Operating Instructions

Capacitive level switch

VEGAPOINT 11

Transistor with IO-Link

Document ID: 63008

Contents

63008-EN-221012

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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, 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 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, qualified 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

The VEGAPOINT 11 is a sensor for point level detection.

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

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

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

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.

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.

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 (ANSI/NFPA 70).

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

A Class 2 power supply unit has to be used for the installation in the USA and Canada.

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGAPOINT 11 point level switch
- Information sheet " *Documents and software*" with:
  - Instrument serial number
  - QR code with link for direct scanning

Information:
Optional instrument features are also described in this operating instructions manual. The respective scope of delivery results from the order specification.

Scope of this operating instructions

This operating instructions manual applies to the following instrument versions:

- Hardware version from 1.0.1
- Software version from 1.2.5

Constituent parts

The VEGAPOINT 11 consists of the components:

- Housing with integrated electronics
- Process fitting
- Plug

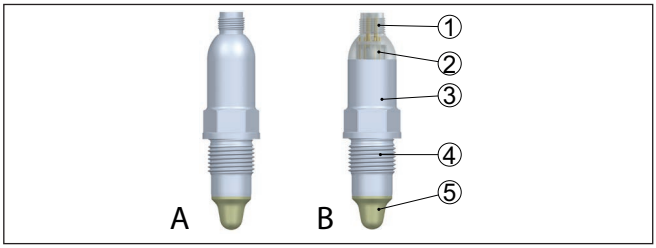

Fig. 1: VEGAPOINT 11

A Device version with full metal housing 316L
B Device version with housing 316L and plastic
1 Plug connection
2 360° status indication
3 Instrument housing
4 Process fitting
5 Sensor

Type label

You will find the type plate on the sensor housing.

The type label contains the most important data for identification and use of the instrument.

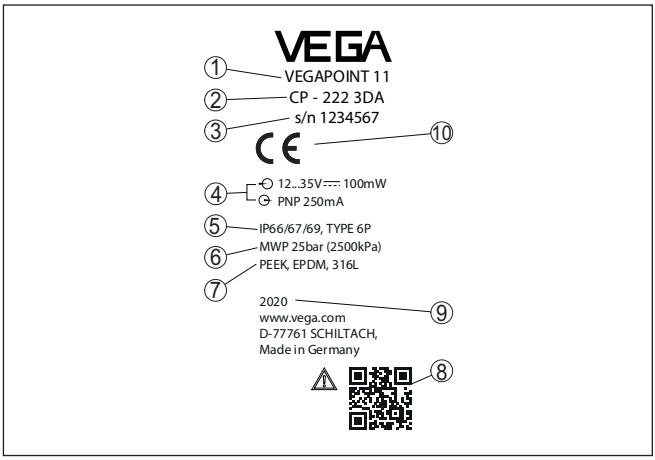

Fig. 2: Layout of the type label (example)

1 *Order number*
2 *Product name*
3 *Serial number*
4 *Voltage supply and signal output*
5 *Protection rating*
6 *Permissible process pressure*
7 *Material wetted parts*
8 *QR code for device documentation*
9 *Fabrication year*
10 *Approvals*

Documents and software

Move to " www.vega.com" and enter in the search field the serial number of your instrument.

There you can find the following information about the instrument:

- Order data
- Documentation
- Software

Alternatively, you can find all via your smartphone:

- Scan the QR-code on the type label of the device or
- Enter serial number manually in the VEGA Tools app (available free of charge in the respective stores)

3.2 Principle of operation

Application area

The VEGAPOINT 11 is a capacitive point level sensor for point level detection

It is designed for industrial use in all areas of process technology and can be used in water-based liquids.

Typical applications are overfill and dry run protection. With a the small sensor unit, VEGAPOINT 11 can be also mounted e.g. in thin pipelines. The sensor allows use in vessels, tanks and pipes. Thanks

to its simple and robust measuring system, VEGAPOINT 11 is virtually unaffected by the chemical and physical properties of the medium.

It functions even under difficult conditions such as turbulence, air bubbles, buildup, strong external vibration or changing products.

If a malfunction is detected or in case of voltage supply, the electronics takes on a defined switching status, i.e. the output is open (safe state).

Functional principle

An alternating electric field is generated at the tip of the measuring electrode. If the sensor is covered with medium, the resonance frequency changes. This change is detected by the electronics and converted into a switching command.

Buildup is ignored to a certain degree and therefore has no influence on the measurement.

3.3 Adjustment

The switching status of VEGAPOINT 11 can be checked from outside (360° status indication).

Note:
The LED illuminated ring is not available for device versions with full metal housing.

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

3.5 Accessories

The instructions for the listed accessories can be found in the download area on our homepage.

Threaded and hygienic socket

Various threaded and hygienic sockets are available for devices with threaded version.

You can find further information in chapter " *Technical Data*".

4 Mounting

4.1 General instructions

Ambient conditions

The instrument is suitable for standard and extended ambient conditions acc. to DIN/EN/IEC/ANSI/ISA/UL/CSA 61010-1. It can be used indoors as well as outdoors.

