Fieldbus Surge Protector

TPH-LBF-IA1.36*
TCP-LBF-IA1.36*
SCP-LBF-IA1.36*

Manual

Your automation, our passion.

PEPPERL+FUCHS

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1 Safety

1.1 Validity

The chapter “Safety” is valid as instruction manual.

Specific processes and instructions in this instruction manual require special provisions to guarantee the safety of the operating personnel.

1.2 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:

Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.

Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

Informative Symbols

Note

This symbol brings important information to your attention.

Action

1. This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

1.3 System Operator and Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the device. The trained and qualified personnel must have read and understood the instruction manual.

1.4 Pertinent Laws, Standards, Directives, and further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location. Observe Directive 1999/92/EC in relation to hazardous areas.

The corresponding datasheets, manuals, declarations of conformity, EU-type examination certificates, certificates, and control drawings if applicable (see datasheet) are an integral part of this document. You can find this information under www.pepperl-fuchs.com.

Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version, which can be found under www.pepperl-fuchs.com.

1.5 Marking

The Surge Protectors are marked with:

Pepperl+Fuchs Group

Lilienthalstraße 200, 68307 Mannheim, Germany

TPH-LBF-IA1.36.DE.0
TPH-LBF-IA1.36.DE.1

SIRA 12 ATEX 2128X
⟨Ex⟩ II 1G Ex ia IIC T4

SIRA 12 ATEX 4176X
⟨Ex⟩ II 3G Ex nAc IIC T4 ,
⟨Ex⟩ II 3G Ex ic IIC T4

TCP-LBF-IA1.36.IE.0
TCP-LBF-IA1.36.IE.1

SIRA 12 ATEX 2128X
⟨Ex⟩ II 1G Ex ia IIC T4

SIRA 12 ATEX 4176X
⟨Ex⟩ II 3G Ex nAc IIC T4 ,
⟨Ex⟩ II 3G Ex ic IIC T4

SCP-LBF-IA1.36.IE.0
SCP-LBF-IA1.36.IE.1

SIRA 12 ATEX 2128X
⟨Ex⟩ II 1G Ex ia IIC T4

SIRA 12 ATEX 4176X
⟨Ex⟩ II 3G Ex nAc IIC T4 ,
⟨Ex⟩ II 3G Ex ic IIC T4

Electrical data see EC-type-examination certificate or datasheet.

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1.6 Intended Use

The TPH-LBF*, TCP-LBF* and SCP-LBF* series of Surge Protectors are intended to be used in conjunction with Pepperl+Fuchs Fieldbus Power Hubs and Device Couplers, to protect them from damage caused by surge voltages or secondary lightning strikes.The Surge Protectors are specifically designed for IEC 61158-2 FOUNDATION fieldbus and PROFIBUS PA fieldbus communication systems.

The device is designed for use in intrinsically safe fieldbus systems according to FISCO, Entity, or DART.

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

The device must only be operated in the specified ambient temperature range and at the specified relative humidity without condensation.

1.7 Mounting and Installation

Observe the installation instructions according to IEC/EN 60079-14.

Prior to mounting, installation, and commissioning of the device you should make yourself familiar with the device and carefully read the instruction manual.

If the device has already been operated in general electrical installations, the device may subsequently no longer be installed in electrical installations used in combination with hazardous areas.

If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i.

Avoid electrostatic charges which could result in electrostatic discharges while installing, operating, or maintaining the device.

The device must be installed and operated only in surrounding enclosures that

- comply with the requirements for surrounding enclosures according to IEC/EN 60079-0,
- are rated with the degree of protection IP54 according to IEC/EN 60529.

1.7.1 Intrinsically Safe Circuits

The device may be installed in Zone 1.

The device may be installed in gas groups IIC, IIB, and IIA.

Observe the compliance of the separation distances between two adjacent intrinsically safe circuits according to IEC/EN 60079-14.

Instructions for Zone 0

If a cable is led into Zone 0, the cable length between the device and the boundary of Zone 0 must be limited to 1 m according to IEC/EN 60079-14.

If the cable is led into Zone 0, the cable must be protected against interferences deriving from lightning.

The shield of the cable may only be led into Zone 0 if it is safely grounded like an equipotential bonding conductor according to IEC/EN 60079-14.

The cables connected to the device must be shielded, or covered by a metal coating, or passed within a metal pipe.

Due to the presence of gas discharge tubes, the surge protective devices do not meet the dielectric strength requirements according to IEC/EN 60079-11 between the intrinsically safe circuits and the parts that may be grounded.

Instructions for Zone 1

Due to the presence of gas discharge tubes, the surge protective devices do not meet the dielectric strength requirements according to IEC/EN 60079-11 between the intrinsically safe circuits and the parts that may be grounded.

Instructions for Zone 21

Due to the presence of gas discharge tubes, the surge protective devices do not meet the dielectric strength requirements according to IEC/EN 60079-11 between the intrinsically safe circuits and the parts that may be grounded.

Instructions for Zone 2

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.

If the Surge Protectors are used on couplers spurs rated as Ex ic intrinsically safe circuit, the trunk module TCP-LBF-IA1.36.* with mounted separation wall must be used.

Due to the presence of gas discharge tubes, the surge protective devices do not meet the insulation from ground or housing requirements according to IEC/EN 60079-15.

Due to the presence of gas discharge tubes, the surge protective devices do not meet the dielectric strength requirements according to IEC/EN 60079-11 between the intrinsically safe circuits and the parts that may be grounded.

The connections must either be mechanically secured or must have a holding force of at least 15 N.

The connections must either be mechanically secured or must have a holding force of at least 15 N. Both, plug and socket connections of FieldConnex surge protectors, device couplers, and Power Hubs, meet the required holding force of at least 15 N.

Instructions for Zone 22

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.

If the Surge Protectors are used on couplers spurs rated as Ex ic intrinsically safe circuit, the trunk module TCP-LBF-IA1.36.* with mounted separation wall must be used.

Due to the presence of gas discharge tubes, the surge protective devices do not meet the insulation from ground or housing requirements according to IEC/EN 60079-15.

Due to the presence of gas discharge tubes, the surge protective devices do not meet the dielectric strength requirements according to IEC/EN 60079-11 between the intrinsically safe circuits and the parts that may be grounded.

The connections must either be mechanically secured or must have a holding force of at least 15 N.

The connections must either be mechanically secured or must have a holding force of at least 15 N. Both, plug and socket connections of FieldConnex surge protectors, device couplers, and Power Hubs, meet the required holding force of at least 15 N.

1.8 Repair and Servicing

The device must not be repaired, changed, or manipulated. In case of failure, always replace the device with an original device.

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1.9 Delivery, Transport, and Storage

Check the packaging and contents for damage.

Check if you have received every item and if the items received are the ones you ordered.

Keep the original packaging. Always store and transport the device in the original packaging.

Always store the device in a clean and dry location. Observe the permissible storage temperature (see datasheet).

1.10 Disposal

The device, built-in components, packaging, and any batteries contained within must be disposed in compliance with the applicable laws and guidelines of the respective country.

2 Product Specifications

2.1 Overview and Application

The FieldConnex® Surge Protector series TPH-LBF*, TCP-LBF* and SCP-LBF* protect fieldbus components and control units from damage caused by voltage surges and secondary lightning strikes. Surge voltages between the fieldbus wire (plus and minus) and between either wire and ground will be safely limited in an ‘over-voltage’ event.

Versions are available where the cable shield is either directly connected to earth or indirectly through a gas discharge tube. The Surge Protectors are designed for use in fieldbus communication topologies according to IEC 61158-2. They conform to IEC 60079-11: FISCO and Entity concepts and are also "DART Intrinsically Safe Compatible" (models without diagnostics). The Surge Protectors allow the coordinated use in an "EMC-orientated Lightning Protection Zones Concept", in accordance with IEC 61312-1. The protective effect is adapted to the EMC interference immunity (conducted high-energy interference impulses) for fieldbus measuring, control, and equipment.

The TPH-LBF*, TCP-LBF*, and SCP-LBF* series Surge Protectors consist of pluggable units, designed to fit directly into 3-pin terminals socket of Pepperl+Fuchs fieldbus components as Power Hubs, Segment Protectors and FieldBarriers, to protect trunk and spur connections of a fieldbus installation. This leads to a significant reduction in design and installation time/cost and significantly reduces the overall equipment footprint.

Specific versions of Surge Protectors include a unique diagnostic function for predictive maintenance of the Surge Protectors themselves. Predictive failures are communicated through Pepperl+Fuchs advanced physical layer infrastructure to allow the maintenance engineer to change defected units, before they start to adversely influence fieldbus communication. The Pepperl+Fuchs advanced physical layer infrastructure is part of the fieldbus segments itself, thus not requiring a manually scheduled maintenance activity.

Equally, the modular ‘insertion-connection’ design allows existing equipment to easily be upgraded, simply by plugging in a Surge Protector module where the existing cables remain in the same place connected to the same terminals. This is also ideal for retrospectively fitting surge protection where required without the need to reroute cables or add any fixings.

The modular approach also allows simple replacement of faulty or failing surge protection modules with minimal effort and time, without interference to neighboring cables or equipment.

The Spur Surge Protectors fit directly onto an grounding rail (type ACC-LBF-EB.*) that is positioned under the module so that individual modules can be easily attached or disconnected without affecting neighboring cables, equipment or modules.

