OPTISWITCH 6600 C

Handbook

Capacitance Level Switch for standard hygienic applications

KROHNE

IMPRINT

1.1 Intended use

The OPTISWITCH 6600 C is a level switch for level detection and dry-run protection for liquids and solids. The device measures liquids such as water and beer and well as viscous and sticky products such as honey or toothpaste. Even dry medias can be measured such as sugar or flour.

The measurement is precise and not affected by the mounting position.

Coating of the sensor or condensate is not detected.

1.2 Certifications

CE marking

The device fulfils the statutory requirements of the following EU directives:

- EMC specification acc. to EN 61326-1 (2006) when installed in enclosed metallic tank. For more data about the EU Directives and European Standards related to this device, refer to the EU Declaration of Conformity. You can find this documentation on the DVD-ROM supplied with the device or it can be downloaded free of charge from the website (Download Center).

The manufacturer certifies successful testing of the product by applying the CE marking.

1.3 Safety instructions from the manufacturer

1.3.1 Copyright and data protection

The contents of this document have been created with great care. Nevertheless, we provide no guarantee that the contents are correct, complete or up-to-date.

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1.3.2 Disclaimer

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This disclaimer does not apply in case the manufacturer has acted on purpose or with gross negligence. In the event any applicable law does not allow such limitations on implied warranties or the exclusion of limitation of certain damages, you may, if such law applies to you, not be subject to some or all of the above disclaimer, exclusions or limitations.

Any product purchased from the manufacturer is warranted in accordance with the relevant product documentation and our Terms and Conditions of Sale.

The manufacturer reserves the right to alter the content of its documents, including this disclaimer in any way, at any time, for any reason, without prior notification, and will not be liable in any way for possible consequences of such changes.

1.3.3 Product liability and warranty

The operator shall bear responsibility for the suitability of the device for the specific purpose. The manufacturer accepts no liability for the consequences of misuse by the operator. Improper installation or operation of the devices (systems) will cause the warranty to be void. The respective "Standard Terms and Conditions" which form the basis for the sales contract shall also apply.

1.3.4 Information concerning the documentation

To prevent any injury to the user or damage to the device it is essential that you read the information in this document and observe applicable national standards, safety requirements and accident prevention regulations.

If this document is not in your native language and if you have any problems understanding the text, we advise you to contact your local office for assistance. The manufacturer can not accept responsibility for any damage or injury caused by misunderstanding of the information in this document.

This document is provided to help you establish operating conditions, which will permit safe and efficient use of this device. Special considerations and precautions are also described in the document, which appear in the form of icons as shown below.

1.3.5 Warnings and symbols used

Safety warnings are indicated by the following symbols.

DANGER!
This warning refers to the immediate danger when working with electricity.

DANGER!
This warning refers to the immediate danger of burns caused by heat or hot surfaces.

DANGER!
This warning refers to the immediate danger when using this device in a hazardous atmosphere.

DANGER!
These warnings must be observed without fail. Even partial disregard of this warning can lead to serious health problems and even death. There is also the risk of seriously damaging the device or parts of the operator's plant.

WARNING!
Disregarding this safety warning, even if only in part, poses the risk of serious health problems. There is also the risk of damaging the device or parts of the operator's plant.

CAUTION!
Disregarding these instructions can result in damage to the device or to parts of the operator's plant.

INFORMATION!
These instructions contain important information for the handling of the device.

LEGAL NOTICE!
This note contains information on statutory directives and standards.

- HANDLING
  This symbol designates all instructions for actions to be carried out by the operator in the specified sequence.

➲ RESULT
This symbol refers to all important consequences of the previous actions.

1.4 Safety instructions for the operator

WARNING!
In general, devices from the manufacturer may only be installed, commissioned, operated and maintained by properly trained and authorized personnel.
This document is provided to help you establish operating conditions, which will permit safe and efficient use of this device.

2.1 Scope of delivery

INFORMATION!
Inspect the packaging carefully for damages or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.

INFORMATION!
Do a check of the packing list to make sure that you have all the elements given in the order.

INFORMATION!
Look at the device nameplate to ensure that the device is delivered according to your order. Check for the correct supply voltage printed on the nameplate.

The following items are supplied with the device:

- Measuring device
- Hygienic adapter (optional)
- Product documentation

2.2 System description

Inputting physical quantities into an SPC or PLC or other computer and control systems requires accurate and reliably working sensors. The sensor is a detecting element that detects level (liquids/solids), identifies a liquid or a changed characteristics of a liquid and converts it into an electrical on/off signal.

2.3 Nameplate

INFORMATION!
Look at the device nameplate to ensure that the device is delivered according to your order. Check for the correct supply voltage printed on the nameplate.

The important technical values are engraved on the device body.

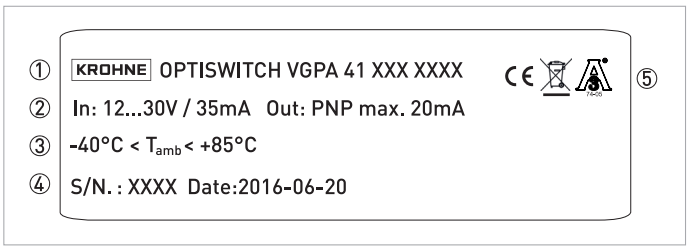


Figure 2-1: Example of engraved technical values

① Device type
② Electrical data for input and output
③ Operating temperature limits
④ Serial number and manufacturing date
⑤ Approval symbols and disposal symbols

3.1 General notes on installation

INFORMATION!
Inspect the packaging carefully for damages or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.

INFORMATION!
Do a check of the packing list to make sure that you have all the elements given in the order.

INFORMATION!
Look at the device nameplate to ensure that the device is delivered according to your order. Check for the correct supply voltage printed on the nameplate.

3.2 Installation requirements

- For the hygienic version, only use the original KROHNE sleeves or adapters. If other systems are used, no guarantee can be given for proper functionality or leak-tightness.
- The connection thread must have direct electrical contact with the threaded sleeve and the metal tank or pipe.
- At the hygienic connection G ½ do not use Teflon or paper gaskets between switch and hygienic adapter. The PEEK sensor together with the stainless steel adapter will perform a hygienic tightening. Assumed that the requirements have been followed.
- The tightening torque for hygienic connection G ½ should be 10...15 N·m.