Process conditions

Note:
For safety reasons, the instrument must only be operated within the permissible process conditions. You can find detailed information on the process conditions in chapter " *Technical data*" of the operating instructions or on the type label.

Hence make sure before mounting that all parts of the instrument exposed to the process are suitable for the existing process conditions.

These are mainly:

- Active measuring component
- Process fitting
- Process seal

Process conditions in particular are:

- Process pressure
- Process temperature
- Chemical properties of the medium
- Abrasion and mechanical influences

Switching point

The VEGAPOINT 11 can be mounted in any position. The instrument must be mounted in such a way that the sensor is at the height of the requested switching point.

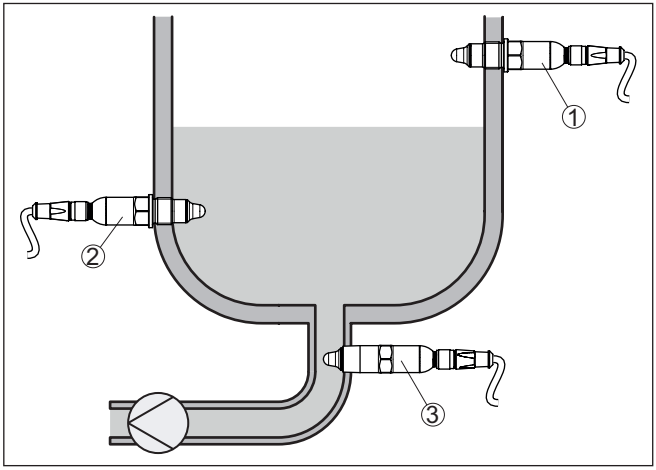

Fig. 3: Installation examples

1 Upper level detection (max.) as overflow protection
2 Lower level detection (min.) as dry run protection
3 Dry run protection (min.) for a pump

Note that the switching point varies depending on the type of medium and the mounting position of the sensor.

Protection against moisture

Protect your instrument against moisture ingress through the following measures:

- Firmly tighten the plug connector
- Lead the connection cable downwards in front of the plug connector

This applies mainly to outdoor installations, in areas where high humidity is expected (e.g. through cleaning processes) and on cooled or heated vessels.

Handling

The level switch is a measuring device for stationary screw mounting and must be treated accordingly. Damage to the measuring tip will destroy the instrument.

Use the hexagon above the thread for screwing in.

After mounting, make sure that the process fitting is screwed in correctly and thus securely seals even at maximum process pressure.

4.2 Mounting instructions

Adhesive products

In adhesive and viscous media, the surfaces of the sensor should protrude into the vessel to avoid buildup. Therefore mounting bosses should not exceed a certain length.

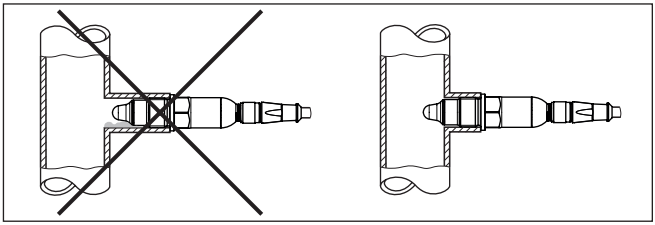

Fig. 4: Adhesive products

In horizontal pipelines, avoid mounting in the upper or lower area of the pipe.

In the upper part of the pipe cavities can form due to air inclusions.

Solids can settle in the lower pipe area. Both can lead to measurement errors.

In horizontal pipelines, lateral installation is therefore recommended.

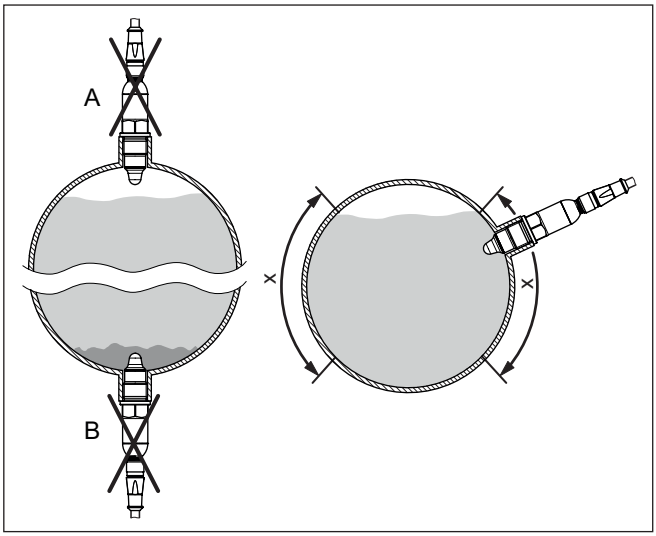

Fig. 5: Installation in horizontal pipelines

x Recommended mounting area
A Not recommended - danger of air inclusions
B Not recommended - Danger of buildup

Inflowing medium

If VEGAPOINT 11 is mounted in the filling stream, unwanted false measurement signals can be generated. For this reason, mount VEGAPOINT 11 at a position in the vessel where no disturbances, e.g. from filling openings, agitators, etc., can occur.

