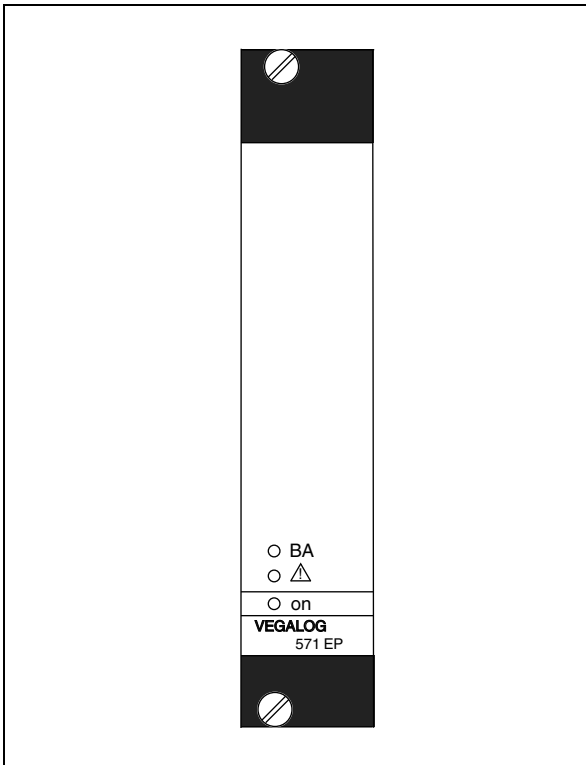


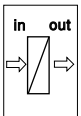
Operating Instructions

VEGALOG 571 EP (Ex)

Input card Profibus PA



Signal conditioning instruments
and communication



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25681-EN-070529

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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 and fault rectification. 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 should be made available to these personnel and put into practice by them.

1.3 Symbolism used



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.



List

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



Action

This arrow indicates a single action.



Sequence

Numbers set in front indicate successive steps in a procedure.

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 operator.

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

2.2 Appropriate use

Together with the VEGALOG 571 processing system, the VEGALOG 571 EP module card is used as input for Profibus PA sensors.

You can find detailed information on the application range in chapter "*Product description*".

Reliability is only ensured if the instrument is used as it was intended according to the specifications in the operating instructions manual as well as possible supplementary instructions.

Due to 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.

2.3 Warning about misuse

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.

2.4 General safety instructions

This is a high-tech instrument requiring the strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating instructions manual, the country-specific installation standards as well as all prevailing safety regulations and accident prevention rules.

The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for trouble-free operation of the instrument.

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

2.5 CE conformity

The protection goals of the EMC Directive 2004/108/EC (EMC) and the Low Voltage Directive 2006/95/EC (LVD) are fulfilled.

Conformity has been judged according to the following standards:

EMC: EN 61326: 1997

(electrical instruments for control technology and laboratory use - EMC requirements)

- Emission: Class A
- Susceptibility: Industrial areas

LVD: EN 61010-1: 1993

(safety regulations for electrical measurement, control and laboratory instruments - part 1: General requirements)

VEGALOG 571 EP is designed for use in an industrial environment. Nevertheless, electromagnetic interference from electrical conductors and radiated emissions must be taken into account, as is usual with a class A instrument according to EN 61326. If VEGALOG 571 EP is used in a different environment, the electromagnetic compatibility to other instruments must be ensured by suitable measures.

2.6 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:

- 19" module card VEGALOG 571 EP
- Documentation
 - this operating instructions manual
 - Ex-specific "*Safety instructions*" (with Ex-versions)
 - if necessary, further certificates

3.2 Principle of operation

Area of application

Together with the VEGALOG 571 processing system, the EP card (input Profibus) is used as input card for Profibus PA sensors. All VEGA Profibus PA sensors can be connected. Instruments of other manufacturers can be used if they support the Profibus-PA AI profile (continuous sensors). The DI profile for switching instruments, however, is not supported.

