

CPK-HF-28

- high-frequency limit level sensors
- for reliable limit level sensing of various liquids, slurries and pastes
- installation with the tubular extender in tanks, containers, sumps or funnels and containers
- resistant to adhesion of viscous and adhering media (ketchups, yoghurts, spreads, syrups, creams, pastes, cleaning agents, etc.)
- unique material type resolution function „medium window“ (the sensor is sensitive only to the set medium and does not react to other substances)
- can replace vibration level sensors
- adjustment with a magnetic pen or by means of a setting wire
- universal design for all types of liquids
- high stability at high sensitivity
- diagnostic function



CE

MIN
-40°C

The **CPK-HF-28** high-frequency level sensor is designed for industrial use for limit sensing of liquid and paste media. The high-frequency level sensor may be a direct replacement for a vibrating level sensor, or for a capacitive level sensor in the case of more demanding applications. The media may be electrically conductive or non-conductive with any permittivity. The sensor can be installed in metal or plastic tanks, filling tanks, sumps, etc. The RG variant can be installed using the TN-28 extension tube or in a similar way. The sensor works on the high frequency band, enabling reliable detection of the level of media, and eliminating deposits or foam on the electrode. The sensor suppresses the influence of deposits of viscous media (ketchup, yoghurt, mayonnaise, patés, syrups, jams, creams, soap) as well as electrically conductive adhesive products (detergents, lyes, chemicals).

The sensor can be set up by applying a magnetic pen to sensitive spots (variants CPK-HF-28_ _ _-P/PD_ _) or using the programming wire (variant CPK-HF-28_ _ _-PD_ _). For remote parametrization using the programmable wire, the special unit is used.

The sensors can be set to perform:

- simple sensing of the presence of the medium (medium/air)
- distinction of the interface between two media (medium/medium), e.g. water/oil
- selective distinction of a specific medium (medium window function), the function can distinguish e.g. oil from water and air, or detect only beer foam and ignore beer and air, etc.

The sensor is made from a stainless steel housing at one end terminated by a sensing electrode, and terminated at the other end and by an enclosure with a status indicator, control elements, and electrical connection. The setting elements are on the sides of the sensor. The sensors are manufactured for use in non-explosive areas only.

VARIANTS OF LEVEL SENSORS

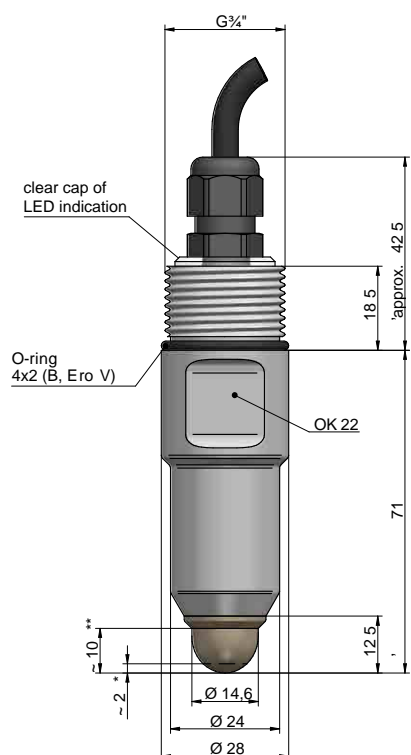
- | | |
|-----------------------|--|
| CPK-HF-28N-1B | min. temperature from -40°C, insulated electrode (PEEK), for various fluids, mashed and paste-like materials, also for fuel, oil or methanol, O-ring NBR |
| CPK-HF-28N-10B | min. temperature from -40°C with protective crown, insulated electrode (PEEK) extended version, for various liquid, mashed and paste-like materials, also for fuel, oil or methanol, O-ring NBR |
| CPK-HF-28N-1E | min. temperature from -40°C, insulated electrode (PEEK), for sensing various liquid, mashed and paste-like materials, also for acids, bases or alcohol, ammonia, acetone, chlorine, O-ring EPDM |
| CPK-HF-28N-10E | min. temperature from -40°C with protective crown, insulated electrode (PEEK) extended version, for various liquid, mashed and paste-like materials, also for acids, bases or alcohol, ammonia, acetone, chlorine, O-ring EPDM |
| CPK-HF-28N-1V | min. temperature from -20°C, insulated electrode (PEEK), for various liquid, mashed and paste-like materials, also for fuel, oil, acids, bases or asphalt, tar, toluene, O-ring FPM (Viton) |
| CPK-HF-28N-10V | min. temperature from -20°C with protective crown, insulated electrode (PEEK) extended version, for various liquid, mashed and paste-like materials, also for fuel, oil, acids, bases or asphalt, tar, toluene, O-ring FPM (Viton) |