5 Connecting to power supply

5.1 Preparing the connection

Safety instructions

Always keep in mind the following safety instructions:

- Carry out electrical connection by trained, qualified personnel authorised by the plant operator
- If overvoltage surges are expected, overvoltage arresters should be installed

Warning:
Only connect or disconnect in de-energized state.

Voltage supply

The data for power supply are specified in chapter " *Technical data*".

Note:
Power the instrument via an energy-limited circuit (power max. 100 W) acc. to IEC 61010-1, e.g.

- Class 2 power supply unit (acc. to UL1310)
- SELV power supply unit (safety extra-low voltage) with suitable internal or external limitation of the output current

Keep in mind the following additional factors that influence the operating voltage:

- Lower output voltage of the power supply unit under nominal load
- Influence of additional instruments in the circuit (see load values in chapter " *Technical data*")

Connection cable

The instrument is connected with standard four-wire cable. If electromagnetic interference is expected which is above the test values of EN 61326-1 for industrial areas, shielded cable should be used.

Plug connections

Make sure that the cable and the plug used have the required temperature resistance and fire safety for max. occurring ambient temperature.

When mounting outdoors, on cooled vessels or in moist areas in which cleaning is made with steam or high pressure, it is very important that the plug is screwed on correctly.

5.2 Connecting

Instrument versions

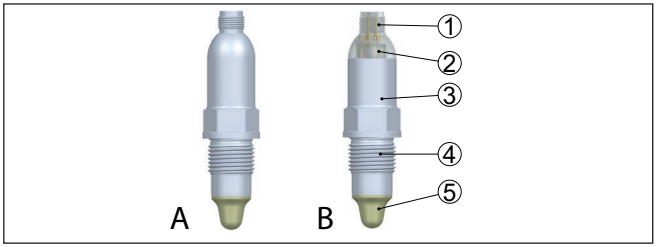

Fig. 6: VEGAPOINT 11 - M12 x 1 plug

A Device version with full metal housing 316L
B Device version with housing 316L and plastic
1 Plug connection
2 360° status indication
3 Instrument housing
4 Process fitting
5 Sensor

M12 x 1 plug connection

This plug connection requires a prefabricated cable with plug. Depending on the version, protection IP66/IP67 or IP69.

5.3 Wiring plan

For connection to binary inputs of a PLC.

M12 x 1 plug

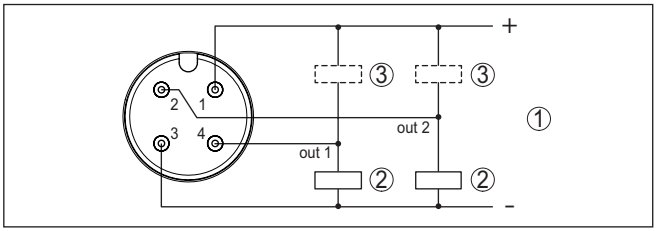

Fig. 7: Wiring plan M12 x 1 plug - Transistor output, three-wire

1 Voltage supply
2 PNP switching
3 NPN switching

Contact, plug connector	Function/Polarity
1	Voltage supply/+
2	Transistor output 2
3	Voltage supply/-
4	Transistor output 1/IO-Link

5.4 Switch-on phase

After switching on, the device first carries out a self-check.

The current measured value is then output on the signal cable.

6 Setup

6.1 Indication of the switching status

The switching status of the electronics can be checked via the 360° status indication (LEDs) integrated in the upper part of the housing.

The colours of the 360° status indication have the following meaning: [1]

- Green lights up - power supply connected, sensor output high-impedance
- Green flashing - Maintenance required
- Yellow lights up - power supply connected, sensor output low impedance
- Red lights - shortcircuit or overload in the load circuit (sensor output high-impedance)
- Red flashing - Error at sensor or electronics (sensor output high impedance) or device is in simulation

6.2 Function table

The following table provides an overview of the switching conditions depending on the set mode and the level (factory setting).

Coverage	**Switching status** [2] **Output 1**	**Switching status** [3] **Output 2**	**Control lamp** [4]
Covered 	open	closed	Green
Uncovered 	closed	open	Yellow
Covered/Uncovered	open	open	Red

6.3 Extended functions

Output

Transistor function

For devices with transistor output, you can set the function of the output.

- Functional principle PNP (Factory setting)
- Functional principle NPN

1) Default setting
2) Default setting
3) Default setting
4) Output 1

With the outputs

Function output (OU1)
In this menu item you can set the function of the two outputs independently of each other.

Closing contact = HNO (Hysterese Normally Open)

Opener = HNC (Hysterese Normally Closed)

Closing contact = FNO (Window Normally Open)

Opener = FNC (Window Normally Closed)

Function output 2 (OU2)
In this menu item you can set the function of the two outputs independently of each other.

The selection options are the same as in output 1.

Hysteresis function (HNO/HNC)
The hysteresis has the task of keeping the switching state of the output stable.

When the switching point (SP) is reached, the output switches and remains in this switching state. Only when the reset point (RP) is reached does the output switch back.

If the measured variable moves between switching and reset point, the state of the output does not change.

