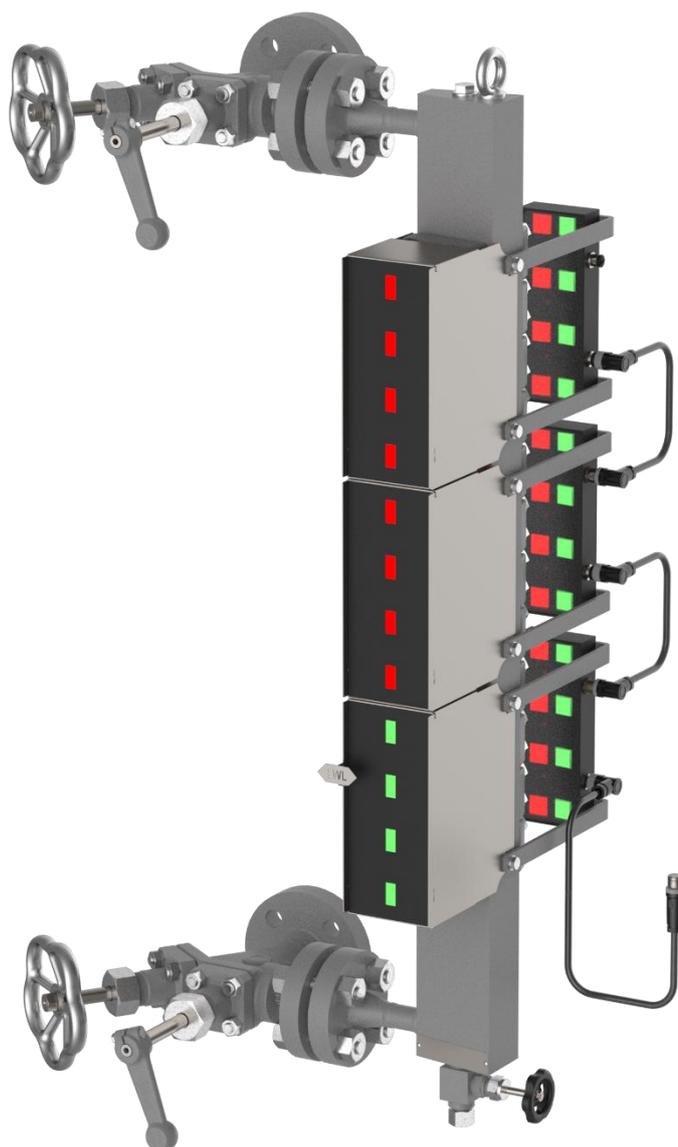




## Bicolour Level Gauge

BU Green-Red



Edition 01/2023

D-04-B-50985-EN-00

## INSTALLATION AND OPERATING INSTRUCTION



## Product philosophy

**Thank you for placing your trust in IGEMA and deciding in favour of one of our high-quality products.**

For more than 100 years, measuring and control systems have been developed, produced and sold worldwide under the IGEMA brand name.

“Steam is our passion” and we offer you the entire programme for the safe and economic operation of your plants, especially in the steam and condensate sector.

Please read the installation and operating instructions carefully to ensure a safe and reliable operation.

In addition to the information on installation and operation, you will also find important information on maintenance, care, safety and value retention of your measuring and control system.



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# 1 Important safety instructions

## **KEEP THESE INSTALLATION AND OPERATING INSTRUCTIONS IN A SAFE PLACE!**

Commissioning as well as maintenance and repair work may only be carried out by qualified persons in compliance with the installation instructions given in this operating manual. The correct installation, commissioning, maintenance and operation of the device presupposes that the person in charge is familiar with measurement and control systems and complies with the general installation and safety instructions. In addition, the correct and intended use of tools and the handling of safety devices must be ensured. Unqualified persons must not be assigned the above tasks!

IGEMA GmbH accepts no liability for damage to property or personal injury caused by unqualified persons or by failure to observe these installation and operating instructions. If no sufficiently qualified person can be found, IGEMA GmbH can be commissioned with the installation/maintenance.

## 1.1 Symbols used in these instructions

In the following installation and operating instructions, safety instructions are marked with the following symbols:



This symbol and signal word refer to a potentially hazardous situation which could result in death or injuries if ignored.

*Danger*



This symbol and signal word indicate live parts with an immediate danger of death from electric shock.

Caution  
electrical  
voltage



This symbol with a signal word indicates a potentially hazardous situation that can result in severe burns and scalds all over the body.

*Caution hot!*



This symbol and signal word refer to a potentially hazardous situation which could result in personal injury, property and environmental damage if ignored.

*Caution*



This symbol and signal word refer to a potentially hazardous situation which could result in damage to the equipment if ignored.

*Attention*



This symbol indicates useful information and recommendations as well as measures that will prolong the value of your measuring and control system.

*Information*



*Caution*

**Use these installation and operating instructions, the identification on the rating plate (see 5.6) and the technical data sheet to check whether the device is suitable for the intended use/application. The device complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.**

The device may only be used to indicate fill levels on containers.

The maximum values of the pressure and temperature range of the device must be checked before installation. If the maximum allowable operating values of the device are lower than those of the system on which it is to be installed, protective instruments for the device, such as pressure reducers or similar, must be provided to avoid limit situations. The device may only be used in accordance with the information in these installation and operating instructions or for the parameters and applications agreed in the supply contract. (see rating plate, 5.6) The operator of the direct water level indicator is obliged to familiarise himself on the compatibility of the medium and the device. In case of doubt, contact the relevant installation manager or site manager.

The correct installation position, alignment and flow direction of the device must be observed! Before installing the IGEMA product on boilers or containers, it is essential to remove all protective covers and, if necessary, the protective film from rating plates and sight glasses.



*Danger*

**Before installation or carrying out maintenance work on the device, safe access must be ensured and a secure working area with sufficient lighting must be defined and marked out. Always use lifting equipment for heavy loads!**

Before starting any work, carefully check which liquids or gases are or have been in the pipeline. (flammable substances, irritating substances, substances hazardous to health) When opening or dismantling the device, residues of the medium can escape. Subsequent fumes are also possible in unpressurized and cold systems. Use designated PPE such as safety goggles and respiratory protection!

Special attention must be paid to the condition of the environment around the installation or maintenance site. Be aware of e.g.: potentially explosive atmospheres, lack of oxygen in tanks and pits, dangerous gases/liquids, extreme temperatures, hot surfaces, fire hazard (e.g. during welding) and moving machine and system components. Protect yourself from excessive noise by taking the required protective measures.

For all maintenance work or new installations, on new or existing boilers or vessels, it is imperative to check that the boiler or vessel has been depressurised and that the pressure has been safely reduced to atmospheric pressure. In principle, no system should be regarded as unpressurized even if indicated by pressure measuring devices such as pressure gauges or sensors. When releasing the pressure, make sure that no persons are in the release area. Carefully check whether you and/or other persons in the vicinity need PPE to protect yourself from external influences such as high and low temperatures, radiation, noise, danger to eyes, loose objects that can fall down or chemicals.

