

LIQUID LEVEL GAUGE FOR WELDING ZGAU

716 O&M, 717 O&M, 718 O&M, 719 O&M

Edition: 07/2016
Date: 01.07.2016



PA Ventiler AB

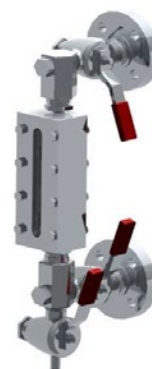
GO WITH OUR FLOW

SPIS TREŚCI

1. Introduction
2. Construction
3. Installation
4. Installation of liquid level gauge of more than 2000 mm
5. First run
6. Replacement of glasses
7. Checking for chokepoint of chamber
8. Final remarks
9. Warranty



716 type 06, 07, 08, 09



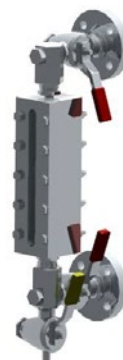
716 type 10,11,12,13,14,15,16,17



717 type 22,23,24,25



717 type 26,27,28,29,30,31,32,33



718 type 18,19,20,21



719 type 34,35,36,37,38,39

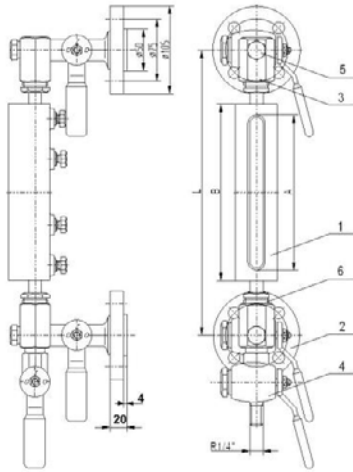
1. Introduction

Liquid level gauges are used to showing liquid level in pressure vessels at following work parameters:

- Liquid level gauges 716 type 06, 07, 08, 09 and 717 type 22,23,24,25 with flat glass 705, 25 bar, temp. max 150°C
- Liquid level gauges 716 type 10,11,12,13,14,15,16,17 and 717 type 26,27,28,29,30,31,32,33 with flat glass 705S/705SCrNi, 40 bar temp. max 250°C
- Liquid level gauges 718 type 18,19,20,21 and 719 type 34,35,36,37,38,39 with flat glass 704, 40 bar, temp. max 250°C

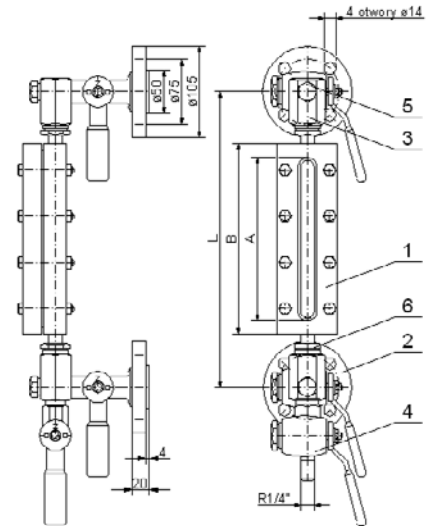
Test and working pressure according to the relevant standard regulations.

2. Construction



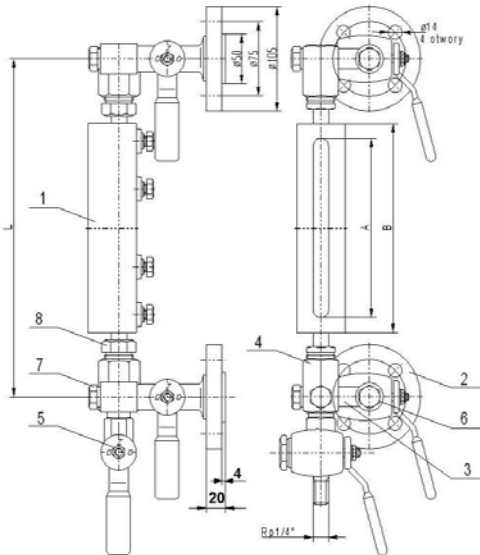
| Position No. | Name of detail | Materials |
|--------------|----------------------|-----------|
| 1 | Frame | P235 |
| 2 | Flange head | S275JR |
| 3 | Gland seal connector | 11SMn30 |
| 4 | Drain cock | S275JR |
| 5 | Screw | 11SMn30 |
| 6 | Nut | S235JR |

