

GR

OPTISWITCH 3000 series Vibration level switch

for solids

- Highly robust tuning fork
- Insensitive to build-up
- Set-up without filling
- Detection of solids in water
- Maintenance-free



Electromagnetic flowmeters
Variable area flowmeters
Mass flowmeters
Ultrasonic flowmeters
Vortex flowmeters
Flow controllers

Level measuring instruments

Pressure and temperature
Heat metering
Communications technology
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Take note of safety instructions for Ex application



Please note the Ex specific safety information which you will find on our homepage www.krohne-mar.com and which come with the appropriate instrument. In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units. The sensors must only be operated on intrinsically safe circuits. The permissible electrical values are stated in the certificate.

1 Description of the measuring principle

Measuring principle

OPTISWITCH is a level sensor with tuning fork for level detection.

It is designed for industrial use in all areas of process technology and is preferably used for bulk solids.

The vibrating element (tuning fork) is energized piezoelectrically and vibrates at its mechanical resonance frequency. The piezos are fixed mechanically and are hence not subject to temperature shock limitations. When the vibrating element is immersed in the product, the vibrating frequency changes. This change is detected by the integrated oscillator and converted into a switching command.

Typical applications are overflow and dry run protection. Thanks to its simple and robust measuring system, OPTISWITCH is virtually unaffected by the chemical and physical properties of the solid.

It functions even when exposed to strong external vibration or changing products.

Fault monitoring

The electronics of OPTISWITCH continuously monitors the following criteria:

- correct vibrating frequency
- line break to the piezo drive

If one of the listed faults is detected or in case of voltage loss, the electronics takes on a defined switching condition, i.e. the relay deenergizes (safe condition).

Solid detection in water

With the OPTISWITCH (3100 C, 3200 C, 3300 C) version for solid detection in water (option), the vibrating element is adjusted to the density of water. If submerged in water (density 1 g/cm³), OPTISWITCH signals "uncovered". Only if the vibrating element is also covered with solids (e.g. sand, sludge, etc.) will the sensor signal "covered".

OPTISWITCH 3100 C, 3200 C, 3300 C

OPTISWITCH 3100 C, 3200 C and 3300 C level switches are available in standard, cable and tube version and, thanks to the large array of process fittings, offer the optimal solution for any application. They are completely manufactured of stainless steel and have all standard approvals.

The OPTISWITCH sensors are largely unaffected by product properties and do not have to be adjusted.

The level switches can be used in applications with process temperatures up to 250°C (482°F) and pressure up to 16 bar (232 psi).

They can detect solids down to >0.008 g/cm³ (>0.0003 lbs/in³).

OPTISWITCH 3000 C

OPTISWITCH 3000 C differs from OPTISWITCH 3100 C, 3200 C and 3300 C in that it has a simple process fitting of synthetic material and only limited selection options. It is suitable for solids from >0.08 g/cm³ (>0.003 lbs/in³).

OPTISWITCH 3000 C is only available as screwed version with plastic housing and without approvals.

The most important advantage of this instrument is its price, which makes the measurement loop very cost-effective.

1.1 Application examples

Plastic processing

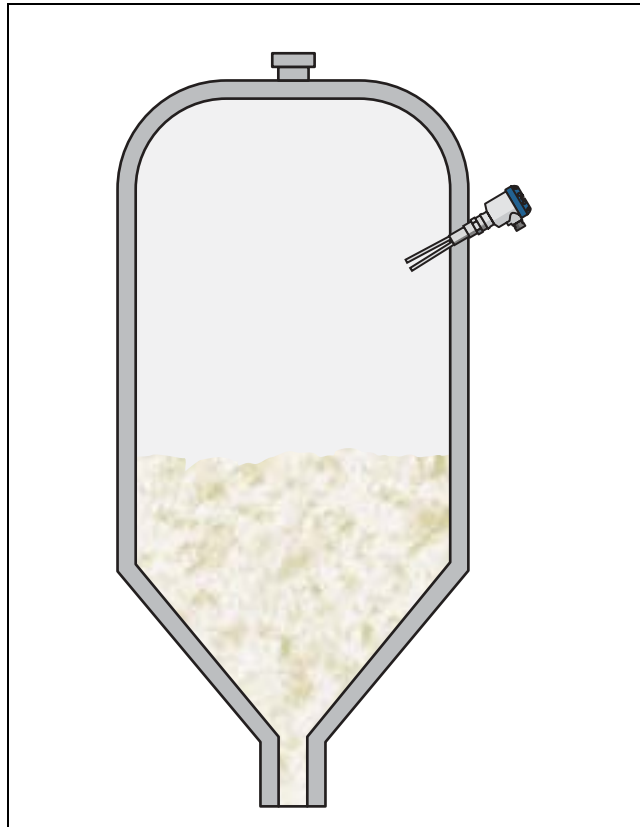


Fig. 1: Level detection in a silo storing plastic granules

A large number of finished products are produced in the chemical industry as powder, granules or pellets. Plastic granules and powder are often stored in high narrow silos which are filled pneumatically.

Vibrating level switches such as OPTISWITCH have proven themselves in recent years for level detection of plastics. Even with small product densities of only 20 g/L and changing products, the instruments always deliver exact measuring results.

Advantages:

- Tuning fork suitable down to a density <20 g/L (e.g. Aerosils)
- Product-independent switching point
- Setup without filling

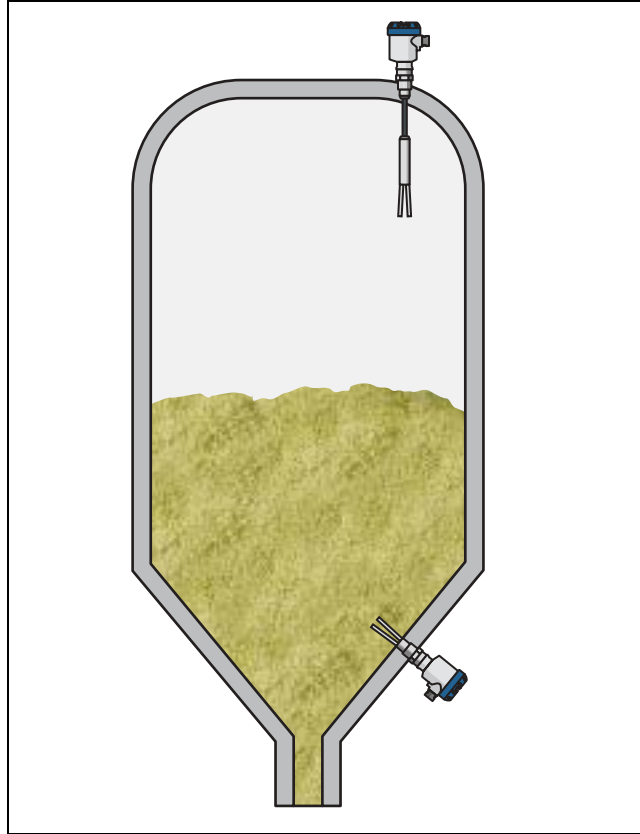
Building material industry

Fig. 2: Silo for aggregate in the building material industry

Cement or aggregates are placed in interim storage in multiple chamber silos. When the chambers are filled, large quantities of dust are generated. Depending on the consistency of the aggregate, different material cones are formed and the product properties can change from filling to filling.

