

# LEVEL GAUGE 2000 Series

## DESCRIPTION

The magnetic level gauge 2000 Series consists in a bypass chamber inside which there is float, containing a magnet that magnetically transmits the liquid level to a housing mounted outside of the chamber. Inside the housing, red and white flags rotate 180° with the movement of the float showing the red face in presence of liquid and the white face in his absence.

It can work as a Level Transmitter or as a Level Switch mounting the appropriate accessories.

The level gauge 2000 Series is suitable for harsh process conditions, with corrosive fluids and high temperature and pressure.

## FEATURES

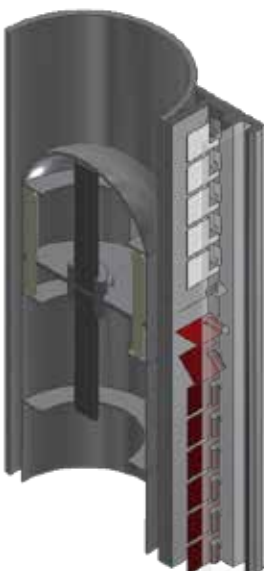
- Complete control on the production which is completely integrated inside the company and highly competent local suppliers.
- Qualified welders and welding procedures compliant with ASME IX and EN ISO 15614.
- Completely customizable on client's needs thanks to the support of our technical and sales departments.
- Over 60 years company experience with instruments installed in the entire world.
- Suitable for the most extreme conditions: highly corrosive fluids, temperature from -160 °C over 400 °C and pressures over 400 bar.

## APPLICATIONS

- Chemical and petrochemical
- Oil & Gas On and Off-shore
- Power plants
- Machine construction
- Naval construction
- Water treatment

## TECHNICAL SPECIFICATIONS

- Minimum flow density 0.3 kg/dm<sup>3</sup> for metallic type and 0.7 kg/dm<sup>3</sup> for plastic type.
- Suitable for interface service.
- Accuracy  $\pm 5$  mm, Repeatability  $\pm 2$  mm.
- Ratings up to PN 400, ANSI 2500.
- Maximum temperature over 400 °C on request.
- Lower temperature over -160 °C on request.
- Maximum length 5 m for metallic type and 4 m for plastic type. Over on request.
- Ambient temperature range -50 °C / +85 °C.
- Metallic type mounts upper and lower shock-absorber mechanism to avoid damages to the float due to rapidly level change.
- Suitable for Full-Vacuum use.



## MATERIALS

### BODY:

Metallic Type	AISI 316-316L dual grade	Standard COD. J
	Hastelloy C-276	On request COD. HC
	Monel 400	On request COD. MO
	Alloy 825	On request COD. 825
	Alloy 625	On request COD. 625
Plastic Type	PVC	Standard COD. P
	Polypropylene	Standard COD. M
	PVDF	Standard COD. PF
	ETFE/PTFE*	On request

More on request

\***Teflon-coated version** for highly corrosive fluids with body in SS 316 coated in ETFE/PTFE.

### FLOAT:

Metallic Type	AISI 316L	Standard COD. 2
	Titanium	On request COD. TI
	Hastelloy C-276	On request COD. HC
Plastic Type	PVC	Standard COD. 5
	Polypropylene	Standard COD. 6
	PVDF	Standard COD. PF
	PFA*	On request

The float material choice is made based of fluid density and corrosivity.  
Other materials on request.

\***Teflon-coated version** for highly corrosive fluids with body in SS316 coated in ETFE/PTFE.

### HOUSING:

Painted aluminium and Glass IP66 for metallic type, Aluminium and Polycarbonate IP66 for plastic type, flags in Iron.

The housing is mounted at 180° from the connections. On request it can be mounted on the left or on the right.

