



OPTISWITCH 6600 C Technical Datasheet

Microwave Level Switch for standard hygienic applications

- Optimised sensor geometry, easy to clean
- Measures products with dielectric constant > 1.5
- Small and compact



1	Product features	3
<hr/>		
1.1	Switch for level detection and dry-run protection	3
1.2	Options and variants	5
1.3	Measuring principle	6
2	Technical data	7
<hr/>		
2.1	Technical data	7
2.2	Dimensions and weights	9
2.3	Temperature limits	10
3	Installation	11
<hr/>		
3.1	Intended use	11
3.2	General notes on installation	11
3.3	Installation requirements	11
3.4	Process connection	11
4	Electrical connections	12
<hr/>		
4.1	Safety instructions	12
4.2	Electrical connection diagrams	12
5	Order information	14
<hr/>		
5.1	Order code for OPTISWITCH 6600 C	14
5.2	Order code for process connection	15

1.1 Switch for level detection and dry-run protection

The **OPTISWITCH 6600 C** is a level switch for level detection and dry-run protection for liquids and solids. Through its small and optimal sensor shape, the device is easy to clean and the risk of clogging of sticky products is minimised.

The device measures liquids such as water and beer and even viscous and sticky products such as honey or toothpaste. Solids (sugar or flour) can be also measured. The measurement is precise and not affected by the mounting position. Coating of the sensor or condensate are not detected.

The OPTISWITCH 6600 C is resistant to CIP and SIP agents. Hygienic installation is possible with the comprehensive range of accessories. For further information refer to chapter "Order information".



- ① Standard version
- ② Hygienic version
- ③ LED for switching point indication

Highlights

- Process temperature -40 ...+115°C / -40...+239°F
- Insensitive to build up or foam
- Measures alternating media
- LED switching point indication
- Hygienic switch entirely made of stainless steel
- Excellent for media separation
- No blockage of the pipeline

Industries

- Food & Beverage
- Pharmaceuticals
- Cosmetics

Typical applications

- Level detection of mustard
- Dry-run protection of cream
- Level detection of ketchup

1.2 Options and variants

LED indication



The information that the switching point is triggered, is been indicated by a blue light.

Pipe assembly



The construction with the reverse-threaded G 1/2 connection can be mounted in a pipe.

Electrical connection is made via a 5 m / 16.4 ft long cable.

Configuration tool

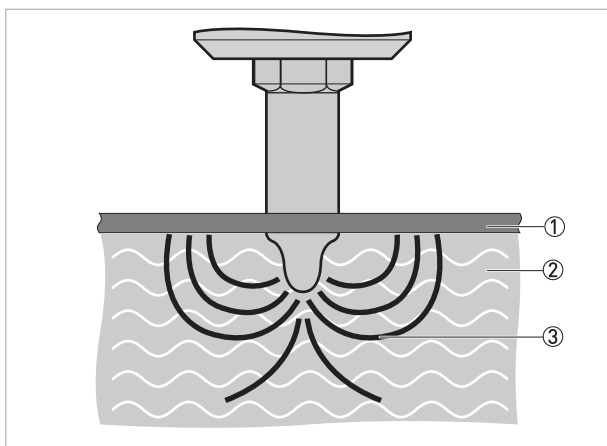


The configuration tool connects the OPTISWITCH 6600 C with a computer. With a corresponding software, it is possible to fine tune the switching point, change the hysteresis or adjust damping.

