S-PT-2XEX-24DC - Surge protection device

2800040

https://www.phoenixcontact.com/us/products/2800040

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Surge protection for two floating signal circuits in the screw-on module with IP67 degree of protection for sensor heads, connection: M20 x 1.5. Tested in accordance with the following types of protection in Ex areas: Ex d/Ex tD/Ex ia IIC/Ex iaD. Suitable for use in the fieldbus system in accordance with the FISCO concept. 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	2800040
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL02
Product key	CL2232
GTIN	4046356411028
Weight per piece (including packing)	239.6 g
Weight per piece (excluding packing)	203.9 g
Customs tariff number	85363010
Country of origin	DE

Technical data

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	4
Wire pairs per module	2

Insulation characteristics

Overvoltage category	III
Pollution degree	2

Electrical properties

Nominal voltage U_N	24 V DC

Connection data

Connection method	Individual wires

Ex data

Maximum inner capacitance C_i	1.65 nF
Max. internal inductance L_i	1 µH
Max. input current I_i	500 mA (T4 / ≤ 75 °C)
	500 mA (T5 / ≤ 75 °C)
	500 mA (T6 / ≤ 60 °C)
Max. input voltage U_i	36 V DC
max. input power P_i	3.00 W
Insulation voltage to ground	500 V AC
Ambient temperature (operation)	-40 °C ... 75 °C (T4)
	-40 °C ... 75 °C (T5)
	-40 °C ... 60 °C (T6)
Operating temperature range	-40 °C ... 100 °C (T4)
	-40 °C ... 75 °C (T5)
	-40 °C ... 60 °C (T6)
Max. surface temperature	135 °C (T4)
	100 °C (T5)
	85 °C (T6)

Dimensions

Dimensional drawing	
Width	28 mm
Height	28 mm
Depth	79 mm

Material specifications

Color	Steel/stainless steel color
Seal material	NBR
Housing material	Stainless steel 1.4404
	ASTM 316L

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	36 V DC
	25 V AC
Operating effective current I_C at U_C	≤ 5 µA
Protective conductor current I_{PE}	≤ 2 µA
Nominal discharge current I_n (8/20) µs (line-line)	260 A
Nominal discharge current I_n (8/20) µs (line-ground)	10 kA
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
Nominal pulse current Ian (10/1000) µs (line-line)	50 A
Output voltage limitation at 1 kV/µs (line-line) spike	≤ 65 V
Output voltage limitation at 1 kV/µs (line-earth) spike	≤ 1.1 kV
Output voltage limitation at 1 kV/µs (line-line) static	≤ 50 V
Voltage protection level U_p (line-line)	≤ 50 V (C3 - 10 A)
Voltage protection level U_p (line-earth)	≤ 1.1 kV (C3 - 100 A)
	≤ 1.1 kV (C1 - 1 kV / 500 A)
	≤ 1.2 kV (C2 - 10 kV / 5 kA)
Response time t_A (line-line)	≤ 1 ns
Response time t_A (line-earth)	≤ 100 ns
Input attenuation aE, sym.	typ. 0.1 dB (1 MHz/50 Ω)
	typ. 0.1 dB (400 kHz / 150 Ω)
Cut-off frequency fg (3 dB), sym. in 50 Ω system	typ. 5 MHz

Cut-off frequency fg (3 dB), sym. in 150 Ω system	typ. 2 MHz
Capacity (Core-Core)	typ. 1.5 nF
Capacity (Core-Earth)	typ. 5 pF
Surge protection fault message	none
Impulse durability (line-line)	C3 - 25 A
Impulse durability (line-earth)	C1 - 1 kV / 500 A
	C2 - 10 kV / 5 kA
	C3 - 100 A
	D1 - 1 kA
Alternating current carrying capacity (line-earth)	10 A - 1 s

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP67
Ambient temperature (operation)	-40 °C ... 80 °C (non-Ex)
Altitude	≤ 2000 m (amsl)

Approvals

Conformity/Approvals

ATEX	Ⓔx II 1 G Ex ia IIC T4...T6
	Ⓔx II 2 G Ex d IIC T4...T6
	Ⓔx II 1 D Ex iaD 20 IP6x T85 °C...135 °C
	Ⓔx II 2 D Ex tD A21 IP6x T85 °C...135 °C
IECEx	Ga Ex ia IIC T4...T6
	Ex d IIC T4...T6
	Ex iaD IP6x T85 °C...135 °C
	Ex tD A21 IP6x T85 °C...135 °C