Drawing 1. Liquid level gauge 716
type 06, 07, 08, 09



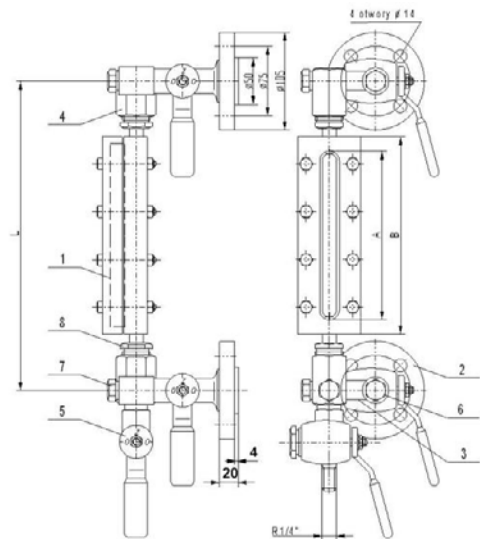
| Position No. | Name of detail | Materials | |
|--------------|----------------------|-----------|---------------|
| | | 716O | 716M |
| 1 | Frame | S275JR | X6CrNiTi18-10 |
| 2 | Flange head | S275JR | X6CrNiTi18-10 |
| 3 | Gland seal connector | 11SMn30 | X6CrNiTi18-10 |
| 4 | Drain cock | S275JR | X6CrNiTi18-10 |
| 5 | Screw | 11SMn30 | X6CrNiTi18-10 |
| 6 | Nut | S275JR | X6CrNiTi18-10 |

Drawing 2. Liquid level gauge 716
type 10,11,12,13,14,15,16,17



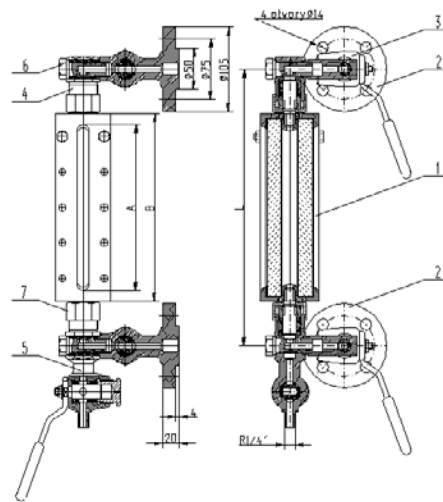
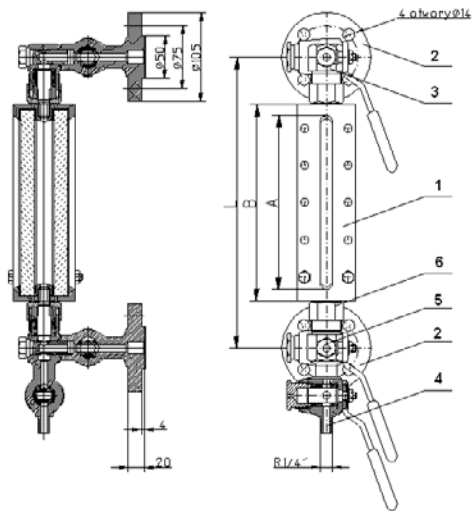
| Position No. | Name of detail | Materials |
|--------------|----------------------|-----------|
| 1 | Frame | P235 |
| 2 | Flange head | S275JR |
| 3 | Side connector | S275JR |
| 4 | Gland seal connector | 11SMn30 |
| 5 | Drain cock | S275JR |
| 6 | Screw | 11SMn30 |
| 7 | Connecting screw | 11SMn30 |
| 8 | Nut | S235JR |

Drawing 3. Liquid level gauge 717
type 22,23,24,25



| Position No. | Name of detail | Materials | |
|--------------|----------------------|-----------|---------------|
| | | 717O | 717M |
| 1 | Frame | S275JR | X6CrNiTi18-10 |
| 2 | Flange head | S275JR | X6CrNiTi18-10 |
| 3 | Side connector | S275JR | X6CrNiTi18-10 |
| 4 | Gland seal connector | 11SMn30 | X6CrNiTi18-10 |
| 5 | Drain cock | S275JR | X6CrNiTi18-10 |
| 6 | Screw | 11SMn30 | X6CrNiTi18-10 |
| 7 | Connecting screw | 11SMn30 | X6CrNiTi18-10 |
| 8 | Nut | S235JR | X6CrNiTi18-10 |

