S-PT-1X2-24DC - Surge protection device

2880668

https://www.phoenixcontact.com/us/products/2880668

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Surge protection in the IP67 screw-on module for measuring sensors, direct mounting with M20 x 1.5 outer thread, cable gland for the signal line, two-stage protective circuit. HART-compatible. Can be used in safety-related circuits up to SIL 3.

Your advantages

- Easiest field mounting with standardized thread
- Versatile in use with universal protective circuit
- Use under extreme ambient conditions with robust design

Commercial data

Item number	2880668
Packing unit	1 pc
Minimum order quantity	1 pc
Note	Made to order (non-returnable)
Sales key	CL02
Product key	CL2231
GTIN	4046356049009
Weight per piece (including packing)	418.1 g
Weight per piece (excluding packing)	352.52 g
Customs tariff number	85363010
Country of origin	DE

Technical data

Notes

Notes on operation	When the bridge is disconnected, the shield connection is indirectly connected to the housing or reference potential.

Product properties

Product type	Surge protection for MCR technology
Product family	SURGETRAB
IEC test classification	C1
	C2
	C3
	D1
Type	Screw-in module
Number of positions	3
Surge protection fault message	none
Wire pairs per module	1

Insulation characteristics

Overvoltage category	III
Pollution degree	2

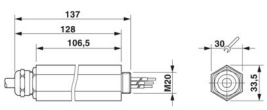
Electrical properties

Nominal voltage U_N	24 V DC

Connection data

Connection method	Screw connection
Screw thread	M3
Tightening torque	0.6 Nm
Conductor cross-section flexible	0.14 mm² ... 1.5 mm²
Conductor cross-section rigid	0.14 mm² ... 1.5 mm²
Conductor cross-section AWG	26 ... 16

Dimensions

Dimensional drawing	
Width	33.5 mm
Height	33.5 mm
Depth	137 mm

Material specifications

Color	Steel/stainless steel color

Housing material	Zinc die-cast, surface bronzed and nickel-plated

Mechanical properties

Mechanical data

Open side panel	No

Protective circuit

Direction of action	Line-Line & Line-Earth Ground
Nominal voltage U_N	24 V DC
Maximum continuous operating voltage U_C	40 V DC
	28 V AC
Rated current	450 mA (55 °C)
Operating effective current I_C at U_C	≤ 10 µA
Protective conductor current I_{PE}	≤ 2 µA
Nominal discharge current I_n (8/20) µs (line-line)	10 kA
Nominal discharge current I_n (8/20) µs (line-ground)	10 kA (per path)
Nominal discharge current I_n (8/20) µs (shield-ground)	10 kA (optional)
Pulse discharge current I_{imp} (10/350) µs	1 kA
Total discharge current I_{Total} (8/20) µs	20 kA
Total discharge current I_{Total} (10/350) µs	2 kA
Max. discharge current I_{max} (8/20) µs maximum (line-line)	10 kA
Max. discharge current I_{max} (8/20) µs maximum (line-earth)	10 kA (per path)
Discharge surge current I_{max} (8/20) µs maximum (shield-ground)	10 kA
Nominal pulse current Ian (10/1000) µs (line-line)	23 A
Nominal pulse current Ian (10/1000) µs (line-earth)	100 A
Nominal pulse current Ian (10/1000) µs (shield-ground)	100 A
Output voltage limitation at 1 kV/µs (line-line) spike	≤ 55 V
Output voltage limitation at 1 kV/µs (line-earth) spike	≤ 450 V (Direct grounding)
Output voltage limitation at 1 kV/µs (shield-ground) spike	≤ 600 V (optional)
Output voltage limitation at 1 kV/µs (line-line) static	≤ 55 V
Output voltage limitation at 1 kV/µs (line-earth) static	≤ 450 V (Direct grounding)
Residual voltage at I_n (conductor-conductor)	≤ 55 V
Residual voltage with Ian (10/1000) µs (line-line)	≤ 65 V
Voltage protection level U_p (line-line)	≤ 80 V (C2 - 10 kV / 5 kA)
Voltage protection level U_p (line-earth)	≤ 450 V (C2 - 10 kV / 5 kA)
Voltage protection level U_p (shield-ground)	≤ 600 V (C2 - 10 kV / 5 kA)
Voltage protection level U_p static (line-line)	≤ 50 V (C2 - 10 kV / 5 kA)
Response time t_A (line-line)	≤ 1 ns
Response time t_A (line-earth)	≤ 100 ns
Response time tA (shield-ground)	≤ 100 ns
Input attenuation aE, sym.	typ. 0.5 dB (≤ 1.5 MHz / 50 Ω)
	typ. 0.2 dB (≤ 300 kHz / 150 Ω)
Cut-off frequency fg (3 dB), sym. in 50 Ω system	typ. 6 MHz
Cut-off frequency fg (3 dB), sym. in 150 Ω system	typ. 2 MHz

