



fill level



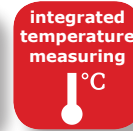
Type:  
**Sonicont® USP4S**

## Ultrasonic filling level transmitter for general applications

Technical information TI02.20

### In brief

Piktogramme:



### Application

- Non-contact level and volume measurement
- Flow measurement at open channels and measuring weirs
- Water and waste water sector
- Process industry
- Environmental technology
- Storage tanks, storage bunkers, silos

### Main features

- Measuring ranges up to 8m
- Connector plug M12 or extension cable version
- High protection class IP65 / IP67 resp. IP68
- Process temperature range  $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$
- Electronic 4...20mA in 2-wire-technology
- High accuracy  $\leq 0,2\%$
- Operating interface Bluetooth® 5.0 LE
- Integrated overvoltage protection
- Envelope curve indication
- Temperature compensation and interference echo suppression



### Description

The device is an electronic ultrasonic filling level transmitter for monitoring, control and continuous measurement of filling levels in liquids, pastes and coarse bulk materials.

Due to its high accuracy and the digital adjustability by Bluetooth® 5.0 LE the device can be suited to a wide variety of applications.

The robust design and the high-quality workmanship turns the device into a very high quality product, which even the most adverse environmental conditions cannot affect, whether the lowest temperatures when used outdoors, extreme shock and vibration stress or aggressive media.

A captive laser marking of the type label ensures the identifiability throughout the entire lifetime of the device.

Obviously is the optional marking of a measurement point designation resp.

TAG, a customer label or of a neutral type label, of course also per laser marking.

A LABS- resp. silicone-free version and a customer specific configuration resp. preset is also optionally available like a factory certifications for drink water suitability.

Customer specific special versions can be realized short-term on request, e.g. special designs or other process materials.

