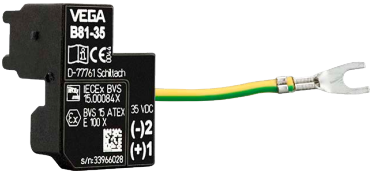
Supplementary instructions

Overvoltage protection

B81-35

For supply and signal cables



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Contents

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1 About this document

1.1 Function

This instruction provides all the information you need for mounting, connection and setup as well as important instructions for maintenance, fault rectification, safety and the exchange of parts. 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 instruction 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 you will reach the document download.

Information, note, tip: This symbol indicates helpful additional information and tips for successful work.

Note: This symbol indicates notes to prevent failures, malfunctions, damage to devices or plants.

Caution: Non-observance of the information marked with this symbol may result in personal injury.

Warning: Non-observance of the information marked with this symbol may result in serious or fatal personal injury.

Danger: Non-observance of the information marked with this symbol results in serious or fatal personal injury.

Ex applications
This symbol indicates special instructions for Ex applications.

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

1 **Sequence of actions**
Numbers set in front indicate successive steps in a procedure.

Disposal
This symbol indicates special instructions for disposal.

2 For your safety

2.1 Authorised personnel

All operations described in this documentation must be carried out only by trained and authorized personnel.

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

2.2 Appropriate use

The overvoltage arrester B81-35 is an accessory part for existing plics® sensors.

2.3 Warning about incorrect use

Inappropriate or incorrect use of this product can give rise to application-specific hazards, e.g. vessel overfill through incorrect mounting or adjustment. Damage to property and persons or environmental contamination can result. Also, the protective characteristics of the instrument can be impaired.

2.4 General safety instructions

The safety information in the operating instructions manual of the respective sensor must be noted.

2.5 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 (NEC - NFPA 70) (USA).

Installations in Canada shall comply with the relevant requirements of the Canadian Electrical Code (CEC Part I) (Canada).

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3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- Overvoltage arrester B81-35
- Screwdriver 2 mm
- Documentation
  - This supplementary instructions manual
  - If necessary, further certificates

Constituent parts

The overvoltage arrester B81-35 consists of a terminal block for the supply and signal cable, a plug connector for the terminals of the sensor electronics and a connection cable for connection to the ground terminal.

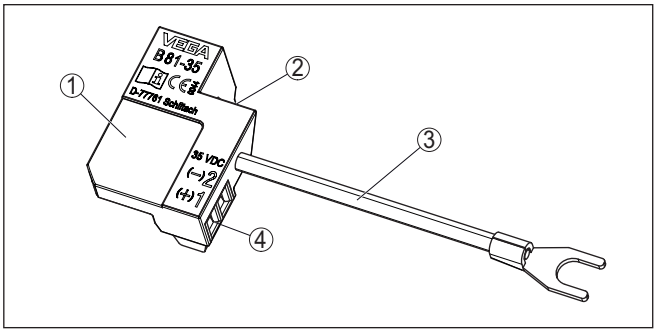

Fig. 1: Configuration, overvoltage arrester B81-35

1 Housing
2 Plug connector for terminals of the sensor electronics (bottom side)
3 Connection cable for connection to the ground terminal
4 Terminal block for supply and signal cable (bottom side)

3.2 Principle of operation

Application area

The overvoltage arrester B81-35 is an accessory part for the following instruments in two-wire technology:

- VEGAPULS series 60 from hardware ≥ 2.0.0, software ≥ 4.0.0
- VEGAPULS 64, 69
- VEGAFLEX 80 series
- VEGABAR series 80
- VEGADIS 82

It is suitable for the following signal outputs:

- 4 … 20 mA
- 4 … 20 mA/HART, 4 … 20 mA/HART SIL
- Profibus PA, Foundation Fieldbus

The overvoltage arrester is used instead of the terminals in the single or double chamber housing.

Functional principle

The overvoltage arrester B81-35 limits voltages on signal cables to a level that is harmless for sensors. As a voltage-limiting component, it contains a gas discharge tube for discharging pulses of up to 10 kA to ground.

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 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 "*Technical data - Ambient conditions*"
- Relative moisture 20 … 85 %

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4 Connecting and mounting

4.1 Preparing the connection

Note safety instructions

Always keep in mind the following safety instructions:

- Connect only in the complete absence of line voltage

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

For effective overvoltage protection, the cables between overvoltage arrester and instrument should be as short as possible.

Cable screening and grounding

If shielded cable is required, we recommend connecting the cable screening on both ends to ground potential. In the sensor, the cable screening should be connected directly to the internal ground terminal. The ground terminal on the outside of the housing must be connected to the ground potential (low impedance).

In Ex systems, grounding is carried out in accordance with the installation regulations. For example, according to DIN EN IEC 60079-14, the cable shielding may only be connected to ground potential on one side.