Standards and regulations

Air clearances and creepage distances

Standards/regulations	IEC 60664-1 / IEC 60079-11
Standards/specifications	EN 61643-21
Note	A2:2013
Standards/specifications	EN 60079-0
Note	2018
Standards/specifications	EN 60079-1
Note	2007
Standards/specifications	EN 60079-11
Note	2012
Standards/specifications	EN 60079-31
Note	2009
Standards/specifications	IEC 60079-0
Note	2017

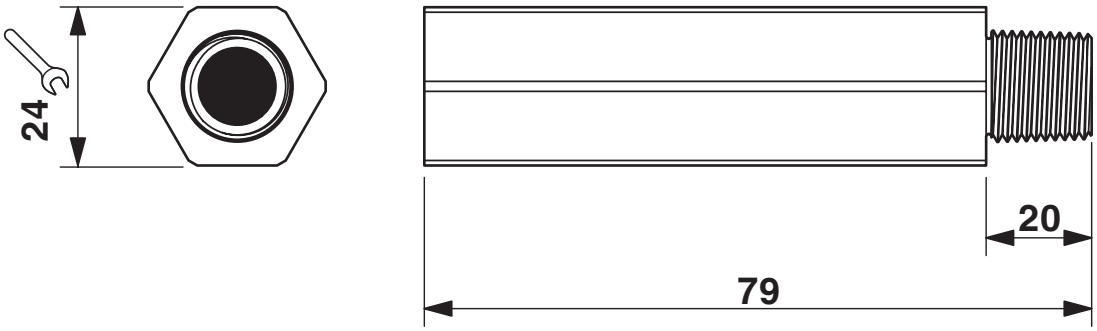
Standards/specifications	IEC 60079-1
Note	2007
Standards/specifications	IEC 60079-11
Note	2011
Standards/specifications	IEC 60079-31
Note	2008
Standards/specifications	GB/T 3836.1
Note	2021
Standards/specifications	GB/T 3836.2
Note	2021
Standards/specifications	GB/T 3836.4
Note	2021
Standards/specifications	GB/T 3836.31
Note	2021

