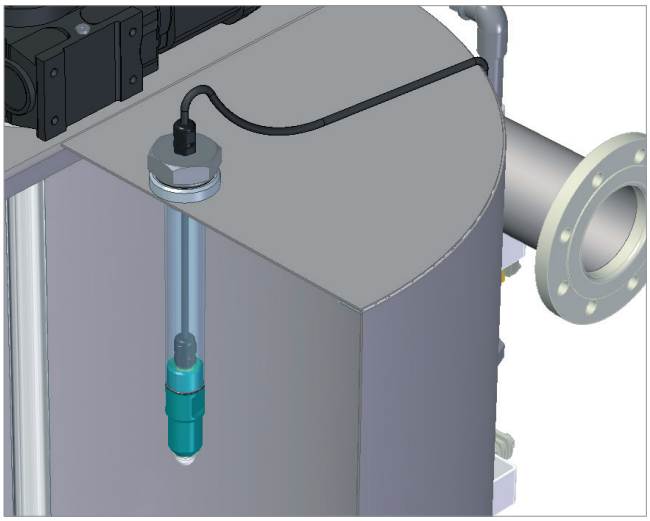
RFLS-28

HIGH-FREQUENCY LEVEL SENSORS

Limit level sensors with elimination of deposits and foam on the electrode



- **Vertical mounting in tanks, vessels, sumps, and containers by means of tubular extender**
- **For reliable limit level sensing of various liquids, slurries and pastes**
- **Resistant to adhesion of viscous and adhering media (ketchup, yoghurt, spread, syrup, cream, cleaning agents, etc.)**
- **Replacement of vibration level sensors**
- **Easy setting with a magnetic pen**
- **The version with a protective crown for installation in places with a risk of mechanical damage of the sensor**
- **Sensor housing made from 1.4404 stainless steel (AISI 316 L)**

Technical specifications

Supply voltage	7 ... 34 V DC
Current consumption	max. 5 mA DC
Output type	PNP (open collector)
Status indication	2x LED (orange, green)
Max. switching current (PNP output)	300 mA
Residual voltage in closed state	max. 1.5 V
Protection class	IP 68
Cable	PVC 3 x 0.5 mm^2
Weight (without cable)	approx. 0.15 kg
Setup technique	magnetic pen MP-8
Electrode coating	PEEK
Relative permittivity of medium	$\varepsilon_r \geq 1.5$

Temperature and pressure resistance – performance N

performance variant	temperature	maximum overpressure
RFLS-28N-1B (1E, 10B, 10E)	-40 °C ... +80 °C	10 MPa
RFLS-28N-1V (10 V)	-20 °C ... +80 °C	10 MPa

BASIC FEATURES AND VARIANTS

The RFLS-28 high-frequency level sensor is intended for industrial use for limit level sensing of liquid and paste media. It is designed for vertical mounting in the tank or using a tubular extender (see the technical data sheet for accessories) or a bracket.

It can directly replace vibrating level sensors, or capacitive level sensors in more demanding applications. Media can be electrically conductive as well as non-conductive. The sensor can be installed in metal or plastic tanks, filling tanks, sumps, etc.

VARIANTS

name	minimum temperature	type
RFLS–28_–1B	from -40 °C	NBR O-ring
RFLS–28_–10B	from -40 °C	with protective crown, NBR O-ring
RFLS–28_–1E	from -40 °C	EPDM O-ring
RFLS–28_–10E	from -40 °C	with protective crown, EPDM O-ring
RFLS–28_–1V	from -20 °C	insulated electrode (PEEK) FPM O-ring (Viton)
RFLS–28_-10V	from -20 °C	with protective crown, FPM O-ring (Viton)

