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ZETKAMA

USER MANUAL		
FLANGED LIQUID LEVEL INDICATOR zGAU	**716N; 716Q; 716M**	**Edition: 1/2018** **Date: 29.03.2018**

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1. Introduction

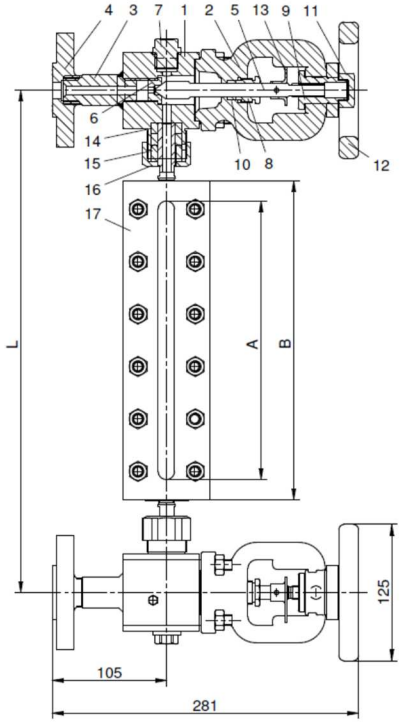
Liquid level indicators are used to indicate the level of the liquid in pressure vessels with the following operation parameters:

- liquid level indicator 716 type 60, 61, 62, 63, 64, 65 with 705.2 frame PN16, PN25, PN 40 bar, max. temp. 300°C
- liquid level indicator 716 type 70, 71, 72, 73, 74, 75 with 705.3 frame PN16, PN25, PN40 bar, max. temp. 300°C
- liquid level indicator 716 type 60, 61, 72, 73, 74, 75 with 705S frame PN40 bar, max. temp. 300°C
- liquid level indicator 716 type 60, 61, 62, 93, 64, 65 with 703 frame PN40 bar, max. temp. 300°C
- liquid level indicator 716 type 80, 82, 84, with glass tube PN16 bar, max. temp. 200°C
- liquid level indicator 716 type 81, 83, 85 with plexiglass PN16 bar, max. temp. 150°C
- liquid level indicator 716 type 90, 92, 94, with combined glass tube PN16 bar, max. temp. 200°C
- liquid level indicator 716 type 91, 93, 95 with combined plexi tube PN16 bar, max. temp. 150°C

Test and working pressure according to the relevant standards.

2. Structure

Figure 1. Liquid level indicator 716 with a frame



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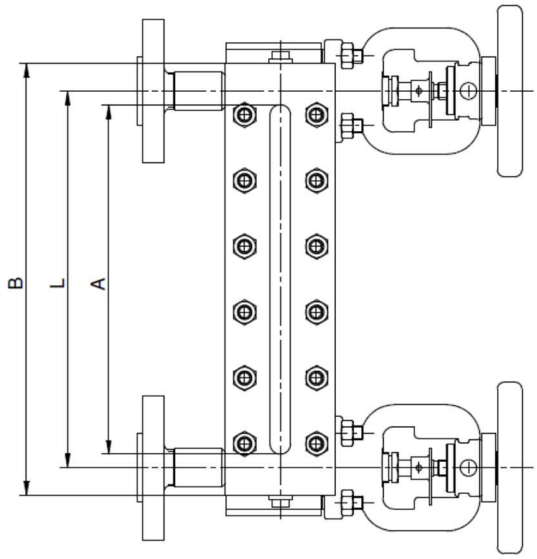
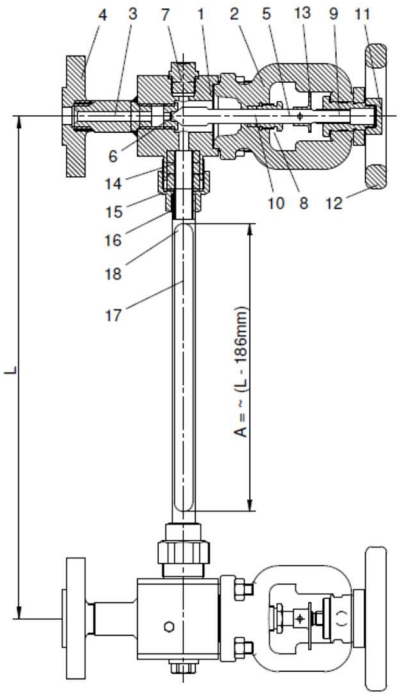


type 7.