3.3 Process connection

The hygienic ½¨ process sleeve is easy to weld into tanks or pipes. This kind of assembly allows installation in conformity with standards of hygiene (to 3-A, EHEDG, FDA, Regulation (EC) No 1935:2004, Regulation (EC) No 2023:2006). The G ½ and G 1 connections can be mounted in any counter thread according to ISO 228.

Various hygienic adapter sleeves are available for fitting to other process connections. .

The sensor can be installed in any desired position.

3.4 Mounting of 3A marked products

The 3A mark is valid only when the product is mounted in a 3A marked counterpart and installed acc. to the installation manual. Use also a 3A marked O-ring or gasket if relevant.

The 3A marked products conforms to the 3A sanitary standards criteria. Materials and surfaces fulfill the FDA demands.

EPDM O-rings supplied with 3A marked products are conform to sanitary standards class II (8% milk fat).

① Use only 3A approved counterparts.
② The inspection hole should be visible and drained. Face it downwards that leaking can be observed.
③ Mount the device in a self-drained position.
④ Level the inner surface of the pipe with the counterpart.
⑤ Weld from the inside of the tank, if possible. Welds shall be free from cracks, crevices and grooves. Weldings should be grinded to R_a = 0.8 µm.

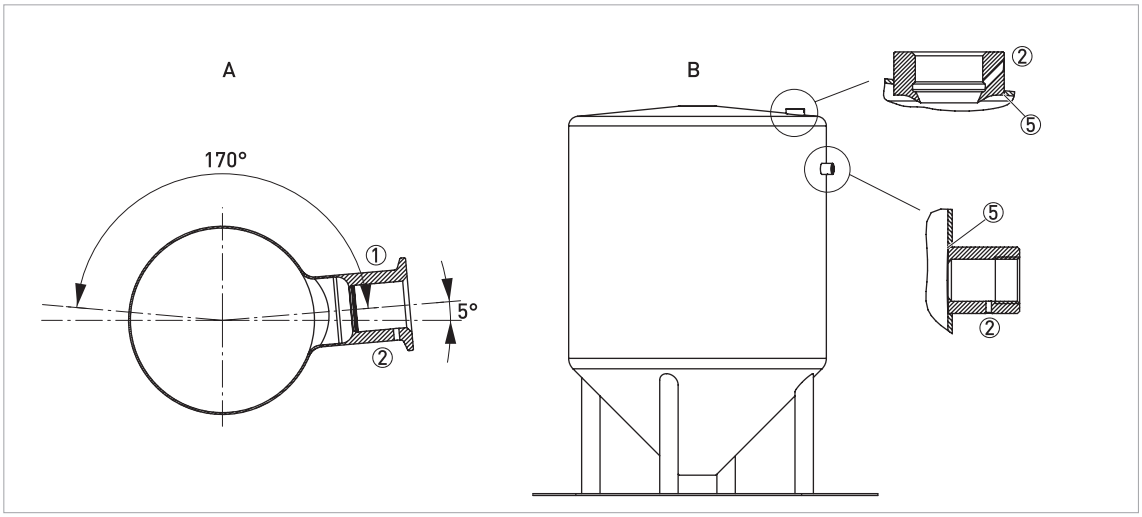


Figure 3-1: Mounting of 3A products in pipe installations (A) or tank installations (B)

3.5 Installation of sliding connection

The following drawing shows how the sliding connection can be used for at least 4 applications:

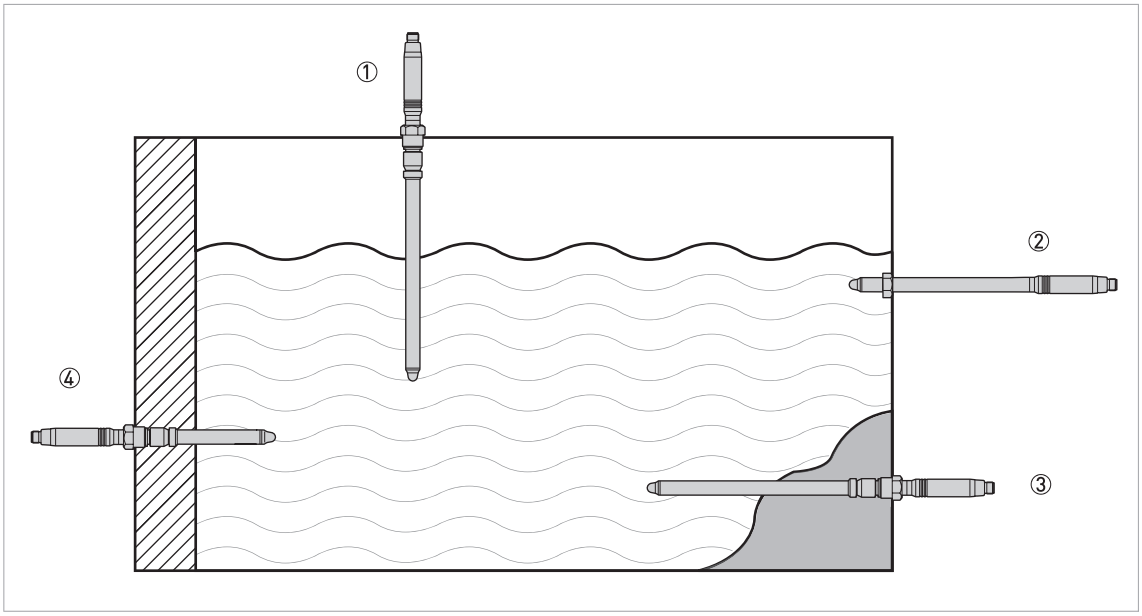


Figure 3-2: Possible applications for sliding connection

① Mounted at the top of a tank to adjust to a certain level.
Serving as a cooling neck in high media temperature applications.
Adjusted to place the sensor tip deeper inside the tank (for lumpy or sticky media).
To reach in through insulation material.

CAUTION!
The OPTISWITCH 6600 C with sliding connection can be mounted with a static pressure up to 5 bar / 72.5 psi. To prevent personnel injuries, it is essential that the safety chain is mounted correctly and undamaged.

CAUTION!
It is essential that the max. ambient temperature for the electronics is never exceeded.