### GASKETS:

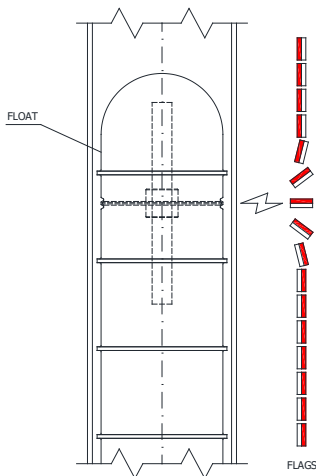
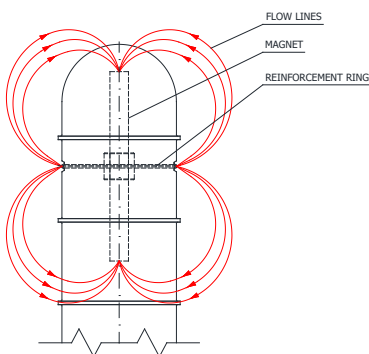
Std. Materials	MODELS	COD
Viton	Plastic Type	V
Graphite	2016-25-40-64	G
PTFE	2016-25-40-64	T
Spiral Wound	2016-25-40-64-100-150	S
Ring Joint	2250-400	R

### BOLTING:

Standard version mounts bolts A193 B7, B7M for NACE version. On request are available:

- B8 (standard for plastic type)
- B8M
- L7
- Teflon-coated bolting

Boltings B7, B7M and L7 are electrolytically galvanized.



## CONNECTIONS PLACEMENTS

The instrument is available with different connections placements:

- Side-Side
- Side-Bottom
- Top-Side
- Top-Bottom

Different connections are available on request, like for example with three Side connections.

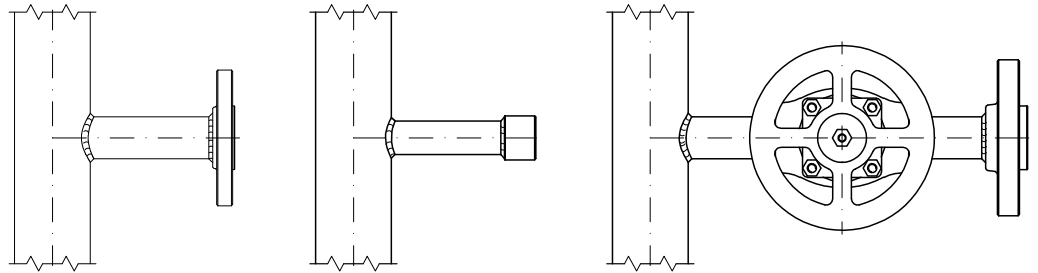
Dimensions B and C are customizable following the float dimension, it is even possible to reduce the housing length to reduce dimensions B and C.

A free space large at least like length B must be available under the instrument to ease the float replacement. If this space is not available, it is possible to install the inspection flange on top of the instrument instead of on bottom or to manufacture a 90° drain or other design changes.

## CONNECTIONS TYPES

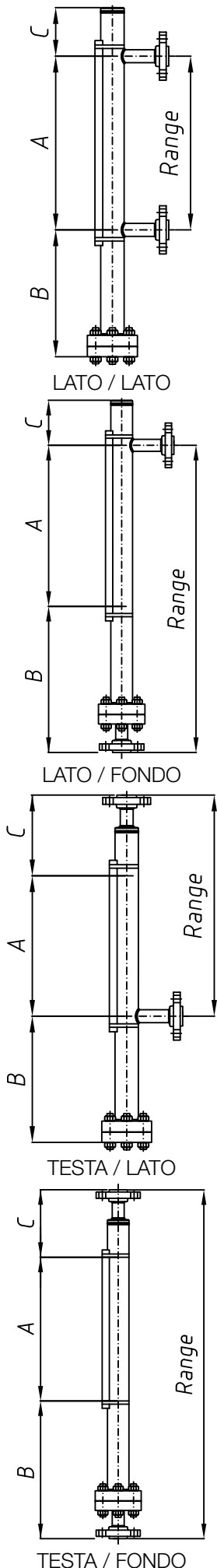
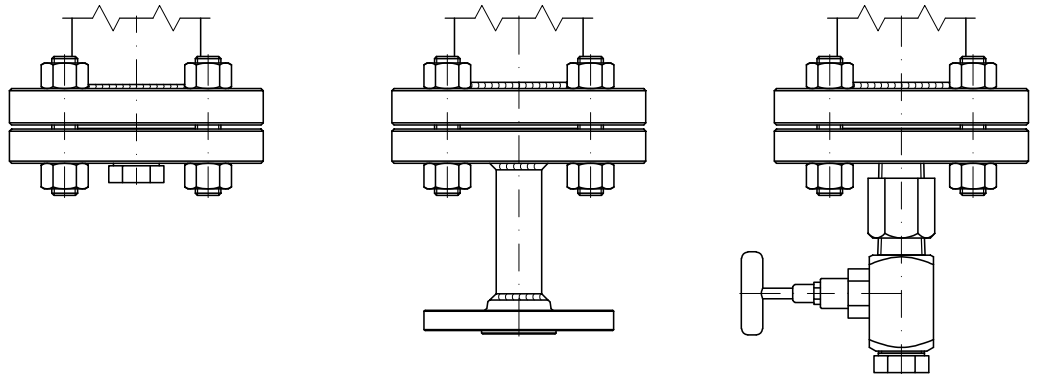
### PROCESS:

- Flanged
- Threaded
- Weld stub



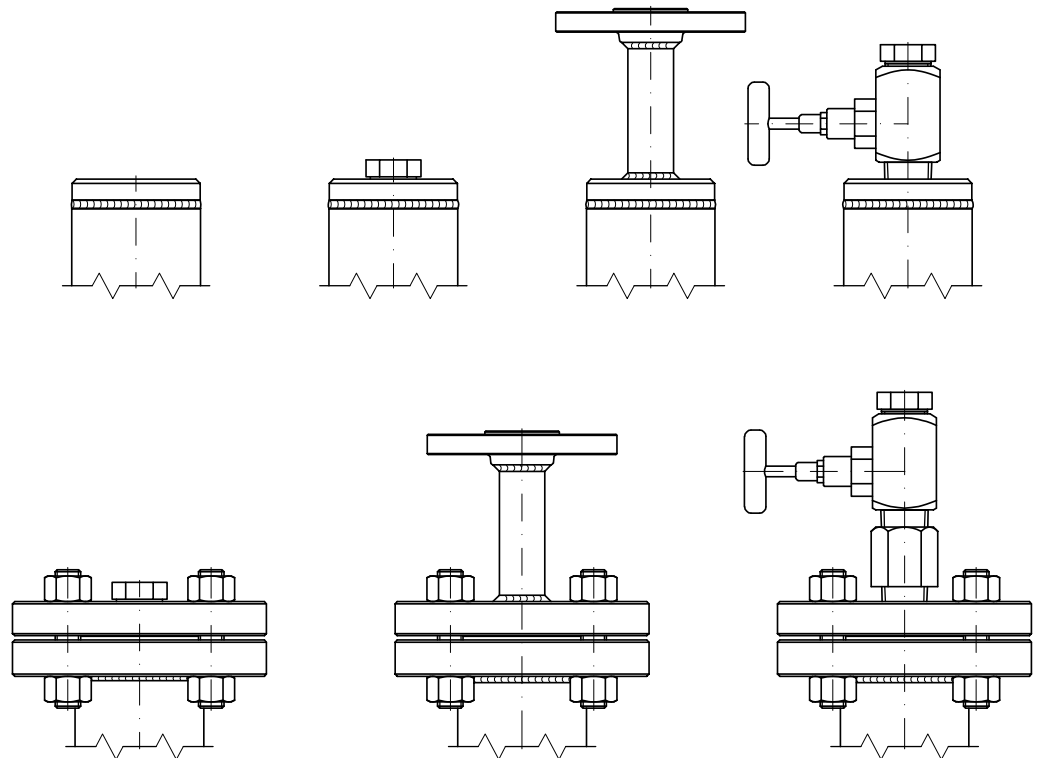
### DRAIN:

- Flanged
- Threaded
- Weld stub



## VENT:

- Blind flat top
- Flat top with threaded vent
- Flat top with flanged vent
- Inspection flange with threaded vent
- Inspection flange with flanged vent



The standard **flanges** available are:

- ANSI B16.5
- EN 1092/1

Standard faces:

- ANSI RF for metallic type
- ANSI FF for plastic type
- EN B

Face finish: 125/250 AARH, plastic type has no finish.

Other flanges or finishes on request.

