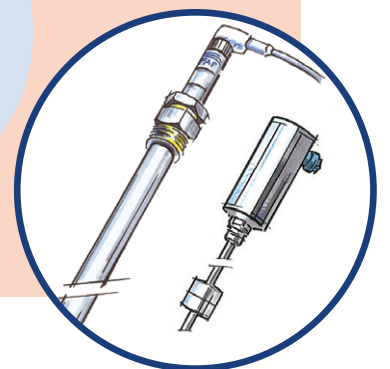


# Continuous Level Sensor

## TORRIX

3  
1.3





# TORRIX


## The highly accurate Filling Level Sensor according to the magnetostrictive Measuring Principle

The highly accurate level sensor TORRIX supplies information on tank levels. Through its continuous filling level measurement it creates quality assurance and safety during the process.

TORRIX is suitable for all liquid media for which a highly accurate level measurement is required.



### Advantages of FAFNIR's Technology

- Measuring accuracy better  $\pm 0,25$  mm
- Resolution better 0,1 mm
- Simultaneous separating layer and filling level measurement possible
- $\mu$ Controller regulated
- Temperature-compensated measuring principle
- 2-wire terminal (4-20 mA)
- **HART**<sup>®</sup>-Protocol 
- Very short measuring intervals
- Application in ex-zone 0 (ATEX, IECEx certificate)
- Durability due to robust structure
- Shock and vibration-proof
- Measuring range along the complete probe length freely adjustable
- Very simple installation and starting

## Function

The sensor operates according to the magnetostrictive measuring process.

A wire of magnetostrictive material is integrated into the probe tube. By means of the micro-controlled sensor electronics electrical impulses are sent through the wire creating a circular magnetic field.

A magnet is built into the float which magnetizes the wire at the float position.

On the location of the superposition of the two magnetic fields a torsion wave is generated which spreads along the wire to the sensor head. The propagation time is registered and processed by the electronics.

## Design

### TORRIX consists of:

- Stainless steel transducer housing (304)
- Stainless steel probe tube (316 Ti); Hastelloy C; other upon request
- Screw-in unit (height adjustable) (Stainless steel 316 Ti; brass); flange (probe tube welded) (Stainless steel 316 Ti; Hastelloy plated)
- Stainless steel product float (316 Ti); Titanium; Hastelloy C

## Accessories

- Transducer analysis e.g. FAFNIR UM 2.3 I; UM 2.1 with I/U-Converter
- Ex-Isolating amplifier

## Installation instruction

When installing the sensor in the ex-range please make sure that the sensor is fed with an approved ex-power supply.

## Technical Data

### Standard Float:

(optional with PTFE-sliding aid)

Form	Material	Press*	Medium**
ball Ø 43	316 Ti	50 bar	≥0,95 g/cm <sup>3</sup>
ball Ø 43	316 Ti	20 bar	≥0,85 g/cm <sup>3</sup>
ball Ø 52	316 Ti	40 bar	≥0,70 g/cm <sup>3</sup>
ball Ø 52	316 Ti	20 bar	≥0,60 g/cm <sup>3</sup>
cylinder Ø 43	316 Ti	16 bar	≥0,70 g/cm <sup>3</sup>
ball Ø 50	Titanium	25 bar	≥0,50 g/cm <sup>3</sup>
ball Ø 52	37872	25 bar	≥0,75 g/cm <sup>3</sup>

\* max. operating pressure \*\* product density

Other floats upon request

### Housing:

- Protection type: IP68 (optional with ventilation screw)
- Measurements: Ø 50 x 120 mm
- Material: Stainless steel
- Cable diameter: 5 ... 10 mm

### Probe Tube:

- Diameter: 12 mm
- Material: Stainless steel 316 Ti; Hastelloy C
- Length: 200 ... 4,000 mm