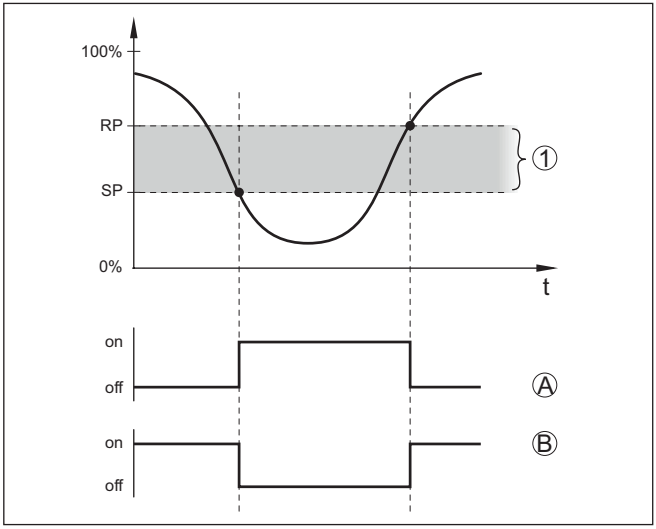

Fig. 8: Hysteresis function

SP Switching point
RP Reset point
A HNO (Hysterese Normally Open) = Closing contact
B HNC (Hysterese Normally Closed) = Opener
t Timeline
1 Hysteresis

Window function (FNO/FNC)
With the window function (FNO and FNC) a nominal range, a so-called window, can be defined.

The output changes its state when the measured variable enters the window between the values Window High (FH) and Window Low (FL). If the measured variable leaves the window, the output returns to its previous state. If the measured variable moves within the window, the state of the output does not change.

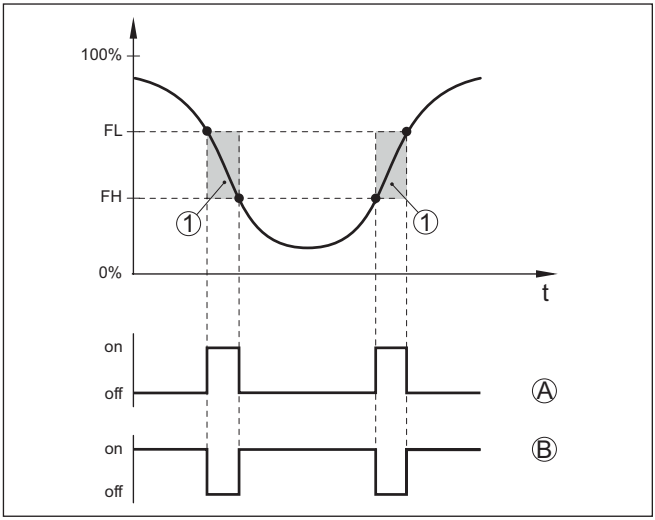

Fig. 9: Window function

FH Window high - upper value
FL Window low - lower value
A FNO (Window Normally Open) = Closing contact
B FNC (Window Normally Closed) = Opener
t Timeline
1 Window area

Switching delay

Here you can adjust the settings for the switching delay.

- Switching delay (DS1)
- Reset delay (DR1)

Switching delay (DS1)
The switching delay (DS) extends the reaction time until the sensor is switched over when the sensor tip is covered.

You can enter a delay time from 0 to 60 seconds.

Reset delay (DR1)
The reset delay (DR) extends the reaction time until the sensor switches over when the sensor tip becomes free.

You can enter a delay time from 0 to 60 seconds.

Switching output

If *User-defined* is selected in the application, you can select the settings for the switching output.

- Switching point (SP1)
- Reset point (RP1)

Switching point (SP1)
The switching point (SP1) indicates the switching threshold of the sensor related to the immersion depth or the degree of coverage.

The percentage defines the lower range limit of the hysteresis.

The setting is a degree for the sensitivity of the sensor tip.

Reset point (RP1)
The reset point (RP) controls the sensitivity of the sensor when the sensor tip becomes free.

The percentage defines the upper range limit of the hysteresis.

The setting is a degree for the sensitivity of the sensor tip.

7 Diagnostics and servicing

7.1 Maintenance

Maintenance

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

Cleaning

The cleaning helps that the type label and markings on the instrument are visible.

Take note of the following:

- Use only cleaning agents which do not corrode the housings, type label and seals
- Use only cleaning methods corresponding to the housing protection rating

7.2 Rectify faults

Reaction when malfunction occurs

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

Causes of malfunction

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

- Sensor
- Process
- Voltage supply
- Signal processing

Fault rectification

The first measure to take is to check the output signal. In many cases, the causes can be determined this way and the faults 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.

7.3 Diagnosis, fault messages

Checking the switching signal

The 360° status indication on the device indicates the operating status of the device. At the same time it indicates the switching state of the output. This enables simple on-site diagnosis without the need for tools.

Error	Cause	Rectification
Green signal lamp off	Voltage supply interrupted.	Check voltage supply and cable connection
	Electronics defective	Exchange the instrument or send it in for repair
Green signal lamp flashes	Maintenance required	Carry out maintenance
Red signal lamp lights (switching output high-impedance)	Error with the electrical connection	Connect device according to wiring plan
	Shortcircuit or overload	Check electrical connection
	Measuring tip damaged	Check whether the measuring tip is damaged
Red signal lamp flashes (switching output high-impedance)	Sensor outside the specification	Check sensor adjustment Switching points may be interchanged
	Sensor is in simulation mode	Terminate simulation mode

Error messages

Information:
You can read out the error codes from the IO-Link data.