Welding neck flanges with full-penetration welds are available on request.

**Threads:**

- NPT-F or NPT-M
- GAS-F or GAS-M

**Weld stub:**

- SW - socket weld
- BW - butt weld

## MODELS AND OPERATING LIMITS

MODEL	RATING	P max [bar] *			
		38 °C	100 °C	150 °C	200 °C
2006	PN6 (standard plastic type)	**			
2016	PN16	19	16	15	13
	ANSI 150	25	21	19	17
2025	PN25	40	35	31	28
2040	PN40	50	43	39	36
2050	ANSI 300	50	42	39	36
2064	PN64 & PN63	63	63	57	53
2100	PN100	100	100	90	84
	ANSI 600	100	84	77	71
2150	PN160	160	160	145	135
	PN140	140	143	130	121
	ANSI 900	107	127	115	107
2250	PN250	250	250	227	210
	ANSI 1500	248	210	192	178
2400	PN400	400	350	320	297
	ANSI 2500	400	400	364	337

\*For version with AISI 316 body

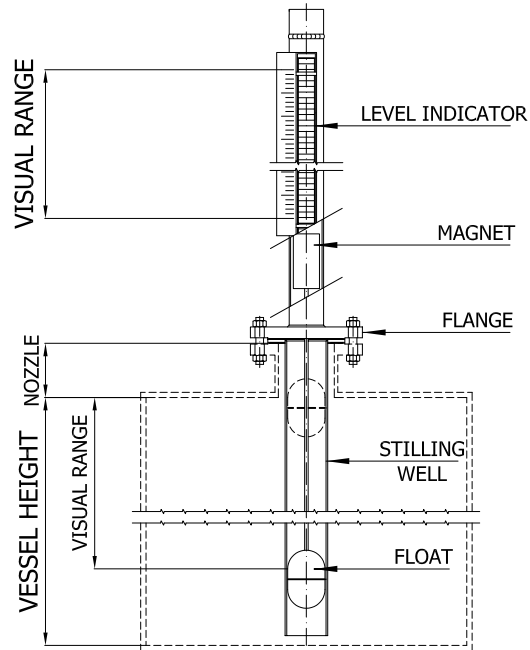
\*\* For plastic type see the following table:

	T min / max [°C]	P max [bar]		
PVC	0 / +60	6 at 25°C	4 at 35°C	1 at 60°C
Polypropylene	0 / +80	6 at 25°C	4 at 45°C	1 at 80°C
PVDF	-10 / +135	6 at 20°C	4 at 65°C	1 at 135°C
ETFE/PTFE	-40 / +150	16 at 20°C	16 at 85°C	14 at 150°C

## MODEL 2000T

Model 2000T is designed for top-mounted applications in underground tanks.

The float trough a metallic rod moves a magnet on the top of the tank that communicates with the housing. It is also available with stillin-well to protect the float and the rod.



## CHA + 2000 VERSION

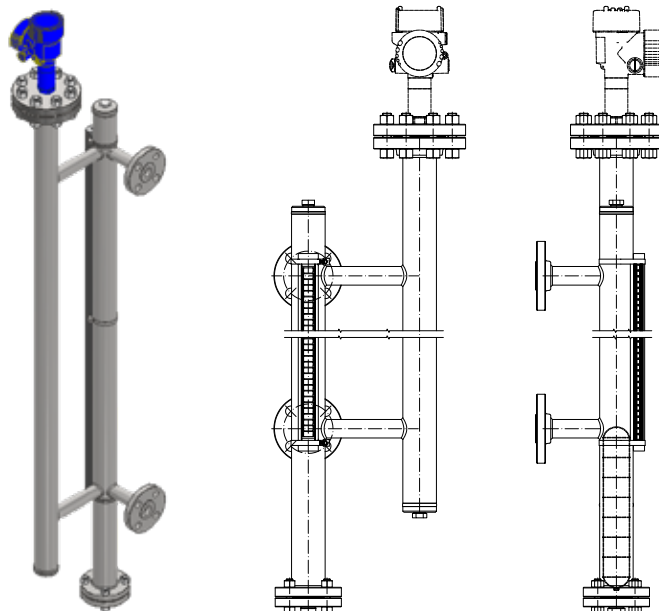
The level gauge 2000 Series can be coupled with a chamber for the external mounting of radar level transmitters. The gauge and the transmitter works independently to add a redundancy level to the level control.

