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These instructions are to be fully examined and understood, prior to installation and/or using the level indicator. Non compliance of the instructions can cause damage to the property and possible result in serious injury.

1. ERIKS operating companies

ECON level indicators are being delivered by several ERIKS operating companies on a worldwide basis. In this manual these will be referred to as 'ERIKS', the individual terms of delivery of the ERIKS operating company having executed the order are applicable.

2. Product description

The ECON level indicators reflex and transparent glass are designed according the information on our website, www.eriks.com and should be used in accordance with the applicable pressure-temperature rating as stated on this website. Level indicators are provided with a nameplate. The marking makes the identification of the level indicator easier and contains:

- Figure number
- Test pressure 3 bar
- ECON tagplate

3. Requirements for maintenance staff

The staff assigned to assembly, operating and maintenance tasks should be qualified to carry out such jobs and in any circumstance, ensure personal safety.

4. Transport and storage

During transport and storage the level indicators should be protected against external forces, influence and damage of the painting layer as well. The purpose of the painting layer is to protect the valve against corrosion, during transport and storage. The level indicators should be stored in an unpolluted space and should also be protected against all atmospheric circumstances. There should be taken care of the temperature and humidity in the room, in order to prevent condensate formation.

5. Function

ECON level indicators are designed to indicate the liquid level of a tank. There are many kinds of different level indicators, with valve connection flanged DN20, DN25 or G 3/4" outside thread.

Most common models/designs with one valve are :

- Figure 1590 with one push-button valve and outside threaded connection. (see Drawing 1)
- Figure 1590F with one push-button valve and flange connection. (see Drawing 2)
- Figure 1590FG with one weight-loaded valve and flange connection. (see Drawing 3)
- Figure 1590G with one weight-loaded valve and threaded connection. (see Drawing 4)

Most common models/designs with two valves are :

- Figure 1590D with two push-button valves and threaded connection. (see Drawing 5)
- Figure 1590FD with two push-button valves and flange connection. (see Drawing 6)
- Figure 1590DG with two weight-loaded valves and threaded connection. (see Drawing 7)
- Figure 1590FDG with two weight-loaded valves and flange connection. (see Drawing 8)

Option model/design without valves :

- without valves, but with welding connections, these models have a welding pipe on both ends, which is directly mounted through the tank wall and secured by welding. Because of this the tank and level indicator form a closed circuit. (Figure 1591)



Note : For single operated level indicators the top air vent connection 3/8" BSP has to be connected to the highest point of the tank. This will guarantee correct venting, necessary for proper fluid communication with the tank.

When the level indicator features two valves, both valves should be opened simultaneously, in order to adjust the fluid level in the column and the correct fluid level in the tank can be read.

The tank will remain sealed by the self-closing valve(s) even if the column is damaged.

