



**INSTRUCTION MANUAL FOR TUBE LEVEL INDICATORS
VBB series**

1. INSTRUMENT DESCRIPTION

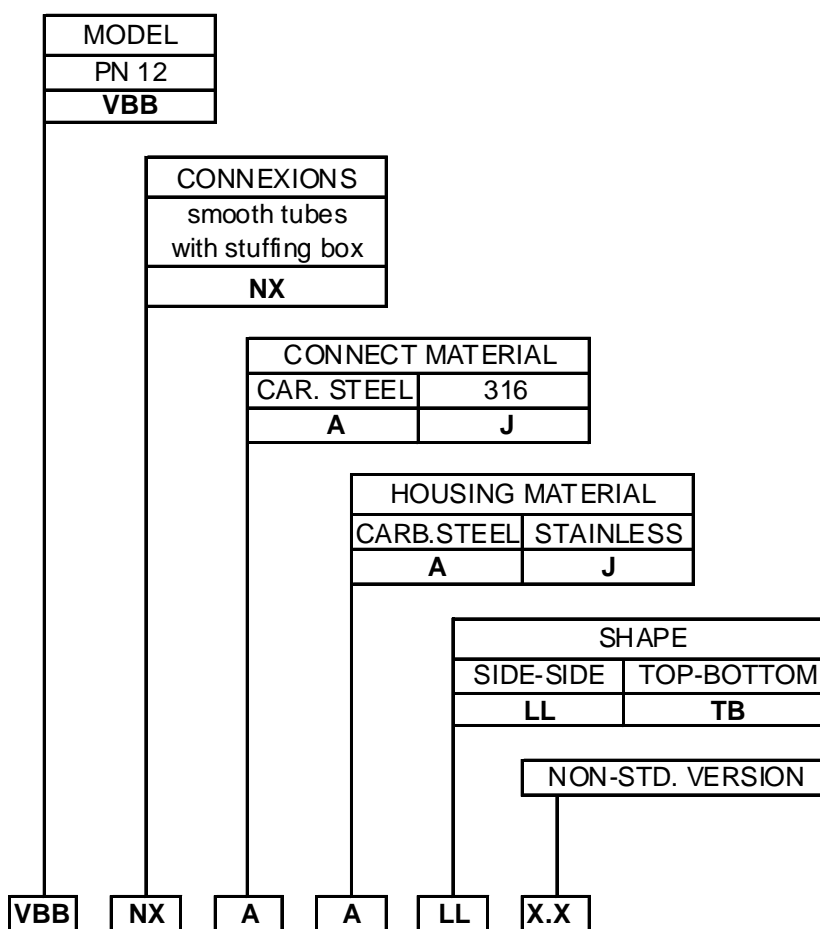
Tube level indicators of the VBB series display the level of fluid in a tank supported by a protective metal frame.

They are generally installed sideways on the tank through tap members.

They can be used with 160°C and 12Bar as maximum values.

In order to assure a fair safety level, we suggest you use the device with fluids that are clean and non-hazardous (since the glass tube is intrinsically brittle).

2. MODEL IDENTIFICATION



Accessories: the instrument can be equipped with various accessories, such as:

- separator and safety ball from AISI 316 steel;
- drain and relief valves;
- standard graduation, in centimetres (other engineering units upon request)

