

<b>USER MANUAL</b>		
<b>LIQUID LEVEL GAUGE WITH A TUBE zGAU</b>	<b>708</b>	<b>Edition: 1/2019 Date: 08.10.2019</b>

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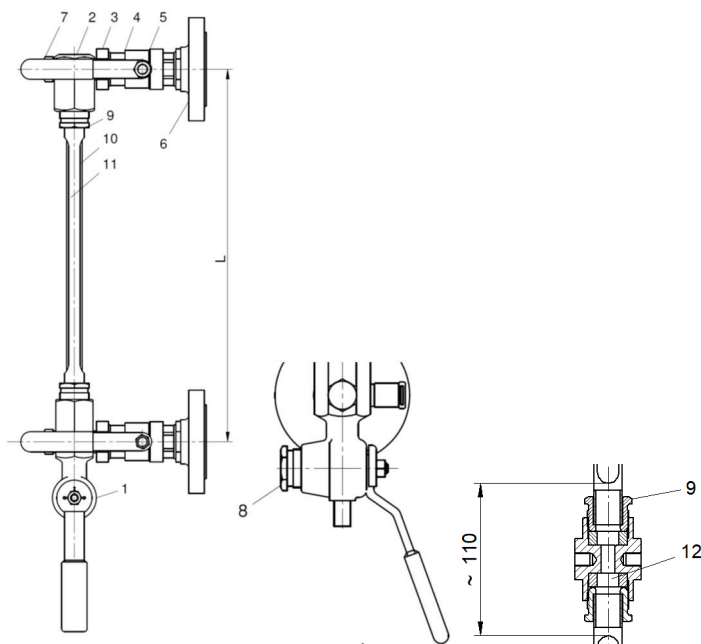
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### 1. PRODUCT DESCRIPTION

Liquid level gauges are used to indicate the level of the liquid in pressure vessels with the following operation parameters:

- **liquid level gauge** 708 with glass tube PN 16 max. temperature 200°C
- **liquid level gauge** 708 with Plexi tube PN 16 max. temperature 120°C

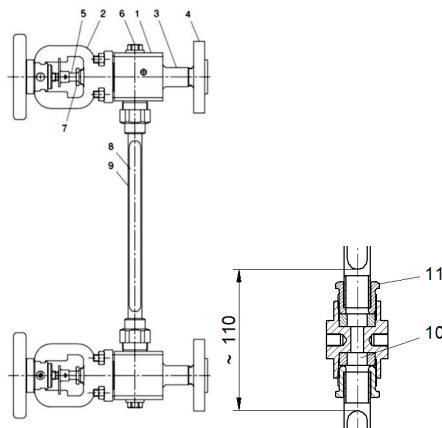
Test and working pressure according to the relevant standards.



Type 6..., 7.... (with flange head 708.2)

	Body material	N		M
		Type with 708.2 head		70, 71, 72, 73, 74, 75
1	Drain cock housing	S275JR 1.044		X5CrNi18-10 1.4301
2	Upper gland connector	11SMn30 1.0715		X6CrNiTi18-10 1.4541
3	Valve nut	X20Cr13 1.4021		X6CrNiTi18-10 1.4541
4	3/4" ball valve / gland valve	316	316 / S235JR 1.0037	316
5	Pipe	S235JR 1.0037		X6CrNiTi18-10 1.4541
6	Flange	Carbon steel		Acid-resistant steel
7	Screw	11SMn30 1.0715		X6CrNiTi18-10 1.4541
8	Bolt	11SMn30 1.0715		X6CrNiTi18-10 1.4541
9	Nut	11SMn30 1.0715		X6CrNiTi18-10 1.4541
10	Tube	glass, Plexi		
11	Tube cover	E235		X5CrNi18-10 1.4301
12	Tube connector in cover	X20Cr13 1.4021		X6CrNiTi18-10 1.4541
<b>Temperature range</b>		<b>120°C</b>		<b>150°C*</b>

