and power supply unit in a single housing is a space-saving solution. Only one power storage device is required to complete the UPS system.

– MINI UPS: for 24 or 12 V DC
– TRIO UPS: for 24 DC

Selecting the power storage device for QUINT UPS-IQ

You can always find the ideal solution for maximum system availability with the new modular system for uninterruptible power supply units. The various storage media feature a wide range of different properties: long service life or a very long buffer time, no maintenance or use at extreme ambient temperatures. Whatever your requirements, we have the ideal power storage device.

Your advantages

Fast installation
– Automatic detection of the power storage device by QUINT UPS-IQ
– Tool-free replacement during operation

Maximum availability
– Constant communication with QUINT UPS-IQ for continuous monitoring and intelligent management

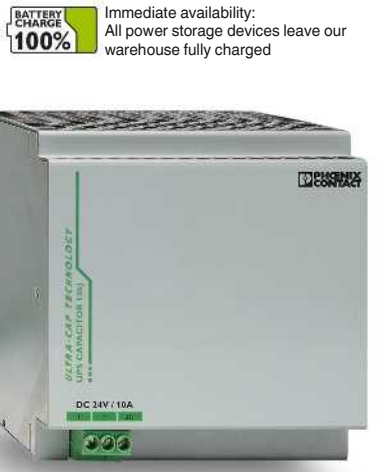
Extremely long service life
– Optimum charging characteristic according to the technology and ambient conditions

Type	Buffer time (typical)	Temperature	Service life At 20°C	Service life At 50°C	Charging cycles At 20°C	Weight (standardized)
UPS-CAP…	< 5 min.	-40 ... 60°C	> 20 years	8 years	> 500,000	0.4 kg
UPS-BAT/LI-ION…	> 40 min.	-20 ... 58°C	15 years	2 years	7000	0.45 kg
UPS-BAT/VRLA-WTR…	> 5 h	-40 ... 60°C	15 years	1.5 years	300	1.3 kg
UPS-BAT/VRLA…	> 8 h	0 ... 40°C	6 ... 9 years	1 year	250	1 kg

UPS-BAT/VRLA...
(Valve Regulated Lead Acid)
- Maximum buffer times
- Lead AGM (Absorbent Glass Mat) technology

UPS-BAT/VRLA-WTR...
(Valve Regulated Lead Acid/ Wide Temperature Range)
- Maximum buffer times at extreme temperatures
- Pure lead AGM (Absorbent Glass Mat) technology

UPS-BAT/LI-ION...
- Long service life with long buffer times
- Lithium-ion technology



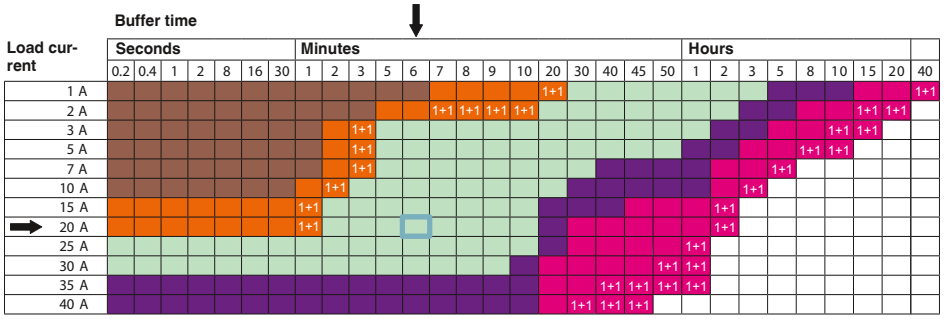
Immediate availability:
All power storage devices leave our warehouse fully charged

UPS-CAP (Capacitor)
- Maximum service life
- Maintenance-free double-layer capacitors

Selection of power storage devices with capacitors, lithium ion, and pure lead AGM technology

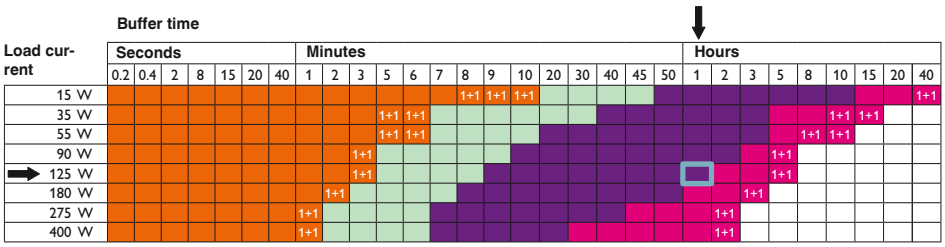
Buffer times for DC UPS modules

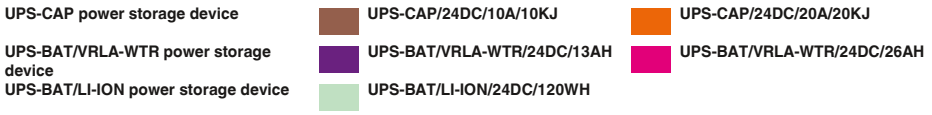
Select your UPS-BAT and UPS-CAP for 24 V DC applications here.
Example: 20 A needs to be buffered for 6 minutes.
Solution: UPS-BAT/LI-ION/24DC/120WH



Buffer times for AC UPS modules

Select your UPS-BAT and UPS-CAP for 120 V AC/230 V AC applications here.
Example: 125 W needs to be buffered for one hour.
Solution: UPS-BAT/VRLA-WTR/24DC/13AH

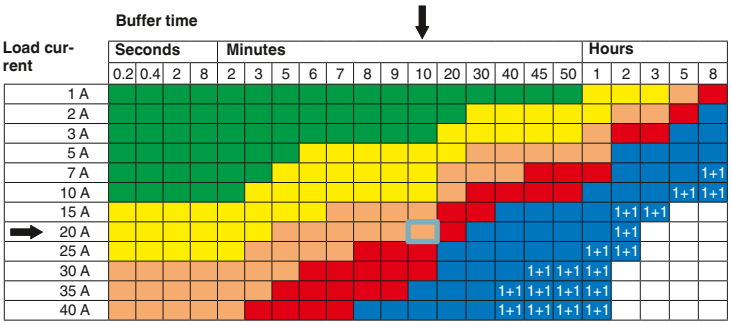




Selection of power storage devices with lead AGM technology

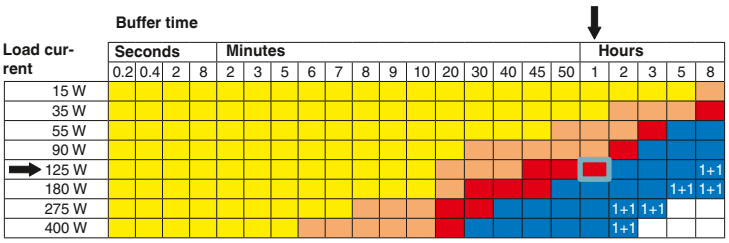
Buffer times for DC UPS modules

Select your UPS-BAT for 24 V DC applications here.
Example: 20 A needs to be buffered for 10 minutes.
Solution: UPS-BAT/VRLA/24DC/7.2AH



Buffer times for AC UPS modules

Select your UPS-BAT for 120 V AC/230 V AC applications here.
Example: 125 W needs to be buffered for one hour.
Solution: UPS-BAT/VRLA/24DC/12AH



1+1 … Two rechargeable battery modules of the same capacity are required in this case.
The data is based on an ambient temperature of 20°C.

QUINT UPS-IQ for DC applications

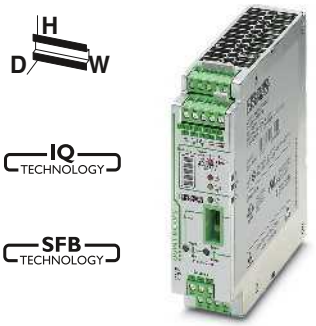
The UPS module for 24 V DC with output currents ranging from 5 to 40 A allows you to create a custom solution combining power supply unit, UPS module, and power storage device.

Optimum use of the buffer time and preventive monitoring of the power storage device:
– Detects the current charging state of the power storage device and calculates the remaining runtime
– Calculates the current life expectancy of the power storage device

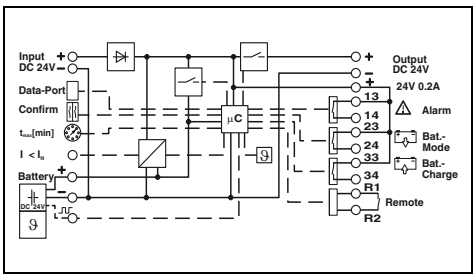
Substantial power reserve:
– For mains and battery operation
– POWER BOOST static power reserve
– Dynamic power reserve with SFB (Selective Fuse Breaking) technology

Fast battery charging:
– Adaptive current management charges the power storage device twice as fast as before, while simultaneously providing sufficient energy for the loads.

Extensive signaling and parameterization:
– Floating relay contacts
– Data port
– Parameterization with memory block



Uninterruptible power supply, 24 V DC / 24 V DC, 5 A

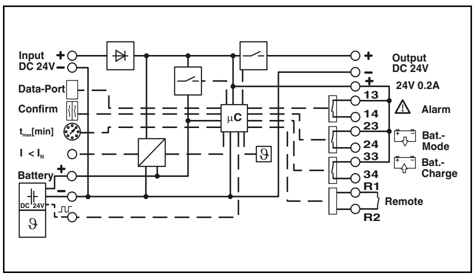
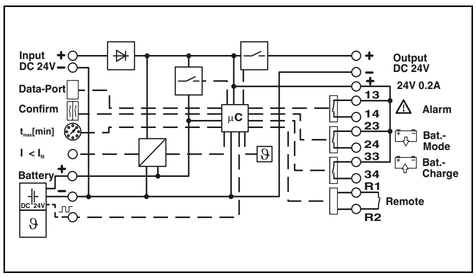
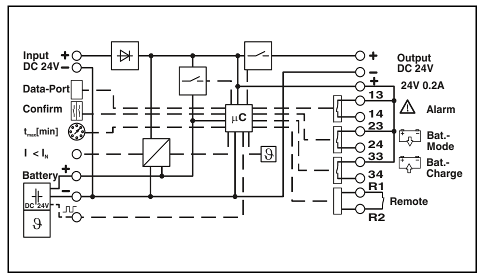


Technical data

Input data	
Nominal input voltage	24 V DC
DC input voltage range	18 V DC ... 30 V DC
Max. current consumption	9.4 A (Maximum, mains operation)
Output data (mains operation)	
Nominal output voltage	24 V DC
Output voltage range	18 V DC ... 30 V DC
Efficiency (typ.)	> 98 % (Mains operation, with charged power storage)
Output current with convection cooling	
- Nominal output current I_N (continual)	5 A (-25 °C ... 60 °C)
- SFB technology (12 ms)	30 A (-25 °C ... 60 °C)
- POWER BOOST I_{BOOST} (continual)	7.5 A (-25 °C ... 40 °C)
Output data (battery operation)	
Nominal output voltage	24 V DC
Output voltage range	19.2 V DC ... 27.6 V DC ($U_{OUT} = U_{BAT}$ - 0.5 V DC)
Output current with convection cooling	
- Nominal output current I_N (continual)	5 A (-25 °C ... 60 °C)
- SFB technology (15 ms)	32.5 A (-25 °C ... 60 °C)
- POWER BOOST I_{BOOST} (continual)	7.5 A (-25 °C ... 40 °C)
Power storage device	
Nominal voltage U_N	24 V DC
End-of-charge voltage	24 V DC ... 29 V DC (temperature compensated)
Nominal capacity range	0.8 Ah ... 140 Ah
Max. charging current	0.2 A ... 1.36 A
Signaling	
Signaling	LED, relay contact, interface/software
Interfaces	IFS (Interface system data port)
General data	
Weight / Dimensions W x H x D	0.5 kg / 35 x 130 x 125 mm
Connection method	Plug-in screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 20 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 20 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Degree of protection / Protection class	IP20 / III
Ambient temperature (operation)	-25 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Derating	60 °C ... 70 °C (2.5%/K)
Max. permissible relative humidity (operation)	≤ 95 % (25°C, no condensation)
Standards/regulations	
UL approvals	UL/C-UL Recognized UL 60950 , UL Listed UL 508

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply, uninterruptible	**QUINT-UPS/ 24DC/ 24DC/ 5**	**2320212**	1

Uninterruptible power supply, 24 V DC / 24 V DC, 10 A	Uninterruptible power supply, 24 V DC / 24 V DC, 20 A	Uninterruptible power supply, 24 V DC / 24 V DC, 40 A
		
		

Technical data

10 A	20 A	40 A
24 V DC	24 V DC	24 V DC
18 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 30 V DC
19 A (Maximum, mains operation)	32.9 A (Maximum, mains operation)	51.9 A (Maximum, mains operation)
24 V DC	24 V DC	24 V DC
18 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 30 V DC
> 98 % (Mains operation, with charged power storage)	> 98 % (Mains operation, with charged power storage)	> 99 % (Mains operation, with charged power storage)
10 A (-25 °C ... 60 °C)	20 A (-25 °C ... 60 °C)	40 A (-25 °C ... 50 °C)
60 A (-25 °C ... 60 °C)	120 A (-25 °C ... 60 °C)	215 A (-25 °C ... 60 °C)
15 A (-25 °C ... 40 °C)	26 A (-25 °C ... 40 °C)	45 A (-25 °C ... 40 °C)
24 V DC	24 V DC	24 V DC
19.2 V DC ... 27.6 V DC ($U_{OUT} = U_{BAT}$ - 0.5 V DC)	19.2 V DC ... 27.6 V DC ($U_{OUT} = U_{BAT}$ - 0.5 V DC)	19.2 V DC ... 27.6 V DC ($U_{OUT} = U_{BAT}$ - 0.5 V DC)
10 A (-25 °C ... 60 °C)	20 A (-25 °C ... 60 °C)	40 A (-25 °C ... 60 °C)
65 A (-25 °C ... 60 °C)	120 A (-25 °C ... 60 °C)	215 A (-25 °C ... 60 °C)
15 A (-25 °C ... 40 °C)	27 A (-25 °C ... 40 °C)	45 A (-25 °C ... 40 °C)
24 V DC	24 V DC	24 V DC
24 V DC ... 29 V DC (temperature compensated)	24 V DC ... 29 V DC (temperature compensated)	24 V DC ... 29 V DC (temperature compensated)
1.3 Ah ... 140 Ah	3 Ah ... 200 Ah	7 Ah ... 200 Ah
0.2 A ... 2.88 A	0.2 A ... 5 A	0.2 A ... 5 A
LED, relay contact, interface/software	LED, relay contact, interface/software	LED, relay contact, interface/software
IFS (Interface system data port)	IFS (Interface system data port)	IFS (Interface system data port)
0.5 kg / 35 x 130 x 125 mm	0.6 kg / 40 x 130 x 125 mm	0.7 kg / 47 x 130 x 125 mm
Plug-in screw connection	Screw connection	Screw connection
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 12 - 10	0.5 - 16 mm^2 / 0.5 - 16 mm^2 / 8 - 6
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 16 - 12	0.2 - 6 mm^2 / 0.2 - 4 mm^2 / 12 - 10	0.5 - 16 mm^2 / 0.5 - 16 mm^2 / 8 - 6
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 4 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 4 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
IP20 / III	IP20 / III	IP20 / III
-25 °C ... 70 °C	-25 °C ... 70 °C	-25 °C ... 70 °C
-40 °C ... 85 °C	-40 °C ... 85 °C	-40 °C ... 85 °C
60 °C ... 70 °C (2.5%/K)	60 °C ... 70 °C (2.5%/K)	60 °C ... 70 °C (2.5%/K)
≥ 95 % (25°C, no condensation)	≤ 95 % (25°C, no condensation)	≤ 95 % (25°C, no condensation)
UL/C-UL Recognized UL 60950 , UL Listed UL 508	UL/C-UL Recognized UL 60950 , UL Listed UL 508	UL/C-UL Recognized UL 60950 , UL Listed UL 508

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-UPS/24DC/24DC/10	2320225	1
QUINT-UPS/ 24DC/ 24DC/20	2320238	1
QUINT-UPS/24DC/24DC/40	2320241	1

QUINT UPS-IQ for DC applications with dual output voltage

The UPS module for two output voltages, 12 and 24 V DC, allows you to create a custom solution combining power supply unit, UPS module, and power storage device.

– Flexible and space-saving thanks to the two output voltages in one unit

Optimum use of the buffer time and preventive monitoring of the power storage device:

– Detects the current charging state of the power storage device and calculates the remaining runtime
– Calculates the current life expectancy of the power storage device

Substantial power reserve:

– For mains and battery operation
– POWER BOOST static power reserve
– Dynamic power reserve with SFB (Selective Fuse Breaking) technology

Fast battery charging:

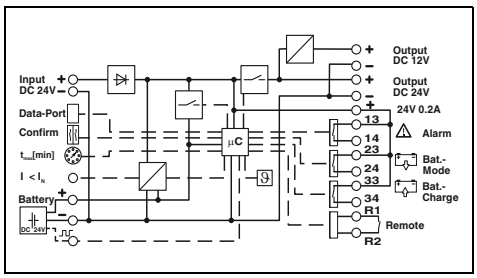
– Adaptive current management charges the power storage device twice as fast as before, while simultaneously providing sufficient energy for the loads.

Extensive signaling and parameterization:

– Floating relay contacts
– Data port
– Parameterization with memory block

N

Uninterruptible power supply, 24 V DC/12 V DC, 5 A and 24 V DC, 10 A



Technical data

Input data		
Nominal input voltage	24 V DC	
DC input voltage range	18 V DC ... 30 V DC	
Max. current consumption	16 A	
Output data (mains operation)	12 V DC	24 V DC
Nominal output voltage	12 V DC	24 V DC
Output voltage range		18 V DC ... 30 V DC ($U_{OUT} = U_{IN}$ - 0.5 V DC)
Efficiency (typ.)	> 93 % (Mains operation, with charged power storage)	> 98 % (Mains operation, with charged power storage)
Output current with convection cooling ($P_{max} = P_{12\,V} + P_{24\,V}$ = 360 W)		
- Nominal output current I_N (continual)	5 A (-25 °C ... 60 °C)	10 A (-25 °C ... 60 °C)
- SFB technology (15 ms)		60 A (-25 °C ... 60 °C)
- POWER BOOST I_{BOOST} (continual)	7.5 A (-25 °C ... 40 °C)	15 A (-25 °C ... 40 °C)
Output data (battery operation)	12 V DC	24 V DC
Nominal output voltage	12 V DC	24 V DC
Output voltage range	-	19.2 V DC ... 27.6 V DC ($U_{OUT} = U_{BAT}$ - 0.5 V DC)
Output current with convection cooling ($P_{max} = P_{12\,V} + P_{24\,V}$ = 360 W)		
- Nominal output current I_N (continual)	5 A (-25 °C ... 60 °C)	10 A (-25 °C ... 60 °C)
- SFB technology (15 ms)		65 A (-25 °C ... 60 °C)
- POWER BOOST I_{BOOST} (continual)	7.5 A (-25 °C ... 60 °C)	15 A (-25 °C ... 60 °C)
Power storage device		
Nominal voltage U_N	24 V DC	
End-of-charge voltage	24 V DC ... 29 V DC (temperature compensated)	
Nominal capacity range	1.3 Ah ... 140 Ah	
Max. charging current	2.88 A	
Signaling		
Signaling	LED, relay contact, interface/software	
Interfaces	IFS (Interface system data port)	
General data		
Weight / Dimensions W x H x D	0.6 kg / 35 x 130 x 125 mm	
Connection method	Plug-in screw connection	
Connection data input/output solid/stranded/AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 16 - 12	
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	
Degree of protection / Protection class	IP20 / III	
Ambient temperature (operation)	-25 °C ... 70 °C	
Derating	60 °C ... 70 °C (2.5%/K)	
Standards/regulations		
UL approvals	UL Listed UL 508 , UL/C-UL Recognized UL 60950	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply, uninterruptible			
	QUINT-UPS/24DC/12DC/5/24DC/10	**2320461**	1

QUINT UPS-IQ for AC applications

The UPS module for 120 V AC/230 V AC with 400 W/500 VA power can be combined with all UPS-CAP and UPS-BAT power storage devices.

Optimum use of the buffer time and preventive monitoring of the power storage device:
– Detects the current charging state of the power storage device and calculates the remaining runtime
– Calculates the current life expectancy of the power storage device

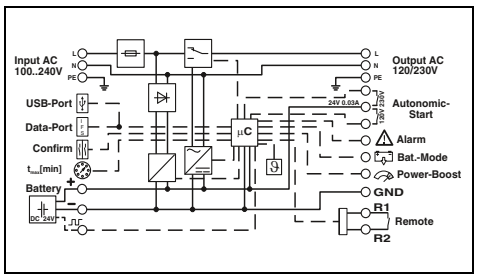
Worldwide use:
– Input voltages from 96 to 264 V AC
– Storage of the level and frequency of the input voltage, in the event of mains failure, the output is automatically supplied with 120 V AC/60 Hz or 230 V AC/50 Hz
– Manual voltage pre-selection possible

Maximum energy efficiency:
– Offline operation: 98% efficiency for charged power storage device

Extensive signaling and parameterization:
– Switching outputs
– USB interface
– Data port
– Parameterization with memory block

Simplified startup:
– The UPS can be switched on without a power supply network

Uninterruptible power supply, 1 AC / 1 AC, 500 VA



Technical data

General input data		
Input voltage range AC	80 V AC ... 264 V AC	
Frequency range	45 Hz ... 65 Hz	
Activation threshold	U_N ±10%. Can be configured using UPS-CONF software.	
Input data	120 V AC	230 V AC
Nominal input voltage	120 V AC	230 V AC
AC input voltage range	80 V AC ... 150 V AC	180 V AC ... 264 V AC
Nominal frequency	60 Hz	50 Hz
Max. current consumption ($I_{IN} = I_{CHARGE} + I_{BOOST}$)	6.8 A	3.7 A
General output data		
Nominal power / Apparent power	400 W / 500 VA	
Derating	> 50 °C ... 70 °C (2.5%/K)	
Switch-over time	< 10 ms	
Efficiency (typ.)	> 98 % (Mains operation)	
Output data (mains operation)	120 V AC	230 V AC
Nominal output voltage	120 V AC	230 V AC
Output voltage range	96 V AC ... 144 V AC	184 V AC ... 276 V AC
- Nominal output current I_N (continual)	4.3 A (-25 °C ... 70 °C)	2.2 A (-25 °C ... 70 °C)
- POWER BOOST I_{BOOST} (continual)	5.2 A (-25 °C ... 70 °C)	2.7 A (-25 °C ... 70 °C)
Output data (battery operation)	120 V AC	230 V AC
Nominal output voltage	120 V AC	230 V AC
- Nominal output current I_N (continual)	4.3 A (-25 °C ... 50 °C)	2.2 A (-25 °C ... 50 °C)
- POWER BOOST I_{BOOST} (5 s)	5.2 A (-25 °C ... 50 °C)	2.7 A (-25 °C ... 50 °C)
Power storage device		
Nominal voltage U_N	24 V DC	
End-of-charge voltage	25 V DC ... 30 V DC (temperature compensated)	
Nominal capacity range	3 Ah ... 200 Ah	
Max. charging current	0.2 A ... 2 A	
Signaling		
Signaling	LED, active switching outputs, interface/software	
Interfaces	IFS (Interface system data port) , MINI-USB type B	
General data		
Classification according to IEC 62040-3	VFD-SS-311	
Weight / Dimensions W x H x D	2.2 kg / 125 x 130 x 125 mm	
Connection method	Screw connection	
Connection data input/output solid/stranded/AWG	1.5 - 6 mm² / 1.5 - 4 mm² / 18 - 10	
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 10	
Degree of protection / Protection class	IP20 / I	
Ambient temperature (operation)	-25 °C ... 70 °C (> 50°C derating)	
Standards/regulations		
UL approvals	UL/C-UL Recognized UL 1778	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply, uninterruptible	**QUINT-UPS/ 1AC/1AC/500VA**	**2320270**	1

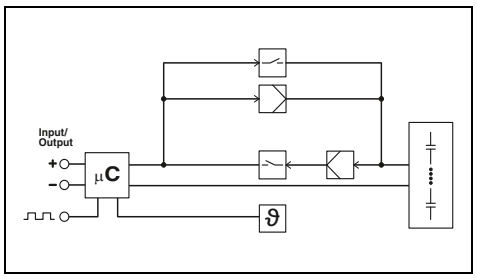
Power storage device for QUINT UPS-IQ

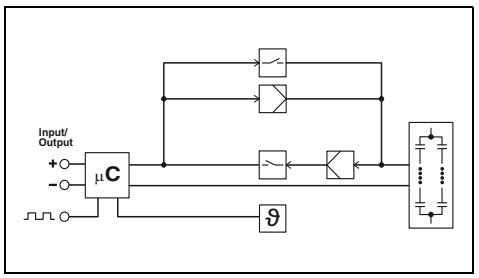
Maintenance-free CAP UPS

– Dual layer capacitors
– Life expectancy: >20 years (20°C), >8 years (50°C)
– Communication with QUINT UPS-IQ
– Integrated temperature sensor
– Works reliably, even under extreme ambient temperatures of -40°C to +60°C

Maintenance-free power storage device, 24 V DC, 10 A, 10 kJ

Maintenance-free power storage device, 24 V DC, 20 A, 20 kJ





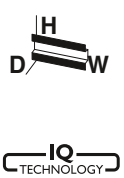
	Technical data	Technical data
Input data		
Nominal input voltage	24 V DC	24 V DC
DC input voltage range	18 V DC ... 30 V DC	18 V DC ... 30 V DC
Nominal capacity	10 kJ	20 kJ
Output data		
Nominal output voltage	24 V DC	24 V DC
Output voltage range	22 V DC ... 27 V DC	22 V DC ... 27 V DC
Output current	10 A	20 A
Output fuse	1x 25 A (internal)	2x 25 A (internal)
Can be connected in parallel / series	Yes / No	Yes / No
Buffer period	6 min (1 A) / 33 s (10 A)	12 min (1 A) / 33 s (20 A)
General data		
Storage medium	Dual layer capacitor	Dual layer capacitor
Weight / Dimensions W x H x D	1.7 kg / 126 x 130 x 126 mm	2.9 kg / 150 x 130 x 176 mm
Degree of protection / Protection class	IP20 / III	IP20 / III
Ambient temperature (operation)	-40 °C ... 60 °C	-40 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 60 °C	-40 °C ... 60 °C
Service life	20 Years (20°C)	20 Years (20°C)
Standards/regulations		
UL approvals	UL Listed UL 508 , UL/C-UL Recognized UL 60950	UL Listed UL 508 , UL/C-UL Recognized UL 60950
GL approvals	GL applied for	GL applied for

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power storage device						
	UPS-CAP/24DC/10A/10KJ	**2320377**	1	**UPS-CAP/24DC/20A/20KJ**	**2320380**	1

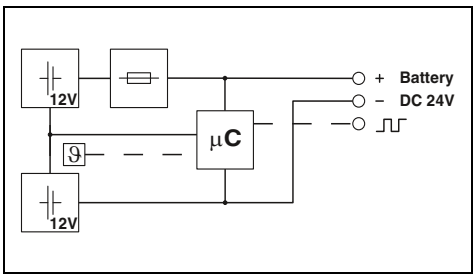
Power storage device for QUINT UPS-IQ

UPS-BAT/LI-ION for long service life with long buffer times

– Lithium-ion technology
– Works reliably, even under extreme ambient temperatures of -20 to +58°C
– Communication with QUINT UPS-IQ
– Integrated temperature sensor for optimum charging
– Battery can be changed without tools



120 Wh



Technical data

Input data/output data	
Nominal voltage	24 V DC
Nominal capacity	120 Wh
Output current	30 A
Output fuse	1x 30 A
Can be connected in parallel / series	Yes / No
Buffer period	14 min (20 A)
General data	
Storage medium	LI-ION, 120 Wh
Weight / Dimensions W x H x D	2.9 kg / 135 x 202 x 110 mm
Degree of protection / Protection class	IP20 / III
Ambient temperature (operation)	-20 °C ... 58 °C
Service life	15 Years (20°C)
Standards/regulations	
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power storage device			
	UPS-BAT/LI-ION/24DC/120WH	**2320351**	1

Power storage device for QUINT UPS-IQ

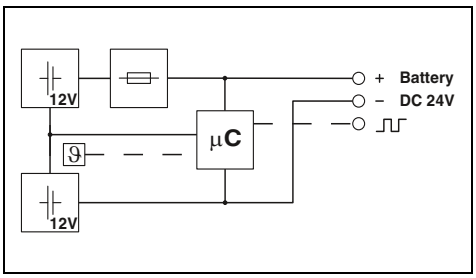
UPS BAT/VRLA for maximum buffer times

– Lead AGM (Absorbent Glass Mat) technology
– Ambient temperatures from 0 to +40°C
– Long buffer times for high currents
– Communication with QUINT UPS-IQ
– Integrated temperature sensor for optimum charging
– Battery can be changed without tools

1.3 Ah

3.4 Ah

Ex:



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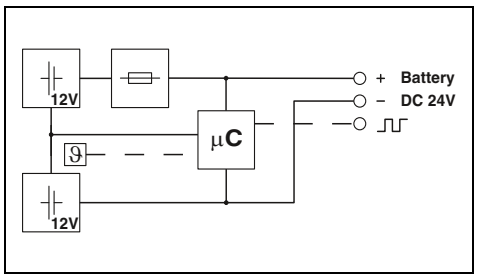