There is always a risk of injury when handling large and/or heavy equipment. Observe the load handling regulation as a minimum requirement for working with loads. Avoid handling the device with your own physical force, e.g. by lifting, pulling, carrying, pushing or supporting it, especially to prevent back injuries. Use lifting equipment to move heavy and bulky equipment in accordance with Article 1, Section 2 of the German Load Handling Regulation (LasthandhabV).



*Caution hot!*

**Under normal operating conditions the surface of the device can become very hot! Under the maximum operating conditions, the surface temperature can exceed 350°C. After shutting off or, if necessary, shutting down the boiler, wait until the temperature has normalized to room level. To avoid the risk of burns and scalds, always use PPE including safety goggles!**

## 1.4 Safety instructions for this device



*Attention*

**These installation and operating instructions are an integral part of the device and must be forwarded to the responsible departments "Goods inward, Transport, Installation, Commissioning and Maintenance". They must be kept in such a way that the technical staff have access to these documents at all times. If the device is passed on to a third party, these installation and operating instructions must also be included in the national language of the third party.**

Avoid shocks and hard contact during transport, as this can lead to damage. During intermediate storage, the device must be kept dry and secured against damage.

When servicing the unit, make sure to use sharp-edged internal parts and avoid shards of broken glass. There is a risk of cutting hands and arms! Always wear work gloves when changing packing, valve seat and valve plug.

For units with a dead weight of 30 kg or more, the customer must provide adequate support (e.g. via a spring suspension device, etc.). This can be attached to the holding strap/eyelet on the device.

When returning goods to IGEMA GmbH, the applicable safety and environmental laws according to GGVSEB [German ordinance on the national and international carriage of dangerous goods by road, rail, and inland waterways] must always be observed. If there are any risks to health or the environment due to residues or the device has a mechanical defect this must be indicated when returning the device and the necessary precautionary measures must be taken. If the returned goods are devices that have come into contact with or contain hazardous substances, a safety data sheet must be enclosed, and the goods must be clearly marked. In addition, the hazardous substance must be reported to the logistics service provider.

## 1.5 Exclusion of liability

IGEMA GmbH Mess- und Regelsysteme will assume no liability if the above regulations, instructions and safety precautions are not observed and followed. If they are not expressly listed in the installation and operating instructions, changes to an IGEMA device are carried out at the risk of the user.

## 2 Contents of packing

1. The level gauge is delivered in 2 units (A and B). (see page 11)

- Unit A consists of:
- upper shutoff valve (2)
  - gauge body (1)
  - lower shutoff valve (3)

- Unit B consists of:
- illumination device (6, 7)

2. Installation and operating instruction

## 3 Important information



*Caution*

The direct water level gauge is for measurement and control purposes and must only be used to display fill levels on a tank. Here care must be taken that pressure and temperature do not exceed the maximum limitations of use. These can be found on the identification plate.

The operator of the direct water level gauge is responsible for the intended use of the indicator.



*Attention*

**Note!**

For displays weighing 30 kilograms or more, the customer must provide sufficient support (e.g. by spring hangers or similar).

### 3.1 Intended use

#### **Bicolour level gauge:**

The bicolour level gauge type BU is a direct water level gauge with illumination which can be used for steam boilers and containers.

This product is in accordance with EU-directive 2014/68/EU. Applied policy acc. to DIN EN 13445 and ASME Boiler and Pressure Vessel Code. Considered regulations AD2000. Furthermore, as a plant component for large water room boilers and water tube boilers, this product meets the requirements of the standards DIN EN 12952-7 and DIN EN 12953-6.

## 4 Explanations

### 4.1 System description

The bicolour level gauge in different versions is used to detect the water level of steam generators or containers.

### 4.2 Function principle

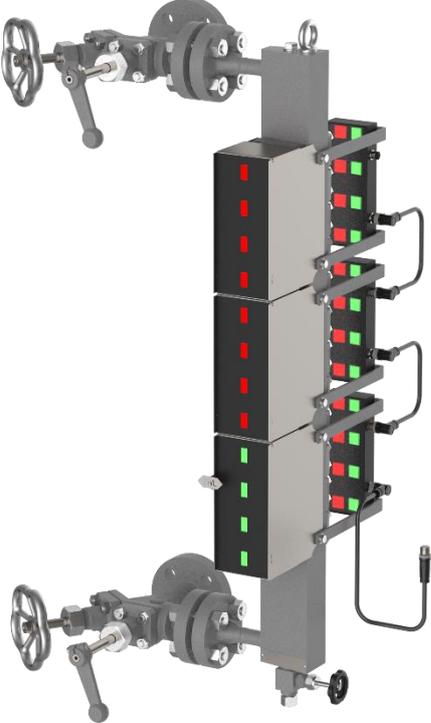
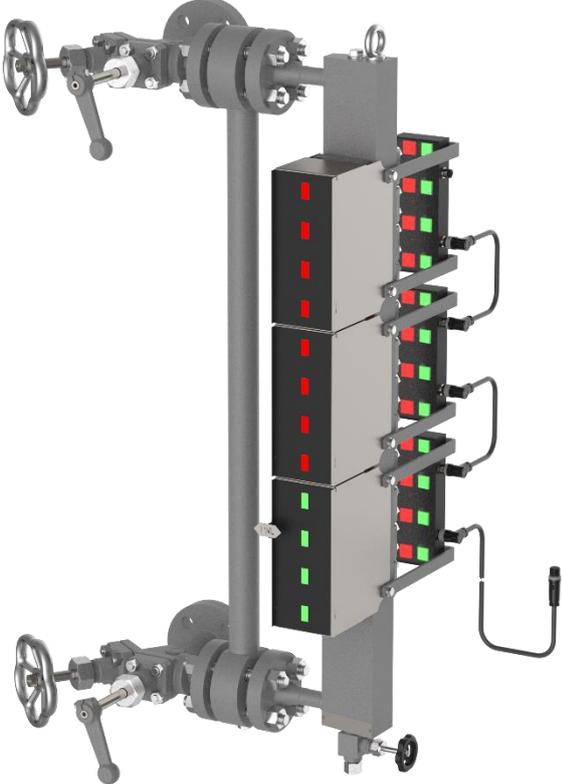
The device works on the principle of communicating pipes.

With the “BU green/red” model, the water level is shown by the rear LED illumination of the steam compartment:

Red and green light falls on the display unit. If there is water in the display area, then the light rays will be diverted in such a way that the green light beam falls on to the slit diaphragm of the display box. In the steam area the light rays are not diverted and the red-light beam is projected.