The following two versions are available:

- EP card, for max. 15 Profibus PA sensors
- EP Ex card, for max. 10 Profibus PA sensors in Ex area

Functional principle

The EP card is used as input card for Profibus PA sensors. It recognises VEGA sensors by means of their serial number and assigns automatically a bus address. For instruments of other manufacturers, the Profibus address must be assigned separately on each instrument as usual.

The voltage supply of the sensors, the sensor measuring signals as well as the parameter adjustment commands are transmitted on the same bus cable.

In conjunction with the communication card VEGACOM 557 Profibus DP, which occupies only one address on the Profibus DP, the VEGALOG 571 processing system acts like a link.

The EP(Ex) card forms the master for the Profibus PA, the DP card a slave on the Profibus DP.

Supply

The module card is powered by the common power supply unit of the VEGALOG system.

You can find detailed specifications on voltage supply in chapter "*Technical data*" in the "*Supplement*".

3.3 Operation

The adjustment of VEGALOG 571 is carried out via a PC which can be connected via the RS232 interface of the CPU. As an alternative, connection via Ethernet and VEGACOM 558 is possible.

The adjustment software PACTware™ with the corresponding DTMs is installed under Windows™ and ensures easy configuration of measuring systems as well as parameter adjustment of connected VEGA sensors. For this purpose, PACTware™ provides a clear adjustment interface with menu structure, window technology and graphic support. In addition, online help is available which describes the available functions and parameter adjustment options. For earlier VEGALOG systems with CPU software 1.xx, the previous software VVO (VEGA Visual Operating) must be used for adjustment.

3.4 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 according to DIN EN 24180.

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 under 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

Storage and transport temperature

- Protected against solar radiation
- Avoiding mechanical shock and vibration
- Storage and transport temperature see "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 ... 85 %

4 Mounting

4.1 General instructions

The module cards of VEGALOG 571 can only be mounted into the 19" carrier BGT LOG 571. It is provided with a special bus board for data transmission between CPU and the individual peripheral cards (LOGBUS). The carrier is designed for mounting into a switching cabinet or 19" housing.

The plug position for the individual cards is individually selectable, the system saves the card positions when switched on.

**Note:**

The plug positions must not be changed after the parameter adjustment because measurement loops that have already been set up would otherwise have to be reconfigured.

4.2 Module

Installation instructions

Provide a module for the VEGALOG 571 EP card. You will find the description in the operating instructions manual "*CPU and carrier*".

**Note:**

The VEGALOG EP card in Ex version must only be used in an Ex module. This Ex module requires also certain distances to neighbouring components and the use of an Ex separating chamber. Also take note of the respectively valid "*Installation and operating conditions*" as well as the special conditions and instructions in the conformity certificates.

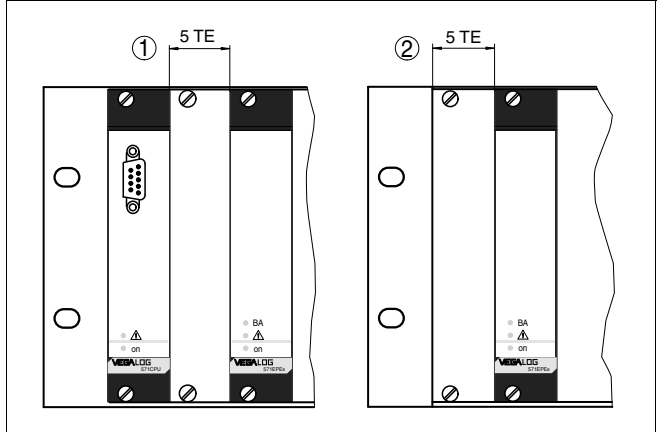


Fig. 1: Min. distances with Ex version
 1 Distance to other module cards
 2 Distance to the carrier

The distance from the soldered side of the EP(Ex) card to other module cards must be at least 10 mm (0.393 in). This distance is ensured by mounting a blind cover with 5 TE width (= width of the front plate EP card) (detail 1).