3. OPERATING PRINCIPLE

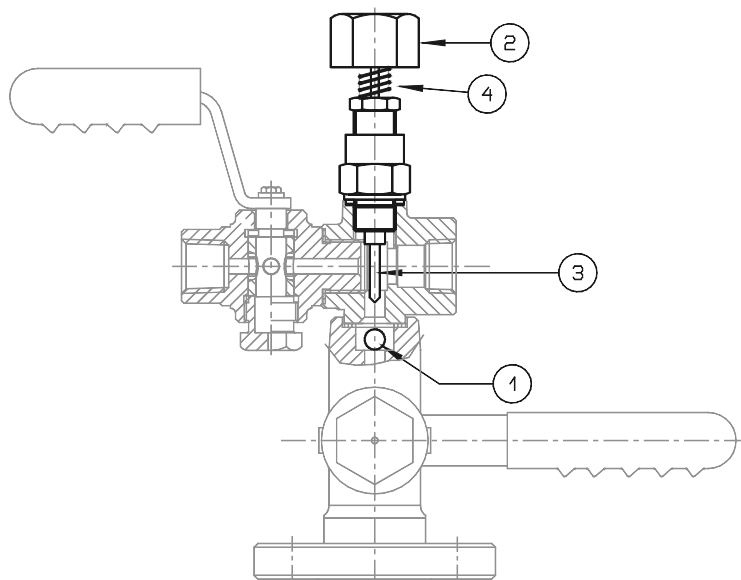
Level indicators of the VBB series operate based on the communicating vessel principle, according to which in two vessels communicating with one another, the fluid level sets at the same height in both.

The device is equipped with a borosilicate glass tube, generally fitted onto two flanged interception members (on request, they may even be threaded or made otherwise).

We always suggest you use a SAFETY BALL for application to the lower connection.

SAFETY BALL FUNCTION

The safety ball is used to prevent the fluid to flow out of the vessel in cases when a crystal breaks. The ball (1) automatically **closes** the passage of the flow that forms when the glass tube breaks. Once instrument integrity is restored, at the starting stage, knob (2) needs to be pressed so that bar (3) moves the ball (1) and allows the glass tube to be correctly filled. It is always advisable to adopt at least one safety ball, to be located in the lower portion of the device. It is better to use at two safety balls, one on above and one below, when the vessel level exceeds than that of the level gauge (e.g. in the event of several level gauges located in a row).



4. INSTALLATION

The (standard) instrument is supplied equipped with intercept valves, a drain valve and a safety ball located in the device lower portion. (Standard) connections are **side-to-side** with facing glass tube.

The instrument shall only be installed and used by qualified staff. Before installing it, check vessel and instrument connections for compatibility, and remove any plugs or other protections possibly located on the connections.

It is strictly forbidden to load the device with external loads and it is the user's obligation to protect it from all stress; never use it as a support point

To avoid galvanic corrosion effects, the use of materials with a different electrochemical potential is forbidden. The user shall adopt all technical measures required to preserve the unit from such an event. The system shall be equipped with the prescribed safety valve, to remedy overpressure beyond the maximum expected values. In the event of air or steam bubble formations, please apply relief valves on the upper connections.

For installation on vessels exposed to strong vibration, please contact our customer service. The system connection process shall be accurate so that all items (flanges, gaskets and tie rods) perfectly match to avoid sealing problems and create useless mechanical stress over the system and/or the instrument, namely on the glass tube.

First, fit the valve assemblies onto the system, and then add the glass tube protection.

Check that the couplings/connections are perfectly upright and aligned with one another; then introduce (very carefully) the glass tube.

The assembling of the glass tube with the interception/connection members shall be made very carefully. It is good rule to have two people carry out this job.

WARNING: the fluid in use shall neither turn into ice nor form deposits that are likely to obstruct the trough-holes.

5. SETTING AT WORK

The device is delivered disassembled, to prevent impact, vibration or sudden movements during shipment from breaking the glass tube. Ensure that all intercept, drain and relief valves are closed.

For very hot fluids, to avoid excessive thermal stress on the glass tube, you need to adapt the body temperature to the process temperature, before opening intercept valves.

Then slowly open the upper intercept valve, to balance pressure values between the instrument and the vessel, and then slowly open the lower intercept valve to let the fluid into the instrument without actuating the safety ball.

As soon as pressure inside the instrument has stabilized, the valves can open wide.

At first start-up, if leaks prove to affect the glass tube seal on reaching the steady state, tighten the stuffing box ring nut (6) located at the end of the tube so as to remove the leak.

N.B: the tightening shall be of few millimetres at a time to prevent the glass tube from breaking.