Drawing 4. Liquid level gauge 717
type 26,27,28,29,30,31,32,33



| Nr poz. | Nazwa detalu | Stosowane materiały | |
|---------|----------------------|---------------------|---------------|
| | | 718O | 718M |
| 1 | Frame | S275JR/C45 | X6CrNiTi18-10 |
| 2 | Flange head | S275JR | X6CrNiTi18-10 |
| 3 | Gland seal connector | 11SMn30 | X6CrNiTi18-10 |
| 4 | Drain cock | S275JR | X6CrNiTi18-10 |
| 5 | Screw | 11SMn30 | X6CrNiTi18-10 |
| 6 | Nut | S235JR | X6CrNiTi18-10 |

| Nr poz. | Nazwa detalu | Stosowane materiały | |
|---------|----------------------|---------------------|---------------|
| | | 719O | 719M |
| 1 | Frame | S275JR/C45 | X6CrNiTi18-10 |
| 2 | Flange head | S275JR | X6CrNiTi18-10 |
| 3 | Side connector | S275JR | X6CrNiTi18-10 |
| 4 | Gland seal connector | 11SMn30 | X6CrNiTi18-10 |
| 5 | Drain cock | S275JR | X6CrNiTi18-10 |
| 6 | Screw | 11SMn30 | X6CrNiTi18-10 |
| 7 | Nut | S235JR | X6CrNiTi18-10 |

Drawing 5. Liquid level gauge 718 type 18,19,20,21

Drawing 6. Liquid level gauge 719 type 34,35,36,37,38,39

Table 1. Dimension of liquid level gauge 716 type 06, 07, 08, 09 and 717 type 22,23,24,25

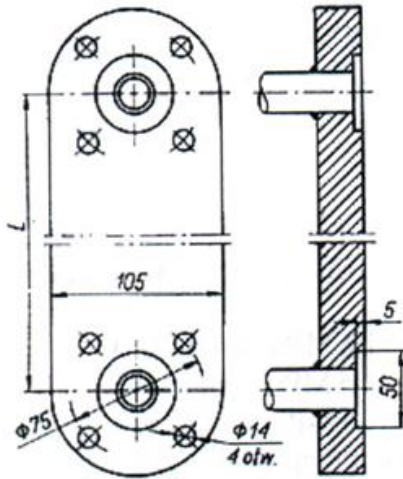
| Size | Axle base L | Length of sight-glass A | Length of frame B | Dimensions of glass |
|------|----------------|----------------------------|----------------------|---------------------|
| | mm | | | |
| 0 | 300 | 140 | 180 | 165x34x17 |
| I | 340 | 200 | 228 | 220x34x17 |
| II | 400 | 260 | 288 | 280x34x17 |
| III | 450 | 305 | 335 | 320x34x17 |
| IV | 500 | 320 | 350 | 340x34x17 |

Table 1. Dimension of liquid level gauge 716 type 10,11,12,13,14,15,16,17, 717 type 26,27,28,29,30,31,32,33, 718 type 18,19,20,21, 719 type 34,35,36,37,38,39

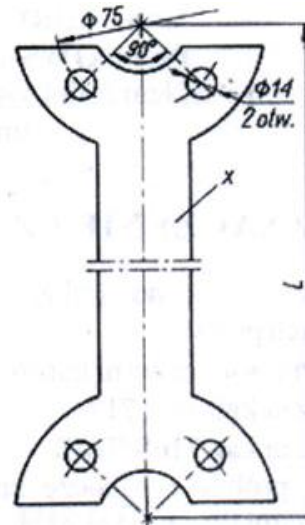
| Size | Axle base L | Length of sight-glass A | Length of frame B | Dimensions of glass |
|------|----------------|----------------------------|----------------------|---------------------|
| | mm | | | |
| 0 | 300 | 140 | 176 | 165x34x17 |
| I | 340 | 195 | 232 | 220x34x17 |
| II | 400 | 255 | 292 | 280x34x17 |
| III | 450 | 295 | 332 | 320x34x17 |
| IV | 500 | 315 | 382 | 340x34x17 |

3. Installation

Before installing liquid level gauge on device, check if liquid level gauge is not damage after transport and if glass is not cracked. Liquid level gauges should be assembled to device on stiff or additionally stiffened fittings in order to protect liquid level gauge against possibility of self-disassembly . For example - solution of stiffening are shown on Drawings 1 and 2.