### Process Connection:

- Screw-in unit for height adjustable mounting R1½ Brass
- G½ Stainless steel 316 Ti
- G½ Stainless steel 316
- Welded standard flanges

### Measuring Accuracy:

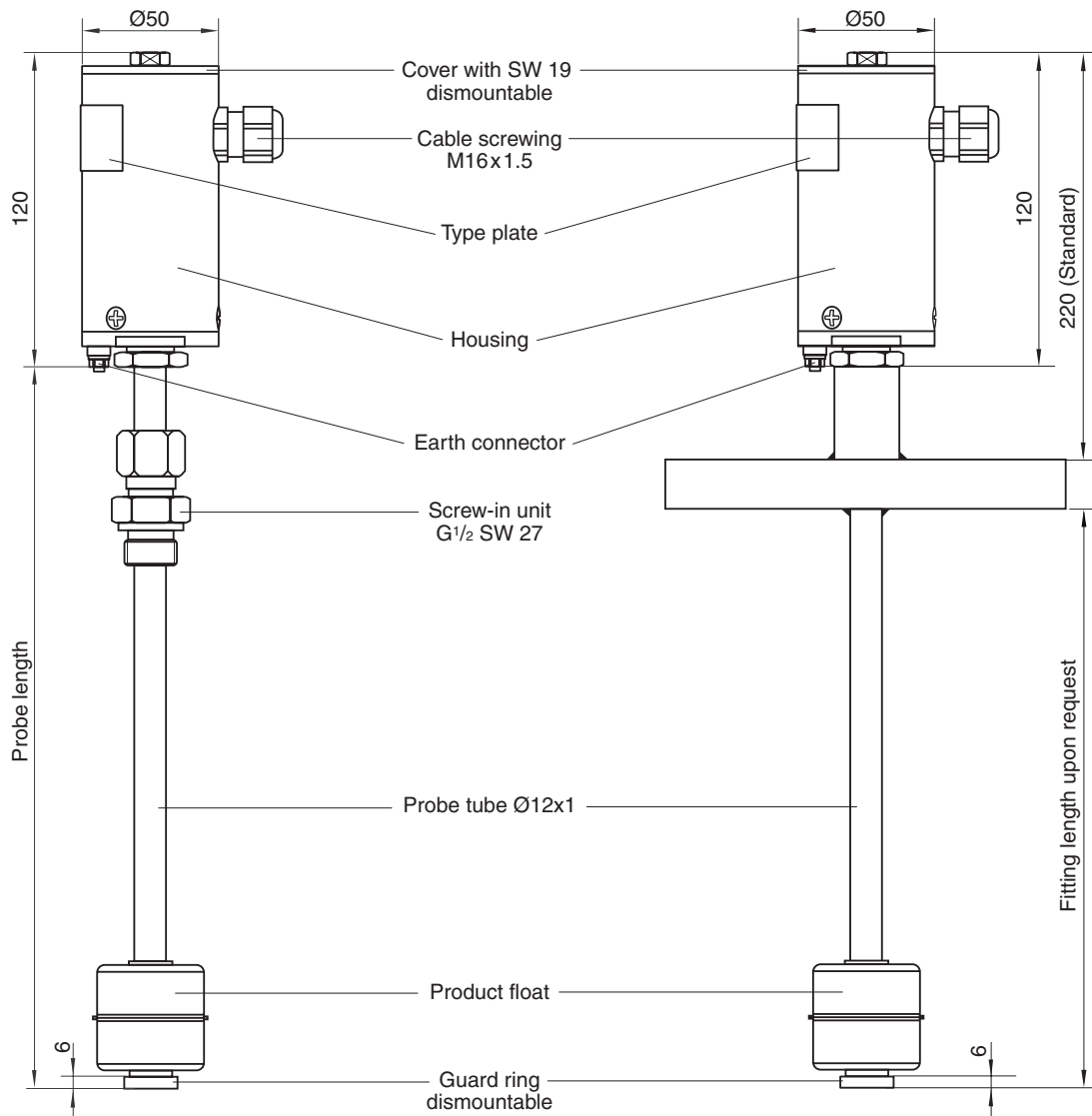
- Filling level: better ±0,25 mm
- Resolution: < 0,1 mm
- Analogue part: ±0,1 % (20 °C) + 0,005 % / K