If the EP(Ex) card is mounted on the left of the carrier BGT LOG 571, a blind cover with 5 TE width must be mounted next to the module of the card (detail 2).

Separation from non-intrinsically safe circuits

A separating wall between the connection positions of the intrinsically safe and non-intrinsically safe circuits must be inserted so that the min. distance of 50 mm (1.97 in) is maintained. When using an Ex separating chamber (supplied with the Ex module), the requirement is fulfilled.

Protection EP Ex-card

With EP Ex module card, protection IP 20 must be maintained. Gaps and free modules must be covered in front by respective blind covers

4.3 Coding

A mechanical coding system avoids later interchanging of the various module cards in the carrier.

The coding system consists of:

- two coded pins in the multipoint connector
- two holes in the male multipoint connector of the respective component

The coded pins are attached to the module.

Equip the female multipoint connector with the two coded pins according to the "Coding chart" and "Position of the coded pins". The function coding points out that these are module cards of VEGALOG. The instrument coding is used to differentiate between the individual module cards.

The male multipoint connectors of the individual module cards point to the holes matching the pin positions.

	Instrument coding	Function coding
CPU card	a1	c3
EP card	a3	c3 and c23 with Ex
AA card	a5	c3
AR card	a7	c3
AT card	a9	c3
EA card	a11	c3
VEGACOM 557	a27	c3, c11
VEGACOM 558	a29	c11
VEGASTAB 593	--	--

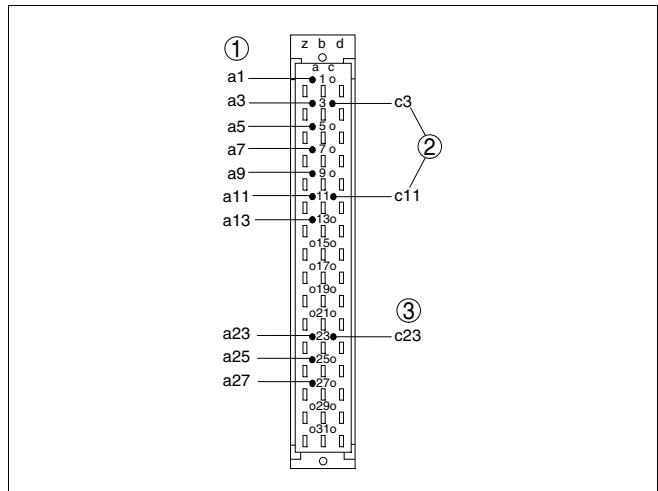


Fig. 2: Positioning of the coded pins on the male multipoint connector

- 1 Instrument coding
- 2 Function coding
- 3 Ex coding

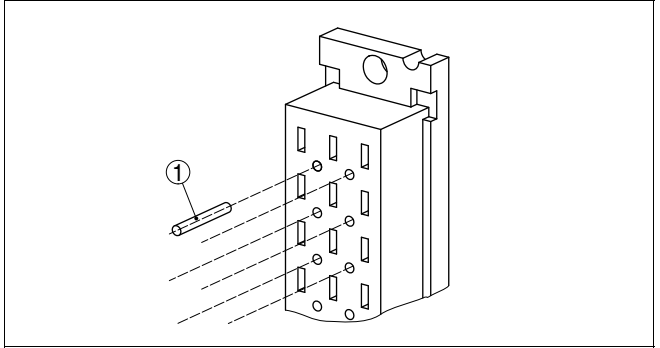


Fig. 3: Detail coded pin mounting
1 Coded pin

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
- If overvoltage surges are expected, overvoltage arresters should be installed

Take note of safety instructions for Ex applications



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

Select power supply

The module card is powered by the common power supply unit of the VEGALOG system.