Drawing 6. Stiffening of connectors of boiler



Drawing 7. Stiffening of liquid level gauges heads

Assembly of liquid level gauge:

- Screw flange of liquid level gauge to device flange applying flat gaskets. First the flange of bottom head should be screwed and then upper head to adjust to required dimension and to screw to connector.
- Non-tilting liquid level gauges 716, 718 should be assembled in vertical position. In case of tilting liquid level gauges 717, 719 with flat glass it is possible to set at an angle below 30°.
- User should mark min. and max. level on the frame.

4. Installation of liquid level gauge of more than 2000 mm

Due to the length and weight of liquid level gauge, the installation should be performed directly on the object. Liquid level gauge should be installed as follows:

- Attach a frame to the tank using the holes in the support frame.
- Assembly bottom cock on the tank outlet
- Put a frame pin in the gland chamber of the lower head and tighten a gland nut slightly, sealing a connection
- Put an upper head on the frame and tighten a gland nut slightly sealing a connection of the frame with the head
- Mount the upper head on the tank outlet and tighten fixing bolts slightly
- Tighten all the bolts and nuts to seal the liquid level indicator connections.

Perform a leakage test of liquid level gauge. In case of any leaks, tighten the bolts or nuts to seal the connections additionally.

Other operating and assembly instructions - according to general instructions applicable to liquid level gauges.

In case of liquid level gauge with leakage test or commissioning supervised at the manufacturer's site, a liquid level gauge should be first mounted on the bolts fixing a frame to the tank, then the heads should be mounted to the tank outlets.

Liquid level gauge should be always hold by the frame and never by he head.

5. First run

During of start of the boiler, at opened liquid level gauge cocks, pressure and temperature grow up slowly and danger of thermal shock does not exist. Fast raising of temperature at liquid level gauges can be cause of shortened time of exploitation of glasses or their cracking.

In case of starting of liquid level gauge, after previous disassembling from working boiler (for example in aim of exchange of glass), danger of fast raising of temperature at liquid level gauge exists. In order to avoid this, the following recommendations should be followed:

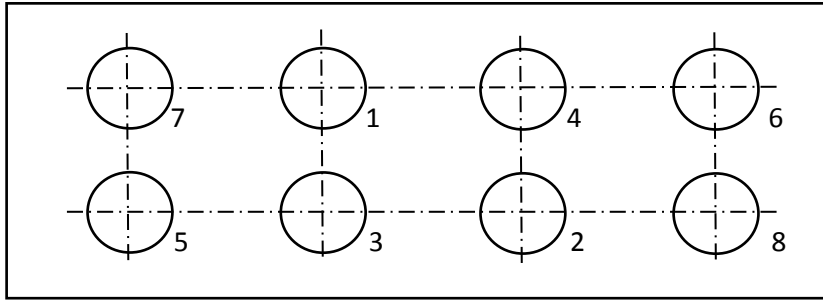
- Close bottom cock, open drain cock, and then gap a top cock to get a clearly visible stream of flowing down of condensate along glass. After period of 50 min. all elements of liquid level gauge should obtained working temperature.
- Close the drain cock. Liquid level gauge will start to fill with condensate. Otworzyć w pełni górną głowicę.
- Full open top cock.
- Full open bottom cock.
- During slow heating, gaskets settle down, and after some time, leakages are possible. All screws, nuts or screw plugs in place of leaks should be screwed by dynamometer key. Before screwing the nut (6 – Drawings 1,2,5) (8 - Drawings 3,4) (7-Drawing 6) heads should be open and close few time with key. This sealing operation should be made at closed heads cock and with open drain cock.
- In case of leaking during exploitation, connections should be sealed as in previous point. If leaks continue, gaskets should be replaced.
- During long stop, liquid level gauge should be drained. This means, top and bottom cock has to be closed, and drain cock open. Position „O” for open and „Z” for close, are marked on gauge of drain cock.

