Industrial radar level sensor
Model ILT-C01, ILT-C05

Applications

- Suitable for liquid, highly viscous and solid media
- Particularly suitable for continuous level measurement of liquids in containers and tanks
- Suitable for industrial applications and mobile working machines

Special features

- Developed for the extreme operating conditions in mobile working machines
- Continuous, accurate measuring signal
- Compact design for easy integration
- Can also be installed outside a container (plastic)
- Calibration function for complex container geometries possible

Radar level sensor, model ILT-C01

Description

The ILT free-beam radar level sensor enables non-contact level measurement, even through plastic vessel walls.

The free-beam radar for level measurement emits electromagnetic waves that are reflected by the surface of the material to be measured. The reflected signals are received and analysed, providing information about the fill level. Up to two additional switch points can be integrated to enable further switching outputs, e.g. for overflow and/or dry run protection.

Thanks to its compact design and easy handling, the model ILT radar sensor is ideal for measuring applications in industrial environments and in mobile working machines. It has been prepared for the requirements of mobile working machines and offers high-precision measurements at temperatures of -40 ... +150 °C [-40 ... +302 °F]. Thanks to metal shielding, the sensor operates, interference-free, at field strengths of up to 100 V/m and remains reliable even with vibrations of up to 40g and shocks of up to 100g. The model ILT is particularly safe in operation, even under difficult conditions such as dust, moisture and heat. The non-contact measuring principle, combined with its maintenance-free design, ensures low total cost of ownership.

Specifications

Overview of versions	
Model	**Description**
ILT-C01	Standard version to 100 °C [212 °F]
ILT-C05	High-temperature version to 150 °C [320 °F]

Basic Information	
Media	■ Water-based ■ Oil-based ■ Solid material
Dielectric constant of the medium	≥ 2
Measurement principle	FMCW (60 GHz technology); frequency band 57.4 ... 61.4 GHz

Accuracy specifications	
Non-repeatability	≤ 2 mm [0.079 in]
Accuracy	±5 mm[1)]
Reference conditions	Per IEC 62828-4

1) Depending on the medium

Measuring range	
Min. measuring distance to probe tip	100 mm
Max. measuring distance to probe tip	5,000 mm
	→ Other measuring distances on request
Beam angle	±6°
Measuring frequency	> 1 Hz
Min. diameter of tank/silo/pipe etc.	50 mm [1.97 in]
	→ Other diameters on request

Process connection (with installation from outside)	
DIN EN ISO 1179-2	G ½ A
	→ Other process connections on request

Output signal	
Switching output 1/2 (SP1/SP2)	
Switching output	■ PNP ■ NPN
Number of switching outputs	Max. 2
Switching function	■ Normally closed (NC) ■ Normally open (NO)
Switching delay [1)]	■ Without ■ 1 s ■ 2 s ■ 3 s ■ 5 s ■ 10 s
Analogue signal output (S+)	
Current (3-wire)	4...20 mA
Voltage (3-wire)	DC 0 ... 5 V
Load	600 Ohm

Output signal	
Auxiliary power (U+/U-)	
4 ... 20 mA current output (3-wire)	DC 8 ... 36 V
DC 0 ... 5 V voltage output (3-wire)	DC 8 ... 36 V
Current supply	Max. 200 mA
Overvoltage resistance	See EMC Directive: EN 61326 emission (group 1, class B) and immunity (industrial environment)
Electrical safety	Protection class III
Dynamic behaviour	
Settling time per IEC 62828-1	1 s
Switch-on time	< 3 s

1) Adjustable only ex-works.

Electrical connection	
Connection type	■ Circular connector M12 x 1, 4-pin ■ Circular connector M12 x 1, 5-pin ■ Cable outlet, unshielded
Wire cross-section	0.25 mm [0.01 in]
Cable diameter	4 ... 10 mm [0.16 ... 0.39 in] (depending on the number of wires)
Cable material	■ PVC ■ PUR ■ Silicone
Cable length	■ 2 m [6.6 ft] ■ 5 m [16.4 ft] ■ Customised: 1 ... 50 m [3.3 ... 164 ft]
Pin assignment	→ See pin assignment
Ingress protection (IP code) per IEC 60529 [1)]	IP67
Short-circuit resistance	Yes
Reverse polarity protection	Yes
Calibration	■ Empty vessel calibration ■ Empty vessel calibration + measuring range adjustment (0% at the vessel bottom) ■ Without possibility of subsequent calibration

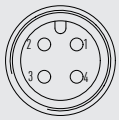
1) The stated ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.

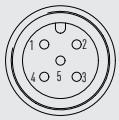
Materials	
Materials (wetted)	
Sensor lens	■ PEEK ■ FKM (seal)
Process connection	Stainless steel 1.4571
Material (in contact with the environment)	
Case	Stainless steel 1.4571
Cable	■ PVC ■ PUR ■ Silicone
Electrical connection M12 x 1	■ Nickel-plated brass ■ PA

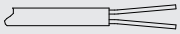
Pin assignment

Legend

U+ Positive power supply terminal
U- Negative power supply terminal
S+ Analogue signal output
SP1 Switching output 1
SP2 Switching output 2

Circular connector M12 x 1		
4-pin		**Level + 1 switch point**
	**1**	U+
	2	S+
	3	U-
	4	SP1

Circular connector M12 x 1		
5-pin		**Level + 2 switch points**
	**1**	U+
	2	S+
	3	U-
	4	SP1
	5	SP2

