

# Operating Instructions

Overvoltage protection in two-wire technology

## B63-48, B63-32

For 4 ... 20 mA/HART, Profibus PA and Foundation Fieldbus circuits



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**VEGA**

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### Safety instructions for Ex areas



Take note of the Ex specific safety instructions for Ex applications. These instructions are attached as documents to each instrument with Ex approval and are part of the operating instructions manual.

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# 1 About this document

## 1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup as well as important instructions for maintenance, fault rectification, the exchange of parts and the safety of the user. Please read this information before putting the instrument into operation and keep this manual accessible in the immediate vicinity of the device.

## 1.2 Target group

This operating instructions manual is directed to trained personnel. The contents of this manual must be made available to the qualified personnel and implemented.

## 1.3 Symbols used



### Document ID

This symbol on the front page of this instruction refers to the Document ID. By entering the Document ID on [www.vega.com](http://www.vega.com) you will reach the document download.



### Information, tip, note

This symbol indicates helpful additional information.



**Caution:** If this warning is ignored, faults or malfunctions can result.



**Warning:** If this warning is ignored, injury to persons and/or serious damage to the instrument can result.

**Danger:** If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.



### Ex applications

This symbol indicates special instructions for Ex applications.



### SIL applications

This symbol indicates instructions for functional safety which must be taken into account particularly for safety-relevant applications.



### List

The dot set in front indicates a list with no implied sequence.



### Action

This arrow indicates a single action.



### Sequence of actions

Numbers set in front indicate successive steps in a procedure.



### Battery disposal

This symbol indicates special information about the disposal of batteries and accumulators.

## 2 For your safety

### 2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.

During work on and with the device the required personal protective equipment must always be worn.

### 2.2 Appropriate use

B63-48, B63-32 are overvoltage arresters in two-wire technology for installation in VEGA sensors of the plics® family.

You can find detailed information about the area of application in chapter "*Product description*".

### 2.3 Warning about incorrect use

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overflow or damage to system components through incorrect mounting or adjustment. Thus damage to property, to persons or environmental contamination can be caused. Also the protective characteristics of the instrument can be influenced.

### 2.4 General safety instructions

This is a state-of-the-art instrument complying with all prevailing regulations and directives. The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for the trouble-free operation of the instrument. When measuring aggressive or corrosive media that can cause a dangerous situation if the instrument malfunctions, the operator has to implement suitable measures to make sure the instrument is functioning properly.

During the entire duration of use, the user is obliged to determine the compliance of the necessary occupational safety measures with the current valid rules and regulations and also take note of new regulations.

The safety instructions in this operating instructions manual, the national installation standards as well as the valid safety regulations and accident prevention rules must be observed by the user.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden. For safety reasons, only the accessory specified by the manufacturer must be used.

To avoid any danger, the safety approval markings and safety tips on the device must also be observed and their meaning looked up in this operating instructions manual.

## 2.5 Safety label on the instrument

The safety approval markings and safety tips on the device must be observed.

## 2.6 EU conformity

The device fulfils the legal requirements of the applicable EU directives. By affixing the CE marking, we confirm successful testing of the product.

You can find the CE Certificate of Conformity in the download section under "[www.vega.com](http://www.vega.com)".

## 2.7 Installation and operation in the USA and Canada

This information is only valid for USA and Canada. Hence the following text is only available in the English language.

Installations in the US shall comply with the relevant requirements of the National Electrical Code (ANSI/NFPA 70).

Installations in Canada shall comply with the relevant requirements of the Canadian Electrical Code

## 2.8 Environmental instructions

Protection of the environment is one of our most important duties.

That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfil this obligation by observing the environmental instructions in this manual:

- Chapter "*Packaging, transport and storage*"
- Chapter "*Disposal*"

## 3 Product description

### 3.1 Configuration

#### Scope of delivery

The scope of delivery encompasses:

- Overvoltage arrester B63-48, B63-32
- O-ring seal<sup>1)</sup>
- Documentation
  - This operating instructions manual
  - Ex specific safety instructions and, if necessary, further certificates

#### Constituent parts

The following illustration shows the structure of B63-48, B63-32:

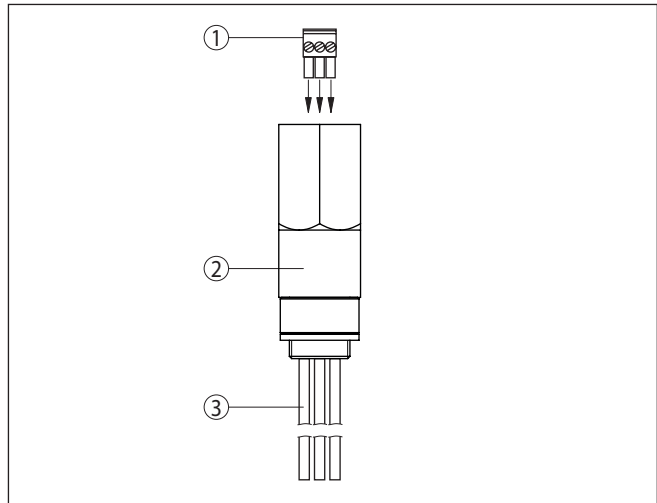


Fig. 1: Configuration of B63-48, B63-32

- 1 Terminals for the signal cable input (unprotected side)
- 2 B63-48, B63-32
- 3 Signal cable output to the sensor (protected side)

### 3.2 Principle of operation

#### Application area

The overvoltage arresters B63-48, B63-32 are completely enclosed in a stainless steel housing. They can be used for VEGA sensors of the plics® family.

- Type B63-48 for 4 ... 20 mA and 4 ... 20 mA/HART sensors
- Type B63-32 for Profibus PA and Foundation Fieldbus sensors

#### Functional principle

B63-48, B63-32 overvoltage arresters reduce any voltage surges that may reach the signal cables to a harmless level. The devices contain voltage-limiting components as well as gas conductors for bleeding off impulses of up to 10 kA to ground.

<sup>1)</sup> Is only used with version thread M20 x 1.5

### 3.3 Packaging, transport and storage

#### Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test based on ISO 4180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

#### Transport

Transport must be carried out in due consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

#### Transport inspection

The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

#### Storage

Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages must be stored only under the following conditions:

- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration

#### Storage and transport temperature

- Storage and transport temperature see chapter "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 ... 85 %

#### Lifting and carrying

With instrument weights of more than 18 kg (39.68 lbs) suitable and approved equipment must be used for lifting and carrying.

## 4 Mounting instructions

B63-48, B63-32 overvoltage arresters are screwed into the position of the cable gland on the sensor housing. The thread of the overvoltage arrester must match with the thread on the sensor housing. The cable gland of the sensor is screwed into the overvoltage arrester. No further assembling necessary.

**Note:**

The attached O-ring seal must be used to reach the housing protection rating of the sensor with version M20 x 1.5.

**Note:**

In order to reach the housing protection rating of the sensor, PTFE gasket strip must be used with the ½ NPT version. First of all, screw in by hand; if necessary, use grease and finally tighten with a ½ turn with a SW 27 wrench.<sup>2)</sup>

<sup>2)</sup> Do not use any grease for sensors with plastic housing



## 5 Connecting to power supply

### 5.1 Preparing the connection

#### Note safety instructions

Always keep in mind the following safety instructions:

- Connect only in the complete absence of line voltage



#### Danger:

The stainless steel housing of B63-48, B63-32 has no electrical function and therefore provides no internal or external connection to ground or potential equalization.

The plant operator is responsible for ensuring an adequate connection, for example within the context of protective grounding, depending on the installation and protection rating.

The B63-48, B63-32 exhibit a voltage resistance of 0.5 kV for one minute in the signal circuit with respect to the stainless steel housing, but not with respect to the green/yellow cable in the sensor circuit. This must be taken into account for the electrical installation.

Before starting setup make sure that the power supply corresponds to the specifications on the type label.

### 5.2 Connection procedure

Proceed as follows:

1. Unscrew housing cover of the sensor
2. If a display and adjustment module is present, remove it according to the operating instructions of the sensor
3. Unscrew the cable gland
4. Push the connection cables through the cable gland into the sensor
5. Screw B63-48, B63-32 into the opening of the cable gland according to the description under "*Mounting instructions*"
6. Shorten the connection cables of B63-48, B63-32 to the suitable length, strip off the wire ends approx. 1 cm (0.4 in)



#### Note:

To ensure an effective overvoltage protection, the connection cables should be as short as possible. Unnecessary cable should not be wound up and placed inside the sensor housing. This could influence the protective function of B63-48, B63-32.