Under " *Device Status*" (ISDU 36) you can find the status of the device.

Failure/Error **Red control lamp lights up**		
Error	**Cause**	**Rectification**
F013	no measured value available	Error in the electronics Restart instrument If the error occurs again, replace the device
F080	General software error	Restart instrument
F105	Measured value is determined	Device is still in the switch-on phase Wait until the device is ready for operation
F111	Switching points interchanged	Repeat sensor adjustment The switching point (SP) must be smaller than the reset point (RP)
F260	Error in the calibration	Repeat device adjustment If the error occurs again, replace the device
F261	Error in the instrument settings	Carry out device reset Reset device to delivery status

Out of specification **Red signal lamp flashes**		
Error	**Cause**	**Rectification**
S600	Electronics temperature too high	Error in the electronics Allow device to cool down and restart If the error occurs again, check the ambient temperature

Out of specification **Red signal lamp flashes**		
Error	**Cause**	**Rectification**
S604	Overload on output	Switching output overloaded Check electrical connection Reduce switching load

Function check **Red signal lamp flashes**		
Error	**Cause**	**Rectification**
C700	Simulation active	Terminate simulation mode

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

Proceed as follows in case of repair:

- 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
- Ask the agency serving you to get the address for the return shipment. You can find the agency on our homepage.

8 Dismount

8.1 Dismounting steps

To remove the device, carry out the steps in chapters " *Mounting*" and " *Connecting to power suplly*" in reverse.

Warning:
When dismounting, pay attention to the process conditions in vessels or pipelines. There is a risk of injury, e.g. due to high pressures or temperatures as well as aggressive or toxic media. Avoid this by taking appropriate protective measures.

8.2 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.

9 Certificates and approvals

9.1 Food and pharmaceutical certificates

Versions for use in the food and pharmaceutical industries are available or in preparation for the device or the device series.

The corresponding certificates can be found on our homepage.

9.2 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.

Electromagnetic compatibility

The instruments are 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 61326-1.

When the device is mounted in metal containers or tubes, the interference resistance requirements of IEC/EN 61326 for "Industrial environment" and the NAMUR recommendation EMC (NE21) are met.

If the device is to be used in other environments, the electromagnetic compatibility to other devices must be ensured by suitable measures.

When using communication via IO-Link, the requirements of IEC/EN 61131-9 are fulfilled.

9.3 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 operating instructions.

10 Supplement

10.1 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.

Materials and weights	
Material 316L corresponds to 1.4404	
Materials, wetted parts	
– Sensor tip	PEEK, polished
– Device seal - Standard version	FKM
– Device seal - Hygienic version	EPDM
– Process seal	Klingersil C-4400
– Process fittings	316L
Materials, non-wetted parts	
– Housing	316L and plastic (Polycarbonate) or 316L
– Device seal - Hygienic design AC and AM [5]	EPDM
Weight	approx. 200 g (0.441 lbs)

General data	
Process fittings	
– Pipe thread, cylindrical (DIN 3852-A) or ISO 228-1	G½, G¾, G1
– Pipe thread, conical (ASME B1.20.1)	½ NPT, ¾ NPT, 1 NPT
– Metric fine thread, cylindrical	M24 x 1.5
Threaded and hygienic adapter	
– Standard hygienic adapter	G½, G1 Other connections via hygiene adapters possible
Max. torque - process fitting	
– Thread G½, ½ NPT	50 Nm (37 lbf ft)
– Thread G¾, ¾ NPT	75 Nm (55 lbf ft)
– Thread G1, 1 NPT	100 Nm (73 lbf ft)
– Hygienic adapter	20 Nm (15 lbf ft)
Surface quality	R_a < 0.76 µm (3.00^{-5} in)

Measurement accuracy	
Hysteresis	approx. 1 mm (0.04 in)

5) not in contact with the medium

Switching delay	approx. 500 ms (on/off) Adjustable: 0.5 … 60 s
Repetitive accuracy	± 1 mm (± 0.04 in)

Ambient conditions

Ambient temperature on the housing	-40 … +70 °C (-40 … +158 °F)
Storage and transport temperature	-40 … +80 °C (-40 … +176 °F)

Mechanical environmental conditions

Sinusoidal vibrations	4M8 (5 g) at 4 … 200 Hz according to EN 60068-2-6 (vibration with resonance)
Impacts	50 g, 2.3 ms according to EN 60068-2-27 (mechanical shock)
Impact resistance	IK05 acc. to IEC 62262

Process conditions

Process pressure	-1 … 25 bar/-100 … 2500 kPa (-14.5 … 363 psig)
Process temperature	-20 … +100 °C (-4 … +212 °F)