Warning:

- Valves are **closed** when the knob is aligned with the connection.
- The drain valve shall only be opened when the instrument is blocked and pressure has been released; at the beginning, the vent shall be opened by a few degrees, so as to slowly release the instrument internal pressure, then action shall be taken on the drain valve to let out all the fluid that is in the level gauge.

6. CALIBRATION

The instrument does not require any calibration to be performed (not applicable).

7. MAINTENANCE

Maintenance shall **only** be performed by qualified personnel, being perfectly aware of operation and having sound and proven experience with this kind of work. A cyclical inspection is recommended (once every six months approximately) to guarantee the perfect working order of the instrument. More in detail, check the glass tube for integrity, since some fluids are likely to deeply corrode the glass.

Inspect and clean the glass and the intercept valves. Moreover, check the ring nut for proper tightening.

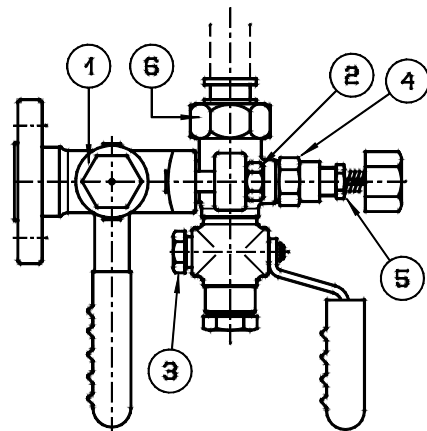
Note: all maintenance activities shall **always** be performed with the instrument having been disconnected and emptied of the fluid that is inside, and after it has come back to room temperature.

7.1. WARNINGS

- **Never** use the instrument at a pressure or temperature value that exceeds the values specified on the rating plate;
- **never** perform settings or replace parts without having read the instructions beforehand; in case of doubts, please contact our customer service department
- **Never** lubricate any part of the instrument;
- If the instrument is used with very high temperatures, take all precautionary measures required to guarantee personal protection to the personnel on duty during the various maintenance stages.

VALVE ASSEMBLY DETAIL VIEW

In cases when leaks show up, owing to the settlement of junctions in positions 1 to 5, operate a further tightening until the leak is undone





7.2. LEVEL BODY MAINTENANCE

Maintenance shall always be performed once the instrument has been removed from the system.

CLEANING AND REPLACING THE GLASS TUBE

Note: - Replacement of glass tube shall only be performed by experienced staff
- Replacement of glass tube always goes along with seal replacement

- Remove the U-protection from its location.
- Unscrew the valve assembly ring nut (see dwg. Valve Assembly)
- (Very carefully) pull out and replace the glass tube along with its seal (27) or clean it with rags or non-abrasive tools.
- Operate the indicator in accordance with paragraph 5 (Setting at work)
- Check all tightening again during the first 24 working hours

VALVE CLEANING

Intercept valves of the glass tube level indicator cannot be cleaned on site. The cleaning shall only be performed at a laboratory bench.

REPLACING THE VALVE CASE

See paragraph 10 (suggested spare parts) for part number references.

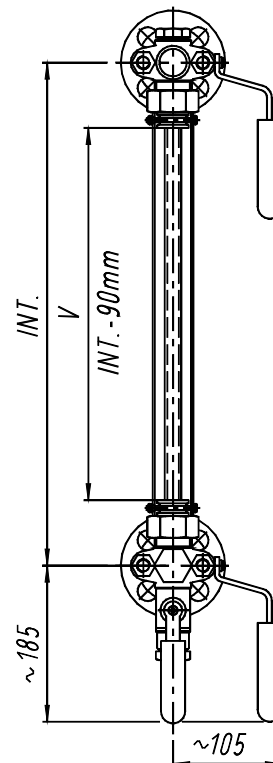
- The replacement of the case shall be performed with the device being disconnected from the system and in a laboratory setting.
- Disassemble the valves from the level gauge body by unscrewing the tie rods (1)
- Unscrew the plug (7) and (9) as a function of the valve type
- With a wooden or aluminium extension, hit the case with a knocker so that all parts that are inside may come out.
- **Warning:** the screw-tap shall not be exposed to blows or scratches, as they would compromise the valve sealing capacity
- Carefully clean the parts
- Apply the ring in two halves (5) or (12) to the screw-tap (4) or (10)
- Introduce the screw-tap into the new case (6) or (11) until it presses against the ring
- Insert the whole set into the valve body, taking care the case is driven by the dedicated slot provided in the valve body.
- Put the case-pressing plug (7) or (9) back in place.
- Move the knob a few times to check for proper rotation.
- Put the valve unit back in place on the level gauge body.
- Set the device to operate, in accordance with paragraph 5 (Setting at work)
- Inspect the seal during the first 24 working hours.