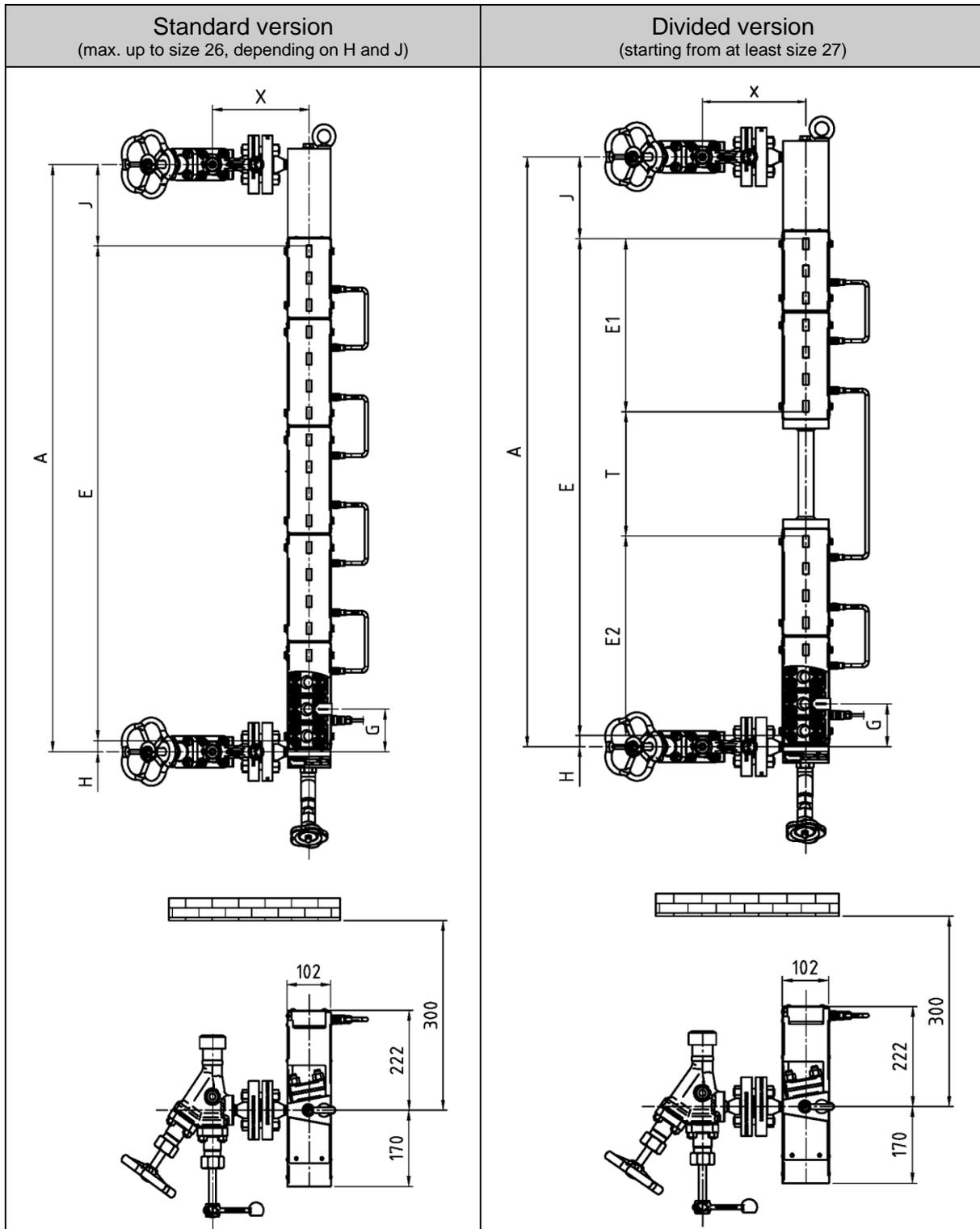
As a result, in the “BU green/red” model the water compartment always appears green and the steam compartment red.

### 4.3 Versions

Standard version	Version with expansion loop
 The standard version of the valve assembly consists of a vertical grey metal frame. At the top, there is a valve with a handwheel. The frame has three main sections, each with a red indicator light on the left and a green indicator light on the right. A cable is connected to the bottom right of the frame. At the bottom, there is another valve with a handwheel.	
Version with tie bar	Version with expansion loop an tie bar
 This version features a vertical grey metal frame with a long, thin tie bar extending from the top valve to the bottom valve. The frame has three main sections with red and green indicator lights. A cable is connected to the bottom right of the frame.	
 This version features a vertical grey metal frame with a long, thin tie bar extending from the top valve to the bottom valve. The frame has three main sections with red and green indicator lights. A cable is connected to the bottom right of the frame. The top valve has a handwheel, and the bottom valve also has a handwheel.	

## 5 Technical data

### 5.1 Unit dimensions



- If the illumination device is divided, one porthole is left out and a dead space (T) of 100 mm arises. The position of the dead space depends on the order.
- Another possible version: with expansion loop and/or tie bar.

### Sight openings:

Size	6	7	8	9	10	11	12	13	14
Sight length E	320	380	440	500	560	620	680	740	800

n= quantity of portholes

**Calculation of sight length:  $E = (n-1) \times 60 + 20$**

### Valves:

Valve	Type
Shutoff valve	A220, A240
Drain valve	AV250

## 5.2 Type of connection

Standard : flanges according to DIN

On request : flanges according to ASME  
welding end or socket welding according to DIN or ASME

## 5.3 Materials

Parts in contact with the medium: C steel or stainless steel.

Pressure holding components: C steel according to DIN or ASME.

## 5.4 Application limits

Max. all. pressure <b>PS</b>	[bar]	200
Max. all. temperature <b>TS</b>	[°C]	367

The maximum operating conditions specified here apply to our standard design.  
These values can be reduced or increased by customer-specific designs or connections.  
In these cases, the conditions of use on the type plate of the level gauge always be valid

## 5.5 Corrosion resistance

The safety of the unit is not influenced by corrosion if it is used as intended.

## 5.6 Identification plate / Marking

The following data are indicated on the identification plate according to EN 19:

 <p>IGEMA GmbH Mess- und Regelsysteme Antwerpener Straße 1 Germany – 48163 Münster</p>  * <p>See installation instructions</p> 	Built	<b>A</b>	Type	<b>B</b>
	PS	<b>C</b>	bar	TS <b>D</b> °C
	Conn. Type	PN <b>E</b>	DN <b>F</b>	
		<b>G</b>		

\* marking depending on the realization

A Date of manufacture

D Max. all. Temperature

G TAG-no. (Optional)