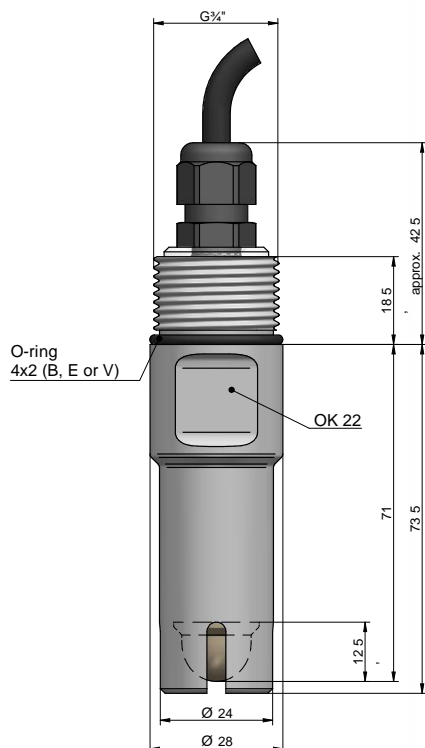
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DIMENSION DRAWINGS

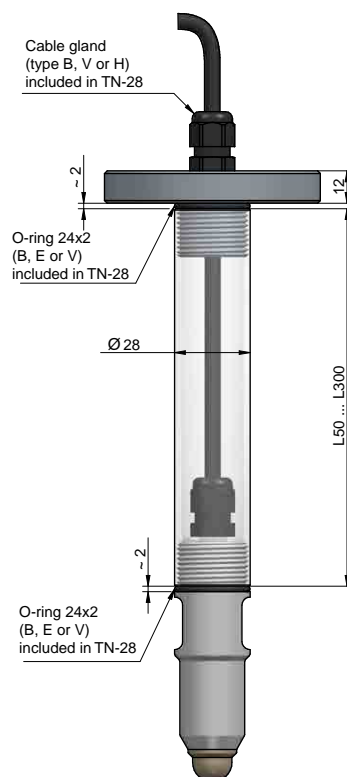
CPK-HF-28 _-1_-RG-_-



CPK-HF-28 _-10_-RG-_-



Extension tube TN-28-P ***



The switching point is the same for both sensor variants.

* Typical switching point position for water (factory default).

** Typical switching point position for oil.

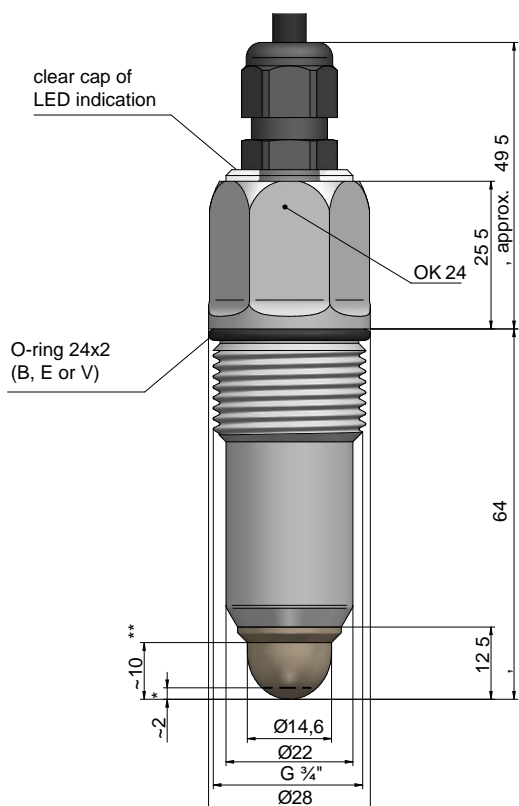
*** Extension tube variants:

P - flange (in figure),

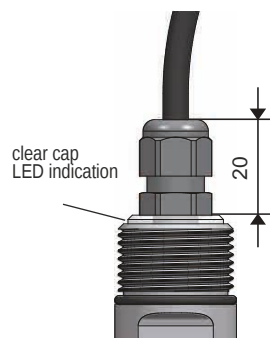
Z - thread G1", **CI** - Tri-Clamp

see the accessories data sheet for the TN-28 extension tube

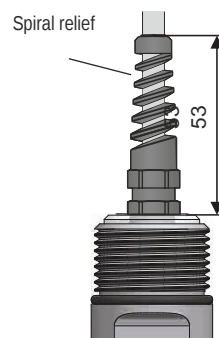
CPK-HF-28 _-1_-FG-_-



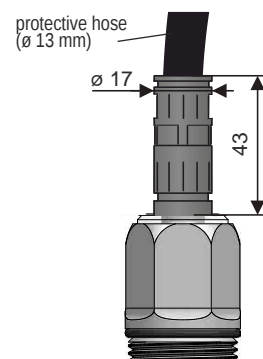
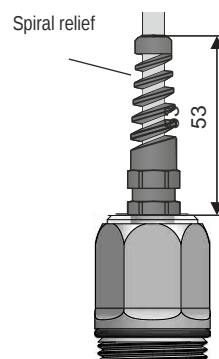
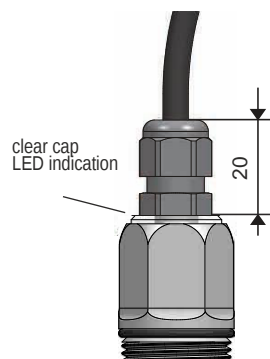
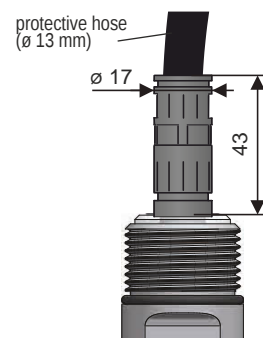
Variant "B" with a standard cable gland



Variant "V" with plastic cable gland with spiral relief - in the case of increased mechanical wear on the cable.



Variant "H" with cable gland for protective hoses - for use in an outdoor area or in an area with high humidity.



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
Protection class	IP 68
Weight (without cable)	approx. 0.15 kg
Ambient temperature range	-40 ... +80 °C
Maximum overpressure	100 bar
Process connection	thread G ¾", NPT ¾"

Materials		
part of the sensor		standard material *
Housing (case)		stainless steel W. Nr. 1.4404 (AISI 316L)
Enclosure		polycarbonate
Electrode coating	type el. 1, 10	PEEK
O-ring seal	CPK-HF-28_-1B, 10B CPK-HF-28_-1E, 10E CPK-HF-28_-1V, 10V	NBR EPDM FPM (Viton)
Cable gland (variant "B", "V", "H")		PA / NBR plastics

Verify chemical compatibility with the media. Upon agreement it is possible to select a different type of material.

Functional safety parameters		
variant of sensor	CPK-HF-28N-_-_-P	CPK-HF-28N-_-_-PD
according to standard	EN 61508 ed.2	
Safety function	MIN, MAX	
Hardware architecture	1oo1 without diagnostic	1oo1 with diagnostic
DC	0 %	99 %
PFH ($T_{Proof} = 1 \text{ rok}$) (for variant N)	$1,471 \cdot 10^{-7}$	$1,471 \cdot 10^{-9}$
DD (for variant N)	0 FIT	145,6FIT
DU (for variant N)	147,1 FIT	1,5 FIT
MTTF _D (for variant N)	776 years	
valid version FW	v2	v3-diagnostic