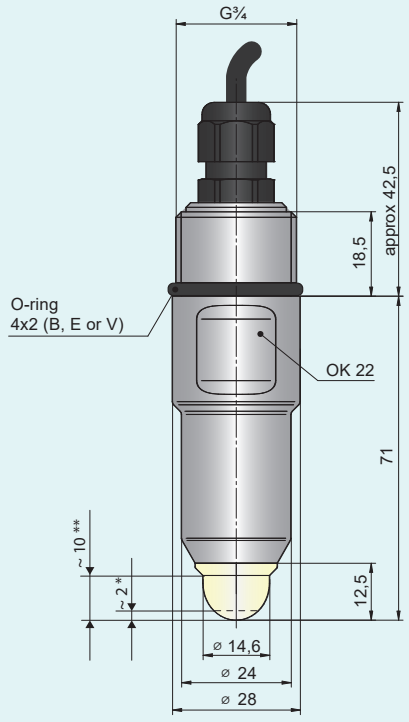
Functional safety parameters

sensor variants	RFLS-28N-_-_-P	RFLS-28N-_-_-PD
According to the norm	EN 61508 ed.2	
Safety features	MIN, MAX	
SIL	2	
Hardware architecture	1oo1 without diagnostics	1oo1 with diagnostics
DC	0 %	99 %
PFH (T_{Proof}= 1 rok) (for the variant N)	$1{,}471 * 10^{-7}$	$1{,}471 * 10^{-9}$
λ_{DD} (for the variant N)	0 FIT	145,6FIT
λ_{DU} (for the variant N)	147,1 FIT	1,5 FIT
$MTTF_D$ (for the variant N)	776 years	
valid version FW	v2	v3-diagnostic

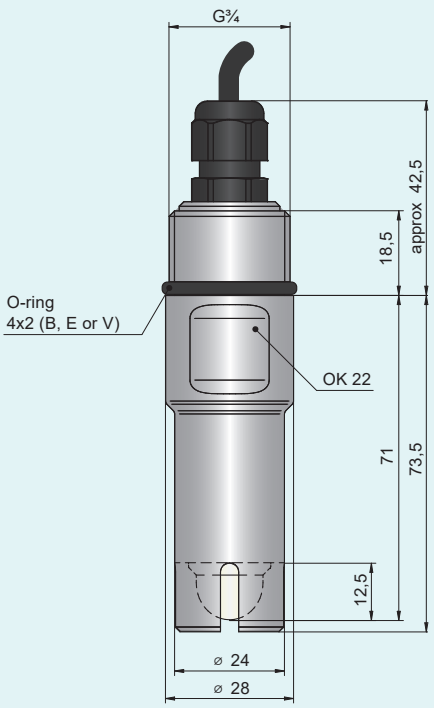
Explanation:
SIL (Safety integrity level)
DC (Diagnostic cover)
PFH - Mean frequency of dangerous safety function error per hour,
T_{Proof} - Functional check period of the safety function of the device
$\lambda_{DD(DU)}$ - Intensity of dangerous detectable (or non-detectable) fault
$MTTF_D$ - Mean time to dangerous failure

DIMENSIONS

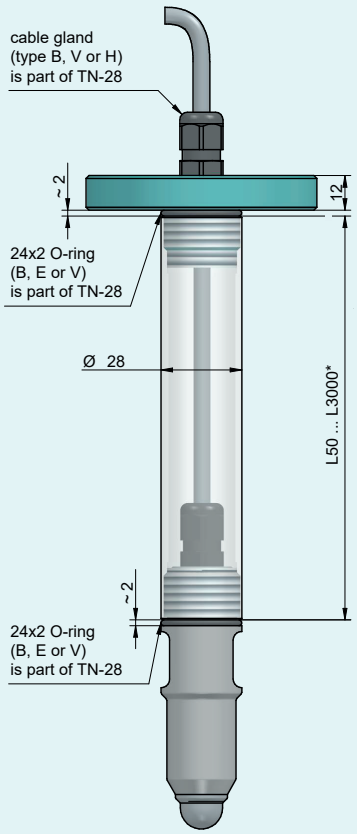
RFLS–28_–1_–G¾



RFLS–28_-10_–G¾



Tubular extender TN-28-P***



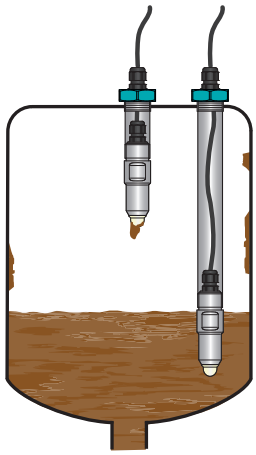
The switching point is the same for both variants of sensors.
* Typical switching point position for water (factory default).
** Typical switching point position for oil.

***** Tubular extender variants:**
P – flange (in figure)
Z – G1" thread
Cl – Tri-Clamp
see the accessories datasheet for TN-28 tubular extender