	Technical data	Technical data
Input data/output data		
Nominal voltage	24 V DC	24 V DC
Nominal capacity	1.3 Ah	3.4 Ah
Output current	15 A	25 A
Output fuse	1x 15 A	1x 25 A
Can be connected in parallel / series	Yes / No	Yes / No
Buffer period	20 min (2 A) / 5 min (5 A)	4.5 min (20 A) / 3 min (25 A)
General data		
Storage medium	Lead rechargeable battery module	Lead rechargeable battery module
Weight / Dimensions W x H x D	1.7 kg / 54 x 157 x 113 mm	3.3 kg / 85 x 191 x 110 mm
Degree of protection / Protection class	IP20 / III	IP20 / III
Ambient temperature (operation)	0 °C ... 40 °C	0 °C ... 40 °C
Service life	6 Years ... 9 Years (20°C)	6 Years ... 9 Years (20°C)
Standards/regulations		
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL/C-UL Recognized UL 1778 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL/C-UL Recognized UL 1778 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

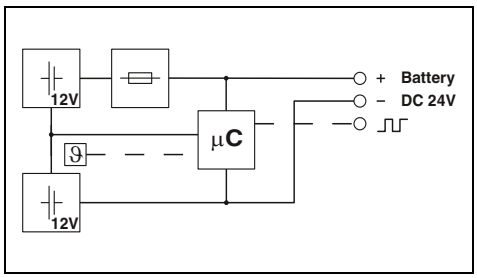
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power storage device						
	UPS-BAT/VRLA/24DC/ 1.3AH	**2320296**	1	**UPS-BAT/VRLA/24DC/ 3.4AH**	**2320306**	1
	Accessories			**Accessories**		
Mounting set						

7.2 Ah

12 Ah

38 Ah

Ex:



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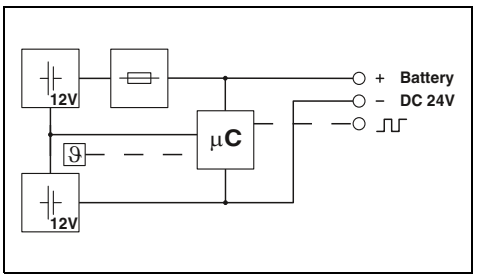
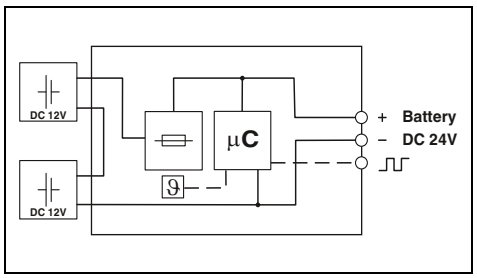




Technical data

24 V DC	
7.2 Ah	
50 A	
2x 25 A	
Yes / No	
10 min (20 A) / 3 min (40 A)	
Lead rechargeable battery module	
5.9 kg / 135 x 202 x 110 mm	
IP20 / III	
0 °C ... 40 °C	
6 Years ... 9 Years (20°C)	
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL/C-UL Recognized UL 1778 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-BAT/VRLA/24DC/ 7.2AH	2320319	1

Accessories

Technical data

24 V DC	
12 Ah	
50 A	
2x 25 A	
Yes / No	
22.5 min (20 A) / 9 min (40 A)	
Lead rechargeable battery module	
8.9 kg / 202 x 202 x 110 mm	
IP20 / III	
0 °C ... 40 °C	
6 Years ... 9 Years (20°C)	
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL/C-UL Recognized UL 1778 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-BAT/VRLA/24DC/12AH	2320322	1

Accessories

Technical data

24 V DC	
38 Ah	
50 A	
2x 25 A	
Yes / No	
72 min (20 A) / 35 min (40 A)	
Lead rechargeable battery module	
26 kg / 330 x 210 x 197 mm	
IP20 / III	
0 °C ... 40 °C	
10 Years ... 12 Years (20°C)	
UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950 , UL/C-UL Recognized UL 1778	

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-BAT/VRLA/24DC/38AH	2320335	1

Accessories

BATTERY MOUNTING KIT	2320788	1

Power storage device for QUINT UPS-IQ

BAT/VRLA-WTR UPS for temperatures from -40°C to +60°C

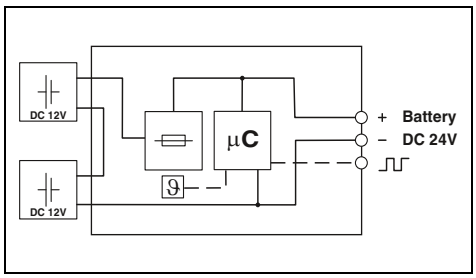
– Pure lead AGM technology
– Communication with QUINT UPS-IQ
– Integrated temperature sensor for optimum charging

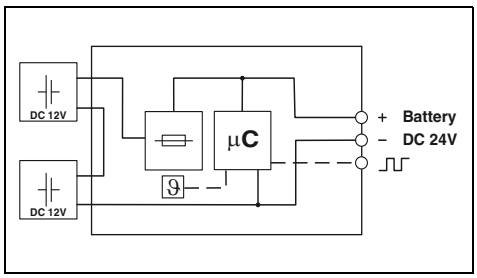
IQ TECHNOLOGY

Power storage device with wide temperature range
24 V DC, 13 Ah

IQ TECHNOLOGY

Power storage device with wide temperature range
24 V DC, 26 Ah





Technical data

Input data/output data		
Nominal voltage	24 V DC	24 V DC
Nominal capacity	13 Ah	26 Ah
Output current	50 A	50 A
Output fuse	2x 25 A	2x 25 A
Can be connected in parallel / series	Yes / No	Yes / No
Buffer period	50 min (10 A) / 10 min (40 A)	120 min (10 A) / 30 min (40 A)
General data		
Storage medium	Pure lead AGM	Pure lead AGM
Weight / Dimensions W x H x D	10.8 kg / 178 x 168 x 172 mm	21.6 kg / 358 x 165 x 169 mm
Degree of protection / Protection class	IP20 / III	IP20 / III
Ambient temperature (operation)	-40 °C ... 60 °C	-40 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 60 °C	-40 °C ... 60 °C
Service life	10 Years ... 15 Years (20°C)	10 Years ... 15 Years (20°C)
Standards/regulations		
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950
GL approvals	GL applied for	GL applied for

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power storage device			
	UPS-BAT/VRLA-WTR/24DC/13AH	**2320416**	1

Accessories

Mounting set	**BATTERY MOUNTING KIT**	**2320788**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-BAT/VRLA-WTR/24DC/26AH	**2320429**	1

Accessories

BATTERY MOUNTING KIT	**2320788**	1

Configuration software for QUINT UPS-IQ

The UPS CONF configuration software can be downloaded free of charge from our homepage. Remember to order the IFS-USB-DATACABLE as well in order to use the software.

Supported operating systems:
– Windows 7 (32 and 64-bit)
– Windows Vista
– Windows XP

Minimum requirements:
– Display: 800 x 600, 256 colors
– Processor: 400 MHz, Pentium processor or similar
– RAM: 96 MB

Description	Ordering data		
	Type	Order No.	Pcs. / Pkt.
Configuration software for QUINT UPS IQ	**UPS-CONF**	**2320403**	1

Accessories for QUINT UPS-IQ and TRIO UPS

IFS-USB-DATACABLE is required for communication between the uninterruptible power supply and the UPS CONF configuration software.

IFS-CONFSTICK for storing the values you have configured and transferring them to other uninterruptible power supplies.

Notes:
1) EMC: Class A product, see page 287

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Used for communication between the UPS CONF configuration software and the QUINT UPS IQ or TRIO UPS uninterruptible power supply Cable length: 3 m	**IFS-USB-DATACABLE**	**2320500**	1			
Multi-functional memory block for the INTERFACE system						
- Flat design				**IFS-CONFSTICK[1])**	**2986122**	1
- Tall design				**IFS-CONFSTICK-L**	**2901103**	1

Accessories for QUINT UPS-IQ

IFS-RS232-DATACABLE
– For Modbus communication with the RS-232 interface
– Connection to the Phoenix Contact COM server for Ethernet communication
– Communicate directly with higher-level controllers, such as Phoenix Contact ILC or RFC, or use as a gateway

IFS-MINI-DIN-DATACABLE
– For direct communication with the ILC from the Phoenix Contact Inline system

IFS-OPEN-END-DATACABLE
– Open cable for flexible communication

QUINT UPS-IQ function blocks
– For further processing of information communicated via data cables
– For PC Worx software
– Free download at www.phoenixcontact.net/products

Description	Ordering data		
	Type	Order No.	Pcs. / Pkt.
Data cable for communication between higher-level controllers and QUINT UPS-IQ uninterruptible power supply units, cable length: 2 m			
Modbus communication	**IFS-RS232-DATACABLE**	**2320490**	1
Direct communication	**IFS-MINI-DIN-DATACABLE**	**2320487**	1
Flexible communication	**IFS-OPEN-END-DATACABLE**	**2320450**	1

Mounting set

– For attaching individual battery blocks to a mounting plate
– Consists of four powder-coated metal brackets and a fabric lashing strap

Description	Ordering data		
	Type	Order No.	Pcs. / Pkt.
Mounting set	**BATTERY MOUNTING KIT**	**2320788**	1

Uninterruptible power supply units for the control cabinet

UPS module with integrated power storage

QUINT-UPS is very easy to install in existing systems. It's just a case of connecting a 24 V DC power supply unit upstream and the reliable UPS solution is complete.

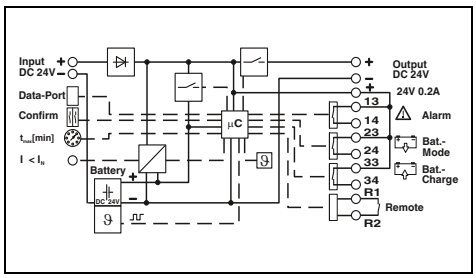
– Advantages of using IQ technology
– Minimal wiring effort
– Maintenance-free power storage device with lead AGM technology

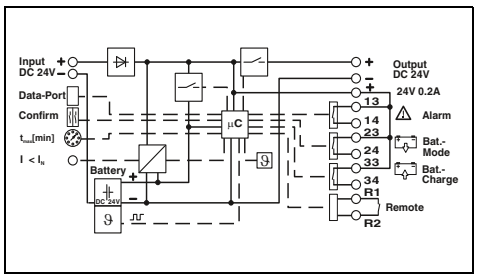
Notes:

The buffer time associated with your solution is dependent on the load current. Exact details for each uninterruptible power supply can be found on page 233

Uninterruptible power supply with integrated power storage, 24 V DC / 24 V DC, 5 A, 1.3 Ah

Uninterruptible power supply with integrated power storage, 24 V DC / 24 V DC, 10 A, 3.4 Ah





	Technical data	Technical data
Input data		
Nominal input voltage	24 V DC	24 V DC
DC input voltage range	18 V DC ... 30 V DC	18 V DC ... 30 V DC
Max. current consumption	9.3 A (24 V DC)	18.6 A (24 V DC)
Output data		
Nominal output voltage	24 V DC	24 V DC
Output voltage range	19.2 V DC ... 27.6 V DC ($U_{OUT} = U_{BAT}$ - 0.5 V DC)	19.2 V DC ... 27.6 V DC ($U_{OUT} = U_{BAT}$ - 0.5 V DC)
Output current	5 A	10 A
Can be connected in parallel / series	Yes / No	Yes / No
Buffer period	50 min (1 A) / 5 min (5 A)	180 min (1 A) / 10 min (10 A)
Max. power dissipation (normal mode / buffer mode)	2.5 W / 3.3 W	3.1 W / 6.3 W
Efficiency (typ.)	> 97.1 % (with charged power storage device)	> 97.6 % (with charged power storage device)
Signaling		
Signaling	LED, relay contact, interface/software	LED, relay contact, interface/software
Interfaces	IFS (Interface system data port)	IFS (Interface system data port)
General data		
Storage medium	Lead rechargeable battery module 1.3 Ah	Lead rechargeable battery module, 3.4 Ah
Weight / Dimensions W x H x D	2.2 kg / 88 x 138 x 125 mm	3.8 kg / 120 x 169 x 125 mm
Installation position	horizontal DIN rail NS 35, EN 60715	horizontal DIN rail NS 35, EN 60715
Spacing when mounting	Can be aligned: horizontal 5 mm, vertical 50 mm	Can be aligned: horizontal 5 mm, vertical 50 mm
Connection method	Plug-in screw connection	Plug-in screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 20 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 16 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 20 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 16 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Degree of protection / Protection class	IP20 / III	IP20 / III
MTBF (EN 29500, 40°C)	> 806493 h	> 806493 h
Ambient temperature (operation)	0 °C ... 40 °C	0 °C ... 40 °C
Ambient temperature (storage/transport)	-15 °C ... 40 °C	-15 °C ... 40 °C
Service life	6 Years ... 9 Years (20°C)	6 Years ... 9 Years (20°C)
Latest startup	9 Months (20 °C ... 30 °C) 6 Months (30 °C ... 40 °C)	9 Months (20 °C ... 30 °C) 6 Months (30 °C ... 40 °C)
Standards/regulations		
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety, safety transformer	EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
UL approvals	UL/C-UL Recognized UL 60950 , UL Listed UL 508	UL/C-UL Recognized UL 60950 , UL Listed UL 508

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power supply, uninterruptible						
	QUINT-UPS/ 24DC/ 24DC/ 5/1.3AH	**2320254**	1	**QUINT-UPS/ 24DC/ 24DC/10/3.4AH**	**2320267**	1

Maintenance-free buffer module

The buffer module can accommodate failures lasting several seconds.

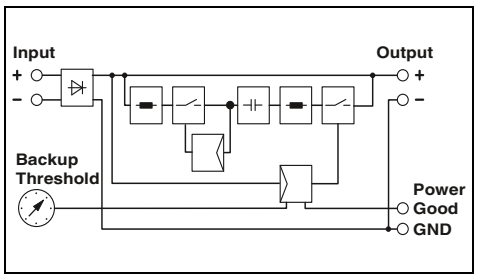
It combines an electronic switch-over unit and a capacitor-based power storage device in the same housing.

Notes:

The buffer time associated with your solution is dependent on the load current. Exact details for each uninterruptible power supply can be found on page 233

Buffer module,
24 V DC / 24 V DC, 40 A

Ex:



Technical data

Input data	
Nominal input voltage	24 V DC
DC input voltage range	18 V DC ... 30 V DC
Current consumption (idling/charging process/max.)	0.1 A / 0.7 A / 44.7 A
Connect threshold (fixed, variable)	< 20 V DC (< 22 V; < 24 V; < 26 V) , (U_{IN} - 1 V)/0.1 s
Output data	
Nominal output voltage	24 V DC (depending on the input voltage)
Output current	40 A
Can be connected in parallel / series	Yes / No
Buffer period	0.2 s (40 A) / 8 s (1 A)
Max. power dissipation (normal mode / buffer mode)	8 W / 48 W
Efficiency (typ.)	> 99 % (with charged power storage device)
Signaling	
Signaling DC OK	LED, active switching output
General data	
Storage medium	Electrolytic capacitor
Weight / Dimensions W x H x D	1.1 kg / 64 x 130 x 125 mm
Installation position	horizontal DIN rail NS 35, EN 60715
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Screw connection
Input connection data (solid/stranded/AWG)	0.5 - 16 mm² / 0.5 - 16 mm² / 8 - 6
Output connection data (solid/stranded/AWG)	0.5 - 16 mm² / 0.5 - 16 mm² / 8 - 6
Signal connection data (solid/stranded/AWG)	0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Degree of protection / Protection class	IP20 / III
MTBF (EN 29500, 40°C)	> 902725 h
Ambient temperature (operation)	-25 °C ... 80 °C
Standards/regulations	
Insulation voltage: input, output/housing	500 V
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
UL approvals	UL/C-UL Recognized UL 60950 , UL Listed UL 508

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply, uninterruptible	**QUINT-BUFFER/24DC/24DC/40**	**2320393**	1

Uninterruptible power supply units for the control cabinet

UPS module with integrated power storage

– Uninterruptible power supply with integrated power storage device

STEP UPS

The STEP BAT power supply unit is included as part of the STEP UPS order. The STEP BAT can be reordered separately. (See accessories on this page)

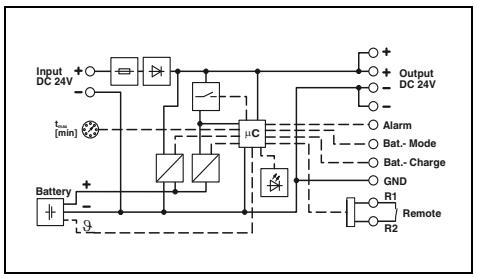
Notes:

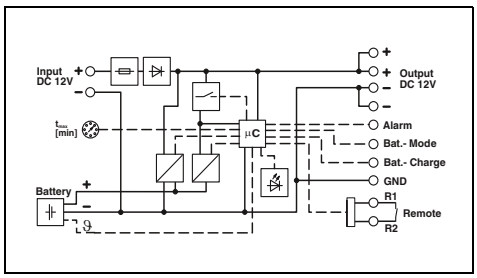
With the STEP-UPS/12DC/12DC/4, buffer times are double those of the STEP-UPS/24DC/24 DC/3. See page 233

N

Uninterruptible power supply with integrated rechargeable battery, 24 V DC / 24 V DC, 3 A

Uninterruptible power supply with integrated rechargeable battery, 12 V DC / 12 V DC, 4 A





	Technical data	Technical data
Input data		
Nominal input voltage	24 V DC	12 V DC
DC input voltage range	22.5 V DC ... 29.5 V DC	10 V DC ... 16.5 V DC
Max. current consumption	4.1 A (24 V DC)	5.7 A (12 V DC)
Current consumption charging process	4.7 A	6 A
Input fuse	7 A (slow-blow, internal)	7 A (slow-blow, internal)
Output data		
Nominal output voltage	24 V DC	12 V DC
Output current standard operation	3 A	4 A
Output current POWER BOOST	4 A (0°C ... 35°C)	5 A (0°C ... 35°C)
Can be connected in parallel / series	No / No	No / No
Buffer period	50 min (1 A) / 25 min (2 A)	100 min (1 A) / 50 min (2 A)
Max. power dissipation (normal mode / buffer mode)	2.7 W / 4.4 W	2 W / 3.4 W
Efficiency (typ.)	> 98 % (Mains operation, with charged power storage)	> 97.4 % (Mains operation, with charged power storage)
Signaling		
Signaling Power OK	LED	LED
Signaling alarm	LED, active transistor switching output	LED, active transistor switching output
Signaling battery charge	LED, active transistor switching output	LED, active transistor switching output
Signaling battery mode	LED, active transistor switching output	LED, active transistor switching output
General data		
Storage medium	Lithium polymer	Lithium polymer
Weight / Dimensions W x H x D	0.45 kg / 108 x 90 x 61 mm	0.46 kg / 108 x 90 x 61 mm
Installation position	horizontal DIN rail NS 35, EN 60715	horizontal DIN rail NS 35, EN 60715
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Screw connection	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Degree of protection / Protection class	IP20 / III	IP20 / III
MTBF (EN 29500, 40°C)	> 1401000 h	> 1997000 h
Ambient temperature (operation)	0 °C ... 40 °C	0 °C ... 40 °C
Standards/regulations		
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety, safety transformer	EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
UL approvals	UL Listed UL 508 , UL/C-UL Recognized UL 60950	UL Listed UL 508 , UL/C-UL Recognized UL 60950

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply, uninterruptible	**STEP-UPS/24DC/24DC/3**	**2868703**	1
Accessories			
Power storage device	**STEP-BAT/LIPO/18.5DC/1.4AH**	**2320364**	1

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply, uninterruptible	**STEP-UPS/12DC/12DC/4**	**2868693**	1
Accessories			
Power storage device	**STEP-BAT/LIPO/18.5DC/1.4AH**	**2320364**	1

Buffer times for UPS with integrated power storage

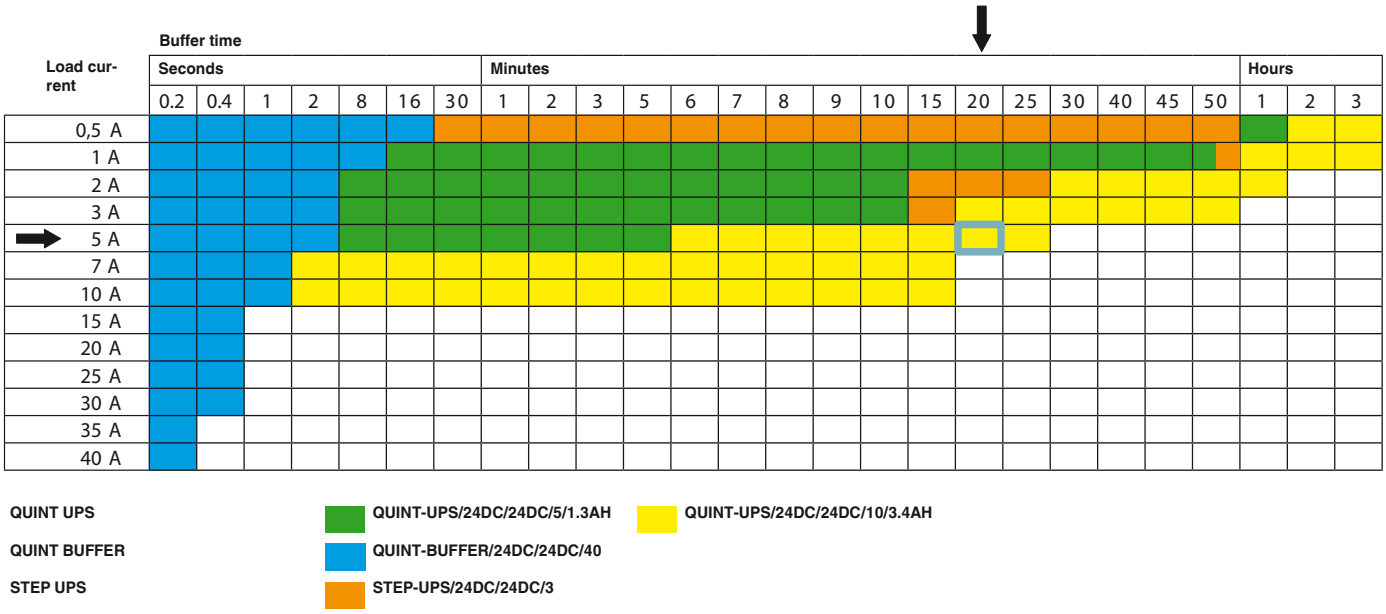
Particularly space-saving and easy to retrofit, the UPS module and power storage device are combined in the same housing. The maintenance-free buffer module is now also available with 40 A load current.

Select your QUINT UPS, QUINT BUFFER, and STEP UPS here.

Example: 5 A needs to be buffered for 20 minutes.

Solution: QUINT-UPS/24DC/24DC/10/3.4AH

Note: with the STEP-UPS/12DC/12DC/4, buffer times are double those of the STEP-UPS/24DC/24 DC/3.



Power storage devices for MINI UPS and TRIO UPS

The UPS module and power supply unit are combined in the same housing in a particularly space-saving way. Only one power storage device is required to complete the UPS system.

MINI UPS

Power storage devices with lead AGM technology for output voltages of 24 or 12 V DC. Buffer times of up to 50 minutes with 1 A load current.

Note: with the MINI-DC-UPS/12DC/4, buffer times are double those of the MINI-DC-UPS/24DC/2.

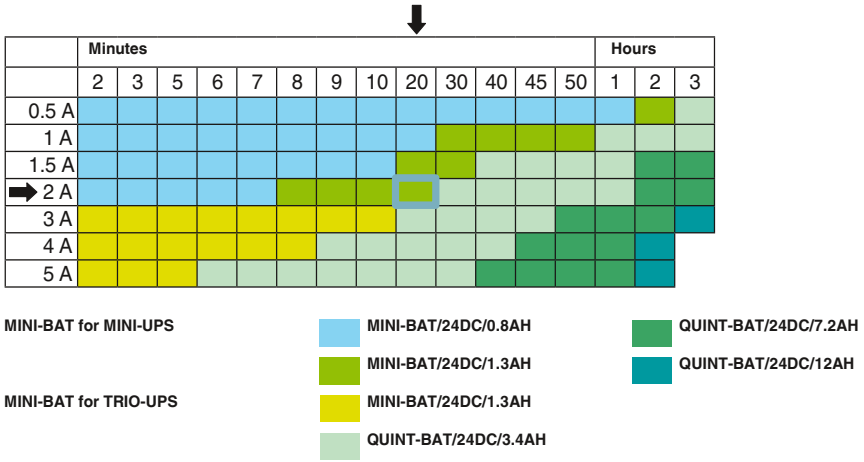
TRIO UPS

Power storage devices with lead AGM technology buffer failures lasting up to 2 hours with 5 A load current.

Select your MINI-BAT and QUINT-BAT for MINI UPS and TRIO UPS here.

Example: 2 A needs to be buffered for 20 minutes.

Solution: MINI-BAT/24DC/1.3AH



UPS module with integrated power supply unit

TRIO UPS

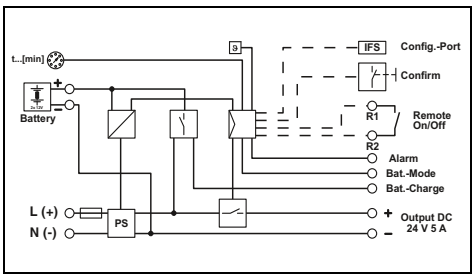
Developed specifically for supplying industrial PCs. Configuration port: freely parameterizable with the UPS CONF configuration software. Configuration stick: parameterize stick once and transfer to any number of TRIO UPS units.

The UPS-CONF TRIO (Order No.: 2320348) configuration software can be downloaded free of charge from our homepage.

UPS with integrated power supply, 100 - 240 V AC / 24 V DC, 5 A

Notes:

The buffer time associated with your solution is dependent on the load current. Exact details for each uninterruptible power supply can be found on page 233



Technical data

Input data	
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 100 V DC ... 350 V DC
Max. current consumption in normal mode	0.95 A / 1.1 A (230 V AC) , 1.7 A / 1.8 A (120 V AC)
Input fuse	6.3 A (slow-blow, internal)
Reliable backup fuse, circuit breaker	B6 , B10 , B16
Output data	
Nominal output voltage	24 V DC
Output current	5 A
Can be connected in parallel / series	No / No
Buffer period	20 min (5 A)
Max. power dissipation (normal mode / buffer mode)	16 W / 4 W
Efficiency (typ.)	> 88 % (230 V AC, network operation)
Signaling	
Interfaces	IFS (Interface system data port)
Signaling Power OK	LED
Signaling alarm	LED, active switching output
Signaling battery charge	LED, active switching output
Signaling battery mode	LED, active switching output
General data	
Storage medium	External, battery 1.3 Ah / 3.4 Ah / 7.2 Ah / 12 Ah
Weight / Dimensions W x H x D	1.1 kg / 60 x 130 x 118 mm
Installation position	horizontal DIN rail NS 35, EN 60715
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Screw connection
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Degree of protection / Protection class	IP20 / I
MTBF (EN 29500, 40°C)	> 596285 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating)
Standards/regulations	
Insulation voltage input/output	2 kV (Routine test) / 4 kV (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Electrical safety, safety transformer	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Power supply, uninterruptible			
	TRIO-UPS/1AC/24DC/ 5	**2866611**	1

UPS module with integrated power supply unit

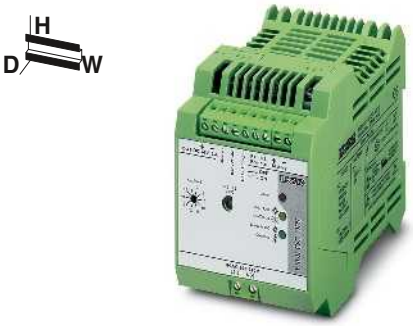
MINI-UPS 24 V DC and 12 V DC

The MINI UPS combines the power supply unit and the UPS module in the same housing in a particularly space-saving way.

Notes:

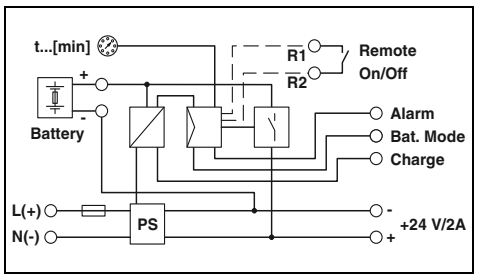
With the MINI-DC-UPS/12DC/4, buffer times are double those of the MINI-DC-UPS/24DC/2.