### Temperature Range:

- Medium: -40 °C ... +125 °C  
-200 °C ... +250 °C
- Sensor head: -40 °C ... +85 °C

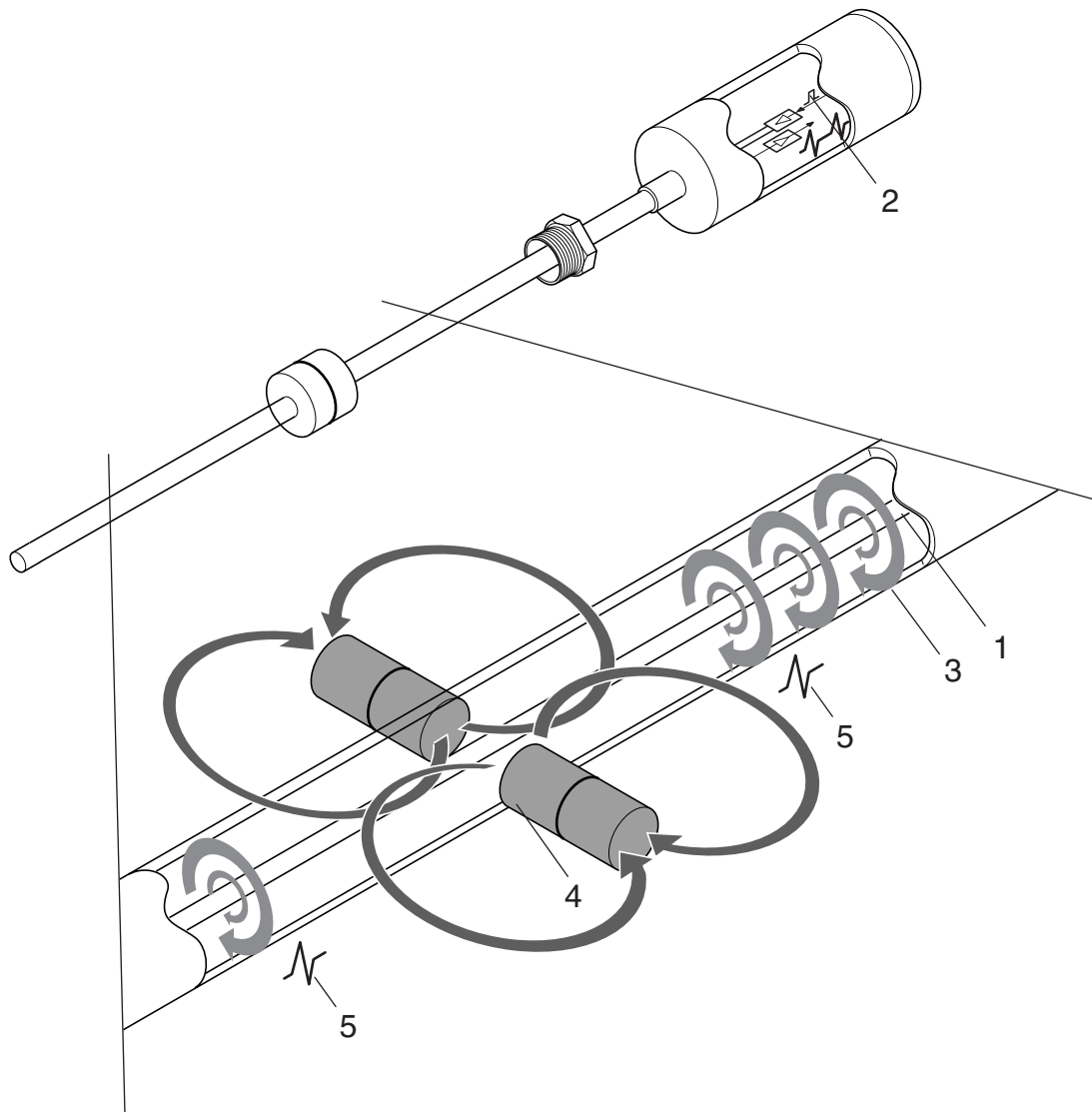
### Electrical Data:

- Connection: 2-wire
- Supply: 10 ... 30 VDC
- Current signal: 4 ... 20 mA
- Error message: adjustable to 3,6 or 21,5 mA
- **HART**®-Protocol Version 6.0



Dimensions in mm

## Function



### Function of the measuring transducer TORRIX

The method of measurement illustrated in the drawing exploits the physical effect of magnetostriction and is largely independent of temperature. Inside the probe tube there is a tense wire (1) made of magnetostrictive material. The sensor circuitry emits pulses of current (2) through the wire, thus generating a

circular magnetic field (3). The level transmitter is a magnet (4), which is integrated into the float. Its magnetic field magnetises the wire axially. Since the two magnetic fields are superimposed, around the float magnet a torsion wave (5) is generated which runs in both directions along the wire. One wave runs directly to the

probe head whilst the other is reflected at the bottom of the probe tube. The time is measured between emission of the current pulse and arrival of the wave at the probe head. The position of the float is determined on the basis of the transit times.

## Purchase Order Codes

Please state the following order number in your purchase order.

### TORRIX

Highly Accurate Filling Level Sensor with clamp housing

**HART®**

excl. 0

**HART®-Protocol** 1

Certificate

excl. 0  
Ex (ATEX) 1

Medium temperature range

-40 °C till +125 °C 1  
-200 °C till +250 °C 2

Process connection

excl. 0  
Screw-in unit brass, R 1 1/2 1  
Cutting ring screw connection stainless steel 316 Ti, G 1/2 2  
Cutting ring screw connection stainless steel 316, SWAGELOK G 1/2 3  
Flange stainless steel 316 Ti (Please state written the data) 4

Float material [for liquids' density]

excl. 0 0  
ball Ø 52, 316 Ti, 20 bar\*, ≥0,60 g/cm<sup>3</sup> 0 2  
ball Ø 43, 316 Ti, 50 bar\*, ≥0,95 g/cm<sup>3</sup> 0 3  
ball Ø 50, Titanium, 25 bar\*, ≥0,50 g/cm<sup>3</sup> 0 4  
cylinder Ø 43, 316 Ti, 16 bar\*, ≥0,70 g/cm<sup>3</sup> 0 7  
ball Ø 52, 37872, 25 bar\*, ≥0,75 g/cm<sup>3</sup> 0 8  
ball Ø 43, 316 Ti, 20 bar\*, ≥0,85 g/cm<sup>3</sup> 0 9  
ball Ø 52, 316 Ti, 40 bar\*, ≥0,70 g/cm<sup>3</sup> 1 0

Probe lengths for flanged version state the fitting length 0 0  
Code two digits: Length in mm / 100 (e. g. 1,500 mm = 15)

Probe tube Ø=12 mm, Material Stainless steel 316 Ti 0  
Stainless steel Hastelloy C4 / C22 1

Order number	523									
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\* max. operating pressure

For flanged versions the following written data are required:

Fitting length	e.g. 151 mm	
Nominal diameter DN	e.g. DN 40	
Pressure stage PN	e.g. PN 16	
Norm DIN/ANSI	e.g. DIN 2527	
Form	e.g. Form C	

For further information contact us by telephone +49/40/39 82 07-0  
Current product information under: [www.fafnir.com](http://www.fafnir.com)

