TTC-6P-3-APL-EX-24DC-UT-I - Surge protection device

1635587

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Surge protection, consisting of protective plug and base element, with integrated status indicator for a 3-wire Ex i signal circuit. For HF applications. Protective circuit exclusively with gas discharge tubes. For use in two-wire Ethernet systems with cable shielding (APL, 2-WISE) and in the fieldbus system (e.g., PROFIBUS PA) in accordance with the FISCO concept. Can be used in safety-related circuits up to SIL 3.

Your advantages

- Space-saving and cost-saving with a narrow overall width of just 6 mm
- Fulfillment of the APL application specification thanks to the optimized protective circuit
- Easy integration of shielding thanks to a third terminal block level on the product
- Continuous monitoring of protective devices, plus mechanical status indicator with optional remote signaling
- The signal is not influenced during maintenance work, thanks to the impedance-neutral insertion and removal of protective plugs

Commercial data

Item number	1635587
Packing unit	1 pc
Minimum order quantity	1 pc
Note	Made to order (non-returnable)
Sales key	CL23
Product key	CL2162
GTIN	4067923157163
Weight per piece (including packing)	44.2 g
Weight per piece (excluding packing)	44.2 g
Customs tariff number	85363030
Country of origin	DE

Technical data

Product properties

Product type	Surge protection for MCR technology
Product family	TERMITRAB complete
IEC test classification	C1
	C2
	C3
	D1
Type	DIN rail module, two-section, divisible

Insulation characteristics

Overvoltage category	III
Pollution degree	2

Electrical properties

Nominal voltage U_N	24 V DC

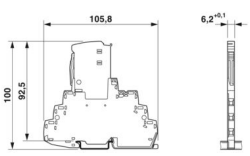
Connection data

Connection method	Screw connection
Screw thread	M3
Tightening torque	0.5 Nm ... 0.6 Nm
Conductor cross-section flexible	0.2 mm² ... 2.5 mm²
Conductor cross-section rigid	0.2 mm² ... 4 mm²
Conductor cross-section AWG	24 ... 12

Ex data

Identification	2 WISE auxiliary device
Maximum inner capacitance C_i	negligible
Max. internal inductance L_i	negligible
Max. input current I_i	1 A (T4 / -40 °C ... +85 °C)
	1 A (T6 / -40 °C ... +70 °C)
Max. input voltage U_i	30 V DC
Ambient temperature (operation)	-40 °C ... 85 °C (T4)
	-40 °C ... 70 °C (T6)

Dimensions

Dimensional drawing	
Width	6.2 mm +0.1 mm
Height	105.8 mm

Depth	100 mm (incl. DIN rail 7.5 mm)

Material specifications

Color	blue (RAL 5015)
Flammability rating according to UL 94	V-0
Insulating material	PBT
Housing material	PBT

Mechanical properties

Mechanical data

Open side panel	No

Protective circuit

Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground
Maximum continuous operating voltage U_C	30 V DC
Operating effective current I_C at U_C	≤ 1 µA
Protective conductor current I_{PE}	≤ 1 µA
Nominal discharge current I_n (8/20) µs (line-ground)	5 kA
Pulse discharge current I_{imp} (10/350) µs (line-earth)	0.5 kA
Total discharge current I_{Total} (8/20) µs	10 kA
Voltage protection level U_p (line-earth)	< 1000 V (C1 - 1 kV / 500 A)
	< 1300 V (C2 - 10 kV / 5 kA)
	< 1300 V (C3 - 100 A)
Response time t_A (line-earth)	≤ 100 ns
Input attenuation aE, sym.	< 0.1 dB (≤ 20 MHz / 100 Ω)
	< 1 dB (≤ 220 MHz / 100 Ω)
Cut-off frequency fg (3 dB), sym. in 100 Ω system	> 250 MHz
Capacity (Core-Earth)	< 13 pF
Resistance per path	< 0.1 Ω ±20 %
Surge protection fault message	optical
Max. required back-up fuse	3.15 A (FF)
Impulse durability (line-earth)	C1 - 1 kV / 500 A
	C2 - 10 kV / 5 kA
	C3 - 100 A
	D1 - 500 A
Pulse reset time (line-earth)	≤ 500 ms

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 85 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Altitude	≤ 2000 m (amsl)