OPTISWITCH offers additional protection against overfilling the aggregate silo. The flexible suspension cable avoids mechanical strain caused by movements of the bulk solid. A filling is not necessary for setup. Because OPTISWITCH has practically no moving parts, it is not subject to wear.

Advantages:

- very rugged tuning fork
- high abrasion resistance

- insensitive to buildup
- setup without filling

2 Type overview

OPTISWITCH 3100 C



OPTISWITCH 3200 C



OPTISWITCH 3300 C



Preferred application:	solids	solids	solids
Length:	-	0.3 ... 80 m (1 ... 262 ft)	0.3 ... 6 m (1 ... 20 ft)
Process fitting:	thread G1½A, flanges	thread G1½A, flanges	thread G1½A, flanges
Process temperature:	-50 ... 150°C (-58 ... 302°F) -50 ... 250°C or -58 ... 482°F (with temp. adapter)	-20 ... 80°C (-4 ... 176°F)	-50 ... 150°C (-58 ... 302°F) -50 ... 250°C or -58 ... 482°F (with temp. adapter)
Process pressure:	-1 ... 16 bar (-100 ... 1600 kPa) (-14.5 ... 232 psi)	-1 ... 6 bar (-100 ... 600 kPa) (-14.5 ... 87 psi)	-1 ... 16 bar (-100 ... 1600 kPa) (-14.5 ... 232 psi)
Signal output:	relay output, transistor output, contactless electronic switch, two- wire output	relay output, transistor output, contactless electronic switch, two- wire output	relay output, transistor output, contactless electronic switch, two-wire output
Ruggedness	++	++	++
Sensitivity	++	++	++
Buildup	++	++	++
Installation length	+	+	+

OPTISWITCH 3000 C



Preferred application:	solids
Length:	-
Process fitting:	thread G1½A
Process temperature:	-50 ... +100°C (-58 ... +212°F)
Process pressure:	-1 ... 6 bar (-100 ... 600 kPa) (-14.5 ... 232 psi)
Signal output:	relay output, transistor output, contactless electronic switch, two- wire output
Ruggedness	+
Sensitivity	-
Buildup	++
Installation length	+

Housing

Plastic



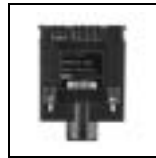
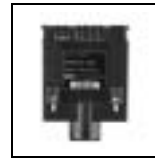
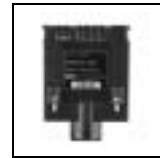
Stainless steel



Aluminium

Electronics

Relay output

Transistor out-
putContactless
electronic
switchTwo-wire out-
put**Sensors**

Tuning fork

ApprovalsGas explosion
protectionDust explosion
protection

3 Mounting information

Switching point

In general, OPTISWITCH can be mounted in any position. The instrument must be mounted in such a way that the tuning fork is at the height of the requested switching point.

Socket

The vibrating element should protrude into the vessel to avoid buildup. For that reason, avoid using mounting bosses for flanges and screwed fittings. This applies particularly to use with adhesive products.

Filling opening

Install the instrument in such a way that the vibrating element does not protrude directly into the filling stream. Should such an installation location be necessary, mount a suitable baffle above or in front of the vibrating element, e.g. L80 x 8 DIN 1028 (see Fig. Part "a."). In abrasive solids, mounting acc. to fig. Part "b." has proven to be a good solution. The mound that forms in the concave baffle protects it from abrasion.

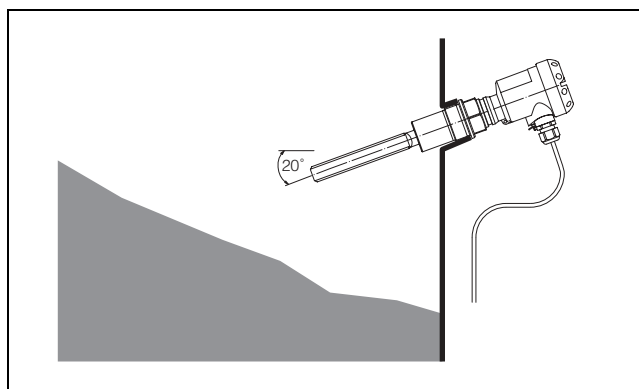


Fig. 3: Horizontal installation

- a. Convex mounting
- b. Concave mounting

Horizontal installation

To achieve a very precise switching point, you can install OPTISWITCH horizontally. However, if the switching point can have a tolerance of a few centimeters, we recommend mounting OPTISWITCH approx. 20° inclined to the vessel bottom to avoid buildup.

Material cone

In silos with bulk solids, material cones can form and, in doing so, change the switching point. Please keep this in mind when installing the sensor in the vessel. We recommend selecting an installation location where the vibrating element detects an average value of the material cone.

The vibrating element must also be mounted at a location that takes the arrangement of the filling and emptying apertures into account.

To compensate measurement errors in cylindrical vessels caused by the solid cone, the sensor must be mounted at a distance of $d/6$ from the vessel wall.