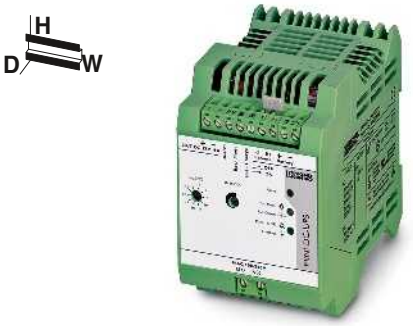
The buffer time associated with your solution is dependent on the load current. Exact details for each uninterruptible power supply can be found on page 233



UPS with integrated power supply, 100 - 240 V AC / 24 V DC, 2 A

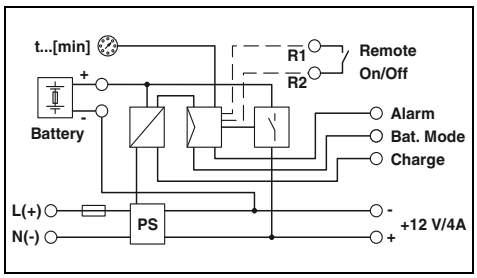
Ex:





UPS with integrated power supply, 100 - 240 V AC / 12 V DC, 4 A

Ex:



	Technical data	Technical data
Input data		
Nominal input voltage range	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Input voltage range AC/DC	85 V AC ... 264 V AC / 100 V DC ... 350 V DC	85 V AC ... 264 V AC / 100 V DC ... 350 V DC
Max. current consumption in normal mode	0.6 A / 0.85 A (230 V AC) , 1.1 A / 1.5 A (120 V AC)	0.5 A / 0.65 A (230 V AC) , 1.15 A / 1.35 A (120 V AC)
Input fuse	3.15 A (slow-blow, internal)	3.15 A (slow-blow, internal)
Reliable backup fuse, circuit breaker	B6 , B10 , B16	B6 , B10 , B16
Output data		
Nominal output voltage	24 V DC (AC input voltage available: 22.5 to 29.5 V DC, AC input voltage not available: 27.9 to 19.2 V DC)	12 V DC (AC input voltage available: 10 to 16 V DC, AC input voltage not available: 13.6 to 9.6 V DC)
Output current	2 A	4 A
Can be connected in parallel / series	No / Yes	No / Yes
Buffer period	20 min (2 A)	20 min (4 A)
Max. power dissipation (idling / normal mode / buffer mode)	3.8 W / 10.1 W / 2.1 W	1.6 W / 10.5 W / 2.6 W
Efficiency (typ.)	> 83 %	> 82 %
Signaling		
Signaling Power OK	LED	LED
Signaling alarm	LED, active switching output	LED, active switching output
Signaling battery charge	LED, active switching output	LED, active switching output
Signaling battery mode	LED, active switching output	LED, active switching output
General data		
Storage medium	External, battery 0.8 Ah / 1.3 Ah	External, rechargeable battery 1.6 Ah / 2.6 Ah
Weight / Dimensions W x H x D	0.45 kg / 67.5 x 99 x 107 mm	0.45 kg / 67.5 x 99 x 107 mm
Installation position	horizontal DIN rail NS 35, EN 60715	horizontal DIN rail NS 35, EN 60715
Spacing when mounting	Can be aligned: Horizontally 0 mm, vertically 50 mm	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Plug-in COMBICON screw connections	Plug-in COMBICON screw connections
Input connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Output connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Signal connection data (solid/stranded/AWG)	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Degree of protection / Protection class	IP20 / II (in an enclosed control cabinet)	IP20 / II (in an enclosed control cabinet)
MTBF (EN 29500, 40°C)	> 728579 h	> 753179 h
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60 °C derating)
Standards/regulations		
Insulation voltage input/output	2 kV (routine test) / 4 kV (type test)	2 kV (routine test) / 4 kV (type test)
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Electrical safety, safety transformer	EN 60950-1/VDE 0805 (SELV)	EN 60950-1/VDE 0805 (SELV)
Electronic equipm. for electrical power installations	EN 50178/VDE 0160 (PELV)	EN 50178/VDE 0160 (PELV)
UL approvals	UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)	UL Listed UL 508 , UL/C-UL Recognized UL 60950 , UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Power supply, uninterruptible						
	MINI-DC-UPS/24DC/2	**2866640**	1	**MINI-DC-UPS/12DC/4**	**2866598**	1

Power storage device for TRIO UPS

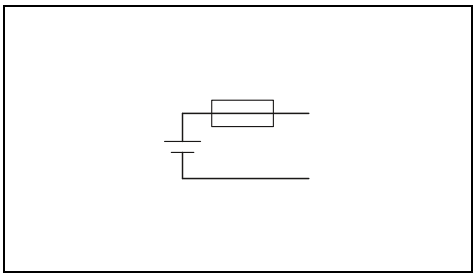
MINI-BAT, QUINT-BAT

MINI-BAT and QUINT BAT for maximum buffer times

– Lead AGM (Absorbent Glass Mat) technology
– Ambient temperatures from 0 to +40°C

Power storage, 24 V DC, 1.3 Ah for TRIO UPS and MINI UPS 2 A

Ex:



Technical data

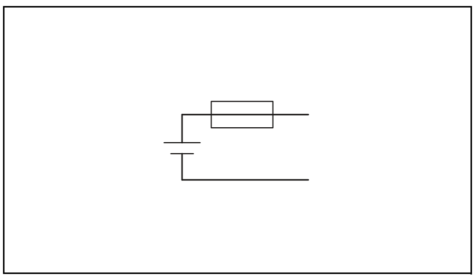
Input data/output data	
Nominal input voltage	24 V DC
Nominal capacity	1.3 Ah
Nominal output voltage	24 V DC
Output current	15 A
Can be connected in parallel / series	Yes / No
General data	
Weight / Dimensions W x H x D	1.7 kg / 52 x 130 x 110 mm
Degree of protection / Protection class	IP20 / III
Ambient temperature (operation)	0 °C ... 40 °C
Service life	6 Years ... 9 Years (20 °C)
Latest startup	9 Months (20 °C ... 30 °C) 6 Months (30 °C ... 40 °C)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Battery module			
	MINI-BAT/24DC/1.3AH	**2866417**	1

Power storage, 24 V DC, 3.4 Ah for TRIO UPS

BSH GL



Technical data

24 V DC
3.4 Ah
24 V DC
25 A
Yes / No

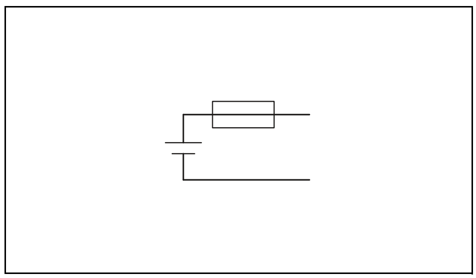
3.5 kg / 112 x 145 x 123 mm
IP20 / III
0 °C ... 40 °C
6 Years ... 9 Years (20 °C)
9 Months (20 °C ... 30 °C)
6 Months (30 °C ... 40 °C)

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-BAT/24DC/ 3.4AH	2866349	1

Power storage, 24 V DC, 7.2 Ah for TRIO UPS

GL



Technical data

24 V DC
7.2 Ah
24 V DC
50 A
Yes / No

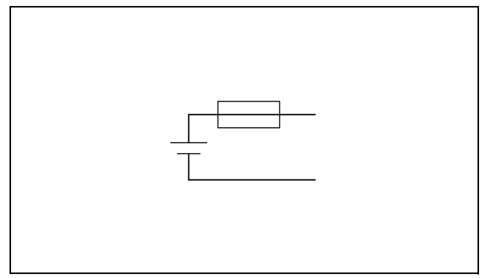
6 kg / 164 x 156 x 110 mm
IP20 / III
0 °C ... 40 °C
6 Years ... 9 Years (20 °C)
9 Months (20 °C ... 30 °C)
6 Months (30 °C ... 40 °C)

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-BAT/24DC/ 7.2AH	2866352	1

Power storage, 24 V DC, 12 Ah for TRIO UPS

GL



Technical data

24 V DC
12 Ah
24 V DC
50 A
Yes / No

9 kg / 231 x 156 x 110 mm
IP20 / III
0 °C ... 40 °C
6 Years ... 9 Years (20 °C)
9 Months (20 °C ... 30 °C)
6 Months (30 °C ... 40 °C)

Ordering data

Type	Order No.	Pcs. / Pkt.
QUINT-BAT/24DC/12AH	2866365	1

Power storage device for MINI UPS

MINI-BAT

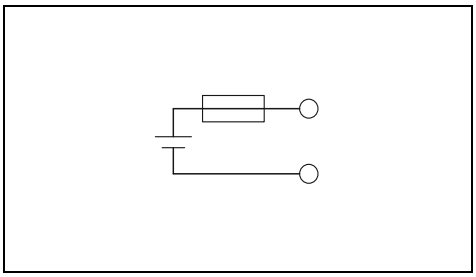
MINI-BAT for maximum buffer times
– Lead AGM (Absorbent Glass Mat) technology
– Ambient temperatures from 0 to +40°C

Notes:

The buffer time associated with your solution is dependent on the load current. Exact details for each uninterruptible power supply can be found on page 233

Power storage, 24 V DC, 0.8 Ah for MINI UPS 2 A

Ex: 



Technical data

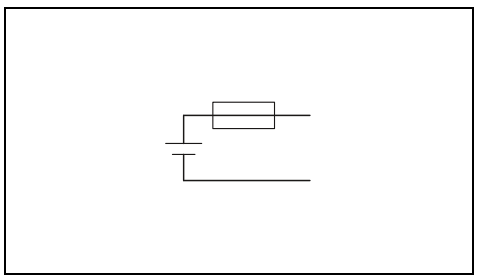
Input data/output data	
Nominal input voltage	24 V DC
Nominal capacity	0.8 Ah
Nominal output voltage	24 V DC
Output current	5 A
Can be connected in parallel / series	Yes / No
General data	
Weight / Dimensions W x H x D	0.9 kg / 67.5 x 99 x 107 mm
Degree of protection / Protection class	IP20 / III
Ambient temperature (operation)	0 °C ... 40 °C
Service life	4 Years (20 °C)
Latest startup	6 Months (20 °C ... 30 °C) 3 Months (30 °C ... 40 °C)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Battery module	**MINI-BAT/24DC/0.8AH**	**2866666**	1

Power storage, 24 V DC, 1.3 Ah
for TRIO UPS and MINI UPS 2 A

Ex:



Technical data

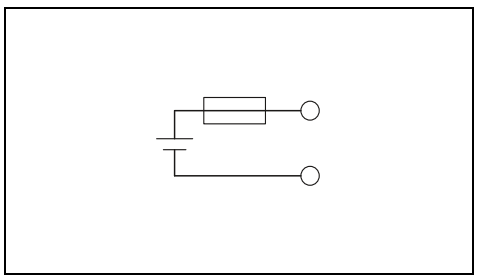
24 V DC
1.3 Ah
24 V DC
15 A
Yes / No
1.7 kg / 52 x 130 x 110 mm
IP20 / III
0 °C ... 40 °C
6 Years ... 9 Years (20 °C)
9 Months (20 °C ... 30 °C)
6 Months (30 °C ... 40 °C)

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-BAT/24DC/1.3AH	2866417	1

Power storage 12 V DC, 1.6 Ah
for MINI UPS 4 A

Ex:



Technical data

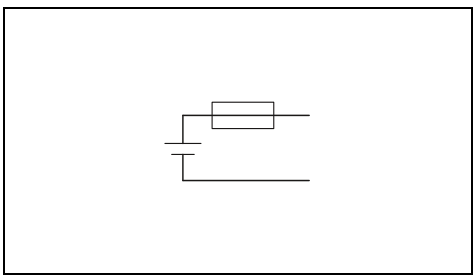
12 V DC
1.6 Ah
12 V DC
10 A
Yes / No
0.9 kg / 67.5 x 99 x 107 mm
IP20 / III
0 °C ... 40 °C
4 Years (20 °C)
6 Months (20 °C ... 30 °C)
3 Months (30 °C ... 40 °C)

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-BAT/12DC/1.6AH	2866572	1

Power storage 12 V DC, 2.6 Ah
for MINI UPS 4 A

Ex:



Technical data

12 V DC
2.6 Ah
12 V DC
15 A
Yes / No
1.7 kg / 52 x 130 x 110 mm
IP20 / III
0 °C ... 40 °C
6 Years ... 9 Years (20 °C)
9 Months (20 °C ... 30 °C)
6 Months (30 °C ... 40 °C)

Ordering data

Type	Order No.	Pcs. / Pkt.
MINI-BAT/12DC/2.6AH	2866569	1

Uninterruptible power supply units for 19" racks/towers

Constant power supply and improved power quality

UPS devices play an important role in ensuring reliable power quality. They bridge power failures and remove other mains faults such as:

– Under voltages or surge voltages
– High-frequency noise
– Frequency fluctuations
– Harmonics

Class VFI-SS-111 UPS devices according to IEC 62040-3

The UPS devices are class VFI-SS-111 single-phase, uninterruptible power supply units. The connected loads are protected against any faults on the mains side. Double conversion technology permanently supplies loads with an output voltage/frequency that is independent of the mains input.

Extensive configuration options:

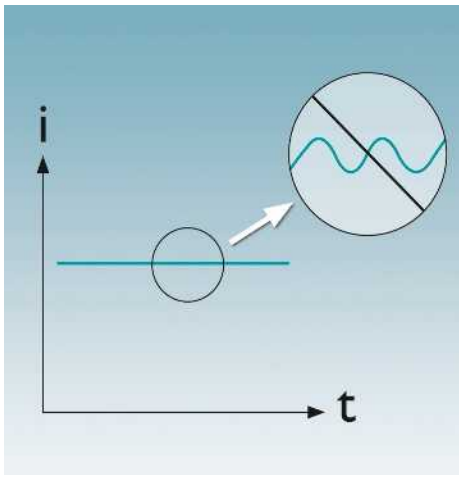
Configure your UPS system according to your requirements and the operating environment.

UPS-CP devices can be configured directly via the control panel, even with no external power supply, provided the batteries are charged:

– Quick status check via LED and illuminated LCD control panel
– Controlled computer shutdown by means of additional software
– Remote access via web browser with SNMP network card

Complete and extend your UPS system:

– DIN rails offer the option of installing the UPS-CP devices in 19" racks
– All devices can be extended with SNMP network cards or relay cards



Long battery life

The special charge control of the UPS-CP devices ensures ripple-free DC voltage without higher-level AC currents.

Integrated safety cut-off

If required the UPS-CP devices can be integrated in a safety concept via a two-pos. connection.

Easy battery replacement

Batteries can be easily replaced during operation and when integrated. This is true for all UPS devices and battery modules.

Stand-alone or 19" rack installation possible

Depending on the application, the control panel on the UPS-CP devices can be rotated 90° for optimum display clarity.

Uninterruptible power supply units for 19" racks/towers

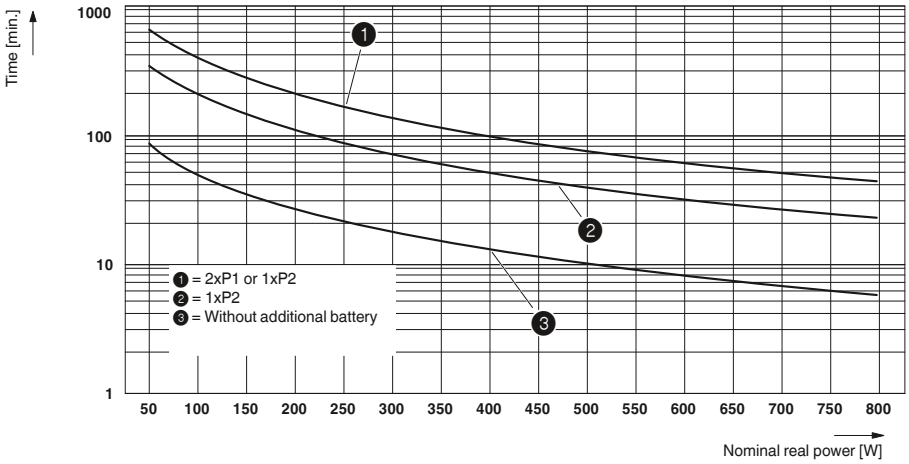
In order to select the ideal UPS, the power requirement of the connected loads and the required bridging time must be known. The diagrams illustrated can be used to select the appropriate UPS.

By adding external battery units, correspondingly longer bridging times can be achieved.

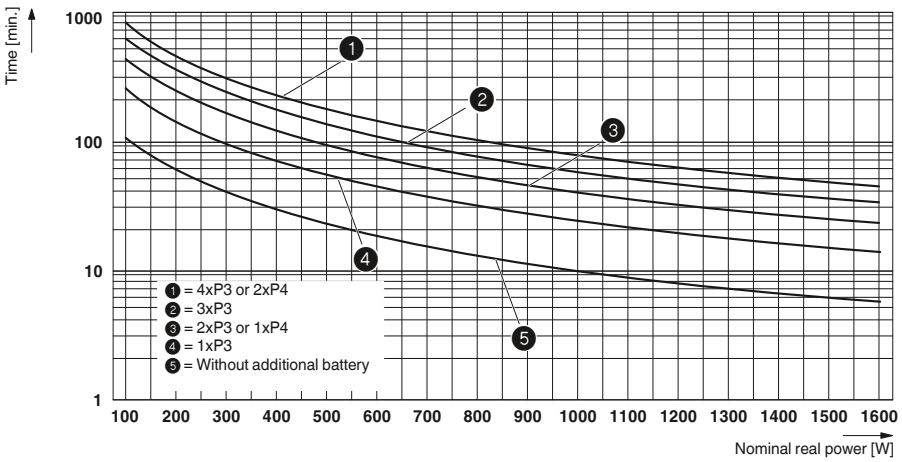
For the assignment and maximum possible number of external battery units, please refer to the table on the right.

UPS-CP-...	... BAT-1KVA-**P1**	... BAT-1KVA-**P2**	... BAT-2/3KVA-**P3**	... BAT-2/3KVA-**P4**	... BAT-4.5/6KVA-**P5**
...1KVA/240AC	Max. 2	Max. 1	—	—	—
...2KVA/240AC	—	—	Max. 4	Max. 2	—
...3KVA/240AC	—	—	Max. 4	Max. 2	—
...4.5KVA/240AC	—	—	—	—	Max. 5
...6KVA/240AC	—	—	—	—	Max. 5

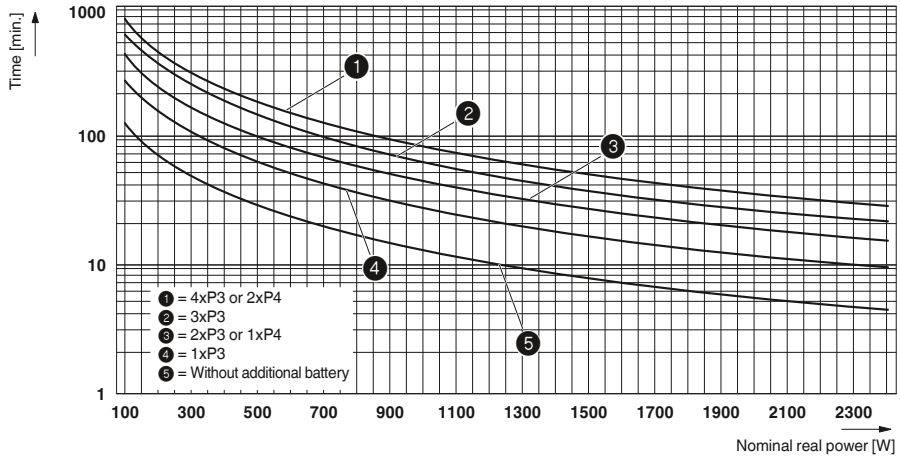
UPS-CP-1kVA/240AC



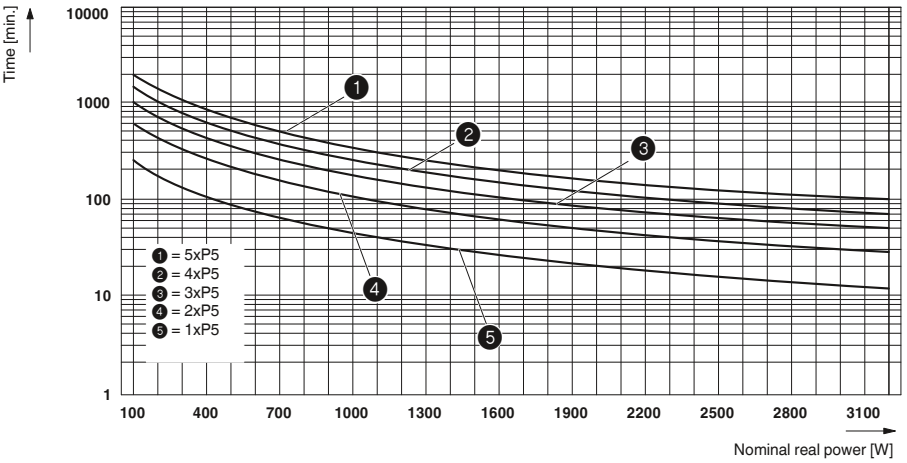
UPS-CP-2kVA/240AC



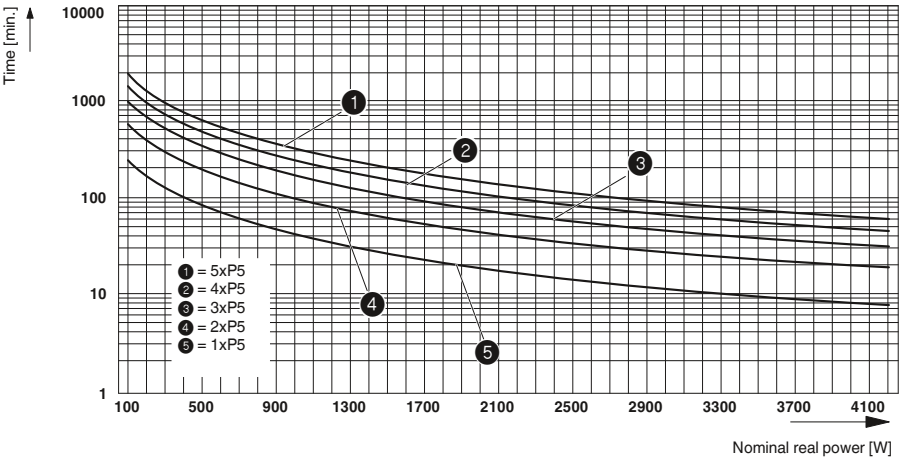
UPS-CP-3kVA/240AC



UPS-CP-4.5kVA/240AC



UPS-CP-6kVA/240AC



UPS devices

- Class VFI-SS-111 single-phase UPS (according to IEC 62040-3)
- Double conversion technology for maximum voltage quality
- Use as rack (19") or tower device with rotatable control panel
- Hot-swappable battery replacement on the front
- Long battery life thanks to ripple-free charging
- Mains-independent output voltage
- Comprehensive accessories for enhanced functions
- Supports a variety of operating systems

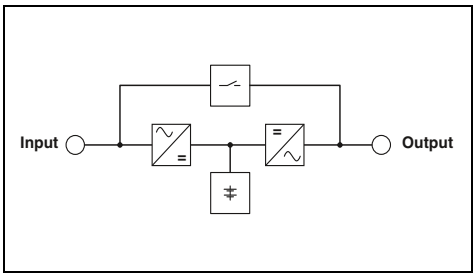
Notes:

1) EMC: Class A product, see page 287

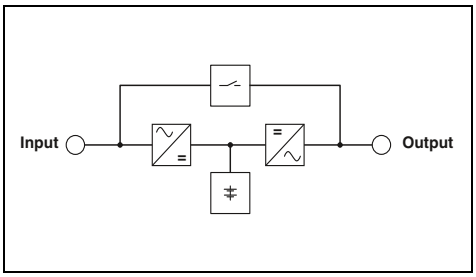
1 kVA nominal power

2 kVA nominal power

Total width 483 mm



Total width 483 mm



	Technical data	Technical data
Common characteristics		
Apparent power	1000 VA	2000 VA
Nominal power (real power)	800 W	1600 W
Power factor	0.8	0.8
UPS topology	Double conversion technology	Double conversion technology
Classification	VFI-SS-111	VFI-SS-111
UPS input side		
AC input voltage range	160 ... 288 V AC	160 ... 288 V AC
AC frequency range	50 Hz ... 60 Hz +/-5 Hz (automatic recognition)	50 Hz ... 60 Hz +/-5 Hz (automatic recognition)
Nominal input current	3.8 A	8 A
Power factor (cos phi)	0.99 (with linear load)	0.99 (with linear load)
Current distortion (THDi)	< 6 % (at full load)	< 6 % (at full load)
UPS output side		
Output voltage range	230 V AC ±1% (200/208/220/230/240 V AC adjustable)	230 V AC ±1% (200/208/220/230/240 V AC adjustable)
Nominal output current	4.35 A	8.7 A
AC frequency range	50 / 60 Hz (automatic recognition)	50 / 60 Hz (automatic recognition)
Battery system		
Battery type	VRLA	VRLA
Bridging time	≥ 6 min	≥ 6 min (Nominal load, in addition)
Charging time	4 h (90% charge)	4 h (90% charge)
Type of battery replacement	Hot-swappable	Hot-swappable
General data		
Ambient temperature (operation)	0 °C ... 40 °C	0 °C ... 40 °C
Ambient temperature (storage/transport)	0 °C ... 45 °C	0 °C ... 45 °C
Degree of protection	IP20	IP20
Height unit	2 HU	2 HU
Design	19" rack/fixed housing	19" rack/fixed housing
Depth	490.00 mm	680.00 mm
Permissible humidity (operation)	0 % ... 90 % (no condensation)	0 % ... 90 % (no condensation)
Noise level	50.00 dB(A)	50.00 dB(A)
Weight	19.00 kg	30.00 kg

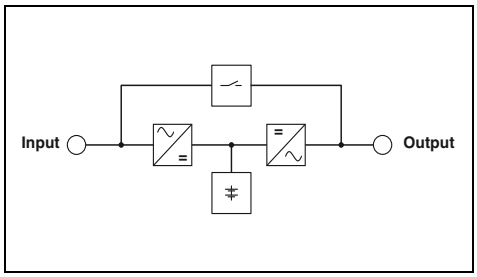
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
UPS compact						
	UPS-CP-1KVA/240AC[1])	**2800274**	1	**UPS-CP-2KVA/240AC[1])**	**2800275**	1
	Accessories			**Accessories**		
Optional power storage device						
	UPS-CP-BAT-1KVA-P1	**2800280**	1	**UPS-CP-BAT-2/3KVA-P3**	**2800283**	1
	UPS-CP-BAT-1KVA-P2	**2800281**	1	**UPS-CP-BAT-2/3KVA-P4**	**2800284**	1
DIN rail						
For 19" rack installation	**UPS-CP-19"MR**	**2800288**	1	**UPS-CP-19"MR**	**2800288**	1

3 kVA nominal power

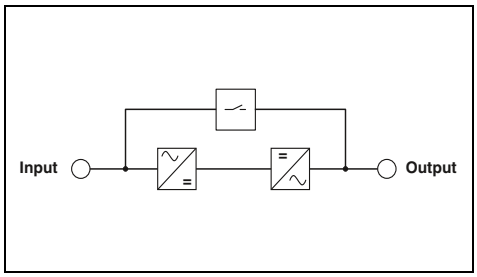
4.5 kVA nominal power

6 kVA nominal power

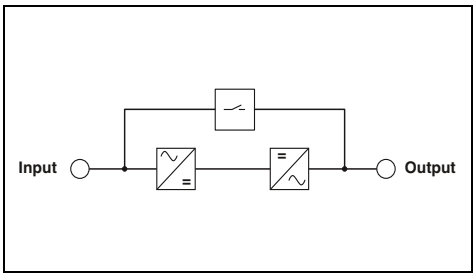
Total width 483 mm



Total width 483 mm



Total width 483 mm



Technical data

3000 VA	
2400 W	
0.8	
Double conversion technology	
VFI-SS-111	
160 ... 288 V AC	
50 Hz ... 60 Hz +/-5 Hz (automatic recognition)	
11.5 A	
0.99 (with linear load)	
< 6 % (at full load)	
230 V AC ±1% (200/208/220/230/240 V AC adjustable)	
13.04 A	
50 / 60 Hz (automatic recognition)	
VRLA	
≥ 5 min (Nominal load, in addition)	
4 h (90% charge)	
Hot-swappable	
0 °C ... 40 °C	
0 °C ... 45 °C	
IP20	
2 HU	
19" rack/fixed housing	
680.00 mm	
0 % ... 90 % (no condensation)	
50.00 dB(A)	
33.00 kg	

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-CP-3KVA/240AC[1])	2800276	1

Accessories

UPS-CP-BAT-2/3KVA-P3	2800283	1
UPS-CP-BAT-2/3KVA-P4	2800284	1
UPS-CP-19"MR	2800288	1

Technical data

4500 VA	
4050 W	
0.9	
Double conversion technology	
VFI-SS-111	
160 ... 280 V AC	
50 Hz ... 60 Hz +/-5 Hz (automatic recognition)	
21.9 A	
0.99 (with linear load)	
< 6 % (at full load)	
230 V AC ±1% (200/208/220/230/240 V AC adjustable)	
19.57 A	
50 / 60 Hz (automatic recognition)	
-	
9 min (Full load)	
-	
-	
0 °C ... 40 °C	
0 °C ... 45 °C	
IP20	
2 HU	
19" rack/fixed housing	
680.00 mm	
0 % ... 90 % (no condensation)	
50.00 dB(A)	
22.00 kg	

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-CP-4.5KVA/240AC[1])	2800277	1

Accessories

UPS-CP-19"MR	2800288	1

Technical data

6000 VA	
5400 W	
0.9	
Double conversion technology	
VFI-SS-111	
160 ... 280 V AC	
50 Hz ... 60 Hz +/-5 Hz (automatic recognition)	
28.48 A	
0.99 (with linear load)	
< 6 % (at full load)	
230 V AC ±1% (200/208/220/230/240 V AC adjustable)	
26.09 A	
50 / 60 Hz (automatic recognition)	
-	
6 min (Full load)	
-	
-	
0 °C ... 40 °C	
0 °C ... 45 °C	
IP20	
2 HU	
19" rack/fixed housing	
680.00 mm	
0 % ... 90 % (no condensation)	
50.00 dB(A)	
22.00 kg	

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-CP-6KVA/240AC[1])	2800278	1

Accessories

UPS-CP-19"MR	2800288	1

Power storage devices

- Power storage for increasing the duration of the bridging
- Hot-swappable battery replacement
- Error-free connection thanks to adapted connection method

For UPS-CP-1KVA, 19 minutes (nominal load)

For UPS-CP-1KVA, 36 minutes (nominal load)

Total width 483 mm

Technical data

Battery system	
Battery type	VRLA
Battery capacity	14.40 Ah
Bridging time	19 min (Nominal load, in addition)
Bridging time	-
Charging time	4 h (90% charge)
Type of battery replacement	Hot-swappable
General data	
Ambient temperature (operation)	0 °C ... 40 °C
Ambient temperature (storage/transport)	0 °C ... 45 °C
Degree of protection	IP20
Height unit	2 HU
Design	19" rack/fixed housing
Depth	680.00 mm
Weight	29.00 kg

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Optional power storage device	**UPS-CP-BAT-1KVA-P1**	**2800280**	1

