

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



1635587

<https://www.phoenixcontact.com/us/products/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

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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
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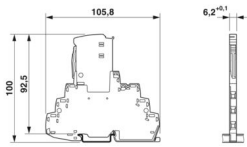
Connection data

Connection method	Screw connection
Screw thread	M3
Tightening torque	0.5 Nm ... 0.6 Nm
Conductor cross-section flexible	0.2 mm ² ... 2.5 mm ²
Conductor cross-section rigid	0.2 mm ² ... 4 mm ²
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

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Depth	100 mm (incl. DIN rail 7.5 mm)
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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
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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	$\leq 1 \mu A$
Protective conductor current I_{PE}	$\leq 1 \mu A$
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 f_g (3 dB), sym. in 100 Ω system	> 250 MHz
Capacity (Core-Earth)	< 13 pF
Resistance per path	< 0.1 $\Omega \pm 20$ %
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)

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

Conformity/Approvals

UL, USA / Canada	Class I, Div. 2
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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
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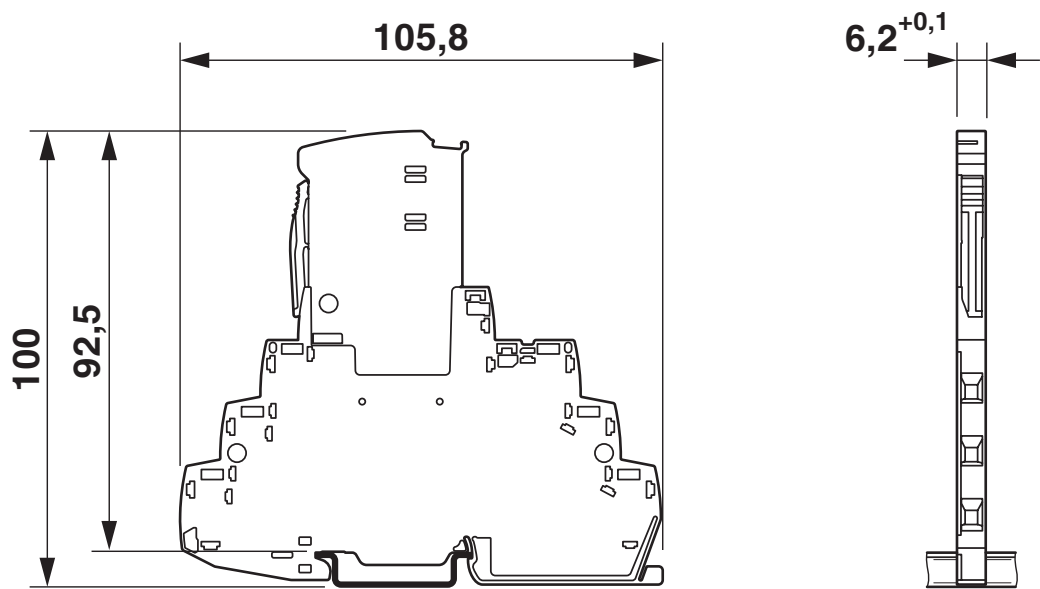
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Drawings

Dimensional drawing



Schematic diagram

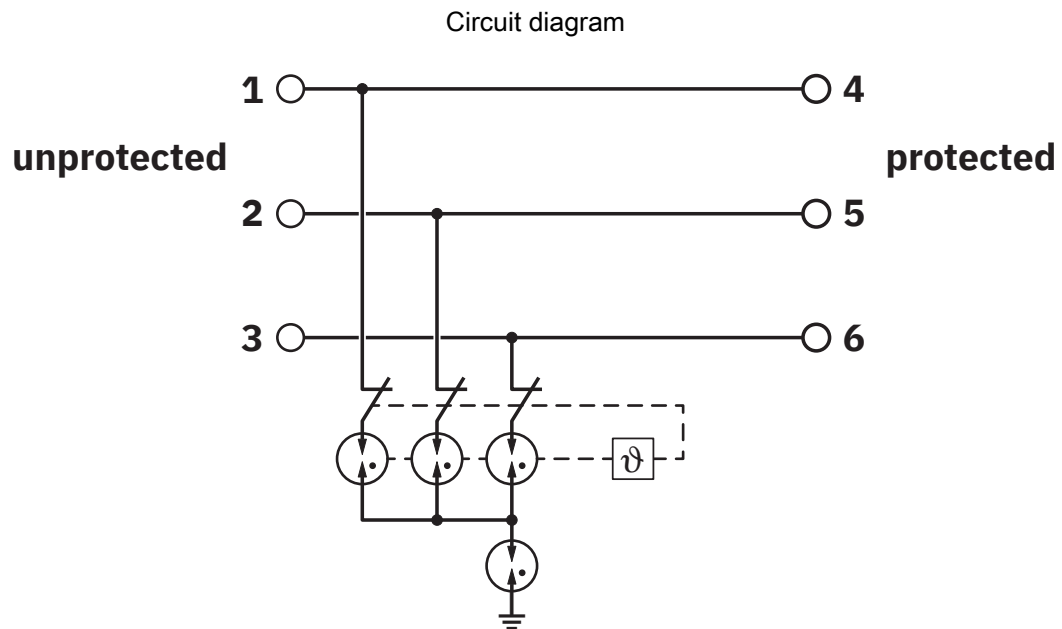
TTC-6P-3-APL-(EX-)24DC-UT-I								
Category	1oo1 architecture, HFT=0				1oo2 architecture, HFT=1			
	PFD _{AVG}	PFH	Used budget of SIL 2 SIF		PFD _{AVG}	PFH	CCF	Used budget of SIL 3 SIF
			PFD _{AVG}	PFH				PFD _{AVG} PFH
	1,49x10 ⁻⁷	1,80x10 ⁻¹¹	0,0 %	0,0 %	7,47x10 ⁻⁹	1,13x10 ⁻¹² 1/h	5 %	0,0 % 0,0 %
					1,49x10 ⁻⁸	2,25x10 ⁻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

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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

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Classifications

ECLASS

ECLASS-13.0	27171502
ECLASS-15.0	27171502

ETIM

ETIM 9.0	EC001625
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Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes, No exemptions
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China RoHS

Environment friendly use period (EFUP)	EFUP-E
	No hazardous substances above the limits

EU REACH SVHC

REACH candidate substance (CAS No.)	No substance above 0.1 wt%
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