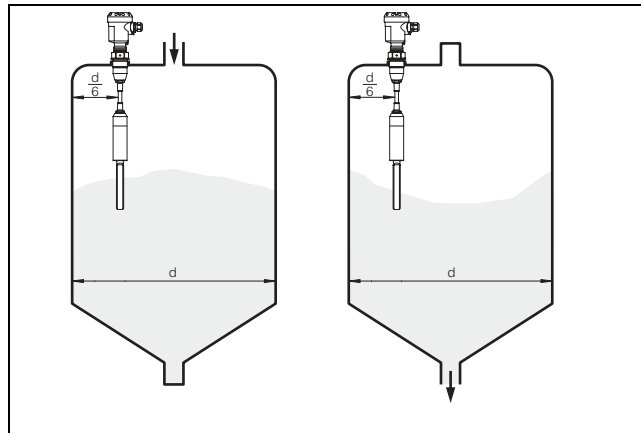


Fig. 4: Filling and emptying centered

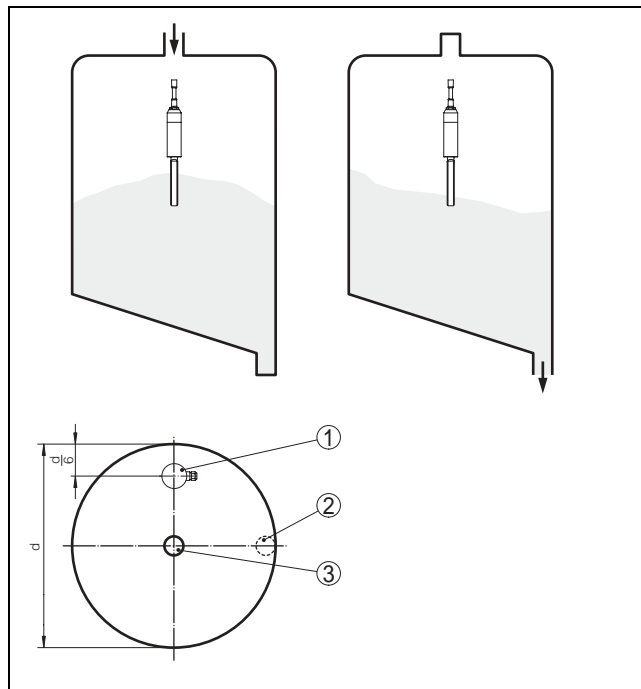


Fig. 5: Filling in the center, emptying laterally

- 1 OPTISWITCH
- 2 Emptying opening
- 3 Filling opening

Tensile load

Make sure that the max. permissible tensile load on the suspension cable is not exceeded (cable version). This can happen mainly with very heavy solids and long measuring lengths. The max. permissible tensile load is stated in the Technical data in the Supplement.

Agitators

Agitators, equipment vibration, or similar, can subject the level switch to strong lateral forces. For this reason, do not use an overly long extension tube for OPTISWITCH, but check if you can mount an OPTISWITCH 3000 C or 3100 C level switch on the side of the vessel in horizontal position.

Extreme vibration in the system, e.g. caused by agitators or turbulence in the vessel, can cause the extension tube of OPTISWITCH to vibrate in resonance. This will cause increased stress on the upper weld joint. Should a longer tube version be necessary, you can fasten a suitable strut or guy wire directly above the vibrating element to steady the extension tube.



This measure applies particularly to applications in Ex areas. Make sure that the tube is not subjected to bending forces through this measure.

Inflowing material

If OPTISWITCH is mounted in the filling stream, unwanted switching signals can be generated. Mount OPTISWITCH at a location in the vessel where no disturbing influence from e.g. filling openings, agitators, etc. can occur.

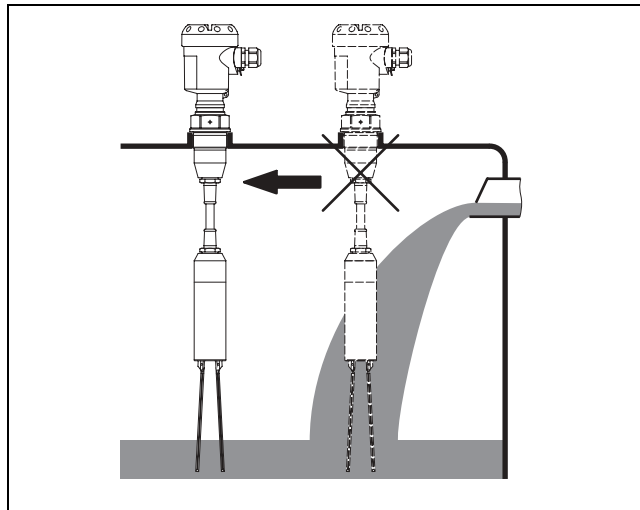


Fig. 6: Inflowing material

Flow

If there is movement within the product, the tuning fork of OPTISWITCH should be mounted in such a way that the surfaces of the fork are parallel to the product flow.

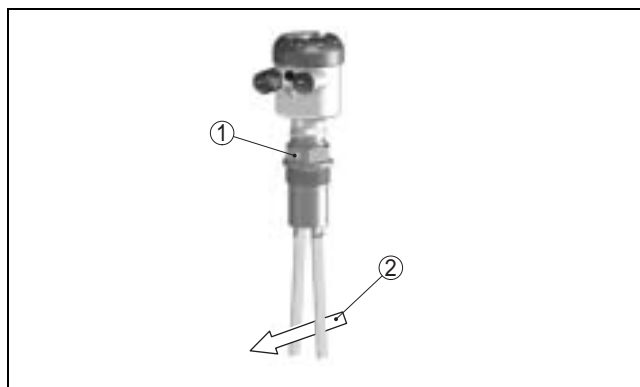


Fig. 7: Orientation of the tuning fork in case of flow

- 1 Marking with screwed version
- 2 Direction of flow

Lock fitting

OPTISWITCH in tube version can be mounted with a lock fitting for height adjustment. Take note of the pressure specifications of the lock fitting.

Keep in mind that the lock fitting must not be used with coated instrument versions.

Baffle for protection against physical damage

In applications such as grit chambers or settling basins for coarse sediments, the vibrating element must be protected against damage with a suitable baffle.

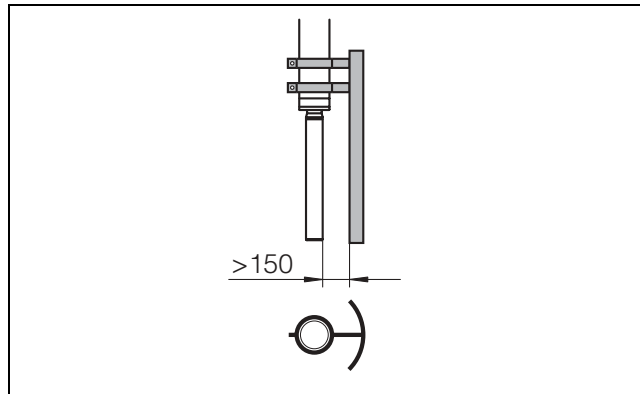


Fig. 8: Baffle for protection against physical damage

Pressure/Vacuum

The process fitting must be sealed if there is gauge or low pressure in the vessel. Check if the seal material is resistant against the measured product and the process temperature.