6. Replacement of glasses

Before replacement of reflex glasses, top and bottom cock should be closed and the drain cock opened. In order to replace of glasses, screw (5 – Drawings 1,2,5) (6 – Drawings 3, 4, 6) in upper and bottom head should be unscrew and frame or glass tube with gland box (3 – Drawings 1, 2, 5) (4 – Drawings 3, 4, 6) has to be removed from the heads.

Replacement of glasses

- Gland nut (6 – Drawings 1,2,5) (8 – Drawings 3,4) (7 – Drawings 6) should be loosen and took out of the frame.
- Frame pressure should be unscrew and damaged glass and gaskets under the glass should be removed.
- Clean up elements of the frame, put on glass with gaskets and assemble the frame. Studs should be screw tight with crisscross pattern, with intuition and even strength. In case of frames 705 tighten of screws should began from central screw and to go on towards ends of the frame. In case of frames 705S/705SCrNi and 704/704 CrNi tighten of nuts was shown on enclosed draft (Drawing 8).
- Gland sleeve of assembled frame should be placed in gland box chambers (after inserting a packing). By screw gland nut (6 – Drawings 1,2,5) (8 – Drawings 3,4) (7 – Drawing 6) to seal up connection initially, and then to push gland box (3 – Drawings 1, 2, 5) (4 – Drawings 3, 4, 6) with the frame onto liquid level gauge's heads. Screw screws (5 – Drawings 1, 2, 5) (6 – Drawings 3, 4, 6) with gaskets (2 pcs. of gaskets $\Phi 22 \times 18 \times 2,5$) in upper and bottom heads.



Drawing 8. Sequence of tightening of screws in liquid level gauge frame

7. Checking for chokepoint of chamber

Because of the possibility of limescale deposition or different dirt inside, liquid level gauge's chambers should be checked for chokepoint. Frequency is dependent on the exploitation conditions and supervision requirements. In aim of checking of chamber chokepoint, liquid level gauge should be blown. Blowing is made for every head separately, by closing one head to blow the second one at open drain cock.

In case of choked chamber:

In case of choked chamber:

- Close bottom cock.
- Unscrew the screw (5 – Drawings 1, 2, 5) (6 – Drawings 3, 4, 6) from bottom head, insert to chamber a rod with diameter up to 8 mm and open the bottom cock.
- Unblock a channel with a rod and then take out the rod and close the bottom cock.
- Fix the bottom screw (5 – Drawings 1, 2, 5) (6 – Drawings 3, 4, 6).

Repeat above for top head.

Due to perform the above actions under pressure, special caution should be exercised, and the person should be trained and protected against possible burn (in case of hot medium). After cleaning of heads, frame should be also cleaned. For cleaning frame, top and bottom headcocks should be closed, drain cock opened and a rod used to clean chamber of the frame carefully through open drain cock.

8. Final remarks

During service of liquid level gauges in exploitation, regulations of UDT as well as different regulations related to pressure devices has to be obey.

Liquid level gauges are assembled in two types dependent on cock's switch handle location: right or left. If client does not specify the type, liquid level gauges are delivered in right type. Change of design is obtained by loosening of screw (5 – Drawings 1, 2, 5) (6 – Drawings 3, 4, 6) and turn of liquid level gauges heads about 180° in relation to gland box and turn of drain cock.

As a standard, flanges are drilled at PN 25/40 bar, as for DN20.

Inlet hole in heads Φ 15 mm.

If during inspections or repairs some parts will prove for replacement, the order of new part should include: number of position, name of the element, size and using material.

9. Warranty

ZETKAMA grants quality warranty with assurance for proper operation of its products, providing that assembly of them is done according to the user's manual and they are operated according to technical conditions and parameters described in ZETKAMA's catalogue cards. Warranty period is 18 months starting from assembly date, however not longer than 24 months from the sales date.

Other warranty terms are to be agreed between the manufacturer of the valve and the purchaser. **The manufacturer reserves the right to introduce technical changes as the result of improving construction and manufacturing technology.** Failure to comply by the user with the regulations and indications included in this user's manual shall exempt the manufacturer from any liability and warranty.