7. Connect wire ends red and black according to chapter "*Wiring plan*" and operating instructions of the respective sensor
8. Connect wire end green/yellow to the internal ground terminal in the sensor housing, connect external ground terminal to potential equalisation
9. Pull out terminal block inside B63-48, B63-32 with pliers
10. Push signal cables and screen through the cable gland and connect according to chapter "*Wiring plan*" to the terminals

11. Check all cable connections, especially the ground connection, to make sure they are tightened sufficiently
12. Insert terminal block into its position by using the pliers. A mechanical coding ensures the correct position
13. Screw cable gland into the thread of B63-48, B63-32, tighten compression nut. The seal ring must completely encircle the cable

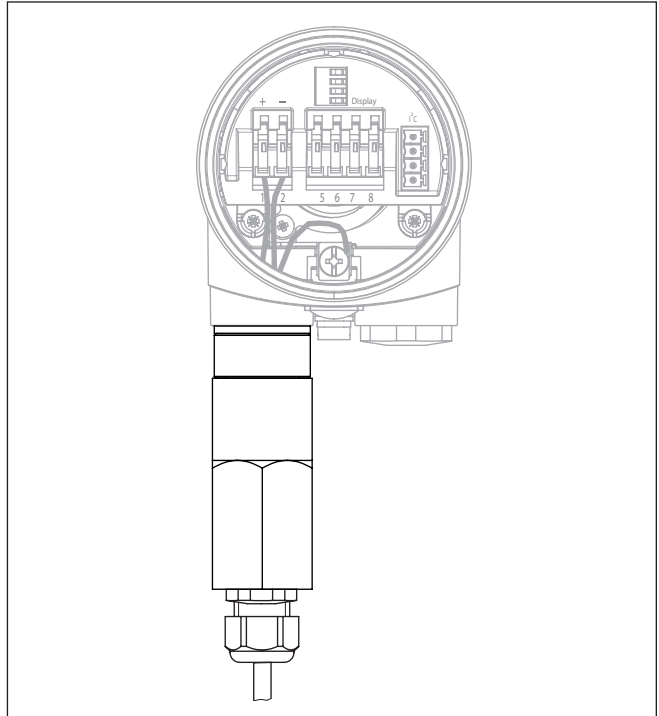


Fig. 2: Overvoltage protection B63-48, B63-32 after installation and connection

14. Screw the housing lid back on  
The electrical connection is finished.

### 5.3 Wiring plan

#### Wiring plan

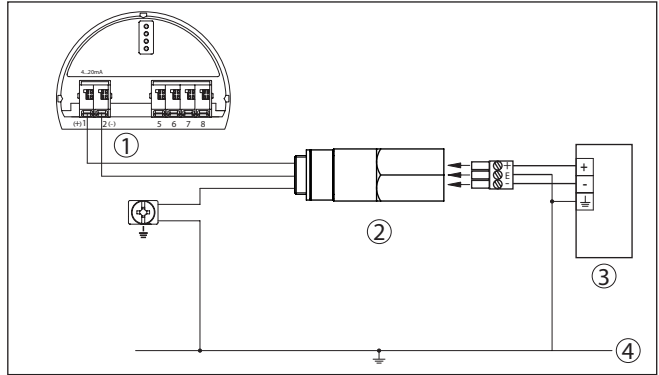


Fig. 3: Wiring schematic B63-32, B63-48

- 1 Sensor
- 2 Overvoltage protection
- 3 Signal conditioning instrument/PLC
- 4 Potential equalisation

Terminals sensor	Wire colour/Polarity
1	Red (+)
2	Black (-)
Ground terminal	Green/Yellow

## 6 Maintenance and fault rectification

### 6.1 Maintenance

If the device is used properly, no special maintenance is required in normal operation.

### 6.2 Rectify faults

#### Reaction when malfunction occurs

The operator of the system is responsible for taking suitable measures to rectify faults.

#### Fault rectification

The first measure to be taken is to check the input/output signal as well as the power supply. In many cases, the causes can be determined and faults can be quickly rectified.

On-site repair of B63-48, B63-32 is not possible.

#### 24 hour service hotline

Should these measures not be successful, please call in urgent cases the VEGA service hotline under the phone no. **+49 1805 858550**.

The hotline is manned 7 days a week round-the-clock. Since we offer this service worldwide, the support is only available in the English language. The service is free, only standard call charges are incurred.

#### Reaction after fault rectification

Depending on the reason for the fault and the measures taken, the steps described in chapter "Set up" may have to be carried out again.

### 6.3 How to proceed if a repair is necessary

You can find an instrument return form as well as detailed information about the procedure in the download area of our homepage: [www.vega.com](http://www.vega.com).

By doing this you help us carry out the repair quickly and without having to call back for needed information.

If a repair is necessary, please proceed as follows:

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and, if need be, also a safety data sheet outside on the packaging
- Please contact the agency serving you to get the address for the return shipment. You can find the agency on our home page [www.vega.com](http://www.vega.com).

## 7 Dismount

### 7.1 Dismounting steps

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

### 7.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the electronics to be easily separable.

#### **WEEE directive 2002/96/EG**

This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws. Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects on humans and the environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you have no way to dispose of the old instrument properly, please contact us concerning return and disposal.