8. DIMENSIONAL DRAWINGS OF THE BODY

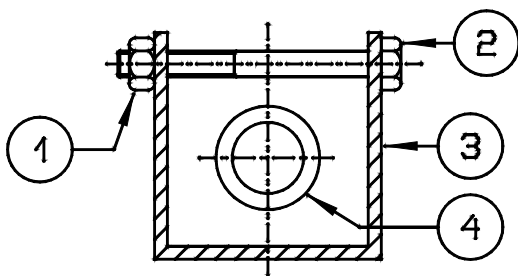
Key:

-INT. = Process connection distance

-V = Dimension of visual part

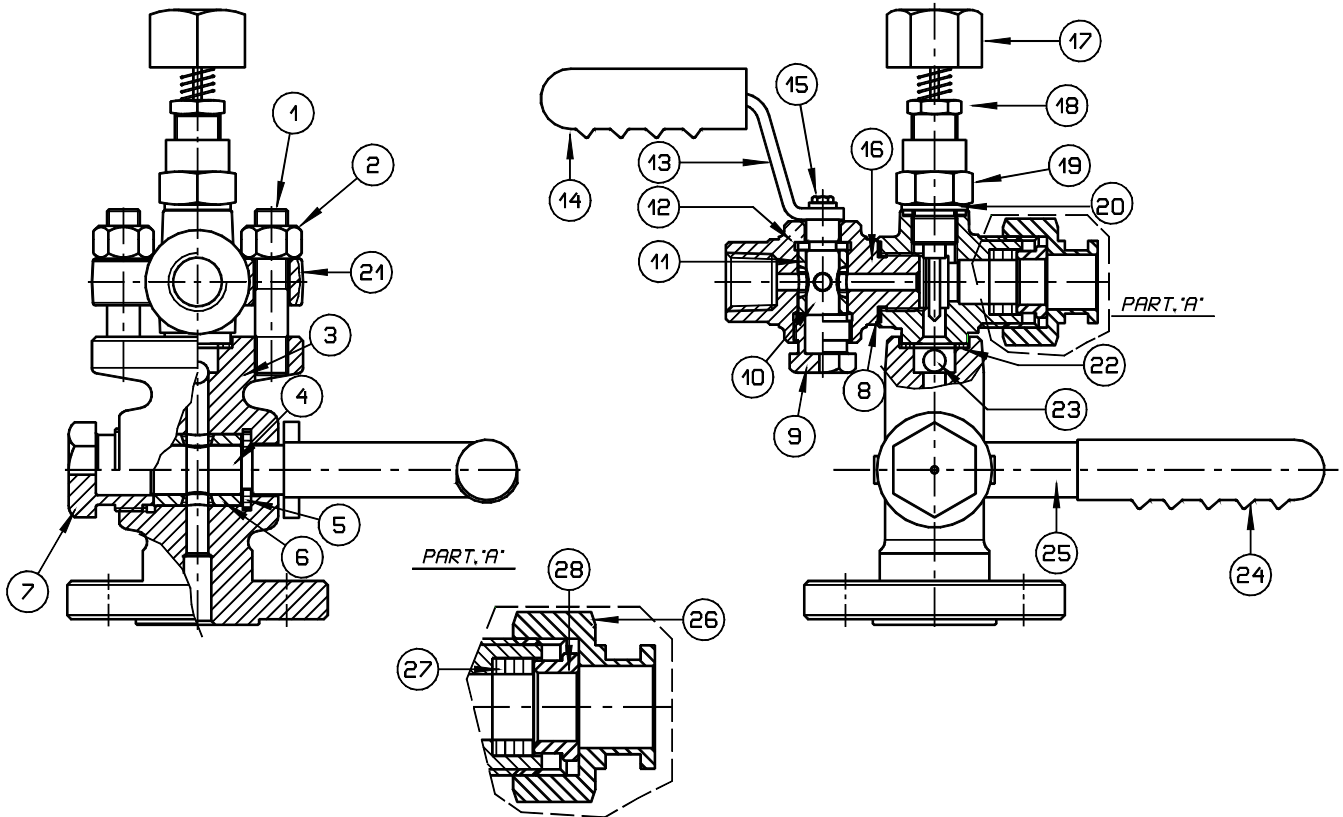


9. RECOMMENDED SPARE PARTS (*)



POS.	DESCRIPTION
1	Nut
2	Tie rod
3	U Protection
4 (*)	Glass tube

Version for NX series valve assembly

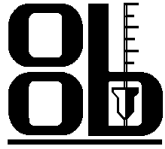


POS.	DESCRIPTION	POS.	DESCRIPTION
1	Tie rod	14	Knob
2	Nut	15	Screw
3	Intercept valve body	16	Drain valve body
4	Male size 18	17	Separator
5	Ring size 18	18	Ring nut
6(*)	Case size 18	19	Separator body
7	Case-presser size 18	20	Seal
8(*)	Seal	21	Flange body
9	Case-presser size 12	22(*)	Seal
10	Male size 12	23	Safety ball
11(*)	Case size 12	24	Knob
12	Ring size 12	25	Handle
13	Handle	26	Ring nut
14	Knob	27(*)	Seal
15	Screw	28	Stuffing box
16	Drain valve body		

The recommended spare parts are marked with an asterisk located beside the position.

Always mention the instrument serial number in your request for spare parts.

This number is provided on the instrument rating plate that is fastened to the housing, and is a five-digit number preceded by the letter "F" (e.g.:F45678).



10. TROUBLESHOOTING

Level indicators of the VBB series are not normally exposed to faults.

Warning: in the event of fluid leaks occurring during use, the level indicator shall be immediately disconnected. Follow the step-by-step instructions as indicated in paragraph 7 (Maintenance) to restore the instrument integrity.

11. DISPOSAL

When the devices have come to the end of their service life, they need to undergo disposal. Always comply with the applicable regulations in force.

During the disposal stages, specially mind the polymers, resins and rubbers used in the manufacture (such as PVC, PTFE, PP, PVDF, neoprene, Viton, etc.).