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The following table gives an overview about types and their specific usage in combinations with Pepperl+Fuchs fieldbus components:

Type	Description	Shield connection	Predictive diagnosis	Hazardous area
TCP-LBF-IA1.36.IE.0	Surge Protector for trunk connections of R2-SP*, R3-SP* fieldbus couplers	Indirectly grounded through GDT	No diagnostics	Entity, FISCO, DART
TCP-LBF-IA1.36.IE.1	Surge Protector for trunk connections of R2-SP* fieldbus couplers	Indirectly grounded through GDT	Includes diagnostics	Entity, FISCO
TPH-LBF-IA1.36.DE.0	Surge Protector for trunk connections of MBHD-FB1-* and MBHC-FB-* Power Hubs	Directly grounded	No diagnostics	Entity, FISCO, DART
TPH-LBF-IA1.36.DE.1	Surge Protector for trunk connections of MBHD-FB* (except type MBHD-FB-D*) and MBHC-FB* Power Hubs	Directly grounded	Includes diagnostics	Entity, FISCO
SCP-LBF-IA1.36.IE.0	Surge Protector for spur connections of R2-SP*, R3-SP*, R4D0-FB* fieldbus couplers	Indirectly grounded through GDT	No diagnostics	Entity, FISCO
SCP-LBF-IA1.36.IE.1	Surge Protector for spur connections of R2-SP*, R4D0-FB* fieldbus couplers	Indirectly grounded through GDT	Includes diagnostics	Entity, FISCO

2.1.1 Cable Shield Grounding Options

Fieldbus supports several methods for cable shield grounding in order to accommodate differing plant references (see FOUNDATION Fieldbus “System Engineering Guideline” AG-181). The most common of the topologies uses a single point for grounding, where the cable shield is connected directly to a clean earth at the control room, whilst all other screens or shields throughout the segment are left open or floating.

Other topologies connect the cable shield at multiple points throughout the segment to earth in order to maximize protection against EMC disturbance.

Surge Protector type *-LBF-IA1.36.IE.* connects the shield indirectly through a gas discharge tube to earth, whilst type *-LBF-IA1.36.DE.* connects the shield directly to earth.

2.1.2 Surge Protector Diagnostics

Surge Protectors types *-LBF-IA1.36.*.1 contain a unique diagnostic function that predicts failures of Surge Protectors, before they adversely affect fieldbus communication or the segment voltages.

The Surge Protector diagnostics monitors, measures, and records any overvoltage event, then compares the events to a given algorithm to predict how many further overvoltage events can be tolerated, before the surge protection electronics fails or degrades to a point where it affects the fieldbus communication.

Surge protection electronics can tolerate a given number or frequency of activations at given levels of voltage, before they completely fail, during which time, the surge protection electronics will gradually degrade. The diagnostic electronics will log and compare any activation to an algorithm that will then decide if the surge protection electronics is reaching its ‘end of effective life’. At this point, the diagnostic electronics generates an alarm that the Pepperl+Fuchs Advanced Diagnostics infrastructure receives, whereon this alarm will be transmitted to the system’s maintenance or operator terminal, containing Pepperl+Fuchs Advanced Diagnostic Manager software. Additionally, at the Surge Protector, a visual alarm is given so that the failing unit, or units, can be quickly identified.

2.1.3 Status and Error Messages

The Surge Protector types *-LBF-IA1.36.*.1 incorporate a LED showing the health or status of the Surge Protector. A green flashing LED indicates that the Surge Protector is healthy. An overvoltage event will be shown as a single flash event of the red LED.

During power up, Surge Protectors with integrated diagnostics show the percentage of the headroom of surge events already used, before the Surge Protectors issue an alarm. Each single flash represents 10 % of used headroom. If the LED shows 10 consecutive red LED flashes, the exchange of the Surge Protector is required at some point before the next expected surge event.

2.1.4 Compatibility for Surge Protector Diagnostics

This predictive maintenance feature for the Surge Protectors is available in combination with the fieldbus coupler types R2-SP-IC*, R4D0-FB-IA*, and the Advanced Diagnostic Module type HD2-DM-A. Using the Surge Protectors in combination with the fieldbus coupler R2-SP-N*, a green/red LED locally on the device indicates the diagnostic information; in this instance, the diagnostic information is not transmitted to the Advanced Diagnostic Module.

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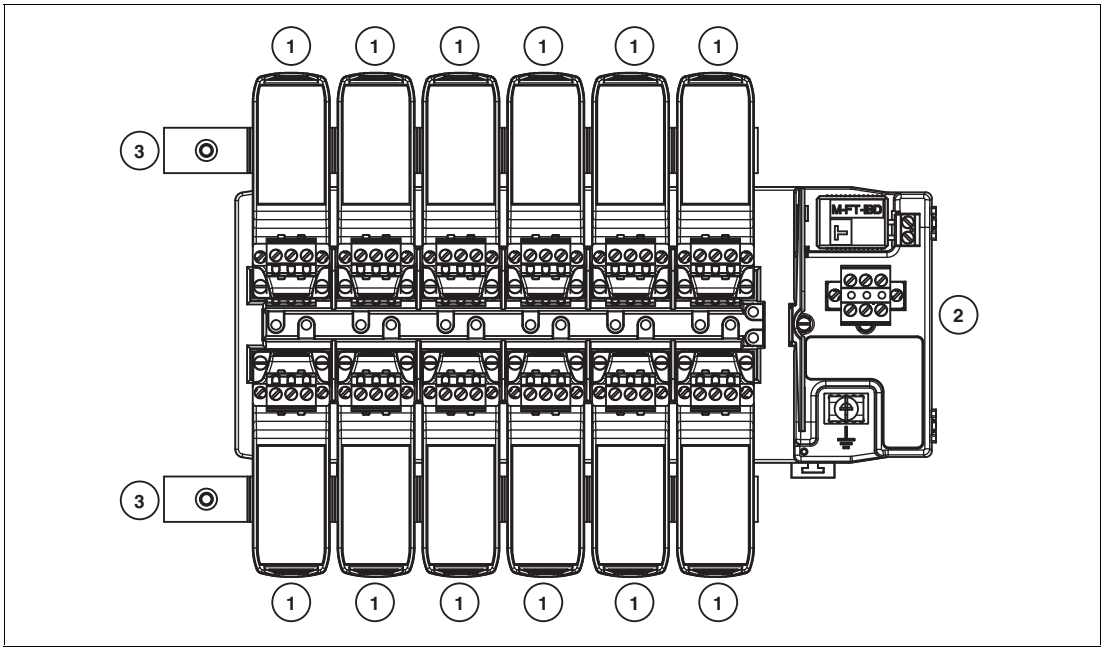
2.2 Component Identity

To protect Pepperl+Fuchs Fieldbus Power Hubs and fieldbus couplers from damage caused by surge voltages or secondary lightning strikes, you can install the TPH-LBF*, TCP-LBF*, or SCP-LBF* Surge Protectors series.

The TCP-LBF* Surge Protectors protect the trunk connection and the SCP-LBF* Surge Protectors protect the spur connection of fieldbus couplers.



1. Surge Protector SCP-LBF*
2. Surge Protector TCP-LBF*
3. Grounding rail ACC-LBF-EB

The TCP-LBF* Surge Protectors protect the trunk connection of Power Hub Motherboards.

2.2.1 Protection of Segment Protector

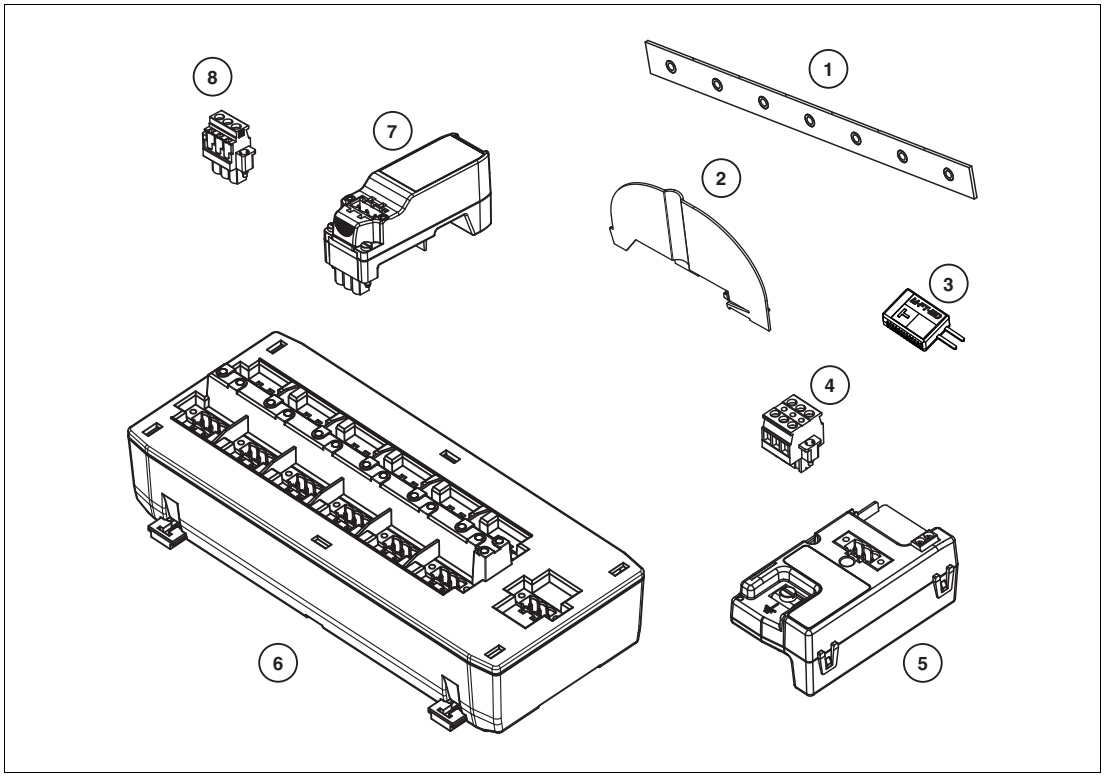


Figure 2.1

1 Grounding rail ACC-LBF-EB.6
2 Separation wall ACC-LBF-SW
3 Terminator M-FT*
4 T-connector
5 Surge Protector TCP-LBF-IA1.36.IE*
6 Segment Protector R2-SP-* or R3-SP-*
7 Surge Protector SCP-LBF-IA1.36.IE*
8 Spur connector

The Surge Protector TCP-LBF-IA1.36.IE* mounts on the trunk connection of the Segment Protector. See chapter 3.2.1

The Surge Protector SCP-LBF-IA1.36.IE* mounts on the spur connection of the Segment Protector. Use 1 Surge Protector for each spur terminal. See chapter 3.2.2