1.3 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

2.1 Technical data

- *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

Resolution	$\pm 1 \text{ mm} / \pm 0.04''$
Hysteresis	$\pm 1 \text{ mm} / \pm 0.04''$
Reference conditions acc. to EN 60770	
Temperature	$+20^\circ\text{C} \pm 5^\circ\text{C} / +70^\circ\text{F} \pm 10^\circ\text{F}$
Pressure	1013 mbar abs. $\pm 20 \text{ mbar} / 14.69 \text{ psig} \pm 0.29 \text{ psig}$
Relative air humidity	60% $\pm 15\%$

Operating conditions

Temperature	
Ambient temperature (T_{amb})	$-40 \dots +85^\circ\text{C} / -40 \dots +185^\circ\text{F}$
Process temperature	$-40 \dots +115^\circ\text{C} / -40 \dots +239^\circ\text{F}$ (refer to separate diagram) $+130^\circ\text{C} / +266^\circ\text{F} < 1 \text{ hour}, T_{\text{amb}} < +40^\circ\text{C} / +104^\circ\text{F}$
Pressure	
Ambient pressure	Atmospheric
Process pressure	Max. 100 bar / 1450 psi
Other conditions	
Ingress protection (acc. to EN 60529)	IP67 equivalent to NEMA 4X

Installation conditions

Installation	In any position. For detailed information refer to chapter "Installation".
Dimensions and weights	For detailed information refer to chapter "Dimensions and weights".

Materials

Sensor housing	Stainless steel 1.4404 / 316L
Process connection	
Sensor insulation	Virgin PEEK, FDA conform
Electrical connection	Plug M12: nickel-plated brass

Process connections

Standard	Hygienic G ½; standard G ½; G 1 and reverse-threaded G ½
Other	For other hygienic process connections, e. g. Tri-Clamp®, DIN 11851, VARIVENT® please refer to the chapter "Order code".

Electrical connections

Power supply	12...30 VDC, 35 mA max.
Power consumption	1.1 W
Power-up time	< 2 s
Reaction time	Max. 0.2 s
Damping	0...10 s
Cable entry	M12 (4 pole Lumberg)

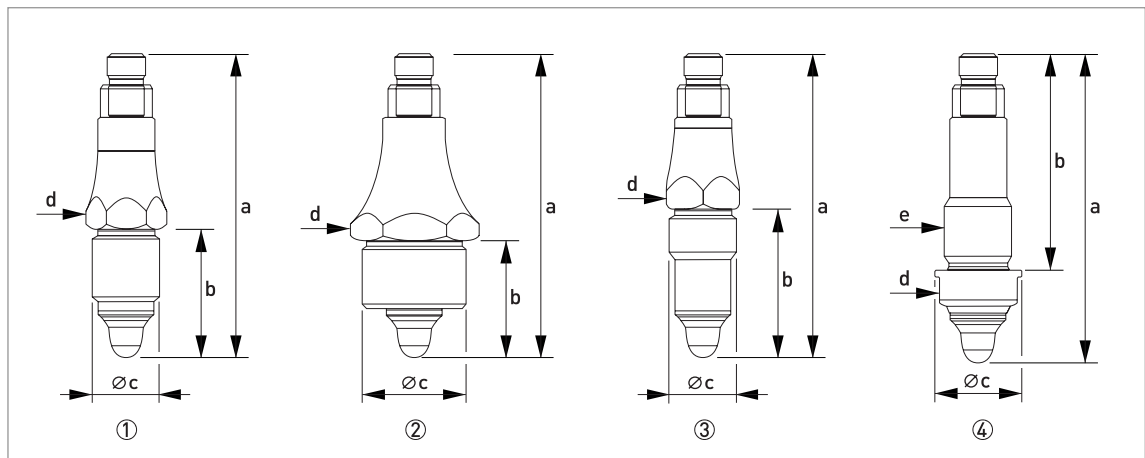
Output

Output (active)	Max. 20 mA, short-circuit and high-temperature protected
Output type	PNP or NPN
Output polarity	See drawing in chapter "Electrical connection".
Active "Low"	NPN; (-VDC + 1.5 V) ± 0.5 V; R _{load} = 10 kilohms
Active "High"	PNP; (VDC - 1.5 V) ± 0.5 V; R _{load} = 10 kilohms
Factory settings	Measure: $\epsilon_r > 2$; damping: 0.1 s
Off leak current	±100 µA max.

