

TTC-6P-3-HF-F-M-24DC-UT-I - Surge protection device



2906787

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Surge protection, consisting of protective plug and base element, with integrated status indicator and knife disconnection for three signal wires with common reference potential. For HF applications and telecommunications interfaces without supply voltage. Indirect grounding via gas discharge tube, EX e approval for zone 2, HART-compatible. 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
- Continuous monitoring of protective devices, plus mechanical status indicator with optional remote signaling
- Finding the right product for all possible requirements in MCR applications is easy, thanks to the complete range of products with customized features
- Easy testing and documentation with CHECKMASTER 2 with pluggable protective modules
- The signal is not influenced during maintenance work, thanks to the impedance-neutral insertion and removal of protective plugs

Commercial data

Item number	2906787
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL2161
Product key	CL2161
GTIN	4055626135441
Weight per piece (including packing)	57.4 g
Weight per piece (excluding packing)	47.4 g
Customs tariff number	85363010
Country of origin	DE

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Technical data

Product properties

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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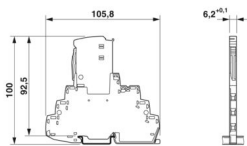
Connection data

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

Maximum input current	600 mA (T4 / ≤ 30 °C)
	500 mA (T4 / > 30 °C ... ≤ 50 °C)
	400 mA (T4 / > 50 °C ... ≤ 70 °C)
Maximum input voltage	30 V DC
Altitude	≤ 2000 m (amsl)
Ambient temperature (operation)	-40 °C ... 70 °C (T4)

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

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Color (Base element)	gray (RAL 7042)
Color (Male connector)	light gray (RAL 7035)
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 & optional Signal Ground/Shield-Earth Ground
Nominal voltage U_N	24 V DC
Maximum continuous operating voltage U_C	30 V DC
	21 V AC
Rated current	600 mA (56 °C)
Operating effective current I_C at U_C	$\leq 5 \mu\text{A}$
Protective conductor current I_{PE}	$\leq 1 \mu\text{A}$
Nominal discharge current I_n (8/20) μs (line-line)	5 kA
Nominal discharge current I_n (8/20) μs (line-ground)	5 kA
Pulse discharge current I_{imp} (10/350) μs (line-line)	0.5 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-line)	$\leq 150 \text{ V}$ (C1 - 1 kV / 500 A)
	$\leq 275 \text{ V}$ (C2 - 10 kV / 5 kA)
	$\leq 45 \text{ V}$ (C3 - 25 A)
	$\leq 55 \text{ V}$ (C3 - 100 A)
Voltage protection level U_p (line-earth)	$\leq 750 \text{ V}$ (C1 - 1 kV / 500 A)
	$\leq 750 \text{ V}$ (C2 - 10 kV / 5 kA)
	$\leq 1.1 \text{ kV}$ (C3 - 25 A)
	$\leq 1.2 \text{ kV}$ (C3 - 100 A)
Voltage protection level U_p static (line-line)	$\leq 75 \text{ V}$ (C1 - 1 kV / 500 A)
	$\leq 120 \text{ V}$ (C2 - 10 kV / 5 kA)
Voltage protection level U_p static (line-earth)	$\leq 750 \text{ V}$ (C1 - 1 kV / 500 A)
	$\leq 750 \text{ V}$ (C2 - 10 kV / 5 kA)
Response time t_A (line-line)	$\leq 1 \text{ ns}$
Response time t_A (line-earth)	$\leq 100 \text{ ns}$
Input attenuation aE, sym.	typ. 0.3 dB ($\leq 8.7 \text{ MHz}/150 \Omega$)
Input attenuation aE, asym.	typ. 0.3 dB ($\leq 10.5 \text{ MHz}/150 \Omega$)
Cut-off frequency f_g (3 dB), sym. in 150 Ω system	typ. 60 MHz
Capacity (Core-Core)	typ. 32 pF
Resistance per path	1.65 $\Omega \pm 20 \%$
Surge protection fault message	optical

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Max. required back-up fuse	630 mA (FF)
Impulse durability (line-line)	C1 - 1 kV / 500 A
	C2 - 10 kV / 5 kA
	C3 - 100 A
Impulse durability (line-earth)	C1 - 1 kV / 500 A
	C2 - 10 kV / 5 kA
	C3 - 100 A
	D1 - 500 A
Pulse reset time (line-line)	≤ 600 ms
Pulse reset time (line-earth)	≤ 30 ms

Additional technical data

Max. total discharge current $I_{total\ max}$ (8/20) μ s	20 kA (1x - non Ex)
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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	≤ 4000 m (amsl)
Permissible humidity (operation)	5 % ... 95 %

Approvals

Conformity/Approvals

UL, USA / Canada	Class I, Div. 2, Groups A, B, C, D T4A
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Standards and regulations

Standards/specifications	IEC 61643-21
Note	2000 + corrigendum 2001 + A1:2008, modified + A2:2012

EN 61643-21

Standards/specifications	EN 61643-21
Note	2001 + A1:2009 + A2:2013
Standards/specifications	IEC 60079-0
Note	2017
Standards/specifications	IEC 60079-7
Note	2017
Standards/specifications	EN IEC 60079-0
Note	2018
Standards/specifications	EN IEC 60079-7
Note	2015 + A1:2018