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2.2.2 Protection of Power Hubs

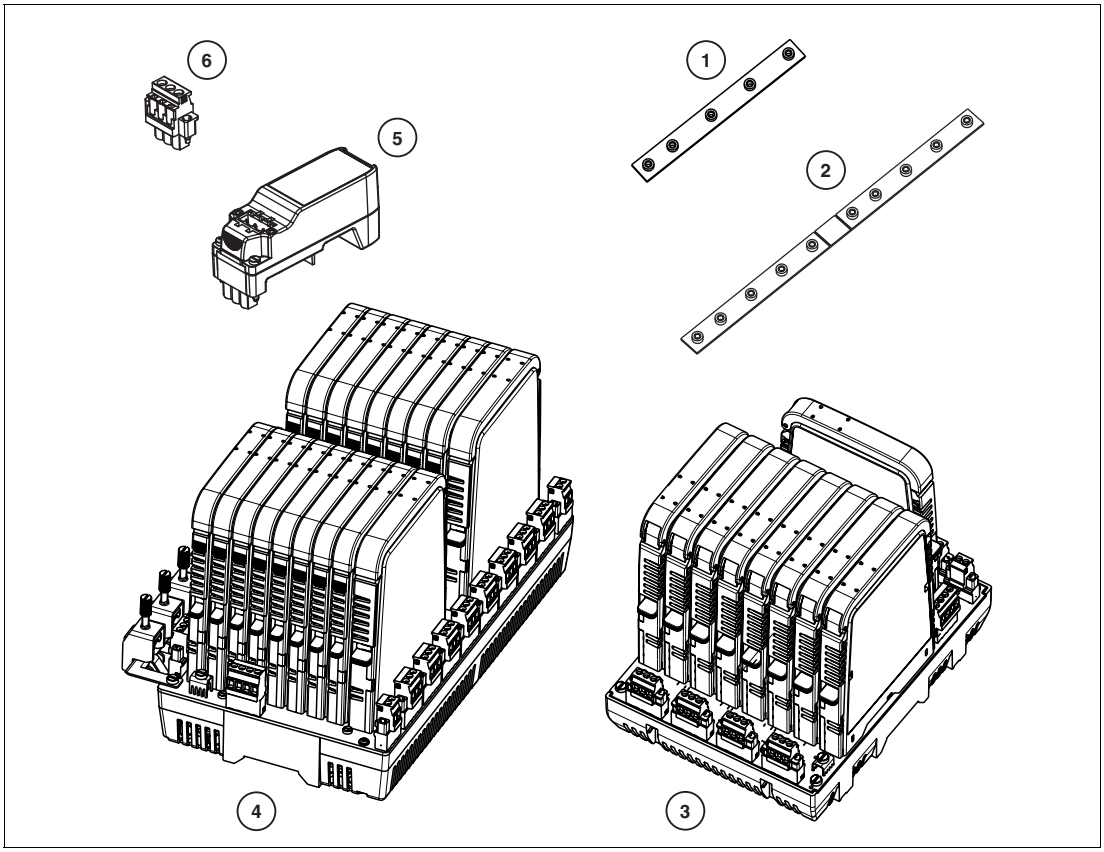

Figure 2.2

1 Grounding rail ACC-LBF-EB.4 suitable for MBHD-FB1-4R* Motherboards
2 Grounding rail ACC-LBF-EB.8 suitable for MBHC-FB-8R* Motherboards
3 Power Hub Motherboard MBHD-FB1-4R*
4 Power Hub Motherboard MBHC-FB-8R*
5 Surge Protector TPH-LBF-IA1.36.IE*
6 Trunk connector

The Surge Protector TPH-LBF-IA1.36.IE* mounts on the trunk connection of the Power Hub Motherboard. Use 1 Surge Protector for each trunk connection. See chapter 3.2.3

2.3 Technical Data

2.3.1 TPH-LBF-IA1.36.DE.*

Fieldbus interface	
Self current consumption	max. 6 mA (for version TPH-LBF-IA1.36.DE.1) , max. 0 mA (for version TPH-LBF-IA1.36.DE.0)
Indicators/operating means	
LED ERR	green flashing: status OK , red flashing: maintenance required , (for version TPH-LBF-IA1.36.DE.1)
Electrical specifications	
Rated voltage	36 V
Rated current	600 mA
Continuous voltage	max. 33 V
Reaction time	
Line/Line	max. 1 ns
Line/Earth	max. 100 ns
Series resistance in line	2 Ω +/- 5 %
Ambient conditions	
Ambient temperature	-40 ... 70 °C (-40 ... 158 °F)
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	SIRA 12 ATEX 2128X
Group, category, type of protection, temperature class	Ⓔx II 1G Ex ia IIC T4
Voltage U_i	24 V
Current I_i	500 mA
Internal capacitance C_i	2 nF
Internal inductance L_i	0.1 µH
Statement of conformity	
Group, category, type of protection, temperature class	Ⓔx II 3G Ex nAc IIC T4 , Ⓔx II 3G Ex ic IIC T4
Voltage U_i	33 V
Current I_i	600 mA
Internal capacitance C_i	2 nF
Internal inductance L_i	0.1 µH

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2.3.2 TCP-LBF-IA1.36.IE*

Fieldbus interface	
Self current consumption	max. 6 mA (for version TCP-LBF-IA1.36.IE.1) , max. 0 mA (for version TCP-LBF-IA1.36.IE.0)
Indicators/operating means	
LED ERR	green flashing: status OK , red flashing: maintenance required , (for version TCP-LBF-IA1.36.IE.1)
Electrical specifications	
Rated voltage	36 V
Rated current	600 mA
Continuous voltage	max. 33 V
Reaction time	
Line/Line	max. 1 ns
Line/Earth	max. 100 ns
Screen/Shield-Earth	max. 100 ns
Series resistance in line	2 Ω +/- 5 %
Ambient conditions	
Ambient temperature	-40 ... 70 °C (-40 ... 158 °F)
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	SIRA 12 ATEX 2128X
Group, category, type of protection, temperature class	Ⓔx II 1G Ex ia IIC T4
Voltage U_i	24 V
Current I_i	500 mA
Internal capacitance C_i	2 nF
Internal inductance L_i	0.1 µH
Statement of conformity	SIRA 12 ATEX 4176X
Group, category, type of protection, temperature class	Ⓔx II 3G Ex nAc IIC T4 , Ⓔx II 3G Ex ic IIC T4
Voltage U_i	33 V
Current I_i	600 mA
Internal capacitance C_i	2 nF
Internal inductance L_i	0.1 µH

2.3.3 SCP-LBF.IA1.36.IE.*

Fieldbus interface	
Self current consumption	max. 6 mA (for version SCP-LBF-IA1.36.IE.1) , max. 0 mA (for version SCP-LBF-IA1.36.IE.0)
Indicators/operating means	
LED ERR	green flashing: status OK , red flashing: maintenance required (for version SCP-LBF-IA1.36.IE.1)
Electrical specifications	
Rated voltage	36 V
Rated current	250 mA
Continuous voltage	max. 33 V
Reaction time	
Line/Line	max. 1 ns
Line/Earth	max. 100 ns
Screen/Shield-Earth	max. 100 ns
Ambient conditions	
Ambient temperature	-40 ... 70 °C (-40 ... 158 °F)
Data for application in connection with Ex-areas	
EC-Type Examination Certificate	SIRA 12 ATEX 2128X
Group, category, type of protection, temperature class	Ⓔx II 1G Ex ia IIC T4
Voltage U_i	24 V
Current I_i	500 mA
Internal capacitance C_i	2 nF
Internal inductance L_i	0.1 µH
Statement of conformity	SIRA 12 ATEX 4176X
Group, category, type of protection, temperature class	Ⓔx II 3G Ex nAc IIC T4 , Ⓔx II 3G Ex ic IIC T4
Voltage U_i	33 V
Current I_i	600 mA
Internal capacitance C_i	2 nF
Internal inductance L_i	0.1 µH

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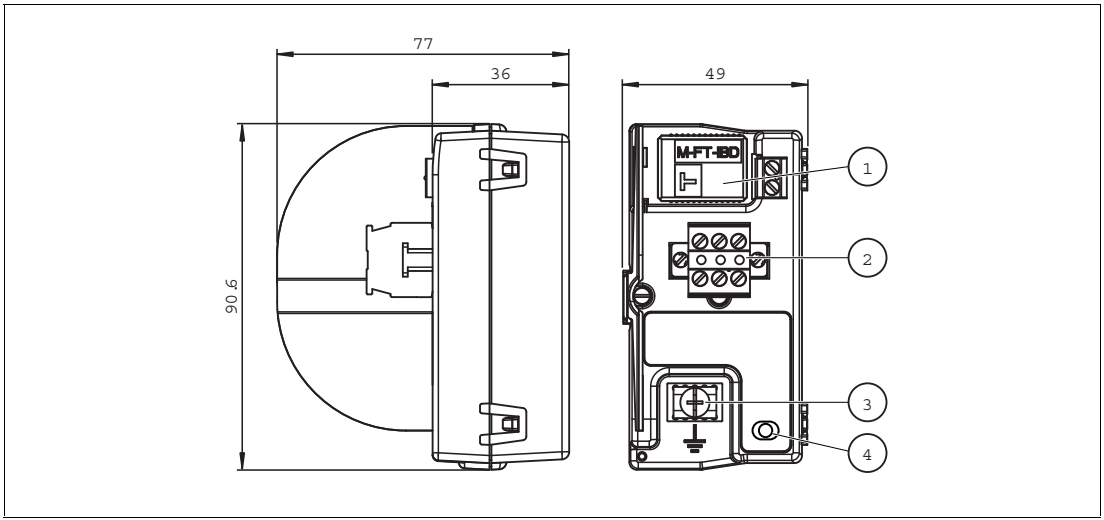
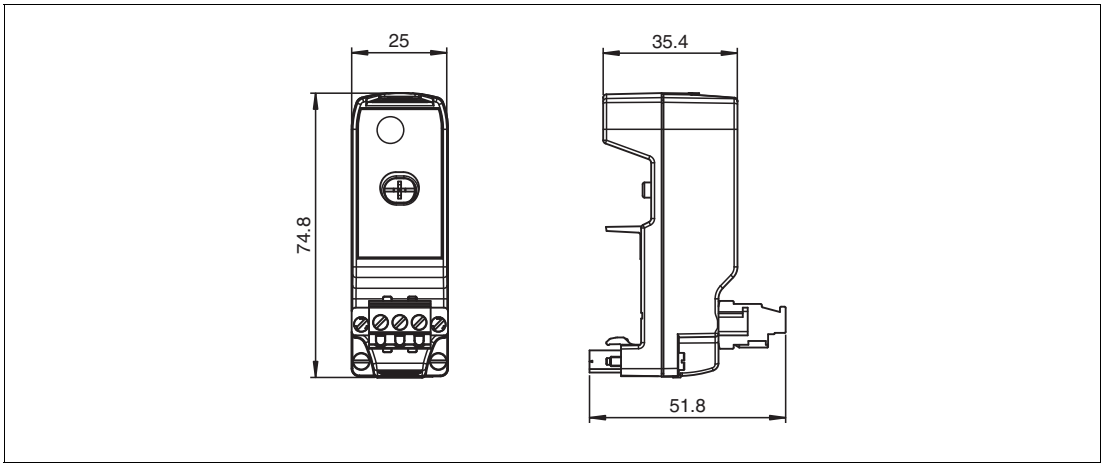
2.4 Dimensional Drawings