The operating conditions for the sliding connection in different media temperatures and specified ambient temperatures can be found in the following drawing.

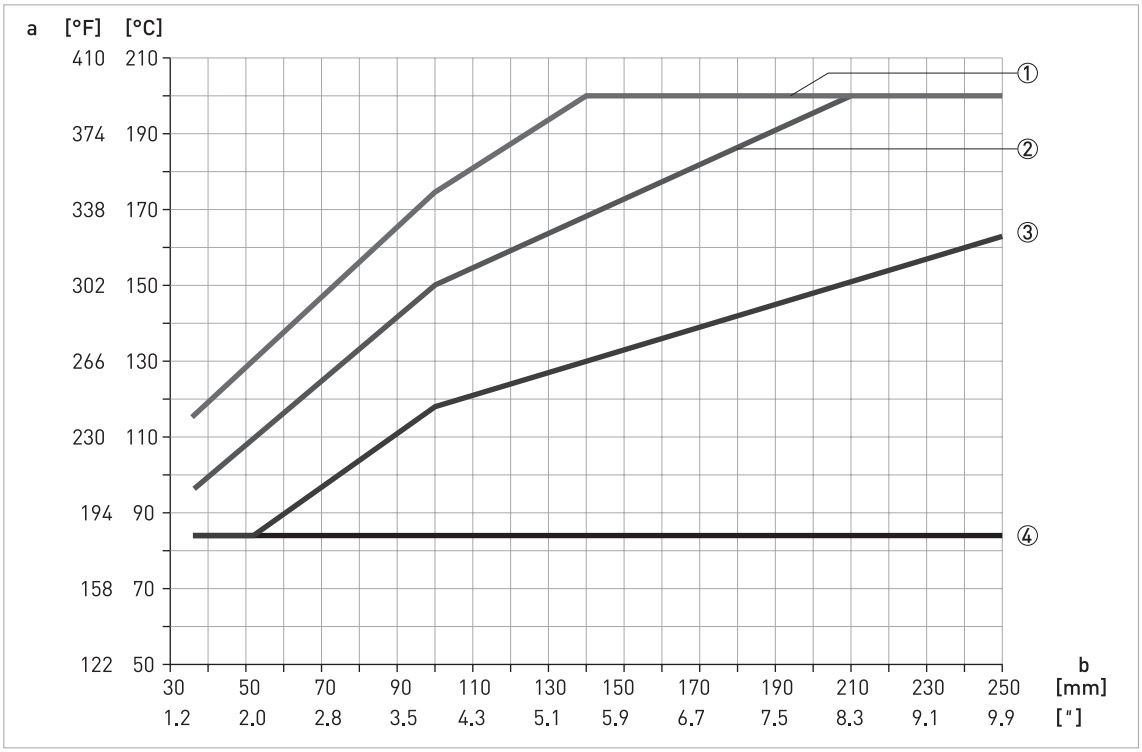


Figure 3-3: Media temperature against external length of sliding connection

a = operating temperature in [°C] or [°F]
b = external length of sliding connection in [mm] or ["]

① T_{amb} = max. +40°C / +104°F
② T_{amb} = max. +60°C / +140°F
③ T_{amb} = max. +75°C / +167°F
④ T_{amb} = max. +85°C / +185°F

Example, how to read the drawing:

A 250 mm / 9.9" sliding connection is mounted in a tank with a total insertion length of 150 mm / 5.9". Hence the external length of the sliding connection will be:
250 - 150 = 100 mm or 9.9 - 5.9 = 4".

The media temperature will be max. +175°C / +347°F.

Read the x-axis at 100 mm / 4" and the y-axis at +160°C / +320°F and find that the ambient temperature must be kept below +40°C / +104°F. In case the radiated heat from the tank will cause a higher ambient temperature at the housing efficient insulation of the tank must be established.

4.1 Safety instructions

DANGER!
All work on the electrical connections may only be carried out with the power disconnected. Take note of the voltage data on the nameplate!

DANGER!
Observe the national regulations for electrical installations!

DANGER!
For devices used in hazardous areas, additional safety notes apply; please refer to the Ex documentation.

WARNING!
Observe without fail the local occupational health and safety regulations. Any work done on the electrical components of the measuring device may only be carried out by properly trained specialists.

INFORMATION!
Look at the device nameplate to ensure that the device is delivered according to your order. Check for the correct supply voltage printed on the nameplate.

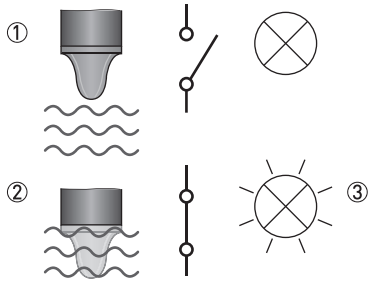
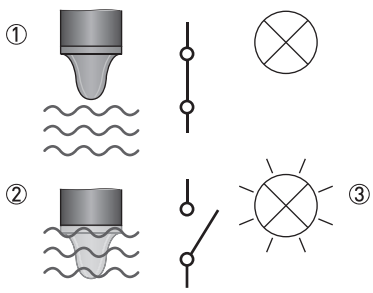
4.2 Description of electrical connection

Pin 1 and 3 are used for supplying a DC voltage of 12...30 V. According to polarity, the output will switch to active or inactive when the sensor is immersed (refer to connection diagram). The terminal wired to the negative pole is connected via an internal protective diode to the housing.

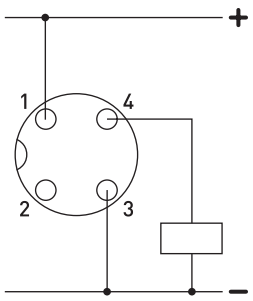
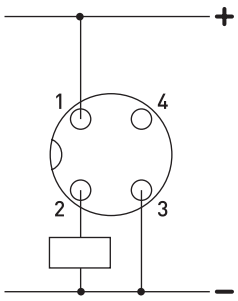
The maximum power consumption is 35 mA (excluding load switched). This value should be taken into account in connection with the recommended use of a fuse. An active switching output (Pin 4) is available. The switching voltage is a minimum of 1 V below the supply voltage. The maximum output current is 20 mA. At higher loads, the current is limited accordingly. Damage through shorting cannot occur.