4 Electrical connection

4.1 Preparing the connection

Note safety instructions

Always observe the following safety instructions:

- Connect only in the complete absence of line voltage

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

Connect the power supply acc. to the following diagrams. Oscillator VB60R and VB60C are designed in protection class 1. To maintain this protection class, it is absolutely necessary that the ground conductor be connected to the internal ground terminal. Take note of the general installation regulations. As a rule, connect OPTISWITCH to vessel ground (PA), or in case of plastic vessels, to the next ground potential. On the side of the housing there is a ground terminal between the cable entries. This connection serves to drain off electrostatic charges. In Ex applications, the installation regulations for hazardous areas must be given priority.

The data for power supply are stated in the Technical data in the Supplement.

Select connection cable

OPTISWITCH is connected with standard cable with round wire cross section. An outer cable diameter of 5 ... 9 mm (0.2 ... 0.35 in) ensures the seal effect of the cable entry.

If cable with a different diameter or wire cross section is used, exchange the seal or use an appropriate cable connection.

Select connection cable for Ex applications



In hazardous areas, only use approved cable connections for OPTISWITCH.



Take note of the corresponding installation regulations for Ex applications.

4.2 Wiring plans

Relay output

We recommend connecting OPTISWITCH in such a way that the switching circuit is open when there is a level signal, line break or failure (safe condition).

The relays are always shown in non-operative condition.

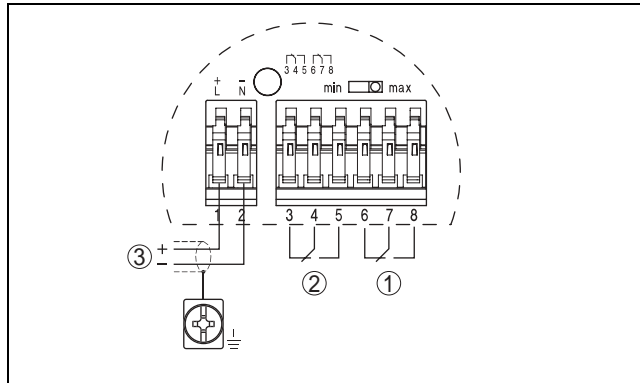


Fig. 9: Wiring plan, single chamber housing

- 1 Power supply
- 2 Relay output
- 3 Relay output

Transistor output

We recommend connecting OPTISWITCH in such a way that the switching circuit is open when there is a level signal, line break or failure (safe condition).

The instrument is used to control relays, contactors, magnet valves, warning lights, horns as well as PLC inputs.

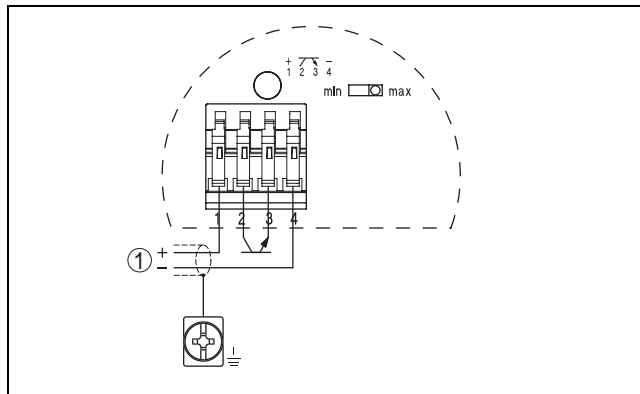


Fig. 10: Wiring plan, single chamber housing

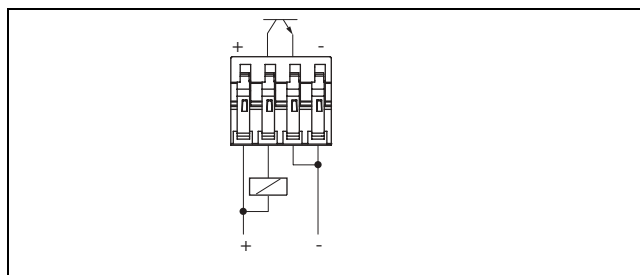


Fig. 11: NPN action

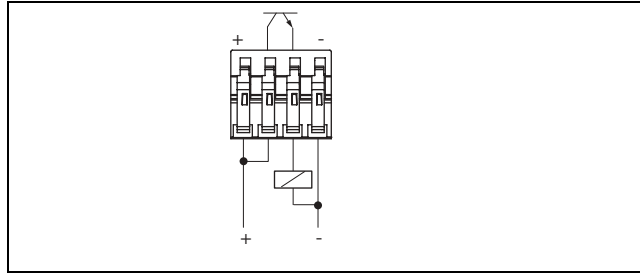


Fig. 12: PNP action

Contactless electronic switch

We recommend connecting OPTISWITCH in such a way that the switching circuit is open when there is a level signal, line break or failure (safe condition).

The contactless electronic switch is always shown in non-operative condition.

The instrument is used for direct control of relays, contactors, magnet valves, warning lights, horns etc. It must not be operated without an intermediately connected load, because the electronics would be destroyed if connected directly to the mains. It is not suitable for connection to low voltage PLC inputs.

Domestic current is temporarily lowered below 1 mA after switching off the load so that contactors, whose holding current is lower than the constant domestic current of the electronics, are reliably switched off.

When OPTISWITCH is used as part of an overfill protection system acc. to WHG, also note the regulations of the general type approval.

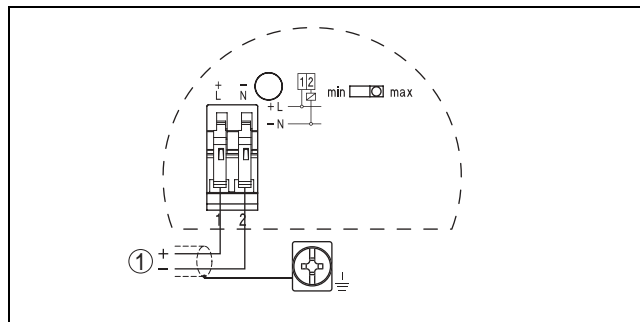


Fig. 13: Wiring plan, single chamber housing

1 Screening

Two-wire output

We recommend connecting OPTISWITCH in such a way that the switching circuit is open when there is a level signal, line break or failure (safe condition).

For connection to a signal conditioning instrument SU 501 dto. Ex. The sensor is powered by the connected signal conditioning instrument. Further information is available in the Technical data in the Supplement, Ex-technical data are available in the supplied safety information manual.

Take note of the operating instructions manual of the signal conditioning instrument. Suitable signal conditioning instruments are listed in the Technical data.