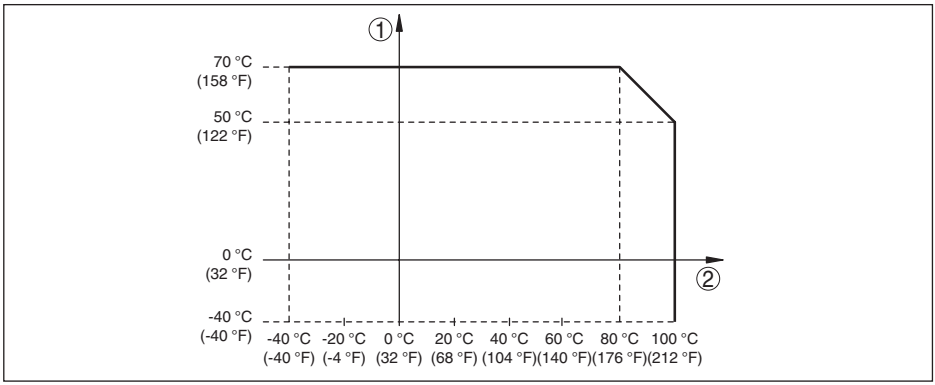

Fig. 10: Dependency ambient temperature to process temperature

1 Ambient temperature in °C (°F)
2 Process temperature in °C (°F)

SIP process temperature (SIP = Sterilization in place)

Vapour stratification up to 1 h	+135 °C (+275 F)
Dielectric constant	≥ 2.0

Indication (NE 107)

360° status indication (LED)

– Green	Power supply on - Output 1 open
– Yellow	Power supply on - Output 1 closed
– Red	Voltage supply on - failure/simulation

Output variable - Transistor output	
Output	Transistor (PNP/NPN)
Load current	max. 250 mA (output, permanently short-circuit proof)
Voltage loss	< 3 V
Switching voltage	< 34 V DC
Blocking current	< 10 µA

Measuring cell temperature	
Range	-40 … +115 °C (-40 … +239 °F)
Resolution	< 0.2 K
Deviation	±3 K
Output of the temperature values via [6]	IO-Link

Voltage supply	
Operating voltage	12 … 35 V DC
Max. power consumption	1 W
Reverse voltage protection	Integrated
Max. power consumption	1 W

Electrical protective measures	
Potential separation	Electronics potential free up to 500 V AC
Protection rating	

Connection technology	Protection according to EN 60529/IEC 529	Protection according to UL 50
M12 x 1 plug	IP66/IP67/IP69	NEMA 6P

Altitude above sea level	up to 5000 m (16404 ft)
Overvoltage category	I
Protection rating (IEC 61010-1)	III
Pollution degree	4

Output variable - Transistor output/IO-Link	
Output signal	Transistor output PNP/NPN
Output signal	IO-Link acc. to IEC 61131-9
Connection technology	Three-wire
Load current	max. 250 mA (output, permanently short-circuit proof)
Overload resistance	yes
Short-circuit resistance	Permanently
Switching voltage	< 34 V DC
Voltage loss	< 3 V
Inverse current PNP	< 10 µA

6) Depending on the instrument version

Inverse current NPN	< 25 µA
Switching time	< 10 ms
Max. cable length to the IO-Link master	20 m (66 ft)
Output	Transistor (PNP/NPN)

10.2 Device communication IO-Link

In the following, the necessary device-specific details are shown. You can find further information of IO-Link on www.io-link.com.

Physical layer

IO-Link specification: Revision 1.1

SIO mode: Yes

Speed: COM2 38.4 kBaud

Min. cycle time 4.0 ms

Length process data word: 32 Bit

IO-Link Data Storage: Yes

Block parameter adjustment: Yes

Direct parameter

Byte	Parameter	HexCode	Note, value
0	-	-	-
1	MasterCycleTime	-	-
2	MinCycleTime	0x28	4 ms
3	M-SequenceCapability	0x2B	Frametypes, SIO-Mode, ISDU
4	Revision ID	0x11	IO-Link Revision 1.1
5	Input process data length	0xC3	4 bytes length (SIO mode available)
6	Output process data length	0x00	Not available
7, 8	VendorID	0x00, 0x62	98
9, 10, 11	DeviceID	0x00, 0x02, 0x00	1024

Process data word

Configuration

Bit	31 (MSB)	…	16	15	…	2	1	0 (LSB)
Sensor	X-value 0.1 % (frequency)			Temperature in °C, resolution 0.1 K			Out2	Out1

Formats

	Value	Type
Out1	1 Bit	Boolean
Out2	1 Bit	Boolean

	Value	Type
Temperature	14 Bit	Integer
X-value	16 Bit	Integer

Events

	HexCode	Type
6202	0x183A	FunctionCheck
6203	0x183B	Maintenance
6204	0x183C	OutOfSpec
6205	0x183D	Failure

Information

Detailed information about error messages can be found under Diagnosis, Error Messages.

Under " *Device Status*" (ISDU 36) you can read out the status of the device.

Device data ISDU

Device data can be parameters, identification data and diagnostic information. They are exchanged acyclically and on request of the IO-Link master. Device data can be written to the sensor (write) or read from the device (read). The ISDU (Indexed Service Data Unit) determines, among other things, whether the data is read or written.