- Explanations:
- DC

Diagnostic cover,
- PFH

Average frequency of dangerous failure per hour
- T_{Proof}

Functional control period of the device safety function
- $DD(DU)$

Detected (resp. undetected) dangerous failure rate per hour
- MTTF_D

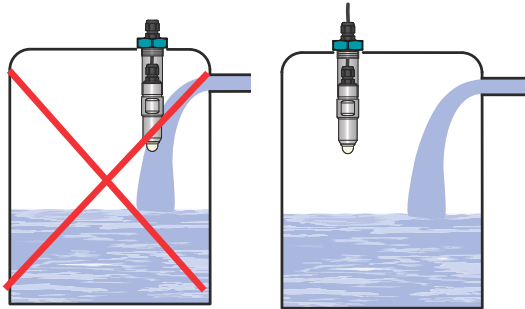
Mean Time To dangerous Failure



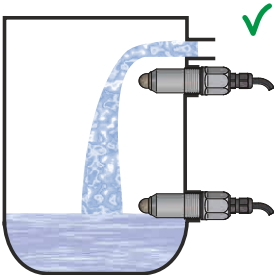
INSTALLATION AND RECOMMENDATIONS

The RG or RN variant of the CPK-HF-28 level sensor is designed for vertical installation in tanks and reservoirs. With the TN-28 extension tube, which is available in three process connection variants (flange, G1" thread, or Tri-Clamp), it can be extended to the required length.

The FG and FN variants of the CPK-HF-28 sensor can be installed either horizontally or at an angle on the wall of the vessel, reservoir, or pipe by screwing into a weld nut or by fixing using a nut. The basic application recommendations are specified below.

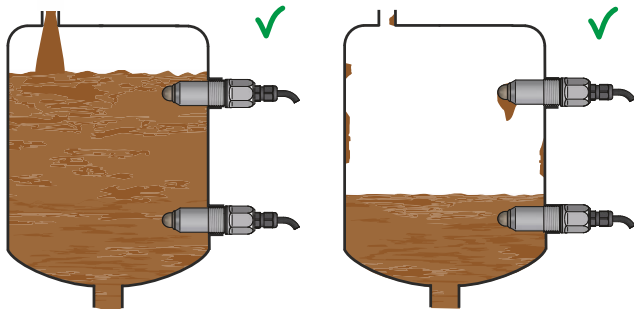


Installation of the level meter out of reach of the filling flow



Possibility of sensor installation in the media inlet point

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



Side installation of sensors in a tank filled with viscous medium

Settings modes for the FG, FN variants			
The sensor can be set to normally closed “O-mode” or to normally open “C-mode” switch types.			
minimum level - mode O		maximum level - mode C	
CLOSED	OPEN	CLOSED	OPEN
illuminated	not illuminated	illuminated	not illuminated

For safety reasons, for scanning min. level, we recommend setting “O-mode” (sensor closes when submerged). A faulty sensor or wiring will take effect here in the same way as level emergency conditions by opening the sensor. Analogously, for the max. level, we recommend setting “C-mode” (sensor opens when submerged).



ORDER CODE

CPK-HF-28N------K **cable length** in [m]

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

- process connection:**
- FG** : front installation, thread G 3/4,
unavailable for 10B, 10E, and 10V type electrodes
 - RG** : back installation, thread G 3/4
 - FN** : front installation, 3/4 NPT,
unavailable for the 10B, 10E, and 10V type electrodes
 - RN** : back installation, 3/4 NPT





- connection method:**
- 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
- type of output:**
- P** : PNP (open collector), setting using a magnetic pen
 - PD** : PNP (open collector with diagnostic), setting using a magnetic pen or programming wire

CORRECT SPECIFICATION EXAMPLES

CPK-HF-28N-1B-FG-P-B-K5

(1B) coated electrode (PEEK, NBR O-ring); (FG) front installation, thread G 3/4; (P) PNP (open collector) output; (B) plastic cable gland; (K5) cable length 5 m.

ACCESSORIES

magnetic pen (1 pc)	included in the price		
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-CI (Tri-Clamp)	
cable over 2 m	at extra cost		
protecting hose (for H cable gland)	at extra cost		