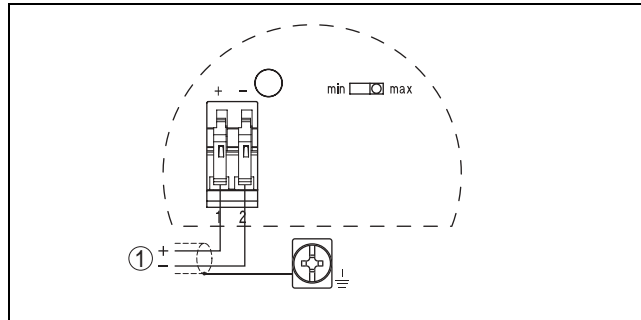


Fig. 14: Wiring plan, single chamber housing

1 Power supply

5 Adjustment

5.1 Adjustment, general

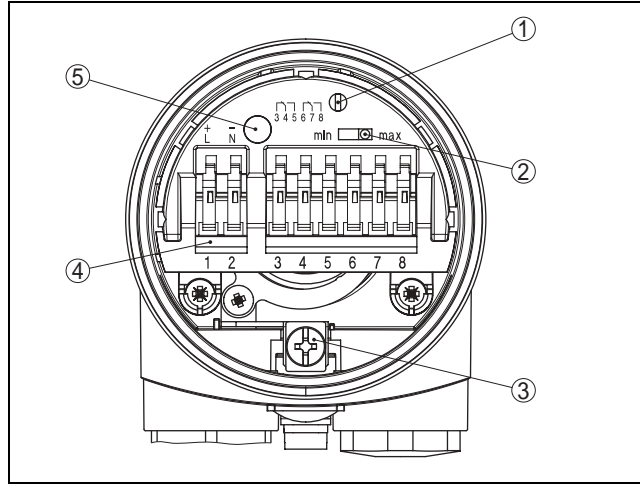


Fig. 15: Adjustment elements electronics module, e.g. relay output (VB60R)

- 1 Potentiometer for switching point adaptation (not with OPTISWITCH 3000 C)
- 2 DIL switch for mode adjustment
- 3 Ground terminal
- 4 Terminals
- 5 Control lamp

Switching point adaptation (1)

OPTISWITCH 3100 C, 3200 C, 3300 C

You can adapt the switching point of OPTISWITCH to the solid with the potentiometer. The switching point is preset and covered by a label. It must only be modified in special cases.

OPTISWITCHs are preset to a product density of $>0.02 \text{ g/cm}^3$ ($>0.0007 \text{ lbs/in}^3$). In very light solids, turn the potentiometer to complete left position ($0.008 \dots 0.1 \text{ g/cm}^3$ or $0.0003 \dots 0.0036 \text{ lbs/in}^3$). By doing this, the tuning fork will be more sensitive and can detect very light solids, such as e.g. Aerosils, more reliably.

OPTISWITCH 3000 C

OPTISWITCH 3000 C can detect solids with a density upwards of $>0.08 \text{ g/cm}^3$ ($>0.003 \text{ lbs/in}^3$).

Mode adjustment (2)

With the mode adjustment (min./max.) you can change the switching condition of the output. You can set the required mode (max. – max. detection or overflow protection, min. – min. detection or dry run protection).

Signal lamp (5)

Diode for indication of the switching condition

6 Technical data

General data

	Material 316L corresponds to 1.4404 or 1.4435	
OPTISWITCH 3000 C	Materials, wetted parts	
	– Process fitting – thread	PBT
	– vibrating element	316L/1.4462 (318S13)
	Materials, non-wetted parts	
	– Housing	plastic PBT (Polyester)
	– Seal ring between housing and housing cover	silicone
	– Ground terminal	stainless steel 1.4571(316Ti)/316L
	Weight	1150 g (40 oz)
	Max. lateral load	600 N (135 lbf)
OPTISWITCH 3100 C	Materials, wetted parts	
	– Process fitting – thread	316L
	– Process fitting – Flange	316L
	– Seal	Klingersil C-4400
	– vibrating element	316L/1.4462 (318S13)
	– extension tube (OPTISWITCH 3300 C) \varnothing 43 mm (1.7 in)	316L
	Materials, non-wetted parts	
	– Housing	plastic PBT (Polyester), Alu-die casting powder-coated, stainless steel 316L
	– Seal ring between housing and housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
	– Ground terminal	stainless steel 1.4571(316Ti)/316L
	Weights	
	– OPTISWITCH 3100 C with plastic housing	1500 g (53 oz)
	– OPTISWITCH 3100 C with Aluminium housing	1950 g (69 oz)
	– OPTISWITCH 3100 C with stainless steel housing	2300 g (81 oz)
	Max. lateral load	600 N (135 lbf)
OPTISWITCH 3200 C	Materials, wetted parts	
	– Process fitting – thread	316L
	– Process fitting – Flange	316L
	– Seal	CR, CSM
	– vibrating element	316L/1.4462 (318S13)
	– suspension cable	PUR
	Materials, non-wetted parts	
	– Housing	plastic PBT (Polyester), Alu-die casting powder-coated, stainless steel 316L
	– Seal ring between housing and housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
	– Ground terminal	stainless steel 1.4571(316Ti)/316L

	Weights	
	– OPTISWITCH 3200 C with plastic housing	1500 g (53 oz)
	– OPTISWITCH 3200 C with Aluminium housing	1950 g (69 oz)
	– OPTISWITCH 3200 C with stainless steel	2300 g (81 oz)
	– suspension cable	approx. 165 g/m (1.8 oz/ft)
	max. permissible tensile load	3000 N (675 lbs)
	Sensor length	0.3 ... 80 m (1 ... 262 ft)
OPTISWITCH 3300 C	Materials, wetted parts	
	– Process fitting – thread	316L
	– Process fitting – Flange	316L
	– Seal	Klingersil C-4400
	– vibrating element	316L/1.4462 (318S13)
	– extension tube (OPTISWITCH 3300 C) ø43 mm (1.7 in)	316L
	Materials, non-wetted parts	
	– Housing	plastic PBT (Polyester), Alu-die casting powder-coated, stainless steel 316L
	– Seal ring between housing and housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
	– Ground terminal	stainless steel 1.4571(316Ti)/316L
	Weights	
	– OPTISWITCH 3300 C with plastic housing	1500 g (53 oz)
	– OPTISWITCH 3300 C with Aluminium housing	1950 g (69 oz)
	– OPTISWITCH 3300 C with stainless steel housing	2300 g (81 oz)
	– extension tube (OPTISWITCH 3300 C) ø43 mm (1.7 in)	approx. 2000 g/m (21.5 oz/ft)
	Sensor length	0.3 ... 6 m (1 ... 20 ft)
	Output variable	
Relay output	Output	relay output (DPDT), 2 floating spdts
	Turn-on voltage	
	– min.	10 mV
	– max.	253 V AC, 253 V DC
	Switching current	
	– min.	10 µA
	– max.	5 A AC, 1 A DC
	Breaking capacity	
	– max.	1250 VA, 50 W
	Contact material (relay contacts)	AgCdO and Au plated
	Modes (adjustable)	min./max.
	Delay time	
	– when immersed	approx. 0.5 s
	– when laid bare	approx. 1 s