High reliability and adaptability to different conditions.

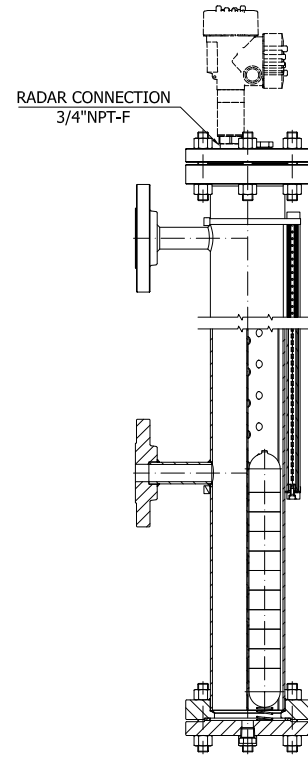
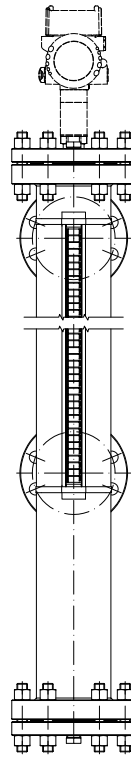
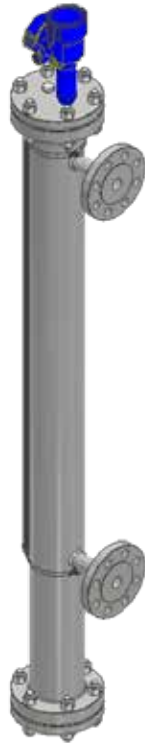
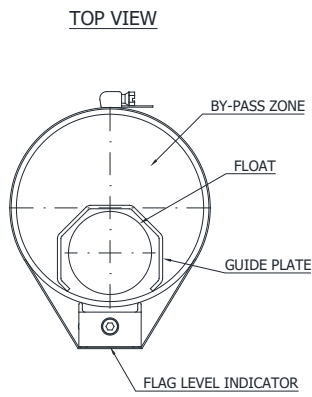
Combination of local indication and continuous measurement in a compact solution.

The coupling is made in two versions:

With **DOUBLE CHAMBER**:



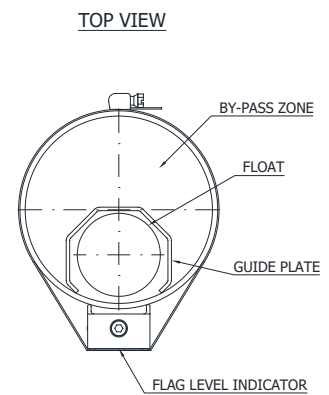
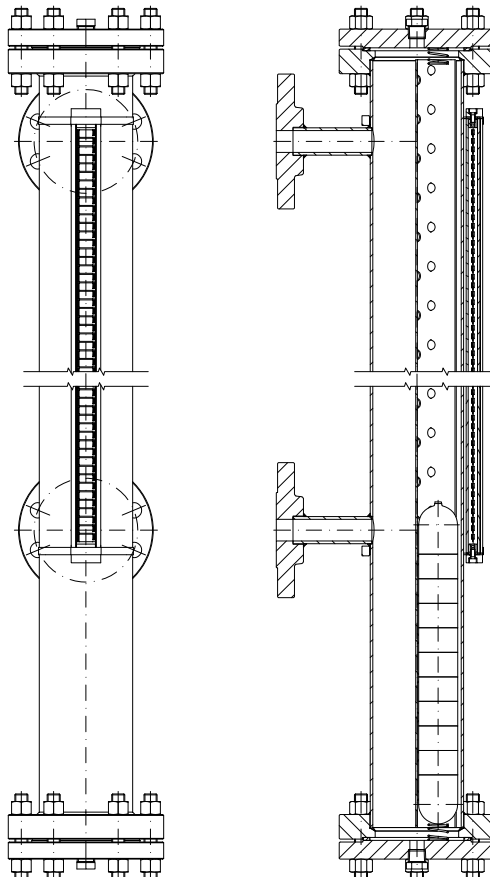
With **INTEGRATED CHAMBER**:



## FLASH-PROOF VERSION

With the potential presence of boiling fluids or flash-point vapors it is available, on request, a large chamber version with float guide to not obstruct the potential bubbles passage, improving the float indication and avoiding float damages.