**ACS-CONTROL-SYSTEM**  
knowledge and systems

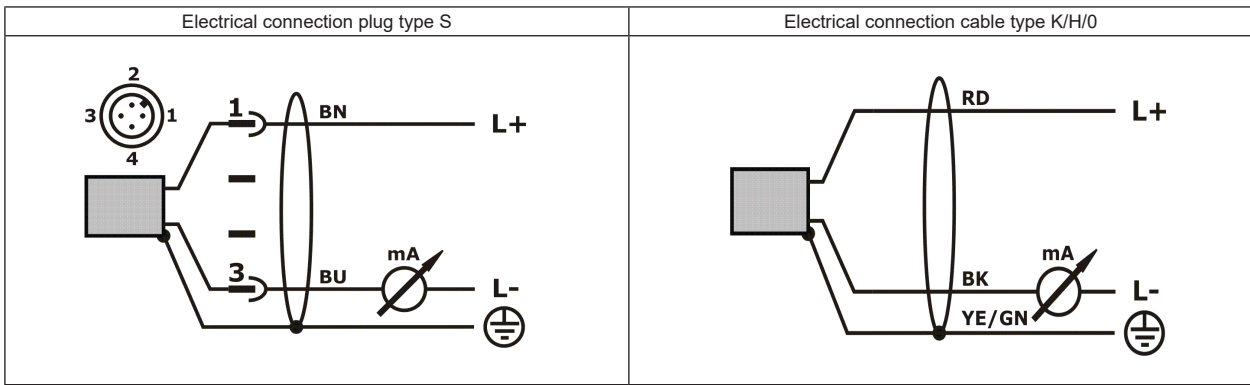


Your partner for measuring technology and automation

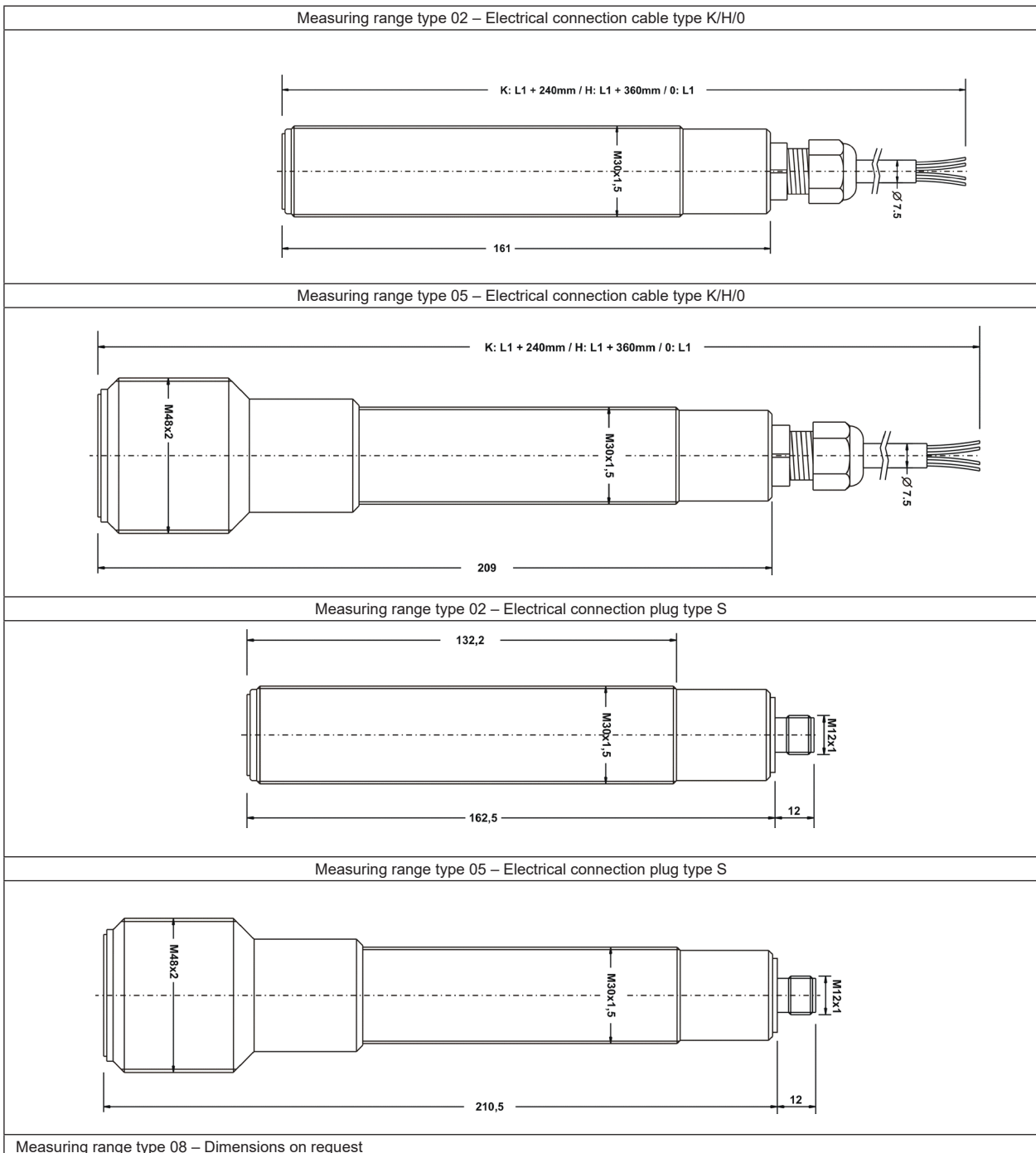
# Technical Data

<b>Input Distance</b>			
Measuring range	MB-02: 0...≤ 2m	MB-05: 0...≤ 5m	MB-08: 0...≤ 8m
Blocking distance BD	≤ 0,10m (typ. 0,06m)	≤ 0,15m (typ. 0,10m)	≤ 0,30m (typ. 0,19m)
Operating frequency	125kHz	75kHz	50kHz
Emitting angle $\alpha$	10° ±2° (-3dB)	14° ±2° (-3dB)	10° ±2° (-3dB)
Detection radius rx rx = tan( $\alpha$ / 2) * Lx	r <sub>x</sub> = 0,087m (L <sub>x</sub> = 1,0m / $\alpha$ = 10°) r <sub>x</sub> = 0,175m (L <sub>x</sub> = 2,0m / $\alpha$ = 10°)	r <sub>x</sub> = 0,307m (L <sub>x</sub> = 2,5m / $\alpha$ = 14°) r <sub>x</sub> = 0,614m (L <sub>x</sub> = 5,0m / $\alpha$ = 14°)	r <sub>x</sub> = 0,491m (L <sub>x</sub> = 4,0m / $\alpha$ = 10°) r <sub>x</sub> = 0,700m (L <sub>x</sub> = 8,0m / $\alpha$ = 10°)
Pulse rate tp (meas. cycle time)	≤ 10Hz / ≥ 100ms	≤ 4Hz / ≥ 250ms	≤ 2Hz / ≥ 500ms
Reference conditions	EN/IEC 60770-1: Characteristic deviation – Limit value adjustment 15..25°C / 860..1060kPa / 45..75%r.F. / ton240s / 24VDC±0,1V / vertical, Process connection bottom, Ideal reflective surface, No interference reflections within signal beam		
	Characteristic deviation = Nonlinearity + Hysteresis + Reproducibility FSO = Full Scale Output = Nominal measuring range Tk = Temperature coefficient Higher deviations possible for special adjustment		
Characteristic deviation	≤ ±2mm or ±0,2%FSO		
Influence of auxiliary power	≤ ±0,002%FSO/V		
Long term drift	≤ ±0,2%FSO/year		
Temperature deviation	Tk Zero (mean value) ≤ ±0,006%FSO/K		
<b>Output current 4...20mA Bluetooth® 5.0 LE</b>			
Analogue output 4...20mA	3,8...20,5mA / ≥ 3,6mA / ≤ 22mA / dl ≤ 1µA		
Permitted load	RL ≤ (Us - 11V) / 22mA		
Time behavior	T90 ≤ Pulsrate t <sub>p</sub> (t <sub>d</sub> = 0s) / ton ≤ 3s (t <sub>d</sub> = 0s)		
Interface	Bluetooth 5.0 LE (2Mbit/s)		
Transmit power	≤ 0,1W		
Range	Outdoor max. 200m / Indoor max. 40m		
<b>Auxiliary power</b>			
Supply voltage Us polarity protected	11...35VDC		
Residual ripple voltage	≤ 2Vpp		
Supply current	≤ 22mA		
<b>Overvoltage protection</b>			
Coarse protection	EL-K/H/0: 75V / 10kA – wave 8/20µs / +L/-L to cable shield EL-S: 150V / 10kA – wave 8/20µs / +L to -L		
Fine protection	36V / all lines to -L		
<b>Process conditions</b>			
Process temperature	-20°C...+70°C		