Accessories

DIN rail For 19" rack installation	**UPS-CP-19"MR**	**2800288**	1

Total width 483 mm

Technical data

Battery system	
Battery type	VRLA
Battery capacity	28.80 Ah
Bridging time	36 min (Nominal load, in addition)
Bridging time	-
Charging time	4 h (90% charge)
Type of battery replacement	Hot-swappable
General data	
Ambient temperature (operation)	0 °C ... 40 °C
Ambient temperature (storage/transport)	0 °C ... 45 °C
Degree of protection	IP20
Height unit	2 HU
Design	19" rack/fixed housing
Depth	680.00 mm
Weight	44.00 kg

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-CP-BAT-1KVA-P2	**2800281**	1

Accessories

UPS-CP-19"MR	**2800288**	1

For UPS-CP-2KVA, 8 minutes (nominal load)
For UPS-CP-3KVA, 5 minutes (nominal load)

Total width 483 mm

Technical data

VRLA
7.20 Ah
8 min (nominal load - 2 kVA)
5 min (nominal load - 3 kVA)
4 h (90% charge)
Hot-swappable

0 °C ... 40 °C
0 °C ... 45 °C
IP20
2 HU
19" rack/fixed housing
680.00 mm
29.00 kg

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-CP-BAT-2/3KVA-P3	2800283	1

Accessories

UPS-CP-19"MR	2800288	1

For UPS-CP-2KVA, 19 minutes (nominal load)
For UPS-CP-3KVA, 12 minutes (nominal load)

Total width 483 mm

Technical data

VRLA
14.40 Ah
19 min (nominal load - 2 kVA)
12 min (nominal load - 3 kVA)
4 h (90% charge)
Hot-swappable

0 °C ... 40 °C
0 °C ... 45 °C
IP20
2 HU
19" rack/fixed housing
680.00 mm
44.00 kg

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-CP-BAT-2/3KVA-P4	2800284	1

Accessories

UPS-CP-19"MR	2800288	1

For UPS-CP-4.5KVA, 10 minutes (nominal load)
For UPS-CP-6KVA, 8 minutes (nominal load)

Total width 483 mm

Technical data

VRLA
7.20 Ah
9 min (Nominal load - 4.5 kVA)
6 min (nominal load - 6 kVA)
4 h (90% charge)
Hot-swappable

0 °C ... 40 °C
0 °C ... 45 °C
IP20
3 HU
19" rack/fixed housing
680.00 mm
70.00 kg

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-CP-BAT-4.5/6KVA-P5	2800285	1

Accessories

UPS-CP-19"MR	2800288	1

UPS accessories

- SNMP network cards for UPS remote control and monitoring
- Relay cards with extended signal outputs for control functions
- External bypass modules for bypassing the UPS during servicing
- Multiple socket strips for connecting additional loads
- Redundancy modules for parallel connection of UPS devices to increase the reliability of the supply

SNMP interface adapter card

6-way relay card

Notes:

1) EMC: Class A product, see page 287

Total width 20 mm

Technical data

	... CARD	... CARD E
Electrical data		
Input		
Nominal voltage	9 V AC ... 30 V AC	9 V AC ... 30 V AC
Nominal current	120 mA	120 mA
Power supply connection	PCB connector	PCB connector
Output		
Nominal voltage	-	-
Nominal current	-	-
Load connection	RJ 45	RJ45, RJ12, Mini-DIN
Available interfaces	Ethernet / 1x RS-232	Ethernet / 3x RS-232
General data		
Ambient temperature (operation)	0 °C ... 60 °C	0 °C ... 60 °C
Ambient temperature (storage/transport)	0 °C ... 45 °C	0 °C ... 45 °C
Degree of protection	-	-
Design	Slot card	Slot card

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Network card			
Basic version (RJ45)	**UPS-SNMP-CARD[1])**	**2800289**	1
Extended version (RJ45, Modbus, AUX port)	**UPS-SNMP-CARD E[1])**	**2800290**	1
Relay card			
6-way relay card			
External bypass module			
For UPS-CP 1 - 3 kVA			
For UPS-CP 4.5 and 6 kVA			
Socket strip			
With 9 x 10 A IEC outputs			
With 4 x 16 A IEC outputs			
With 5 x 16 A + 9 x 10 A IEC outputs			
Redundancy module			
For two units			
For three units			
RCCMD software license			
	UPS-CP RCCMD LICENSEKEY	**2800550**	1

Total width 20 mm

Technical data

-
-
PCB connector
40 V DC
max. 25 mA
Screw terminal block
Screw terminal block
0 °C ... 40 °C
0 °C ... 45 °C
-
Slot card

Ordering data

Type	Order No.	Pcs. / Pkt.
UPS-6REL[1])	**2800287**	1

External bypass module

Multiple socket strip

Module for parallel/redundancy operation with external bypass

Total width 482.6 mm

Technical data	
... 1/2/3KVA	... 4.5/6KVA
240 V AC max. 16 A Socket C20 - IEC 60320	240 V AC max. 32 A Cable L/N/PE
240 V AC 16 A (thermal fuse)	240 V AC 32 A
6 x C13/10 A - IEC 60320	Cable L/N/PE; 2.8 m; open ends
-	-
0 °C ... 40 °C 0 °C ... 45 °C IP20 19" rack patch module	0 °C ... 40 °C 0 °C ... 45 °C IP20 19" rack patch module

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
UPS-CP-BP-1/2/3KVA	**2800291**	1
UPS-CP-BP-4.5/6KVA	**2800292**	1

Total width 483 mm

Technical data		
... 9X10A-IEC	... 4X16A-IEC	... 5X16A/9X10A-IEC
240 V AC max. 16 A C20 - IEC 60320	240 V AC max. 16 A C20 - IEC 60320	240 V AC max. 32 A Terminal block base - L/N/PE
240 V AC 10 A (thermal fuse)	240 V AC 16 A (thermal fuse)	240 V AC 16 A (10 A/thermal fuse)
9 x C13 - IEC 60320	4 x C19 - IEC 60320	5 x C19/16 A - IEC 60320
-		-
0 °C ... 40 °C 0 °C ... 45 °C IP20 19" rack patch module	0 °C ... 40 °C 0 °C ... 45 °C IP20 19" rack patch module	0 °C ... 40 °C 0 °C ... 45 °C IP20 19" rack patch module

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
UPS-CP-MS-9X10A-IEC	**2800293**	1
UPS-CP-MS-4X16A-IEC	**2800294**	1
UPS-CP-MS-5X16A/9X10A-IEC	**2800296**	1

Total width 483 mm

Technical data	
... 32A-4.5/6KV	... 63A-4.5/6KV
240 V AC max. 32 A Cable L/N/PE; 2.8 m; open ends	240 V AC max. 63 A Cable L/N/PE; 2.8 m; open ends
240 V AC 32 A	240 V AC 63 A
Cable L/N/PE; 2.8 m; open ends	Cable L/N/PE; 2.8 m; open ends
-	-
0 °C ... 40 °C 0 °C ... 45 °C IP20 19" rack patch module	0 °C ... 40 °C 0 °C ... 45 °C IP20 19" rack patch module

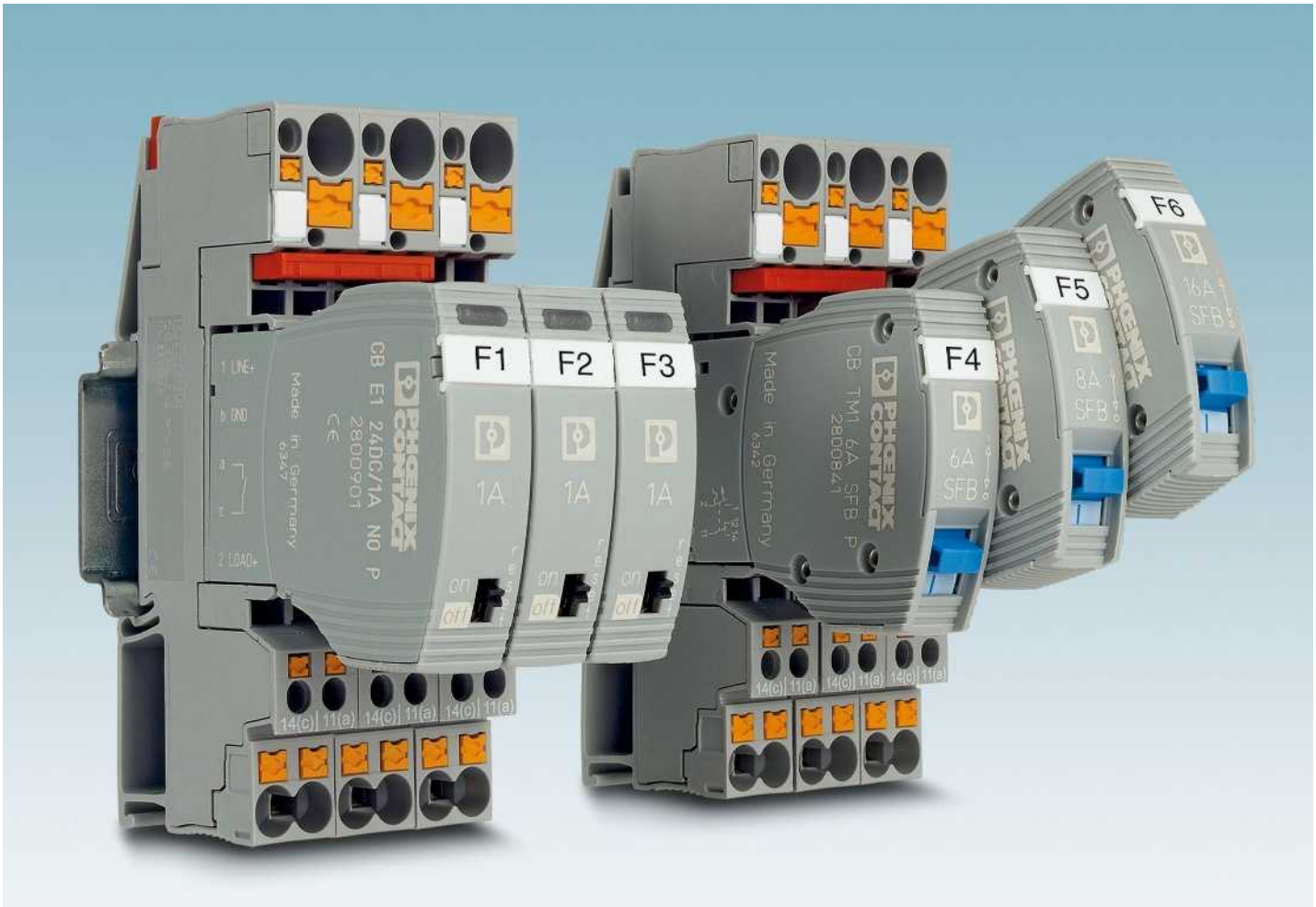
Ordering data		
Type	**Order No.**	Pcs. / Pkt.
UPS-CP-PU-240AC/32A-4.5/6KV	**2800297**	1
UPS-CP-PU-240AC/63A-4.5/6KV	**2800298**	1


10
TCP
0.5
A
2
1
2
1A
SFB
2A
M1
3A
F1
10A
on
off
reset
12(b)
1
2
14(c)
11(a)
14(c)
11(a)
14(c)
11(a)
14(c)
11(a)

Protective devices

High-grade device circuit breakers offer safety for your systems

Device circuit breakers are a key factor in high system availability. In the event of overload and short-circuit currents, they selectively shut down the faulty circuit.



Branch out

The device circuit breakers provide reliable protection even if your systems involve long cable paths. Together with the SFB technology* of the QUINT POWER power supply units, the special SFB trigger characteristic of the CB device circuit breakers ensures fast shutdown in the event of an error. This combination offers maximum protection against overload and short-circuit currents.

*SFB = Selective fuse breaking, selective shutdown

Individual adaptation

You can pre-wire your systems with base elements and individually equip them with protective plugs on site. The device circuit breakers can also be quickly adapted to accommodate necessary changes in your system. Should you change a load, simply replace the relevant protective plug. Various tripping methods, characteristic curves, and nominal currents are available depending on the application.

Modular extension

It couldn't be easier. Enhance your system with additional device circuit breakers in no time at all. You can bridge the power distribution, remote signaling or even the auxiliary voltage for electronic circuit breakers without this resulting in significant wiring costs. The uniform, plug-in housing concept as well as the bridgeability of the base elements simplify installation.

Device circuit breaker board

The multi-channel circuit breaker boards are used in standard production machines or in control and process technology, for example.

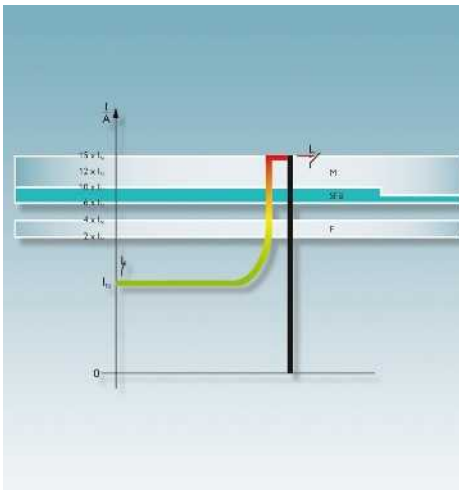
Central potential distribution minimizes the time and effort that has to be spent on installation. The boards are very versatile in application, as each one is populated with thermomagnetic circuit breakers individually.

Latching

You can quickly and easily remove the plugs from the base element. The new latching ensures a secure fit in harsh environments and where there are vibrations in the installation environment. It holds the plug in place in the base element.

Coding

Straightforward coding means that components can be mounted on the base element according to individual requirements without any errors.



SFB trigger characteristic

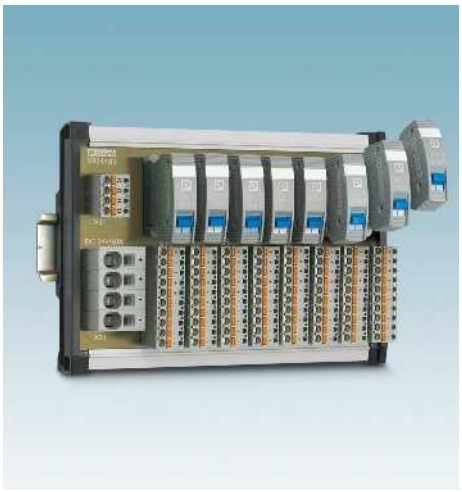
Thermomagnetic device circuit breakers with the SFB trigger characteristic* provide maximum overcurrent protection – even in large systems with long cable paths.

Bridge

With the unique bridge system from our standard range, the device circuit breakers can be combined easily as per your requirements. Potentials of the same type can be connected quickly and safely.

Variable connection technologies

You can choose base elements with either push-in or screw connection technology.



Device circuit breaker board

The multi-channel device circuit breaker boards are available with 4, 8 or 12 channels.

Product overview

Circuit breakers: electronic

CB E1...
Page 256

EC-E1 + EC-E4
Page 268

EC-E
Page 269

ECP-E
Page 270

ECP-E2
Page 271

ECP-E3
Page 272

Selective

ECP ...
Page 273

Thermal

TCP ...32V
Page 264

TCP ...
Page 265

Circuit breakers: thermomagnetic

CB-TM1...SFB
Page 259

CB-TM2...SFB
Page 259

CB-TM1...M1 P
Page 260

CB-TM1...F1 P
Page 260

CB-TM2...M1 P
Page 260

CB-TM2...F1 P
Page 260

UT 6-TMC M
Page 263

TMC 1 F1 100 0,2A
Page 266

TMCP 1 F1 300 0,2A
Page 266

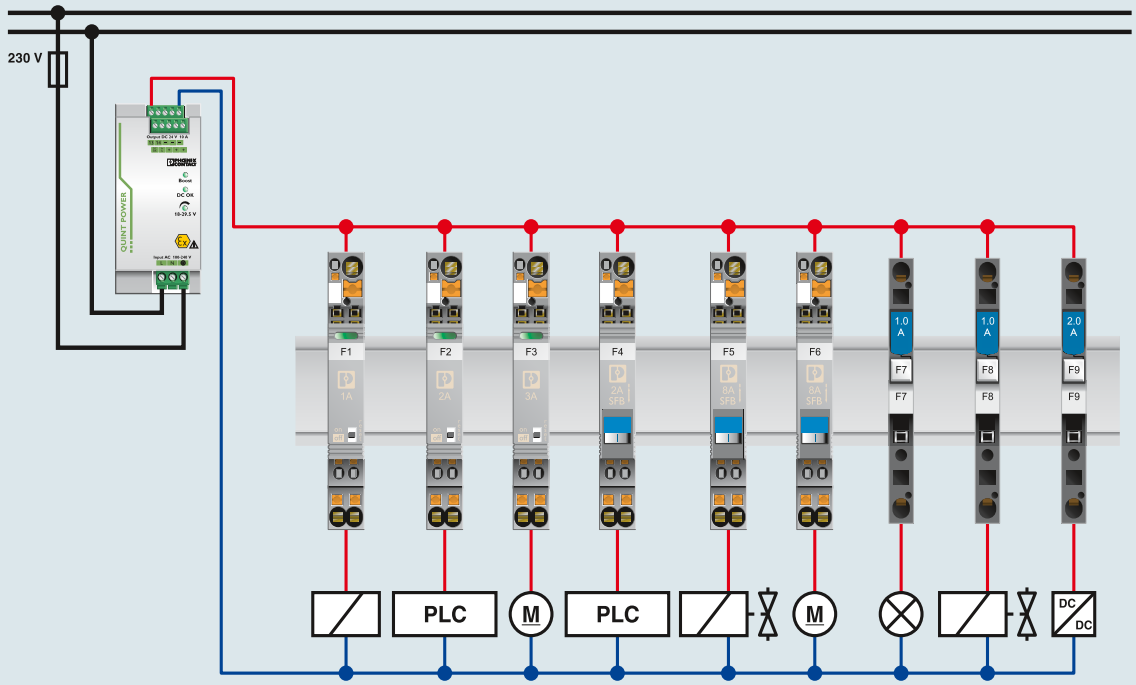
Board

CBB TM 04...P-PT
Page 262

CBB TM 08...P-PT
Page 262

CBB TM 12...P-PT
Page 262

CB device circuit breakers



CB E1...

Page 256

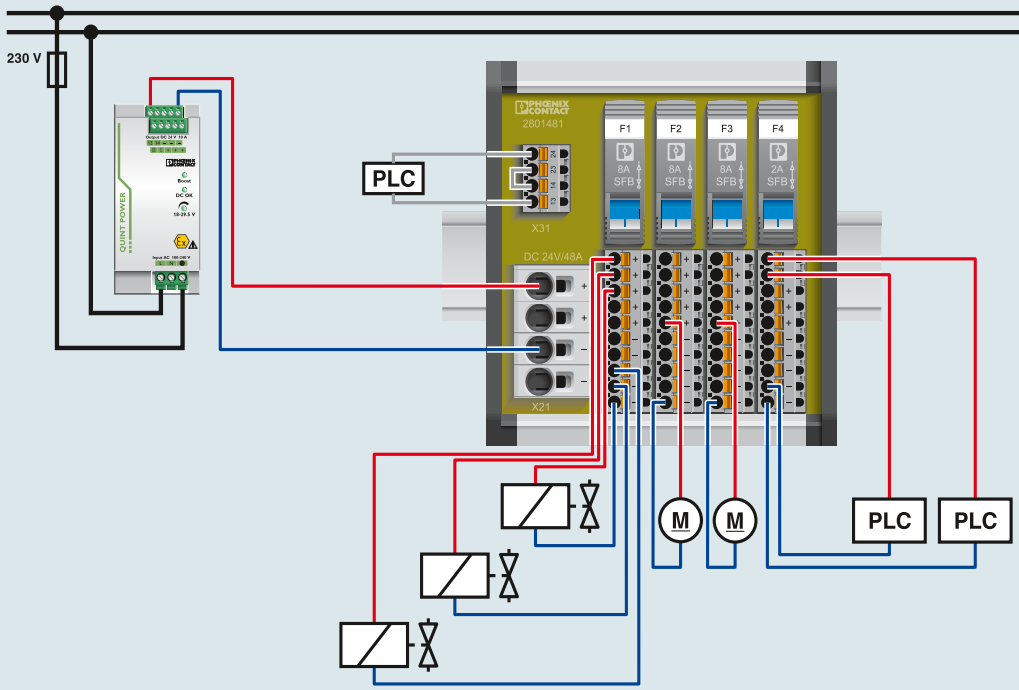
CB-TM1...

Page 259

TCP ...

Page 265

Device circuit breaker board

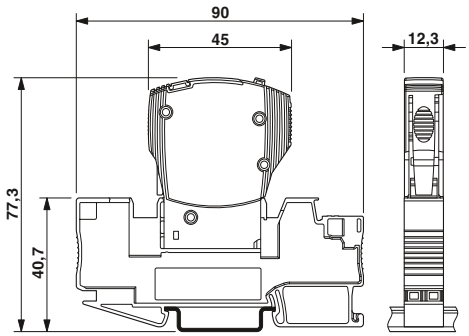


CBB TM...P-PT

Page 262

Plug-in electronic circuit breakers

- Device circuit breakers for protecting against voltage dips caused by overloads and short circuits
- Integrated active current limitation
- Remote control possible
- Maximum ease of maintenance thanks to the two-piece design
- Snap-in function for secure hold and easy removal
- Plug coding possible
- Narrow design



The figure shows the complete module consisting of a base element and connector

1 N/O contact

Total width 12.3 mm

Technical data

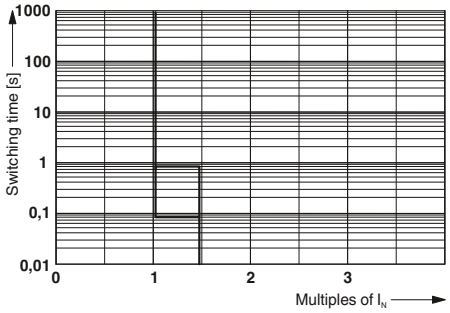
Rated data	
Operating voltage	24 V DC
Nominal current I_N	Depends on the selected item version
Disconnection	
Switch-off time	See trigger characteristic
Switch off	typ. 1.25 x I_N
Current limitation	active
General data	
Temperature range	0 °C ... 50 °C (without condensation)
Degree of protection	IP30 (Actuation area)
Standards/regulations	UL 2367 / UL 508 / CSA 22.2 / EN 61000-6-3

Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Electronic circuit breaker, 1-pos.				
	1 A	**CB E1 24DC/1A NO P**	**2800901**	1
	2 A	**CB E1 24DC/2A NO P**	**2800902**	1
	3 A	**CB E1 24DC/3A NO P**	**2800903**	1
	4 A	**CB E1 24DC/4A NO P**	**2800904**	1
	6 A	**CB E1 24DC/6A NO P**	**2800905**	1
	8 A			
	10 A			

Accessories

Bridge plug, 0 volt distribution			
	CB PT BRIDGE	**2801014**	1
Base element			
With push-in connection technology	**CB 1/6-2/4 PT-BE**	**2800929**	10
With screw connection technology	**CB 1/10-1/10 UT-BE**	**2801305**	10
Plug-in bridge, for cross connections in the bridge shaft	For FBS ..., see page 258		



Trigger characteristic

1 N/C contact

Total width 12.3 mm

Technical data

24 V DC
Depends on the selected item version

See trigger characteristic
typ. 1.25 x I_N
active

0 °C ... 50 °C (without condensation)
IP30 (Actuation area)
UL 2367 / UL 508 / CSA 22.2 / EN 61000-6-3

Ordering data

Type	Order No.	Pcs. / Pkt.
CB E1 24DC/1A NC P	**2800915**	1
CB E1 24DC/2A NC P	**2800916**	1
CB E1 24DC/3A NC P	**2800917**	1
CB E1 24DC/4A NC P	**2800918**	1
CB E1 24DC/6A NC P	**2800919**	1

Accessories

CB PT BRIDGE	**2801014**	1
CB 1/6-2/4 PT-BE	**2800929**	10
CB 1/10-1/10 UT-BE	**2801305**	10

For FBS ..., see page 258

1 x Reset IN + 1 x Status OUT

Total width 12.3 mm

Technical data

24 V DC
Depends on the selected item version

See trigger characteristic
typ. 1.25 x I_N
active

0 °C ... 50 °C (without condensation)
IP30 (Actuation area)
UL 2367 / UL 508 / CSA 22.2 / EN 61000-6-3

Ordering data

Type	Order No.	Pcs. / Pkt.
CB E1 24DC/1A S-R P	**2800908**	1
CB E1 24DC/2A S-R P	**2800909**	1
CB E1 24DC/3A S-R P	**2800910**	1
CB E1 24DC/4A S-R P	**2800911**	1
CB E1 24DC/6A S-R P	**2800912**	1
CB E1 24DC/8A S-R P	**2800913**	1
CB E1 24DC/10A S-R P	**2800914**	1

Accessories

CB PT BRIDGE	**2801014**	1
CB 1/6-2/4 PT-BE	**2800929**	10
CB 1/10-1/10 UT-BE	**2801305**	10

For FBS ..., see page 258

1 x Control IN + 1 x Status OUT

Total width 12.3 mm

Technical data

24 V DC
Depends on the selected item version

See trigger characteristic
typ. 1.25 x I_N
active

0 °C ... 50 °C (without condensation)
IP30 (Actuation area)
UL 2367 / UL 508 / CSA 22.2 / EN 61000-6-3

Ordering data

Type	Order No.	Pcs. / Pkt.
CB E1 24DC/1A S-C P	**2800922**	1
CB E1 24DC/2A S-C P	**2800923**	1
CB E1 24DC/3A S-C P	**2800924**	1
CB E1 24DC/4A S-C P	**2800925**	1
CB E1 24DC/6A S-C P	**2800926**	1
CB E1 24DC/8A S-C P	**2800927**	1
CB E1 24DC/10A S-C P	**2800928**	1

Accessories

CB PT BRIDGE	**2801014**	1
CB 1/6-2/4 PT-BE	**2800929**	10
CB 1/10-1/10 UT-BE	**2801305**	10

For FBS ..., see page 258

Base element and plug-in bridges

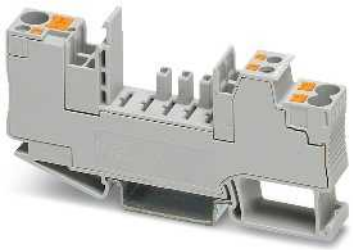
N

Base elements

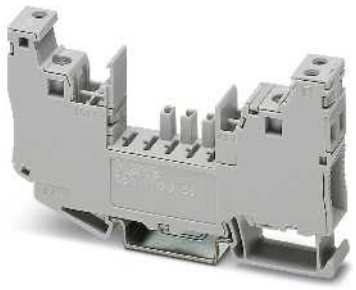
– For accommodating CB TM…/CB E…. device circuit breakers
– Rail-mountable module
– With bridge shafts
– Systematic structure with 1-channel base elements possible

Notes:

Can be loaded with up to 41 A if two bridges are connected for the supply.