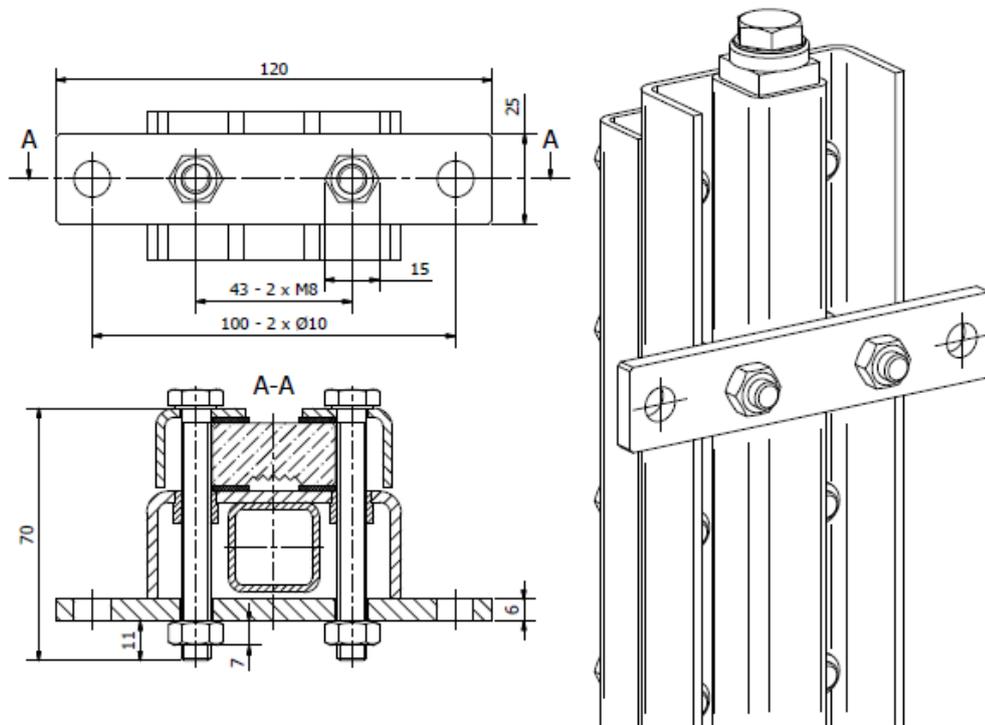
6. Application

The ECON level indicators are used for fuel and oil tanks. The level indicators are designed for standard operating conditions. For the use of extreme conditions e.g. aggressive or abrasive media, it is recommended to mention this at the ordering stage, to verify whether the level indicator is suitable. The installation designer is responsible for the level indicator selection, suitable for the working conditions. The level indicators are unsuitable, without written permission of an ERIKS company, to apply for hazardous media as referred into Regulation (EC) No 1272/2008

7. Installation

During the assembly of the level indicators, the following rules should be observed:

- make sure, before assembly, that the level indicators were not damaged during transport or storage, are executed according request and are to your order specification and are suitable for the job.
- take off dust caps of the valves.
- make sure that the thread or flange on the tank is executed in the same standard as the valve connection and also free from pollution.
- choose a position on the tank which is flat and unobstructed vertically for mounting of the level indicator.
- for level indicators with a valve on the bottom and at the top, mark out two holes on the tank wall at the same centre distance as the valves centre. If the level indicator has only one valve at the bottom, mark the bottom valve only. The markings will locate the valves and both markings should be positioned on an exact vertical center line.
- the bottom valve must be located above any known or suspected sludge level.
- drill a hole at each marked position, weld a nipple with inside thread G 3/4" (ISO228-1) or a flange according to the valve perpendicular to the tank wall, as connection for the valve.
- remove pollution, as burrs and welding parts from the new tank connection.
- for a correct functioning, the level indicator must be connected stress free, vertical supports must be arranged to prevent any additional stress, caused by the weight of the level indicator and the valves. For level indicators with a "H" length or "H.O.H" length below 2000 MM, the adjustable support(s) should be used, which will be mounted to the level indicator. When desired the support can be moved vertically (please note bolting torque).



- for sealing the threaded valve connections to the tank wall, refer to provisions of UNI ISO 228-1 standard or other applicable standards depending on case.
- for mounting the threaded valves, always use appropriated sealing material on the thread.
- for mounting the flange valve, use appropriate gaskets and fasteners.
- for mounting the column (level indicator body) to the valve(s), use included compression fittings, this job must be done by using suitable tools.
- level indicators with a length larger than 3,8 Meters, can be supplied divided for packing, both parts already with connection plate. Connection plates are designed only to join sections vertically and will not support the gauge sections in a horizontal position.
- after installation, a tightness check must be made on the joint seals, bolts and nuts.
- the bolt torque should also be checked, after the first few hours of installation.

8. Operating instructions to read the fluid level of the tank

Level indicator with one valve :

- press the bottom valve or lift the bottom weight and hold open. The fluid inside the tank should now flow into column.
- when the liquid level settles, release the valve to seal of the column from the tank.