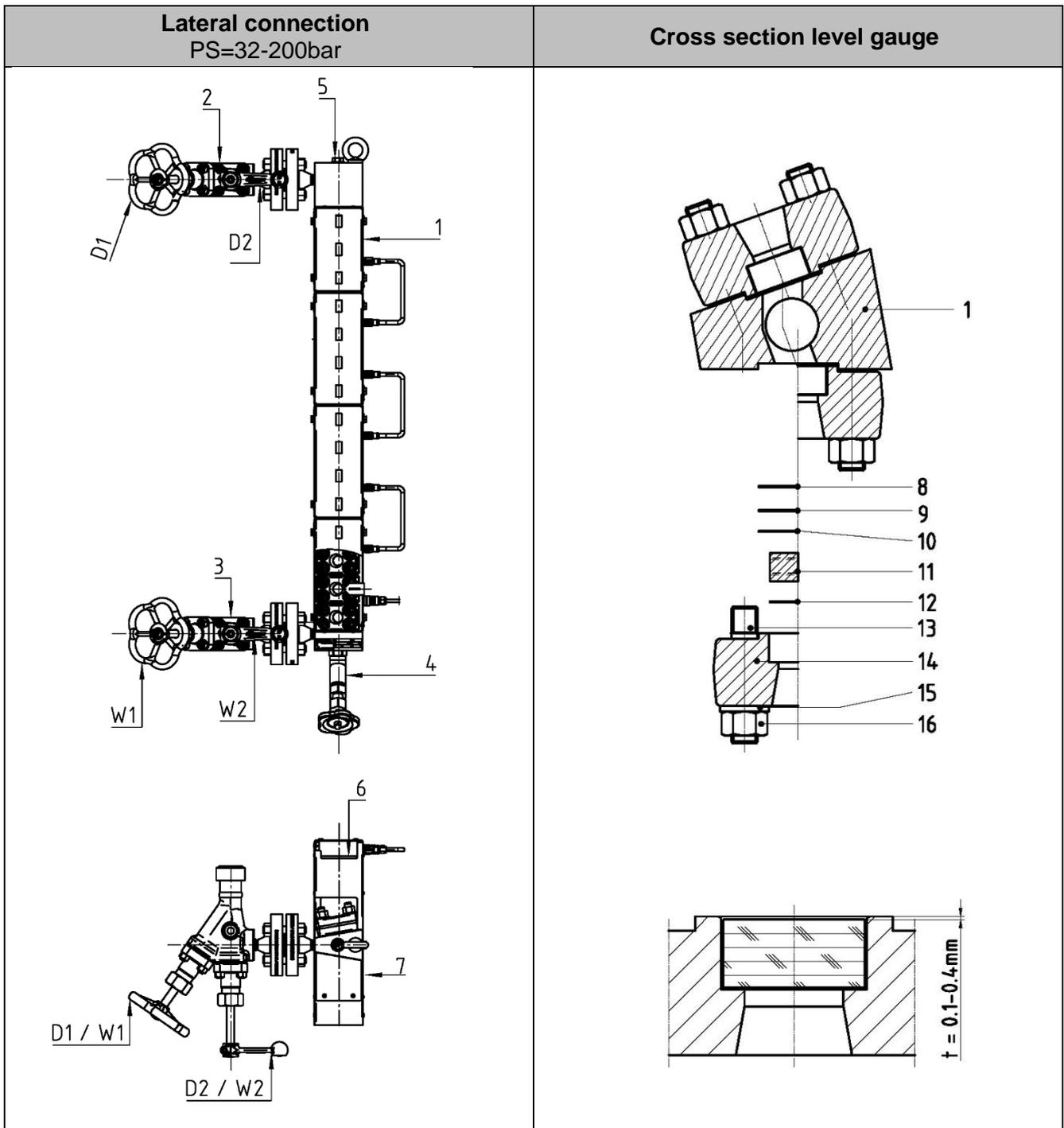
B Type of unit

E Nominal pressure (not listed)

C Max. all. Pressure

F Nominal diameter

## 6 Construction



- |                          |                  |
|--------------------------|------------------|
| (1) Gauge body           | (9) Mica packet  |
| (2) Upper shutoff valve  | (10) Ring gasket |
| (3) Lower shutoff valve  | (11) Glass       |
| (4) Drain valve          | (12) Ring gasket |
| (5) Plug G $\frac{1}{2}$ | (13) Cover screw |
| (6) Illumination         | (14) Cover       |
| (7) Dazdling box         | (15) Washer      |
| (8) Sealing ring         | (16) Hexagon nut |

## 7 Assembly

### 7.1 Version with flange

- Respect installation position!
- Remove protection caps from connection flanges. Caps only serve as transport protection.
- Ensure that sealing surfaces are clean and undamaged.
- Mount bicolour level gauge.

### 7.2 Version with welding end

- Respect installation position!
- Remove protection caps from connection flanges. Caps only serve as transport protection.
- Assembly only by using welding process 111 and 141.

### 7.3 Heat treatment of weld seams

Supplementary temper tests of weld seams are not required.

### 7.4 Drain piping

- Close valves (D1, D2, W1, W2) after mounting.
- Mount drain piping on drain valve (4) (to be provided by the customer).



**Ensure that drain piping has free outlet to atmosphere and is protected from pressure peaks!**

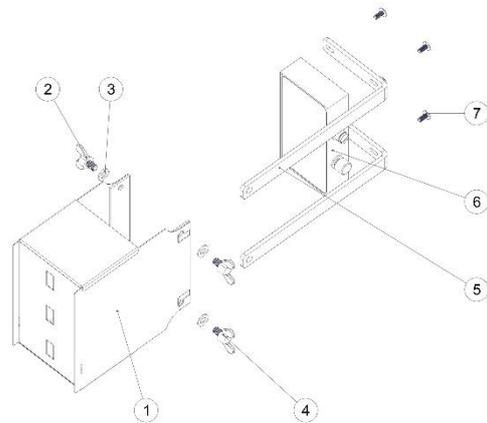
*Caution*

## 7.5 Illumination device mounting on the indicator

**Before assembly, check the scope of delivery shown for completeness.**

The quantities depend on the configuration of the indicator. Shown here are the quantities for one illuminator.

Pos.	Designation	Quantity
1	Glare box	1
2	Wing screw M8 x 12	2
3	Washer für M8	4
4	Wing screw M8 x 16	2
5	Holding bracket	2
6	LED Secure SOL	1
7	Screw M5 x 12	4



Danger

**The work described below may only be performed by trained personnel. The electrical connection must be made in accordance with VDE 0110 or the local regulations.**



Caution hot!

**Assembly may only be carried out when the device is cold!  
The lighting equipment should be installed only after the unit has been tempered.**

**Follow the steps below to mount the illumination device:**

Note that the electrical connections must ALWAYS be on the wide side of the indicator body.

(Fig. 4)

Mount the glare box (pos. 1) to the body of the indicator by means of the wing screws (pos. 2). This mounting is done in the first step on the opposite side of the mounting of the retaining bracket. Place the washers (pos. 3) underneath. (Fig. 1)

Now mount the retaining bracket (pos. 5) on the opposite side by screwing the wing screws (pos. 4) through the holes of the retaining bracket and the glare box into the threaded hole in the display body. Again, place the washers (pos. 3) underneath. (Fig. 2)

Montieren Sie die Leuchte mittels der Schrauben (Pos.7) an den Haltebügeln.

To be able to position the light so that the light radiation hits the display on the glare box correctly, adjust the position of the light using the slotted holes. (Fig. 3)