Mounting

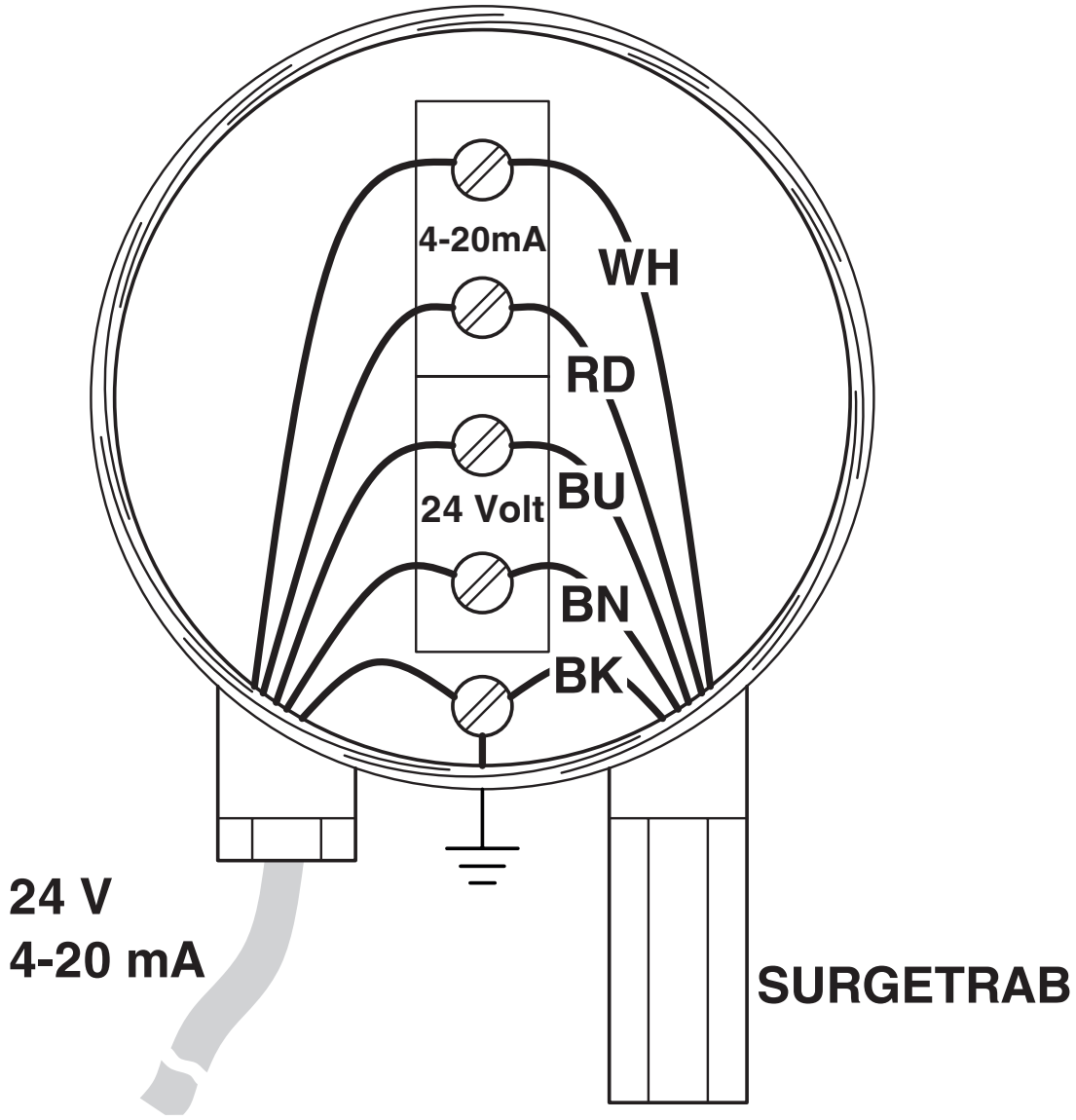
Mounting type	M20

Drawings

Dimensional drawing



Application drawing

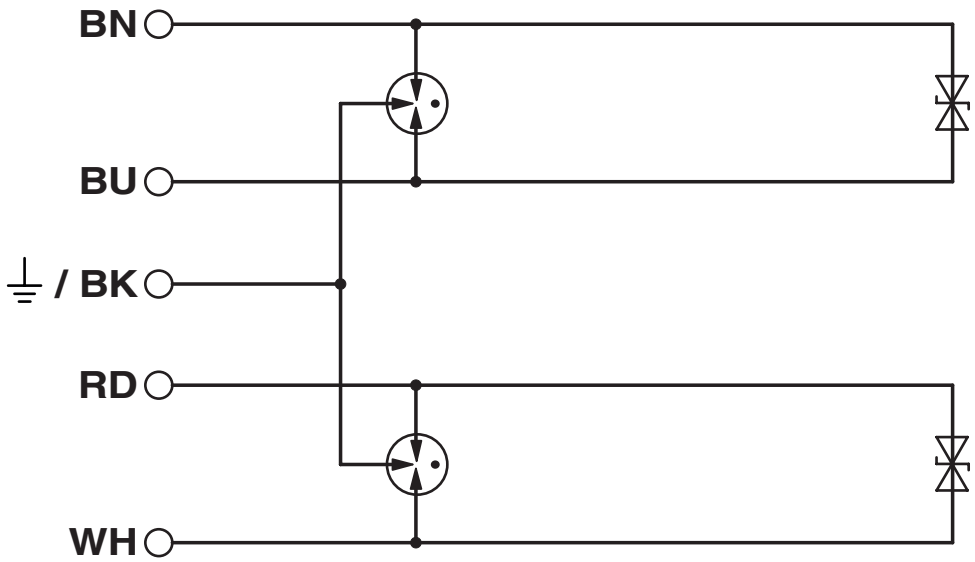


Schematic diagram

S-PT-2XEX-...DC-*									
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
	$8.43_{x10^{-5}}$	$1.50_{x10^{-9}}$ 1/h	0.1 %	0.2 %	$4.22_{x10^{-7}}$	$7.50_{x10^{-11}}$ 1/h	5 %	0.0 %	0.1 %
					$8.43_{x10^{-7}}$	$1.50_{x10^{-10}}$ 1/h	10 %	0.1 %	0.2 %
Calculation based on exida report, Phoenix Contact 09/08-42 R011 V4R1 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



Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2800040

Functional Safety
Approval ID: 09-08-42 R011 V4R1

ATEX
Approval ID: KEMA 09ATEX0028 X

IECEx
Approval ID: IECEx KEM 09.0014X

CCC
Approval ID: 2020322316000794

CCC
Approval ID: 2025322304006705

KC-s
Approval ID: 26-KA4BO-0005X

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Approval ID: 26-KA4BO-0006X

Classifications

ECLASS

ECLASS-13.0	27171502
ECLASS-15.0	27171502

ETIM

ETIM 10.0	EC001466

UNSPSC

UNSPSC 21.0	39121600

Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

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	77e4c354-cf9b-43ae-8016-f500835ba77f

EF3.1 Climate Change

CO2e kg	10.626 kg CO2e

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