You can find detailed specifications on voltage supply in chapter "*Technical data*" in the "*Supplement*".

5.2 Connection cable and bus configuration

For the connection technology, take note of "*Profibus directive of the Profibus user organisation e.V.*" (order no. 2.141) as well as the Profibus specification.

The connection cables must be specified for the expected operating temperatures and must have an outer diameter of 6 ... 12 mm to ensure the seal effect of the cable gland on the sensor.

Only screened cable can offer reliable protection against electromagnetic interference. Screened and twisted cables are hence prescribed according to the Profibus specification (IEC 61158-2).

Connection resistance on Profibus PA

The EP(Ex) card generates together with the cable a bus segment, the beginning and end of which must be terminated by a bus termination. This termination is made via two terminating resistors. In Ex area, they must have an appropriate approval.



Note:

A terminating resistor is already permanently integrated in the EP(Ex) cards. Hence only one termination of the bus end is necessary.

Screening

According to the Profibus specification, the screening should be carried out on two ends. To avoid potential equalization currents, a potential equalisation system must be available apart from the screening.

For grounding on both sides in non-Ex area, the cable screen can be also connected on one ground side capacitively to ground potential. Make sure that a low impedance ground connection (fundamental, plate or mains earth) is used.

Profibus PA in Ex area

When used in Ex areas, a PA bus including all connected instruments must be setup in flame proofing intrinsic safety "i". With four-wire instruments requiring a separate power supply, at least the PA connection must be in intrinsic safety. VEGA sensors for PA Ex environment are generally in two-wire instruments.

Connection cable and lengths

The connection cables must correspond to the Profibus specification and the FISCO model. The sensor cable must correspond to the values of the reference cable according to IEC 61158-2.

The following three factors must be taken into account for calculating the max. line length:

- Transmission speed
- Bus structure (cable sections, branch cable)
- Current consumption of all sensors [mA]

Transmission speed

Up to 31.25 bits/s

- Max. 1900 m Profibus PA
- Max. 1000 m Profibus PA in Ex area

Bus structure (cable sections, branch cable)

Each branch >1.2 m is a branch cable, max. number of branch cables = 24.

Max. lengths of the branch cables:

- 1 ... 12 branch cable = 120 m each (Ex: 30 m)
- 13 ... 18 branch cable = 60 m each (Ex: 30 m)
- 19 ... 24 branch cable = 30 m each (Ex: 30 m)

Length of all cable sections + length of all branch cables = cable length.

The total length of the cable must not exceed 1900 m (1000 m with Ex).

Current consumption of all sensors [mA]

The current consumption of all connected sensor types must be added together. The max. cable length [m] is shown in the diagrams.

VEGA sensor type	Current consumption
VEGASON 51P ... 53P 54P ... 56P 61 ... 63 64, 65 (four-wire)	10 mA; ± 1 mA 45 mA with $U_{\text{Terminal}} = 24$ V 10 mA, ± 0.5 mA 10 mA, ± 0.5 mA
VEGAPULS 51P ... 54P 42P ... 45P 61 ... 68	10 mA; ± 1 mA 10 mA; ± 1 mA 10 mA, ± 0.5 mA
VEGAFLEX 51P, 52P 61 ... 67	10 mA; ± 1 mA 10 mA, ± 0.5 mA
VEGABAR 40 ... 44 52 ... 54 61 ... 67	10 mA; ± 1 mA 10 mA, ± 0.5 mA 10 mA, ± 0.5 mA
D series D90 ... D97	10 mA; ± 1 mA
VEGACAL 62 ... 66	10 mA, ± 0.5 mA
VEGACAP	11.5 mA; ± 1 mA

Cable lengths with PA reference cable type A (44 Ohm/km;
0.8 mm)