Resistance per path	2.2 Ω ±10 %
Surge protection fault message	none
Max. required back-up fuse	500 mA (T)
Impulse durability (line-line)	C2 - 10 kV / 5 kA
	D1 - 1 kA
Impulse durability (line-earth)	C2 - 10 kV / 5 kA
	D1 - 1 kA
Impulse durability (shield-ground)	C2 - 10 kV/5 kA
	D1 - 1 kA

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP67
Ambient temperature (operation)	-40 °C ... 85 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Altitude	≤ 2000 m (amsl)

Standards and regulations

Air clearances and creepage distances

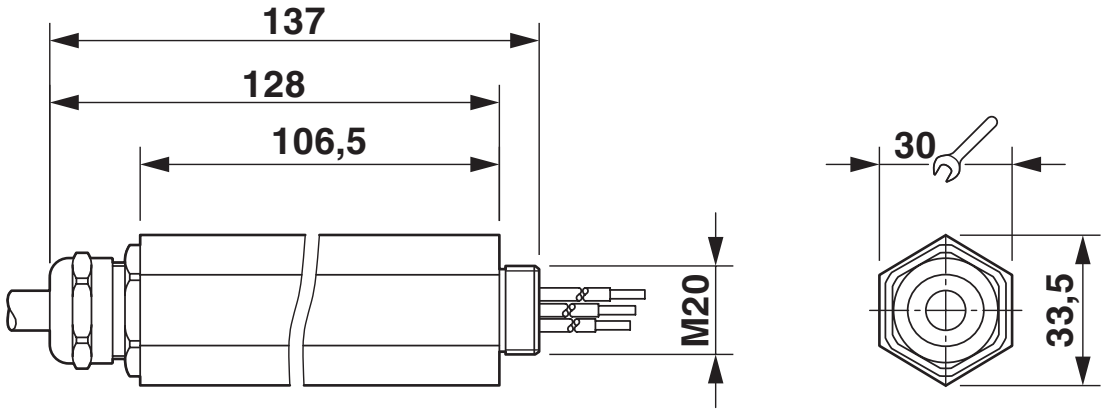
Standards/regulations	IEC 60664-1 / VDE 0110-1
Standards/specifications	IEC 61643-21
Note	2002

