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## Square-dowel level indicator

Level gauges

Model 466

Level indicator box

Model 166-EC

### General Details

These are applicable to boilers, containers, tanks, cylinders, etc., for checking the level of liquids, gases and steam.

A polyprismatic reflection peep-hole with multiple openings provides an optical level reading, clearly differentiating between the liquid and gas phases of the fluids.

Proper gauge functioning is only guaranteed in steam boilers if the water in the boiler is kept within the parameters required by current regulations.

In the event of outdoor assembly, special care should be taken to ensure that the glass elements are properly protected from inclement weather conditions. Under these conditions, we recommend fitting a protective mica sheet Mod.066-PM between the glass and the atmosphere.

The level cocks are fitted with a replaceable mobile or floating needle-type seal device (17), with a safety ball included (3). In the event of the peep-hole breaking (26) a pressure imbalance occurs which moves the ball (3) over the seat (16) thus preventing the fluid from being released.

The level indicator box does not have any gland seals so avoiding irremediable losses of fluid through those areas.

### 1-Assembly

The assembly is the same for the gauges with control lever (13) on the right or the left.

The level indicator box can and should be fitted with a bleed valve, Mod.999 connected to the drain pipe, for regular checking of the level gauge and cleaning it.

The attachment brackets should be aligned in such a way that the gauge can be assembled without stress. Only use suitable gaskets, nuts and bolts for the assembly work.

The level indicator box is easy to attach using brackets (2), making maintenance simple since there is no need to remove the cocks even under working conditions. The level indicator box may be turned around 360°.

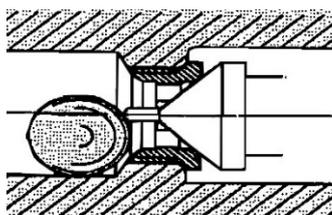
### 2-Start-up

Before starting up the equipment, check that the gauges are turned off and the bleed valve is closed.

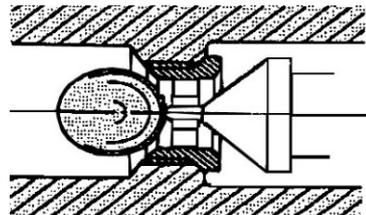
Once it is operating, personnel should stand next to the level indicator rather than in front of it.

If it is installed on a steam boiler, we recommend that it be heated up slowly so as to avoid unacceptable stresses inside the gauge. To do so, you simply have to turn on the gauges a little until the service temperature is reached. The gauges should only be fully turned on afterwards.

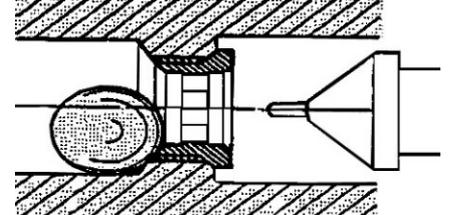
The gauge is fitted with an automatic ball shut-off device (3). This only works when the gauges are fully turned on!



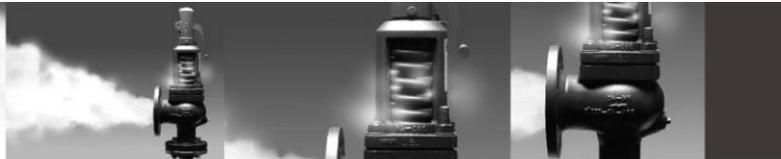
Position 0 = Valve



Position 1 = Valve half



Position 2 = Valve open



If the level indicator box is cold and the boiler is hot, avoid heat stresses and carry on in the following way:

Open the bleed valve. Open the top gauge slightly (about  $\frac{1}{4}$  of a turn), the inside of the box (24) and the glass element (26) is warmed up as the steam comes in until the service temperature is reached. Shut off the bleed valve and open up the bottom gauge very slowly until the level of the liquid is adjusted and the difference in the pressure between the boiler and the level gauge is balanced. During this period, you should carefully examine all the gaskets (5) (23) (30) (20) and gland seal nuts (12) for the gauges and the level indicator box.

If the gauges are turned on too quickly this will cause an incorrect reading for the liquid level.

Important note! Once the pressure between the boiler and the gauge has been adjusted, the gauges should be turned on to the maximum limit so that the safety ball (3) becomes operational.

Should it not be completely watertight, the bolts (32) and the seal gland nuts (12) should be tightened again carefully. After it has been in service for a few hours, this should be checked again. If the leaks continue and cannot be stopped, please contact your supplier before any irreparable damage is caused.

Both during the first commissioning and after any repair, cleaning or maintenance work for the plant, the gauge should be rinsed with water to remove any harmful particles.

During the first few days of operation, the back bolts (32) for the level indicator box should be tightened again using a torque spanner proportionately from the centre, in a cross upwards and downwards with a torque of 24 Nm.

Some moveable optical stickers showing the maximum, medium and minimum levels are supplied together with the level indicator box.

### 3-Shutdown

Turn off the top gauge and then the bottom one and gradually open the bleed valve.

### 4-Functioning

#### Blowing

So as to protect the glass elements, carry out a maintenance blowing procedure in the following way:

- Turn off both the top and bottom gauges.
- Open the bleed valve.
- Turn the top gauge on and then off very slowly (maximum of  $\frac{1}{4}$  of a turn), so as to prevent the automatic ball seal device (3) from operating; do this twice in a row within the space of 1 or 2 seconds and then turn it off again.
- Close the bleed valve.