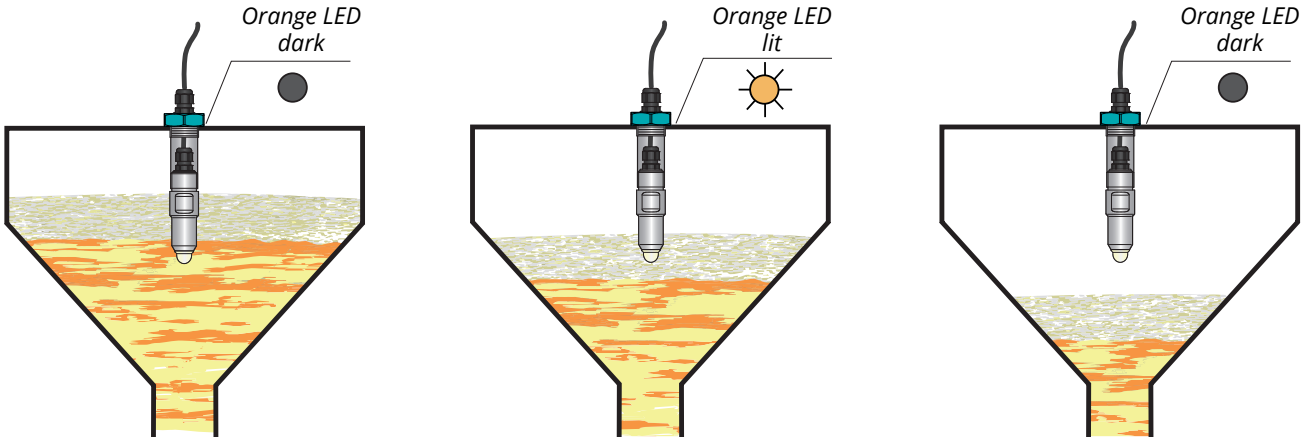
USE

Thanks to its construction, the sensor is also suitable for detecting levels of both viscous and electrically conductive media (yoghurt, jams, mayonnaise, spreads, liquid soaps, creams, and pastes). After setting the sensitivity to a specific medium, the sensor reliably reacts to the presence or absence of medium level. The sensor does not react to residues and deposits of viscous media on the measuring electrode.

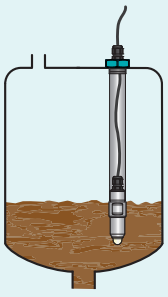
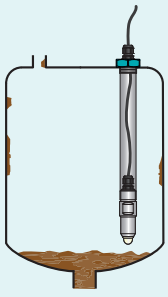
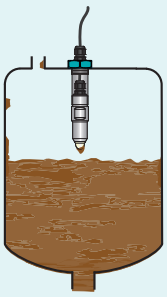
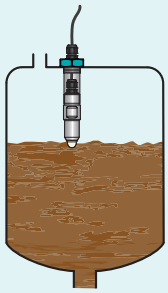
The sensor can also be used to distinguish a specific medium from others – using the "Medium window" function. E.g. the sensor can distinguish oil from water and air, can detect only beer foam and ignore beer and air, etc.



Installation of sensors in the tank filled with a viscous medium



Example of foam indication ignoring beer and air

The sensor can be set to normally open "O-mode" or to normally closed "C-mode"			
Min. level – O-mode		**Max. level – C-mode**	
			
closed	open	closed	open
			
lit	dark	lit	dark

For safety reasons, for scanning min. level, we recommend you to use the "O" mode setting (sensor closes when submerged). A faulty sensor or wiring would behave in the same way as emergency level position by opening the output. Analogously for the max. level, we recommend to set the "C" mode (sensor opens when submerged).

ORDER CODE

RFLS-28

PERFORMANCE

N	non-explosive areas

ELECTRODE TYPE

1B	coated electrode (PEEK, NBR O-ring)
10B	coated electrode (PEEK, NBR O-ring) with protective crown
1E	coated electrode (PEEK, EPDM O-ring)
10E	coated electrode (PEEK, EPDM O-ring) with protective crown
1V	coated electrode (PEEK, FPM O-ring (Viton))
10V	coated electrode (PEEK, FPM O-ring (Viton)) with protective crown

PROCESS CONNECTION

G¾	pipe thread G ¾"

OUTPUT TYPE

P	PNP (open collector)

TYPE OF ELECTRICAL CONNECTION

B	standard plastic cable gland (compatible with TN-28)
V	standard plastic cable gland with spiral, cannot be used for TN-28
H	plastic cable gland for protective hose, cannot be used for TN-28

CABLE

K	cable length in m

RFLS-28 N - 1B - G¾ - P - B - K 5 **EXAMPLE OF CODING**

ACCESSORIES

magnetic pen (1 pc)	included in the price	MP-8	
O-ring (NBR, EPDM, FPM/Viton), (1 pc)	included in the price		
tubular extender	at extra cost	TN-28-P (flange) TN-28-Z (G1" thread) TN-28-Cl (Tri-Clamp)	
cable over 2 m	at extra cost		
protecting hose (for H cable gland)	at extra cost		

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