Figure 2. Liquid level indicator 716 with glass or plexi tube



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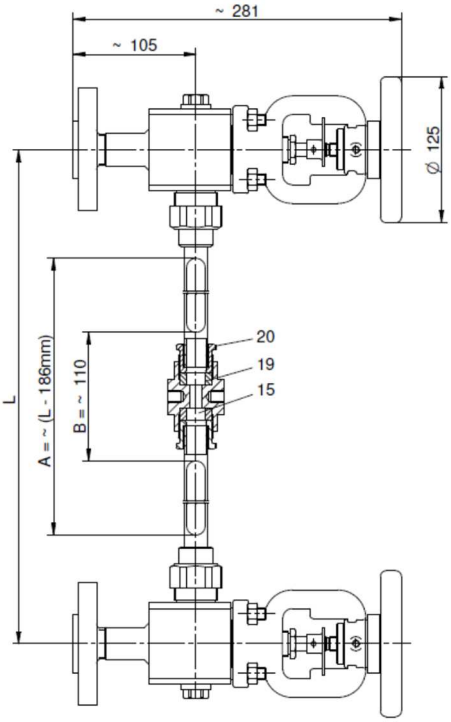

type 9...

type 60, 61, 70, 71, 80, 81, 90, 91
Liquid level indicator with flange connections

type 62, 63, 72, 73, 82, 83, 92, 93
Liquid level indicator with threaded connections

type 64, 65, 74, 75, 84, 85, 94, 95
Liquid level indicators with welding connections

No.	Hull material	N		Q		M	
	TYPE	60, 61, 62, 63, 64, 65 70, 71, 72, 73, 74, 75	80, 81, 82, 83, 84, 85 90, 91, 92, 93, 94, 95	60, 61, 62, 63, 64, 65 70, 71, 72, 73, 74, 75	80, 81, 82, 83, 84, 85 90, 91, 92, 93, 94, 95	60, 61, 62, 63, 64, 65 70, 71, 72, 73, 74, 75	80, 81, 82, 83, 84, 85 90, 91, 92, 93, 94, 95
1	Liquid level indicator's head	S235JR 1.0037		13CrMo4-5 1.7335		X6CrNiTi18-10 1.4541	
2	Cover	GP240GH 1.0619				GX5CrNi19-10 1.4308	
3	Tube	S235JR 1.0037		13CrMo4-5 1.7335		X6CrNiTi18-10 1.4541	
4	Flange (60, 61, 70, 71, 80, 81, 90 , 91)	S235JR 1.0037		13CrMo4-5 1.7335		X6CrNiTi18-10 1.4541	
	Threaded tip (62, 63, 72, 73, 82, 83, 92, 93)	S235JR 1.0037		13CrMo4-5 1.7335		316 1.4401	
	tip to be welded (64, 65, 74, 75, 85, 86, 94, 95)	S235JR 1.0037		13CrMo4-5 1.7335		X6CrNiTi18-10 1.4541	
5	Mandrel	X20Cr13 1.4021				X6CrNiTiMo17-2-2 1.4571	
6	Head's plug	X6CrNiTi18-10 1.4541					
7	Cork ½ "	Carbon steel				X6CrNiTi18-10 1.4541	
8	Gland	X20Cr13 1.4021				X6CrNiTi18-10 1.4541	
9	Bushing	X20Cr13 1.4021					
10	Gland's seal	Graphite					
11	Wheel nut	115mN30					
12	Hand wheel	Aluminum					
13	Opening indicator	S235JR 1.0037				X6CrNiTi18-10	1.4541
14	Frame seal	Graphite					
15	Pressure ring	S235JR 1.0037		13CrMo4-5 1.7335		X6CrNiTi18-10 1.4541	
16	Nut clamp	S235JR 1.0037		13CrMo4-5 1.7335		X6CrNiTi18-10 1.4541	
17	Liquid level indicator / tube	S235JR / S275JR / C45	Glass, plexiglass	S235JR / S275JR / C45	Glass, plexiglass	X6CrNiTi18-10 1.4541	Glass, plexiglass
18	Glass tube cover	------	E235	------	E235	------	X5CrNi18-10 1.4301
19	Tube connector in a cover	------	X20Cr13 1.4021	------	X20Cr13 1.4021	------	X6CrNiTi18-10 1.4541
20	Plug	------	11SMn30 1.0715	------	11SMn30 1.0715	------	X6CrNiTi18-10 1.4541