Level indicator with two valves :

- press the top valve or lift the top weight (if fitted) and hold open.
- press the bottom valve or lift the bottom weight and hold open. The fluid inside the tank should now flow into the column.
- when the liquid level settles, release the valves to seal of the column from the tank.



Note: because of the self-closing valve(s), the liquid level in the column stays the same. When a new reading is required, the valve(s) should be opened.

9. **Maintenance**

During maintenance, the following rules must be observed:

- always keep personal safety precautions in mind and always use appropriate protection e.g. clothing, masks, gloves etc.
- be alert that the temperature still can be very high or low and can cause burns.
- make sure that the pressure is reduced to atmospheric pressure.
- dust, grease and medium residual, must be frequently removed from the valve body and all moving parts, such as stem, to maintain all operating functions.
- during maintenance of level indicator body (column) it is not allowed to open the valves.

Check the column and valve(s) for signs of leakage. Even minor defaults can become big problems when no attention is paid to them. If leakage is detected, the gasket loading should be checked as follows: With torque wrench set at 20Nm, go over the bolts following the sequence shown in Drawing 10. The pressure in the level indicator should be relieved before retightening is attempted.

If leakage continues after retightening, the section should be disassembled. The bolts should be removed, following the sequence shown on Drawing 11 and the parts examined to determine a reason other than bolt loading for the continued leakage. Before removing the cover plate, carefully mark it's position for reassembly. Remove the cover plate, glass and gaskets. Remove the gaskets be careful not to damage the seating surface, examine the seating surface and examine the impression in the gaskets to determine that the glass was properly centered and evenly loaded. After correcting the reason for leakage, reassemble the section using new glass and new gaskets. Although a used glass may look perfect, it may have lost some of its original temper. Therefore, the glass must also be replaced when dismantling and reassembling a level indicator.

Before starting any service jobs on the level indicator, the column must be drained and depressurized to atmospheric pressure, if necessary then loosen the compression fittings between column and valve(s) and mounting supports. When no welding has taken place, taking out of the column is very easily.

Before starting the reassembling, check if the seating surface for the gaskets are in good condition. Centralize the gasket/glass/gasket package, use new glass and gaskets and the old cover plate and bolts. Be sure the cover plate is firmly seated. Turn all bolts finger tight, following the sequence shown on Drawing 10, repeating this procedure twice.



Note: It is important that all cover-bolts are tightened evenly !!!

First finger tight and after that by using a torque wrench set for 5Nm, tightening nut No. 1, then work outward following the sequence shown in Drawing 10 until all bolts are evenly tightened. Repeat this procedure, increasing the torque by 5Nm increment, till a uniform torque of 20Nm is reached.

Maintenance on the valves:

Maintenance on the valves requires draining of the tank below level of connection point of the lowest valve and then draining of the level indicator. After this dismantling of the complete level indicator, including valves is very easily.

Be sure to relieve internal valve pressure before performing maintenance on valves.

When the valve is leaking over the seat, the O-ring sealing has to be renewed. Take out the lock washers on the inlet side and remove ring, spring, disc and O-ring, replace the new O-ring taking care of the seating surface. When the valve is leaking over the stem, replace the O-rings on the stem. (see Drawing 12 and 13)

10. Service and repair

All service and repair jobs should be carried out by authorized staff, using suitable tools and user shall use genuine valve parts.

- welding repair and drilling of the valve is forbidden.
- after replacement of the push-button or weighted valve, it is necessary to check the valve operation and tightness of all connections. Leakage test should be carried out.
- after installation, the valve should be checked and maintained periodically at least every 3 months, depending on the medium.

11. Safety notes



- do not perform maintenance on fitted valves, with the system under pressure.
- the maximum working pressure may not exceed 3 bar.
- the maximum working temperature may not exceed 90° Celsius.
- do not stress the fitted valve(s) or column with external loads.
- make sure the valve is not damaged in any way as this could impair good operation.
- keep the valve away from heat sources that might impair good operation.
- the valves have to be operated periodically, in order to avoid that the disc will stick to the seat, with the natural consequence of an increasing of the operating force or torque on the push-button or weight. This interval period is to be decided by the operator, depending on the application. In any case we advise a limit period of three weeks.
- the user should check, if used materials are suitable for the application.