Approvals and certifications

CE	This device fulfils the statutory requirements of the EC 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	3A for hygienic G ½, FDA conform materials

2.2 Dimensions and weights



- ① Standard G ½ version
- ② G 1 version
- ③ Hygienic G ½ version
- ④ Reverse-threaded G ½ version

	Dimensions		Approx. weight without adapter	
	[mm]	[inch]	[kg]	[lb]
Standard G ½ version				
a	97	3.82	0.1	0.22
b	41	1.61		
c	G ½ – 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			

2.3 Temperature limits

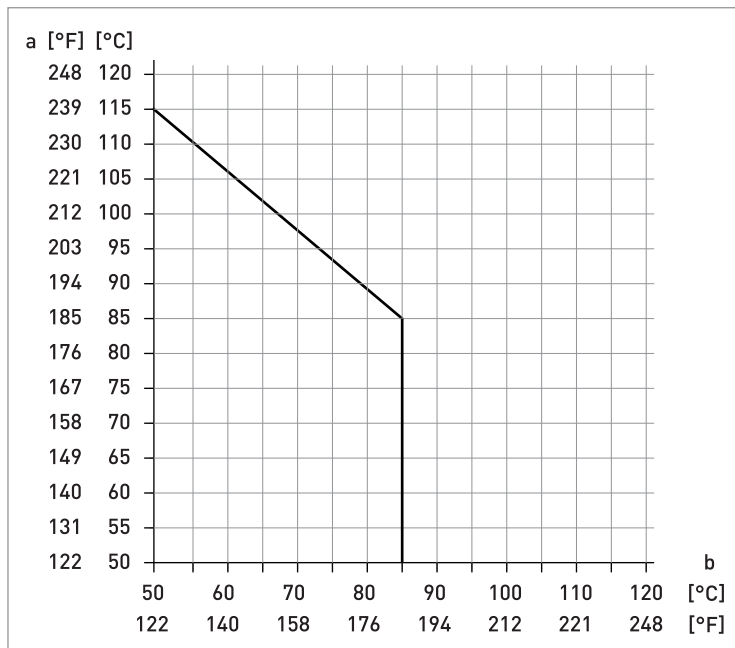


Figure 2-1: Media temperature versus ambient temperature

a: media temperature in [°C] or [°F]
 b: ambient temperature in [°C] or [°F]

CIP: +130°C / +266°F < 1 hour ($T_{amb} < +40°C / +104°F$)

3.1 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.

3.2 General notes on installation

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

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

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.

3.3 Installation requirements

- For the hygienic version, use only the recommended 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 the sleeve should be 25...30 N·m / 18.44...22.13 lb_f·ft.

3.4 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 3A, FDA). 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. For more information please refer to chapter "Order code".

The sensor can be installed in any desired position.

4.1 Safety instructions

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

Observe the national regulations for electrical installations!

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

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.

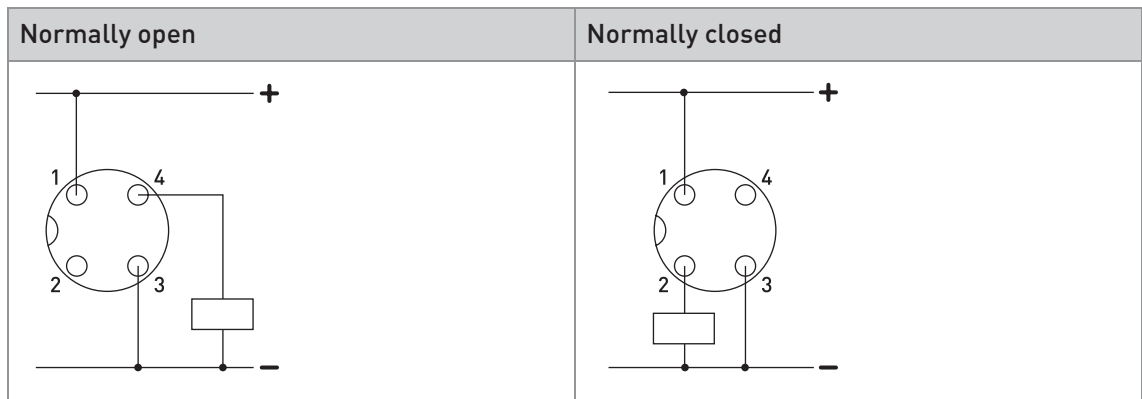
Look at the device nameplate to ensure that the device is delivered according to your order. Check for the correct supply voltage printed on the nameplate.