The asymmetric float position ensure the correct transmission of his magnetic field to the flags and the chamber width ensure the correct operating even in case of solid impurities in the fluid.





## TRANSMITTERS

On the 2000 Series level indicator can be installed a reed chain TL Series or magnetostrictive MD series level transmitter.

### TL Series reed chain transmitter

A probe, consisting in a chain of resistances and reed contacts, is mounted outside of the level gauge 2000 Series, the float's magnetic field closes one of the reeds contacts creating a resistance variation that is converted in a linear 4/20 mA signal by an electronic circuit.

- Resolution 10 mm
- For ranges up to 4 m and over on request
- Ex d or Ex i option
- HART® option

### MD Series magnetostrictive transmitter

A probe is installed outside of the 2000 Series chamber, the float's magnetic field causes a signal that uses the magnetostriction phenomenon. The transmitter receive this impulse and generates a 4/20 mA signal proportional to the liquid level in the chamber.

- Resolution 0.1 mm
- For ranges up to 6 m
- Ex d or Ex i option
- HART® option

For more information see TL Series and MD Series catalogues.



## SWITCHES

On the 2000 Series level gauge can be installed one or more level switches T25 Series: a bi-stable SPDT reed contact.

The switch is mounted with stainless steel brackets on the side of the instrument to provide a low or high level alarm triggered by the float's magnetic field.

- Approvals Ex d, Ex i, SIL, EAC Ex
- Pneumatic option
- Namur option
- Cable up to 10 m or electrical connection NPT-F or ISO M20x1.5
- Temperature up to 350 °C
- Option flameproof version or intrinsically safe version with cable or housing

For more information see T25 Series catalogue.



## REMOTE INDICATOR

The level gauge 2000 Series can be provided with the remote indicator BAR20WP.

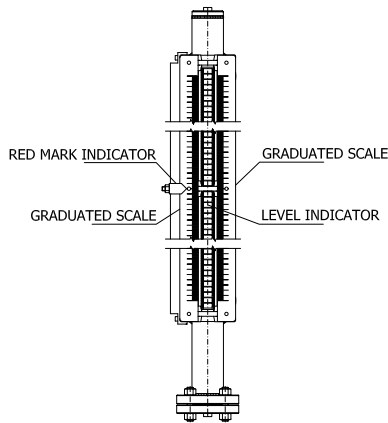
The remote display BAR20WP receive a 4-20 mA signal and it can be set as an active or passive device through a jumper switch.

- Power supply: 24 Vdc +/-10 % nominal - 115/230 Vac - 47/63 Hz
- Max. power consumption: 5W
- Circuit resistance: 340 Ω
- Max. distance: 1000 m con cavi multipolo EN IEC 60228 - 0.75 mm<sup>2</sup> - class 5/6 R= 26 ohm/Km

For more information see BAR20WP catalogue.







Doppia scala graduata con puntatore

## HOUSING ACCESSORIES

- Polycarbonate window also for metallic type
- AISI 316 and glass or polycarbonate
- Hermetically sealed version in glass or polycarbonate
- Neutral gas flow version for critical applications
- Plexiglas plate for cryogenic applications up to -195 °C
- Flags in ferromagnetic stainless steel

Red/Yellow flags as accessory to indicate a damage to the float: in case the float sinks to the float of the instrument, the flags will show the yellow face.

## VALVES

As accessory on the level indicator 2000 Series can be installed vent, drain and shut-off valves; the choice of the valve type is made in function of the design temperature and pressure.