4.3 Electrical connection diagrams

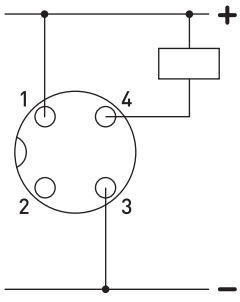
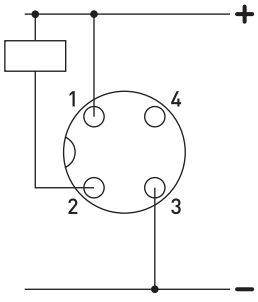
Description of normally open (NO) and normally closed (NC)

Normally open	Normally closed
	
① 0 mA ② 20 mA ③ LED	① 20 mA ② 0 mA ③ LED

PNP

Normally open	Normally closed
	

NPN

Normally open	Normally closed
	

M12 plug

1: brown; 2: white; 3: blue; 4: black

4.4 Configuration tool

The configuration tool can be ordered optionally to configure the OPTISWITCH 6600 C.

Scope of delivery:

- Interface unit
- CD with software and product drivers (DTM)
- USB cable
- Cable with M12 connector
- M12 connection cable

The configuration tool connects the OPTISWITCH 6600 C with a computer. With the corresponding software, it is possible to get an online communication with the OPTISWITCH 6600 C.
By using this tool, device information like serial number, switching point range and tag numbers are displayed on the computer. Settings as switching point and damping can be changed. Self-learning function for the contact output is possible as well as reset function to the default values of the switching point.

By fine-tuning of the switching point settings, OPTISWITCH 6600 C could differentiate between various products which are covering the sensor. In other words, the device could be set to trigger on a specific product and ignore a second product. Basis for this would be a different ε_r value of the two products.

DANGER!
Disconnect the power supply before connecting the configuration tool to the switch!

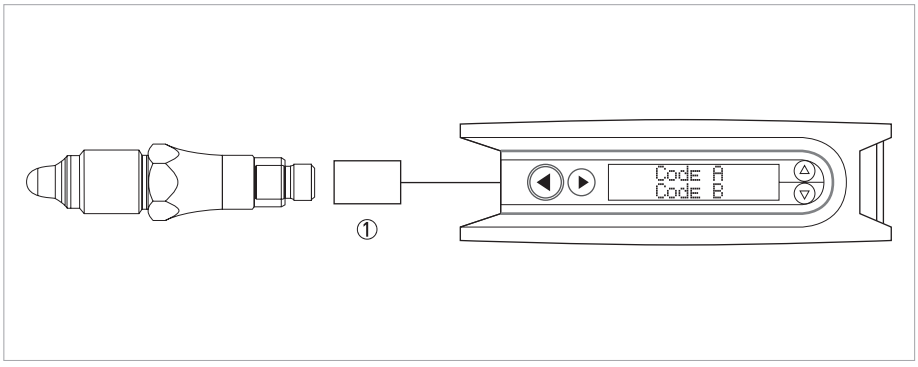


Figure 4-1: Electrical connection of configuration tool

① M12 plug

INFORMATION!
Ambient temperature range is 0...+50°C / +32...+122°F.

DANGER!
The configuration tool cannot be connected to the OPTISWITCH 6600 C within the hazardous area. For programming, remove the device out of this area.

5.1 Start-up

Before connecting to power, please check that the system has been correctly installed. This includes:

- The device must be mechanically safe and mounted in compliance with the regulations.
- Check the leak-tightness at the sleeve.
- Make sure that the M12 plug is properly connected.
- The power connections must have been made in compliance with the regulations.
- Check that the electrical operating data of the power supply are correct.

- Switching on the power.

➲ Check for correct switching function.

5.2 Fault diagnosis and corrective action

Fault	Cause	Action / elimination
LED not "on"	Sensor cap not in contact with liquid product	-
	Supply voltage < 12 V, permittivity too low	Measure voltage at pin 1 and 3
No switching output	Cable break	Check continuity of cables
	Incorrect polarity of supply	Reverse terminal 1 and 3
	Short-circuit	Check wiring

6.1 Availability of services

The manufacturer offers a range of services to support the customer after expiration of the warranty. These include repair, maintenance, technical support and training.

INFORMATION!
For more precise information, please contact your local sales office.

6.2 Returning the device to the manufacturer

6.2.1 General information

This device has been carefully manufactured and tested. If installed and operated in accordance with these operating instructions, it will rarely present any problems.

WARNING!
Should you nevertheless need to return a device for inspection or repair, please pay strict attention to the following points:

- *Due to statutory regulations on environmental protection and safeguarding the health and safety of the personnel, the manufacturer may only handle, test and repair returned devices that have been in contact with products without risk to personnel and environment.*
- *This means that the manufacturer can only service this device if it is accompanied by the following certificate (see next section) confirming that the device is safe to handle.*

WARNING!
If the device has been operated with toxic, caustic, radioactive, flammable or water-endangering products, you are kindly requested:

- *to check and ensure, if necessary by rinsing or neutralising, that all cavities are free from such dangerous substances,*
- *to enclose a certificate with the device confirming that it is safe to handle and stating the product used.*

6.2.2 Form (for copying) to accompany a returned device

CAUTION!
To avoid any risk for our service personnel, this form has to be accessible from outside of the packaging with the returned device.

Company:		Address:
Department:		Name:
Tel. no.:		Fax no. and/or Email address:
Manufacturer's order no. or serial no.:		
The device has been operated with the following medium:		
This medium is:		radioactive
		water-hazardous
		toxic
		caustic
		flammable
		We checked that all cavities in the device are free from such substances.
		We have flushed out and neutralized all cavities in the device.
We hereby confirm that there is no risk to persons or the environment through any residual media contained in the device when it is returned.		
Date:		Signature:
Stamp:		

6.3 Disposal

LEGAL NOTICE!
Disposal must be carried out in accordance with legislation applicable in your country.