4.2 Electrical connection diagrams

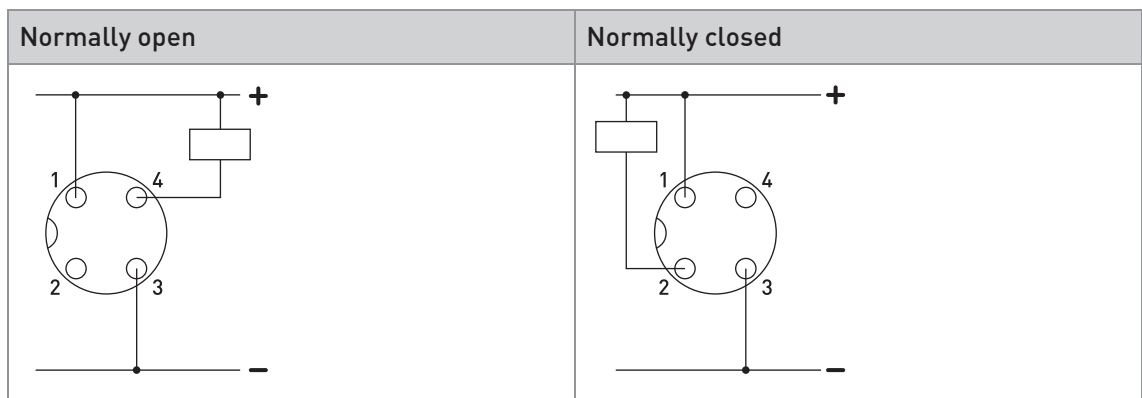
Description of normally open (NO) and normally closed (NC)

Normally open	Normally closed
<p>① 0 mA ② 20 mA ③ LED</p>	<p>① 20 mA ② 0 mA ③ LED</p>

PNP



NPN



M12 plug

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

5.1 Order code for OPTISWITCH 6600 C

VGPA	1	OPTISWITCH 6600 C, with IP67 (equivalent to NEMA 4X), stainless steel housing – FDA compliant materials The use of VGP7 process connections is required for 3A approved switches.					
		Process connection					
		1	G ½ – standard sensor length 18 mm / 0.7" (for use with hygienic process connections)				
		2	G 1 – standard sensor length 18 mm / 0.7" (not hygienic)				
		3	G ½ – standard sensor length 18 mm / 0.7" (not hygienic)				
		4	G ½ A – for reverse-threaded mounting (not 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)				
		Approvals					
		0	Without				
		1	Certified acc. to 3A, G ½ in combination with hygienic adapter VGP7				
			ATEX II 3G Ex nA II T5 ①				
			ATEX II 1G Ex ia IIC T5 ①				
		4	ATEX II 1D Ex ta IIIC 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.						
VGPA	4	1				0 0 Order code	