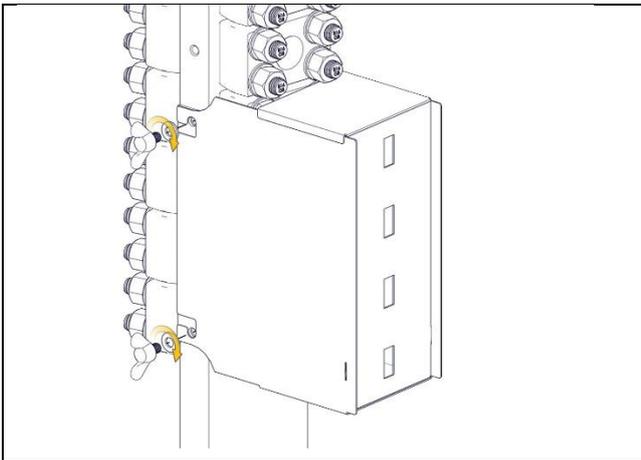


Fig. 1

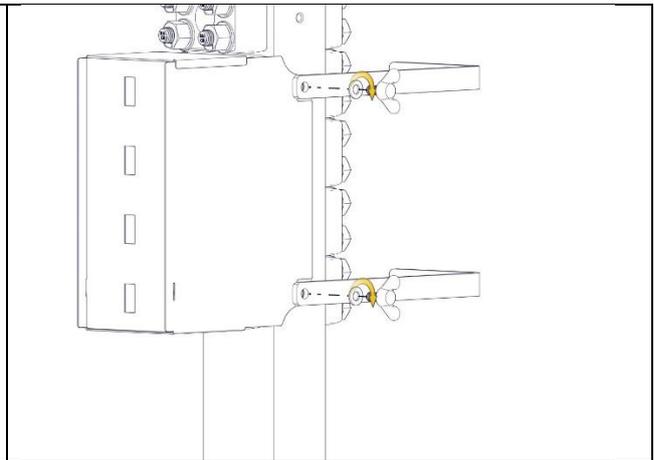


Fig. 2

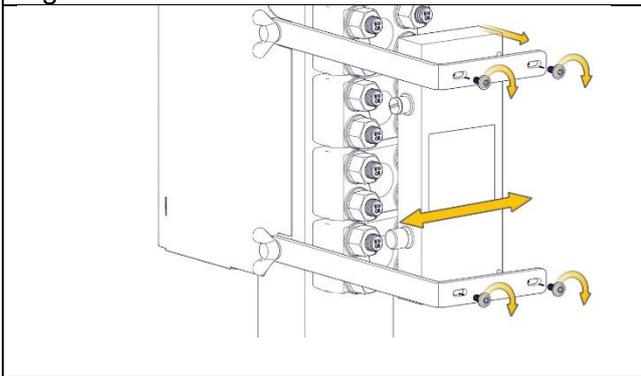


Fig. 3

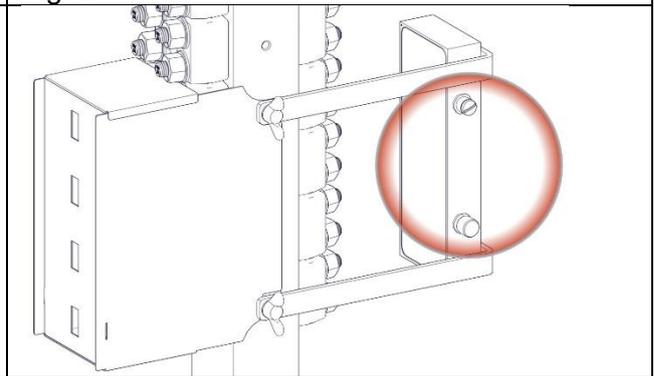


Fig. 4

## 7.6 Insulation

The indicator must not be insulated.

If the indicator will be insulated, this is at your own risk.

IGEMA GmbH does not accept any liability for damage caused by the insulation of the indicator and its components.

In principle, care must be taken that electrical components are not insulated and must not be exposed to any head build-up.

## 8 Commissioning



*Danger*

Commissioning and maintenance must be carried out by qualified personnel! If no sufficiently qualified person can be employed, IGEMA GmbH can be commissioned to carry out the commissioning. In principle IGEMA GmbH recommends commissioning the indicator at the same time as the boiler (item 8.2). If it is not possible to commission the indicator according to item 8.2, the indicator can be commissioned with the boiler under pressure and temperature (item 8.3)

All liquid level gauges are subjected to 100% pressure testing before delivery. In individual cases, material settling may occur during transport, longer storage or during assembly. All screw connections must therefore be checked for tight fit and appropriate torque (see following text).

### 8.1 Before commissioning

Before commissioning, the indicator must be checked for damage and all screw connections must be checked for tightening torque  $Md_{max}$  according to the table (see item 9.5)!

The union nuts of the valves must be tightened so that no leakage occurs at the spindle and the handwheel / hand lever can still be turned.



*Information*

#### **Note!**

**After commissioning, slight leaks can occur in the valves, but these will reappear after a short time due to temperature and pressure.**

## 8.2 Commissioning of the indicator at the same time as the boiler



*Caution!*

First make sure that the drain valve (4) is closed. Then open the shut-off valves (2, 3) to the stop. The boiler can now be commissioned with the indicator. After commissioning the indicator must be checked for function and leakage. The specified torques and the described tightening sequence (item 9.5) apply.

## 8.3 Commissioning of the indicator, when the boiler is under pressure



*Caution hot!*

The shut-off valves (2, 3) must be closed and the drain valve (4) needs to be fully open. Next, slowly and carefully open the upper shut-off valve (2) a little so that the glasses and its sealing will be carefully heated with steam, until the operating temperature has been reached. This takes about 5-10 minutes. Afterwards close the upper shut-off valve. Next, close the drain valve (4). Now the upper shut-off valve (2) can be opened slowly until it stops. Next, the lower shut-off valve (3) must be opened slightly (lever approx. 5min position), so that the ball in the valve cannot obstruct the valve passage. After pressure equalization, open the lower shut-off valve (3) until it stops. Wait for the water level to be adjusted and then check the indicator for leakage.

## 9 Maintenance

It is assumed that the person charged with the maintenance tasks is fully conversant with measurement and control systems. Untrained persons must not carry out maintenance work!

If there is no adequately qualified person available, IGEMA GmbH can be brought in to service your measurement and control system.

**When replacing components, it must be ensured that only original IGEMA GmbH parts are used.**

**Any warranty is void if components from other manufacturers are used.**

### 9.1 Preventive Maintenance

The following points should be observed to maximize gauge life:

Proper cleaning and maintenance of level gauges in steam service is vital for enhanced performance and service life. The gaskets and mica shields shall always be replaced during maintenance, even if they appear to be in perfect condition. Gaskets relax and can harden over time while defects in mica (i.e., chips or scratches) become points of high stress concentration. Even with no visible defects, a used glass has surface stresses induced from the original assembly and pressurization of the gauge. If reassembled, the gaskets and sealing surfaces will apply new stresses, which are likely to break the mica either during assembly or when the gauge is pressurized.

Therefore, new mica is always required. The gauge glass must be kept clean to ensure the visible water level in the chamber accurately represents the water level in the boiler.

The user must determine upon evaluation of his or her own operating experience an appropriate maintenance schedule necessary for the specific application. Note that the frequency and method of blow-down/purging may affect service life and performance of glass level gauges. Realistic maintenance schedules can only be determined with full knowledge of the services and application situation involved.

## 9.2 Leakages

The effect of heat on the bolts, screws and nuts can cause leakage.

- In case of leakage, close upper and lower shutoff valve (2, 3) and slowly open drain valve (4) a little.
- Fully open drain valve if noise of escaping pressure is no longer audible.
- Tighten cover screws (13) in several steps using successively opposite diagonal tightening from top to bottom (see table item 9.5) until tightening torque **Md<sub>max</sub>** is reached.

Replace sealing if necessary and check sealing surface.



*Danger*

**Severe burns and scalding's on the whole body are possible!**

**Before replacing the sealings, level gauge must be pressure less and empty!**

## 9.3 Cleaning and purging of level gauge



*Caution hot!*

**Close top and bottom shutoff valves (D1, W1).**

**Open drain valve (4), unit will empty; this normally signifies that cleaning is completed.**

**Put the device into operation as described under item 8.**

**If cleaning was not sufficient:**

- Close upper and lower shutoff device (D2, W2).
- Open upper and lower shutoff device (D1, W1) and drain valve (4). Slowly open upper shutoff device (D2). The steam flowing through the unit cleans the mica shields.
- Close upper shutoff device (D2) and drain valve (4) again.
- For commissioning, see item 8.