## 8 Supplement

### 8.1 Technical data

#### Note for approved instruments

The technical data in the respective safety instructions are valid for approved instruments (e.g. with Ex approval). These data can differ from the data listed herein, for example regarding the process conditions or the voltage supply.

#### General data

Version	The device can be screwed into the sensor housing instead of the cable gland
Housing material	316Ti
Weight approx.	175 g (0.385 lbs)

#### Electrical characteristics<sup>3)</sup>

Operating voltage/Signal	
– B63-48	9 ... 48 V DC/4 ... 20 mA/HART
– B63-32	9 ... 32 V DC/Profibus PA, Foundation Fieldbus
Leakage current at nominal voltage	< 10 $\mu$ A
Max. permissible current	1 A
Internal resistance	1 $\Omega$
Response voltage (1 kV/ $\mu$ s)	< 76 V
Response time	< 1 $\mu$ s
Discharge current	< 10 kA (8/20 $\mu$ s)
Band width	1 MHz

#### Electromechanical data

Screw terminals for cable cross-section	< 1 mm <sup>2</sup> (AWG 18)
Number of wires	two signal cables, one ground cable
Wire cross-section	1.5 mm <sup>2</sup> (AWG 14)
Cable length	250 mm (9.843 in)

#### Ambient conditions

Ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
Storage and transport temperature	-40 ... +85 °C (-40 ... +185 °F)
Moisture	5 ... +95 % (non-condensing)

#### Electrical protective measures

Protection in assembled and connected state	IP 66/67
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#### Approvals

Instruments with approvals can have different technical specifications depending on the version.

<sup>3)</sup> Reference temperature 25 °C (77 °F).

For that reason the associated approval documents of these instruments have to be carefully noted. They are part of the delivery or can be downloaded under "[www.vega.com](http://www.vega.com)", "*Instrument search (serial number)*" as well as via "*Downloads*" and "*Approvals*".

## 8.2 Dimensions

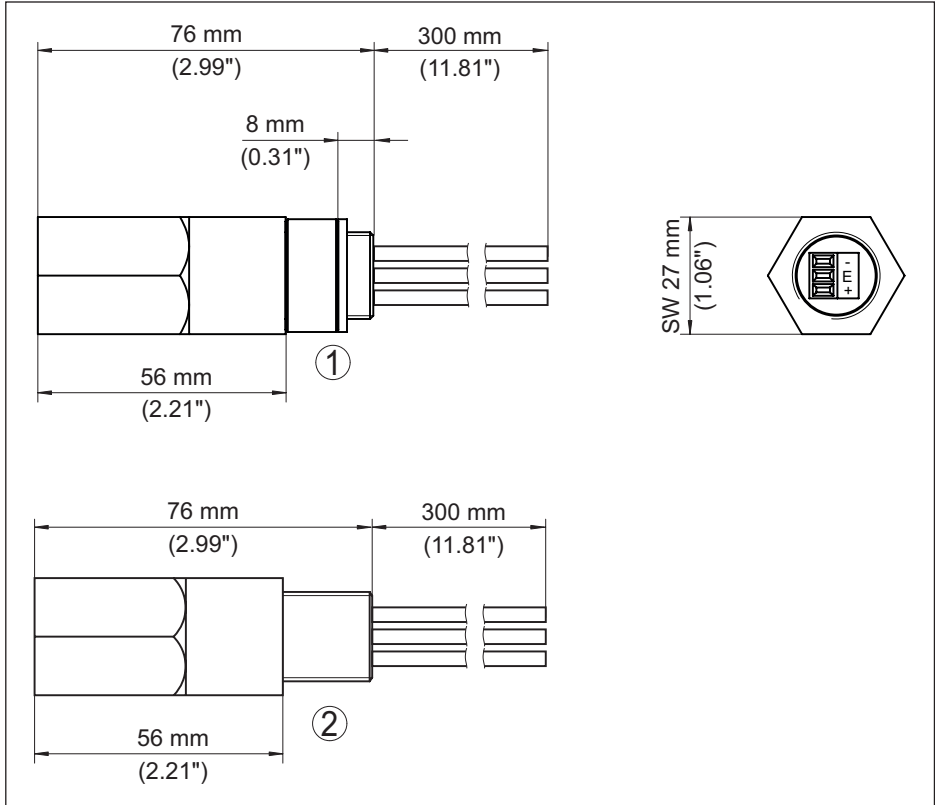


Fig. 4: Dimensions B63-48, B63-32

- 1 Thread M20 x 1.5
- 2 Thread 1/2 NPT

Printing date:

# VEGA

All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

Subject to change without prior notice

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