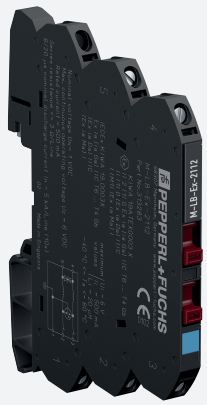


Surge Protection Barrier

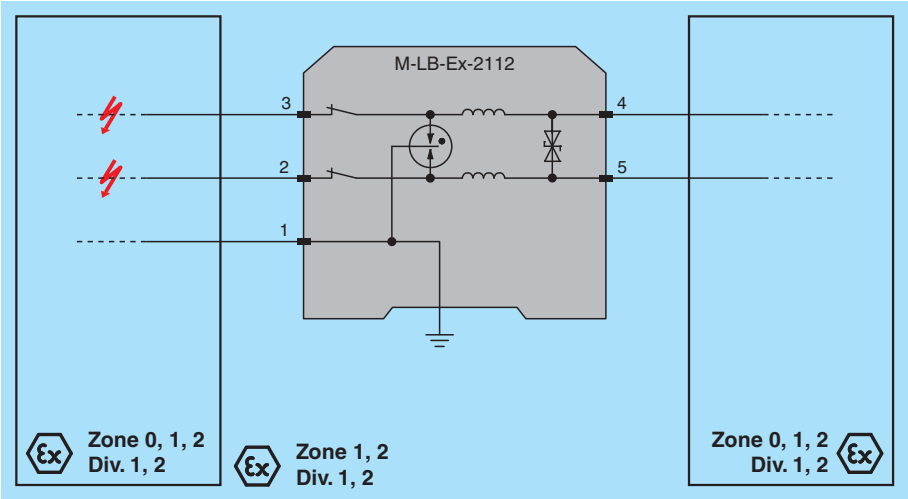
M-LB-Ex-2112

- Surge protection barrier for 2 signal lines
- Nominal voltage 1 V DC
- Surge protection barrier for non-grounded signal lines
- Max. surge current (8/20 µs) 20 kA
- Connection via screw terminals
- DIN rail mountable
- Up to SIL 3 acc. to IEC/EN 61508

Function

The device 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 loop voltage during the duration of the overvoltage pulse.
The device is used for intrinsic safety applications.
The device is HART transparent.
The device is mounted on a 35 mm DIN mounting rail according to EN 60715.

Connection



Technical Data

General specifications		
Number of protected signal lines		2
Topology		non-grounded
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 3
Electrical specifications		
Connection		protected area: terminals 4, 5 unprotected area: terminals 2, 3 shielding/grounding: terminal 1 (optional)
Rated current	I_r	500 mA , restrictions see derating tables UL : 400 mA , restrictions see control drawing
Leakage current		< 5 µA at 1 V and 25 °C (77 °F) , line-line
Nominal voltage		1 V DC

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Technical Data

Maximum continuous operating voltage	U_c	6 V DC
Series resistance		≤ 3 Ω per line
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)
Total discharge current (8/20 µs)	I_{total}	20 kA (1x) , overstressed fault mode 3 acc. to IEC 61643-21
Voltage protection level	U_p	max. 12 V line-line for nominal discharge current I_n max. 1400 V line-earth for nominal discharge current I_n
Impulse reset time		< 500 ms
Insertion loss		≤ 3 dB at 0 ... 400 kHz in 100 Ω system
Conformity		
Electromagnetic compatibility		EN 61326-3-1:2017
Degree of protection		IEC 60529:2013
Functional safety		IEC/EN 61508:2010
Surge protective devices for low voltage		IEC 61643-21:2000+A1:2008+A2:2012
Ambient conditions		
Ambient temperature		-40 ... 80 °C (-40 ... 176 °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
Corrosion resistance		acc. to ISA-S71.04, severity level G3
Mechanical specifications		
Degree of protection		IP20 , after mounting of the insulation spacer
Connection		screw terminals , max. core cross section 1 x 2.5 mm^2
Material		Polyamide (PA)
Mass		approx. 32 g
Dimensions		6.2 x 93 x 72.4 mm (0.24 x 3.7 x 2.8 inch) (W x H x D)
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU-type examination certificate		KIWA 19 ATEX 0003 X
Marking		Ⓔx II 2(1)G Ex ia [ia Ga] IIC T6...T4 Gb Ⓔx II (1)D [Ex ia Da] IIIC Ⓔx I (M1) [Ex ia Ma] I
Temperature class		T6, T5 or T4 , restrictions see derating tables
Voltage	U_i	6 V
Current	I_i	500 mA , restrictions see derating tables
Internal capacitance	C_i	negligible
Internal inductance	L_i	20 µH
Directive conformity		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 , EN 60079-11:2012
International approvals		
UL approval		E501704 E501881
Control drawing		116-0479
Current	I_i	400 mA , restrictions see control drawing
Breakdown voltage	U_{BR}	6 ... 12 V line-line at 100 V/s acc. to UL 497B < 1000 V at 100 V/µs acc. to UL 497B
IECEx approval		
IECEx certificate		IECEx KIWA 19.0003X
IECEx marking		Ex ia [ia Ga] IIC T6...T4 Gb [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.

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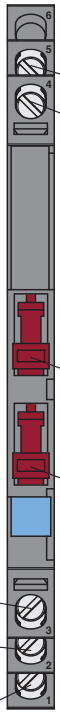
Assembly

Front view



Matching System Components

	USLKG6N	Terminal block for equipotential bonding

Accessories

	M-LB-2800	Insulation spacer for surge protection system M-LB-2000

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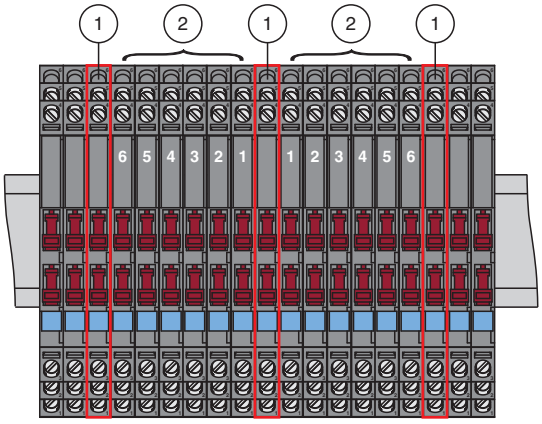
Operation

Derating of the Rated Current

This derating is valid for mounting in areas requiring explosion protection level Gb or Gc and temperature class T4 or in a non-hazardous area under following special conditions:
The increased rated current of 0.5 A is only applicable for a device (1) if the current in at least 6 adjacent devices (2) from both sides of the device is < 80 % of the increased current, see figure.



Max. ambient temperature	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C
I_i (I_r)	500 mA	420 mA	340 mA	260 mA	180 mA	100 mA

Linear interpolation allowed, extrapolation not allowed.

This derating is valid for mounting in areas requiring explosion protection level Gb or Gc and temperature class T4 or in a non-hazardous area.

Max. ambient temperature	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C
I_i (I_r)	400 mA	340 mA	280 mA	220 mA	160 mA	100 mA

Linear interpolation allowed, extrapolation not allowed.

This derating is valid for mounting in areas requiring explosion protection level Gb or Gc and temperature class T5 or T6.

Max. ambient temperature	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C
I_i (I_r)	280 mA	224 mA	168 mA	112 mA	56 mA	0 mA

Linear interpolation allowed, extrapolation not allowed.

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

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