2.4.1 TCP-LBF-IA1.36.IE*

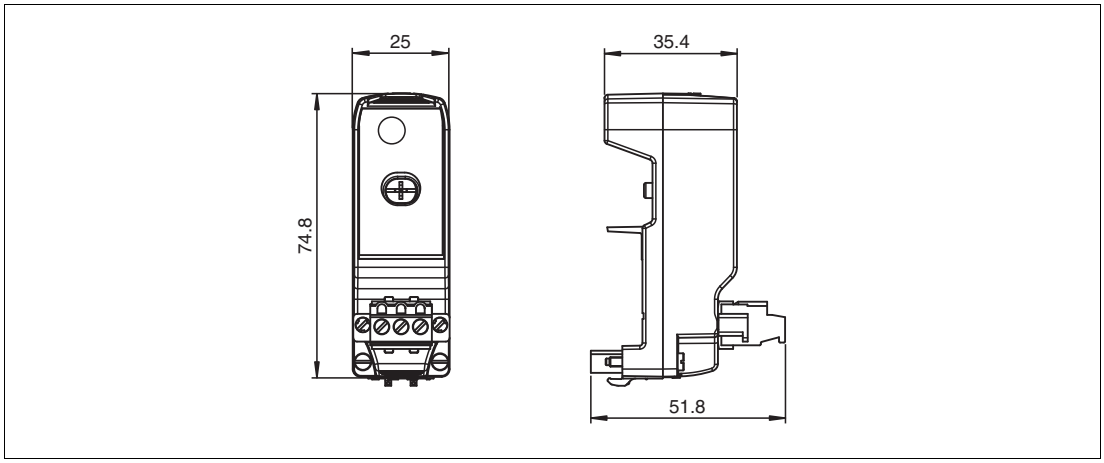


1 Terminator M-FT*
2 T-connector
3 Grounding terminal
4 LED, red (only TCP-LBF-IA1.36.IE.1)

2.4.2 Surge Protector SCP-LBF-IA1.36.IE*



2.4.3 Surge Protector TPH-LBF-IA1.36.DE*



3 Installation

3.1 Installation of Surge Protector

Prior to mounting, installation, and commissioning of the device you should make yourself familiar with the device and carefully read the instruction manual.

Observe the EC-type-examination certificate. It is especially important to maintain any "special conditions for safe use" that may be indicated.

The devices may be installed in a corrosive location acc. to ISA-S71.04-1985, severity level G3.

Pay attention to avoid electrostatic discharges while operating the installed device. Avoid electrostatic charge.

Recognized rules of the technology and setup requirements must be observed during mounting and dismounting. Especially for tasks on electrical systems, special safety requirements must be observed. Special attention must be paid to the following points:

1. Has the device been installed in accordance with the specification?
2. Is the device free of damage?
3. Is IP protection ensured?
4. Is the mounted device mechanically locked?

3.2 Mounting and Dismounting

3.2.1 Surge Protector TCP-LBF-IA1.36.IE* for Trunk Connection

The Surge Protector TCP-LBF-IA1.36.IE* in combination with the fieldbus couplers R2-SP-* and R3-SP-*.

Warning!

WARNING!

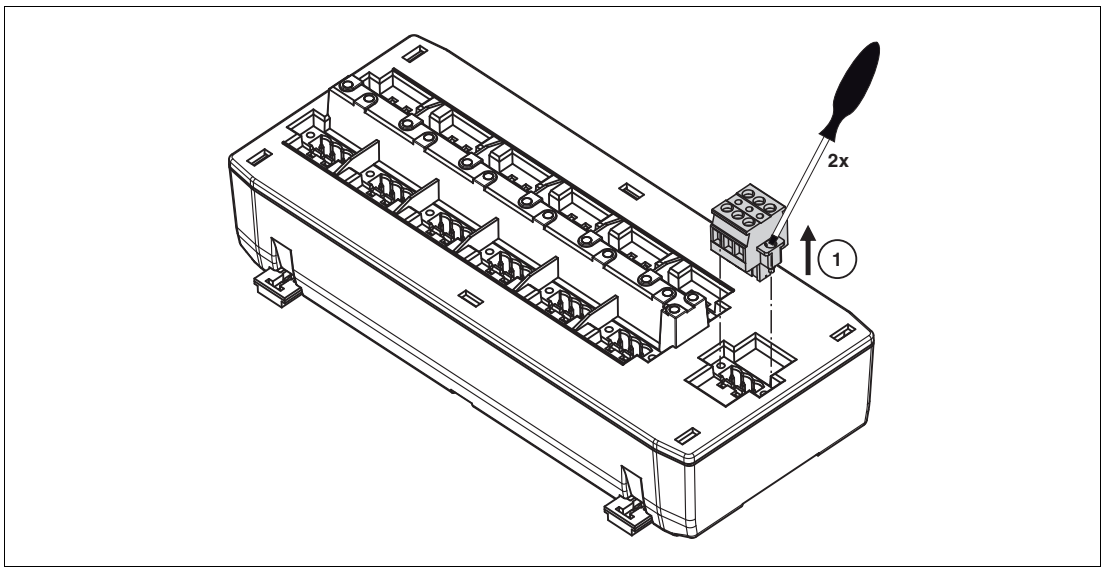
The TCP-LBF-IA1.36.IE.1 and the TCP-LBF-IA1.36.DE.1 Surge Protector must not be used in combination with the DART Segment Protector R3-SP-*!

The Surge Protectors are delivered without T-connector and Terminator M-FT*.
Both have to be taken from the fieldbus coupler the Surge Protector will be used with.

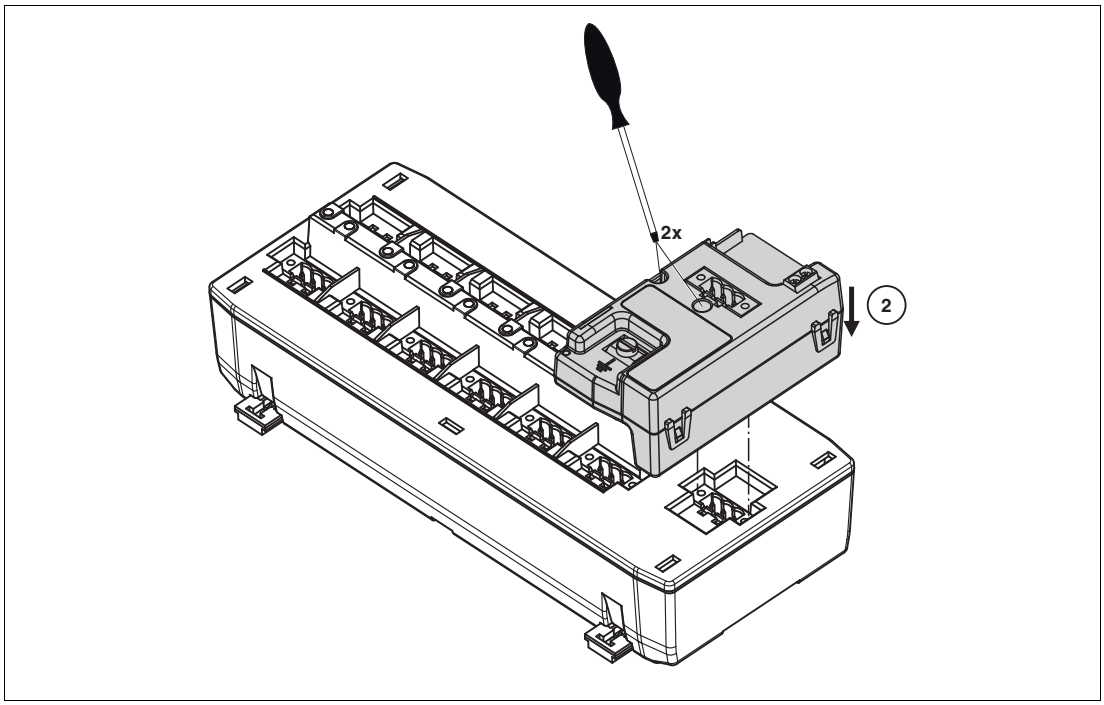
3.2.1.1 Mounting the Surge Protector

Mounting

1. Remove the T-connector and Terminator from the trunk connection (1).



2. Plug the Surge Protector in the trunk connection and fix the Surge Protector with the 2 screws on the Segment Protector (2).



3. Plug the T-connector in the trunk connection of the Surge Protector and fix the T-connector with the 2 screws (3).
4. Screw the Terminator into the corresponding terminal block of the Surge Protector (4).