Material	M, N, Q (PN40)																																			
TYPE	60, 61, 62, 63, 64, 65																																			
Size	0		I			II			III			IV		V			VI			VII			VIII			IX		X		XI						
	-	a	-	a	b	-	a	b	-	a	b	-	a	-	a	b	-	a	b	-	a	b	-	a	b	-	a	-	a	-	a					
L (mm)	300	305	340	335	330	370	365	360	400	395	390	430	435	460	455	450	500	505	510	520	530	545	550	565	570	600	605	650	630	700	690					
A (mm)	115		140			165			195			225		255			295			315			345			405		435		475						
B (mm)	152		177			202			232			262		292			332			352			382			442		472		512						
Glass size	140x34x17		165x34x17			190x34x17			220x34x17			250x34x17		280x34x17			320x34x17			340x34x17			370x34x17			430x34x17		460x34x17		500x34x17						

NOTE: Other lengths upon request, according to customer requirements

Material	M, N, Q (PN40)										
TYPE	70, 71, 72, 73, 74, 75										
Size	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
L (mm)	160	185	215	245	275	315	335	365	425	455	495
A (mm)	140	165	195	225	255	295	315	345	405	435	475
B (mm)	200	225	255	285	315	355	375	405	465	495	535
Glass size	165x34x17	190x34x17	220x34x17	250x34x17	280x34x17	320x34x17	340x34x17	370x34x17	430x34x17	460x34x17	500x34x17

NOTE: Other lengths upon agreement with the manufacturer according to customer requirements

Material	Q, M (PN63)																													
TYPE	60, 61, 62, 63, 64, 65																													
Size	0		I			II			III			IV		V			VI			VII			VIII			IX		X		XI	
	-	a	-	a	b	-	a	b	-	a	b	-	a	-	a	b	-	a	b	-	a	b	-	a	b	-	a	-	a	-	a
L (mm)	320	325	360	355	350	390	385	380	420	415	410	450	455	480	475	470	520	525	530	540	550	565	570	585	590	620	625	670	650	720	710
A (mm)	115		140			165			195			225		255			295			315			345			405		435		475	
B (mm)	172		197			222			252			282		312			352			372			402			462		492		532	
Glass size	140x34x17		165x34x17			190x34x17			220x34x17			250x34x17		280x34x17			320x34x17			340x34x17			370x34x17			430x34x17		460x34x17		500x34x17	

NOTE: Other lengths upon agreement with the manufacturer according to customer requirements

For version 8 ... and 9 ... and length according to customer's order.
Version 8...- maximum spacing - 1600 mm
Version 9...- maximum spacing - 3000 mm

For liquid level indicators with tube, axis spacing in accordance with the order.
Maximum L axis spacing for versions 80, 81, 82,83, 84, 85 - 1600 mm
Maximum L axis spacing for versions 90, 91, 92, 93, 94, 95 - 3000 mm

3. Installation

Before installing the liquid level indicator on a device, verify that the liquid level indicator has not been damaged during transport and that the glass has not been broken. Liquid level indicators must be installed on a device to rigid or additionally tightened ferrules to secure liquid level indicator against the possible self-disassembly under pressure. Sample solution for tightening has been shown in figures 3 and 4.