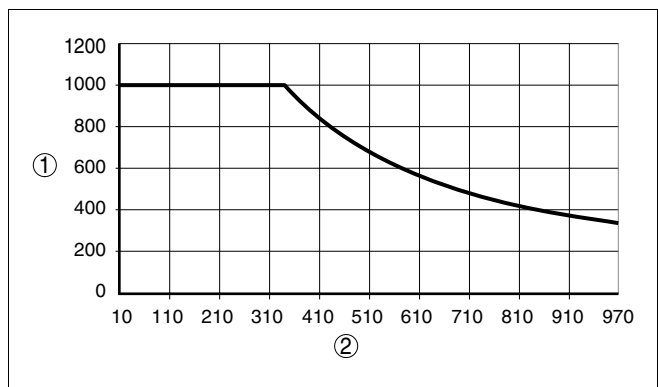


Fig. 4: Cable length in non-Ex area

- 1 Max. cable length in m
- 2 Current consumption of all connected sensors in mA

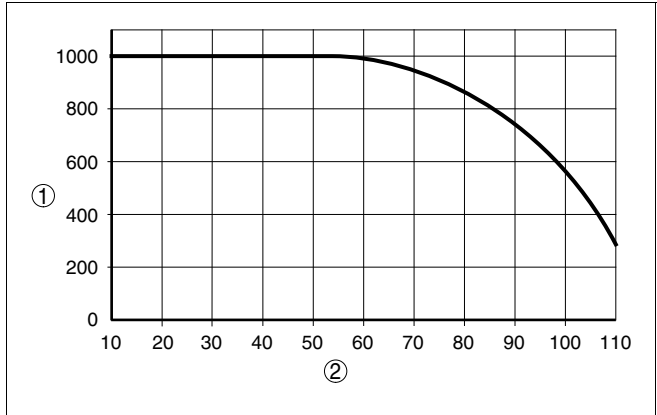


Fig. 5: Cable length in Ex area

- 1 Max. cable length in m
- 2 Current consumption of all connected sensors in mA

Recommended bus cable types

Manufacturer/T-type	Siemens Sinec 6XV1 830-5AH10	Siemens Sinec L26XV1 830-35H10	Lapp UNI-TRONIC® BUS PA
R _{DC}	44 Ohm/km	44 Ohm/km	44 Ohm/km
Number of cores	2	2	2
A [mm ²]	0.75	0.75	0.75
Z _{31.25 kHz}	100 ±20 Ohm	100 ±20 Ohm	100 ±20 Ohm
C [nF/km]	<90	<90	<90
Damping	<3 dB/km 39 kHz	<3 dB/km 39 kHz	<3 dB/km 39 kHz
Screen	Cu braiding	Cu braiding	Cu braiding

5.3 Wiring plan

EP card

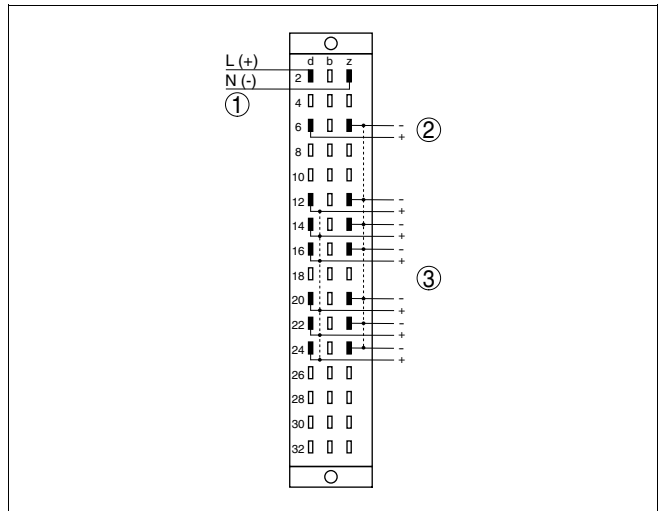


Fig. 6: VEGALOG 571 EP¹⁾

- 1 Voltage supply for VEGALOG 571 EP
- 2 Voltage supply for Profibus PA
- 3 max. 15 sensors (max. 500 mA)



Note:

The external voltage supply for Profibus PA is generally necessary and must correspond to the Profibus directives (IEC 61158-2). This applies also to the connection of four-wire sensors with separate voltage supply. You can find detailed specifications to voltage supply in chapter "*Technical data*" in the "*Supplement*".