Shut-off:

- Ball valves
- Globe valves for high temperature and pressure
- Gate valves for high temperature and pressure

Drain / Vent:

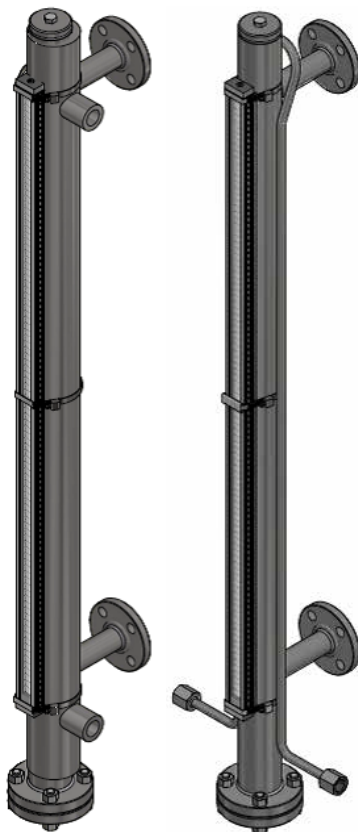
- Ball valves
- Needle valves for high temperature and pressure
- Globe valves for very high temperature and pressure
- Gate valves for very high temperature and pressure

## GRADUATED SCALE

As an accessory on request on the level gauge 2000 Series can be installed a graduated scale in AISI 316 in percentage, mm or other unit of measure on request, both of volume (m<sup>3</sup>, L, etc.) and of length (ft, inch, etc.).

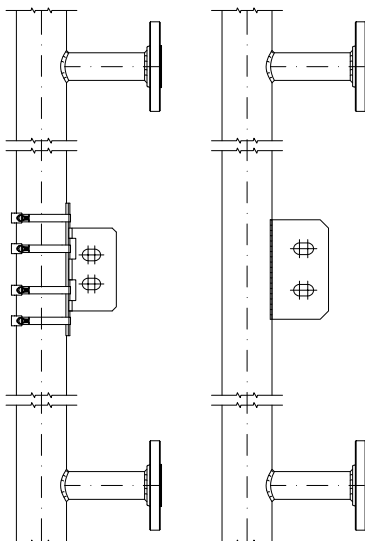
On request, a double graduated scale can be installed with two different units of measure on the two sides of the housing (for example mm and inch).

On the scale can be installed adjustable pointers.



Tracciatura vapore con camicia

Tracciatura vapore con tubetti



Staffe saldate e regolabili

## HEAT EXCHANGE AND INSULATION

As accessory the level indicator 2000 Series can be supplied with:

- Insulation
- Electric tracing
- Tubes steam tracing
- Jacket steam tracing

## TESTS AVAILABLE

- Penetration test
- Hydrostatic test
- RX test on full-penetration welds
- Tests on painting
- PMI test
- Hardness test
- Ferrite test

## OTHER ACCESSORIES

- Welded or adjustable brackets to reduce the connection stress in case on high length. In plastic type included in standard version.
- Execution with full-penetration welds.
- Standard Officine Orobiche paintings or compliant to customer specifications.



## APPROVALS

On request the following approvals are available:

- PED 2014/68 UE
- EAC CUTR032
- EAC CUTR012
- ATEX Ex II GD c IIC TX, II GD c IIB TX
- NACE MR-0175 e MR-0103



For transmitters and switches:

- ATEX Ex ia
- ATEX Ex d
- IECEx db, ia, tb
- EAC CUTR012
- IEC 61508 SIL 2

## TRACEABILITY AND SPARE PARTS

The level gauge 2000 Series comes without spare parts because it is designed to operate for his entire life without changing any part.

Our company database contains information about the instruments manufactured in 60 years and allows us to provide as spare parts:

- Floats
- Housings with eventual graduated scales
- Transmitters and switches
- Complete instruments

It is also possible to upgrade an already installed instrument with:

- Transmitter
- Switches
- Graduated scales



## MODEL CODE

Example: **2016 - J - 2 - G**

- 2016** Model
- J** Body in stainless steel AISI 316
- 2** Float in stainless steel AISI 316
- A** Gaskets in graphite

In order phase state:

- Materials
- Fluid density
- Operating and design conditions
- Range and connections type
- Accessories

To request spare parts state the F number of the instrument, written in the top-right of the label:



Our technical and commercial departments are available to discuss any variation or customization not mentioned in this catalogue.



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