1-pos. with push-in connection, input 1 x 6 mm²/output 2 x 4 mm²



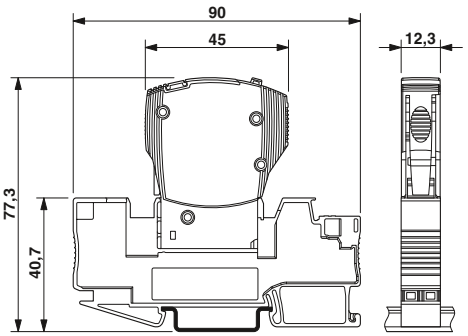
1-pos. with screw connection, input 1 x 10 mm²/output 1 x 10 mm²

	Total width 12.3 mm	Total width 12.3 mm
	Technical data	**Technical data**
Rated surge voltage	4 kV	2.5 kV
General data		
Dimensions W / H / D	12.3 mm / 90 mm / 46.7 mm	12.3 mm / 90.8 mm / 70 mm
Connection method	Push-in connection	Screw connection
Temperature range	-30 °C ... 60 °C	-30 °C ... 60 °C
Degree of protection	IP30 (Actuation area)	IP30 (Actuation area)
Inflammability class according to UL 94	V0	V0
Standards/regulations	IEC 60947-7-1	UL 1059

		Ordering data			**Ordering data**		
Description		**Type**	**Order No.**	Pcs. / Pkt.	**Type**	**Order No.**	Pcs. / Pkt.
Base element							
		CB 1/6-2/4 PT-BE	**2800929**	10	**CB 1/10-1/10 UT-BE**	**2801305**	10
		Accessories			**Accessories**		
Plug-in bridge, red	Number of positions						
	2	**FBS 2-6**	**3030336**	50	**FBS 2-6**	**3030336**	50
	3	**FBS 3-6**	**3030242**	50	**FBS 3-6**	**3030242**	50
	4	**FBS 4-6**	**3030255**	50	**FBS 4-6**	**3030255**	50
	5	**FBS 5-6**	**3030349**	50	**FBS 5-6**	**3030349**	50
	10	**FBS 10-6**	**3030271**	10	**FBS 10-6**	**3030271**	10
	20	**FBS 20-6**	**3030365**	10	**FBS 20-6**	**3030365**	10
	50	**FBS 50-6**	**3032224**	10	**FBS 50-6**	**3032224**	10
Plug-in bridge, blue	Number of positions						
	2	**FBS 2-6 BU**	**3036932**	50	**FBS 2-6 BU**	**3036932**	50
	3	**FBS 3-6 BU**	**3036945**	50	**FBS 3-6 BU**	**3036945**	50
	4	**FBS 4-6 BU**	**3036958**	50	**FBS 4-6 BU**	**3036958**	50
	5	**FBS 5-6 BU**	**3036961**	50	**FBS 5-6 BU**	**3036961**	50
	10	**FBS 10-6 BU**	**3032198**	10	**FBS 10-6 BU**	**3032198**	10
	20	**FBS 20-6 BU**	**3032208**	10	**FBS 20-6 BU**	**3032208**	10
	50	**FBS 50-6 BU**	**3032211**	10	**FBS 50-6 BU**	**3032211**	10
Plug-in bridge, gray	Number of positions						
	2	**FBS 2-6 GY**	**3032237**	50	**FBS 2-6 GY**	**3032237**	50
	3	**FBS 3-6 GY**	**3032240**	50	**FBS 3-6 GY**	**3032240**	50
	4	**FBS 4-6 GY**	**3032279**	50	**FBS 4-6 GY**	**3032279**	50
	5	**FBS 5-6 GY**	**3032266**	50	**FBS 5-6 GY**	**3032266**	50
	10	**FBS 10-6 GY**	**3032253**	10	**FBS 10-6 GY**	**3032253**	10

Plug-in thermomagnetic circuit breakers

- Device circuit breakers for protecting against voltage dips caused by overloads and short circuits
- SFB characteristic curve enables longer cables and release times < 10 ms
- Maximum ease of maintenance thanks to the two-piece design
- Snap-in function for secure hold and easy removal
- Plug coding possible
- Narrow design



The figure shows the complete module consisting of a base element and connector

Can be plugged in, SFB characteristic curve

Total width 12.3 mm

Technical data

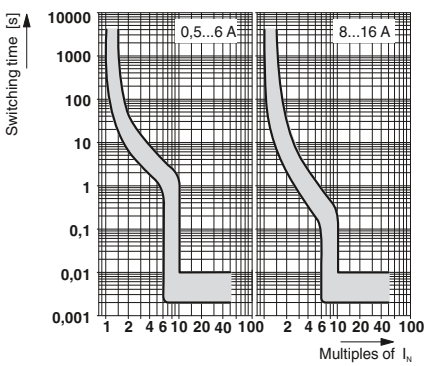
Rated data		
Rated voltage	IEC	UL/CUL
Rated voltage	240 V AC	277 V AC
Rated voltage	50 V DC	50 V DC
Rated current I_n	Depends on the selected item version	
Disconnection		
Switch-off time	See trigger characteristic	
Fuse type	SFB	
Rated short-circuit switching capacity I_{cn}	300 A (240 V AC) / 600 A (50 V DC)	
Cycles, max.	6000 (at 1 x I_n)	
General data		
Temperature range	-30 °C ... 60 °C	
Degree of protection	IP30 (Actuation area)	
Standards/regulations	EN 60934 / UL 1077 / UL 508 / CSA 22.2	

Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Thermomagnetic circuit breaker, plug-in, 1-pos., signal contact 1 PDT				
	0.5 A	**CB TM1 0.5A SFB P**	**2800835**	1
	1 A	**CB TM1 1A SFB P**	**2800836**	1
	2 A	**CB TM1 2A SFB P**	**2800837**	1
	3 A	**CB TM1 3A SFB P**	**2800838**	1
	4 A	**CB TM1 4A SFB P**	**2800839**	1
	5 A	**CB TM1 5A SFB P**	**2800840**	1
	6 A	**CB TM1 6A SFB P**	**2800841**	1
	8 A	**CB TM1 8A SFB P**	**2800842**	1
	10 A	**CB TM1 10A SFB P**	**2800843**	1
	12 A	**CB TM1 12A SFB P**	**2800844**	1
	16 A	**CB TM1 16A SFB P**	**2800845**	1
Thermomagnetic circuit breaker, plug-in, 2-pos., signal contact 1 PDT				
	0.5 A	**CB TM2 0.5A SFB P**	**2800868**	1
	1 A	**CB TM2 1A SFB P**	**2800869**	1
	2 A	**CB TM2 2A SFB P**	**2800870**	1
	3 A	**CB TM2 3A SFB P**	**2800871**	1
	4 A	**CB TM2 4A SFB P**	**2800872**	1
	5 A	**CB TM2 5A SFB P**	**2800873**	1
	6 A	**CB TM2 6A SFB P**	**2800874**	1
	8 A	**CB TM2 8A SFB P**	**2800875**	1
	10 A	**CB TM2 10A SFB P**	**2800876**	1
	12 A	**CB TM2 12A SFB P**	**2800877**	1
	16 A	**CB TM2 16A SFB P**	**2800878**	1

Accessories

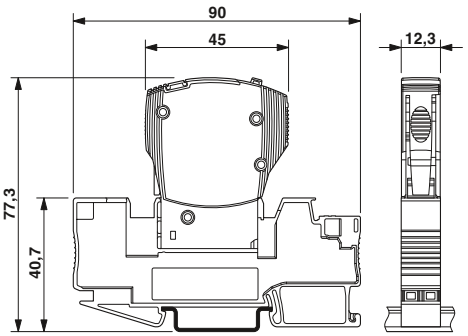
Bridge plug, 0 volt distribution			
	CB PT BRIDGE	**2801014**	1
Base element			
With push-in connection technology	**CB 1/6-2/4 PT-BE**	**2800929**	10
With screw connection technology	**CB 1/10-1/10 UT-BE**	**2801305**	10



Trigger characteristic in the DC range

Plug-in thermomagnetic circuit breakers

- Device circuit breakers for protecting against voltage dips caused by overloads and short circuits
- Medium-blow and fast-blow tripping characteristics
- 1 and 2-pos. circuit breakers
- Maximum ease of maintenance thanks to the two-piece design
- Snap-in function for secure hold and easy removal
- Plug coding possible
- Narrow design



The figure shows the complete module consisting of a base element and connector

Can be plugged in, M1 characteristic curve, 1-pos.

Total width 12.3 mm

Technical data

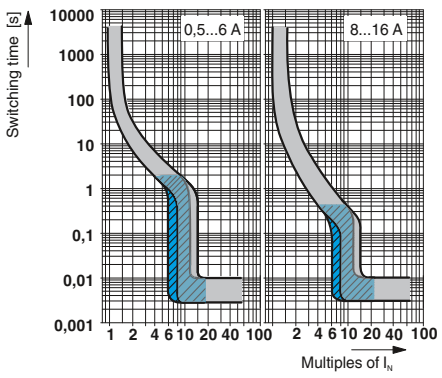
Rated data		
Rated voltage	IEC	UL/CUL
Rated voltage	240 V AC	277 V AC
Rated current I_n	50 V DC	50 V DC
	Depends on the selected item version	
Disconnection		
Switch-off time	See trigger characteristic	
Fuse type	normal blow	
Rated short-circuit switching capacity I_{cn}	300 A (240 V AC) / 600 A (50 V DC)	
Cycles, max.	6000 (at 1 x I_n)	
General data		
Temperature range	-30 °C ... 60 °C	
Degree of protection	IP30 (Actuation area)	
Standards/regulations	EN 60934 / UL 1077 / UL 508 / CSA 22.2	

Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Thermomagnetic circuit breaker, plug-in, signal contact 1 PDT				
	0.5 A	**CB TM1 0.5A M1 P**	**2800846**	1
	1 A	**CB TM1 1A M1 P**	**2800847**	1
	2 A	**CB TM1 2A M1 P**	**2800848**	1
	3 A	**CB TM1 3A M1 P**	**2800849**	1
	4 A	**CB TM1 4A M1 P**	**2800850**	1
	5 A	**CB TM1 5A M1 P**	**2800851**	1
	6 A	**CB TM1 6A M1 P**	**2800852**	1
	8 A	**CB TM1 8A M1 P**	**2800853**	1
	10 A	**CB TM1 10A M1 P**	**2800854**	1
	12 A	**CB TM1 12A M1 P**	**2800855**	1
	16 A	**CB TM1 16A M1 P**	**2800856**	1

Accessories

Bridge plug, 0 volt distribution			
	CB PT BRIDGE	**2801014**	1
Base element			
With push-in connection technology	**CB 1/6-2/4 PT-BE**	**2800929**	10
With screw connection technology	**CB 1/10-1/10 UT-BE**	**2801305**	10



Trigger characteristic
Gray: DC range, blue: AC range

Can be plugged in, M1 characteristic curve, 2-pos.

Total width 24.6 mm

Technical data

IEC	UL/CUL
240 V AC	277 V AC
80 V DC	80 V DC
Depends on the selected item version	
See trigger characteristic	
normal blow	
400 A (240 V AC) / 600 A (80 V DC)	
6000 (240 V AC/1 x I_n)	
-30 °C ... 60 °C	
IP30 (Actuation area)	
EN 60934 / UL 1077 / UL 508 / CSA 22.2	

Ordering data

Type	Order No.	Pcs. / Pkt.
CB TM2 0.5A M1 P	**2800879**	1
CB TM2 1A M1 P	**2800880**	1
CB TM2 2A M1 P	**2800881**	1
CB TM2 3A M1 P	**2800882**	1
CB TM2 4A M1 P	**2800883**	1
CB TM2 5A M1 P	**2800884**	1
CB TM2 6A M1 P	**2800885**	1
CB TM2 8A M1 P	**2800886**	1
CB TM2 10A M1 P	**2800887**	1
CB TM2 12A M1 P	**2800888**	1
CB TM2 16A M1 P	**2800889**	1

Accessories

CB PT BRIDGE	**2801014**	1
CB 1/6-2/4 PT-BE	**2800929**	10
CB 1/10-1/10 UT-BE	**2801305**	10

Can be plugged in, F1 characteristic curve, 1-pos.

Total width 12.3 mm

Technical data

IEC	UL/CUL
240 V AC	277 V AC
50 V DC	50 V DC
Depends on the selected item version	
See trigger characteristic	
fast blow	
300 A (240 V AC) / 600 A (50 V DC)	
6000 (at 1 x I_n)	
-30 °C ... 60 °C	
IP30 (Actuation area)	
EN 60934 / UL 1077 / UL 508 / CSA 22.2	

Ordering data

Type	Order No.	Pcs. / Pkt.
CB TM1 0.5A F1 P	**2800857**	1
CB TM1 1A F1 P	**2800858**	1
CB TM1 2A F1 P	**2800859**	1
CB TM1 3A F1 P	**2800860**	1
CB TM1 4A F1 P	**2800861**	1
CB TM1 5A F1 P	**2800862**	1
CB TM1 6A F1 P	**2800863**	1
CB TM1 8A F1 P	**2800864**	1
CB TM1 10A F1 P	**2800865**	1
CB TM1 12A F1 P	**2800866**	1
CB TM1 16A F1 P	**2800867**	1

Accessories

CB PT BRIDGE	**2801014**	1
CB 1/6-2/4 PT-BE	**2800929**	10
CB 1/10-1/10 UT-BE	**2801305**	10

Can be plugged in, F1 characteristic curve, 2-pos.

Total width 24.6 mm

Technical data

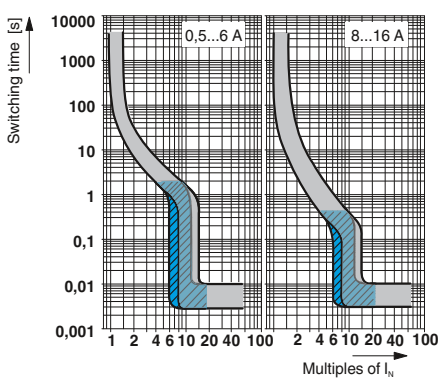
IEC	UL/CUL
240 V AC	277 V AC
80 V DC	80 V DC
Depends on the selected item version	
See trigger characteristic	
fast blow	
400 A (240 V AC) / 600 A (80 V DC)	
6000 (240 V AC/1 x I_n)	
-30 °C ... 60 °C	
IP30 (Actuation area)	
EN 60934 / UL 1077 / UL 508 / CSA 22.2	

Ordering data

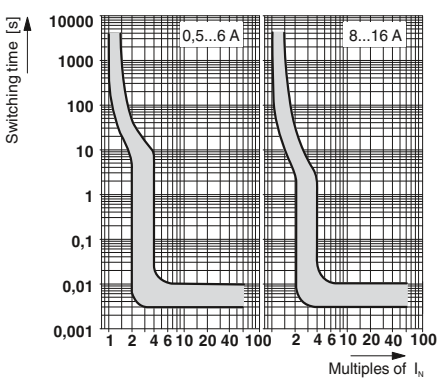
Type	Order No.	Pcs. / Pkt.
CB TM2 0.5A F1 P	**2800890**	1
CB TM2 1A F1 P	**2800891**	1
CB TM2 2A F1 P	**2800892**	1
CB TM2 3A F1 P	**2800893**	1
CB TM2 4A F1 P	**2800894**	1
CB TM2 5A F1 P	**2800895**	1
CB TM2 6A F1 P	**2800896**	1
CB TM2 8A F1 P	**2800897**	1
CB TM2 10A F1 P	**2800898**	1
CB TM2 12A F1 P	**2800899**	1
CB TM2 16A F1 P	**2800900**	1

Accessories

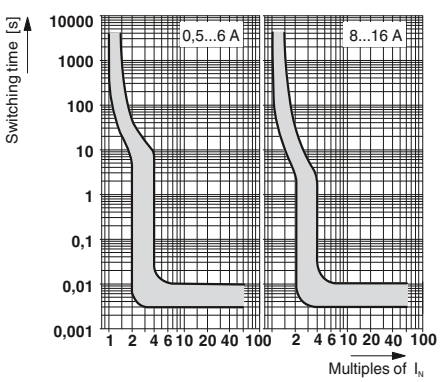
CB PT BRIDGE	**2801014**	1
CB 1/6-2/4 PT-BE	**2800929**	10
CB 1/10-1/10 UT-BE	**2801305**	10



Trigger characteristic
Gray: DC range, blue: AC range



Trigger characteristic in the DC range



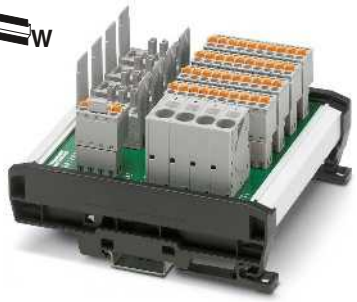
Trigger characteristic in the DC range

Device circuit breaker board

N

- Reduced installation time thanks to multi-channel device circuit breaker board (4/8/12 channels)
- Space savings of up to 35% thanks to compact design
- Fuse protection of up to 12 A per channel provides best possible protection for connected loads
- Up to 5 loads can be protected simultaneously with the additional terminal points
- Integrated group remote signaling ensures that you are always kept informed
- High current carrying capacity of the board supports supply of up to 60 A
- Maximum overcurrent protection across long cable paths thanks to device circuit breakers with SFB trigger characteristic

Notes:
The board is supplied **without** a plug.
Only type CB TM1... plugs can be used.
For dimensional drawings, see www.phoenixcontact.net/products



DIN-rail mountable

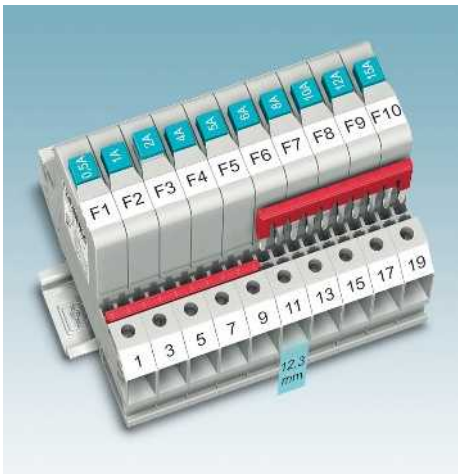
Technical data

Rated data		CBB TM 04	CBB TM 08	CBB TM 12
Rated voltage				
	Main circuit	24 V DC	24 V DC	24 V DC
	Remote indication circuit	24 V DC	24 V DC	24 V DC
Rated current I_n				
	Complete main circuit	48 A DC	60 A DC	60 A DC
	Main circuit per channel	12 A DC	12 A DC	12 A DC
	Remote indication circuit	1 A DC	1 A DC	1 A DC
Rated insulation voltage U_i		50 V DC	50 V DC	50 V DC
Rated surge voltage		0.5 kV	0.5 kV	0.5 kV
General data				
Dimensions W / H / D		118.5 mm / 127.8 mm / 72 mm	185.5 mm / 127.8 mm / 72 mm	252.5 mm / 127.8 mm / 72 mm
Ambient temperature (operation)		-30 °C ... 60 °C (At max. 45 A, see derating)	-30 °C ... 60 °C (At In 60 A)	-30 °C ... 60 °C (At In 60 A)
Degree of protection		IP20 (Terminal blocks and fuse holders) IP00 (PCB)		
Test standards		DIN EN 50178		

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Device circuit breaker board, for accommodating device circuit breakers			
With 4 channels	**CBB TM 04 2X2RC P-PT**	**2801481**	1
With 8 channels	**CBB TM 08 2X4RC P-PT**	**2801482**	1
With 12 channels	**CBB TM 12 2X6RC P-PT**	**2801483**	1

Thermomagnetic circuit breaker UT 6-TMC ...



DIN-rail mountable

- Thermomagnetic circuit breakers feature a compact design, large-surface labeling options, and a double plug-in bridge shaft
- They can be integrated into the CLIPLINE complete system via the plug-in bridge shaft
- 12.3 mm compact design
- High level of system availability thanks to their reclosure function and clear status display
- Eleven nominal current levels can be selected from 0.5 A to 16 A
- Clear assignment of the relevant circuit breaker thanks to the large center labeling area

A complete data sheet is available to download for each product at **www.phoenixcontact.net/products.**

Total width 12.3 mm

Technical data

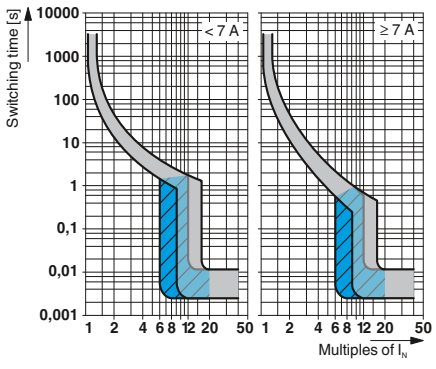
Rated data	IEC	UL/CUL
Rated voltage	240 V AC	240 V AC
Rated voltage	28 V DC	28 V DC
Rated current I_n	Depends on the selected item version	
Disconnection		
Switch-off time	See trigger characteristic	
Fuse type	Normal blow (M1)	
Rated short-circuit switching capacity I_{cn}	200 A (240 V AC) / 400 A (28 V DC)	
Cycles, max.	6000 (at 1 x I_n)	
General data		
Dimensions W / H / D	12.3 mm / 85.5 mm / 89.5 mm	
Connection method	Screw connection	
Connection data solid / stranded / AWG	0.2 ... 10 mm² / 0.2 ... 10 mm² / 24 - 8	
Stranded conductor cross section with ferrule	0.25 ... 6 mm²	
Temperature range	-30 °C ... 60 °C	
Degree of protection	IP40 (Actuation area) / IP20 (Connection area)	
Standards/regulations	EN 60934 / UL 1077 / CSA 22.2	

Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Thermomagnetic circuit breaker, for mounting on NS 35...				
	0.5 A	**UT 6-TMC M 0,5A**	**0916603**	6
	1 A	**UT 6-TMC M 1A**	**0916604**	6
	2 A	**UT 6-TMC M 2A**	**0916605**	6
	4 A	**UT 6-TMC M 4A**	**0916606**	6
	5 A	**UT 6-TMC M 5A**	**0916607**	6
	6 A	**UT 6-TMC M 6A**	**0916608**	6
	8 A	**UT 6-TMC M 8A**	**0916609**	6
	10 A	**UT 6-TMC M 10A**	**0916610**	6
	12 A	**UT 6-TMC M 12A**	**0916611**	6
	15 A	**UT 6-TMC M 15A**	**0916612**	6
	16 A	**UT 6-TMC M 16A**	**0916613**	6

Accessories

Plug-in bridge, red	Number of positions			
	2	**FBS 2-6**	**3030336**	50
	3	**FBS 3-6**	**3030242**	50
	4	**FBS 4-6**	**3030255**	50
	5	**FBS 5-6**	**3030349**	50
	10	**FBS 10-6**	**3030271**	10
	20	**FBS 20-6**	**3030365**	10
Warning label, for UT series		**WS UT 6**	**3047345**	10
Screwdriver		**SZS 1,0X4,0 VDE**	**1205066**	10
Lateral groove labeling		For UC-TM 12 or ZB 12, see page 111		



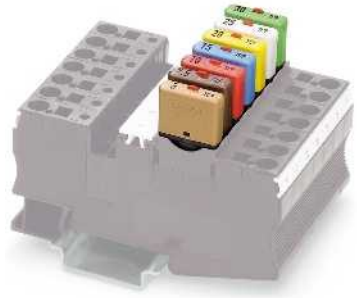
Trigger characteristic

TCP thermal circuit breaker

– Plug-in thermal miniature circuit breakers combine the protective mechanism of an auto flat-type fuse with the advantages of a circuit breaker
– In the event of an error, the time-sensitive search for a suitable replacement fuse is eliminated thanks to the reclosure function
– The area of application extends to the protection of integrated circuits in all battery and onboard systems with up to 32 V DC
– Fits in all fuse holders designed for flat-type fuse inserts according to ISO 8820−3 (DIN 72581−3)
– A version with screw or spring-cage connection is used as a basic terminal block

You can find more fuse terminal blocks in Catalog 3, Modular terminal blocks.

Notes:
Attention: The reset button must not be obstructed. During installation, please leave enough room for using button.
For additional technical data, drawings, and accessories, please visit www.phoenixcontact.net/products.
You can find a wide selection of fuse terminal blocks in Catalog 3, Modular terminal blocks
[1]) If the fuse is faulty, the downstream circuit is not off load.



For fuse holder

Total width 6 mm

Technical data

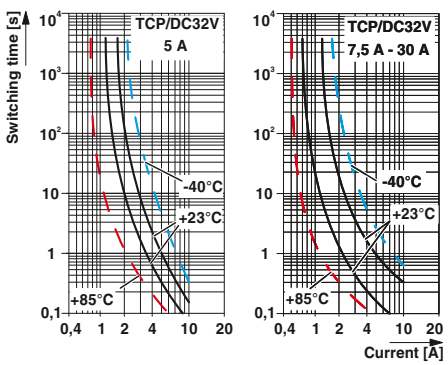
Rated data	IEC
Rated voltage	32 V DC
Rated current I_n	Depends on the selected item version
Disconnection	
Switch-off time	See trigger characteristic
Fuse type	Slow-blow
Rated short-circuit switching capacity I_{cn}	≤ 50 A (300 switch-offs)
General data	
Dimensions W / H / D	6 mm / 20 mm / 31.2 mm
Height	17 mm
Temperature range	-40 °C ... 85 °C
Degree of protection	IP30 (Actuation area)

Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
One-pos., thermal circuit breaker, for fuse holders in acc. with ISO 8820-3				
	5 A	**TCP 5/DC32V**	**0700005**	50
	7.5 A	**TCP 7,5/DC32V**	**0700007**	50
	10 A	**TCP 10/DC32V**	**0700010**	50
	15 A	**TCP 15/DC32V**	**0700015**	50
	20 A	**TCP 20/DC32V**	**0700020**	50
	25 A	**TCP 25/DC32V**	**0700025**	50
	30 A	**TCP 30/DC32V**	**0700030**	50
	40 A	**TCP 40/DC32V**	**0700040**	50

Accessories

Fuse terminal block, with spring-cage connection, for mounting on NS 35...			
	ST 4-FSI/C	**3036372**	50
With LED for 12 V DC, 1.7 mA	**ST 4-FSI/C-LED 12**	**3036495**	50
With LED for 24 V DC, 1.9 mA[1])	**ST 4-FSI/C-LED 24**	**3036505**	50
Fuse terminal block, for mounting on NS 32... or NS 35...			
	UK 6-FSI/C	**3118203**	50
With LED for 12 V DC	**UK 6-FSI/C-LED12**	**3001925**	50
With LED for 24 V DC, 1.9 mA[1])	**UK 6-FSI/C-LED24**	**3001938**	50



Trigger characteristic

TCP thermal circuit breaker

- The reclosable thermal circuit breaker is available in nine nominal current levels ranging from 0.25 to 10 A
- The integrated switching function enables immediate reclosure and thus ensures the availability of the system
- Compact design
- A version with screw or spring-cage connection is used as a basic terminal block
- Potential distribution possible by means of bridges

A complete data sheet is available to download for each product at **www.phoenixcontact.net/products.**

Notes:

Note:
When mounted in rows, the nominal current of the devices can be transmitted only at 80% or must be correspondingly overdimensioned.

For additional technical data, drawings, and accessories, please visit www.phoenixcontact.net/products.

Can be plugged into a fuse terminal block

Total width 8.2 mm

Technical data

Rated data	IEC
Rated voltage	250 V AC
Rated voltage	65 V DC
Rated current I_n	Depends on the selected item version
Disconnection	
Switch-off time	See trigger characteristic
Fuse type	Slow-blow
General data	
Dimensions W / H / D	8.2 mm / 64 mm / 88.5 mm
Temperature range	-20 °C ... 60 °C
Degree of protection	IP40 (Actuation area)

Ordering data

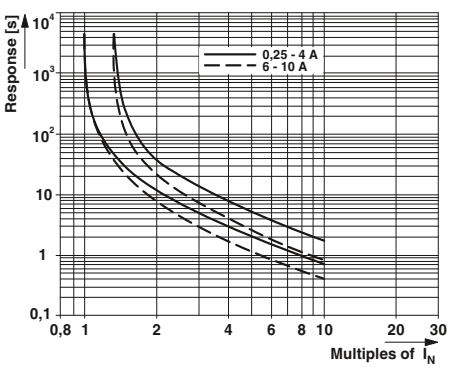
Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Thermal miniature circuit breaker, can be plugged into UK 6 FSI/C or ST 4-FSI/C fuse terminal block				
	0.25 A	**TCP 0,25A**	**0712123**	20
	0.5 A	**TCP 0,5A**	**0712152**	20
	1 A	**TCP 1A**	**0712194**	20
	2 A	**TCP 2A**	**0712217**	20
	3 A	**TCP 3A**	**0712233**	20
	4 A	**TCP 4A**	**0712259**	20
	6 A	**TCP 6A**	**0712275**	20
	8 A	**TCP 8A**	**0712291**	20
	10 A	**TCP 10A**	**0712314**	20

Accessories

Fuse terminal block, for mounting on NS 32... or NS 35...	**UK 6-FSI/C**	**3118203**	50
Fuse terminal block, with spring-cage connection, for mounting on NS 35...	**ST 4-FSI/C**	**3036372**	50

Lateral groove labeling

For ZB 5, see page 111



Trigger characteristic

TMC thermomagnetic circuit breaker

- Available with fast-blow and medium-blow characteristic curve for various nominal current strengths
- Single or two-pos. main current path
- All TMCP ... plug-in thermomagnetic circuit breakers also have integrated signal contacts

Notes:
For additional technical data, drawings, and accessories, please visit www.phoenixcontact.net/products.
[1]) Please observe the type key on the right side.
[2]) Main contact

DIN-rail mountable

Can be plugged onto base

Total width 12.5 mm

Total width 12.5 mm

Technical data

Rated data	IEC	IEC
Rated voltage	250 V AC	250 V AC
Rated voltage	65 V DC	65 V DC
Rated current I_n	Depends on the selected item version	Depends on the selected item version
Disconnection		
Switch-off time	See trigger characteristic	See trigger characteristic
Fuse type	Fast blow (F1)	Fast blow (F1)
Rated short-circuit switching capacity I_{cn}	400 A / 2500 A (32 V DC)	400 A / 2500 A (32 V DC)
General data		
Dimensions W / H / D	12.5 mm / 82.5 mm / 96 mm	38 mm / 115 mm / 121 mm
Connection method	Screw connection	plug-in
Connection data solid / stranded / AWG	0.2 ... 6 mm²[2]) / 0.2 ... 4 mm² / 24 - 10	-
Stranded conductor cross section with ferrule	0.25 ... 4 mm²	-
Temperature range	-30 °C ... 60 °C	-30 °C ... 60 °C
Degree of protection	IP30 (Actuation area) / IP20 (Connection area)	IP30 (Actuation area) / IP00 (Connection area)

Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Thermomagnetic circuit breaker, with universal foot for mounting on NS 32... or NS 35...[1])		**TMC 1 F1 100 0,2A**	**0914015**	6
Thermomagnetic circuit breaker, plug-in, one, two or three-position[1])		**TMCP 1 F1 300 0,2A**	**0915506**	6

Accessories

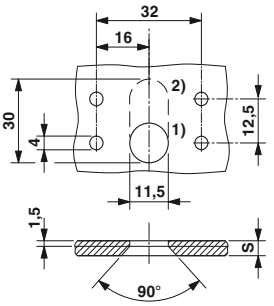
Spring lock, for mechanical locking in the case of overhead mounting, 1-pos.	**SPRING-LOCK**	**0713009**	10
Modular socket, 2-position, for holding two circuit breakers, each with a single position	**TMCP SOCKET M**	**0916589**	10
Socket termination elements, can be plugged in both left and right, contain the connections for the reset inputs/group query	**TMCP CONNECT LR**	**0916592**	3
Signal bridge, plug-in, for bridging group signaling when there is a free slot on the TMCP SOCKET M socket	**TMCP SB**	**0916602**	6

Multiplication factor for higher ambient temperatures for TCP..., UT 6-TMC..., TMC..., and TMCP...

Note:
When mounted in rows with simultaneous load, a mutual thermal effect occurs. This is equivalent to a rise in the ambient temperature. It depends on the nominal current, the ambient temperature, the number of devices, and the distance between devices. The nominal device current can be either overdimensioned (see multiplication factor for temperature behavior) or limited to just > 80%. Please request the maximum permissible current if planning to mount in rows.

Ambient temperature, °C	Multiplication factor
-30	0.76
-20	0.79
-10	0.83
0	0.93
+10	0.93
+23	1.00
+30	1.04
+40	1.11
+50	1.19
+60	1.29

Drilling diagram for front plate mounting of TMCP



S > 1,5 mm

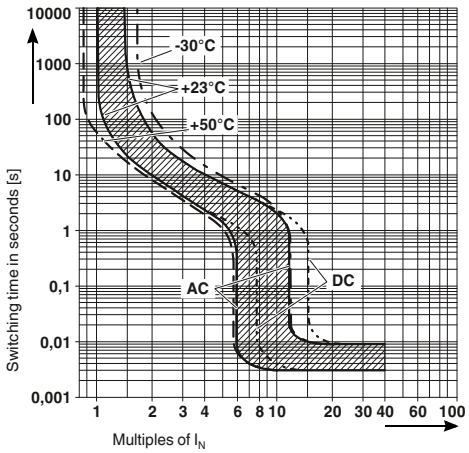
1) 1-pos.