¹⁾ Broken lines = Connections on the EP card.

EP card Ex version

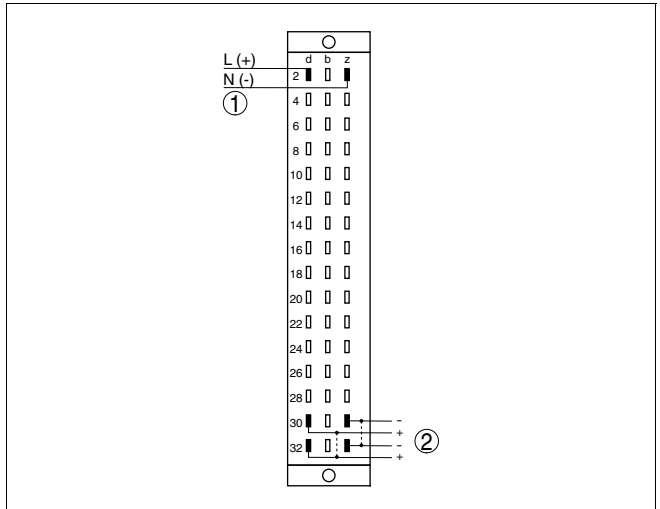


Fig. 7: VEGALOG 571 EP Ex²⁾
 1 Voltage supply for VEGALOG 571 EP and PA sensors
 2 max. 10 sensors (max. 110 mA)

²⁾ Broken lines = Connections on the EP card.

6 Set up

6.1 Indicating and adjustment elements

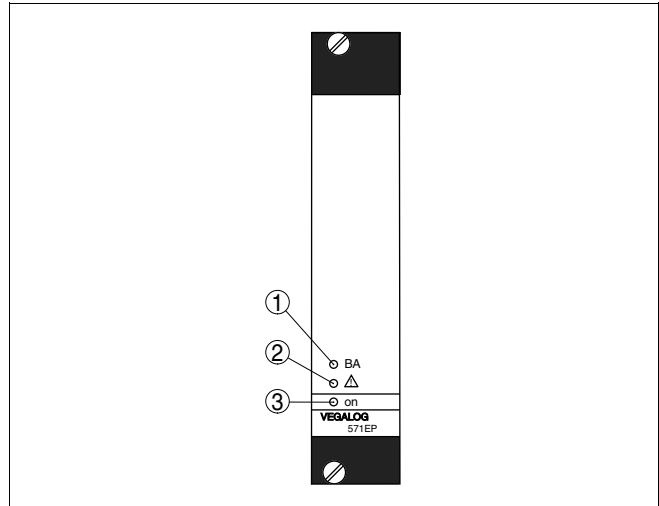


Fig. 8: Indicating and adjustment elements

- 1 LED for bus activity
- 2 LED for fault signal
- 3 LED for operating voltage

Description of the status LEDs

- LED bus activity [1]
 - lights, if there is a valid data exchange
 - flashes during sensor search and addressing
- LED fault signal [2]
 - flashes in case of communication problems on the LOGBUS
 - lights during initialisation and during the self-test
 - lights permanently during a hardware error
- LED operating voltage [3]
 - lights when voltage supply is on

The module cards of the VEGALOG system have no own adjustment elements. All adjustment measures are carried out with the PC through the adjustment software PACTware™. Setup information is available in the operating instructions manual "VEGALOG 571 CPU" as well as in the online help of PACTware™.

6.2 Addressing of the bus participants

In a Profibus system (DP and PA level) each participant, whether master or slave, must have an unambiguous address which can be addressed by the bus system.