Mounting

Mounting type	DIN rail: TH 35 - 7.5 mm
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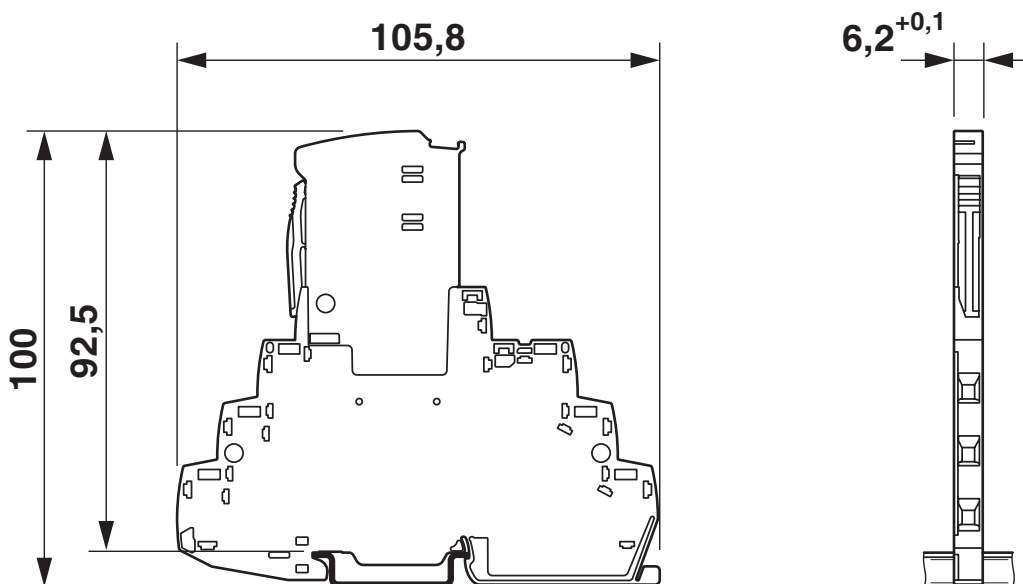


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Drawings

Dimensional drawing



Schematic diagram

TTC-6P-3-HF-F-M-...-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
	3.32·10 ⁻⁵	5.90·10 ⁻⁹ 1/h	0.3 %	0.6 %	1.66·10 ⁻⁶	2.95·10 ⁻¹⁰ 1/h	5 %	0.2 %	0.3 %
					3.32·10 ⁻⁶	5.90·10 ⁻¹⁰ 1/h	10 %	0.3 %	0.6 %
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

Diagram



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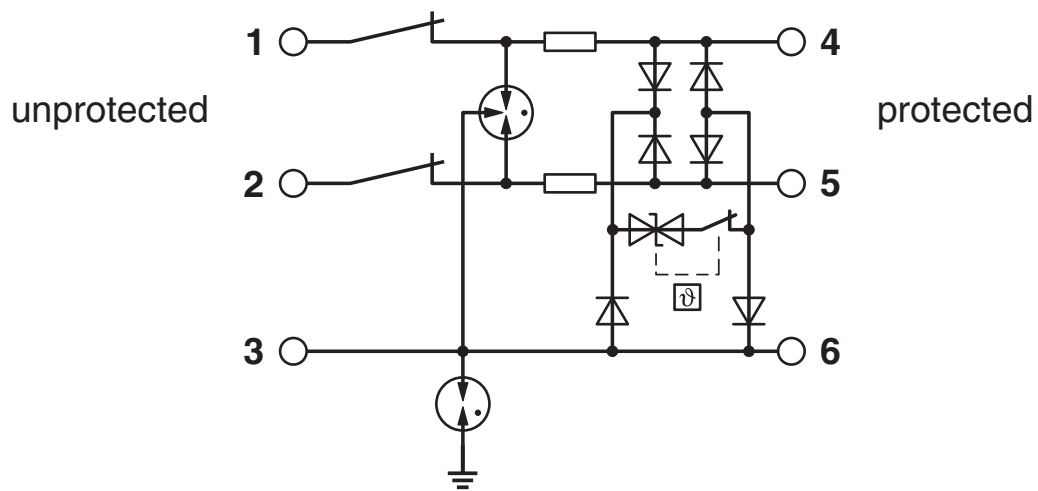
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Diagram

Derating for Ex-areas (Zone 2, EX ec)

ϑ [°C]	I [mA]
$\leq 30^{\circ}\text{C}$	600 mA
$> 30^{\circ}\text{C} \dots \leq 50^{\circ}\text{C}$	500 mA
$> 50^{\circ}\text{C} \dots \leq 70^{\circ}\text{C}$	400 mA

Circuit diagram



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Approvals

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 **CSA**
Approval ID: 70136717


 **DNV GL**
Approval ID: TAE000027G


 **UL Listed**
Approval ID: FILE E 138168

 **CSAus**
Approval ID: 70136717


UAE-RoHS
Approval ID: 22-06-16783

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

 **IECEX**
Approval ID: IECEX BVS 21.0057X

 **ATEX**
Approval ID: BVS 21 ATEX E 052 X

 **UKCA-EX**
Approval ID: DEKRA 23UKEX7003X

 **cULus Listed**
Approval ID: File E 333250

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Classifications

ECLASS

ECLASS-13.0	27171503
ECLASS-15.0	27171503

ETIM

ETIM 10.0	EC001466
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UNSPSC

UNSPSC 21.0	39121600
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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	f3e721b8-f270-476b-9228-ca5787bd3ff0

EF3.1 Climate Change

CO2e kg	1.546 kg CO2e
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