IO-Link specific device data

Designation	ISDU (dez)	ISDU (hex)	Size (Byte)	Data type	Access	Value
Device Access	12	0x000C	-	-	RW	-
Profile Identification	13	0x000D	2	unsigned8[2]	RO	0x40, 0x00
PD-Descriptor	14	0x000E	12	unsigned8[12]	RO	0x01, 0x01, 0x00, 0x01, 0x01, 0x01, 0x03, 0x0E, 0x02, 0x03, 0x0E, 0x10
Vendor Name	16	0x0010	31	String	RO	VEGA Gries-haber KG
VendorText	17	0x0011	31	String	RO	www.vega.com
Product Name	18	0x0012	31	String	RO	VEGAPOINT
Product ID	19	0x0013	31	String	RO	VEGAPOINT 11
Produc tText	20	0x0014	31	String	RO	LevelSwitch
Serial Number	21	0x0015	16	String	RO	-
Hardware Revision	22	0x0016	20	String	RO	-

Designation	ISDU (dez)	ISDU (hex)	Size (Byte)	Data type	Access	Value
Software Revision	23	0x0017	20	String	RO	-
Application Specific Tag	24	0x0018	Max. 31	String	RW	Sensor
Function Tag	25	0x0019	Max. 31	String	RW	-
Location Tag	26	0x001A	Max. 31	String	RW	-
Device Status	36	0x0024	1	unsigned8[2]	RO	-
Detailed Device Status	37	0x0025	12	unsigned8[12]	RO	-
PDin	40	0x0028	4	-	RO	see process word

VEGA-specific device data

Designation	ISDU (dez)	ISDU (hex)	Size (Byte)	Data type	Access	Value range
Measurement loop name (TAG)	256	0x0100	20	String	RW	Sensor
Application	257	0x0101	1	unsigned8	RW	0 = User defined 1 = Standard
Switching point (SP1)	258	0x0102	4	Float	RW	0 … 100 %
Reset point (RP1)	259	0x0103	4	Float	RW	0 … 100 %
Switching delay (DS1)	260	0x0104	4	Float	RW	0 … 60 s
Reset delay (DR1)	261	0x0105	4	Float	RW	0 … 60 s
Switching point (FH1)	262	0x0106	4	Float	RW	0 … 100 %
Reset point (FL1)	263	0x0107	4	Float	RW	0 … 100 %
Switching delay (DS1)	264	0x0108	4	Float	RW	0 … 60 s
Reset delay (DR1)	265	0x0109	4	Float	RW	0 … 60 s
Switching point (SP2)	266	0x010A	4	Float	RW	0 … 100 %
Reset point (RP2)	267	0x010B	4	Float	RW	0 … 100 %
Switching delay (DS2)	268	0x010C	4	Float	RW	0 … 60 s
Reset delay (DR2)	269	0x010D	4	Float	RW	0 … 60 s
Switching point (FH2)	270	0x010E	4	Float	RW	0 … 100 %
Reset point (FL2)	271	0x010F	4	Float	RW	0 … 100 %
Switching delay (DS2)	272	0x0110	4	Float	RW	0 … 60 s
Reset delay (DR2)	273	0x0111	4	Float	RW	0 … 60 s
Transistor function (P-N)	274	0x0112	1	unsigned8	RW	0 = pnp, 1 = npn
Function output (OU1)	275	0x0113	1	unsigned8	RW	0 = HNO, 1=HNC 2 = FNO, 3=FNC

Designation	ISDU (dez)	ISDU (hex)	Size (Byte)	Data type	Access	Value range
Function output 2 (OU2)	276	0x0114	1	unsigned8	RW	0 = HNO, 1=HNC 2 = FNO, 3=FNC
Temperature unit (TMP)	291	0x0123	4	Float	RW	1001 = °C 1002 = °F
Device status acc. to NE 107	294	0x0126	1	Unsigned8	RO	0 = Good 1 = Function Check 2 = Maintenance required 3 = Out of Specification 4 = Failure
Device status	295	0x0127	19	Unsigned16	RO	-
Counter for change of parameters (PCO)	296	0x0128	4	Unsigned32	RO	-
Actual electronics temperature	297	0x0129	4	Float	RO	-20 … +70 °C -4 … +158 °F
Min. electronics temperature	299	0x012B	4	Float	RO	-20 … +70 °C -4 … +158 °F
Max. electronics temperature	300	0x012C	4	Float	RO	-20 … +70 °C -4 … +158 °F
Actual measuring cell temperature	301	0x011C	4	Float	RO	-20 … +100 °C -4 … +212 °F
Min. measuring cell temperature	302	0x011D	4	Float	RO	-20 … +100 °C -4 … +212 °F
Max. measuring cell temperature	303	0x011E	4	Float	RO	-20 … +100 °C -4 … +212 °F
Actual resonance frequency	304	0x0130	4	Float	RO	0 … 100 %
Min. resonance frequency	305	0x0131	4	Float	RO	0 … 100 %
Max. resonance frequency	306	0x0132	4	Float	RO	0 … 100 %
Probe	307	0x0133	2	Unsigned16	RO	0 = Not Covered 256 = Covered 512 = Covered inside Window 768 = Covered outside Window
Output	308	0x0134	2	Unsigned16	RO	0 = Open 1 = Closed
Output 2	309	0x0135	2	Unsigned16	RO	0 = Open 1 = Closed