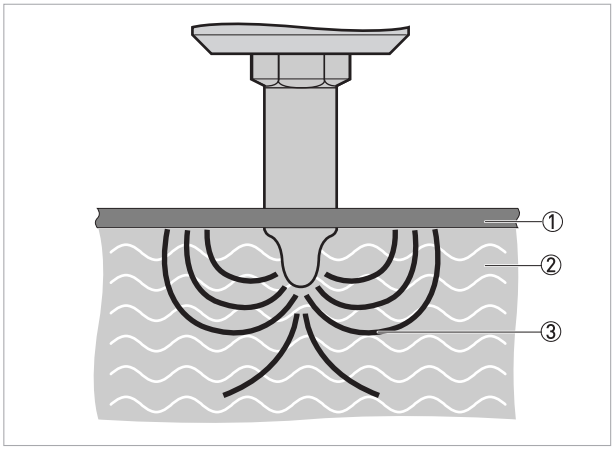
Separate collection of WEEE (Waste Electrical and Electronic Equipment) in the European Union:

According to the directive 2012/19/EU, the monitoring and control instruments marked with the WEEE symbol and reaching their end-of-life **must not be disposed of with other waste**.
The user must dispose of the WEEE to a designated collection point for the recycling of WEEE or send them back to our local organisation or authorised representative.

7.1 Measuring principle

A high frequency signal sweep is radiated from the sensor tip into the tank / pipe. The medium will act as a virtual capacitor, which together with a coil in the sensor head, will form a circuit creating the switching point signal. This virtual capacity will depend of the dielectric value of the medium and it is well defined for most media.

The measurement is precise and unaffected by the mounting position.



① Tank wall / pipe wall
② Medium
③ Line of electric flux

7.2 Technical data

INFORMATION!

- *The following data is provided for general applications. If you require data that is more relevant to your specific application, please contact us or your local sales office.*
- *Additional information (certificates, special tools, software,...) and complete product documentation can be downloaded free of charge from the website (Downloadcenter).*

Measuring system

Measuring principle	Electromagnetic wave, 100..180 MHz
Application range	Level detection, dry-run protection and media separation of liquids and solids.

Design

Construction	The measurement system consists of a measuring sensor and the electronic unit which is available in a compact version. The switching point is signalled by a blue LED indication at the neck of the M12 connector.
Options	Teach-In function for applications where the medium is hard to detect.
Accessories	Comprehensive range of adapters and process connections for hygienic installation. Please refer to the specific data sheet "Accessories".

Measuring accuracy

Repeatability	±1 mm / ±0.04¨
Hysteresis	±1 mm / ±0.04¨
Reference conditions acc. to EN 60770	
Temperature	+20°C ±5°C / +68°F ±41°F
Pressure	1013 mbar abs. ±20 mbara / 14.69 psi abs. ±0.29 psia
Humidity (IEC 68-2-38)	< 98% RH, condensing

Operating conditions

Temperature	
Ambient temperature (T_{amb})	-40…+85°C / -40…+185°F
Storage temperature	-40°C...+85°C / -40 ...+185°F
Process temperature	-40…+115°C / -40…+239°F (refer to separate diagram) +135°C / +275°F < 1 hour, T_{amb} < +50°C / +122°F
Pressure	
Ambient pressure	Atmospheric
Process pressure	Max. 100 bar / 1450 psi G 1/2 hygienic connection max. 10 bar / 145 psi Sliding connection max. 5 bar / 70 psi
Other conditions	
Ingress protection (acc. to EN 60529)	IP67 equivalent to NEMA 4X
	IP69K (with the appropriate cable)

Installation conditions

Installation	In any position. For more data, refer to *Installation* on page 10.
Dimensions and weights	For more data, refer to *Dimensions and weights* on page 24.

Materials

Sensor housing	Stainless steel 1.4404 / 316L
Process connection	
Sensor insulation	Virgin PEEK, FDA / Regulation (EC) No 1935:2004 / Regulation (EC) No 2023:2006
Electrical connection	Plug M12: nickel-plated brass
Surface Roughness of wetted part	Ra < 0.8µm (Ra < 0.4µm in option)

Process connections

Standard	G 1 A, G ½A and ½ NPT
Other	For more data about process connection options, refer to *Device order code* on page 28.

Electrical connections

Power supply	12…30 V DC, 35 mA max.
Power consumption	25 mA typical, 50 mA max.
Power-up time	< 2 s
Reaction time	0.1 s typical (0.15 +/- 0.05 s)
Damping	0...10 s
Cable entry	M12 (4 pin Polycarbonate) or M12 (4 pin stainless steel)

Output

Output (active)	Max. 20 mA, short-circuit and high-temperature protected
Output type	PNP or NPN
Output polarity	Reverse polarity protected
Voltage drop Active "Low"	NPN; (-V DC + 1.5 V) ± 0.5 V; R_{load} = 10 kilohms
Voltage drop Active "High"	PNP; (V DC - 1.5 V) ± 0.5 V; R_{load} = 10 kilohms
Factory settings	Switching range < 75% (εr > 2)
	Damping: 0.1 s
Off leak current	±100 µA max.