Cable outlet		
Unshielded		**Level + 2 switch points**
	**Brown**	U+
	White	U-
	Green	S+
	Yellow	SP1
	Pink	SP2

Operating conditions	
Medium temperature limit	■ ILT-C01 -40 … +100 °C [-40 … +212 °F] ■ ILT-C05 -40 … +150 °C [-40 … +302 °F]
Ambient temperature limit	-40 … +100 °C [-40 … +212 °F]
Storage temperature limit	-40 … +70 °C [-40 … +158 °F]
Pressure limit of medium	0 … 25 bar [0 … 362 psi]
Vibration resistance per IEC 60068-2-6	40 g, 10 ... 2,000 Hz
Permanent vibration resistance per IEC 60068-2-6	10 g, 10 ... 2,000 Hz
Shock resistance per IEC 60068-2-27	100g, 11 ms
Free fall in line with IEC 60068-2-31	
Single instrument	1 m [3.28 ft]
Multiple packaging	0.5 m [1.64 ft]
Mounting position	Vertical
Ingress protection (IP code) per IEC 60529	IP67
EMC	
ESD per ISO 10605	±8 kV contact discharge, ±15 kV air discharge
HF field per ISO 11452-2	100 V/m
BCI per ISO 11452-4	200 mA
Pulse 1 per ISO 7637-2[1)]	Level III
Pulse 2a per ISO 7637-2[1)]	Level III
Pulse 2b per ISO 7637-2[1)]	Level III
Pulse 3a per ISO 7637-2[1)]	Level III
Pulse 3b per ISO 7637-2[1)]	Level III
Fast transient pulses per ISO 7637-3	Level IV
Radio disturbances per CISPR 25	30 ... 1,000 MHz

1) Does not apply for ratiometric output signal

Packaging and instrument labelling	
Packaging	■ Individual packaging ■ Multiple packaging (up to 50 pieces possible)
Instrument labelling (product label)	■ WIKA product label, adhesive foil ■ Customised product label on request

Approvals

Logo	Description	Region
CE	**EU declaration of conformity**	European Union
	EMC Directive EN 61326 emission (group 1, class B) and immunity (industrial environments)	
	RED – Radio Equipment Directive ETSI EN 305 550 The instrument may be used without restrictions in the EU and in the EFTA countries.	
	RoHS directive	

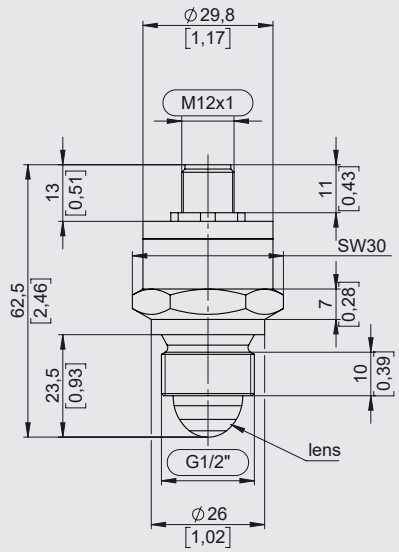
Certificates

Description	
Certificates	■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy) ■ 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metal parts, indication accuracy, calibration certificate)

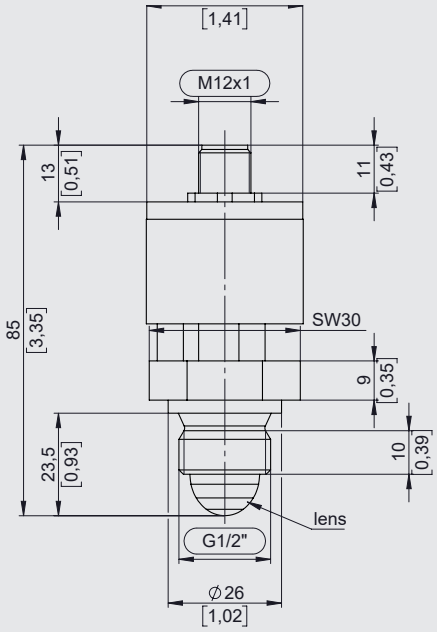
→ Other certificates on request

Dimensions in mm [in]

Type ILT-C01



Type ILT-C05



Accessories and spare parts

Description		Temperature range	Cable diameter	Cable length	Order number
Circular connector M12 x 1 with moulded cable					
	Straight version, cut to length, 4-pin, PUR cable, UL Listed, IP67	-20 ... +80 °C [-4 ... +176 °F]	4.5 mm [0.18 in]	2 m [6.6 ft]	14086880
				5 m [16.4 ft]	14086883
				10 m [32.8 ft]	14086884
	Angled version, cut to length, 4-pin, PUR cable, UL Listed, IP67	-20 ... +80 °C [-4 ... +176 °F]	4.5 mm [0.18 in]	2 m [6.6 ft]	14086889
				5 m [16.4 ft]	14086891
				10 m [32.8 ft]	14086892
Connection cable M12 x 1 with integrated LED display					
	Connection cable, 4-pin, PUR cable, UL Listed, IP67 1 x LED green, 2 x LED yellow	-20 ... +80 °C [-4 ... +176 °F]	4.5 mm [0.18 in]	2 m [6.6 ft]	14252834
	Connection cable, 4-pin, PUR cable, UL Listed, IP67 1 x LED green, 2 x LED yellow	-20 ... +80 °C [-4 ... +176 °F]	4.5 mm [0.18 in]	5 m [16.4 ft]	14252835

Description	Order number
Calibration magnet	14760395

Ordering information

Model / Medium / Process connection / Switching functions / Electrical connection / Options

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