

# FM02

## Magnetostrictive Level Sensor

- **high accuracy measurement**
- **high resolution < 0,1 mm**
- **wear-free**
- **low maintenance, no recalibration**
- **linear**
- **insensitive to vibrations**
- **max. pressure: 40 bar, max temperature: 185 °C**
- **max. length of sliding pipe: 5800 mm**



### Description:

A float carrying a permanent magnet moves up and down a sliding tube supported by the liquid level.

This tube contains a magnetostrictive wire through which the electronics send short current pulses that carry a ring-shaped magnetic field around them. If this field hits the static magnetic field of the float magnet, the result is a torsion pulse which moves towards the sensor head at ultrasonic speed and is detected here.

The time between emission of the current and arrival of the impulse is directly proportional to the distance of the float and thus to the filling level. It is measured and converted into a 4...20 mA current signal which is available at the output of the device.

### Typical applications:

The sensor is used wherever small to medium filling levels, even of aggressive media, are measured. The magnetostrictive measuring principle guarantees highest accuracy and, due to its hermetically sealed stainless steel construction, good resistance.

The user can use the output signal either proportional to the filling level or to the empty height. These characteristics qualify the FM02 especially for use in the chemical and pharmaceutical industries, in biotechnical plants, as well as in the pulp, paper and food industries, especially since the sensor can be supplied with Ex zone 0 approval.

## Versions:

Stainless steel (standard): process connection, sliding pipe and float made of CrNi-steel 1.4571 (float of titanium on request)

Following versions are available on request:

- high temperature version (up to 400 °C)
- plastic version (PVC, PP, PVDF)
- sterile version
- ATEX version

## Type of Float:

Type	Form	Density [kg/m³]	Nominal size	Dimensions [mm]	for Sliding pipe-Ø [mm]
1	Cylinder	> 800	PN 16	44 x 52	14
2	Sphere	> 770	PN 40	52 x 52	14
3	Sphere	> 600	PN 32	62 x 61	14
4	Sphere	> 400	PN 25	83 x 81	14
5	Sphere	Sphere	PN 25	80 x 76	18
6	Sphere	> 600	PN 25	98 x 96	18
7	Sphere	> 530	PN 25	105 x 103	18
8	Sphere	> 400	PN 25	120 x 117	18
9	Sphere	> 540	PN 25	120 x 116	18

## Length of Sliding Pipe:

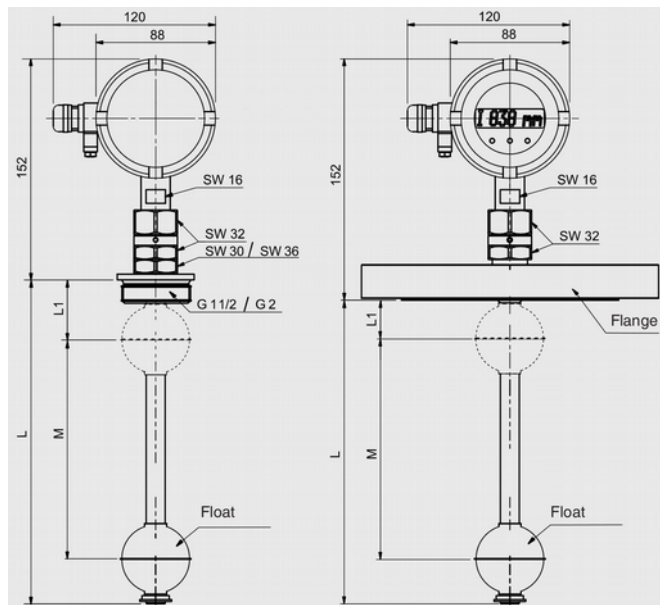
The sliding tube length L is freely selectable between 200 mm and 5800 mm. The technical necessity of a projection (inactive zone) and a shelter (damping zone) must be observed.

If only a section of the measuring length is to be placed on the 4...20 mA output, zero and end point of this range measured must be specified as the length in mm from the lower end of the probe.

## Dimensions:

Housing without display

Housing with display



## Order Code:

Order number: **FM02. 0. G40. 1. 2870. 0**

Magnetostrictive level sensor

### Display:

0 = without display  
1 = with local LCD display

### Process connection:

G40 = G 1 ½ screw-in thread upwards  
G50 = G 2 screw-in thread downwards  
Fxxx = flange DN 50... DN 200  
Axxx = ANSI flange 2"...8"

### Process pressure:

1 = PN 16  
2 = PN 25  
3 = PN 32  
4 = PN 40  
9 = special

### Measuring length:

--- in mm

### Options:

0 = without  
9 = please specify in plain text

## Technical Data:

### Materials:

**Process connection:** CrNi-steel 1.4571  
**Sliding pipe:** CrNi-steel 1.4571  
**Float:** CrNi-steel 1.4571  
**Housing:** CrNi-steel 1.4404 (316L), titanium on request

**Display (optional):** LCD-matrix

**Process connection:** G 1 ½, G 2 screw-in thread upwards  
DIN flange DN 50... DN 200,  
PN 6 ... PN 100  
ANSI flange 2"...8",  
class 150...600

**Sliding pipe-Ø:** 14 mm (up to 3000 mm length),  
18 mm (up to 5800 mm length)

**Max. pressure:** 40 bar (100 bar with float of titanium)

**Temperature range:** medium: -60...+185 °C  
ambient: -40...85°C (without display)  
-20...70°C (with display)

**Output signal** 4...20 mA, HART®

**Power supply:** 15...30 VDC

**Accuracy:** < +/- 0,5 mm

**Resolution:** < 0,1 mm

**Load:** max 900 Ohm at 30 V

**Mounting position:** vertical +/- 30°

**Protection class** IP67