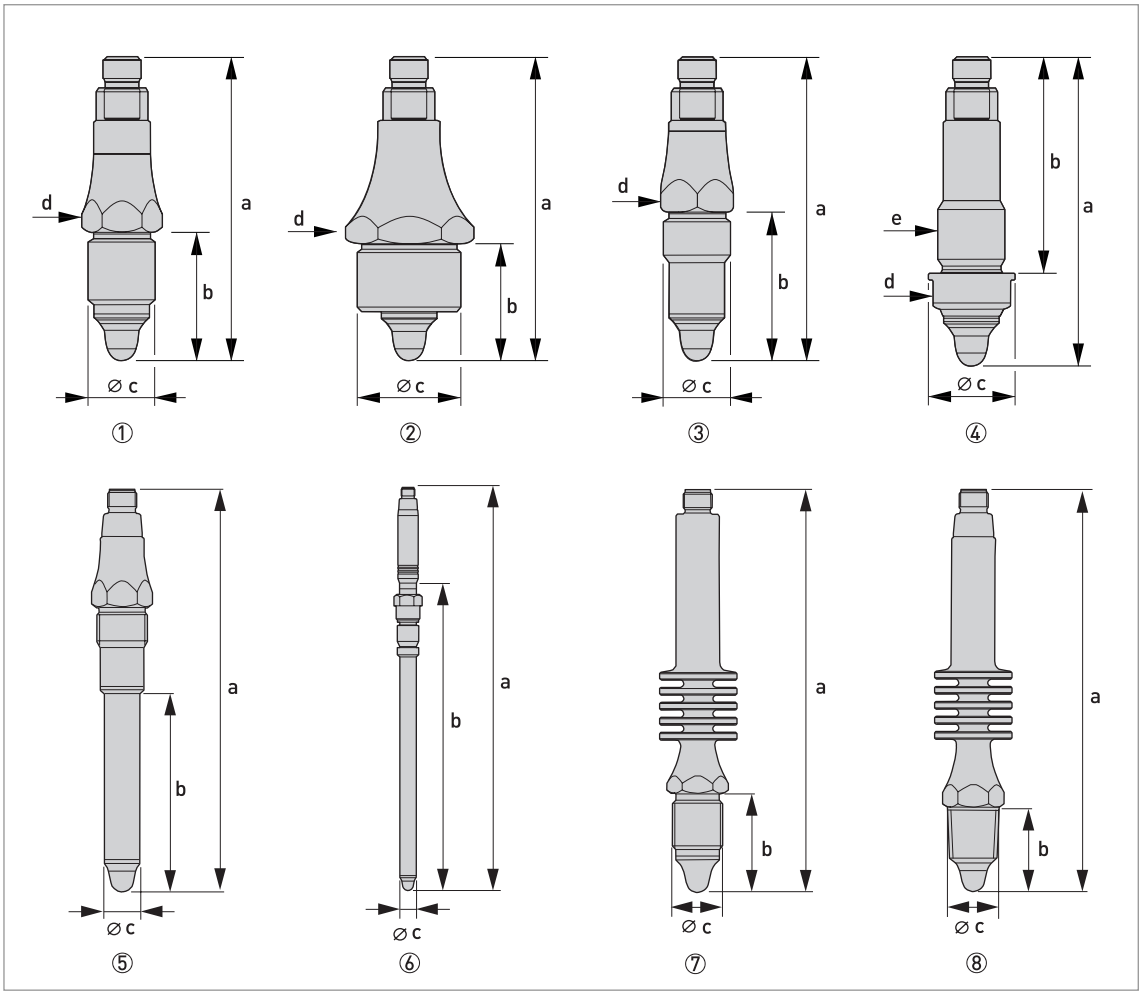
Approvals and certifications

CE	This device fulfils the statutory requirements of the EU directives. The manufacturer certifies successful testing of the product by applying the CE marking.
Other standards and approvals	
Electromagnetic compatibility (EMC)	EN 61326-1 (2006)
Vibration resistance	IEC 60068-2-6, GL test 2
Hygiene	3-A / EHEDG, materials agree with FDA / Regulation (EC) No 1935:2004 / Regulation (EC) No 2023:2006

Explosion protection	**ATEX II 1 G Ex ia IIC T4/T5** Maximum values (for barrier selection): U_i: 30 V DC ; I_i: 100 mA; P_i: 0.75 W Internal capacitance, Ci: 43 nF Internal inductance Li: 10 µH Temperature class: T1...T4: -40°C < T_{amb} < + 85°C T1...T5: -40°C < T_{amb} < +74°C ①
	ATEX II 1 D Ex ta IIIC T100 °C Da Voltage supply range 30 V DC max. Temperature class T100 °C: -40°C< T_{amb} < +85°C Protection class of cable accessory IP67
	ATEX II 3 G Ex nA II T4/T5 Voltage supply range 30 V DC max. Temperature class T1...T4: -40°C< T_{amb} < +85°C T1...T5: -40°C< T_{amb} < +74°C

① Recommended barrier: PROFSI3-b25100-ALG-LS

7.3 Dimensions and weights



① Standard G ½ version
② G 1 version
③ Hygienic G ½ version
④ Reverse-threaded G ½ version
⑤ Hygenic long sensor length G ½
⑥ Long sensor legth G ½ (sliding connection)
⑦ Standard sensor length (with cooling neck)
⑧ ½ NPT Standard sensor length (with cooling neck)

	Dimensions		Approx. weight without adapter	
	[mm]	[inch]	[kg]	[lb]
Standard G ½ or ½¨NPT version				
a	97	3.82	0.1	0.22
b	41	1.61		
c	G ½ or ½¨NPT– ISO 228/1			
d	WS 22	WS 0.87		
G 1 version				
a	97	3.82	0.15	0.33
b	38	1.50		
c	G 1 – ISO 228/1			
d	WS 36	WS 1.41		
Hygienic G ½ version				
a	97	3.82	0.1	0.22
b	48	1.89		
c	G ½ – ISO 228/1			
d	WS 22	WS 0.87		
Reverse-threaded G ½ version				
a	97	3.82	0.1	0.22
b	68	2.68		
c	Ø27	Ø1.06		
d	WS 24	WS 0.94		
e	G ½ A – ISO 228/1			
Hygenic long sensor length G ½ version				
a	166	6.54	0.12	0,27
b	117	4.61		
c	14.6	0.55		
Long sensor length G ½ version (sliding connection)				
a	357	14.06	0.25	0.55
b	272	10.71		
c	14.6	0.55		
Standard sensor length (with cooling neck)				
a	166	6.54	0.21	0.46
b	41	1.61		
c	G ½			
½ NPT standard sensor length (with coooling neck)				
a	166	6.54	0.21	0.46
b	35	1.38		
c	½ -14 NPT			