2) 2-pos.

TMC and TMCP trigger characteristics

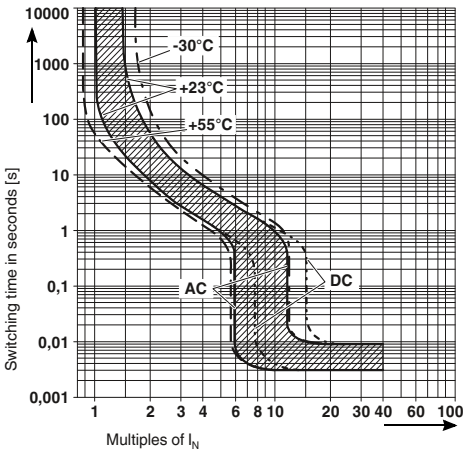
Medium-blow (M1): 0.2 - 6 A nominal value

Lower tripping limit: 1.05 I_N
Upper tripping limit: 1.4 I_N



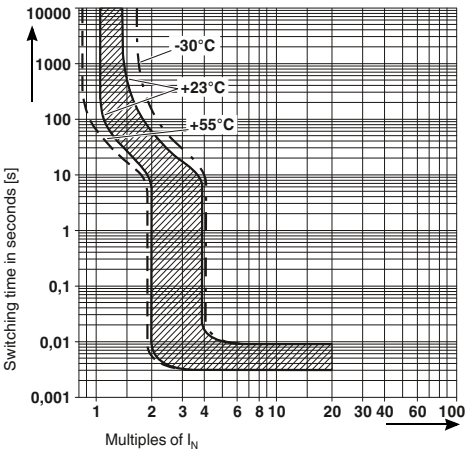
Medium-blow (M1): 8 - 16 A nominal value

Lower tripping limit: 1.05 I_N
Upper tripping limit: 1.4 I_N



Fast-blow (F1): 0.2 - 16 A nominal value
Only for DC applications

Lower tripping limit: 1.05 I_N
Upper tripping limit: 1.4 I_N



TMC and TMCP type keys

The type key indicates the unique structure of the product.

Type	Main current paths	Characteristic curve	Auxiliary contact versions	Nominal current
TMC or **TMCP**	**1** ≙ Single-pos. **2** ≙ Two-pos. **3** ≙ Three-pos.	**F1** ≙ Therm. 1.05 - 1.4 I_N, magn. 2 - 4 I_N DC (fast-blow), **Only for DC applications** **M1** ≙ Therm. 1.05 - 1.4 I_N, magn. 6 - 12 I_N AC, 7.8 - 15.6 I_N DC (medium-blow)	**100** ≙ Single-pos.: 1 N/O contact **200** ≙ Single-pos.: 1 N/C contact **120** ≙ Two-pos.: 1 N/O contact, 1 N/C contact **122** ≙ Three-pos.: 1 N/O contact, 2 N/C contacts **300**[4] ≙ 1 N/O contact and 1 N/C contact per position	0.2 A 2.5 A 0.3 A 3 A 0.4 A 4 A 0.5 A 5 A 0.6 A 6 A 0.8 A 8 A 1 A 10 A 1.5 A 12 A 2 A 16 A

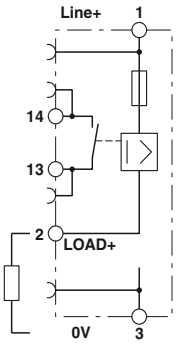
Ordering example:

TMC with single-pos. main current path, one N/O contact, medium-blow characteristic curve, and a nominal current of 2 A.

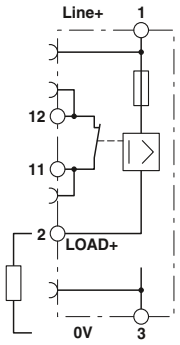
TMC	1	M1	100	2 A

4) Only version for TMCP, cannot be used for TMC.

EC-E1 and EC-E4 electronic circuit breakers



EC-E 1 ...



EC-E 4 ...

With signal contact as N/C contact or N/O contact

Total width 12.5 mm

- Selective protection of all 24 V DC load circuits at switched-mode power supply units
- A combination of active electronic current limitation in the event of short circuit and overload shutdown ensures that the circuit breaker can respond to overloads faster than the switched-mode power supply unit
- The residual current is always limited to 1.3 - 1.8 times the nominal current

A complete data sheet is available to download for each product at **www.phoenixcontact.net/products.**

Notes:

For additional technical data, drawings, and accessories, please visit www.phoenixcontact.net/products.

Technical data

Rated data	IEC
Operating voltage	24 V DC
Rated current I_n	Depends on the selected item version
Disconnection	
Switch-off time	See trigger characteristic
Fuse type	Electronic
General data	
Dimensions W / H / D	12.5 mm / 83 mm / 80 mm
Connection method	Screw connection
Connection data solid / stranded / AWG	0.5 ... 16 mm² / 0.5 ... 16 mm² / 20 - 6
Stranded conductor cross section with ferrule	0.5 ... 10 mm²
Temperature range	0 °C ... 50 °C (without condensation)
Degree of protection	IP20 (Housing)
Inflammability class according to UL 94	V0

Ordering data

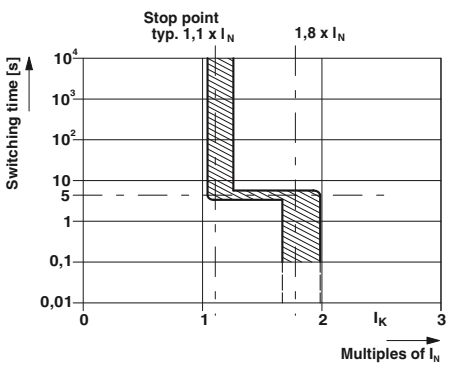
Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Electronic circuit breaker, signal contact: 1 N/O contact				
	0.5 A	**EC-E1 0,5A**	**0903022**	6
	1 A	**EC-E1 1A**	**0903023**	6
	2 A	**EC-E1 2A**	**0903024**	6
	3 A	**EC-E1 3A**	**0903025**	6
	4 A	**EC-E1 4A**	**0903026**	6
	6 A	**EC-E1 6A**	**0903028**	6
	8 A	**EC-E1 8A**	**0903029**	6
	10 A	**EC-E1 10A**	**0903030**	6
	12 A	**EC-E1 12A**	**0903031**	6
Electronic circuit breaker, signal contact: 1 N/C contact				
	0.5 A	**EC-E4 0,5A**	**0903040**	6
	1 A	**EC-E4 1A**	**0903032**	6
	2 A	**EC-E4 2A**	**0903033**	6
	3 A	**EC-E4 3A**	**0903034**	6
	4 A	**EC-E4 4A**	**0903035**	6
	6 A	**EC-E4 6A**	**0903036**	6
	8 A	**EC-E4 8A**	**0903037**	6
	10 A	**EC-E4 10A**	**0903038**	6
	12 A	**EC-E4 12A**	**0903039**	6

Accessories

Cont. plug-in bridge, 500 mm long, isolated, can be cut to length, for potential distribution			
Nominal current: 32 A		**FBST 500-PLC BU**	**2966692**	20
		FBST 500-PLC RD	**2966786**	20
		FBST 500 TMC-N GY	**0901028**	10
Screwdriver		**SZS 0,6X3,5**	**1205053**	10

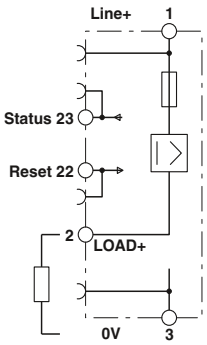
Lateral groove labeling

For ZBF 12, see page 111



Trigger characteristic

EC-E electronic circuit breakers



EC-E ...

With reset input and status output

- Selective protection of all 24 V DC load circuits at switched-mode power supply units
- A combination of active electronic current limitation in the event of short circuit and overload shutdown ensures that the circuit breaker can respond to overloads faster than the switched-mode power supply unit
- The residual current is always limited to 1.3 - 1.8 times the nominal current

A complete data sheet is available to download for each product at **www.phoenixcontact.net/products.**

Notes:

For additional technical data, drawings, and accessories, please visit www.phoenixcontact.net/products.

Total width 12.5 mm

Technical data

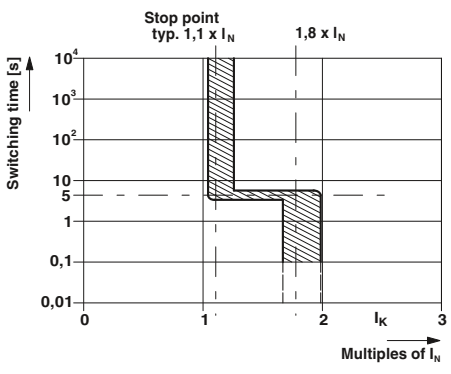
Rated data	IEC
Operating voltage	24 V DC
Rated current I_n	Depends on the selected item version
Disconnection	
Switch-off time	See trigger characteristic
Fuse type	Electronic
General data	
Dimensions W / H / D	12.5 mm / 83 mm / 80 mm
Connection method	Screw connection
Connection data solid / stranded / AWG	0.5 ... 16 mm² / 0.5 ... 16 mm² / 26 - 6
Stranded conductor cross section with ferrule	0.5 ... 10 mm²
Temperature range	0 °C ... 50 °C (without condensation)
Degree of protection	IP20 (Housing)
Inflammability class according to UL 94	V0

Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Electronic circuit breaker, with reset input				
	0.5 A	**EC-E 0,5A DC24V**	**0903041**	6
	1 A	**EC-E 1A DC24V**	**0903042**	6
	2 A	**EC-E 2A DC24V**	**0903043**	6
	3 A	**EC-E 3A DC24V**	**0903044**	6
	4 A	**EC-E 4A DC24V**	**0903045**	6
	6 A	**EC-E 6A DC24V**	**0903046**	6
	8 A	**EC-E 8A DC24V**	**0903047**	6
	10 A	**EC-E 10A DC24V**	**0903048**	6
	12 A	**EC-E 12A DC24V**	**0903049**	6

Accessories

Cont. plug-in bridge, 500 mm long, isolated, can be cut to length, for potential distribution			
Nominal current: 32 A	**FBST 500-PLC BU**	**2966692**	20
	FBST 500-PLC RD	**2966786**	20
	FBST 500 TMC-N GY	**0901028**	10
Lateral groove labeling	For ZBF 12, see page 111		



Trigger characteristic

ECP-E plug-in electronic circuit breaker

The area of application for the electronic circuit-breaker ECP-E extends to all aspects connected with the power supply unit. In the event of an overload, power supply units reduce their output voltage and all the connected loads are no longer supplied with sufficient power, e.g., in the case of short-circuit at the load.

The solution here is the electronic circuit breaker:

– Selective protection of all 24 V DC load circuits at switched-mode power supply units
– Residual current always limited to 1.8 times the nominal current
– Capacitive loads can be switched on and loads are only switched off in the event of an overload or short circuit

After detecting overload or short-circuit in the load circuit, the load output of the ECP-E is locked. The current flow is interrupted in the faulty current circuit. The ECP-E and subsequently the current circuit can be activated again through the electronic reset input (13;14) or manually at the device through the slide-type switch.

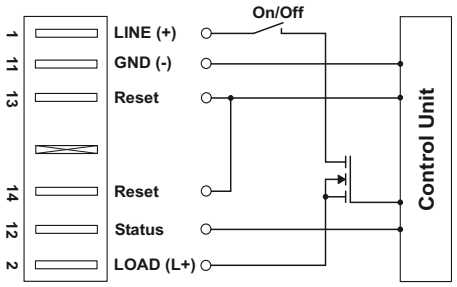
The ECP-E has the following features:

– The operating or error state is indicated by a multi-color LED as well as an integrated status output (12)
– Design width of just 12.5 mm
– Can be plugged onto TMCP SOCKET M base

A complete data sheet is available to download for each product at **www.phoenixcontact.net/products.**

Notes:

For additional technical data, drawings, and accessories, please visit www.phoenixcontact.net/products.



With reset input and status output

Total width 12.5 mm

Technical data

Rated data	IEC
Operating voltage	24 V DC
Rated current I_n	Depends on the selected item version
Disconnection	
Switch-off time	See trigger characteristic
Fuse type	Electronic
General data	
Dimensions W / H / D	38 mm / 115 mm / 112.5 mm
Temperature range	0 °C ... 50 °C (without condensation)
Degree of protection	IP30 (Actuation area)
Inflammability class according to UL 94	V0

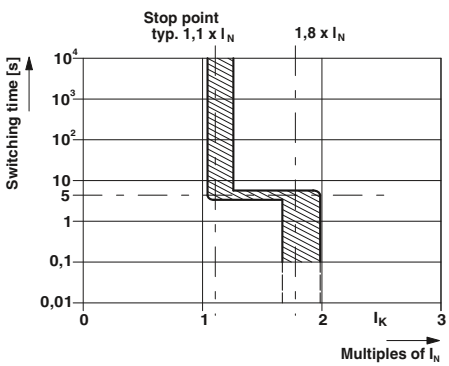
Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Electronic circuit breaker, standard variant with status output and reset input, can be plugged into TMCP socket, signaling through three-color LED				
	1 A	**ECP-E 1A**	**0900113**	5
	2 A	**ECP-E 2A**	**0900210**	5
	3 A	**ECP-E 3A**	**0900317**	5
	4 A	**ECP-E 4A**	**0900414**	5
	6 A	**ECP-E 6A**	**0900618**	5
	8 A	**ECP-E 8A**	**0900812**	5
	10 A	**ECP-E 10A**	**0901002**	5
	12 A	**ECP-E-12A**	**0900126**	5

Accessories

Modular socket, 2-position, for holding two circuit breakers, each with a single position	**TMCP SOCKET M**	**0916589**	10
Socket termination elements, can be plugged in both left and right, contain the connections for the reset inputs/group query	**TMCP CONNECT LR**	**0916592**	3

Lateral groove labeling — ZB 6, see page 111

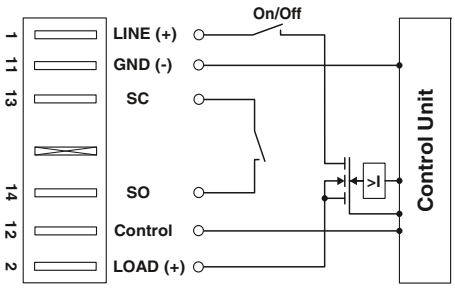


ECP-E2 plug-in electronic circuit breaker

- Area of application covers all aspects of the switched-mode power supply unit
- Includes the advantages of current limitation
- Responds faster than switched-mode power supply unit to overload and short circuit
- Output voltage of switched-mode power supply unit remains stable
- Sufficient supply of all error-free load circuits
- In addition, the ECP-E2 can be controlled remotely by the control input (12), e.g., by means of a PLC

Notes:

For additional technical data, drawings, and accessories, please visit www.phoenixcontact.net/products.



With control input and group request

Total width 12.5 mm

Technical data

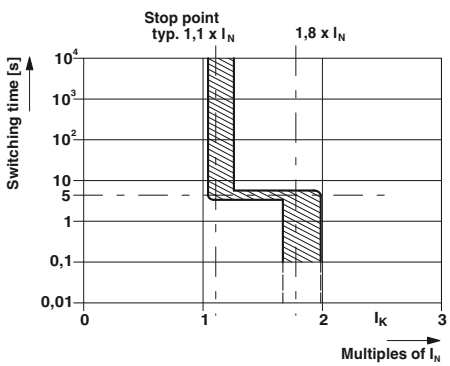
Rated data	IEC
Operating voltage	24 V DC
Rated current I_n	Depends on the selected item version
Disconnection	
Switch-off time	See trigger characteristic
Fuse type	Electronic
General data	
Dimensions W / H / D	38 mm / 115 mm / 112.5 mm
Temperature range	0 °C ... 50 °C (without condensation)
Degree of protection	IP30 (Actuation area)
Inflammability class according to UL 94	V0

Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Electronic circuit breaker, variant with control input and group query, can be plugged into TMCP socket, signaling through three-color LED				
	1 A	**ECP-E2-1A**	**0900139**	5
	2 A	**ECP-E2-2A**	**0900236**	5
	3 A	**ECP-E2-3A**	**0900333**	5
	4 A	**ECP-E2-4A**	**0900430**	5
	6 A	**ECP-E2-6A**	**0900634**	5
	8 A	**ECP-E2-8A**	**0900838**	5
	10 A	**ECP-E2-10A**	**0900100**	5
	12 A	**ECP-E2-12A**	**0900207**	5

Accessories

Modular socket, 2-position, for holding two circuit breakers, each with a single position	**TMCP SOCKET M**	**0916589**	10
Socket termination elements, can be plugged in both left and right, contain the connections for the reset inputs/group query	**TMCP CONNECT LR**	**0916592**	3
Lateral groove labeling	ZB 6, see page 111		

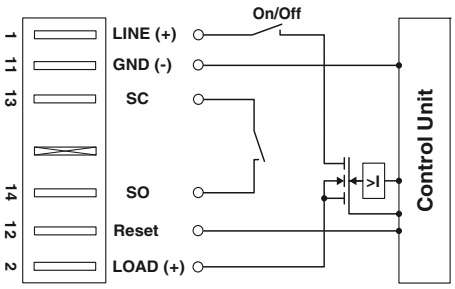


ECP-E3 electronic circuit breaker

- Area of application covers all aspects of the switched-mode power supply unit
- Includes the advantages of current limitation
- Responds faster than switched-mode power supply unit to overload and short circuit
- Output voltage of switched-mode power supply unit remains stable
- Sufficient supply of all error-free load circuits
- In addition, the ECP-E3 can be restarted by the reset input (12), e.g., by means of a PLC

Notes:

For additional technical data, drawings, and accessories, please visit www.phoenixcontact.net/products.



With reset input and group query

Total width 12.5 mm

Technical data

Rated data	IEC
Operating voltage	24 V DC
Rated current I_n	Depends on the selected item version
Disconnection	
Switch-off time	See trigger characteristic
Fuse type	Electronic
General data	
Dimensions W / H / D	38 mm / 115 mm / 112.5 mm
Temperature range	0 °C ... 50 °C (without condensation)
Degree of protection	IP30 (Actuation area)
Inflammability class according to UL 94	V0

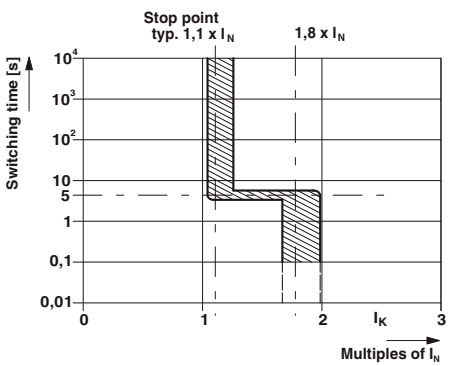
Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Electronic circuit breaker, variant with control input and group query, can be plugged into TMCP socket, signaling through three-color LED				
	1 A	**ECP-E3 1A**	**0912041**	5
	2 A	**ECP-E3 2A**	**0912042**	5
	3 A	**ECP-E3 3A**	**0912043**	5
	4 A	**ECP-E3 4A**	**0912044**	5
	6 A	**ECP-E3 6A**	**0912046**	5
	8 A	**ECP-E3 8A**	**0912048**	5
	10 A	**ECP-E3 10A**	**0912050**	5
	12 A	**ECP-E3 12A**	**0912052**	5

Accessories

Modular socket, 2-position, for holding two circuit breakers, each with a single position	**TMCP SOCKET M**	**0916589**	10
Socket termination elements, can be plugged in both left and right, contain the connections for the reset inputs/group query	**TMCP CONNECT LR**	**0916592**	3

Lateral groove labeling — ZB 6, see page 111



ECP selective circuit breaker

The area of application for the ECP ... extends to all aspects of the power supply unit. In the case of an overload, power supply units reduce the output voltage. As a consequence, all connected loads would no longer be sufficiently supplied. This means that if an error occurs in one load of a system, the voltage will be affected in all load circuits.

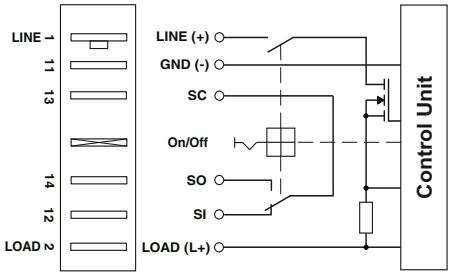
The solution here is the electronic circuit breaker:

– Selective protection of all 24 V DC load circuits at switched-mode power supply units
– Residual current always limited to 1.8 times the nominal current
– Combination of active electronic current limitation and proven circuit breaker technology including electrical isolation
– Capacitive loads can be switched on and loads are only switched off in the event of an overload or short circuit

Other properties:

– Operating or error state indicated by LED and integrated signal contacts
– Design width of just 12.5 mm
– Can be plugged onto TMCP SOCKET M base

A complete data sheet is available to download for each product at **www.phoenixcontact.net/products.**



Can be plugged onto base

Total width 12.5 mm

Technical data

Rated data	IEC
Operating voltage	24 V DC
Rated current I_n	Depends on the selected item version
Disconnection	
Switch-off time	See trigger characteristic
Fuse type	Electronic
General data	
Dimensions W / H / D	38 mm / 115 mm / 147.5 mm
Temperature range	0 °C ... 50 °C (without condensation)
Degree of protection	IP30 (Actuation area)
Inflammability class according to UL 94	V0

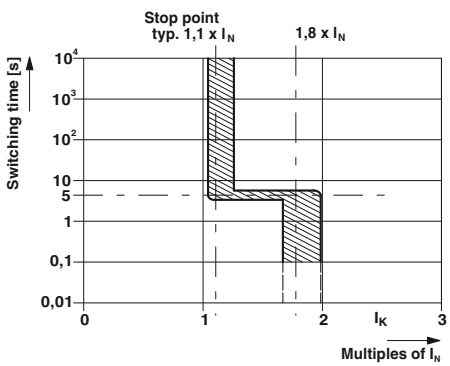
Ordering data

Description	Nominal current	Type	Order No.	Pcs. / Pkt.
Selective circuit breaker, can be plugged into TMCP base, signaling using two-color LED, floating signal contact, on/off pushbutton				
	2 A	**ECP 2**	**0911034**	5
	3 A	**ECP 3**	**0911047**	5
	4 A	**ECP 4**	**0912034**	5
	6 A	**ECP 6**	**0912033**	5
	8 A	**ECP 8**	**0912019**	5
	10 A	**ECP 10**	**0912020**	5
Selective circuit breaker, as above, but nominal current can be set via a switch, 1 A and 2 A				
	1 A (Adjustable)	**ECP 1-2**	**0912018**	5
Selective circuit breaker, as above, but nominal current can be set via a switch, 3 A and 6 A				
	3 A (Adjustable)	**ECP 3-6**	**0916536**	5

Accessories

Modular socket, 2-position, for holding two circuit breakers, each with a single position	**TMCP SOCKET M**	**0916589**	10
Socket termination elements, can be plugged in both left and right, contain the connections for the reset inputs/group query	**TMCP CONNECT LR**	**0916592**	3
Spring lock, for mechanical locking in the case of overhead mounting, 1-pos.	**ECP-LOCK**	**0912021**	10

Lateral groove labeling — ZB 6, see page 111



Base for ECP and TMCP

- The TMCP SOCKET M base element is used to mount TMCP ... and ECP ... plug-in circuit breakers on DIN rails
- Flexible structure with any number of positions
- Individual protection thanks to free combination of both circuit breaker types on a single module
- The TMCP CONNECT LR termination elements are plugged in at the start and end of the module structure
- Supply indicated via connections 11 and 12
- Separate signal request for each circuit breaker
- Using connections 13 and 14 in the termination elements, a signal loop can be created via all circuit breakers quickly and without the need for additional wiring.
- All electrical connections of the main and signal contacts are located in the base
- Potential distribution possible by means of bridges
- User-friendly spring-cage connection
- Large-surface labeling options make it easier to assign the circuit breakers to the modules

Notes:

For additional technical data, drawings, and accessories, please visit www.phoenixcontact.net/products.

To accommodate single-position circuit breakers

Total width 25 mm

Technical data

General data	
Dimensions W / H / D	25 mm / 115 mm / 110.5 mm
Connection method	Spring-cage connection
Connection data solid / stranded / AWG	1.5 ... 10 mm² / 1.5 ... 10 mm² / 15 - 7

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Modular socket, 2-position, for holding two circuit breakers, each with a single position	**TMCP SOCKET M**	**0916589**	10

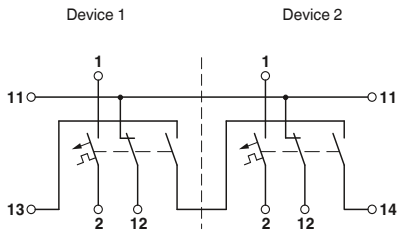
Accessories

Socket termination elements, can be plugged in both left and right, contain the connections for the reset inputs/group query	**TMCP CONNECT LR**	**0916592**	3
Signal bridge, plug-in, for bridging group signaling when there is a free slot on the TMCP SOCKET M, nominal current: 1 A	**TMCP SB**	**0916602**	6
Fixed bridge, plug-in, 500 mm long, can be cut to length, for distribution of the input potential in the socket, nominal current: 50 A	**FBST 500 TMCP**	**0916615**	20
Continuous plug-in bridge, 500 mm long, can be cut to length, for potential distribution, nominal current: 32 A	**FBST 500-PLC BU**	**2966692**	20
Continuous plug-in bridge, 500 mm long, can be cut to length, for potential distribution, nominal current: 32 A Nominal current: 32 A	**FBST 500-PLC RD**	**2966786**	20
Lateral groove labeling	ZB 6, see page 111		

Backup fuse

A backup fuse together with a circuit breaker must always be used if there is a risk of the maximum switching capacity being exceeded in the event of a fault. The adjacent table specifies the maximum switching current, the respective internal resistance and the resulting backup fuse.

TMCP circuit diagram



Display and definitions in the switched-off, zero-current state.

TMCP and TMC nominal currents, internal resistances and backup fuses

Nominal current	Maximum backup fuse	Internal resistance [Ω]		Switching capacity as per EN 60934
		F1 (fast blow) for DC	M1 (normal blow) for DC/AC	
[A]	[A]			[A]
0.2	Any	39.3	26.1	400
0.3	Any	17.5	11.6	400
0.4	Any	9.2	6.6	400
0.5	Any	6.8	4.1	400
0.6	Any	4.2	3	400
0.8	Any	2.8	1.65	400
1	Any	1.6	1.10	400
1.5	25	0.78	0.47	400
2	25	0.42	0.28	400
2.5	25	0.26	0.183	400
3	25	0.18	0.124	400
4	25	0.12	0.077	400
5	25	0.092	0.063	400
6	50	0.054	0.045	800
8	50	0.025	≤ 0.02	800
10	50	0.022	≤ 0.02	800
12	50	≤ 0.02	≤ 0.02	800
16	50	≤ 0.02	≤ 0.02	800

Installation instructions for surge protective devices

Installation direction:

Surge protective devices with a multi-stage configuration which are looped into the circuit are marked "**IN**" and "**OUT**". They must be connected before the device to be protected so that "**IN**" points towards the direction from which the surge voltage is expected.

The device to be protected should be connected to the terminal points marked "**OUT**". This is the only way to ensure correct operation of the surge protective device in the event of a surge voltage coupling.

Connection:

The protective conductor connection of the system to be protected should be connected directly and via the shortest route to the ground connection of the surge protective device or the corresponding connection terminal block on the "**OUT**" side of the surge protective device.

This is the only way to ensure that impermissibly high voltages due to potential increases caused by discharge currents are prevented between the ground connections of the surge protective device and the device to be protected. The same is true for the connection between ground and the live conductors of the device to be protected (see figure: ground connection).

Equipotential bonding:

Correct operation of the surge protective devices requires complete equipotential bonding in accordance with the applicable regulations.

Cable routing:

Protected and unprotected cables must not be laid directly parallel to one another. They must be physically separated or shielded from one another so that surge voltages cannot be coupled from unprotected cables to protected ones. If crossed, cables that can influence one another must be crossed at right angles.

Quenching follow currents:

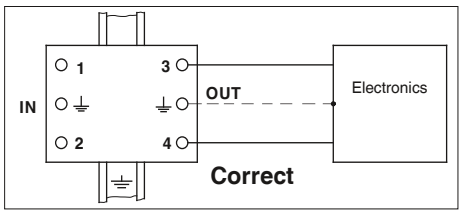
Gas-filled surge arresters only have limited self-quenching capability and are therefore almost always suitable for protecting message transmission systems.

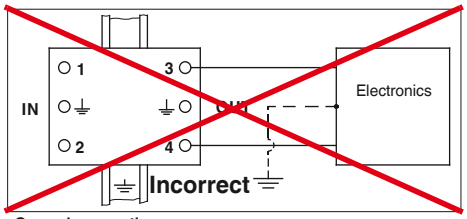
The arresters easily meet the requirements of the usually high-impedance remote indication circuits. Distinct quenching behavior is observed under the following conditions in the case of systems with higher operating voltage or lower impedance:

AC application: if the possible short-circuit current of the source exceeds the alternating current carrying capacity, a fuse is required to prevent overheating caused by the follow current.

DC application: for voltages > 12 V DC, the possible short-circuit current of the source must not exceed 100 mA. Otherwise a fuse that enables shutdown within 5 seconds should be selected. Self-quenching capability is ensured for voltages ≤ 12 V. Please note, however, that the specific technical data for the product must always be observed.