Mounting

Mounting type	direct screw connection

Drawings

Dimensional drawing

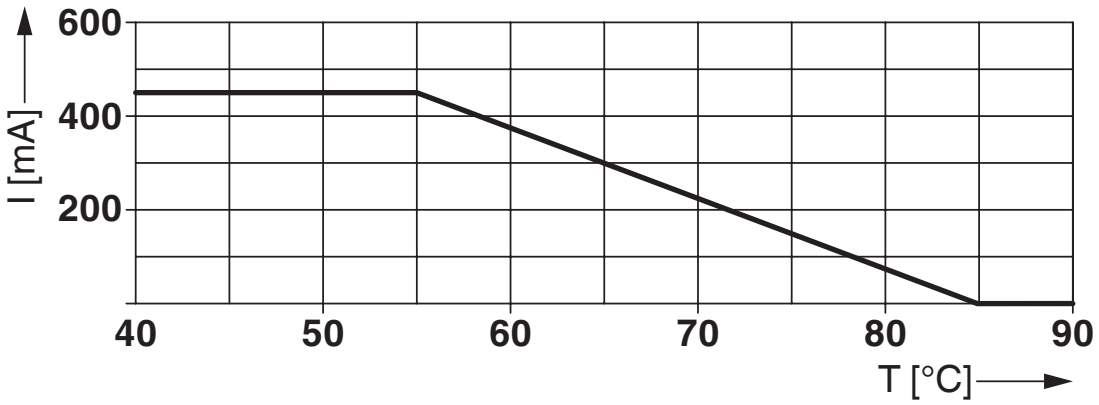


Schematic diagram

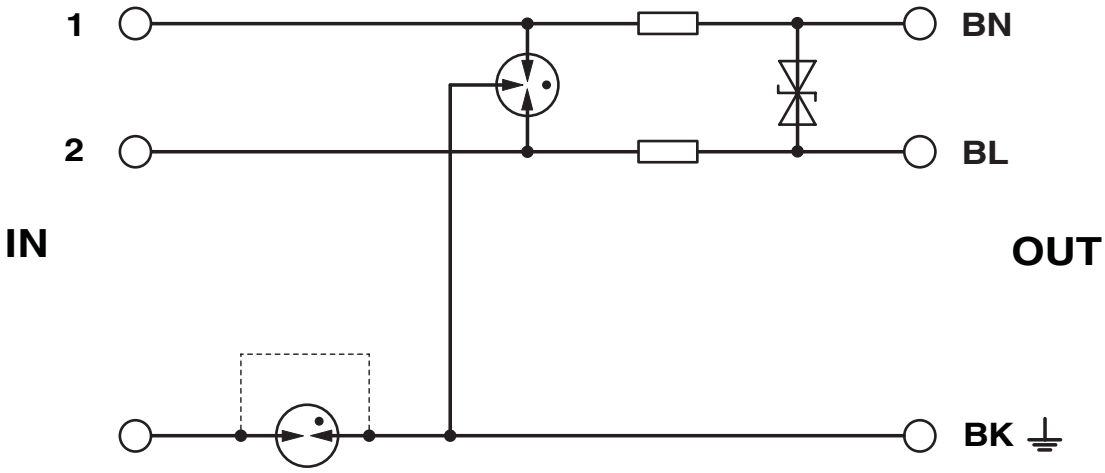
S-PT-1X2-24DC*									
Category	1oo1 architecture, HFT=0				1oo2 architecture, HFT=1				
	PFD_{AVG}	PFH	Used budget of SIL 2 SIF		PFD_{AVG}	PFH	CCF	Used budget of SIL 3 SIF	
			PFD_{AVG}	PFH				PFD_{AVG}	PFH
	$4.50_{x10^{-6}}$	$8.00_{x10^{-10}}$ 1/h	0.0 %	0.1 %	$2.25_{x10^{-7}}$	$4.00_{x10^{-11}}$ 1/h	5 %	0.0 %	0.0 %
					$4.50_{x10^{-7}}$	$8.00_{x10^{-11}}$ 1/h	10 %	0.0 %	0.1 %
	Calculation based on exida report, Phoenix Contact 23/05-128 R029 V1R0 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

Diagram



Circuit diagram



Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2880668

Functional Safety
Approval ID: 23-05-128 R029 V1R0

Classifications

ECLASS

ECLASS-13.0	27171501
ECLASS-15.0	27171501

ETIM

ETIM 10.0	EC001466

UNSPSC

UNSPSC 21.0	39121600

Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a)

China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	4d77b868-fb3a-4416-952c-40f64197bc26

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