7.4 Temperature limits

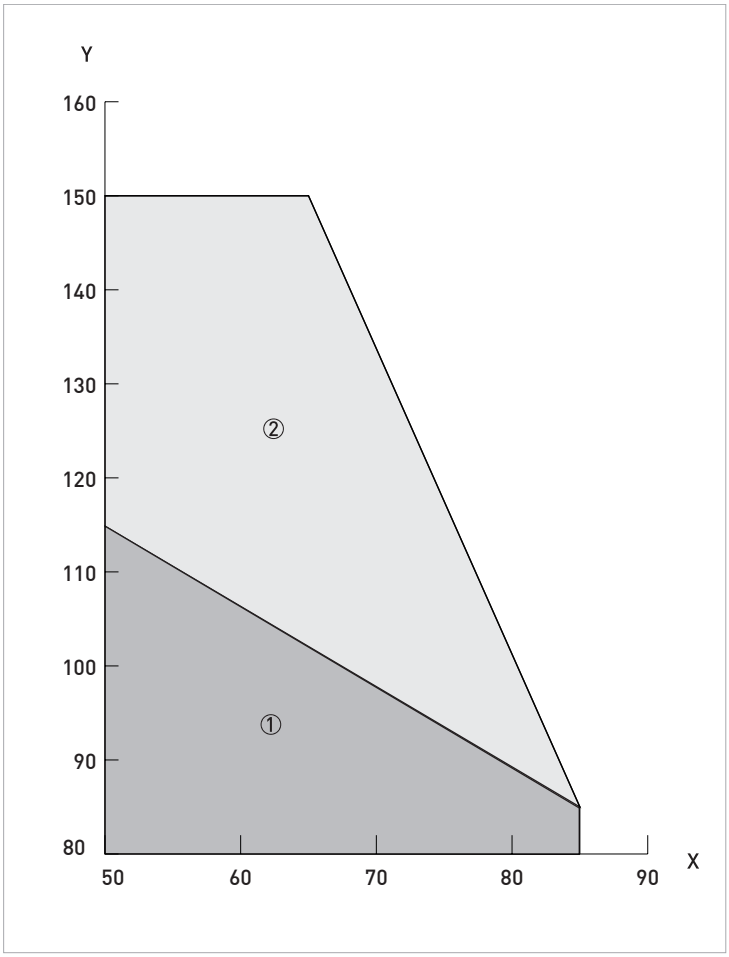


Figure 7-1: For all process connections except sliding connection

X: Ambient temperature in [°C]
Y: Process temperature max in [°C]
① Without cooling neck
② With cooling neck

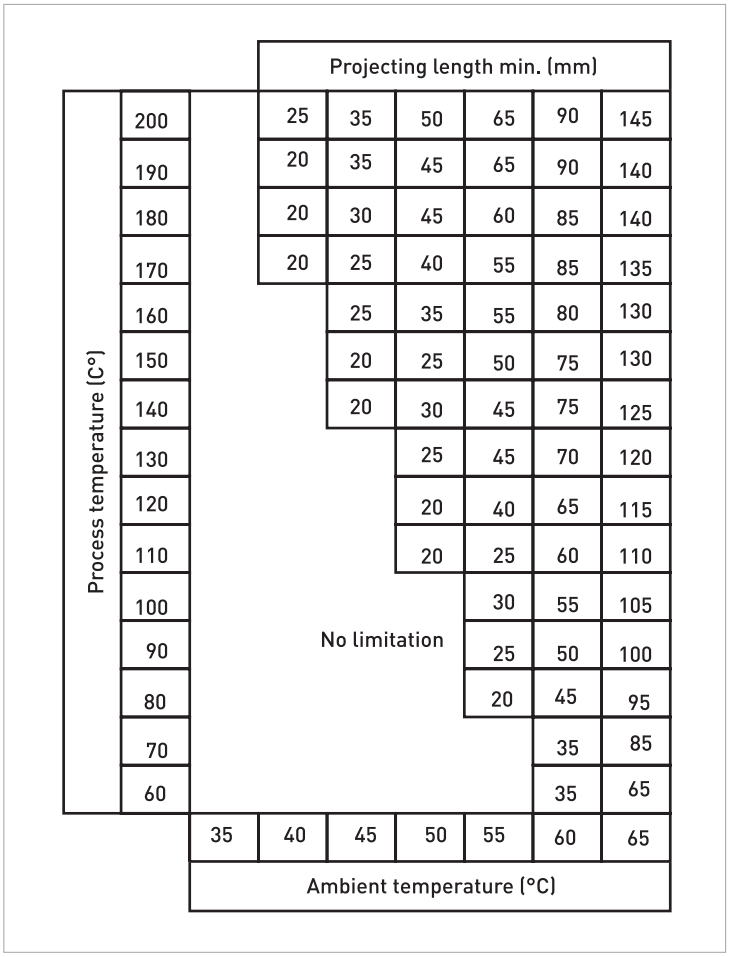


Figure 7-2: For process connection with sliding connection

8.1 Device order code

VGPA	4	1	OPTISWITCH 6600 C, with IP67 (equivalent to NEMA 4X), stainless steel housing – materials agree with FDA / Regulation (EC) No 1935:2004 / Regulation (EC) No 2023:2006 The use of VGP7 process connections is required for 3-A / EHEDG approved switches.						
			Process connection						
			1	G ½ A– standard sensor length 15 mm / 0.6¨ (for use with hygienic process connections)					
			2	G 1 A– standard sensor length 15 mm / 0.6¨ (non-hygienic)					
			3	G ½ A – standard sensor length 15 mm / 0.6¨ (non-hygienic)					
			4	G ½ A – for reverse mounting (non-hygienic)					
			6	G ½ A – Long sensor length 82 mm / 3.2¨ (hygienic with hygienic process connection)					
			7	G ½ A – Long sensor length 250 mm / 9.8¨ (sliding connection / for hygienic use)					
			B	G ½ A – Standard sensor length 15 mm /0.6¨ (with cooling neck / non-hygienic)					
			G	½¨NPT – Standard sensor length 15 mm /0.6¨ (non-hygienic)					
			H	½¨NPT – Standard sensor length 15 mm /0.6¨ (with cooling neck / non-hygienic)					
				Electrical connection					
				1	M12 – 4-pin connector plug				
				2	IP67; 5 m / 16.4 ft non-shielded cable with flying leads (max. temperature: +70°C / +158°F)				
				4	M12 – 4-pin connector plug (stainless steel), no LED				
					Approvals				
					0	Without			
					3	ATEX II 1G Ex ia IIC T5 ①			
					4	ATEX II 1D Ex ta IIIC T100°C Da ①			
					5	ATEX II 1G Ex ia IIC T4/T5 and ATEX II 1D Ex ta III T100°C Da ①			
						Output			
						0	PNP output		
						1	NPN output		
							Output configuration		
							0	Standard	
							1	Customer settings – based on data from an installed device. "% of triggering, damping, hysteresis, output mode" to be specified separately.	
								Other Approvals	
								0	None
								A	Food contact (FDA rules, EC 1935/2004, EC 2023/2006 and EU 10/2011)
								B	Food contact (FDA rules, EC 1935/2004, EC 2023/2006 and EU 10/2011) + 3-A® + EHEDG - only with process connection code 1 (G1/2 A) and in combination with hygienic adapters
VGPA	4	1							**Order code (complete this code on the pages that follow)**