12. Troubleshooting

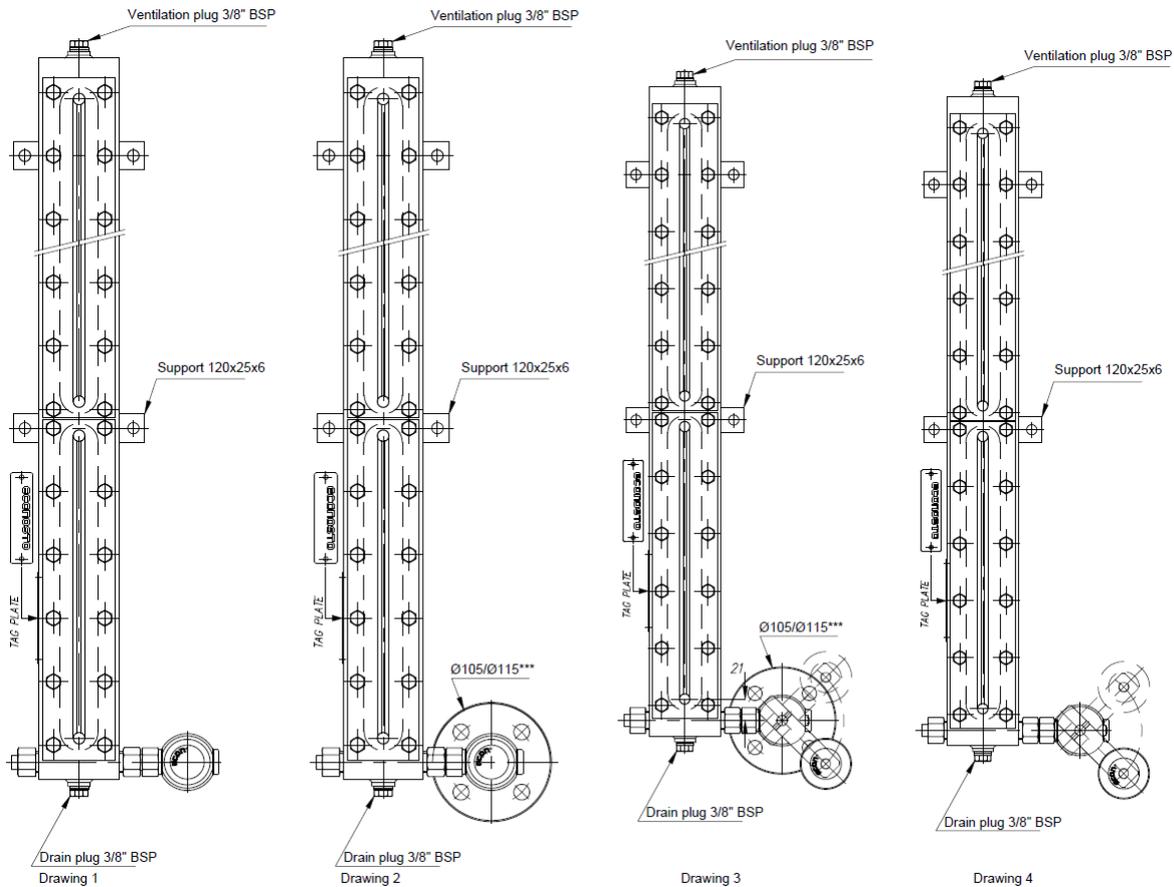
It is essential that the safety regulations are observed when identifying the fault.