For types with gland valve max temperature = 200°C



Type 8... (with flange head 708.1)

	Body material	N		M
		Type with 708.1 head		80, 81, 82, 83, 84, 85
1	Head of liquid level gauge	S235JR 1.0037		X6CrNiTi18-10 1.4541
2	Cover	GP240GH 1.0619		GX5CrNi19-10 1.4308
3	Pipe	S235JR 1.0037		X6CrNiTi18-10 1.4541
4	Flange	Carbon steel		Acid-resistant steel
5	Pin	X20Cr13 1.4021		X6CrNiTi18-10 1.4541
6	1/2" plug	Carbon steel		316 1.4401
7	Gland	11SmN30 1.0715		X6CrNiTi18-10 1.4541
8	Tube	Glass, Plexi		
9	Tube cover	E235		X5CrNi18-10 1.4301
10	Tube connector in cover	X20Cr13 1.4021		X6CrNiTi18-10 1.4541
11	Nut	11SMn30 1.0715		X6CrNiTi18-10 1.4541
<b>Temperature range</b>		<b>200°C*</b>		

\* For Plexi tubes max. temperature is 120°C

**CONNECTIONS:**

**Flange:**




- DN15 – DN50 acc. to EN 1092-1, DN15 – DN50 ANSI #150, 300, 600  
Other connection flanges after consultation with the manufacturer

**Threaded:**

G½”, G¾”, G1”, NPT½”, NPT¾”, NPT1”  
Other threaded connections after consultation with the manufacturer

**To be welded:**

To be agreed with the manufacturer

		
types 60, 61, 70, 71, 80, 81	types 62, 63, 72, 73, 82, 83	types 64, 65, 74, 75, 84, 85
Version with flange connections	Version with threaded connections	Version with welding connection

**2. REQUIREMENTS FOR MAINTENANCE STAFF**

The staff assigned to assembly, operating and maintenance tasks should be qualified to carry out such jobs.









**3. TRANSPORT AND STORAGE**

Transport and storage should be carried out at temperature from –20° to 65°C, and the liquid level gauges should be protected against external forces influence and destruction of paint/zinc coating (depending on type). The paint / zinc coating is intended to protect the gauges against corrosion during transport and storage. The liquid level gauges should be kept at unpolluted rooms and they should be also protected against influence of atmospheric conditions. There should be applied drying agent or heating at damp rooms in order to prevent condensate formation.

The outer surfaces of the liquid level gauge are painted to protect them against corrosion during transport and storage.

 **Liquid level gauges should be transported and stored in such a way as not to damage the glass tube.**

**4. APPLICATION**

industries				
	INDUSTRY	MARINE INDUSTRY	PETROCHEMIST RY	HEATING
media				
	TAP WATER	SEWAGE	GLYCOL	PROCESS WATER

The liquid level gauge fig. 708 can serve as a boiler liquid level gauge up to a temperature of 150°C

The working medium determines the possibility of using certain materials. Liquid level gauges are designed for normal conditions of use. In case of operating conditions exceeding these requirements, such as in case of aggressive or abrasive agents, the user should contact the manufacturer before ordering.

The operating pressure should be adjusted to the maximum medium temperature according to the table below.

	PN		-10°C	RT	50°C	100°C	150°C	200°C
S235JR	16	bar	16	16	16	16	16	16
S275JR			16	16	16	16	16	16
X6CrNiTi18-10			16	16	16	16	16	16

## 5. INSTALLATION

Before installing the liquid level gauge on a device, verify that the liquid level gauge has not been damaged during transport and that the glass has not been broken. Liquid level gauges must be installed on a device to rigid or additionally tightened ferrules to secure liquid level gauge against the possible self-disassembly under pressure. Sample solution for tightening has been shown in figures 2 and 3.