									Surface Finish	
									0	Standard 0.8 µm surface roughness
									1	0.8 µm surface roughness - electro-polished
									2	0.4 µm surface roughness
VGPA	4	1								Order code

① For more data about how to order this option, speak to your supplier

Order code for configuration tool (incl. interface unit + USB cable + CD with driver + alligator clips + M12 connection cable)

XGP9	0	0	0	0	1	0	Order code

8.2 Order code for process connections options

Hygienic connections

Code	Old code	Description	Max. pressure		Approval options
			[barg]	[psig]	
KPW3-321	HWN 200	Weld-in sleeve (outside Ø30 mm)	100	1450	3-A® / EHEDG
KPW3-322	HWN 210	Collared weld-in sleeve	40	580	3-A® / EHEDG
KPW2-327	HWN 220	Weld-in sleeve with shoulder – for DN65…150 pipes	40	580	—
KPW2-326	HWN 220	Weld-in sleeve with shoulder – for DN25…50 pipes	40	580	—
KPW2-324	HWN 250	Spherical weld-in sleeve – for angled sensor mounting	40	580	—
KPH-32CB	HGA 200	Hygienic adapter for G 1 process connection	40	580	—
KPH1-3236	HSM 251	DN51 adapter SMS 1145 ①	25	363	—
KPH3-3213	HTC 240	1½¨ Tri-Clamp® DN25/40 DIN 32676, 25/38 mm ISO 2852 ①	40	580	3-A® / EHEDG
KPH3-3216	HTC 250	2¨ Tri-Clamp® DN50 DIN 32676, 51 mm ISO 2852 ①	40	580	3-A® / EHEDG
KPH3-3221	HMT 225	DN25 conical nozzle DIN 11851 ①	40	580	3-A® / EHEDG
KPH3-3224	HMT 240	DN40 conical nozzle DIN 11851 ①	40	580	3-A® / EHEDG
KPH3-3225	HMT 250	DN50 conical nozzle DIN 11851 ①	10	145	3-A® / EHEDG
KPH3-3254	—	DN40 conical nozzle DIN 11851 Type A ①	10	145	3-A® / EHEDG
KPH3-3255	—	DN50 conical nozzle DIN 11851 Type A ①	40	580	3-A® / EHEDG
KPH3-324E	HVF 250	DN40/50 Varivent® Type N	10	145	3-A® / EHEDG
KPW2-621	—	3-A® DN38 weld in tank part ①	40	580	3-A® / EHEDG
KPW2-626	—	3-A® DN38 weld in pipe extrusion	40	580	3-A® / EHEDG
KPX5-32	HST 200	Allen screw blanking plug	100	1450	—
KPH1-32A1	—	E&H FTL – process connection code EE2, Rd 52	40	580	—
KPH1-32BA	—	E&H FTL – process connection code GQ2 (G ¾), Ø23.7 mm	40	580	—
KPH1-32BC	—	Vegaswing – process connection codes GB/GBV (G ¾), Ø21.3 mm	40	580	—
KPH1-32CD	—	Vegaswing – process connection codes GA/GAV (G 1), Ø21.3 mm	40	580	—
KPI1-A2D	—	G 1½ Cable holder for use with OPTISWITCH 6600 solids	10	145	—

① To order union nuts and gaskets, refer to "Accessories" in the section that follows

Non-hygienic connections

Code	Old code	Description	Max. pressure		Approval options
			[barg]	[psig]	
KPW1-721	NWN 200	Weld-in sleeve (outside Ø30 mm) for thick wall tank	100	1450	—

INFORMATION!
All hygienic process connections agree with FDA regulations, Regulation (EC) No 1935:2004 and Regulation (EC) No 2023:2006.

8.3 Order code for accessories

Code	Description	New hygienic connection code	Old hygienic connection code	Approval options
KPX4-310	Clamp-ring AISI 304 for 1½¨ Tri-Clamp® DN40 DIN 32676, 38 mm ISO 2852	KPH1-3213	HTC 240	—
KPX3-7232	EPDM gasket for 1½¨ Tri-Clamp® DN25/40 DIN 32676 25/38 mm ISO 2852	KPH1-3213	HTC 240	FDA
KPX4-610	Clamp-ring AISI 304 for 2¨ Tri-Clamp® DN50 DIN 32676, 51 mm ISO 2852	KPH1–3216	HTC 250	—
KPX3-7262	EPDM gasket for 2¨ Tri-Clamp®, DN50 DIN 32676, 51 mm ISO 2852	KPH1–3216	HTC 250	FDA
KPX4-630	Union nut AISI 304 for DN51 adapter SMS 1145	KPH1-3236	HSM 251	—
KPX3-8160	NBR gasket for DN51 adapter SMS 1145	KPH1–3236	HSM 251	—
KPX4-140	Union nut AISI 304 for DN25 conical nozzle DIN 11851	KPH1–3221	HMT 225	—
KPX3-9110	NBR gasket for DN25 conical nozzle DIN 11851	KPH1–3221	HMT 225	—
KPX4-440	Union nut AISI 304 for DN40 conical nozzle DIN 11851	KPH1–3224	HMT 240	—
KPX3-9140	NBR gasket for DN40 conical nozzle DIN 11851	KPH1–3224	HMT 240	—
KPX2-A22	EPDM gasket for DN40 conical nozzle DIN 11864-1 from A	—	—	—
KPX2-A32	FKM gasket for DN40 conical nozzle DIN 11864-1 from A	—	—	—
KPX4-540	Union nut AISI 304 for DN50 conical nozzle DIN 11851	KPH1–3225	HMT 250	—
KPX3-9150	NBR gasket for DN50 conical nozzle DIN 11851	KPH1–3225	HMT 250	—
KPX2-B32	FKM gasket for DN50 conical nozzle DIN 11864-1 from A	—	—	—
KPX2-123	EPDM O-ring 3A DN38	within order code OPTISWITCH 6500	—	3-A® /FDA
KPX2-323	EPDM O-ring for DN40/50 VARIVENT® Type N	KPH1–324E	HVF 250	3-A® /FDA

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