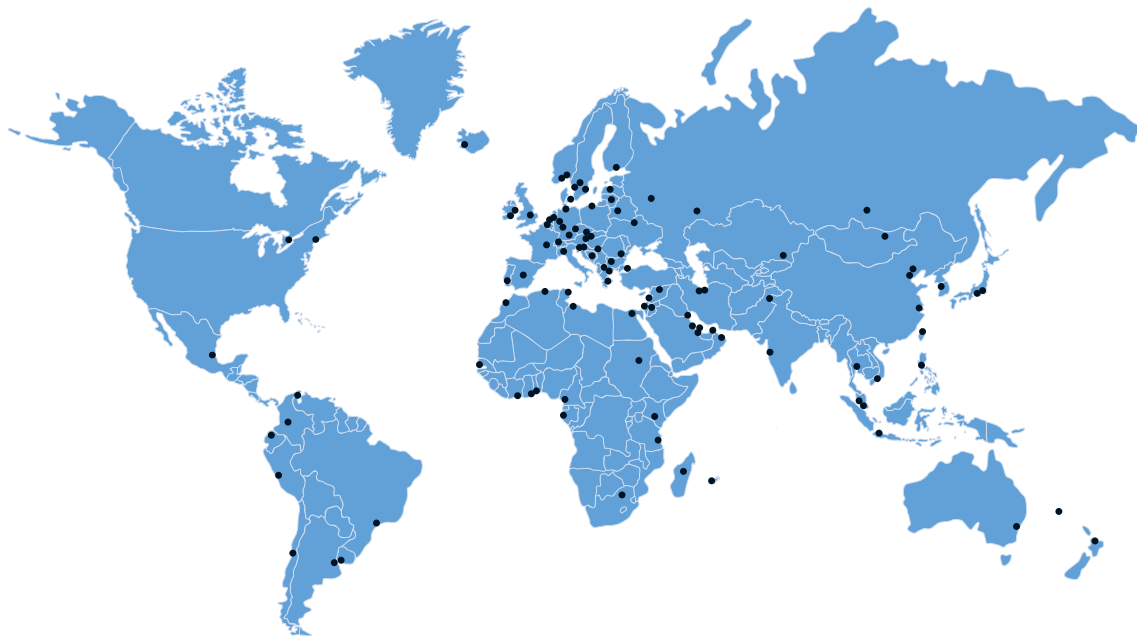
① For more data about how to order this option, speak to your supplier

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

XGP9	0	0	0	0	0	1	0	Order code
-------------	---	---	---	---	---	---	---	------------

5.2 Order code for process connection

VGP7	4	Process connection type						
		0	Without					
		1	Weld-in sleeve; HWN 200					
		2	Collared weld-in sleeve; HWN 210					
		3	Weld-in sleeve with shoulder for pipes DN25...50; HWN 220					
		4	Hygienic adapter for G 1 process connection; HGA 200					
		7	Spherical weld-in sleeve for angled sensor mounting; HWN 250					
		8	DRD – DN50 sanitary connection; HMM 250					
		A	DIN 11851 – DN25 conical nozzle including rotating union nut and gasket; HMT 225					
		B	DIN 11851 – DN50 conical nozzle, including rotating union nut and gasket; HMT 250					
		C	VARIVENT® flange type N – DN40/50, including O-ring; HVF 250					
		D	2" Tri-Clamp® – ; DN50 DIN 32676; 51 mm ISO 2852; including EPDM seal; HTC 250					
		U	DIN 11851 – DN40 conical nozzle, including rotating union nut and gasket; HMT 240					
		V	1½" Tri-Clamp® – DN25/40 DIN 32676; 25/38 mm ISO 2852; including EPDM seal; HTC 240					
		W	SMS adapter 1145 / 2", including union nut; HSM 251					
		X	Non-hygienic weld-in sleeve (with standard surfaces only); NWM 200					
		Z	Allen screw blanking plug; HST 200					
				Surfaces				
				0	Standard			
				1	Inside electro-polished			
VGP7	4	0	0	0	0	Order code		



KROHNE – Process instrumentation and measurement solutions

- Flow
- Level
- Temperature
- Pressure
- Process Analysis
- Services

Head Office KROHNE Messtechnik GmbH
Ludwig-Krohne-Str. 5
47058 Duisburg (Germany)
Tel.: +49 203 301 0
Fax: +49 203 301 10389
info@krohne.com

The current list of all KROHNE contacts and addresses can be found at:
www.krohne.com

KROHNE