Problem	Possible cause	Corrective measures
No flow level	Empty tank	Fill
	Obstruction in valve or column	Clear obstruction
	Incorrect air ventilation	Check air ventilation (see Chapter 5)
Filling level indicator failed	Incorrect use	See operating instruction, Chapter 8
Broken sight glass	Misuse	Replace glass
	Not exact vertical mounted and/or not stress free. Torsion/bending of column	Replace glass and check inline valves and tank flatness
Valve is not sealing	O-ring(s) damaged	Replace O-ring(s)
	Broken spring(s), internal/external (push-button valve)	Replace spring(s)
Rough moving stem	For example because of pollution, swelling O-ring(s) or damaged o-ring(s)	Check the sealing on the stem and replace if necessary the O-ring(s)
Weight-loaded valve is leaking	Check if the weight is correct mounted	Install the weighted valve in the correct manner at 45° see drawings

Leakage from sight glass gasket	Loose bolt of the cover	Tighten bolts in sequence
	Damaged gasket	Replace gasket
Leakage from fitting	Loose union nut	Tighten union nut
	Damaged O-ring	Replace O-ring

13. Removal

Dismantled and rejected valves cannot be disposed with household waste. The valves are made of materials which can be re-used and should be delivered to designated recycling centers.



Drawing 1

Figure 1590 with one push-button valve, threaded connection on the right side, on the left side is also possible.

Drawing 2

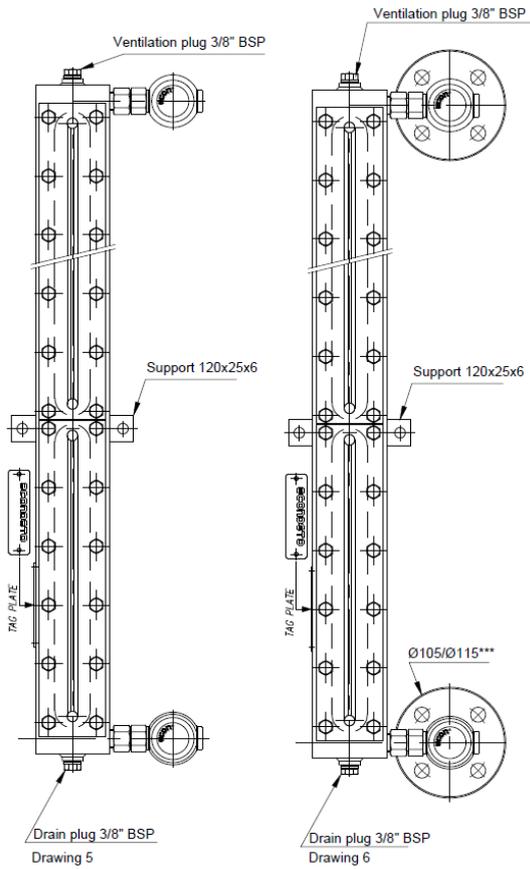
Figure 1590F with one push-button valve, flanged connection on the right side, on the left side is also possible.

Drawing 3

Figure 1590FG with one weighted valve, flanged connection on the right side, on the left side is also possible.

Drawing 4

Figure 1590G with one weighted valve, threaded connection on the right side, on the left side is also possible.

