

# Instruction Manual

## Marking

Analog Inputs FB3201B2, FB3202B2, FB3203B2
Pepperl+Fuchs GmbH Lilienthalstraße 200, 68307 Mannheim, Germany
EC-Type Examination Certificate: BVS 13 ATEX E 050 X Group, category, type of protection, temperature class: $\text{Ex}$ II 2(1) G Ex d [ia Ga] IIC T4 Gb $\text{Ex}$ II (1) D [Ex ia Da] IIIC

table 1

## Validity

Specific processes and instructions in this instruction manual require special provisions to guarantee the safety of the operating personnel. Observe laws, standards, and directives applicable to the intended use and the operating location. Observe Directive 1999/92/EC in relation to hazardous areas.

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If the device replaces a predecessor device, the documentation for the verification of intrinsic safety must be adjusted.

The corresponding datasheets, declarations of conformity, EC-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](http://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](http://www.pepperl-fuchs.com).

## Target Group, Personnel

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

Mounting, installation, commissioning, operation, maintenance and dismantling of the device may only be carried out by appropriate trained and qualified personnel. The instruction manual must be read and understood.

## Intended Use

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

Use the device only within the specified ambient conditions.

Only use the device stationary.

The device is an associated apparatus according to IEC/EN 60079-11.

The I/O modules, com units, and power supplies of the remote I/O system must only be used together with the associated backplanes.

The backplane connections are non-intrinsically safe.

The I/O modules of the remote I/O system act as an interface between signals from the hazardous area and the non-hazardous area.

## Improper Use

Protection of the personnel and the plant is not ensured if the device is not being used according to its intended use.

The device is not suitable for isolating signals in power installations unless this is noted separately in the corresponding datasheet.

## Mounting and Installation

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 instruction manuals for the associated backplanes.

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

Do not mount the device at locations where an aggressive atmosphere may be present.

All circuits connected to the device must comply with the overvoltage category II (or better) according to IEC/EN 60664-1.

Do not mount a damaged or polluted device.

Only use accessories specified by the manufacturer.

Push the module into the slot until all rear catches have audibly engaged in position. The module must engage twice.

Do not push the modules into the slots with too much force. The rear connections of the devices may be damaged if using excessive force. In this case the explosion protection can no longer be ensured.

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

The device may only be installed and operated in Zone 1 if mounted in a surrounding enclosure, which corresponds to equipment protection level Gb.

If intrinsically safe and non-intrinsically safe circuits are being operated together, the connections of the non-intrinsically safe circuits must be covered. The cover must comply with degree of protection IP30 according to IEC/EN 60529.

## Requirements for Cables and Connection Lines

Observe the following points when installing cables and connection lines: Observe the permissible core cross-section of the conductor.

The insulation stripping length must be considered.

When installing the conductors the insulation must reach up to the terminal.

If you use stranded conductors, crimp wire end ferrules on the conductor ends.

Never pull the cable. A wire could become loose from the terminal and protection against electric shock can no longer be ensured. Always pull the terminal.

Unused cables and connection lines must be either connected to terminals or securely tied down and isolated.

## Requirements for Usage as Associated Apparatus

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.

Intrinsically safe circuits of associated apparatus (installed in non-hazardous area) can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14.

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

Observe the maximum values of the device, when connecting the device to intrinsically safe apparatus.

The respective peak values of the field device and the associated apparatus with regard to explosion protection should be considered when connecting intrinsically safe field devices with intrinsically safe circuits of associated apparatus (verification of intrinsic safety). Make sure to observe IEC/EN 60079-14 and IEC/EN 60079-25.

If more channels of one device are connected in parallel, ensure the parallel connection is made directly at the terminals of the device. When verifying the intrinsic safety, observe the maximum values for the parallel connection.

If no  $L_o$  and  $C_o$  values are specified for the simultaneous appearance of lumped inductances and capacitances, the following rule applies.

- The specified value for  $L_o$  and  $C_o$  is used if one of the following conditions applies:
  - The circuit has distributed inductances and capacitances only, e. g., in cables and connection lines.
  - The total value of  $L_i$  (excluding cable) of the circuit is  $< 1\%$  of the specified  $L_o$  value.
  - The total value of  $C_i$  (excluding cable) of the circuit is  $< 1\%$  of the specified  $C_o$  value.
- A maximum of 50 % of the specified value for  $L_o$  and  $C_o$  is used if the following condition applies:
  - The total value of  $L_i$  (excluding cable) of the circuit is  $\geq 1\%$  of the specified  $L_o$  value.
  - The total value of  $C_i$  (excluding cable) of the circuit is  $\geq 1\%$  of the specified  $C_o$  value.
- The reduced capacitance for gas groups I, IIA and IIB must not exceed the value of  $1\ \mu\text{F}$  (including cable). The reduced capacitance for gas group IIC must not exceed the value of  $600\ \text{nF}$  (including cable).

## Surrounding Enclosure

Place warning marking "Warning – Refer to instruction manuals!" visibly on the surrounding enclosure.

Place warning marking "Warning – Non-intrinsically safe circuits protected by internal cover with a degree of protection IP30!" visibly on the surrounding enclosure.

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

Place warning marking "Warning – Avoid electrostatic charge!" visibly on the surrounding enclosure.

The surrounding enclosure when energized may be opened for maintenance in Zone 1 provided that the following conditions are met:

- The connections of the non-intrinsically safe circuits must be protected by a cover with a degree of protection IP30.
- All other devices in the surrounding enclosure must permit the opening of the surrounding enclosure when energized in Zone 1.
- An appropriate marking is placed on the surrounding enclosure.

## Operation, Maintenance, Repair

Prior to using the device you should make yourself familiar with the device and carefully read the instruction manual.

Substitution of components may impair intrinsic safety.

Do not use a damaged or polluted device.

Only use accessories specified by the manufacturer.

The device must not be repaired, changed or manipulated.

If there is a defect, always replace the device with an original device from Pepperl+Fuchs.

Only remove the device with the corresponding mounting tool. The mounting tool requires a two-stage removing procedure.

1. Unlock
2. Remove

Push the module into the slot until all rear catches have audibly engaged in position. The module must engage twice.

Do not push the modules into the slots with too much force. The rear connections of the devices may be damaged if using excessive force. In this case the explosion protection can no longer be ensured.

Observe IEC/EN 60079-17 for maintenance and inspection of associated apparatus.

The surrounding enclosure when energized may be opened for maintenance in Zone 1 provided that the following conditions are met:

- The connections of the non-intrinsically safe circuits must be protected by a cover with a degree of protection IP30.
- All other devices in the surrounding enclosure must permit the opening of the surrounding enclosure when energized in Zone 1.
- An appropriate marking is placed on the surrounding enclosure.

Except for FB I/O modules with Ex e connections, all FB I/O modules, FB power supplies, and FB com units may be swapped in Zone 1 while energized (hot swap).

#### **Requirements for Cables and Connection Lines**

Observe the following points when installing cables and connection lines:

Observe the permissible core cross-section of the conductor.

The insulation stripping length must be considered.

When installing the conductors the insulation must reach up to the terminal.

If you use stranded conductors, crimp wire end ferrules on the conductor ends.

Never pull the cable. A wire could become loose from the terminal and protection against electric shock can no longer be ensured. Always pull the terminal.

Unused cables and connection lines must be either connected to terminals or securely tied down and isolated.

#### **Delivery, Transport, Disposal**

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.

Store the device in a clean and dry environment. The permitted ambient conditions (see datasheet) must be considered.

Disposing of device, packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.