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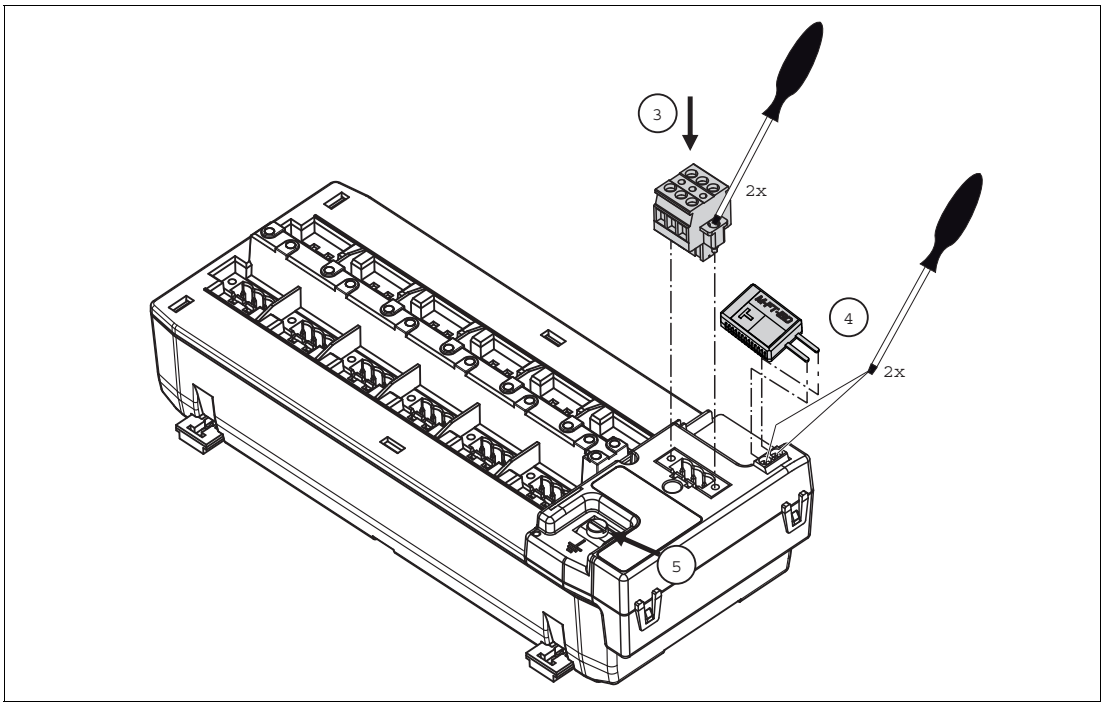
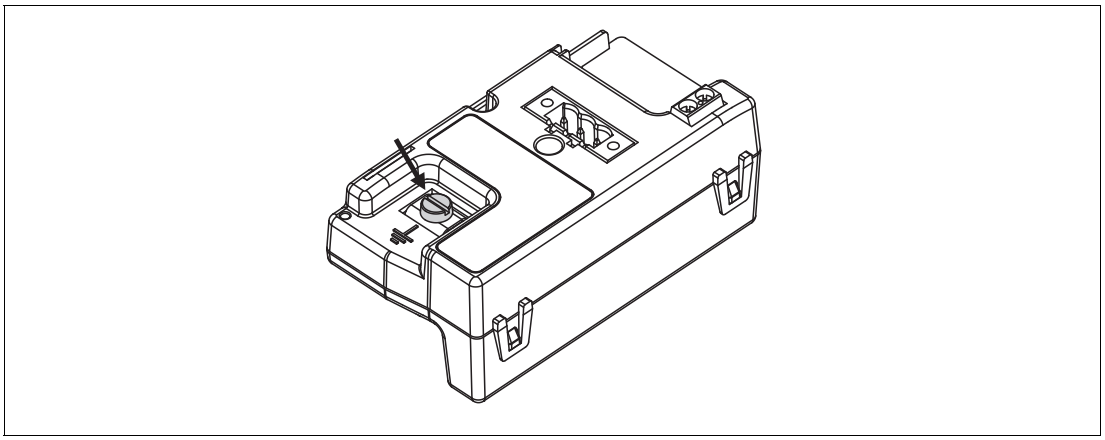
5. Connect the grounding rail to the grounding terminal of the housing (5).



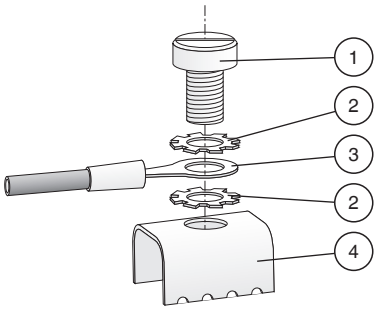
The grounding terminal should be connected to an equal potential bonding system using a minimum cross core section of 4 mm^2.



The shield connection of the trunk is internally indirectly connected to the grounding terminal through a gas discharge tube.

Connect the ground cable to a cable lug

1. Position the cable lug (3) over the grounding terminal so that the cable points downwards.
2. Screw the cable lug (3) to the grounding terminal (4) using 2 toothed lock washers (2).
3. Tighten the screw with a torque of 1.5 Nm (1).

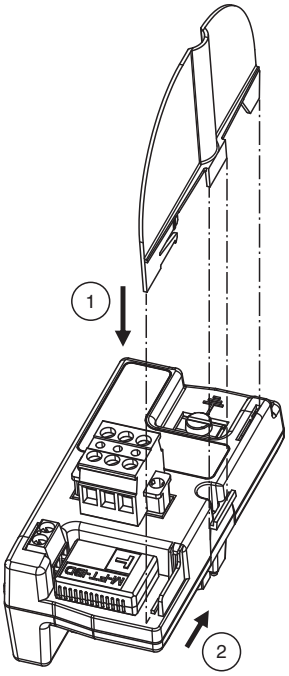


3.2.1.2 Mounting the Separation Wall

When using R2-SP* Segment Protectors in combination with fieldbus power supplies to generate Ex ic rated spur outputs, the delivered separation wall ACC-LBF-SW has to be installed on the Segment Protector. This is to guarantee the clearance distance of 50 mm between the trunk connector and the spur connector.

Mounting

1. Insert the lugs of the separation wall into the openings of the Surge Protector (1).
2. Slide the separation wall backwards until it snaps into place (2).



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3.2.2 Surge Protector SCP-LBF-IA1.36.IE* for Spur Connection

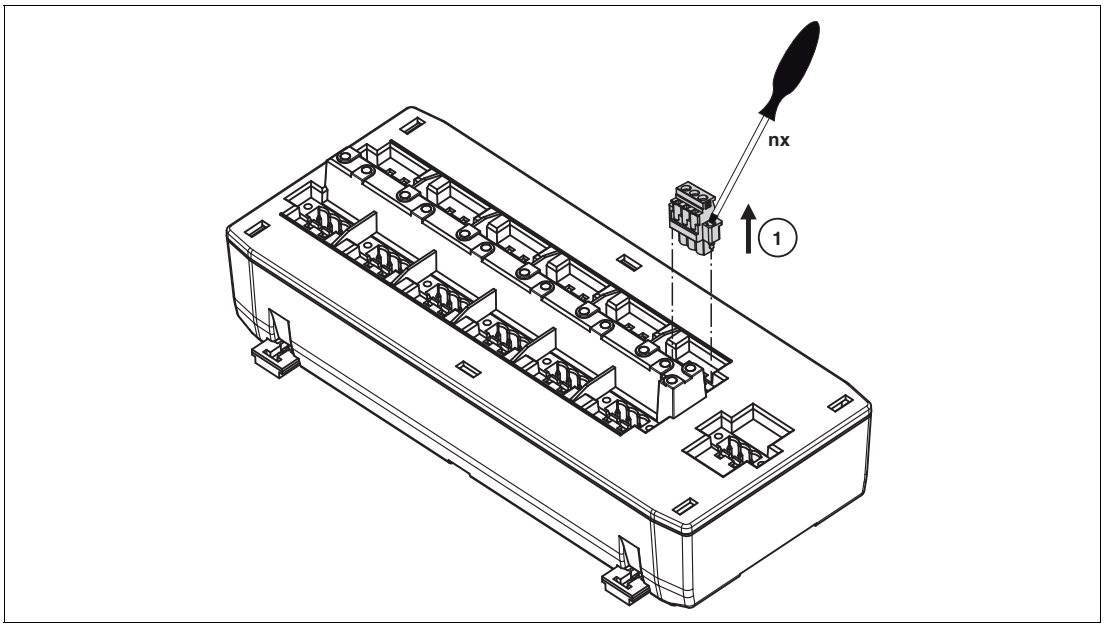
SCP-LBF-IA1.36.IE* Surge Protectors in combination with the fieldbus couplers R2-SP*, R3-SP*, R4D0-FB*.

The Surge Protector comes without a spur connector. The spur connector has to be taken from the fieldbus coupler the Surge Protector will be used with.