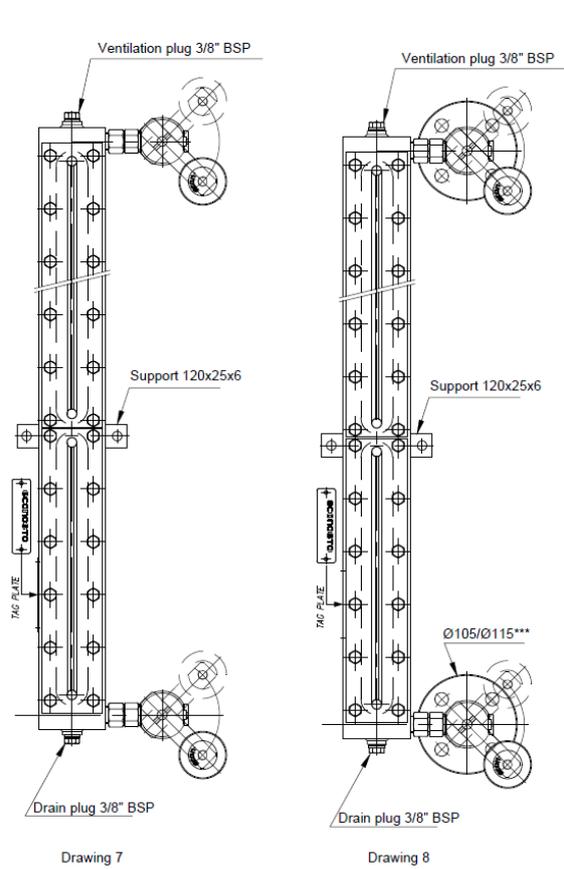


Drawing 5

Figure 1590D with two push-button valves, threaded connection on the right side, connection left on request.

Drawing 6

Figure 1590FD with two push-button valves, flanged connection on the right side, connection left on request.



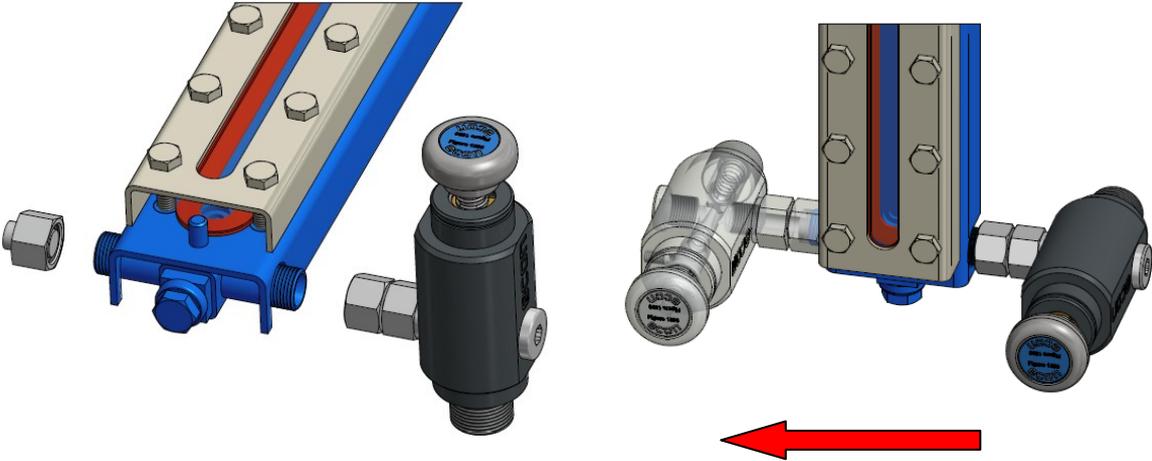
Drawing 7

Figure 1590DG with two weighted valves, threaded connection on the right side, connection left on request.