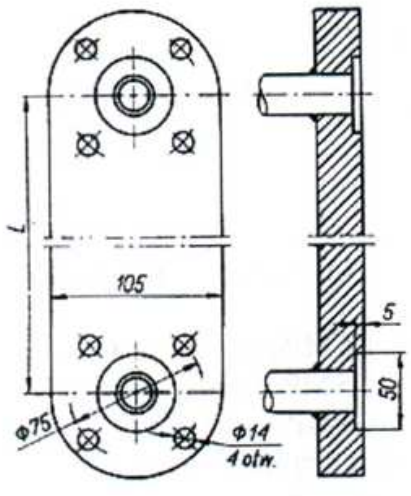

Figure 3. Boiler's ferrules setting

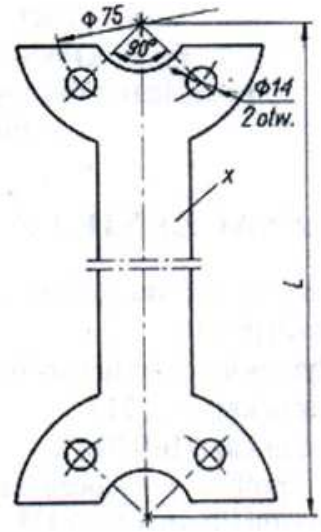

Figure 4. Tightening of liquid level indicator's heads

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

– Screw the flanges liquid level indicator'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 a factor (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.

- In the case of use of heads with a glass tube, you should secure the tube against mechanical damage.
- Liquid level indicators 716 must be mounted in a vertical position
- On the frame or the tube, the user should select the minimum and maximum level.

4. Installation of liquid level indicators that are longer than 1600 mm

Due to the length and weight of the liquid level indicator, the installation must be carried out directly on the object.
Liquid level indicator must be mounted as follows:
- attach the frame to the tank using the holes made in the frame support,
- mount the base head on the ferrule coming out of the tank,
- place frame's peg put in the lower glanded chamber and slightly tighten the glanded nut sealing the connection
- put the top head on the frame and slightly tighten the glanded nut sealing the connection of the frame with the head,
- mount the upper head on the ferrule coming out of the tank and slightly tighten the screws,
- then tighten all nuts and bolts to seal connections of the liquid level indicator.

Perform leak test for liquid level indicators. In the event of any leaks, tighten the bolts or nuts in order to seal the connectors.

Other tips for operation and installation according to the User Manual of ARMAK liquid level indicators.

In the case of liquid level indicators made with leak test or with surveillance acceptance at the manufacturer, the liquid level indicator must first be fixed on the screws mounting the frame to the tank, then you must mount the heads to the ferrules coming out of the tank.

Always hold the liquid level indicator by the frame, never by the heads.

5. Commissioning

During boiler's commissioning, with open liquid level indicator'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 indicator's temperature can cause shortened glass operation or its breaking.
When restarting the liquid level indicator, after removing the working boiler first (e.g. to replace the glass) there is a danger of a sharp temperature rise in the liquid level indicator. To avoid this, you must adhere to the following recommendations:
- Close the bottom head, open the drain cock (if equipped, in other case, drain plug), and then to lift the upper head in such a way as to clearly see the condensate stream flowing along the glass. After a period of about 50 min. all liquid level indicators should reach the operating temperature.
- Close the drain cock (or screw the plug). The liquid level indicator will start to fill with the condensate.
- Open the upper head fully.
- Open the lower head fully.
- During the slow heating of the gaskets are slightly "down". If after running the liquid level indicator, there occur leaks, tighten all the screws, nuts or plugs with the wrench in areas of leakage. The sealing should be carried out with closed and open drain cock (plug).
- 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 indicator should be dewatered. This means that you must close the lower and upper head and open the cock (plug).