Transistor output	Output	floating transistor output, overload and permanently shortcircuit proof
	Load current	max. 400 mA
	Turn-on voltage	max. 55 V DC
	Blocking current	<100 μ A
	Modes (adjustable)	min./max.
	Delay time – when immersed – when laid bare	approx. 0.5 s approx. 1 s
Contactless electronic switch	Output	Contactless electronic switch
	Modes (adjustable)	min./max.
	Delay time – when immersed – when laid bare	approx. 0.5 s approx. 1 s
	Two-wire output	Output
Output signal – min. mode		vibrating element uncovered - 16 mA \pm 1 mA; vibrating element covered - 8 mA \pm 1 mA
– max. mode		vibrating element uncovered - 8 mA \pm 1 mA; vibrating element covered - 16 mA \pm 1 mA
– Fault signal		<2 mA
Modes (adjustable)		min./max.
Delay time – when immersed – when laid bare		approx. 0.5 s approx. 1 s
Ambient conditions		
	Ambient temperature on the housing	-40 ... +70°C (-40 ... +158°F)
	Storage and transport temperature	-40 ... +80°C (-40 ... 176°F)
Process conditions		
OPTISWITCH 3000 C	Parameter	level of solids
	Process pressure	-1 ... 6 bar (-14.5 ... 87 psi) with PN 40
	Process temperature OPTISWITCH of 316L	-50 ... +100°C (-58 ... +212°F)
	Density	>0.08 g/cm ³ (>0.003 lbs/in ³)
	Granular size	\emptyset max. 15 mm (\emptyset max. 0.6 in)
OPTISWITCH 3100 C, 3300 C	Parameter	level of solids
	Process pressure	-1 ... 6 bar (-14.5 ... 232 psi) with PN 40

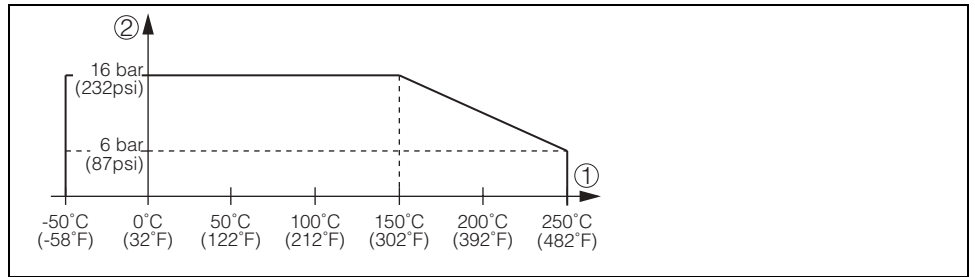


Fig. 16: Process pressure – Product temperature

- 1 Product temperature
- 2 Process pressure

Process temperature OPTISWITCH of 316L -50 ... 150°C (-58 ... 302°F)

Process temperature (thread or flange temperature) with temperature adapter (option) -50 ... +250°C (-58 ... +482°F)

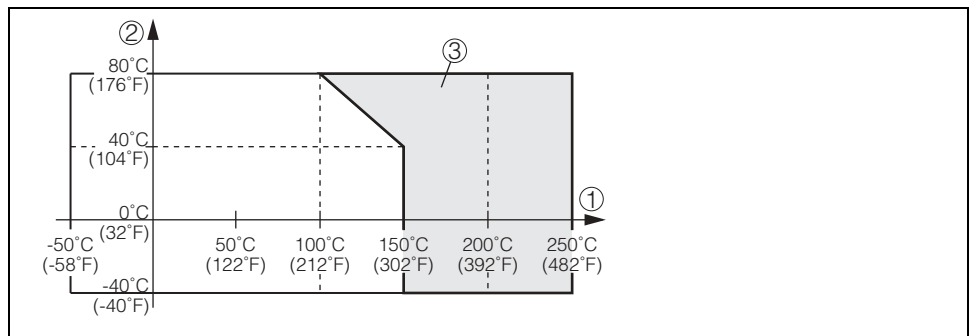


Fig. 17: Ambient temperature – Product temperature

- 1 Product temperature
- 2 Ambient temperature
- 3 Temperature range with temperature adapter

OPTISWITCH 3200 C

Density	>0.008 g/cm ³ (>0.0003 lbs/in ³)
Granular size	ø max. 15 mm (ø max. 0.6 in)
Parameter	level of solids
Process pressure	-1 ... 6 bar (-14.5 ... 87 psi) with PN 40
Process temperature OPTISWITCH of 1.4435 (316L)	-20 ... 80°C (-4 ... 176°F)
Density	>0.008 g/cm ³ (>0.0003 lbs/in ³)
Granular size	ø max. 15 mm (ø max. 0.6 in)

Electromechanical data

Cable entry/plug (dependent on the version)

– Single chamber housing

- 1x cable entry M20x1.5 (cable-ø5 ... 9 mm), 1x blind stopper

M20x1.5, attached 1x cable entry
M20x1.5

or:

- 1x cable entry 1/2 NPT, 1x blind stopper 1/2 NPT, 1x cable entry 1/2 NPT

or:

- 1x plug M12x1, 1x blind stopper M20x1.5

Spring-loaded terminals

for wire cross sections up to 1.5 mm²

Adjustment elements

Electronics versions – relay output, transistor output, contactless electronic switch

Mode switch
– min.
– max.

min. detection or dry run protection
max. detection or overflow protection

Electronics version – two-wire output

Mode switch
– min.

– max.

vibrating element uncovered -
16 mA ±1 mA vibrating element covered -
8 mA ±1 mA
vibrating element uncovered -
8 mA ±1 mA vibrating element covered -
16 mA ±1 mA

Power supply

Relay output

Supply voltage

20 ... 253 V AC, 50/60 Hz, 20 ... 72 V DC
(at U > 60 V DC the ambient temperature must be max. 50°C/122°F)

Power consumption

1 ... 8 VA (AC), approx. 1.3 W (DC)

Transistor output

Supply voltage

10 ... 55 V DC

Power consumption

max. 0.5 W

Contactless electronic switch

Supply voltage

20 ... 253 V AC, 50/60 Hz, 20 ... 253 V DC

Domestic current requirement

approx. 3 mA (via load circuit)

Load current

– min
– max

10 mA
400 mA (with I > 300 mA the ambient temperature can be max. 60°C) max. 4 A
up to 40 ms

Two-wire output

Supply voltage

10 ... 36 V DC (via the signal conditioning instrument)

Electrical protective measures

Electronics versions – relay output, contactless electronic switch

Protection

IP 66/IP 67

Overvoltage category

III

Protection class

I

Electronics versions – transistor output, two-wire output	Protection	IP 66/IP 67
	Overtoltage category	III
	Protection class	II

Approvals

OPTISWITCH 3000 C OPTISWITCH 3000 C has no approvals.

