

Field of application

CONTACT RLBFI is designed for level detection in tanks and dry-run protection of pumps by empty pipe monitoring.

It detects liquid, pasty or oily media, but also solid-bulk materials like flour or plastic granulate.

The CONTACT RLBFI is capable of media differentiation by distinguishing the specific properties, such as oil, water, foam and liquid.

Reliable performance is assured in any mounting position (from top, bottom or side). Depending on the desired process connection, different mounting options are available.

Corresponding mounting aids and adaptors for conventional process connections are available as an accessory.

Two switching outputs are available with dedicated switching windows.

The switching function is programmable as PNP, NPN or digital (pushpull) polarity, as well as the switching logic like Normally Open (NO), Normally Closed (NC) or inverted.

CONTACT RLBFI in its default configuration covers a major part of potential applications. Where customer-specific configuration is required because of demanding media (e. g. foamy or adhering), qTeach, remote teach, IO-Link or the FlexProgrammer allows for easy optimization of the switching windows.

The measured data can be visualized on a PC for further parameter adjustment, for example time constant of a damping function and inverted switching output logic.

Measuring principle

An electrode integrated into the sensor tip forms a capacitor with the environment.

The medium determines the capacity value depending on its dielectric constant (DC values).

A resonant circuit occurs together with a coil in the sensor electronics. Depending on the resonance frequency measured and the programmable trigger threshold, the switch signal is activated.



The EHEDG certificate is only valid in connection with the appropriate installation parts. These are marked with the "EHEDG Certified" logo.



The 3-A Sanitary Standard requirements are only met with the appropriate installation parts. These are marked with the 3-A logo.



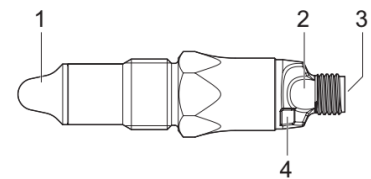
Approved for explosion hazard areas when installed as specified.



Approved by Underwriter Laboratories (UL) for use in the USA and Canada as an industrial control device.

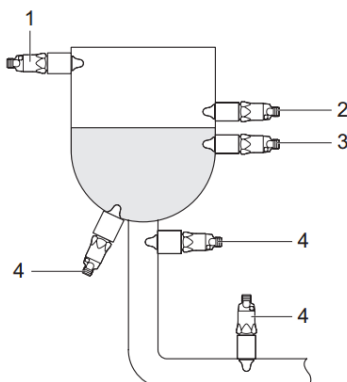
Highlights of the product

- Detection of liquids, bulk solids and powders. One sensor for all applications.
- Compact immersion length
- Capable of differentiation between foam and liquid
- Insensitive to adherent or sticky media
- Status indication via multicolour LED
- Compact stainless steel housing, up to IP69K protection
- Teach-in on-site or remote via control cable
- Two switching outputs with dedicated switching windows
- Configuration and IO-Link interface



Construction and function

1. Sensor tip
2. LED
3. Connection with M12 plug
4. qTeach detector



Assembly

- Overfill protection
- Limit level, max.
- Limit level, min.
- Run-dry protection

The sensor can be mounted on any point in the vessel.

A sensor mounted at the top of the vessel (1) ensures against overfilling.

Sensors attached further down detect a maximum (2) or minimum (3) limit level.

A sensor attached at the bottom or on the outfeed pipe (4) can protect a connected pump against dry running.

Technical data

Housing	
Style	Compact design
Overall sizeW	Refer to section "Dimensional drawings"
Material	Stainless steel
Electrical connection	
Connector variant	M12-A, 4-pin, polycarbonate M12-A, 4-pin, stainless steel
Ambient conditions	
Operating temperature range	-40 ... 85°C
Storage temperature range	-40 ... 85°C
Humidity	< 98 % RH, condensing
Degree of protection (EN 60529)	IP67 IP69K (with appropriate cable)
Vibration (sinusoidal) (EN 60068-2-6)	1.6 mm p-p (2 ... 25 Hz), 4 g (25 ... 100 Hz), 1 octave / min.
Process connection	
Connection variants	Refer to section "Dimensional drawings"
Mounting position	Any (top, bottom, side)
Wetted parts material	PEEK Natura AISI 316L (1.4404)
Surface roughness wetted parts	Ra < 0.8 µm
Process conditions	
Process temperature	Refer to section "Process conditions"
Process pressure	Refer to section "Process conditions"
Power supply	
Voltage supply range	8 ... 36 V DC
Current consumption (no load)	< 35 mA typ., 50 mA max
Power supply	
Reverse polarity protection	Yes
Power-up time	< 3 s
Output signal	
Output type	PNP NPN Digital (push-pull)
Current rating	100 mA max.
Short circuit protection	Yes
Voltage drop	PNP: (+Vs -0.5 V) ± 0.2 V, Rload ≥ 10 kΩ NPN: (+0.4 V) ± 0.2 V, Rload ≥ 10 kΩ
Off leak current	< 100 µA max.
Switching logic	Normally open (NO) Normally closed (NC) Active high Active low
Interface	IO-Link 1.1
Performance characteristics	
Repeatability	± 1 mm
Hysteresis	± 1 mm
Response time	0.04 s typ
Media characteristics	DC > 1.5
Damping	0.0 ... 10.0 s (adjustable)