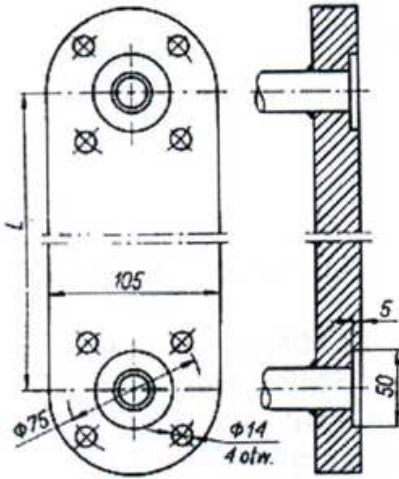


Fig. 2. Boiler ferrules setting

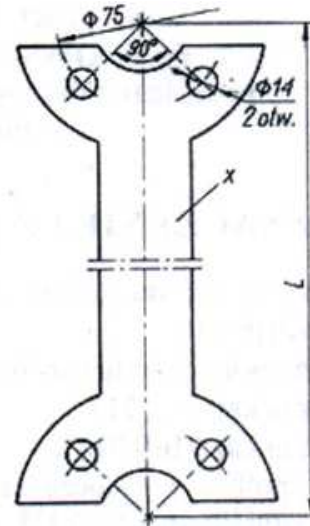


Fig. 3. Tightening of liquid level indicator's heads

When mounting a liquid level gauge on the device, you must:

Screw the flanges of liquid level gauge's heads (threaded screw connections) to the ferrules of the device using flat gaskets. The seal of the threaded connection depends on the conditions of use and medium (Teflon tape, glue, ...). The first step is to screw (weld) the flange (screw connection) of the bottom head and then move the top head to the required dimension and screw (weld) to the connection ferrules.

Liquid level gauges 708 must be mounted in a vertical position

On the tube (tube cover) a user should select the minimum and maximum level (unless equipped with a level gauge at the factory).

When using glass tube heads, the tube should be protected against mechanical damage. An example of protection is shown in Figure 4. The length of the tube should be determined according to the following formula:

Axis spacing – 28mm = tube length (for types 6..., 7...)

Axis spacing – 60mm = tube length (for type 8...)