Automatic addressing

As a default setting, VEGA Profibus sensors are shipped with address setting 126 (= software addressing). Under this requirement, the EP(Ex) card recognises all VEGA Profibus sensors by means of their serial number and the addressing is carried out automatically. The hardware addressing being usual according to the Profibus standard is deleted.

The hardware addressing must be always carried out for Profibus PA sensors of other manufacturers.



Note:

After switching on the system, it can take up to two minutes until the sensors are recognised and the automatic addressing is finished. The yellow LED flashes also during this period.

In general, the addressing can also be carried out via the hardware addressing. Depending on the instrument version, this carried out with VEGA sensors through:

- DIP address switch
- MINICOM adjustment module
- Indicating and adjustment module



Note:

Make sure that no addresses are used twice. If by error, two or more sensors are assigned to the same address, the system will react with a bus failure, i.e. the data traffic of the corresponding sensors is interfered or the sensors are not recognised.

If an address was already assigned to individual sensors in the total system via hardware addressing, this addressing remains. The EP(Ex) card recognises already assigned addresses and positions additional addresses around the existing ones during the automatic addressing.



Note:

The following addresses are assigned and must not be used in case of a hardware addressing.

- 0 (fix, preset address of the EP(Ex) module card)
- 123 ... 126 (preset addresses for automatic addressing)

Also note the following instructions:

- The supply voltage directly on the sensor must be at least 9 V
- During the parameter adjustment of the PA sensors series 40/50 via VEGACONNECT 3 or MINICOM, indicating and adjustment module, the adjustment and the scaling in the sensor itself should not be modified because this can influence the measured value to be transmitted
- plics[®] sensors are supported from EP firmware version 1.40

7 Maintenance and fault rectification

7.1 Maintenance

When used as directed in normal operation, the module card VEGALOG 571 EP is completely maintenance-free.

7.2 Fault rectification

Causes of malfunction

VEGALOG 571 EP offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.:

- Measured value from sensor not correct
- Supply voltage
- Interference on the cables

Fault clearance

The first measures to be taken are to check the input/output signal as well as evaluate fault messages. The diagnostic information is updated in a 5 sec. cycle.

PACTware™ with the suitable DTM offers comprehensive diagnostics options. The integrated online help offers you additional information. In many cases, the causes can be determined this way and faults can be easily rectified.

24 hour service hotline

However, if these measures are not successful, call the VEGA service hotline in urgent cases under the phone no. **+49 1805 858550**.

The hotline is available to you 7 days a week round-the-clock. Since we offer this service world-wide, the support is only available in the English language. The service is free of charge, only the standard telephone costs will be charged.

Fault messages via LED status indication

The operating condition of the CPU and peripheral cards is displayed via the status LEDs in the front plate.

- LED bus activity (yellow)
 - lights, if there is a valid data exchange
 - flashes during sensor search and addressing
- LED failure message (red)
 - flashes in case of communication problems on the LOGBUS
 - lights during initialisation and during the self-test
 - lights permanently during a hardware error
- LED operating voltage (green)
 - lights when voltage supply is on

7.3 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) from the Internet on our homepage www.vega.com under: "*Downloads - Forms and certificates - Repair form*".

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

- 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 ask the agency serving you for the address of your return shipment. You can find the respective agency on our website www.vega.com under: "*Company - VEGA world-wide*"

8 Dismounting

8.1 Dismounting steps

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

8.2 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 (in Germany, e.g. ElektroG). 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 to persons and environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you cannot dispose of the instrument properly, please contact us about disposal methods or return.