Process pressure	-0,3...2 bar		
<b>Environmental conditions</b>			
Environmental temperature	-20°C...+70°C		
Protection level	EL-K/H/0: IP68 [≤3m/≤0,3bar] (EN/IEC 60529) EL-S: IP65/IP67 (EN/IEC 60529)		
Climatic classification	4K4H (EN/IEC 60721-3-4)		
Shock classification	50g [11ms] (EN/IEC 60068-2-27)		
Vibration classification	20g [10...2000 Hz] (EN/IEC 60068-2-6)		
EM compatibility	Operation device class B / Industrial range (EN/IEC 61326)		
MTTF	388 years		
Tightening torque	≤ 20Nm		
Weight	EL-K/H/0: MB-02: 0,2kg + (L1 x 0,068kg/m) MB-05: 0,3kg + (L1 x 0,068kg/m) MB-05: 0,5kg + (L1 x 0,068kg/m)	EL-S: MB-02: 0,2kg MB-05: 0,3kg MB-05: 0,5kg	
<b>Materials</b>			
Process wetted	PVDF, POM, PA, NBR, FPM, PE, PUR		
Cable	Breaking force > 900N Bending radius > 120mm Cross-section 0,22mm <sup>2</sup> Resistance 90Ohm/km		

# Electrical connection



# Dimensions (mm)



# Order code

USP4S	<b>Type (AF)</b> Standard
P	<b>Measuring system – material diaphragm (process wetted) / sensor type (MS)</b> PVDF / Piezo
S	<b>Approval (ZL)</b> Standard
U Y	<b>Process connection (PA)</b> Terminal enclosure, thread DIN 13 – M30x1,5 others
0	
G Y	<b>Material process connection (process wetted) (WP)</b> POM others
0	
02 05 08 YY	<b>Measuring range (MB)</b> 0...2 m 0...5 m 0...8 m Special measuring range
A Y	<b>Electronic – output (EA)</b> Current 4...20mA, 2-wire, Bluetooth® 5.0 LE others
1 Y	<b>Electronic – function (EF)</b> Standard others
0	<b>Process temperature (PT)</b> Standard –20°C...+70°C
0	
0	
K H MB 02: L1 ≥ 700mm / MB 05: L1 ≥ 1.000mm 0 S Y	<b>Electrical connection (EL)</b> Cable, confection stranded wires, length L1 +240mm Cable, confection Hydrolog HLF4, length L1 -360mm Cable, without confection, incl. confection kit Plug M12 others
0 A B G Y	<b>Material Cable (process wetted) (WS)</b> without Cable sheath PE Cable sheath PUR Cable sheath PUR, increased diffusion-tightness others
	<b>Length L1 / mm (≤ 300.000mm)</b>
	<b>Additional options</b> -SF LABS-free, silicone-free / paint compatible version -ML Measurement point designation / TAG – Laser marking -KL Customer label on device – Laser marking -TN Type label neutral -KF Configuration / Preset

Sonicont® USP4 P S 0 0 0 0 0 0 0





fill level



water level



pressure



temperature



flow



visualization



signal converter



sensoric



IoT-Solutions



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