All metal parts, after the removal of seals and gaskets, special protective coatings requested by the customer and all other plastic parts, can be recycled.

12. GUARANTEE

All level indicators of the VBB series are guaranteed to be free from manufacturing faults over a period of 12 months from the date of shipment. In the event of failures, implying return of goods within the limit specified above, Officine Orobiche will replace (**shipment fees not included**) all damaged parts free, provided that the failure does not ensue from incorrect use. Officine Orobiche shall never be held responsible for any incorrect use of their products when these are used for purposes other than those mentioned in the specifications approved at the order stage. In these cases, no complaints will ever be taken into consideration. No damage and/or fee, whether direct or indirect, ensuing from an incorrect installation or use shall ever be debited to Officine Orobiche.

The instrument can be used for a maximum life period of 10 years dating from delivery.

When this period is over, there are two alternative options:

- 1) Replace it with a new instrument.
- 2) Have the old instrument overhauled by Officine Orobiche.

INSTRUMENT RETURN PROCEDURE

The instrument returning to the factory shall bear, in attachment, the following data:

- 1) Buyer's name.
- 2) Description of the material.
- 3) Detected fault.
- 4) Process data.
- 5) Specification of the fluids that have been used with the instrument.

The instrument shall be returned perfectly clean and free from dust or deposits. Otherwise, Officine Orobiche reserves the right not to carry out the servicing and return the instrument to the sender.