Permissible humidity (operation)	5 % ... 95 %

Approvals

Conformity/Approvals

UL, USA / Canada	Class I, Div. 2

Standards and regulations

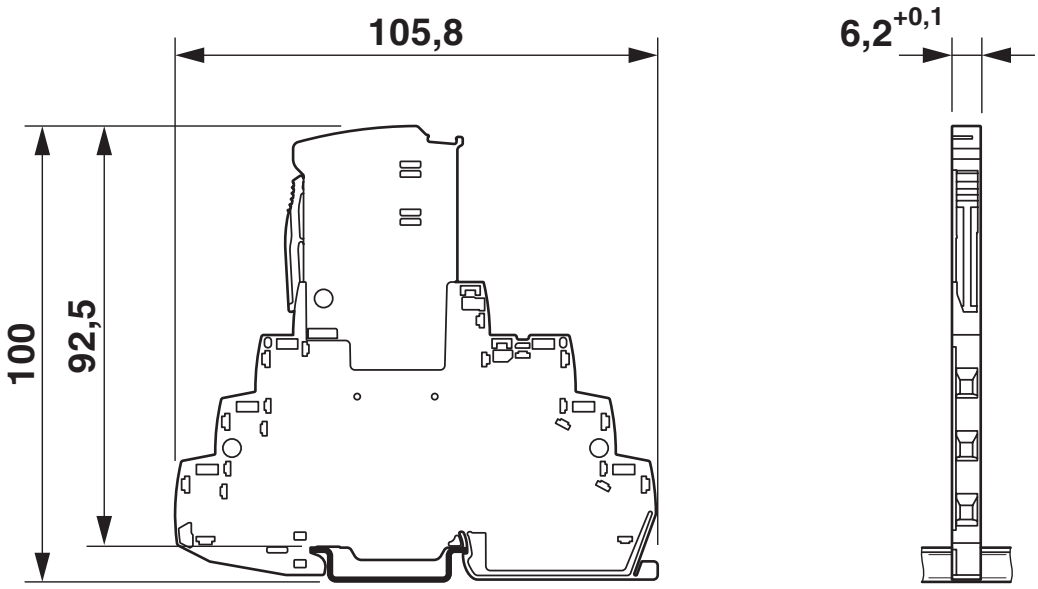
Standards/specifications	EN/IEC 60079-0
Note	2018
Standards/specifications	EN 60079-11
Note	2012
Standards/specifications	CLC TS 60079-47
Note	2021
Standards/specifications	EN 61643-21
Note	2001 + A1:2009 + A2:2013
Standards/specifications	IEC 60079-0
Note	2017
Standards/specifications	IEC 60079-11
Note	2011
Standards/specifications	IEC/TS 60079-47
Note	2021
Standards/specifications	IEC 61643-21
Note	2000 + corrigendum 2001 + A1:2008, modified + A2:2012

Mounting

Mounting type	DIN rail: TH 35 - 7.5 mm

Drawings

Dimensional drawing

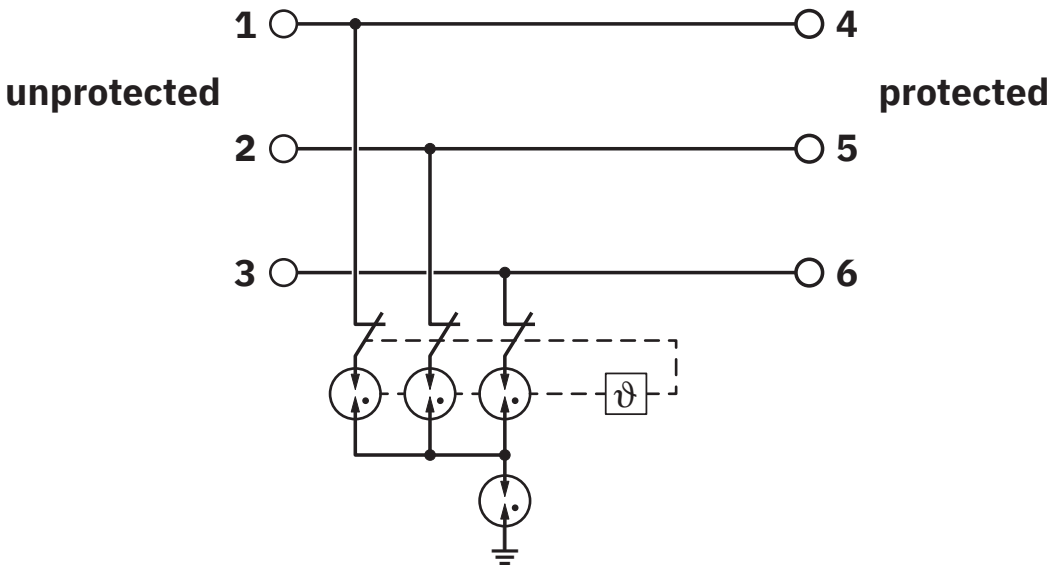


Schematic diagram

TTC-6P-3-APL-(EX-)24DC-UT-I									
Category	1oo1 architecture, HFT=0				1oo2 architecture, HFT=1				
	PFD_{AVG}	PFH	Used budget of SIL 2 SIF		PFD_{AVG}	PFH	CCF	Used budget of SIL 3 SIF	
			PFD_{AVG}	PFH				PFD_{AVG}	PFH
	$1{,}49_{x10^{-7}}$	$1{,}80_{x10^{-11}}$	0,0 %	0,0 %	$7{,}47_{x10^{-9}}$	$1{,}13_{x10^{-12}}$ 1/h	5 %	0,0 %	0,0 %
					$1{,}49_{x10^{-8}}$	$2{,}25_{x10^{-12}}$ 1/h	10 %	0,0 %	0,0 %
	Calculation based on exida report, Phoenix Contact 16/06-072 R022 V4R2 exida Profile 1, FMEDA Analysis 2, T_{proof}: 1 year, MT: 10 years, MTTR: 24 hours, PTC: 99% Used standards IEC/EN 61508, edition 2010 (device specific) IEC/EN 61511, edition 2016 + COR1:2016 + A1:2017 (system specific)								

Functional safety scenarios

Circuit diagram



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Approvals

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Functional Safety
Approval ID: 16-06-072 R022 V4R3

UL Listed
Approval ID: FILE E 138168

DNV GL
Approval ID: TAE000027G

IECEx
Approval ID: IECEx BVS 16.0090X

ATEX
Approval ID: BVS 16 ATEX E 125 X

CCC
Approval ID: 2020322316000780

cULus Listed
Approval ID: File E 333250

Classifications

ECLASS

ECLASS-13.0	27171502
ECLASS-15.0	27171502

ETIM

ETIM 9.0	EC001625

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