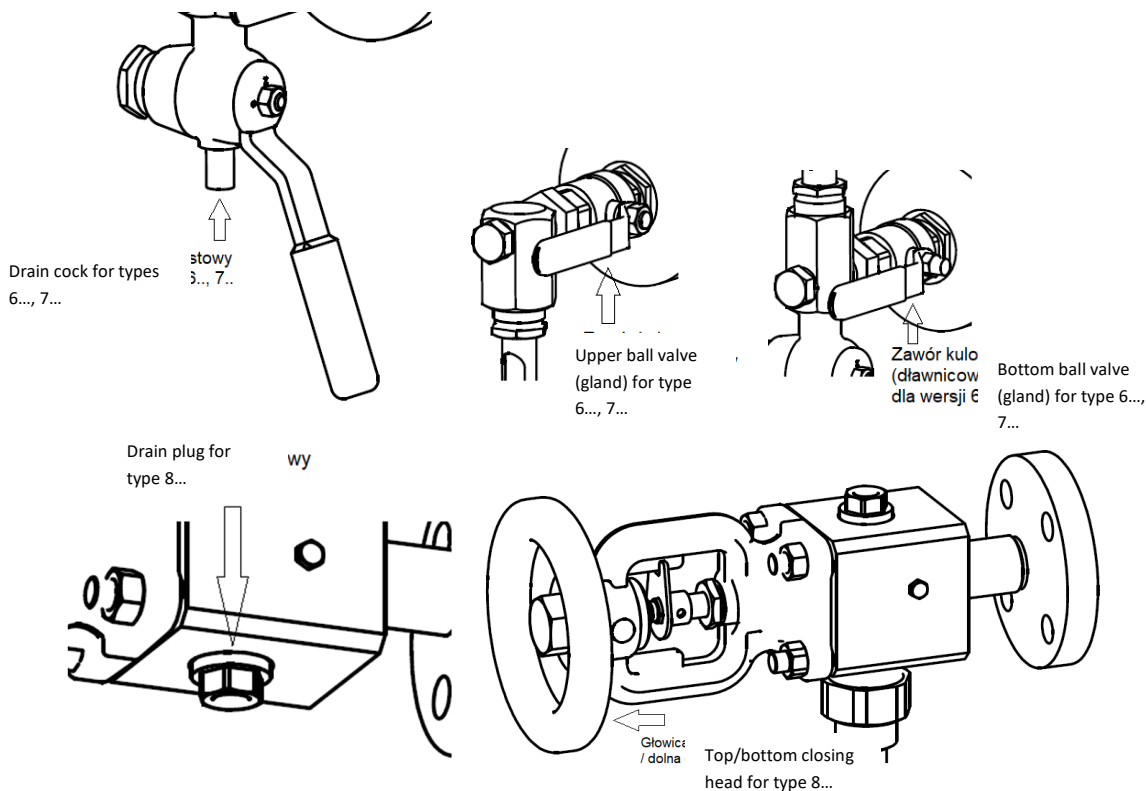
Fig. 4. Protection of glass tube

## 6. COMMISSIONING

During boiler's commissioning, with open liquid level gauge's heads, the pressure and temperature rise slowly and there is no danger of thermal shock which could affect the glass. However, the rapid increase in liquid level gauge's temperature can cause shortened glass operation or its breaking.

When restarting the liquid level gauge, after removing it from the working boiler first (e.g. to replace the tube) there is a danger of a sharp temperature rise in the liquid level gauge. To avoid this, you must adhere to the following recommendations:

Close the bottom ball valve (head)<sup>1</sup>, open the drain cock (drain plug for type 8...), and then open slightly the upper ball valve (head)<sup>1</sup> in such a way as to clearly see the condensate stream flowing along the tube glass. After a period of about 50 min. all liquid level gauge elements should reach the operating temperature.

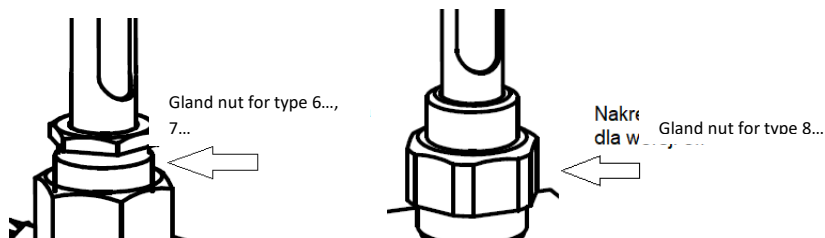


Close the drain cock (or screw the plug). The liquid level gauge will start to fill with the condensate.

Open the upper ball valve (head) fully<sup>2</sup>.

Open the lower ball valve (head) fully<sup>1</sup>.

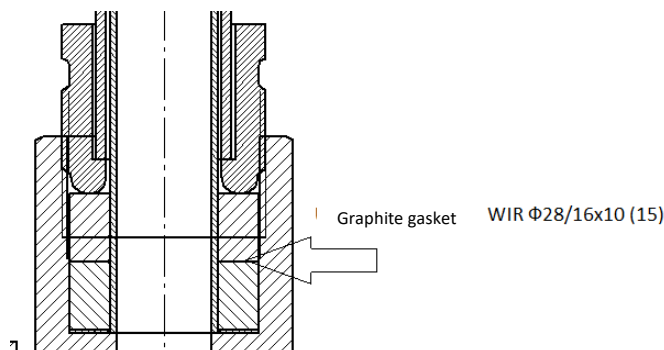
During slow heating, the seals are affected by temperature and may slightly change their dimensions. If there are leaks after starting the liquid level gauge, tighten with a torque wrench all bolts, nuts or screws in places of leakage. Before tightening the packing nut, first open and close the heads several times with a wrench. This sealing should be carried out with the heads closed and the drain cock/plug open.