Designation	ISDU (dez)	ISDU (hex)	Size (Byte)	Data type	Access	Value range
Device name	310	0x0136	19	String	RO	-
Serial number	311	0x0137	16	String	RO	-
Hardware version	312	0x0138	19	String	RO	-
Software version	313	0x0139	19	String	RO	-
Device revision	314	0x013A	2	Unsigned16	RO	-
Simulation switching output	315	0x013B	1	Unsigned8	RW	0 = Off 1= On
Simulation value output	316	0x013C	2	Unsigned16	RW	0 = Open 1= Closed
Simulation switching output 2	317	0x013D	1	Unsigned8	RW	0 = Off 1= On
Simulation value output	318	0x013E	2	Unsigned16	RW	0 = Open 1= Closed
Device status detailed status	319	0x013F	4	Unsigned32	RO	-

- Switch point settings (ISDU 258, 259, 262, 263, 266, 267, 270, 271) are generally possible but the settings are only effective if, under " *Application*", the setting " *User defined*" was selected.
- Switching point settings (SP, RP, FH, FL) depending on the selection under " *Function Output*".
- Temperature specifications in °C or °F, depending on the setting under " *Temperature Unit*".

System commands

Designation	ISDU (dez)	ISDU (hex)	Access
Factory Reset	130	0x082	WO
Reset Pointer - Resonance Frequency	161	0x0A1	WO
Reset Pointer - Measuring Cell Temperature	163	0x0A3	WO
Reset Pointer - Electronic Temperature	164	0x0A4	WO

10.3 Dimensions

VEGAPOINT 11, standard version - thread

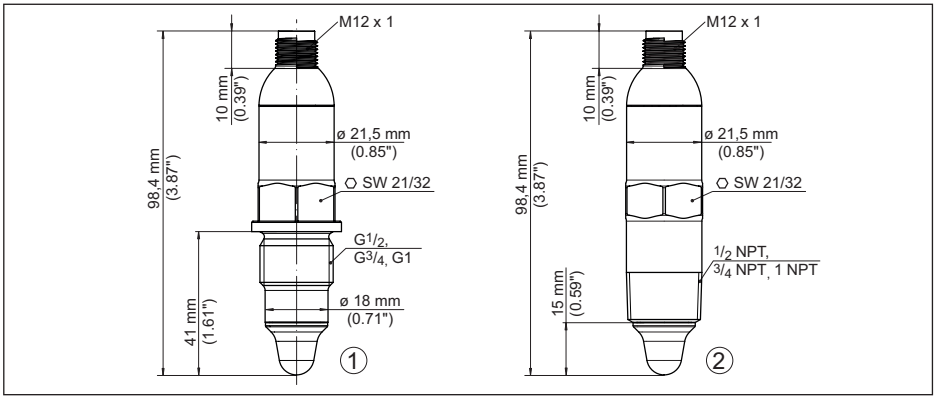

Fig. 11: VEGAPOINT 11, standard version - thread

1 Thread G½, G¾, G1 (DIN ISO 228/1) with M12 x 1 plug connection (Housing: 316L and plastic)
2 Thread ½ NPT, ¾ NPT, 1 NPT with M12 x 1 plug connection (full metal housing: 316L)

VEGAPOINT 11, hygienic version - Thread

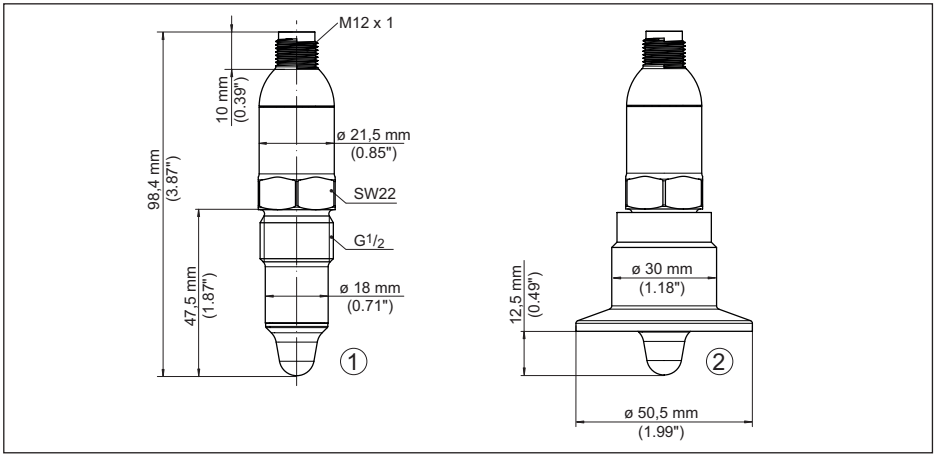

Fig. 12: VEGAPOINT 11, hygienic version - Thread

1 Thread G½ for hygienic threaded adapter (DIN ISO 228/1) with M12 x 1 plug connection
2 VEGAPOINT 11, hygienic version in threaded adapter, Clamp

Keep in mind that the total length is extended by the plug connection.

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