**Spares kits and product numbers are listed in item 13 Spare Parts and Accessories.**

## 9.4 Exchange of glasses and mica shields

**As soon as the cover rails are loosened, new glasses, mica panes and seals must always be installed!**

For safety and for full use of the indicator, the glasses, mica and seals must be replaced annually. Without the annual replacement, IGEMA will not accept any warranty if this causes damage to the sealing surfaces of the indicator body.



**Attention! Disassembly only in cold condition!**

*Caution hot!*

- Close shutoff devices (D1, D2, W1, W2).
- Open drain valve (4). Unit is drained.
- Remove nuts (16) of cover screws (13) and remove cover (14).
- Remove sealing ring (8), mica packet (9), ring gasket (10), glass (11) and ring gasket (12).
- Completely remove sealing residues.
- Clean sealing surface of indicator body and supporting surface of cover.

## 9.5 Assembly

**Place mica packets (surface with mark “Wasserseite” (“Water side”) towards the medium!  
Insert the glasses that marking is readable from the outside!**

- Cover screw with grease (13) use only suitable lubricant.
- For installation order see cross section of level gauge.
- Tighten cover screws (13) in several steps using successively opposite diagonal tightening from top to bottom (see table item 9.6) until tightening torque **Md<sub>max</sub>** is reached.
- Fitting the lighting equipment
- For commissioning, see item 8.
- Check for leakage and retighten screw connections if necessary!

## 9.6 Tightening torques

Working pressure <b>PS</b> [bar]	Material		Tightening torque Md → <b>Md<sub>max</sub></b> [Nm] in steps					
	Bolt	Nut	1	2	3	4	5	6
200	GB	GA	35	55	75	90	<b>105</b>	-
200	B16	7	35	55	75	95	115	<b>130</b>
200	GC	GC	40	60	80	100	120	<b>135</b>
200	B7	2H	40	60	80	100	120	<b>135</b>

## 10 Shutoff valve

### Type marking:

A	2	20, 40
Shutoff valve	Number of shutoff possibilities	Serial no.

### 10.1 General information and operating instructions

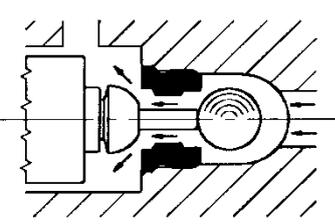
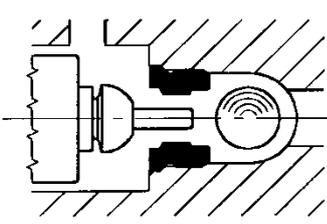
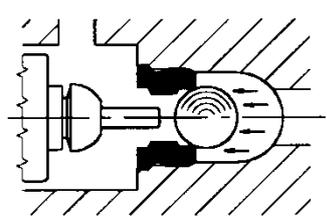
IGEMA shutoff valves are mostly maintenance-free and easy to handle. All IGEMA valves are equipped with metal gaskets, the valve spindles are sealed with a gland packing. The shutoff valve versions go from simple shutoff (designation A1--) to double shutoff (designation A2--). All main valve spindles are equipped with a quick closure function that ensures that the valve can be opened or closed with a  $\frac{1}{3}$  turn.

### 10.2 Functional principle

Handle/handwheel rotated clockwise: shutoff valve is closed.  
 Handle/handwheel rotated anticlockwise: shutoff valve is opened.  
**Tools to increase hand torque are not permitted.**

### 10.3 Self-closing ball safety function

All IGEMA GmbH shutoff valves are equipped with a self-closing ball function. The self-closing ball is a safety device which automatically closes valve passage of shutoff valve if e.g. level gauge is damaged (e.g. mica break).

Fig.1	Fig.2	Fig. 3
		
<i>Ball position during commissioning or flushing / purging</i>	<i>Ball position during normal operation</i>	<i>Ball position during glass/mica break or incorrect commissioning</i>

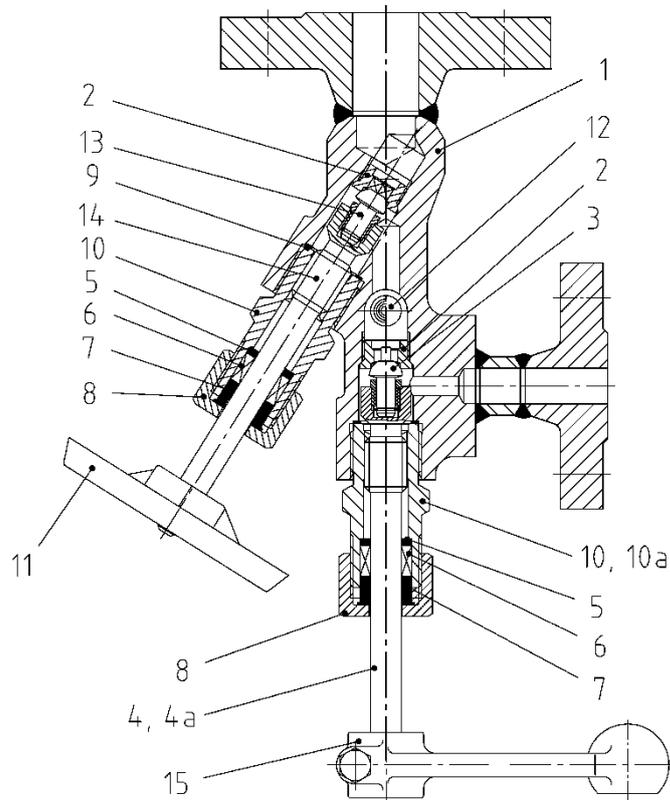


*Attention*

**Functioning of self-closing ball is only guaranteed if valve is fully opened. Residues (dirt, welding beads etc.) can put self-closing ball out of action.**

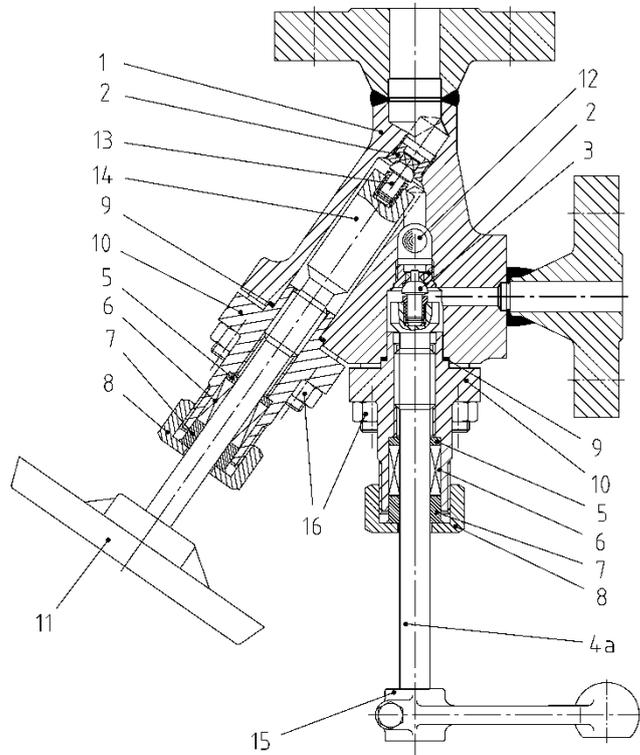
**A220**

- Lateral connection flange
- Straight valve part always with self-closing ball and hand lever
- Lateral valve part always with handwheel
- On request: straight valve part with quick closing spindle