3.2.2.1 Mounting the Surge Protector for Spur Connections

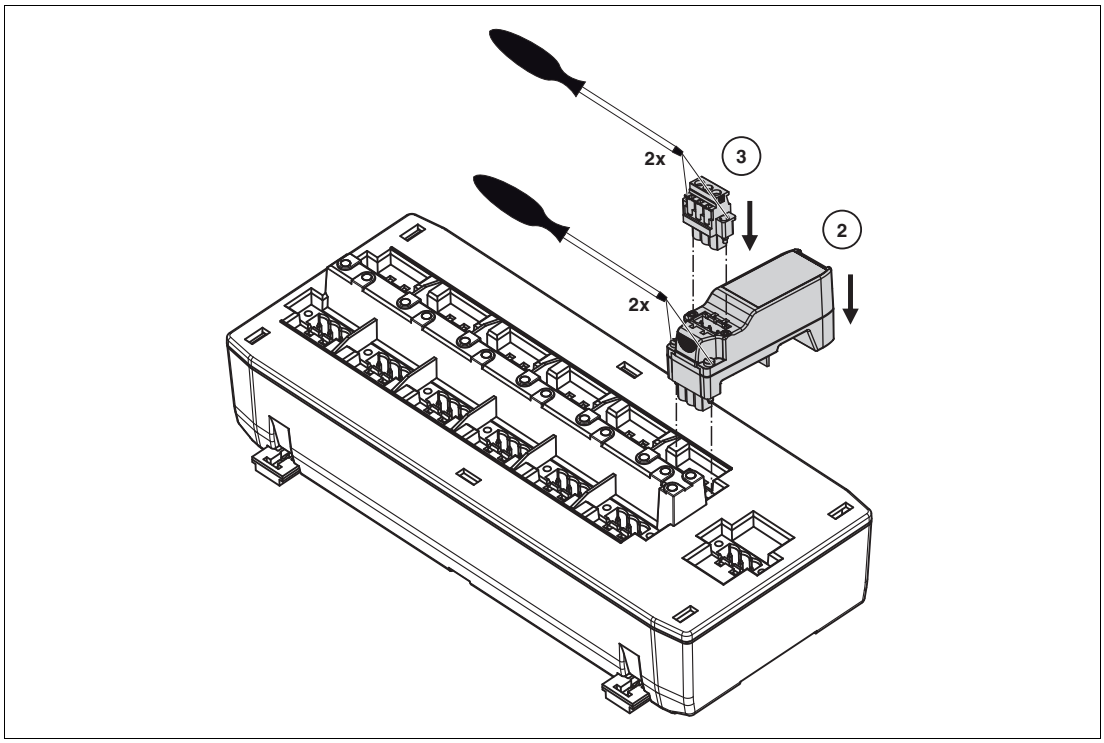
Mounting

1. Remove the spur connector from the spur connection (1).

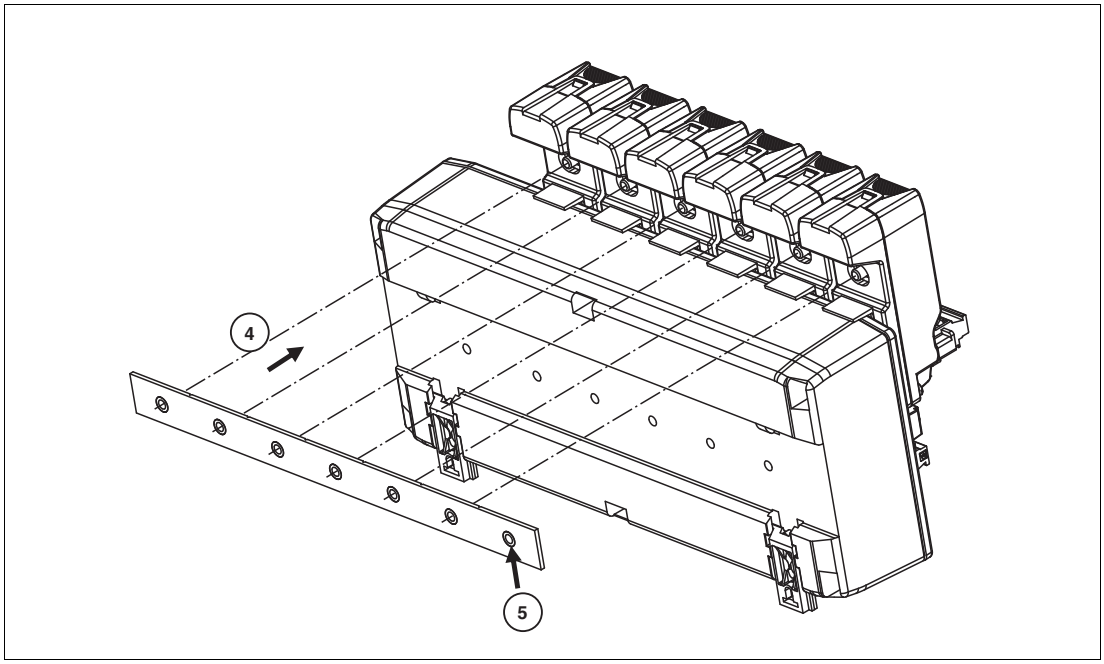


2. Plug the Surge Protector into the spur connection and fix the Surge Protector with 2 screws (2).

3. Plug the spur connector into the Surge Protector and fix the spur connector with 2 screws (3).



4. Mount the grounding rail at the bottom of the Surge Protector (4).
Note that you can connect multiple Surge Protectors via one single grounding rail.



5. Connect the grounding rail to the grounding terminal of the housing (5).

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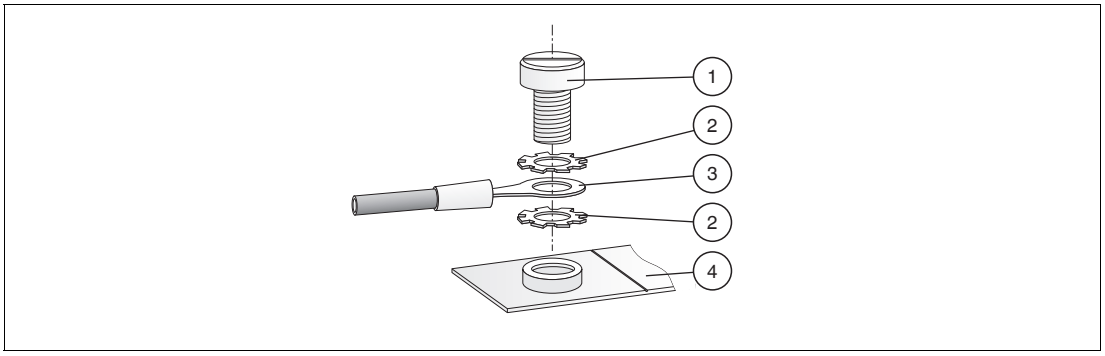
3.2.2.2 Grounding rail ACC-LBF-EB.6

For attaching Surge Protectors to the spur connections of Pepperl+Fuchs fieldbus couplers R2-SP*, R3-SP*, and F4D0-FB-IA*, the optional grounding rail ACC-LBF-EB.6 is used to provide a common earth point and mechanical support for up to 6 SCP-LBF-1.36* modules. For Surge Protectors that are placed on both sides of the fieldbus couplers, 2 grounding rails ACC-LBF-EB.6 are required. If fieldbus couplers are used with less than 6 spurs on one side, the grounding rail can easily be cut or snapped to length.

The grounding rail provides a screw clamp to be connected to an equal potential bonding system using a minimum cross core section of 4 mm ^{2}.

3.2.2.3 Connect the Ground Cable at the Grounding Rail

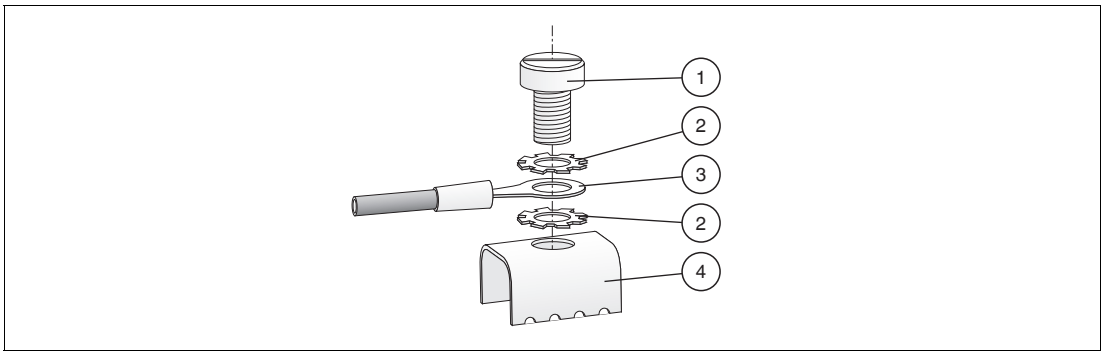
1. Position the cable lug (3) over the grounding terminal of the grounding rail (4), so that the cable points downwards.
2. Screw the cable lug (3) to the grounding terminal (4) using 2 toothed lock washers (2).
3. Tighten the screw with a torque of 1.5 Nm (1).



Internally, the shield connection of the trunk is directly connected to the grounding terminal through a gas discharge tube.

3.2.2.4 Connect the Grounding Rail to the Grounding Terminal of the Housing

1. Position the cable lug (3) over the grounding terminal (4) so that the cable points downwards.
2. Screw the cable lug to the grounding terminal (4) using 2 toothed lock washers (2).
3. Tighten the screw with a torque of 1.5 Nm (1).



3.2.3 Surge Protector TPH-LBF-IA1.36.DE* Trunk Connection for Power Hub

TPH-LBF-IA1.36.DE* Surge Protectors in combination with Power Hub Motherboards.

Warning!

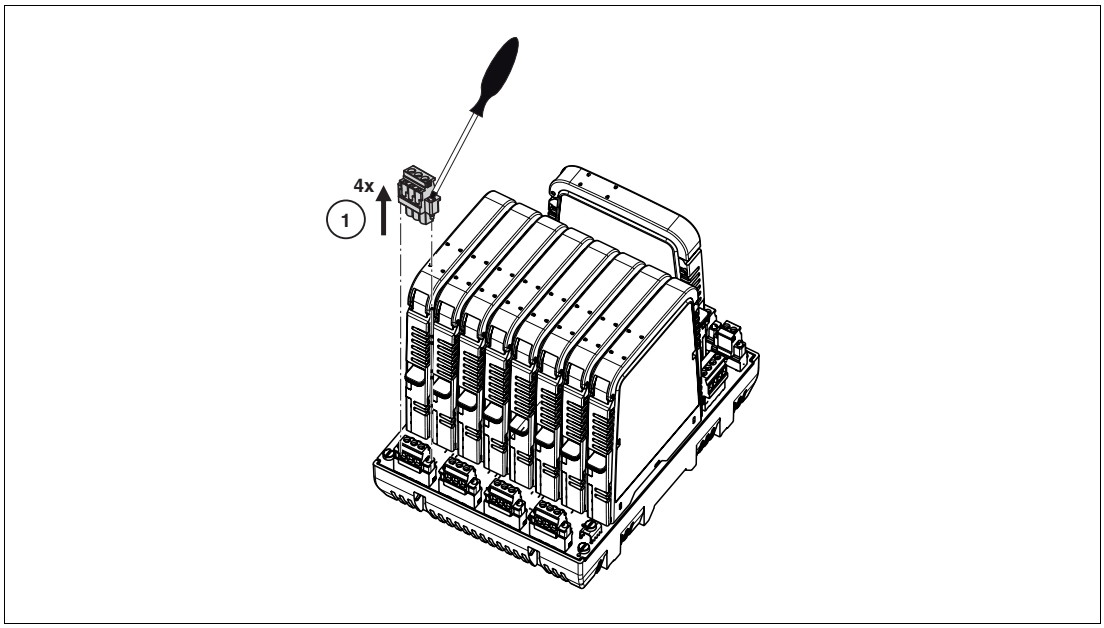
WARNING!