<sup>1</sup> Depending on ordered option

<sup>2</sup> Depending on ordered option

In the event of leaks during operation, seal the connections as in the previous paragraph. If the leaks cannot be eliminated - replace the gasket.



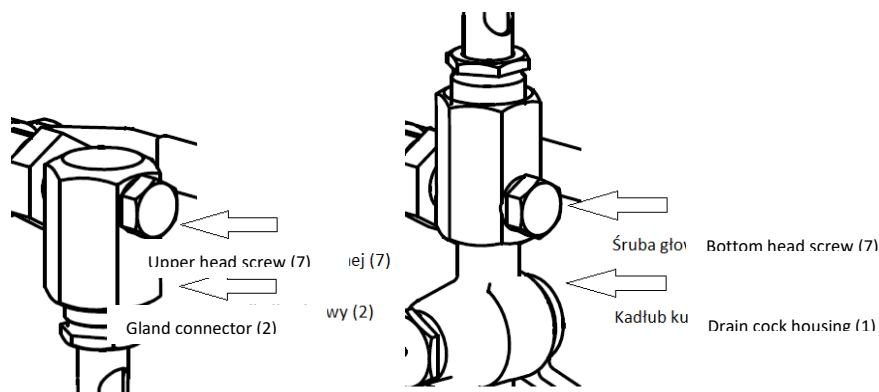
During longer standstill, the liquid level gauge should be dewatered. This means that you must close the lower and upper ball valves (heads)<sup>3</sup>, and open the drain tap/plug. The „O” for open and „Z” for closed are marked on the tap gauge.

## 7. SERVICE AND REPAIR

### GLASS TUBE REPLACEMENT

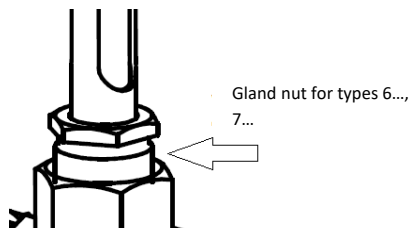
#### For types 6..., 7...

Before replacing the glass tube, you must close the heads of the liquid level gauge and open the drain cock. To replace the glass, unscrew the screw (7) in the top and bottom heads and then slide the glass (Plexiglas) tube off the heads along with the gland connector (2) and the drain cock housing (1).



### GLASS TUBE REPLACEMENT

Loosen the packing nuts (16) and extend the glass tube with its cover.



Install a new tube and gland packing, pre-seal the connection with packing nuts, and then slide the gland connectors (2) with the glass (Plexiglas) tube onto the heads. Screw in the screws (7) with gaskets (2 pcs.  $\Phi 22 \times 18 \times 2,5$  each) in the upper and bottom head.

In the case of a glass tube (Plexiglas) with a cover, the above operations must be carried out taking into account the cover.

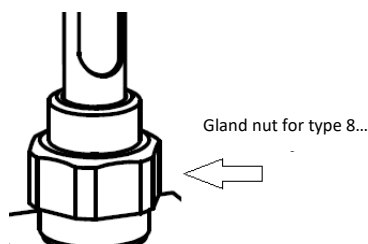
<sup>3</sup> Depending on ordered option

### **For type 8...**

Before replacing the tube glass, close the liquid level gauge heads and open the drain cock (unscrew the plug). To replace the tube, unscrew the packing nut in the upper and lower heads, and then slide the glass (Plexiglas) tube off along with the cover.



**To replace the tube, remove the liquid level gauge from the tank.**



### **TUBE REPLACEMENT**

Loosen the packing nuts and extend the glass (Plexiglas) tube with the cover.

Install a new tube and gland packing, pre-seal the connection with packing nuts, then insert the glass tube (Plexiglas).



**In the case of a glass tube (Plexiglas) with a cover, the above operations must be carried out taking into account the cover.**

After completing the above actions, all connections should be sealed and the liquid level gauge must be restarted in accordance with point 6.