**A240**

- Lateral connection flange
- Straight valve part always with self-closing ball, hand lever and quick-closing spindle
- Lateral valve part always with handwheel



1	Valve housing	9	Sealing ring
2	Seat	10	Upper part
3	Cone set with stud	10a	Upper part (quick closing)
4	Valve spindle	11	Handwheel
4a	Quick closing / valve spindle	12	Ball
5	Base ring	13	Cone set without stud
6	Gland packing	14	Valve spindle (inclined part)
7	Stuffing box	15	Hand lever
8	Screw cap	16	Hexagon nut

## 10.5 Commissioning



*Danger*

**Before every commissioning, re-commissioning, repair or conversion, ensure proper completion of all installation/assembly works and that valve has the correct functioning position.**

**Check specifications of material, pressure and temperature!**

- Open shutoff device of valve without self-closing ball on steam and water holding boiler studs counterclockwisely as far as it will go (backseat).
- Slightly open shutoff device of valve with self-closing ball on steam and water holding boiler studs counterclockwisely to prevent that ball closes valve passage (see fig. 1). Fully open spindle after accomplished pressure balance (backseat).
- Compare function of level gauge and water level height with the other safety fittings.



**Carry out maintenance works and disassembly only if boiler and level gauge are empty and pressure less.**

*Danger*



**Observe that lubricant is suitable for medium and operating temperature. Keep spindle thread always greased.**

*Caution*

### **Leakages on spindle (4, 4a, 14)/gland packing (6)**

- Re-tighten screw cap (8) gradually.  
Life of valve can be increased by regular control on tightness.

### **Replacement of seat (2), cone set (3, 13) and cone (12)**

- Screw out upper part of valve (10, 10a) with valve spindle (4, 4a, 14) and remove from valve housing (1).
- Unfasten screw cap (8) and remove valve spindle (4, 4a, 14) from upper part of valve (10, 10a).
- Remove and replace cone set (3, 13).
- Screw out seat (2) with socket wrench (AF10).
- Remove ball (12), check and replace if necessary.
- Grease thread of new seat (2) and screw in.  
Tightening torque **Md= 70 Nm**
- For assembly see item 9.4.

### **Replacement of packing set [base ring (5), gland packing (6), stuffing box (7)]**

- Screw out upper part of valve (10, 10a) with valve spindle (4, 4a, 14) and remove from valve housing (1).
- Unfasten handwheel (11) / hand lever (15).
- Unfasten screw cap (8) and screw out valve spindle (4, 4a, 14) from upper part of valve (10, 10a).
- Push out packing set (5, 6, 7).
- Carefully remove deposits on valve spindle (4, 4a, 14).
- For assembly see item 9.4.

## 10.7 Assembly

1. Grease thread of valve spindle (4, 4a, 14) and screw in valve spindle in upper part of valve (10, 10a) as far as it will go.
2. Insert base ring (5), gland packing (6) and stuffing box (7).
3. Screw on screw cap (8) and tighten gradually.  
- *spindle must stay movable* -
4. Screw in complete upper part of valve (10, 10a) with new sealing ring (9) into valve housing (1) with tightening torque  **$M_d \text{ max} = 280 \text{ Nm}$**  or for valves A240 with hex nuts (16) and tightening torque  **$M_d \text{ max} = 65 \text{ Nm}$** .
5. Fix handwheel (11) / hand lever (15).
6. Close shutoff device.

## 11 Drain valve

### 11.1 Information



*Attention*

The drain piping to the drain valve must ensure that no leakage of the medium into the atmosphere is possible and must be protected from pressure surges.

If the drain valve is equipped with a Ø12 cutting ring screw, the Ø12x1 pipe (from material 35.8) must be mounted as per DIN 2353. With a welding end only welding processes 111 and 141 are permitted.

### 11.2 Functional principle

Handwheel rotated clockwise: drain valve is closed.

Handwheel rotated anticlockwise: drain valve is opened.

**Tools to increase hand torque are not permitted.**



*Information*

Spare parts and further information can be found in the product-specific assembly and operating instructions or in the data sheet.

### 11.3 Assembly



*Danger*

The drain line to the drain valve must ensure that no free escape of the medium into the atmosphere is possible and must be secured against pressure surges.

### 11.4 Commissioning

Rust, sand or similar impurities inside of the medium or during first flushing can cause leakage if they remain in the area of the seat.

#### **Purging of valve:**

- Fully open valve for purging. The pre-pressed gland packing can lose its denseness due to a longer storage (see chapter 11.4).
- Close valve.



**Dismantle only when the level indicator is depressurised and empty.**

*Danger*

In case of defects and leaks, the complete drain valve must be replaced!

### Exchanging of the valve



**The exchanging of the valve may only be carried out by specialists!**

*Caution*



Loosen the pipe screw connection from the drain valve and pull off the pipe. Unscrew the shut-off valve from the transparent level gauge. Screw a new drain valve with a new seal (supplied with shut-off valve) into the transparent level gauge, paying attention to the position of the handwheel. Screw the pipeline onto the shut-off valve. Check for leaks, tighten screw connections if necessary.



**Spare parts and further information can be found in the product-specific assembly and operating instructions or in the data sheet.**

*Information*

## 12 Case of damage



**Provide security in the danger zone.**

**Severe burns and scalding's on the whole body are possible!**

*Danger*

- Check if no further steam escapes at the damaged place.
- **Set boiler pressure less!**

Close valves as follows:

- 1 Close shutoff device without self-closing ball on steam and water holding stud.
- 2 Close shutoff devices with self-closing ball on steam and water holding stud.
- 3 Slowly open drain valve. Level gauge becomes pressure less and water is drained.
- 4 For commissioning with new spare parts see item 10.3.

## 13 Spare parts

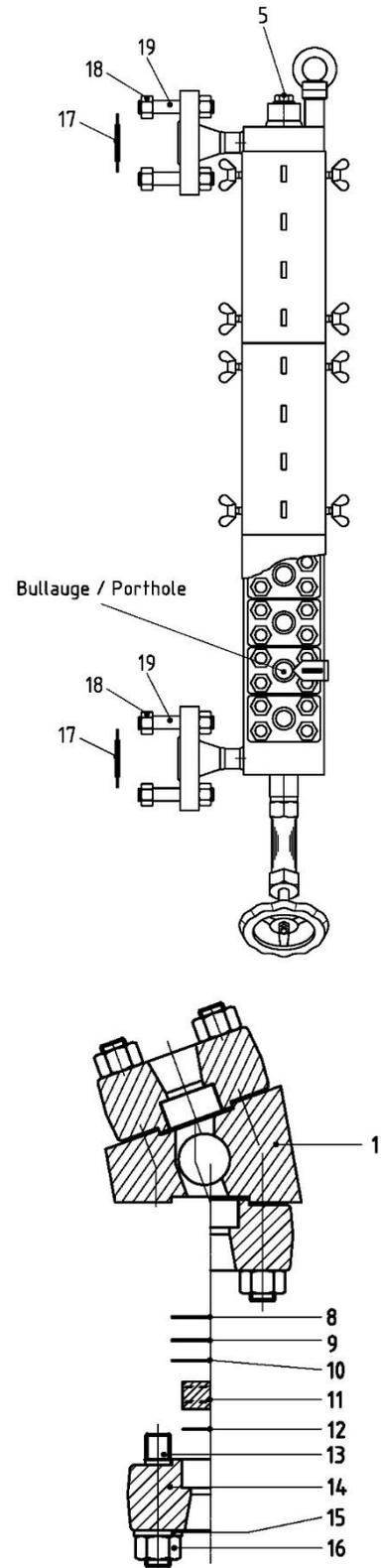
Always indicate article no. and serial no. (indicated on the identification plate) in case of spare parts order!

