

Features

- Protection module for 1 signal line
- Nominal voltage 24 V DC
- Protection module for grounded signal lines
- Max. surge current (8/20 μs) 10 kA
- Uninterruptable operation (auto reset)
- Status indication output
- Mounting on base module, pluggable
- Up to SIL 3 acc. to IEC 61508

Function

The protection module limits induced transients of different causes, e. g. lightning or switching operations. The limitation is achieved by diverting the current to earth and limiting the signal circuit voltage during the duration of the overvoltage pulse.

The device has LEDs for the status indication. If required, this status is transferred to the corresponding function module via a status indication output.

The device is used in applications where more than 2 signal lines have to be protected, e. g. in applications with 3-wire resistance thermometers or 4-/6-wire measuring bridges.

The device is HART transparent.

The device is inserted onto the base module and forms the surge protection barrier together with the base module.

The device can be replaced without tools by a locking lever.

Assembly

Front view

Connection
Status indication output



LED red:
Fault

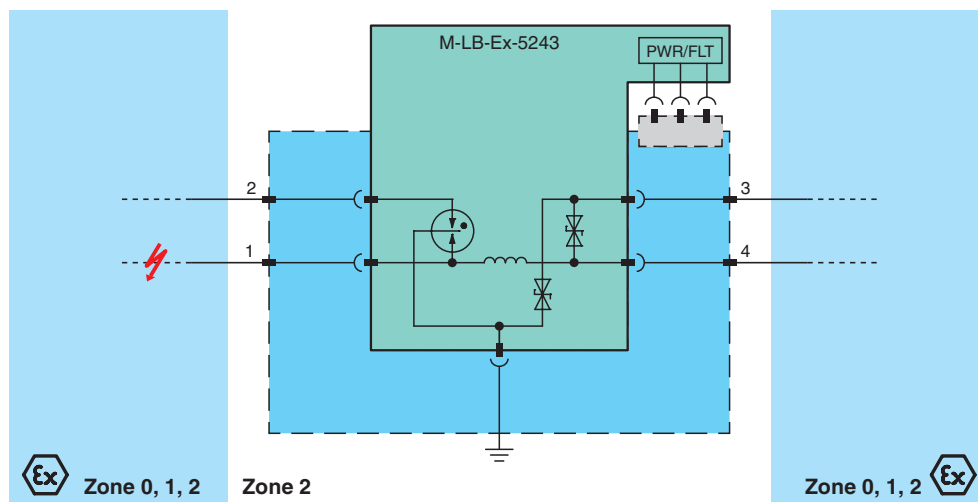
LED yellow:
Maintenance

LED green:
Power supply






SIL 3

Connection



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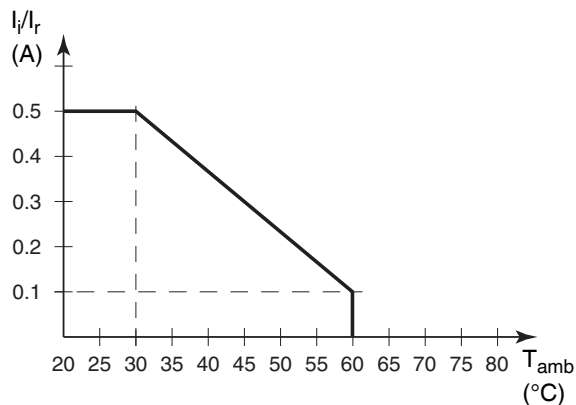
General specifications	
Number of protected signal lines	1
Topology	grounded
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 3
Supply	
Connection	via Universal Power Rail M-UPR-03-S
Nominal voltage	see power feed module M-LB-5300
Current	≤ 8 mA
Electrical specifications	
Connection	protected area: terminal 4 unprotected area: terminals 1, 3
Rated current I_r	500 mA , restrictions see derating characteristics
Leakage current	< 3 μA at 24 V and 25 °C (77 °F) , line-line
Nominal voltage	24 V DC
Maximum continuous operating voltage U_c	30 V DC
Series resistance	≤ 0.5 Ω per line at 25 °C (77 °F)
Impulse rating	1 kV/0.5 kA (category C1) 10 kV/5 kA (category C2) 1 kA (category D1)
Impulse discharge current (10/350 μs) I_{imp}	1 kA per line (2x)
Nominal discharge current (8/20 μs) I_n	5 kA per line (10x)
Rated surge current (8/20 μs) I_{SM}	10 kA per line (1x)
Total discharge current (8/20 μs) I_{total}	10 kA (1x)
Voltage protection level U_p	≤ 55 V line-line for nominal discharge current I_n ≤ 60 V line-earth for nominal discharge current I_n
Impulse reset time	< 500 ms
Power dissipation	$I_{Loop}^2 \times 2 \times 0.6 \Omega + U_{Supply} \times 8 \text{ mA}$
Insertion loss	≤ 0.04 dB, at 0 ... 4 kHz, in 600 Ω-System ≤ 3 dB, at 0 ... 550 kHz, in 100 Ω-System
Output	
Additional functions	
Status indication	fault and maintenance signal via Universal Power Rail M-UPR-03-S
Galvanic isolation	
Signal lines/fault indication output	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Signal lines/power supply	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Indicators/settings	
Display elements	LED PWR (power supply), green LED LED FLT (fault signal), red LED LED CHK (maintenance signal), yellow LED
Directive conformity	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)
Conformity	
Degree of protection	IEC 60529:2013
Functional safety	IEC/EN 61508:2010
Surge protective devices for low voltage	EN 61643-21:2001+A1:2009+A2:2013 IEC 61643-21:2001+A1:2008+A2:2012
Ambient conditions	
Ambient temperature	-40 ... 60 °C (-40 ... 140 °F) Observe the temperature range limited by derating, see section derating.
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Relative humidity	max. 95 % , without condensation
Mechanical specifications	
Degree of protection	IP20
Mass	approx. 20 g
Dimensions	6.2 x 77 x 79 mm
Mounting	pluggable in base module for mounting on 35 mm DIN mounting rail
Data for application in connection with hazardous areas	
EU-Type Examination Certificate	BVS 17 ATEX E 069 X
Marking	 II 3(1)G Ex ec [ia Ga] IIC T4 Gc  II (1)D [Ex ia Da] IIIC  I (M1) [Ex ia Ma] I
Voltage U_i	30 V

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Current	I_i	500 mA , restrictions see derating characteristics
Internal capacitance	C_i	negligible
Internal inductance	L_i	18 μ H
Supply		
Maximum safe voltage	U_m	60 V AC/DC (Attention! The rated voltage can be lower.)
Fault indication output		
Maximum safe voltage	U_m	60 V AC/DC (Attention! The rated voltage can be lower.)
Galvanic isolation		
Signal lines/fault indication output		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Signal lines/power supply		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-7:2015 , EN 60079-11:2012
International approvals		
IECEX approval		
IECEX certificate		IECEX BVS 17.0061X
IECEX marking		Ex ec [ia Ga] IIC T4 Gc [Ex ia Da] IIIC [Ex ia Ma] I
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com .
Accessories		
Designation		system components: - base module with screw terminals M-LB-Ex-5000 - base module with spring terminals M-LB-Ex-5000.SP - power feed module M-LB-5300 - fault status module M-LB-5400 - maintenance status module M-LB-5500 - universal power rail M-UPR-03-S - place holder module M-LB-Ex-5900 - insulation spacer M-UPR-I

Derating of the Rated Current



In the case of a short circuit, the rated current must not be exceeded.

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