The TPH-LBF-IA1.36.DE.1 Surge Protector must not be used in combination with the DART Power Hub Backplane MBHD-FB-D*!

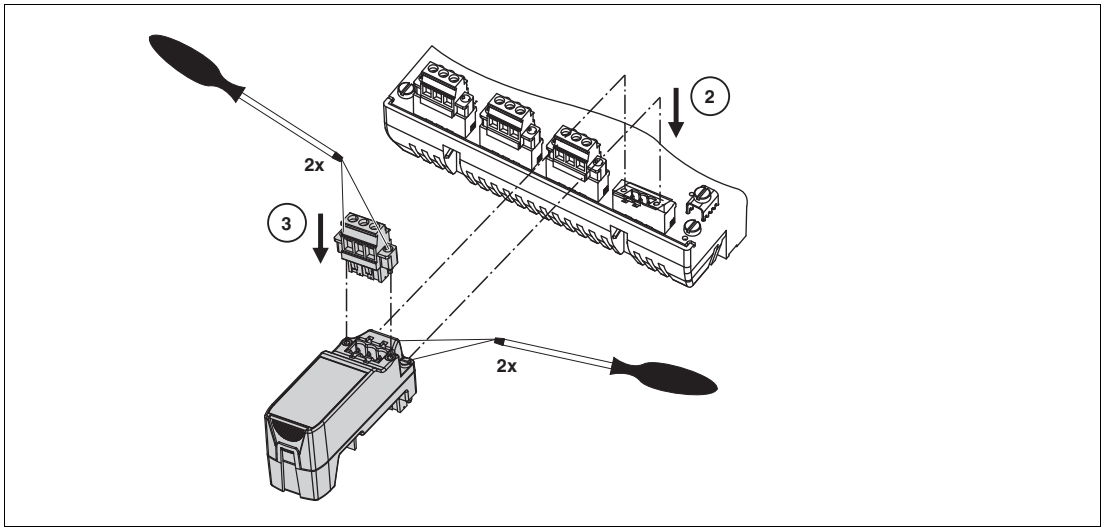
3.2.3.1 Mounting the Surge Protector

Mounting on Motherboards (*-8R)

1. Remove the trunk connector from the trunk connection (1).



2. Plug the Surge Protector into the trunk connection and fix the Surge Protector with 2 screws (2).
3. Plug the trunk connector into the Surge Protector and fix the trunk connector with 2 screws (3).



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4. Mount the grounding rail at the bottom of the Surge Protector (4).
Note that you can connect multiple Surge Protectors via one single grounding rail.
5. Connect the grounding rail to the grounding terminal of the housing (5).

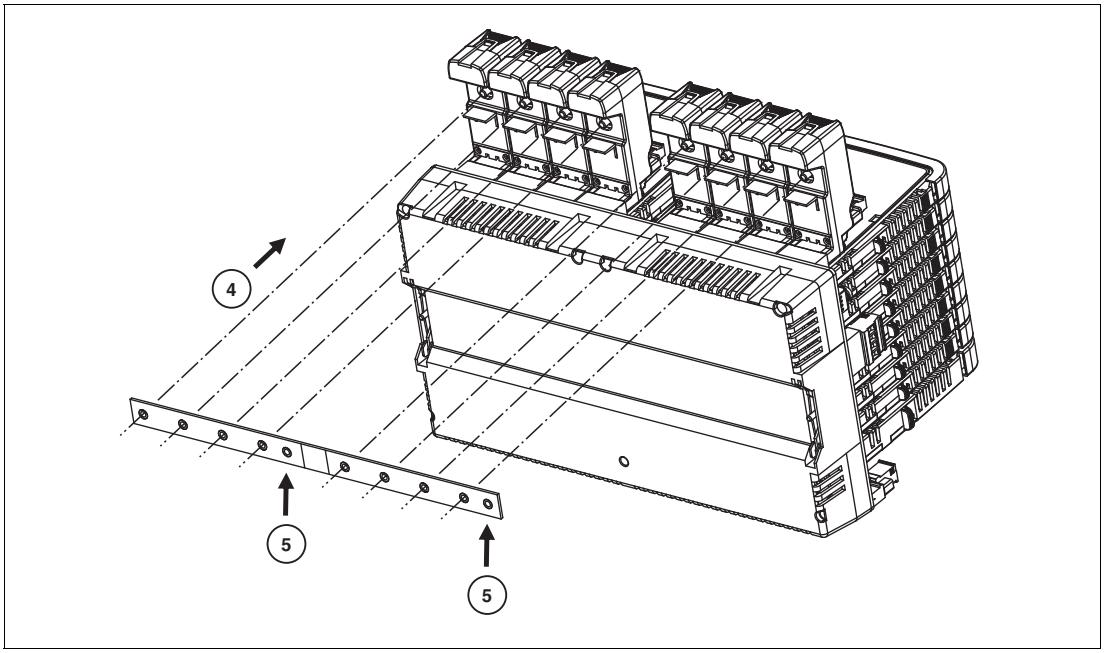
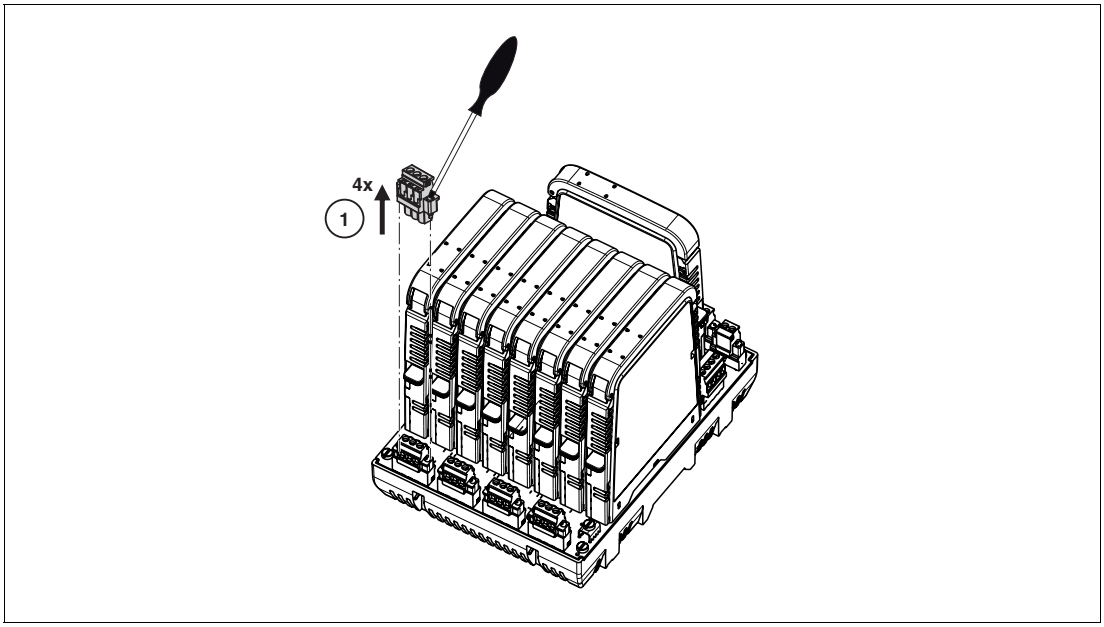


Figure 3.1 Mounting on 8-channel motherboards (*-8R)

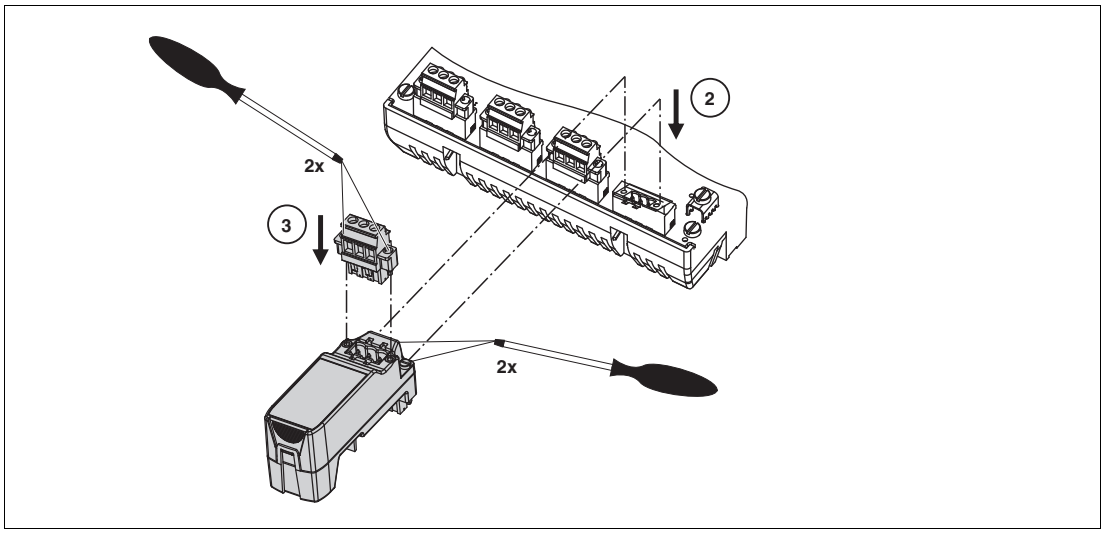
Mounting on Rotated Motherboards (*-8R.R)

1. Remove the trunk connector from the trunk connection (1).



2. Plug the Surge Protector into the trunk connection and fix the Surge Protector with 2 screws (2).

3. Plug the trunk connector into the Surge Protector and fix the trunk connector with 2 screws (3).



4. Mount the grounding rail in 2 parts on the motherboard. Separate the grounding rail and rotate one of them before mounting, see figure.