Technical data

Factory settings	
Switching range (dielectric constant DC)	< 75 % (DC > 2)
Range hysteresis	2.4 %
Switching logic	SW1: Normally open (NO) SW2: Normally closed (NC)
qTeach	activated
Damping	0.1 s
Compliance and approvals	
EMC Immunity	EN 61326
EMC Emission	EN 61326 (installed in a closed metal tank)
Safety	cULus listed, Class 2, E365692
Hygiene	FDA (21 CFR 177.2415)
Explosion protection	IECEX ATEX
IECEX Ex ia IIC T4 Ga, IECEX Ex ta IIIC T100 °C Da	
Maximum values (for barrier selection)	Ui: 30 V DC max. Ii: 100 mA Pi: 750 mW
Internal capacitance	Ci: 63 nF
Internal inductance	Li: 617 µH
Temperature class	T1 ... T4: -40 < Tamb < 85°C T100 °C: -40 < Tamb < 85°C
Degree of protection for cable	IP67
IECEX Ex nA IIC T4 Gc	
Voltage supply range	Un: 30 V DC max.
Current rating	In: 100 mA
Temperature class	T1 ... T4: -40 < Tamb < 85°C
Degree of protection for cable	IP67
ATEX II 1G Ex ia IIC T4 Ga, ATEX II 1D Ex ta IIIC T100 °C Da	
Maximum values (for barrier selection)	Ui: 30 V DC max. Ii: 100 mA Pi: 750 mW
Internal capacitance	Ci: 63 nF
Internal inductance	Li: 617 µH
Temperature class	T1 ... T4: -40 < Tamb < 85°C T100 °C: -40 < Tamb < 85°C
Degree of protection for cable	IP67
ATEX II 3G Ex nA IIC T4 Gc	
Voltage supply range	Un: 30 V DC max.
Current rating	In: 100 mA
Temperature class	T1 ... T4: -40 < Tamb < 85°C
Degree of protection for cable	IP67

Note:

Information on product characteristics may relate to defined product options.

Information in format AXX-X... relates to "Connection Identifier" (BCID) and dedicated ordering code.

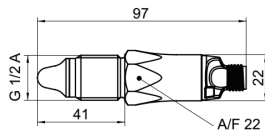
Accessories

- Hygienic weld-in sleeves for "Process connection"
- Thread adapters for "Process connection"
- Industrial weld-in sleeves for "Process connection"
- Hygienic connectors with stainless steel knurl, protection up to IP69K connection
- Industrial connectors, protection up to IP67

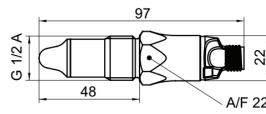
Process conditions

Process connection	BCID	Order code	Process temperature continuous Tamb < 50 °C	Process pressure bar	Process temperature max. temporary t < 1 h Tamb < 50 °C	Process pressure max. temporary t < 1 h bar
G 1/2 A ISO 228-1	G07	RLBFI	-40 ... 115°C	-1 ... 100 bar	135°C	-1 ... 100 bar
G 1/2 A hygienic	A03	RLBFH/I	-40 ... 115°C	-1 ... 10 bar	135°C	-1 ... 5 bar
1/2-14 NPT	N02	RLBFI	-40 ... 115°C	-1 ... 100 bar	135°C	-1 ... 100 bar

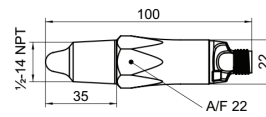
Dimensional drawings and Process connection



G 1/2 A ISO 228-1
G07-G070



G 1/2 A hygienic
A03-A030



1/2-14 NPT
N02-N020