### **CHECKING PATENCY OF CHANNELS**

Due to the possibility of scale deposits or other impurities coming from the medium or from the installation in the liquid level gauge channels, their patency should be checked. The frequency of this activity depends on the operating conditions and should meet regulatory requirements.

To check the patency of the channels, the liquid level gauge should be blown. Blowing is carried out for each head separately, by closing one head to blow the other, with the drain cock open.

### **For types 6..., 7...**

If it is necessary to unblock the channels:

- Close the bottom head closing gate.
- Unscrew the fixing screw (7) from the bottom head, insert a rod up to 8 mm in diameter into the channel, set the closing gate in the open position.
- Pierce the channel, then remove the rod and close the closing gate.
- Screw in the fixing screw (7).

The above operation should be repeated for the upper head.

Due to carrying out the above mentioned operations under pressure, extreme caution should be exercised, and the person performing them should be trained and protected against possible burns (in the case of hot agents). After cleaning the heads, clean the glass tube (Plexiglas) as well. To clean it, close the gates of both heads, open the drain cock closing gate and insert the rod into the hole of the cock, carefully clean the tube.

### **For type 8...**

If it is necessary to unblock the channels:

- Close the inflow of the agent to the liquid level gauge (it is best to carry out check of patency of the channels according to the tank inspection schedule - it is necessary to remove the liquid level gauge from the device)
- Remove the nuts securing the cover (2) with the head (1)
- Insert a rod up to 5 mm in diameter into the channel (or 8 mm after removing the screw inside the head)
- Pierce the channel and then remove the rod
- If the head screw is removed, it must be screwed in again when the gasket is replaced (according to the manufacturer's instructions)
- Screw the cover and the head back on again, remembering to replace the gasket between them

## 8. REASONS OF OPERATING DISTURBANCES AND REMEDY

Fault	Possible reason	Remedy
No flow	Closed ball / gland valves	Open the valves
	Flange caps have not been removed	Remove flange caps
Poor flow	Minimally opened ball / gland valves	Open the valves
	Scale in flow channels	Clean the flow channels as per point 7.2.
Leak at the tube	The connection after starting the liquid level gauge was not sealed	Tighten with a suitable wrench
	Gasket wear	Replace gaskets
Leak at the gland (for type 8....)	The connection after starting the liquid level gauge was not sealed	Tighten with a suitable wrench
	Gasket wear	Replace gaskets

## 9. DECOMMISSIONING

All obsolete and dismantled liquid level gauges must not be disposed with household waste. The liquid level gauges are made of materials which can be re used and should be delivered to designated recycling centres.

## 10. SPARE PARTS

Gasket between cover and liquid level gauge head: *Graphite gasket ECONOGRAPH 40x55x1*

Gland seal: *GRAFMET950 18x12x8*

Screw plug and drain plug sealing: *Gasket made of acid-resistant steel with graphite filling SPS  $\Phi 21 \times 26 \times 2,5$*

Sealing of the glass tube: *Graphite gasket WIR  $\Phi 28/16 \times 10$*

## 11. WARRANTY TERMS

ZETKAMA grants quality guarantees providing correct functioning of their products, provided that the assembly is performed in accordance with the user manual and operation in accordance with the technical conditions and specifications in the ZETKAMA catalogue cards. The warranty period is 18 months from the date of installation, but not longer than 24 months from the date of sale.

Warranty claim does not cover assembly of foreign parts and design changes done by user as well as pressure set changes and natural wear.

Immediately after detection the user should inform ZETKAMA about hidden defects of the product.

A claim should be prepared in written form.

Other warranty conditions require agreement between the manufacturer of the valve and the buyer.



**The manufacturer reserves the right to make technical changes as a result of improvements in the design and manufacturing technology.**

Non-compliance by the user of rules and instructions contained in this manual releases the manufacturer from all liability and the warranty.

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