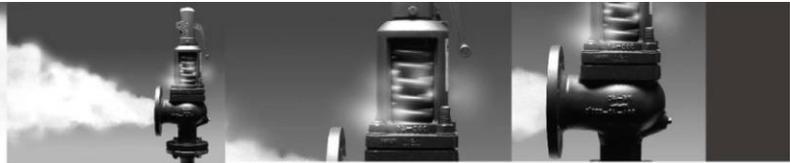
#### Bleeding

In steam boilers and other containers with fluids that form precipitation, carry out at least one 2 to 3-second bleed at 8-hour intervals in the following way:

- Turn off the top and bottom gauges.
- Open the bleed valve.
- Turn on the top gauge a little, maximum of  $\frac{1}{4}$  of a turn, until the gauge box and the glass reach the service temperature.
- Turn on the bottom gauge slowly.
- Turn off the top gauge.
- As soon as clean water can be seen in the water gauge pipe, close the bleed valve.
- Turn off the bottom gauge.

### 5-Functioning without Permanent Personnel Surveillance (TRD 604)

While functioning without permanent surveillance, the level indicator box should have the top and bottom gauges turned off and the bleed valve open.



## 6-Maintenance

In order to carry out any maintenance or repair work, the level indicator box must be out of service. Please help us to prevent accidents! Make sure of the following before proceeding.

### Gauges

Thorough and regular cleaning, in accordance with the working conditions, is recommended.

The gauges are fitted with the bleed cap (6) that allows the thorough cleaning of crystallisations and sediments by introducing a rod with a maximum diameter of 7 mm.

Given the low cost of the gauges, we do not recommend carrying out repairs on them but rather replacing the whole gauge. In any event, if necessary, the element to be replaced or repaired should be dismantled under the manufacturer's supervision or by an authorised distributor following the manufacturer's recommendations and using original spare parts.

In the event of a leak in the watertight areas, tighten the seal gland nut (12) again. If the leaks persist, replace the graphite rings (10) while the level indicator box is out of service.

In order to replace the joint from the axle of the level gauges, remove the nut (15), the washer (14) and release the lever (13). Loosen the seal gland nut (12) and remove it through the axle together with the seal gland (11). Using pliers, remove the remains of the old graphite rings (10) and replace them with new ones. Put the seal gland (11) and the seal gland nut (12) back in place and tighten with a flat spanner. Put the lever (13), the washer (14) and the nut (15) back in place and tighten. During commissioning, the seal gland nut (12) should be tightened again until the whole unit is watertight.

### Cleaning the Glass

Under operating conditions, the constant boiling-evaporation results in suspended waste products such as oil and grease becoming deposited on the peep-hole glass. The frequency with which the glass should be cleaned using a grease remover is determined by its state.

Remove the cap (6) from the level indicator box and the inside may be cleaned using a brush soaked with the appropriate grease remover.

### Replacing the Glass

The top and bottom gauges should be turned off gradually. Open the bleed valve. Check that the gauges are not leaking so that the level indicator box will be left without pressure. If no water or steam leaks are detected, gradually loosen the cap (6) and after checking once more that there is no longer any pressure, remove it completely.

Loosen and remove the nuts (8) and the flange (2), thereby releasing the whole level indicator box unit.

Loosen the rear bolts from the level indicator box (32) just enough to remove the plate (27), the set of gaskets (30) and the glass (26). Scrape off the remains of the gaskets stuck to the box (24) and the plate (27) using a paint scraper or similar device. Remember that only clean and smooth seal surfaces will allow the glass to be mounted securely.

Put the gasket (30) and the glass (26) into place with the prisms facing inwards, then the gasket (30) and the plate (27) and centre the whole unit with the box (24) using centring pins (25). Tighten the rear bolts (32) using a torque spanner proportionately from the centre, in a cross, upwards and downwards, with a tightening torque of 24 Nm.

Check and put the gaskets (20) into position on the pins (19) and (22) and carefully place the whole unit onto the level gauges. Place the flanges (2) over the studs (33) and the nuts (8) and tighten in place until the whole unit is watertight.

### Note:

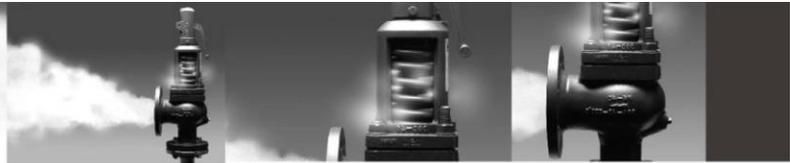
Only original VYC brand glass elements should be used as spare parts, since there are also lower quality glass elements on the market that do not provide the same required safety guarantees.

The gaskets (30) are made of two different materials. Depending on the working conditions, one or the other is placed in contact with the fluid. (See the catalogue for Mod.066 Reflection and transparency glass).

Under extreme working conditions such as high pressures or temperatures, we recommend fitting protective plates made of mica Model 066-PM in combination with transparency glass (See the catalogue for Mod.066-PM Protective mica plates).

### Hazard Warning:

In accordance with safety precautions for all models, we strongly recommend replacing the glass element only with the pressurised container out of service, if possible. Otherwise, please take all the necessary safety measures.



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## 7-New Start-up

This should be carried out in accordance with the specifications in point 2. When starting up a boiler again after cleaning, foreign bodies that come from the water in the boiler may become embedded in the locking elements. That is why in-depth cleaning and blowing should be carried out in accordance with point 4.

## 8- Caution! : Safety Warning

During any work on containers subjected to pressure and/or high temperatures, there is a clear risk of accidents.

All appropriate safety measures should be taken and the manufacturer's recommendations followed.