OPTISWITCH 3100 C, 3200 C, 3300 C, electronics versions – relay output, transistor output, contactless electronic switch ATEX II 1/2G, 2G EEx d IIC T6

ATEX II 1/2 D IP66 T

ATEX II 1G, 1/2G, 2G EEx ia IIC T6

OPTISWITCH 3100 C, 3200 C, 3300 C, electronics version – two-wire output

ATEX II 1G, 1/2G, 2G EEx ia IIC T6 +
ATEX II 1/2 D IP66 T6

ATEX II 1/2G, 2G EEx d IIC T6

ATEX II 1/2 D IP66 T

CE conformity

Electronics versions – relay output, transistor output, two-wire output

EMVG (89/336/EWG), Emission:
EN 61326: 1997 (class B), Susceptibility:
EN 61326: 1997/A1: 1998

NSR (73/23/EWG), EN 61010-1: 2001

Electronics version – contactless electronic switch

EMVG (89/336/EWG), Emission:
EN 61326/A1: 1998 (class B), Susceptibility:
EN 61326: 1997/A1: 1998

NSR (73/23/EWG), EN 61010-1: 2001

7 Dimensions

Housing

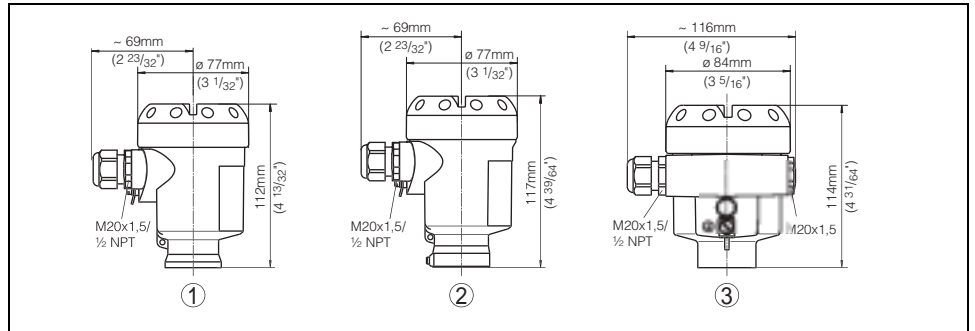


Fig. 18: Housing versions (OPTISWITCH 3000 C only with plastic housing)