### 13.1 Bicolour level gauge

n = quantity of portholes

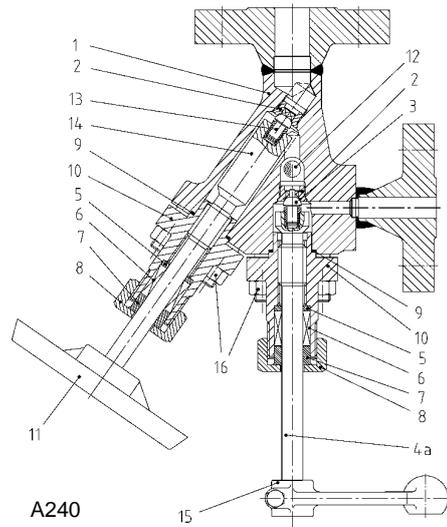
Pos. no.	Designation	Max. allowable pressure PS [bar]	Article no.	Quantity	
8	Sealing ring	32-200 (DIN, ASME)	40-00136	2xn	
10	Ring gasket		40-00205		
11	Glass		40-00042		
12	Ring gasket		40-00155		
13	Cover screw		40-01064		8xn
14	Cover		25-01103		2xn
15	Washer		40-00667		8xn
16	Hexagon nut		40-00721		
5	Plug		40-00329		
	Sealing ring		40-00099		1
9	Mica packet	32-100 (DIN, ASME)	40-00988	2xn	
		160-200 (DIN, ASME)	40-00989		

Pos. no.	Designation	DIN 2690 DIN 2697 ASME B16.5	Article-no.	Quantity
17	Sealing ring	PN 40	40-00156	2
	Serrated gasket	PN 63-100	40-00206	
		PN 160-320	40-00207	
		Class 300-600	40-01536	
		Class 900-1500	40-01591	
		Class 2500	40-01664	
18	Hexagon nut	PN 40-160	40-00583	16
		PN 250-320	40-00723	
		Class 300-600	40-00741	
		Class 900-2500	40-01471	
19	Threaded bolt	PN 40	40-00350	8
		PN 63-160	40-00352	
		PN 250-320	40-00381	
		Class 300	40-01713	
		Class 400-600	40-01540	
		Class 900-1500	40-01467	
	Class 2500	40-01686		



### 13.2 Shutoff valve

Pos. no.	Designation	Article no.	
		A220	A240
2	Seat	15-00115	
3	Cone set with stud		
12	Ball		
2	Seat	15-00114	
13	Cone set without stud		
4	Valve spindle	25-00126	
4a	Quick closing valve spindle	25-00553	25-00654
14	Valve spindle (inclined part)	25-00652	25-00653
9	Sealing ring	40-00117	40-00119
5	Base ring	15-00113	15-00112
6	Gland packing		
7	Stuffing box		
8	Screw cap	25-00008	25-00662
11	Complete handwheel	15-00237	15-00419
15	Complete hand lever	15-00338	15-00324
16	Hexagon nut		40-00583



### 13.3 Drain valve

Pos. no.	Designation	Max. all. pressure PS [bar]	Article-no.
-	Drain valve AV250 with cutting ring screw connection	250	15-16613



## 14 Decommissioning



*Danger*

**Severe burns and scalding's on the whole body are possible!**

**Before detaching flange connections, screws of stuffing box cover screws or screw plugs, all connected lines must be pressure less (0 bar) and cooled off to ambient temperature (20°C)!**

### 14.1 Disposal

Dismount unit and separate waste products.

When disposing the unit, observe legal regulations for waste disposal.



This high-quality IGEMA product was designed, manufactured and tested in accordance with the QM system requirements of DIN EN ISO 9001:2015.

Should the delivered device show transport damages or should there be any complaints despite our final quality control, please contact our SERVICE department immediately under the phone number

+49 2501 92424-0.



## Herstellereklärung Manufacturer's Declaration

### Zur EU-Richtlinie 2014/68/EU

Die Firma:  
IGEMA GmbH  
Antwerpener Str. 1  
48163 Münster, Deutschland

erklärt, dass die  
Füllstand-Direktanzeiger /  
2-Farbenanzeiger  
Grün-Rot LS  
Grün-Rot BU  
Schwarz-Weiß

mit der Richtlinie übereinstimmen und  
auf Grund des geringen Druck-  
Volumen-Verhältnisses von  $p^*V < 50$ ,  
bei einem Fluid der Gruppe 2, nach  
Art. 4 Abs.3 ausgelegt wurden.

Angewandte Normen:  
DIN EN 13445

Weitere berücksichtigte Regelwerke:  
AD2000

Als Anlagenkomponente für Groß-  
wasserraumkessel / Wasserrohrkessel  
erfüllt das Produkt ebenfalls die  
Normen:

DIN EN 12952-7  
DIN EN 13953-6

Zertifiziertes  
Qualitätsmanagementsystem nach  
ISO9001:2015

Münster, 14.10.2020

  
E.H. Kilchert  
(Geschäftsführer)  
(Managing Director)

### Regarding EU-Directive 2014/68/EU

The company:  
IGEMA GmbH  
Antwerpener Str. 1  
48163 Münster, Germany

declares that the  
Direct Level Gauges / Bicolour level  
gauge  
LS green-red  
BU green-red  
Black-white

comply with the directive and, due to the  
small pressure-volume ratio of  
 $p^*V < 50$ , with a fluid of group 2, were  
designed in accordance with art. 4  
para. 3.

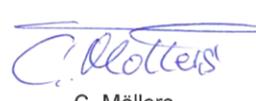
Applied standards:  
DIN EN 13445

Additional considered technical rules:  
AD2000

As a system for shell boilers / water-  
tube boilers, the product also meets the  
requirements of the standards:

DIN EN 12952-7  
DIN EN 13953-6

Certified Qualitymanagementsystem as  
per ISO9001:2015

  
C. Möllers  
(Leitung Konstruktion)  
(Head of construction)

IGEMA GmbH - Antwerpener Str. 1 - D-48163 Münster - Tel: +49(0)2501/92424-0 Fax: +49(0)2501/92424-99 - info@igema.com - www.igema.com

**BOILER MONITORING HEAT & STEAM TECHNOLOGY**











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*Productpage on the internet*



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