9 Supplement

9.1 Technical data

General data

Series	19" module card for BGT LOG 571
Dimensions	W = 25.4 mm (1 in), H = 128.4 mm (5.06 in), D = 166 mm (6.54 in)
Weight	approx. 400 g (0.882 lbs)

Voltage supply EP card

Operating voltage card (PIN d2, z2)	24 V DC (18 ... 36 V)
max. power consumption	2 W (without sensors)
Operating voltage Profibus (PIN d6, z6)	24 V DC (20 ... 32 V DC) according to IEC 61158-2
max. power consumption	8 W with 15 sensors à 10 mA

Voltage supply EP card Ex version

Operating voltage card (PIN d2, z2)	24 V DC (18 ... 36 V)
max. power consumption	8.5 W with 10 sensors à 10 mA

Electrical connection

Module card	Multipoint connector according to DIN 41612, series F, 48-pole (d, b, z) with coding hole
Module in carrier BGT LOG 571	Suitable female multipoint connector according to DIN 41612 with connection via standard connection technologies

Sensor input

Number of sensors	15x Profibus PA (10x with Ex version)
Kind of input	
– Active input	Sensor power supply by VEGALOG 571 EP
Measured value transmission	
– Profibus DP/DPV-1 protocol	Manchester II coding
Terminal voltage	
– non-Ex version	depending on Profibus PA supply
– Ex version	approx. 12 V
Current limitation	approx. 500 mA (approx. 110 mA with Ex)

Connection cable two-wire Profibus PA cable according to IEC 61158-2

Indications

LED displays

- | | |
|---------------------------------------|---------------|
| – Status indication operating voltage | 1x LED green |
| – Status indication fault signal | 1x LED red |
| – Status indication bus activity | 1x LED yellow |
-

Ambient conditions

Ambient temperature	-20 ... +60 °C (-4 ... +140 °F)
Storage and transport temperature	-20 ... +80 °C (-4 ... +176 °F)

Electrical protective measures

Protection mounted into BGT LOG 571

- | | |
|---|-------|
| – front side completely equipped or covered | IP 40 |
| – upper and lower side | IP 20 |
| – wiring side | IP 00 |

Protection class I (in the carrier BGT LOG 571)

Overvoltage category II

Electrical separating measures

Galvanic separation according to VDE 0106, part 1 (only Ex version) between voltage supply, LOGBUS connection and measuring data outputs

Reference voltage 253 V

9.2 Dimensions

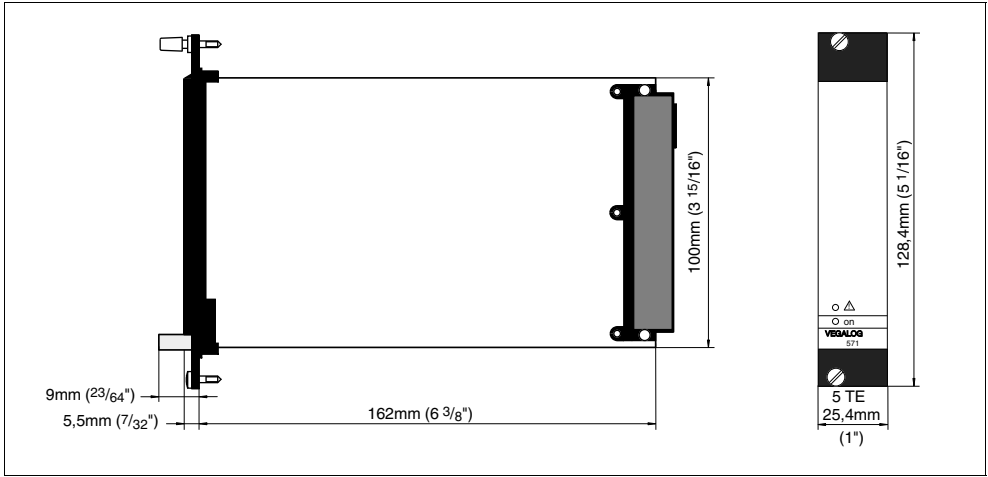


Fig. 9: Dimensions VEGALOG 571 EP



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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.

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