4.2 Connecting

Connection technology

The connection to voltage supply and the signal output is carried out via screw terminals, the connection to the sensor electronics through contact pins in the housing. The connection to the ground terminal is carried out via a connection cable with cable lug.

Connection procedure

Proceed as follows:

1. Unscrew the housing lid
2. If a display and adjustment module is installed, remove it by turning it to the left
3. Lift the terminal block for the sensor supply from the sensor electronics with a screwdriver and pull it off
4. Loosen compression nut of the cable entry gland
5. Remove approx. 10 cm (4 in) of the cable mantle, strip approx. 1 cm (0.4 in) of insulation from the ends of the individual wires
6. Insert the cable into the sensor through the cable entry
7. Connect the wire ends according to the wiring diagram to the screw termins. You can find the max. wire cross-section under "*Technical data*"
8. Check the hold of the wires in the terminals by lightly pulling on them
9. Connect the connection cable of the overvoltage arrester to the internal ground terminal, connect the external ground terminal to potential equalisation
10. Plug the overvoltage arrester onto the sensor electronics

Fig. 2: Plug the overvoltage arrester onto the sensor electronics - single chamber housing

Fig. 3: Plug the overvoltage arrester onto the sensor electronics - Aluminium single chamber housing

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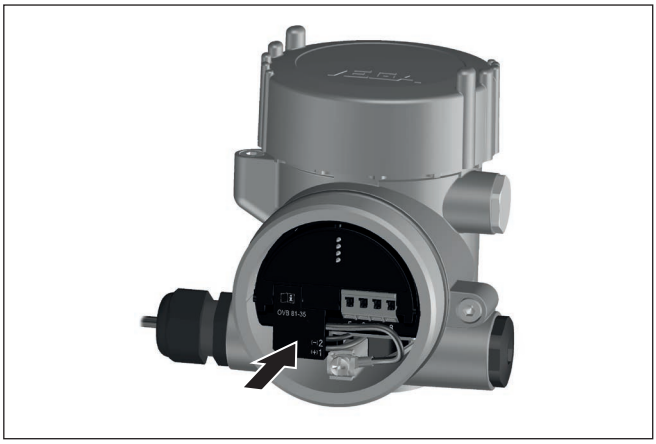

Fig. 4: Plug the overvoltage arrester onto the sensor electronics - double chamber housing

11. Tighten the compression nut of the cable entry gland. The seal ring must completely encircle the cable
12. Reinsert the display and adjustment module, if one was installed
13. Screw the housing lid back on

The electrical connection is finished.

Disassembly is carried out in reverse order.

4.3 Wiring plan

Circuit diagram

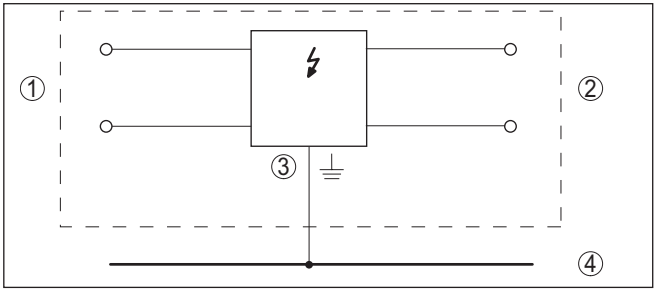

Fig. 5: Circuit diagram B81-35

1 Unprotected side (terminals)
2 Protected side (plug connector)
3 Connection to the inner ground terminal on the sensor
4 Potential equalisation

Electronics and connection compartment

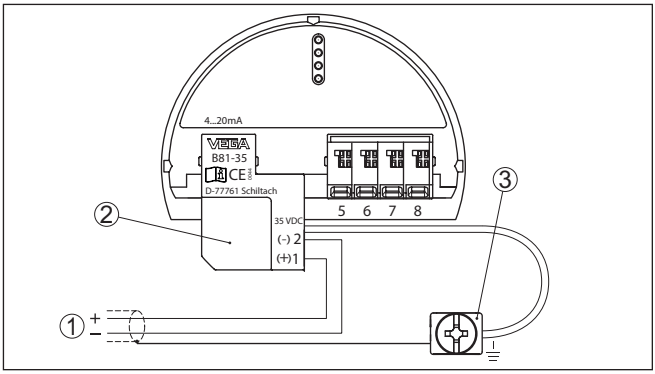

Fig. 6: Electronics and connection compartment, single chamber housing, connection compartment, double chamber housing

1 *Voltage supply/Signal output*
2 *Overvoltage protection*
3 *Ground terminal for connection of the cable screenand the connection cable of the overvoltage arrester*

5 Diagnostics and servicing

5.1 Maintenance

Maintenance

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

5.2 Rectify faults

Reaction when malfunction occurs

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

Causes of malfunction

Maximum reliability is ensured. Nevertheless, faults can occur during operation. These may be caused by the following, e.g.:

- Voltage supply
- Interference on the lines, contact problems

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.