Backup fuse: the system must be protected against impermissibly high short-circuit currents due to arrester overload. The maximum permissible or required backup fuse for the affected arrester is documented in the technical data of the relevant product.





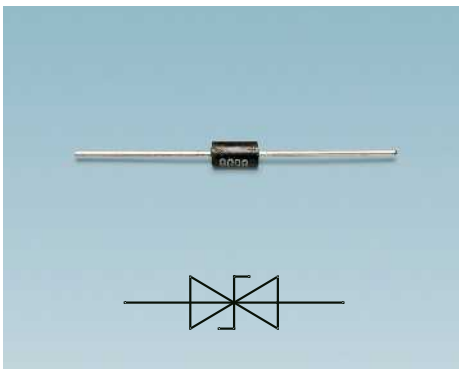
Ground connection

Surge voltage limiting components

The main function-specific components for lightning arresters and surge protective devices are spark gaps, gas-filled surge arresters, varistors, and diodes, as well as decoupling impedances.

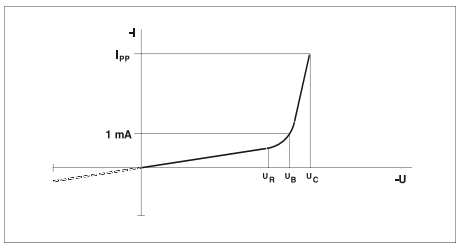
All components have specific advantages and disadvantages. In order to achieve optimum protection, protective circuits and multi-stage protection concepts that combine various components can be implemented.

Suppressor diode



The reverse voltage U_R is the highest voltage that the diode can safely block. A current of 1 mA flows through the suppressor diode at the breakdown voltage U_B. At this point the suppressor diode starts limiting the surge voltage.

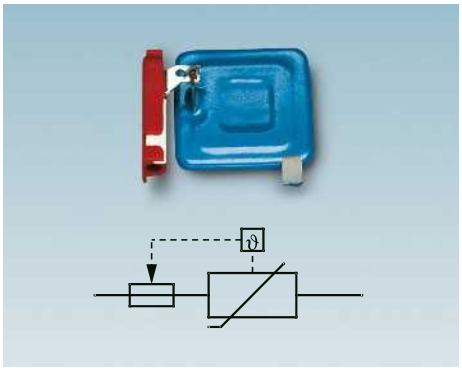
The maximum clamping voltage U_C is the highest voltage which can be present at the suppressor diode in the event of a peak pulse current I_{pp} (10/1000) µs.



U/I characteristic curve of a suppressor diode
Explanation:

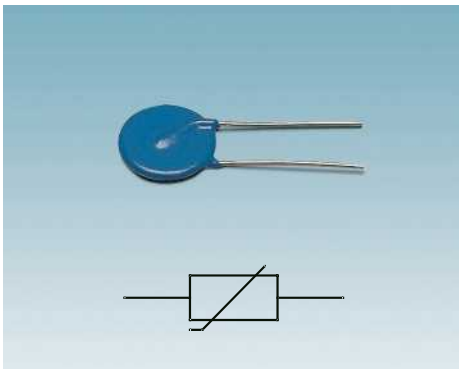
U_R	= Reverse voltage
U_B	= Breakdown voltage
U_C	= Clamping voltage
I_{pp}	= Peak pulse current
I_R	= Reverse current

Varistors

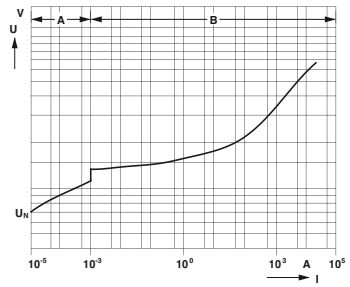


Block varistor with thermal disconnect device

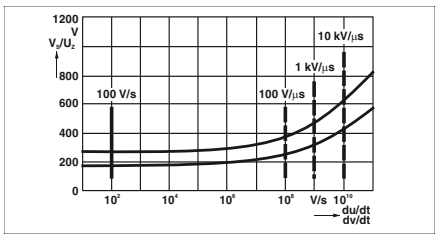
Varistors are "voltage-dependent resistors" which, due to their voltage/current characteristic curves enable a high discharge capacity with a low residual voltage.



Disc varistor

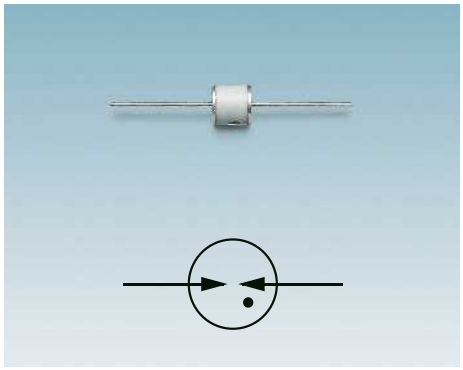


U/I characteristic curve of metal oxide varistors
Explanation:
A = High-resistance operating area
B = Low-resistance operating area/ limiting area



Characteristic ignition curve of a gas-filled surge arrester
Static response behavior
Dynamic response behavior

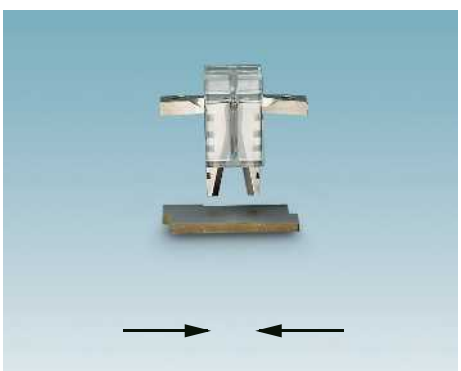
Gas-filled surge arresters



Gas-filled surge arresters consist of an electrode arrangement in a ceramic or glass tube. Between the electrodes is an inert gas, such as argon or neon. When the igniting voltage is reached, the component changes to a low-resistance state as a result of the gas discharge used. The igniting voltage is not a constant, instead it is dependent on the rate of rise of the surge voltage.

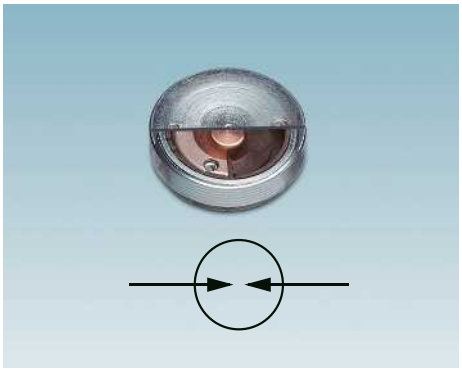
After igniting the discharge path, an arc voltage between 10 and 30 V typically occurs, which can be measured as a voltage drop at the arrester. In this low-resistance state, a line follow current, whose value depends on the impedance of the mains connected upstream, can flow through the arrester. In order to interrupt line follow currents that exceed the self-quenching capability, a fuse must be connected upstream of the surge arrester. Series connection of varistors or resistors is also possible.

Spark gaps

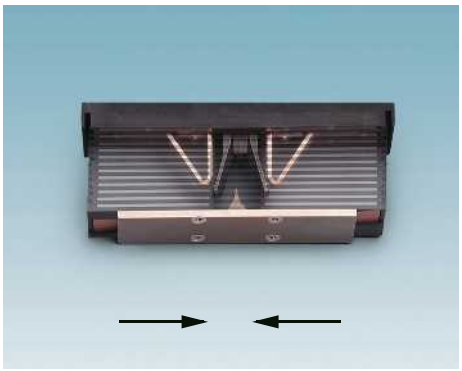


ArC spark gap

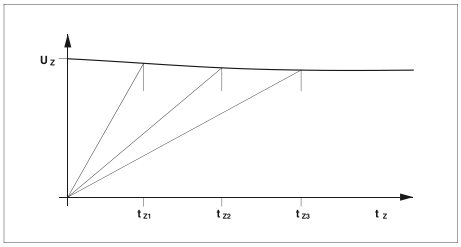
The ArC spark gap in the FLASHTRAB lightning arrester is based on arc chopping technology. Two spark horns positioned opposite one another are kept at a distance by an isolator bridge bar. In addition, a baffle plate is fitted below the electrodes in the direction of the opening. In the event of a surge voltage, surface discharge occurs along the isolator bridge bar, which creates an arc. This is driven along the spark horns towards the baffle plate where it is chopped up. The resulting physical effects quench the arc and the associated line follow currents.
A significant increase in the follow current quenching capacity can be achieved with spark gap types in which quenching plates are arranged around the spark horns.



Encapsulated ArC spark gap



ArC spark gap with quenching plates



Characteristic ignition curve of a spark gap

Surge protective devices

The wide range of different applications also requires numerous different surge protective devices with application-specific properties. Important criteria include the type of circuit, the surge-voltage limiting properties, and the design. The TRABTECH range from Phoenix Contact offers numerous versions, such as adapters, junction boxes or DIN-rail-mountable arresters in a modular and compact design, providing practical system solutions for all applications.

In line with their intended application, surge protective devices are designed for high electrical loads. However, excessive or very frequent surge voltages may lead to overload. This can result in a reduction or even failure of the protective function, and the affected protective device having to be replaced. Where possible, surge protective devices should therefore have a plug-in design and support testing.

The TRABTECH product range from Phoenix Contact takes these requirements into consideration as far as modern technology permits. The product range includes surge protective devices in the form of adapters, as well as devices with a two-piece plug-in modular design.

The protective devices in the FLASHTRAB, VALVETRAB, PLUGTRAB, and COMTRAB product ranges are particularly interesting with regard to their plug-in capability and testability. They have been developed with various protective circuits and different nominal voltages for applications in power supply, measurement and control, and data interface protection.

With components that are perfectly designed to work together, i.e., gas-filled surge arresters, varistors, and suppressor diodes depending on the protective circuit, their specific advantages are fully utilized.

Explanation of terms

AC withstand voltage

The r.m.s. value of the highest sinusoidal voltage at mains frequency which will not lead to a disruptive discharge under the specified test conditions.

Aging

Modification of the original performance data due to disturbing pulses, operation or unfavorable ambient conditions.

Ambient conditions

The immediate ambient conditions for the device or the relevant air and creepage distances.

Arc voltage U_{bo}

The arc voltage is the instantaneous value of the voltage on a discharge path (arc discharge) during an arresting process.

Arrester

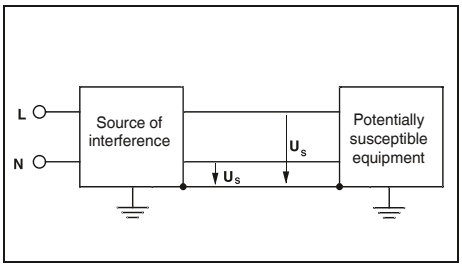
Item of equipment that mainly consists of voltage-dependent resistors and/or spark gaps. Both elements can be connected in series or in parallel, or even used individually. Arresters are used to protect other electrical equipment and electrical systems against impermissibly high surge voltages.

Associated electrical equipment

An item of electrical equipment in which not all circuits are intrinsically safe, but which contains circuits that can influence the safety of the intrinsically safe circuits to which they are connected.

Asymmetrical interference

Asymmetrical means that the source of interference and the potentially susceptible equipment are grounded, i.e., they have a capacitive or galvanic connection to the protective conductor. As shown in the figure, the interference moves from the source along both conductors to the potentially susceptible equipment and back via ground. The terms “common-mode interference” or “common mode” are also used.



Asymmetrical voltage, common mode voltage

Average voltage between each conductor and a specified reference point, usually reference ground or ground.

Burst

Pulses which occur repeatedly within a specific time interval.

Common mode voltage

The common mode voltage is the voltage which occurs in the event of interference between live conductors and ground.

Coupling

Interaction between circuits, in which energy is transferred capacitively, inductively or galvanically from one circuit to the other.

Direct or close-up strikes

These cause surge voltages with an energy level that constitutes a considerable part of the total energy of the lightning discharge.

Discharge of static electricity; electrostatic discharge; ESD

The transmission of an electrical charge between bodies with different electrostatic potentials when they are in close proximity or touching.

Disconnect device

This is a device which disconnects a SPD from the mains when it fails. It is designed to prevent a permanent fault in the system caused by the faulty surge arrester and provide an optical indication of the faulty SPD.

Disturbance variable

The disturbance variable is an electromagnetic (or electrical or magnetic) variable, which can have an undesirable influence on electrical equipment.

Electromagnetic compatibility (EMC)

The ability of a device or system to operate without faults in an electromagnetic environment without itself causing electromagnetic interference, which would be unacceptable for other devices in this environment.

Electromagnetic environment

The sum of all electromagnetic phenomena at a given location.

Electromagnetic interference
A loss in the quality of the operating behavior, such as malfunction or failure of electrical or electronic equipment, that is caused by an electromagnetic disturbance variable.

Equipment to be protected
All equipment of a structural system or a range which requires surge protection or lightning protection.

Equipotential bonding
The removal of potential differences between conductive parts, in which all points assume virtually the same potential.

A distinction is made between functional equipotential bonding and protective equipotential bonding.

Equipotential bonding conductors
These are electrically conductive connections used to create equipotential bonding.

Equipotential bonding strip
This is the strip which is designed to connect protective conductors, equipotential bonding conductors, and conductors for functional earth grounding to the ground conductor and the ground electrodes.

Equipotential bonding system
This refers to all the interconnected equipotential bonding conductors, including the conductive parts such as housing or external conductive parts which work in the same way.

The equipotential bonding system can also be the grounding system or part of a grounding system.

Exposure
Exposure is an insufficient distance between the lightning protection system and metal installations or electrical systems which leads to a risk of flashover or disruptive discharge in the event of a lightning strike.

Exposure voltage
The exposure voltage is a voltage that occurs at the exposure point when lightning strikes the lightning protection system.

Follow current I_f
Current which flows through the SPD following discharge and is supplied by the mains. The follow current differs considerably from the continuous operating current.

Gas-filled surge arrester
The gas-filled surge arrester is a discharge path which is filled with a gas other than air, generally an inert gas.

Ground
This expression refers to the earth and the ground.

Ground conductor
A conductor which connects the equipment to be grounded to a ground electrode, as long as the ground conductor is not laid in the ground or, if laid in the ground, is insulated.

Ground electrode
A conductor embedded in the ground with an electrically conductive connection to ground. Parts of supply lines to a ground electrode, which are not insulated in the ground, are considered to be parts of the ground electrode.

Grounding
Grounding is the sum of all means and measures used for grounding.

Grounding resistance
The resistance between the grounding system and the reference ground. The amount of grounding resistance depends on the interaction of the individual ground electrodes.

Impulse sparkover voltage of 1.2/50 µs
Highest voltage value before the disruptive discharge between the electrodes of the spark gap of a SPD.

Impulse withstand voltage U_{st}
The peak value of the highest surge voltage with a predefined form and polarity, which will not lead to a disruptive discharge under the specified test conditions.

Note: the impulse withstand voltage is equal to or greater than the rated surge voltage.

Inactive parts
Inactive parts are conductive parts that are electrically isolated from all live parts through basic insulation.

Insertion attenuation
To determine the insertion attenuation of a SPD, the mains and frequency are specified. The attenuation value is defined as the ratio of voltages that occur immediately before and after the insertion point of the SPD to be tested. The result is expressed in decibels.

Insulation coordination
The assignment of characteristic insulation data for an item of equipment for:
- Expected surge voltages
- Characteristic data of the surge protective device
- Expected ambient conditions
- Protective measures against contamination

Interference suppression
Measure to reduce or avoid the electromagnetic disturbance variables that occur.

Intrinsically safe circuit
A circuit protected against sparks and thermal effects that may occur under the conditions specified in DIN EN 60079-11 (which include error-free operation and specific fault conditions), which can cause the ignition of a particular explosive gas atmosphere.

Intrinsically safe electrical equipment
Electrical equipment in which all circuits are intrinsically safe.

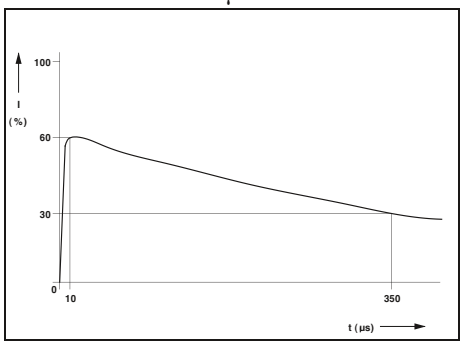
Lightning protection system
All devices as a whole that provide external and internal lightning protection for the system to be protected.

Lightning surge current I_{imp}
Lightning surge currents are characterized by the parameters peak value, charge, specific energy, and current increase rate. The lightning surge current I_{imp} is a measurement for the discharge capacity of lightning arresters (class I). It is determined according to a defined test procedure using 10/350 µs waveform test pulses.

Lightning surge voltage
Surge voltage as a result of lightning discharge.

Lightning test current

The (10/350) µs lightning test current has a rise time of 10 µs and a decay time to half-value of 350 µs.



10/350 lightning current pulse according to IEC 62305-1

Live parts

Live parts are conductors and conductive parts of equipment that are energized under normal operating conditions.

Maximum continuous voltage U_c

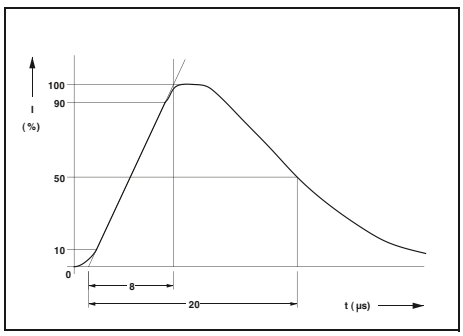
The rated voltage is the maximum permissible r.m.s. value of the power-frequency AC voltage, which may be permanently applied to the protective paths of the arrester.

Nominal current I_N or load current I_L

Highest continuous current for products according to IEC 61643 which can flow through the surge protective device at the specified temperature without altering the electrical operating properties. For higher operating temperatures, the nominal current is lower (derating).

Nominal discharge surge current I_n

Peak value of the current flowing through the SPD with surge form (8/20) µs. It is used to classify the SPD according to class II. Source: EN 61643-11



8/20 surge current pulse according to IEC 60060-1

Nominal voltage U_N

A suitable rounded voltage value, which is specified by the manufacturer for equipment for the purpose of designation or identification.

Normal mode voltage

The normal mode voltage is the voltage which occurs in the event of interference between two conductors of a circuit.

Potentially susceptible equipment

All electrical equipment whose function can be influenced by disturbance variables is referred to as potentially susceptible equipment. Influence on function may be in the form of a functional disturbance, reduction in function, malfunction or failure.

Protection level U_p

A parameter that characterizes the performance capabilities of the SPD with regard to voltage limitation via its connection terminal blocks. This value, which should be specified by the manufacturer, must be greater than the highest measured value of the clamping voltages.

Protective paths

The voltage-limiting or switching components of the SPD can be connected between conductor/conductor, conductor/ground, conductor/neutral conductor, and neutral conductor/ground or a combination of these options. These circuit types are referred to as protective paths.

Pulse

Rapid, brief alteration of a physical variable, followed by a fast return to the original value.

Pulse burst; burst

Result of a limited number of pulses or waves of a limited duration.

Rate of rise

Average rate of change of a variable between two specified values, e.g., 10% and 90% of the peak value.

Reference ground

An area of the earth, particularly of the earth's surface, which is so far away from the ground conductors that no noticeable voltages occur between any points of this area as a result of the current entering the earth.

Remote strikes

These usually cause surge voltages with a significantly lower energy level than close-up strikes. Remote strikes are responsible for causing surge voltages in electrical and electronic systems.

Residual current device (RCD)

Residual current devices are devices which isolate electrical systems from the power supply system as soon as the residual current to ground exceeds a specific value.

Residual voltage U_{res}

The peak voltage value that occurs while discharge surge current is flowing via the terminal blocks of the SPD. Source: EN 61643-11:2002

Response

A response is when either:

– The peak value of the ohmic components of the current flowing through the arrester reaches 5 mA
– A voltage dip with an increase in the peak value of the current flowing through the arrester to 5 mA occurs

Selective residual current device

Selective residual current devices are time-delayed circuit breakers.

Short circuit stability

Highest interference-free short-circuit current the SPD can withstand.

Source of interference

A source of interference is the origin of disturbance variables. In principle, any electrical equipment, such as motors or fluorescent lamps, can be a source of interference.

Specialist

A specialist is a person who, because of their education, experience, and instruction, and their knowledge of relevant regulations, can assess any required operations and recognize any possible dangers.

Note: when considering a person's professional training, several years' experience in the relevant field can also be taken into account.

Spike

A relatively short single-polarity pulse.

Surface discharge surge arrester

The surface discharge surge arrester, according to DIN VDE 0845 Part 1, is a discharge path in which gas discharge is initiated by means of surface discharge.

Surge current of (8/20) µs

Surge current with a rise time of 8 µs and a decay time to half-value of 20 µs. Source: IEC 60060-1

Surge current of (10/350) µs
Surge current with a rise time of 10 µs and a decay time to half-value of 350 µs. Source: IEC 62305-1

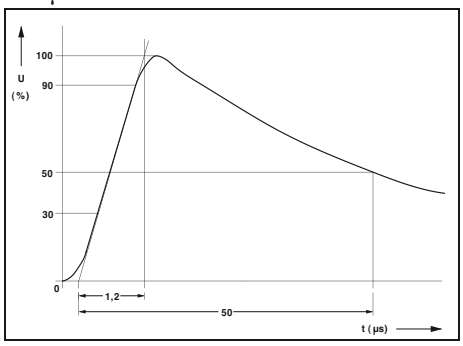
Surge protection equipment (SPE)
Surge protection equipment consists of surge protective devices and all equipment in telecommunications systems, including their cables, used for surge protection.

Surge protective device (SPD)
A device to limit surge voltages and discharge surge currents. It contains at least one non-linear voltage-limiting component.

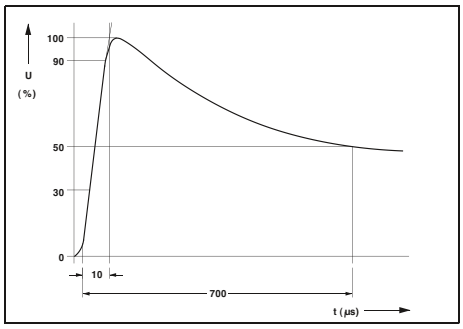
Surge voltage
Any voltage with a peak value that exceeds the corresponding peak value of the maximum continuous voltage under normal operating conditions.
Source: EN 60664-1

Surge voltage category
Assignment of electrical equipment to the anticipated surge voltage.

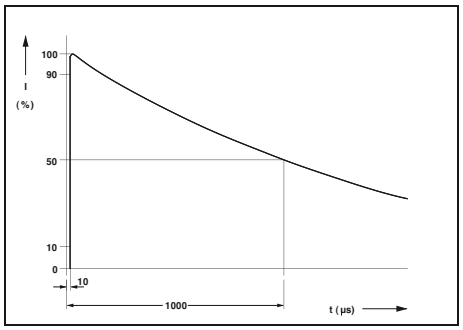
Surge voltage of (1.2/50) µs
Surge voltage with a rise time of 1.2 µs and a decay time to half-value of 50 µs. Source: IEC 60060-1



1.2/50 surge voltage pulse according to IEC 60060-1



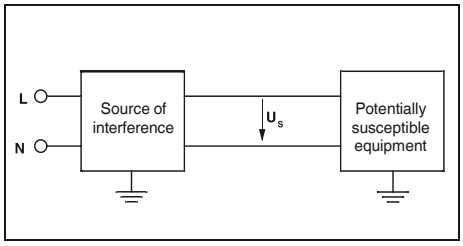
10/700 surge voltage pulse according to ITU-T K.44



10/1000 surge current pulse according to IEEE C62.41.1

Switching surge voltage
Surge voltage as a result of a switching operation.

Symmetrical interference
As shown in the figure, the disturbance variable moves from the source along one conductor to the potentially susceptible equipment and back along the other conductor. The terms "normal-mode interference" or "differential mode" are also used.



Symmetrical interference voltage
Interference voltage between two wires of a cable (e.g., double cable) or between two connection points of electrical equipment for this cable type.

Symmetrical voltage, differential mode voltage
Voltage between two live conductors from one defined group.

Temperature range
Range between the minimum and maximum temperature that may be present at/in housing. For devices without self-heating, this value is the permissible ambient temperature. For devices with self-heating, these values are the maximum temperatures that may occur at/in the device during operation.

To ground
An electrically conductive part, e.g., the lightning protection system is connected to ground via a grounding system.

Transient
Describes a phenomenon or variable which changes during what is, in comparison to the time scale being observed, a short period of time between two consecutive stationary states.

Transients
Irregular and relatively short positive and/or negative voltage or current changes between two stationary states.

Varistors
A varistor is a bipolar non-linear resistor with a symmetrical voltage/current characteristic curve and a resistance value which decreases as the voltage increases.

Quality in quantity

Integrated management system

The aim of the Phoenix Contact integrated management system is to coordinate all the requirements regarding products, processes, and organization.

Statutory and regulatory requirements, as well as those of international standards and our customers, are met and, in some cases, even exceeded in all phases of the product lifecycle.

In the Phoenix Contact management system, the integration of quality, environmental protection, and safety in the workplace is monitored each year for conformance by internationally recognized independent bodies. Certification in accordance with international standards ISO 9001, ISO 14001, and BS OHSAS 18001 is the result of our corporate philosophy of meeting the needs of our customers, staff, and environment as best as possible. They serve as the basis for innovative products with the familiar high Phoenix quality standard, actively practiced environmental protection, and responsibility in the field of occupational health and safety. Of course, we integrate all further requirements of standards, international approvals or special customer requirements into company processes.

This system provides a building block for the success of the Phoenix Contact Group and its products and services.

CE marking

The CE mark was introduced as an important instrument for the free movement of goods and services within the single European market. By attaching the mark to a product, the manufacturer confirms that it complies with all applicable European Union (EU) directives. EC directives describe the product properties with regard to device safety and avoiding danger. These are legally binding regulations of the European Union (EU). In other words, compliance with the requirements is a **statutory condition for marketing the product within the EU**.

Where applicable, the products that our company currently manufactures fall within the scope of the following directives:

– 2006/95/EC
  Electrical equipment designed for use within certain voltage limits (Low Voltage Directive)
– 2004/108/EC
  Electromagnetic compatibility (EMC Directive)
– 2006/42/EC
  Safety of machinery (Machinery Directive)
– 94/9/EC
  Equipment and protective systems intended for use in potentially explosive areas (ATEX Directive 100a)
– 1999/5/EC
  Radio and telecommunications terminal equipment (R&TTE)

The standards upon which the specified directives are based, have been part of our standard of development for a long time. This guarantees conformance with European directives. The numbers of the directives indicate their version at the time of publication. In the event of changes to directives and/or standards, our products will undergo conformity assessment again in good time and a new declaration of conformity will be issued promptly. The current declarations for each product can also be found in our Download Center.

The EMC Directive occupies a special place among the European directives listed. It defines electromagnetic compatibility as a fundamental property of devices based on mandatory guidelines. European Law therefore acknowledges the electromagnetic compatibility of devices and systems as an important condition for error-free operation of machinery and systems. Phoenix Contact is one of the leading international companies in surge protection, and therefore possesses broad expertise in EMC. This expertise and the experience gained over years of developing and applying industrial interface and communication technology have resulted in our products having an extremely high standard of quality with regard to electromagnetic compatibility. It was with a view to providing other companies with this expertise that our associate company, Phoenix Testlab, was founded. Phoenix Testlab GmbH is an independent, accredited service provider offering EMC testing that conforms to European standards. At Phoenix Testlab, devices are also tested with regard to their electrical safety, mechanical influences, and their behavior in relation to environmental influences. Furthermore, Phoenix Testlab is a "Notified Body" in accordance with EMC Directive 2004/108/EC and according to R&TTE Directive 1999/5/EC for radio and telecommunications terminal equipment. As a "Telecom Certification Body" (TCB), Phoenix Testlab may also approve these products for markets in the USA, Canada, and Japan.

Standards and regulations

All relevant standards and regulations are used as the basis for the development and maintenance of our products.

International standards are subject to continuous changes as a result of harmonization and new developments. In line with this process, the current version of all standards that are relevant to our products is documented in the product area on our website at **www.phoenixcontact.net/products**.

Online product information service on the web

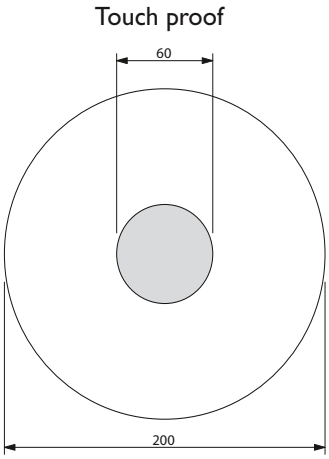
Phoenix Contact's product range is growing constantly.

Due to our commitment to product monitoring, all products are subject to improvement.

The Internet is an ideal platform to quickly communicate new product developments and improvements to the market.

You can quickly access the relevant Phoenix Contact website for your region via www.phoenixcontact.com. Here, you will always find the latest overview of products, solutions, and services from Phoenix Contact. This includes technical documents, such as data sheets and user manuals, the latest driver and demo software, plus a means of contacting the appropriate contact person directly.

Shock protection



Example: pressure actuation

The accident prevention regulations BGV A 2 issued by the German employer's liability insurance association for precision mechanics and electrical engineering apply to the operators of electrical systems and are aimed at the prevention of electrical accidents by means of special safety requirements.

These regulations contain specifications regarding the safety distances for work, operation, and occasional handling in the proximity of "live parts" in low-voltage systems up to 1000 V ~ or 1500 V –.

