

Surge Protection Barrier

M-LB-2144

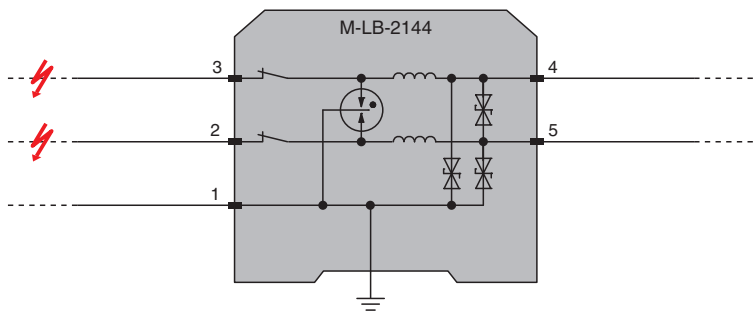
- Surge protection barrier for 2 signal lines
- Nominal voltage 24 V DC
- Surge protection barrier for grounded signal lines
- Max. surge current (8/20 μ s) 20 kA
- Connection via screw terminals
- DIN rail mountable
- Up to SIL 3 acc. to IEC/EN 61508



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 HART transparent. The device is mounted on a 35 mm DIN mounting rail according to EN 60715.

Connection



Zone 2
Div. 2

Technical Data

| General specifications | |
|--------------------------------------|--|
| Number of protected signal lines | 2 |
| Topology | 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 derating tables |
| Leakage current | < 6 μ A at 24 V and 25 °C (77 °F) , line-line |
| Nominal voltage | 24 V DC |

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Technical Data

| | | |
|--|-------------|---|
| Maximum continuous operating voltage | U_c | 30 V DC |
| Series resistance | | $\leq 3 \Omega$ 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 μ s) | I_{imp} | 1 kA per line (2x) |
| Nominal discharge current (8/20 μ s) | I_n | 5 kA per line (10x) |
| Total discharge current (8/20 μ s) | I_{total} | 20 kA (1x) , overstressed fault mode 3 acc. to IEC 61643-21 |
| Voltage protection level | U_p | max. 45 V line-line for nominal discharge current I_n max. 60 V line-earth for nominal discharge current I_n |
| Impulse reset time | | < 500 ms |
| Insertion loss | | ≤ 3 dB at 0 ... 700 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 | | |
| Certificate | | KIWA 19 ATEX 0002 X |
| Marking | | Ⓢ II 3G Ex ec IIC T6...T4 Gc |
| Temperature class | | T6, T5 or T4 , restrictions see derating tables |
| Directive conformity | | |
| Directive 2014/34/EU | | EN IEC 60079-0:2018+AC:2020 , EN 60079-7:2015+A1:2018 |
| International approvals | | |
| UL approval | | E501704 E501881 |
| Breakdown voltage | U_{BR} | 30 ... 45 V line-line at 100 V/s acc. to UL 497B 30 ... 45 V line-earth at 100 V/s acc. to UL 497B < 1000 V at 100 V/ μ s acc. to UL 497B |
| IECEX approval | | |
| IECEX certificate | | IECEX KIWA 19.0002X |
| IECEX marking | | Ex ec IIC T6...T4 Gc |
| 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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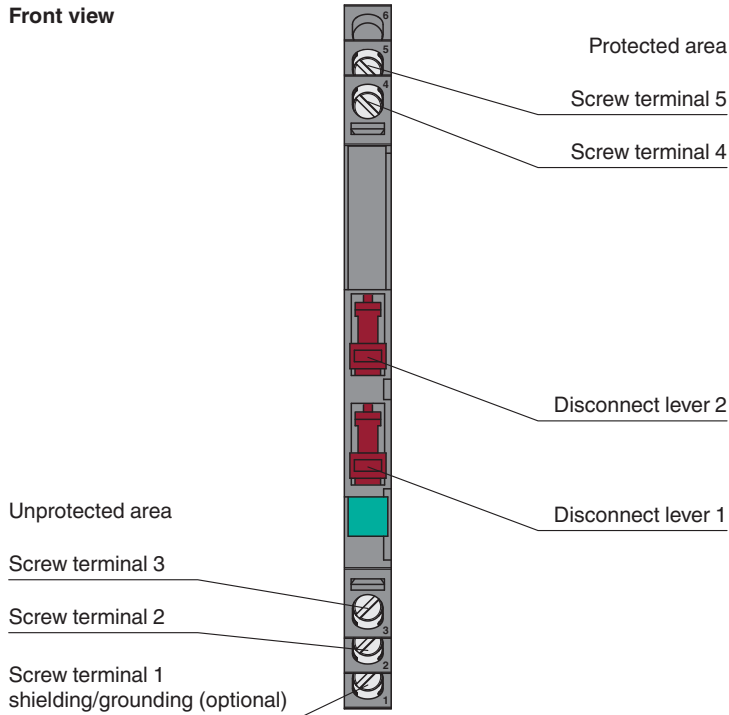
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Assembly


Front view



Matching System Components

| | | |
|---|----------------|--|
|  | USLKG6N | Terminal block for equipotential bonding |
|---|----------------|--|

Accessories

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

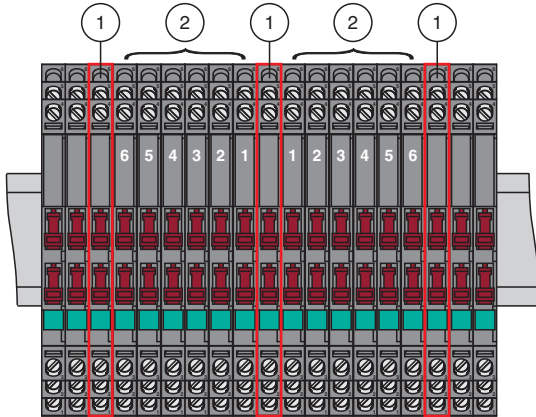
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Operation

Derating of the Rated Current

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

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

Linear interpolation allowed, extrapolation not allowed.

Derating for Mounting According to UL

This derating is valid for mounting in Zone 2 or Division 2 areas requiring temperature class T4 or in a non-hazardous area.

| | | | | | |
|---------------------------------|--------|--------|--------|--------|--------|
| Max. ambient temperature | 40 °C | 50 °C | 60 °C | 70 °C | 80 °C |
| I_r | 400 mA | 325 mA | 250 mA | 175 mA | 100 mA |

Linear interpolation allowed, extrapolation not allowed.

This derating is valid for mounting in Zone 2 or Division 2 areas requiring temperature class T5.

| | | | | | |
|---------------------------------|--------|--------|--------|-------|-------|
| Max. ambient temperature | 40 °C | 50 °C | 60 °C | 70 °C | 80 °C |
| I_r | 280 mA | 210 mA | 140 mA | 70 mA | 0 mA |

Linear interpolation allowed, extrapolation not allowed.

This derating is valid for mounting in Zone 2 or Division 2 areas requiring temperature class T6.

| | | | | |
|---------------------------------|--------|--------|--------|-------|
| Max. ambient temperature | 40 °C | 50 °C | 60 °C | 70 °C |
| I_r | 280 mA | 210 mA | 140 mA | 70 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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