- 1 Plastic housing
- 2 Stainless steel housing
- 3 Aluminium housing

OPTISWITCH 3000 C

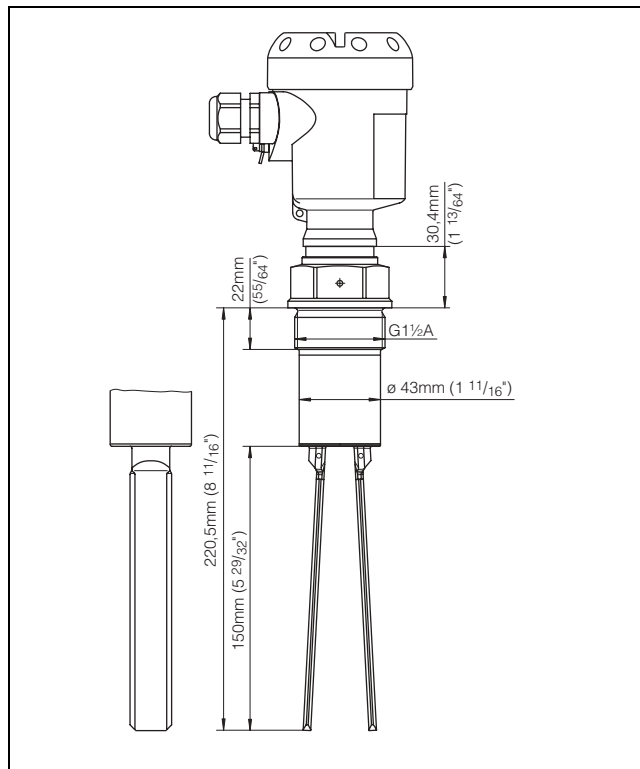


Fig. 19: OPTISWITCH 3000 C - Screwed version G1½

OPTISWITCH 3100 C

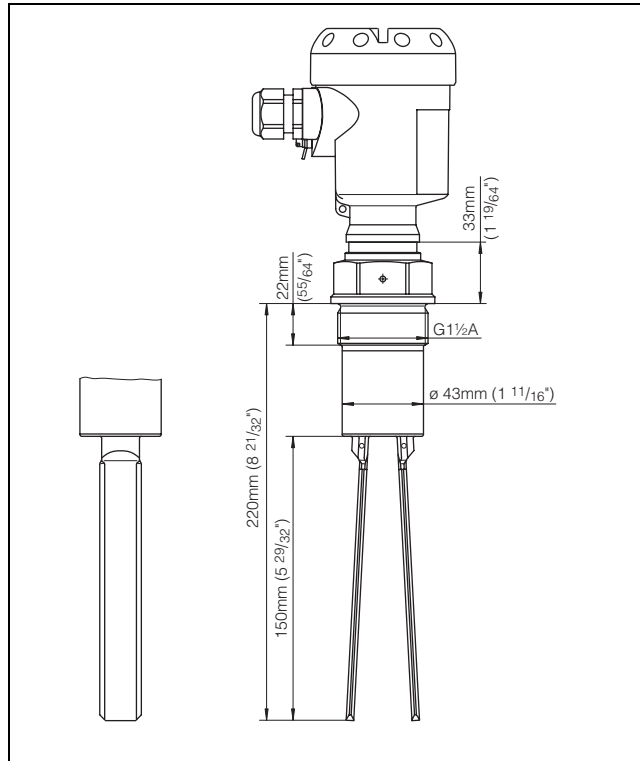


Fig. 20: OPTISWITCH 3100 C - Screwed version G1 1/2

OPTISWITCH 3200 C

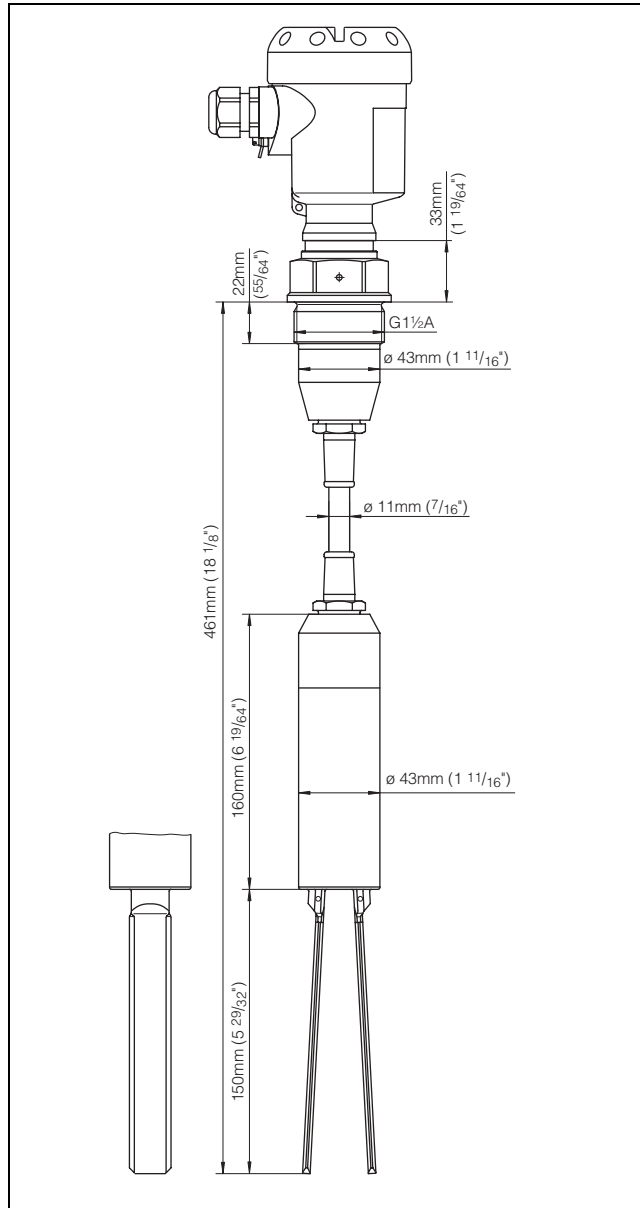


Fig. 21: OPTISWITCH 3200 C - Screwed version G1½

OPTISWITCH 3300 C

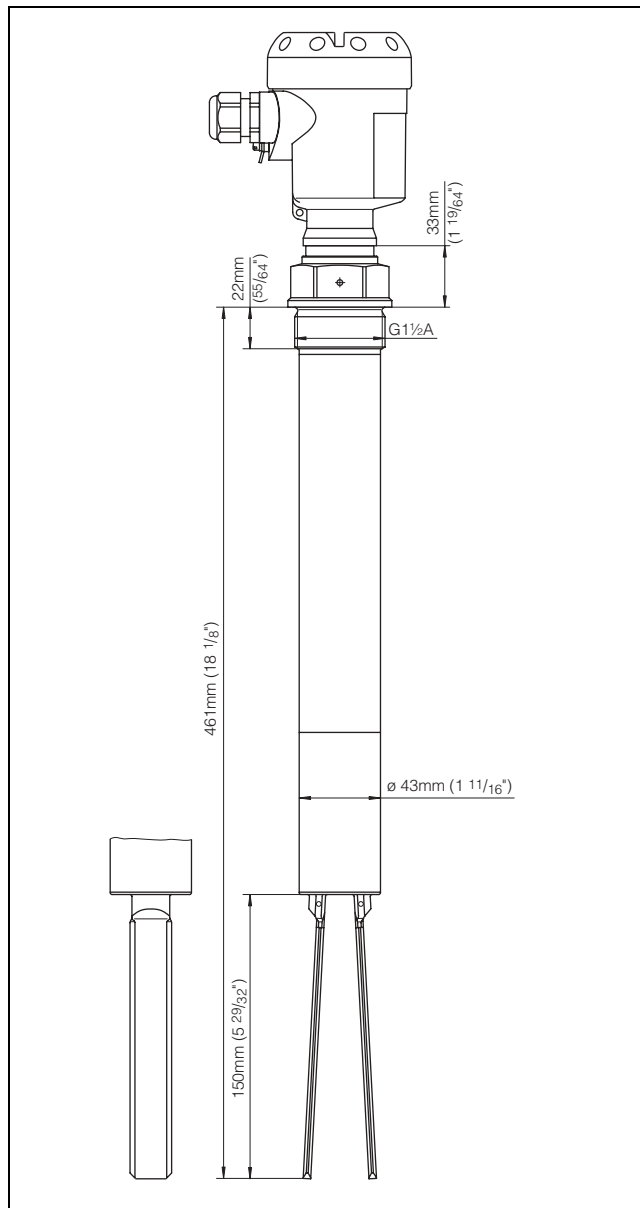


Fig. 22: OPTISWITCH 3300 C - Screwed version G 1 1/2

Temperature adapter

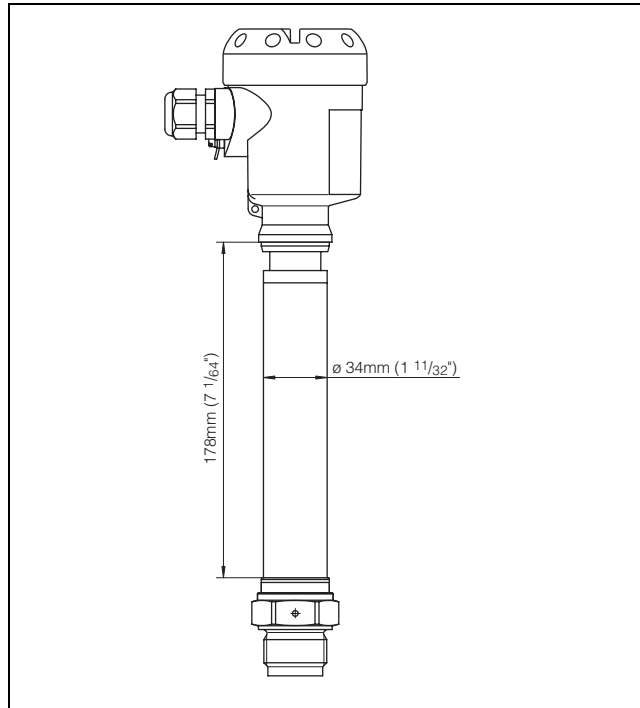


Fig. 23: Temperature adapter (only for OPTISWITCH 3100 C and 3200 C)