- Work with live parts is only permitted once they have been de-energized. Operational activities are only permitted in the vicinity of live parts if these parts are de-energized or are protected against direct contact (§ 6). The following safety measures are applicable when working in close proximity to live parts:
- Provision of the de-energized state for the duration of the work
- Ensure shock protection is in place in the form of covers or barriers during the work
- Assurance that proximity limits will not be violated (§ 7)

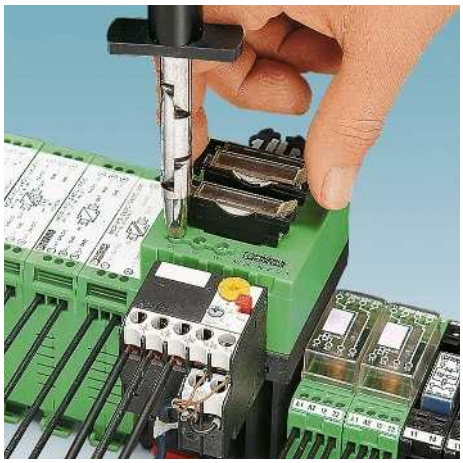
The term "occasional handling" has been introduced for the operation of elements such as pushbuttons, rocker arms or rotary buttons in the proximity of live parts.

In VDE 0105-1, this is covered by "operation with partial protection against direct contact".

Detailed specifications for "occasional handling" can be found in DIN VDE 0106-100. This specifies to what degree live parts in the proximity of operating elements are to be protected against contact. The basis for this is the definition of a "protection area for occasional handling"; this is the area into which the user must reach in order to handle the machine.

The most important thing is that an area formed by an even envelope curve 30 mm in radius must surround the live parts. This area must be **touch proof**, i.e., the live parts of the electrical device must not be within reach of the VDE test finger in accordance with IEC 60529/DIN VDE 0470-1 (test finger).

Back of hand safety is specified for the "rest of the area" up to 100 mm around the operating element. **Back of hand safety** means that when a force of 50 N is applied to a ball with a diameter of 50 mm, this does not come into contact with the live parts of the equipment. No special measures for shock



protection are provided outside this area.

Note: systems and equipment that are operated with SELV up to 25 V ~ or 60 V – are considered to be protected against direct contact.

According to § 5, Subsection 4 of the BGV A 2 regulations, there is no need to test the condition of the system prior to initial startup if the company has confirmation from the manufacturer or installer that the electrical systems and equipment conform to

BGV A 2. The confirmation required relates to systems and equipment that have been installed and are ready for operation and can only be issued by the installer or installation company. The manufacturer of the electrical equipment can only issue a confirmation that products have been produced in accordance with the relevant electrotechnical DIN VDE regulations stipulated in BGV A 2. The installer must bear this in mind when selecting the equipment to be used.

In the field of connection technology, Phoenix Contact offers a wide range of products that are touch proof or that can be protected against contact using covers. Depending on the conditions, all of this must be taken into account when selecting the individual types of terminal block and accessories.

Quality features of insulating housing

Thermoplastics

The majority of our insulating housing is made from thermoplastic materials. Roughly speaking, these can be divided into amorphous and semi-crystalline substances. Thermoplastics are processed using the efficient and environmentally-friendly injection molding process. They have good recycling properties and can be re-used. We use many materials that are modified in different ways to meet the demanding requirements that electrical and electronic modules, devices, and systems have to meet with regard to their mechanical, thermal, and electrical properties.

Behavior of plastics under the influence of temperature (operating temperatures, mechanical influences)

All plastics undergo a process referred to as thermal aging when they are subjected to heat over long periods. This process causes changes in the mechanical and electrical properties of the material. External influences, e.g., radiation, additional mechanical, chemical or electrical stresses, amplify this effect. Special tests on samples can yield characteristic data which provides a good means of drawing comparisons between different plastics. However, applying these characteristics to an evaluation of molded plastic parts is only possible to a limited extent, and can only give the designer a rough guide when it comes to selecting a plastic material. This catalog uses the following assessment criteria: the **RTI value** according to UL746B/ANSI 746 B (elec. based on dielectric strength) and the **Ti value** according to IEC 60216-1 (based on a 50% reduction in tensile strength after 20,000 hours).

IEC 60947-7-1/EN 60947-7-1 specifies a permissible temperature increase of 45 K for modular terminal blocks under nominal load. Phoenix Contact terminal blocks meet this requirement.

The properties of plastics are not only affected by the influence of heat as described above; they also undergo changes as a result of cold influences. When subjected to cold as well as low levels of humidity, plastics become increasingly brittle with the result that they are no longer capable of withstanding the same mechanical loads. As the table on the right shows, the plastics concerned can be used down to a temperature of -40°C, but only without a mechanical load. As far as the products presented in the catalog are concerned, it is the ambient temperature specified in each case that is to be regarded as definitive for operation. Regardless of the plastics used, this may be subject to further restrictions (e.g., limited to -20°C) as a result of the components used or other restrictive parameters.

At very low temperatures, this means that any form of mechanical load on the plastic components must be avoided (e.g., mounting of products on/removal of products from the DIN rail, actuation of terminal points, locking/ejection of relays from bases, prizing out of plug-in bridges, bending of cables and lines, etc.), as there is always an associated risk of damage. Unless otherwise indicated, it is recommended that you carry out the specified mounting/operational tasks in a temperature range from -10°C to +40°C.

Inflammability characteristics of plastics (UL 94)

Inflammability tests for plastics have been defined by Underwriters Laboratories (USA) in regulation UL 94. This applies to all areas of application, but in particular to electrical engineering. A horizontal or vertical test is carried out at the test laboratory to determine the inflammability of the plastic material with a naked flame. In order of increasing resistance to combustion, the evaluation classes are HB, V2, V1, V0, and 5V. Test results are recorded on "yellow cards" and are published annually in the **Recognized Component Directory.**

Thermoplastics: non-reinforced polyamide, PA

We use modern, semi-crystalline polyamide insulation material, which has now become an essential component in electrical engineering and electronics. It has long occupied a leading position and is authorized for use by the relevant approval authorities such as the CSA, NEMKO, KEMA, PTB, SEV, UL, VDE, etc.

Polyamide also has excellent electrical, mechanical, chemical, and other properties, even at high operating temperatures. Brief peak temperatures up to approximately 200°C are permitted as a result of heat aging stabilization. Depending on the type (PA 4.6, 6.6, 6.10, etc.), its melting point is in the region of 215°C to 295°C.

Polyamide absorbs moisture from its surroundings, on average 2.8%. However, this moisture is not in the form of crystallization water in the plastic itself, but chemically bonded H_2O groups in the molecule structure. This makes the plastic flexible and resistant to breakage, even at temperatures as low as -40°C. According to UL 94, PA belongs to inflammability class V2 to V0.

Thermoplastics: polyester, PBT

We use the semi-crystalline thermoplastic polyester in non-reinforced and fiberglass-reinforced variants for special applications which require increased dimensional and form stability.

In addition to the high operating temperature, the material is characterized by excellent mechanical strength and hardness, and does not absorb moisture from its surroundings. PBT is therefore particularly suitable for strips, for example, which are soldered onto PCBs and subsequently have to pass a burn-in test while they are subjected to heat. According to UL 94, PBT belongs to inflammability class V2 to V0.

Thermoplastics: polycarbonate, PC

Polycarbonate combines many advantages such as rigidity, impact strength, transparency, dimensional stability, good insulation properties, and resistance to heat.

This amorphous material only absorbs moisture to a very limited degree, and is used for items such as large, rigid electronic component housing.

In its transparent form, polycarbonate is particularly suitable for use as cover profiles or marking materials.

PC has good resistance properties against mineral acids, saturated aliphatic hydrocarbons, gasoline, greases, and oils.

The material is less resistant to solvents, benzene, lyes, acetone, and ammonia. Strain cracks may result from contact with certain chemicals.

According to UL 94, PC belongs to inflammability class V2 to V0.

Thermoplastics: polycarbonate fiber-reinforced, PC-F

Compared to non-reinforced materials, fiber-reinforced polycarbonates feature greater rigidity, impact strength, and operating temperature. In other respects, their properties are largely identical to those of non-reinforced polycarbonate.

Thermoplastics: ABS

We use the thermoplastic molding compound ABS for products which must have good impact and notched impact properties in addition to high mechanical stability and rigidity. The products are resistant to chemicals and stress cracking due to their special surface quality and hardness.

The characteristic thermal properties provide good dimensional stability at both low and high temperatures. Products made from ABS can be coated with metallic surfaces, e.g., nickel.

According to UL 94, the molding compound used belongs to inflammability class HB to V0.

Dimensions: width / height / depth

The dimensions for "width / height / depth" are defined as follows for all DIN-rail mountable products in the INTERFACE range:

- Width: measurement taken along the DIN rail
- Height: measurement taken across the DIN rail
- Depth: measurement taken starting from the mounting plate and including the NS 35/ 7,5 DIN rail (EN 60715)

The width, height, and depth never change, even if the products shown in this catalog happen to be photographed from two different perspectives (horizontal or vertical).

To make things easier for you, one of the following two symbols has been included next to each product photo:

Properties	Unit/level	Polyamide PA	Polyester PBT	Polycarbonate PC	Polycarbonate PC-F	ABS
Operating temperature RTI */**	°C	≤ 105	≤ 105	≤ 125	≤ 120	≤ 80
Minimum temperature (without mechanical load)	°C	-40	-40	-40	-40	-40
Dielectric strength acc. to IEC 60243-1/DIN VDE 0303-21	kV/cm	600	400	> 300		850
Creep resistance	CTI...M	550	225	175		200
IEC 60112/DIN VDE 0303-1	CTI...	600	225	175	175	600
Tropical and termite resistance		Good	Good	Good		
Specific contact resistance IEC 60093/VDE 0303 Part 30; IEC 60167/VDE 0303 Part 31	Ω cm	10^{12}	10^{16}	> 10^{16}	> 10^{14}	10^{14}
Surface resistance IEC 60093/VDE 0303 Part 30; IEC 60167/VDE 0303 Part 31	Ω	10^{10}	10^{13}	> 10^{14}		10^{13}
Inflammability class according to UL 94		V2 - V0	V0	V2 - V0	V0	HB - V0

* According to UL 746 B/ANSI 746 B (elec.) ** Minimum value

Tightening torque of terminal block screws

IEC 60947-1/EN 60947-1, modified, Table 4 specifies tightening torques for screw connections based on the screw size for electrical and mechanical type tests.

Extract from IEC 60 947-1/EN 60 947-1, Table 4
The torque according to IEC and the recommended tightening torque for Phoenix Contact terminal blocks are specified.

Thread	Head screw with slot	
	Torque [Nm]	Recommended tightening torque [Nm]
M2.5 (M2.6)	0.4	0.4 - 0.5
M3	0.5	0.5 - 0.6
M3.5	0.8	0.8 - 1.0
M4	1.2	1.2 - 1.5
M5	2.0	3
M6	2.5	4

Connection cross section

The rated cross sections of modular terminal blocks must be specified by the manufacturer in accordance with IEC 60947-7-1. The rated cross section is the maximum conductor cross section that can be connected in single-, multi- or fine-strand versions subject to specific thermal, mechanical and electrical requirements.

The manufacturer must also specify the **rated connection capacity**, i.e., the area of the conductor that can be connected, as well as the number of conductors that can be connected simultaneously and the necessary preparation of the conductor ends. The conductors can be **solid (single or multi-strand)** or **stranded (fine-strand)**.

These values can be found in the product-specific technical data.

The rated connection capacity of the Phoenix Contact modular terminal blocks usually exceeds standard requirements, which specify that it must only be possible to connect one conductor with one of the two next smallest cross sections, excluding the rated cross section (standardized for the cross section range from 0.2 to 35 mm²).

In addition, conductors with a rated cross section can usually be wired with ferrules with plastic sleeve.

Phoenix Contact modular terminal blocks are designed to allow copper conductors to be connected to them untreated. "Special treatment" or the use of ferrules – both permitted according to IEC 60947-7-1 – is not required. If ferrules are nevertheless used to protect stranded conductors against splicing, the connection capacity of the stranded conductor is generally reduced by one level.

Structure and dimensions of connecting cables

Cross section	Single-strand		Multi-strand		Fine-strand		American Wire Gauge [AWG]						
	Diameter max. dimension	Number of wires	Diameter max. dimension	Number of wires (minimum number)	Diameter max. dimension	Number of wires (guide value)	Gauge No.	Solid wires			Stranded wires		
[mm²]							AWG	[∅ mm]	[circ. mils]	[mm²]	[∅ mm]	[circ. mils]	[mm²]
0.2	0.5	1	–	–	–	–	24	0.51	404	0.21	–	–	–
0.5	0.9	1	1.1	7	1.1	16	20	0.81	1022	0.52	0.97	1111	0.56
0.75	1.0	1	1.2	7	1.3	24	18	1.02	1620	0.82	1.16	1600	0.82
1	1.2	1	1.4	7	1.5	32	(17)	1.15	2050	1.04			
–	–	–	–	–	–	–	16	1.29	2580	1.31	1.50	2580	1.32
1.5	1.5	1	1.7	7	1.8	30	(15)	1.45	3260	1.65			
–	–	–	–	–	–	–	14	1.63	4110	2.08	**1.85**	4100	2.09
2.5	1.9	1	2.2	7	2.3	50	(13)	1.83	5180	2.63			
–	–	–	–	–	–	–	12	2.05	6530	3.31	**2.41**	6500	3.32
4	2.4	1	2.7	7	2.9	56	(11)	2.30	8230	4.17			
–	–	–	–	–	–	–	10	2.59	10380	5.26	2.95	10530	5.37
6	2.9	1	3.3	7	3.9	84	(9)	2.91	13100	6.63			
–	–	–	–	–	–	–	8	3.26	16510	8.37	3.73	16625	8.48
10	3.7	1	4.2	7	5.1	80	(7)	3.67	20800	10.56	4.15	20820	10.55
-	-	-	-	-	-	-	6	4.12	26240	13.30	4.67	26250	13.39
16	4.6	1	5.3	7	6.3	126	(5)	4.62	33100	16.77	5.24	33100	16.77
-	-	-	-	-	-	-	4	5.19	41740	21.15	5.90	41650	21.24
25	-	-	6.6	7	7.8	196	3	5.83	52600	26.67	6.61	52630	26.67
35	-	-	7.9	7	9.2	276	2	6.54	66360	33.62	7.42	66150	33.74
-	-	-	-	-	-	-	1	7.35	83690	42.41	8.33	83706	42.69

Current carrying capacity

Standard IEC 60947-7-1/EN 60947-7-1/ DIN VDE 0611-1 specifies the test currents for the individual conductor cross sections listed in the adjacent table. The corresponding currents are listed with the connection data for the individual terminal blocks. The type tests for modular terminal blocks are based on this data.

Test currents according to IEC 60947-7-1/EN 60947-7-1, Table 5

Rated cross section	[mm²]	0.2	0.5	0.75	1.0	1.5	2.5	4	6	10	16
Test current	[A]	4	6	9	13.5	17.5	24	32	41	57	76

Overview of certification bodies and safety marks

Certification bodies and approvals		Country code
CB scheme	IECEE CB Scheme (in combination with certifying body)	International
CCA	CENELEC Certification Agreement (CCA inspection report) (in combination with certifying body)	EU
SP	Canadian Standards Association (CSA)	CA
UL	Underwriters Laboratories Inc. (UL)	US
c UL	Underwriters Laboratories Inc. (UL) - UL approval for Canada -	CA
c UL us	Underwriters Laboratories Inc. (UL) Combined logo - UL approval for the USA and Canada -	US CA
IMQ	INSIEME PER LA QUALITA'E LA SICUREZZA	IT
GOST	Gosudarstvenne Komitet Standartov (GOST)	RU
KEMA KEUR	DEKRA Certification B.V.	NL
ÖVE	Österreichischer Verband für Elektrotechnik	AT
SABS	South African Bureau of Standards	ZA
SEV	electrosuisse SEV Verband für Elektro-, Energie- und Informationstechnik	CH
VDE	Verband Deutscher Elektrotechniker e.V.(VDE) – Approval of drawings – Reports with production monitoring	DE
GS	Berufsgenossenschaft (BG) GS - Geprüfte Sicherheit	DE
TÜV	TÜV Rheinland Industrie Service GmbH	DE

Explosion protection		Country code
FM APPROVED	FM Approvals	US
DEKRA	DEKRA Certification B.V.	NL
PTB	Physikalisch-Technische Bundesanstalt	DE
QS International	QS Schaffhausen	CH
VTT	VTT Expert Services Oy	FI
IBExU	IBExU Institut für Sicherheitstechnik GmbH	DE
UC	TÜV Rheinland do Brasil	BR
UL	Underwriters Laboratories Inc. (UL)	US
TÜV NORD	TÜV Nord	DE
DEKRA	DEKRA EXAM GmbH	DE

Ship classification societies		Country code
	Bureau Veritas	FR
GL	Germanischer Lloyd AG	DE
Lloyd's Register	Lloyd's Register EMEA	GB
ClassNK	Nippon Kaiji Kyokai	JP
	Det Norske Veritas	NO
	Polski Rejestr Statków	PL
	Russian Maritime Register of Shipping	RU
KR	Korean Register of Shipping	KR
ABS	American Bureau of Shipping	US

Note:

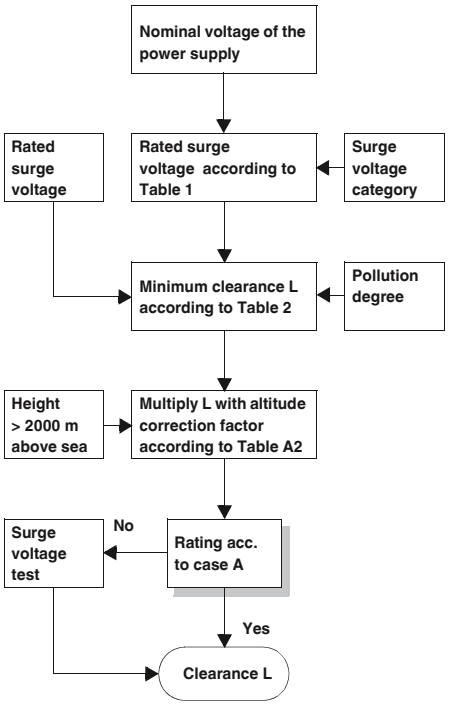
Subject to changes that serve the purpose of technical progress.

EMC: Class A product:

In accordance with statutory regulations, our products are indicated with this footnote if they are intended for use in industrial environments. This means that the permissible limit values for residential applications may be exceeded in the event of conducted and emitted interference. In such cases, the operator may have to take additional safety measures in order to ensure electromagnetic compatibility in residential applications.

Dimensioning of clearances

Schematic for determining clearances



Altitude correction factors (extract from Table A.2)

Height in m	Normal air pressure in kPa	Multiplication factor for gaps
2000	80.0	1.00
3000	70.0	1.14
4000	62.0	1.29
5000	54.0	1.48
6000	47.0	1.70
7000	41.0	1.95
8000	35.5	2.25
9000	30.5	2.62
10000	26.5	3.02
15000	12.0	6.67
20000	5.5	14.50

Rated surge voltages for items that are directly supplied by the low-voltage network (extract from Table 1)

Nominal voltage of the power supply system [1] (mains) acc. to IEC 60038 [3] [V]		Conductor-neutral conductor voltage derived from the total nominal AC voltage or nominal DC voltage	Rated surge voltage [2] [V] Surge voltage category [4]			
Three-phase	Single-phase	[V]	I	II	III	IV
	120 to 240	50	330	500	800	1500
		100	500	800	1500	2500
		150	800	1500	2500	4000
230/400 277/480		300	1500	2500	4000	6000
400/690		600	2500	4000	6000	8000
1000		1000	4000	6000	8000	12000

[1]) Refer to Appendix B for application in existing deviating low-voltage networks and their nominal voltages.

[2]) Items with this rated surge voltage may be used in systems in accordance with IEC 60364-4-443.

[3]) The slash, i.e., /, indicates a three-phase 4-conductor system. The lower value is the conductor-to-neutral conductor voltage, whereas the higher value is the conductor-to-conductor voltage. When only one value is specified, it refers to a three-phase 3-conductor system, and indicates the conductor-to-conductor voltage.

[4]) Refer to 2.2.2.1.1 for an explanation of surge voltage categories.

Minimum clearances for surge voltages (extract from Table 2)

Required impulse withstand voltage [1] [5]	Condition A Non-homogeneous field (refer to 1.3.15) Pollution degree [6]			Condition B Homogeneous field (refer to 1.3.14) Pollution degree [6]		
	1 [mm]	2 [mm]	3 [mm]	1 [mm]	2 [mm]	3 [mm]
0.33 [2])	0.01	0.2 [3]) [4])	0.8 [4])	0.01	0.2 [3]) [4])	0.8 [4])
0.40	0.02			0.02		
0.5 [2])	0.04			0.04		
0.60	0.06			0.06		
0.80 [2])	0.10			0.10		
1.0	0.15			0.15		
1.2	0.25	0.25		0.2		
1.5 [2])	0.5	0.5		0.3	0.3	
2.0	1.0	1.0	1.0	0.45	0.45	
2.5 [2])	1.5	1.5	1.5	0.6	0.6	
3.0	2.0	2.0	2.0	0.8	0.8	
4.0 [2])	3	3	3	1.2	1.2	1.2
5.0	4	4	4	1.5	1.5	1.5
6.0 [2])	5.5	5.5	5.5	2	2	2
8.0 [2])	8	8	8	3	3	3
10	11	11	11	3.5	3.5	3.5
12 [2])	14	14	14	4.5	4.5	4.5
15	18	18	18	5.5	5.5	5.5
20	25	25	25	8	8	8
25	33	33	33	10	10	10
30	40	40	40	12.5	12.5	12.5
40	60	60	60	17	17	17
50	75	75	75	22	22	22
60	90	90	90	27	27	27
80	130	130	130	35	35	35
100	170	170	170	45	45	45

[1]) This voltage is:
– For function insulation: the highest surge voltage expected for the clearance
– For basic insulation, if influenced directly or considerably by surge voltages from the low-voltage network: the item's rated surge voltage
– For a different basic insulation: the highest surge voltage possible in the circuit

[2]) Preferred values

[3]) For PCBs, the values of pollution degree 1 are applicable, except that no deviation below the value of 0.04 mm is permitted, as specified in Table 4.

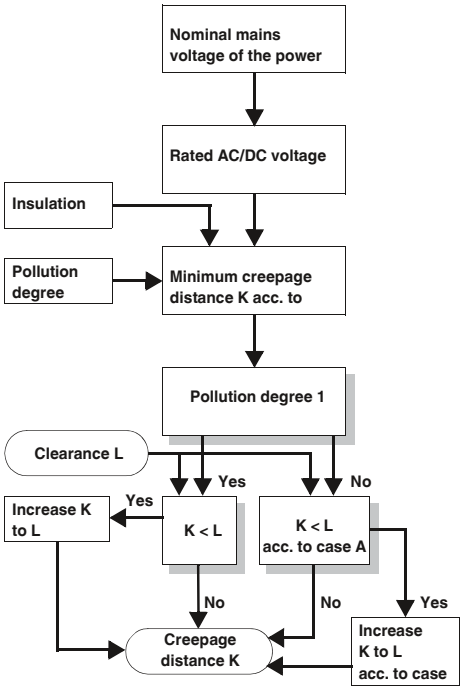
[4]) Minimum clearances for pollution degrees 2 and 3 are based on the corresponding creepage distances. This resistance is reduced due to the effects of humidity.

[5]) Values can be interpolated for parts or circuits within items that are subjected to surge voltages.

[6]) The distances for pollution degree 4 are equal to those for pollution degree 3, except that the minimum clearance is 1.6 mm.

Dimensioning of creepage distances

Schematic for determining creepage distances



Single-phase 3 or 2-conductor AC or DC voltage systems (extract from Table 3a)

Nominal voltage of the power supply system (mains) *)	Voltages for Table 4	
	for conductor-conductor All systems	for conductor-ground insulation [1] 3-conductor systems center point
[V]	[V]	[V]
12.5	12.5	–
24 25	25	–
30	32	–
42 48 50 **)	50	–
60	63	–
30 - 60	63	32
100 **)	100	–
110 120	125	–
150 **)	160	–
220	250	–
110 - 220 220 - 240	250	125
300 **)	320	–
220 - 440	500	250
600 **)	630	–
480 - 960	1000	500
1000 **)	1000	–

[1]) Conductor-ground insulation levels for non-grounded systems or those grounded through impedance correspond to conductor-conductor insulation levels as the operating voltage of every conductor to ground can, in practice, reach the conductor-conductor voltage. This is due to the fact that the actual voltage to ground is determined by the insulation resistance and the capacitive reactance of each conductor to ground. A low (but permissible) insulation resistance of one conductor can thereby practically ground it and increase the other two to conductor-conductor voltage to ground.
*) Refer to 2.2.1 for correlation with the rated voltage.
**) These values correspond to the values in Table 1.

Three-phase 4 or 3-conductor AC voltage systems (extract from Table 3b)

Nominal voltage of the power supply system (mains) *)	Voltages for Table 4		
	for conductor-conductor insulation All systems	Insulation for conductor- Three-phase 4-conductor systems with grounded neutral conductor [2]	Three-phase 3-conductor systems non-grounded [1] or conductor grounded
[V]	[V]	[V]	[V]
60	63	32	63
110/120/127	125	80	125
150 **)	160	–	160
208	200	125	200
220/230/240	250	160	250
300 **)	320	–	320
380/400/415	400	250	400
440	500	250	400
480/500	500	320	500
575	630	400	630
600 **)	630	–	630
660/690	630	400	630
720/830	800	500	800
960	1000	630	1000
1000 **)	1000	–	1000

[1]) Conductor-ground insulation levels for non-grounded systems or those grounded through impedance correspond to conductor-conductor insulation levels as the operating voltage of every conductor to ground can, in practice, reach the conductor-conductor voltage. This is due to the fact that the actual voltage to ground is determined by the insulation resistance and the capacitive reactance of each conductor to ground. A low (but permissible) insulation resistance of one conductor can thereby practically ground it and increase the other two to conductor-conductor voltage to ground.
[2]) For items designed for use in three-phase 4-conductor and three-phase 3-conductor systems, grounded as well as non-grounded, only the values for 3-conductor systems may be used.
*) Refer to 2.2.1 for correlation with the rated voltage.
**) These values correspond to the values in Table 1.

Creepage distances to prevent failures occurring due to creepage (extract from Table 4)

Voltage [1] r.m.s. value	Minimum creepage distances								
	Printed circuits Pollution degree		Pollution degree						
	1	2	1	2			3		
	All insulation material groups	All insulation material groups except IIIb	All insulation material groups	Insulation material group			Insulation material group		
				I	II	III	I	II	III [2]
[V]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
10	0.025	0.04	0.08	0.40	0.40	0.40	**1.00**	**1.00**	**1.00**
12.5	0.025	0.04	0.09	0.42	0.42	0.42	**1.05**	**1.05**	**1.05**
16	0.025	0.04	0.10	0.45	0.45	0.45	**1.10**	**1.10**	**1.10**
20	0.025	0.04	0.11	0.48	0.48	0.48	**1.20**	**1.20**	**1.20**
25	0.025	0.04	0.125	0.50	0.50	0.50	**1.25**	**1.25**	**1.25**
32	0.025	0.04	0.14	0.53	0.53	0.53	**1.30**	**1.30**	**1.30**
40	0.025	0.04	0.16	0.56	0.80	1.10	**1.4**	**1.6**	**1.8**
50	0.025	0.04	0.18	0.60	0.85	1.20	**1.5**	**1.7**	**1.9**
63	0.040	0.63	0.20	0.63	0.90	1.25	**1.6**	**1.8**	**2.0**
80	0.063	0.10	0.22	0.67	0.95	1.3	**1.7**	**1.9**	**2.1**
100	0.10	0.16	0.25	0.71	1.00	1.4	**1.8**	**2.0**	**2.2**
125	0.16	0.25	0.28	0.75	1.05	1.5	**1.9**	**2.1**	**2.4**
160	0.25	0.40	0.32	0.80	1.1	1.6	**2.0**	**2.2**	**2.5**
200	0.40	0.63	0.42	1.00	1.4	2.0	**2.5**	**2.8**	**3.2**
250	0.56	1.00	0.56	1.25	1.8	2.5	**3.2**	**3.6**	**4.0**
320	0.75	1.60	0.75	1.60	2.2	3.2	**4.0**	**4.5**	**5.0**
400	1.00	2.00	1.00	2.00	2.8	4.0	**5.0**	**5.6**	**6.3**
500	1.30	2.50	1.30	2.50	3.6	5.0	**6.3**	**7.1**	**8.0**
630	1.80	3.20	1.8	3.2	4.5	6.3	**8.0**	**9**	**10.0**
800	2.40	4.00	2.4	4.0	5.6	8.0	**10.0**	**11**	**12.5**
1000	3.20	5.00	3.2	5.0	7.1	10	**12.5**	**14**	**16.0**
1250			4.2	6.3	9	12.5	**16**	**18**	**20**
1600			5.6	8	11	16	**20**	**22**	**25**
2000			7.5	10	14	20	**25**	**28**	**32**
2500			10	12.5	18	25	**32**	**36**	**40**
3200			12.5	16	22	32	**40**	**45**	**50**
4000			16	20	28	40	**50**	**56**	**63**
5000			20	25	36	50	**63**	**71**	**80**
6300			25	32	45	63	**80**	**90**	**100**
8000			32	40	56	80	**100**	**110**	**125**
10000			40	50	71	100	**125**	**140**	**160**

[1]) This voltage is:
a) For function insulation: the working voltage
b) For basic and additional insulation of a circuit supplied directly by the low-voltage network: either the voltage selected from Table 3a or 3b on the basis of the rated voltage of the equipment or the rated insulation voltage
c) For basic and additional insulation of systems, equipment and internal circuits which are not supplied directly from the mains: the highest r.m.s. value of the voltage that, within the bounds of the rated data, can occur in the system, the equipment or the internal circuit, when supplied with rated voltage and in the case of the most unfavorable combination of operating conditions.

[2]) With pollution degree 3, insulation material group IIIb is not recommended for use if voltages are greater than 630 V.

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