6. Glass replacement (for liquid level indicator with a frame)

Before replacing the reflective glass, you must close the heads of the liquid level indicator and open the drain cock (unscrew the plug). To replace the glass, unscrew the screw (16) in the top and bottom head and then slide the frame off the heads (17).

NOTE: In order to replace the frame, remove the liquid level indicator from the tank.

Glass replacement

- Loosen the glanded nuts (16) and remove the frame.
- Unscrew the tightening screws of the frame and remove the damaged glass and the seal under the glass.
- Clean frame elements, apply the gaskets and the glass and then assemble the frame. Tighten the screws slternately, gently and evenly. The screws tightening torque max. 30 Nm. In the case of 705.2, 705.3, 705S and 703 frames, tightening of screws is shown in the attached sketch (Figure 5).
- Pegs of a ready-assembled frame should be placed in glanded chambers (first, place sealant in chamber). Initially seal the connection with nuts(16) and then insert the frame (17) on the liquid level indicator's head.

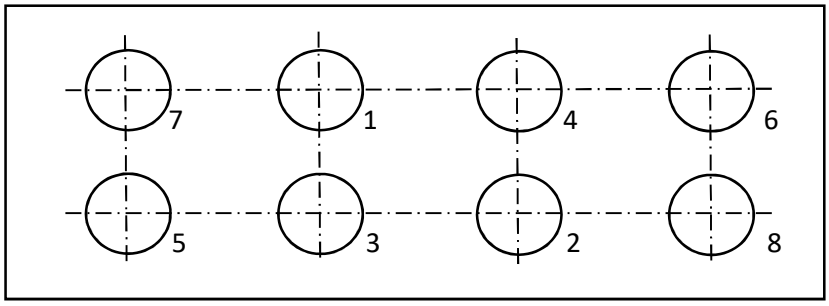

Figure 5. Screws tightening order diagram

7. Tube replacement

Before replacing the glass tube, you must close the heads of the liquid level indicator and open the drain cock (unscrew the plug). To replace the tubes, unscrew a glanded nut (16) in the top and bottom head and then slide the glass tube off the heads along with the cover (17) (18).
NOTE: In order to replace the tube, remove the liquid level indicator from the tank.

Tube replacement

- Loosen the glanded nuts (16) and remove the glass tube with the cover (17).
- Place a new tube and glanded sealant (14), initially tighten the connection with glanded nuts (16), and then slide the glass tube.
- In the case of a glass tube with a cover, perform the above steps including the cover.

After you have performed the above listed steps, tighten all connections and restart the liquid level indicator in accordance with section 4.

8. Cover seals replacement

In case of leaks on the gland connection with a cover:
- Close the top and bottom heads
- Unscrew the gland (8) and remove the remnants of the gland seal (10). Blow through the whole to remove all remnants of the seal.
- Place a new seal and initially tighten the gland.
- Open the liquid level indicator's heads and in the event of leaks, gently tighten the gland for full tightness.

9. Final remarks

When handling the liquid level indicators during the operation, comply with the provisions of the Technical Supervision Office and other provisions concerning the operation of the pressure equipment.
Conventionally, heads' flanges are drilled on PN 25/40 bar, like for DN 20.

If at the time of the maintenance or repair, a user finds damage to an element requiring replacement, when ordering spare parts, please use the position number and the name of the element and specify the marking, the size of the liquid level indicator and the material it is made of.

10. Warranty

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 ZETKAMY directories. The warranty period is 18 months from the date of installation, but not longer than 24 months from the date of sale.

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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