Reaction after fault rectification

Depending on the reason for the fault and the measures taken, the steps described in chapter "*Setup*" must be carried out again or must be checked for plausibility and completeness.

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 also available outside normal working hours, seven days a week around the clock.

Since we offer this service worldwide, the support is provided in English. The service itself is free of charge, the only costs involved are the normal call charges.

5.3 How to proceed if a repair is necessary

On our homepage you will find detailed information on how to proceed in the event of a repair.

So that we can carry out the repair quickly and without queries, generate a instrument return form there with the data of your device.

The following is required:

- The serial number of the instrument
- A short description of the fault
- Details of the medium, if applicable

Print the generated instrument return form.

Clean the instrument and pack it damage-proof.

Send the printed instrument return form and possibly a safety data sheet together with the device.

You will find the address for the return on the generated instrument return form.

6 Dismount

6.1 Dismounting steps

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

6.2 Disposal

Pass the instrument on to a specialised recycling company and do not use the municipal collecting points.

Remove any batteries in advance, if they can be removed from the device, and dispose of them separately.

If personal data is stored on the old device to be disposed of, delete it before disposal.

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

7 Certificates and approvals

7.1 Approvals for Ex areas

Approved versions for use in hazardous areas are available or in preparation for the device or the device series.

You can find the relevant documents on our homepage.

7.2 Conformity

The device complies with the legal requirements of the applicable country-specific directives or technical regulations. We confirm conformity with the corresponding labelling.

The corresponding conformity declarations can be found on our homepage.

7.3 Environment management system

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.

Help us to meet these requirements and observe the environmental instructions in the chapters "*Packaging, transport and storage*", "*Disposal*" of this instructions manual.

8 Supplement

8.1 Technical data

Note for approved instruments

The technical data in the respective safety instructions which are included in delivery 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.

All approval documents can be downloaded from our homepage.

General data	
Version	Module for inserting into the sensor electronics
Housing material	PA

Electrical characteristics	
Highest continuous operating voltage	35 V DC
Max. permissible input current	500 mA
DC response voltage	600 V -20 %/+35 %
Impulse response voltage	
– 100 V/µs	850 V
– 1000 V/µs	1100 V
Discharge current	< 10 kA (8/20 µs)
Category according to DIN EN 61643-21	C1 (2 kV/1 kA)
Overload failure mode	1
signal transmission	4 … 20 mA, 4 … 20 mA/HART, fieldbus
Functional safety	SIL non-reactive

Electromechanical data	
Wire cross-section, screw terminals	
– Massive wire	1.5 mm^2
– Stranded wire with end sleeve	0.5 mm^2

Ambient conditions	
Ambient, storage and transport temperature	-40 … +80 °C (-40 … +176 °F)

Electrical protective measures	
Protection rating	
– unassembled	IP20
– Mounted into the sensor housing	according to housing protection

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8.2 Dimensions

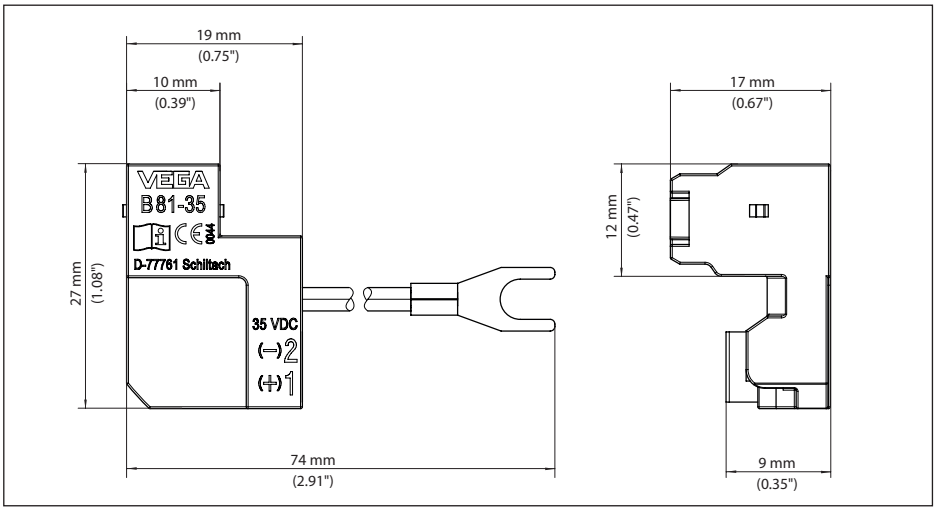

Fig. 7: Dimensions, overvoltage protection

8.3 Industrial property rights

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8.4 Trademark

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