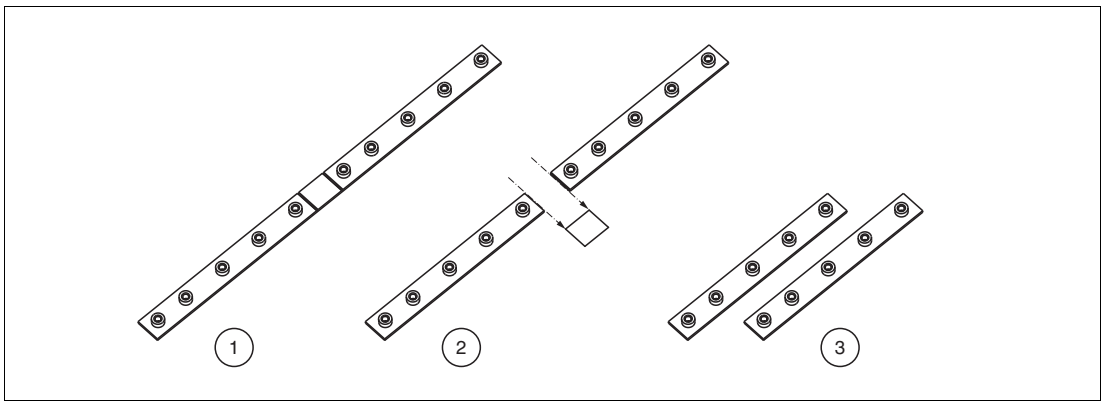


Figure 3.2 Preparation of the grounding rail mounting

5. Mount the grounding rail at the bottom of the Surge Protector (4).
Note that you can connect multiple Surge Protectors via one single grounding rail.

6. Connect the grounding rail to the grounding terminal of the housing (5).

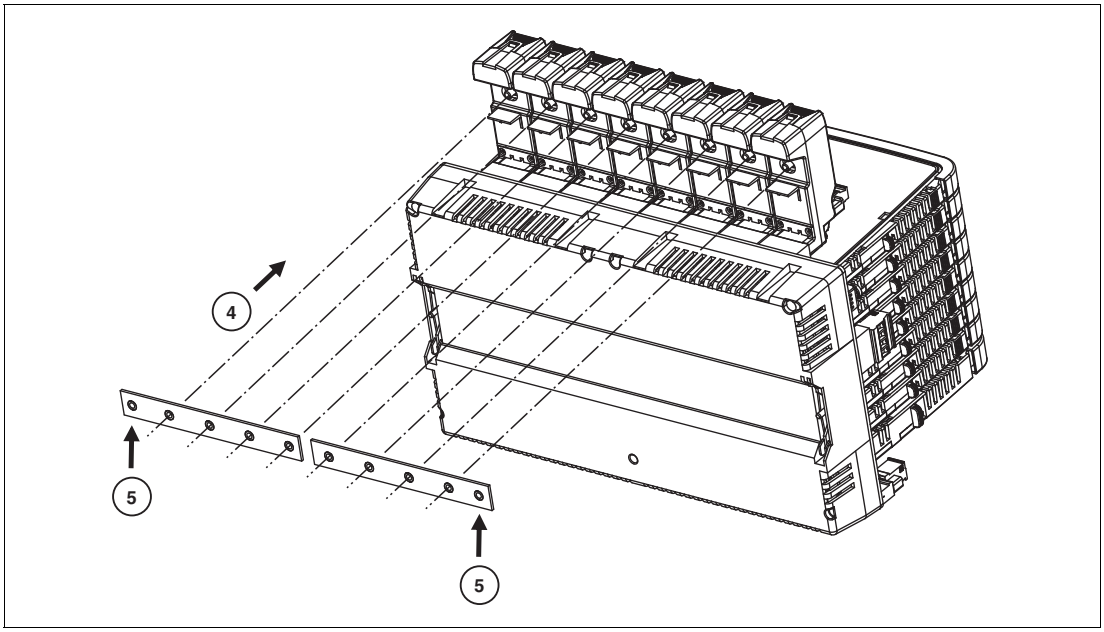


Figure 3.3 Mounting on rotated 8-channel motherboards (*-8R.R)

3.2.3.2 Grounding Rail ACC-LBF-EB.8

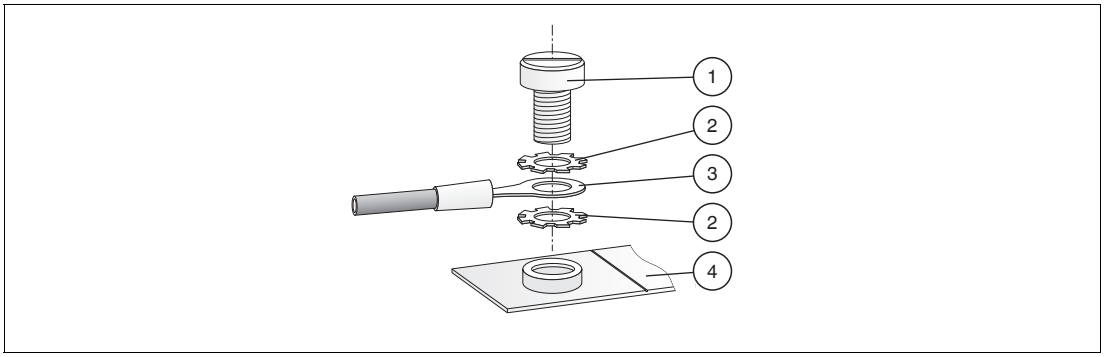
For attaching Surge Protectors to the trunk connections of the Pepperl+Fuchs Power Hub MBHD-FB1*, the optional grounding rail ACC-LBF-EB.8 is used to provide a common earth point and mechanical support for the TPH-LBF-1.36* modules.

The grounding rail provides a screw clamp to be connected to an equal potential bonding system using a minimum cross core section of 4 mm^2.

Internally, the shield connection of the trunk is directly connected to the grounding terminal through a gas discharge tube.

3.2.3.3 Connect the Ground Cable at the Grounding Rail

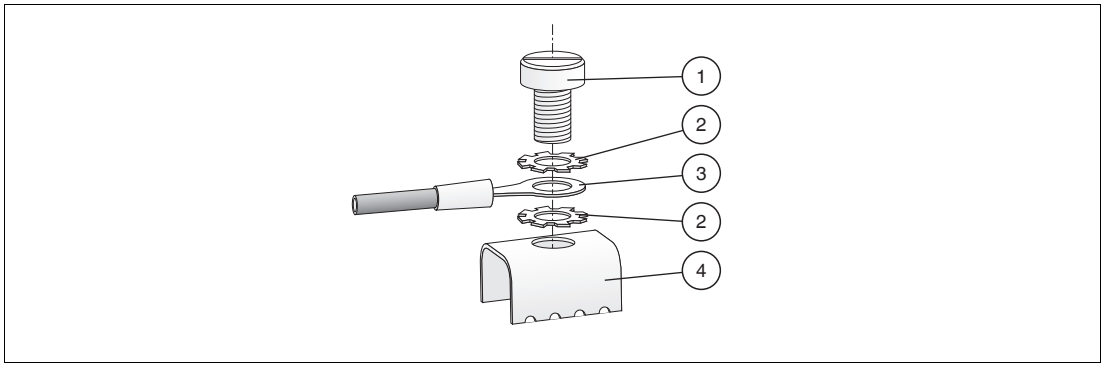
1. Position the cable lug (3) over the grounding terminal of the grounding rail (4), so that the cable points downwards.
2. Screw the cable lug (3) to the grounding terminal (4) using 2 toothed lock washers (2).
3. Tighten the screw with a torque of 1.5 Nm (1).



Internally, the shield connection of the trunk is directly connected to the grounding terminal through a gas discharge tube.

3.2.3.4 Connect the Grounding Rail to the Grounding Terminal of the Housing

1. Position the cable lug (3) over the grounding terminal (4) so that the cable points downwards.
2. Screw the cable lug to the grounding terminal (4) using 2 toothed lock washers (2).
3. Tighten the screw with a torque of 1.5 Nm (1).



4 Appendix

4.1 Ordering Information

Designation	Description
TPH-LBF-IA1.36.DE.0	Surge Protector for Power Hub trunk connection, shield directly grounded.
TPH-LBF-IA1.36.DE.1	Surge Protector for Power Hub trunk connection, diagnostics included, shield directly grounded.
ACC-LBF-SW.3	Separation wall for TPH-LBF-IA1.36* in Ex ic application. Package of 3 pieces.
TCP-LBF-IA1. 36.IE.1	Surge Protector for fieldbus coupler trunk connection, diagnostics included, shield grounded through GDT.
SCP-LBF-IA1. 36.IE.0	Surge Protector for fieldbus coupler spur connection, shield grounded through GDT.
SCP-LBF-IA1. 36.IE.1	Surge Protector for fieldbus coupler spur connection, diagnostics included, shield grounded through GDT.
ACC-LBF-EB.4	Grounding rail to provide a common earth point and mechanical support for up to 4 TPH-LBF-1.36* modules on MBHD-FB1-4R* Power Hubs.
ACC-LBF-EB.6	Grounding rail to provide a common earth point and mechanical support for up to 6 SCP-LBF-1.36* modules.
ACC-LBF-EB.8	Grounding rail to provide a common earth point and mechanical support for up to 8 TPH-LBF-1.36* modules on MBHC-FB-8R* Power Hubs.

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