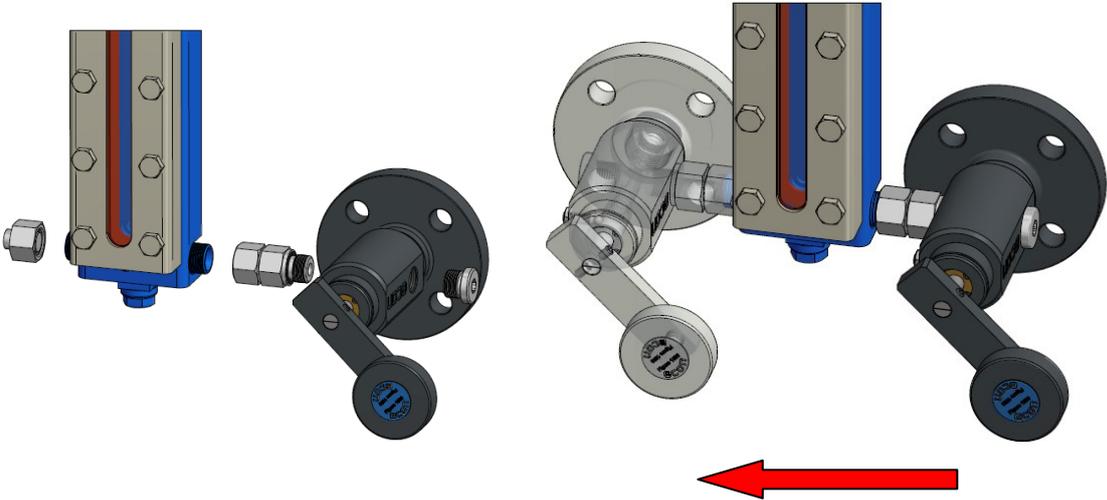
Drawing 8

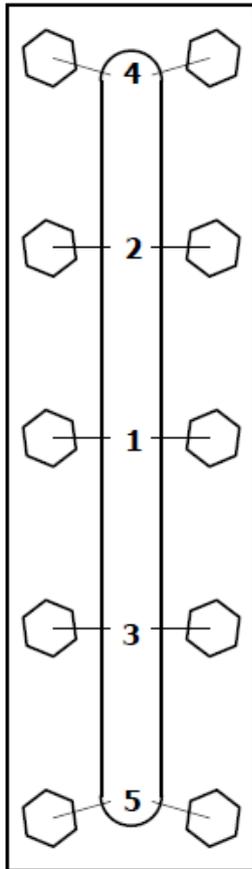
Figure 1590FDG with two weighted valves, flanged connection on the right side, connection left on request.

Installation push-button valve, connection changed from the right side to the left side.

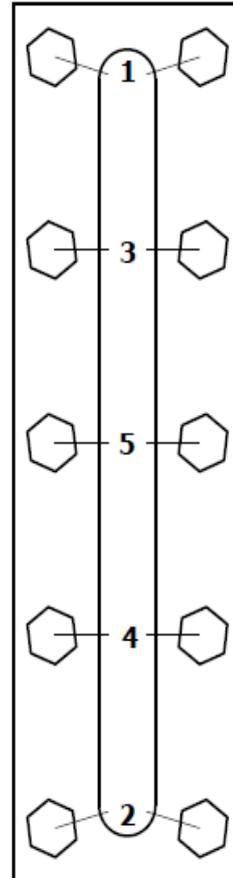


Installation weight-loaded valve, connection changed from the right side to the left side.

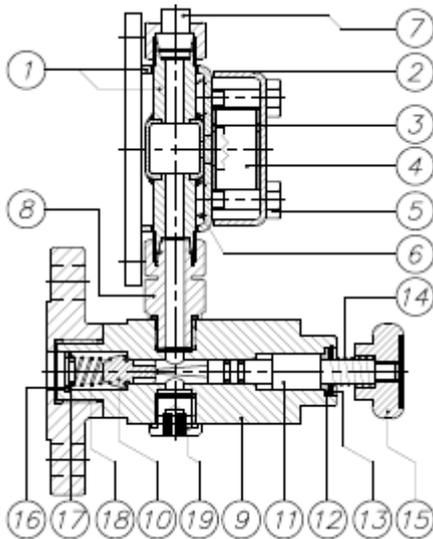




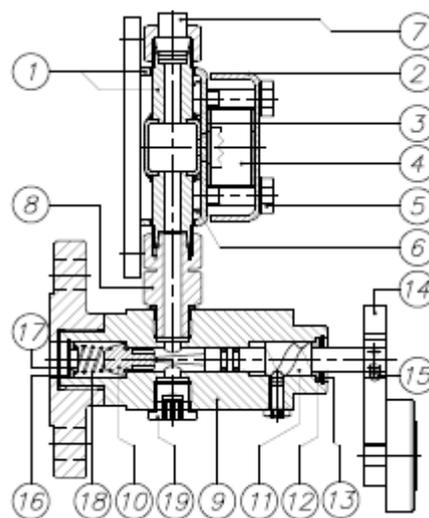
Drawing 10
Torque tightening sequence



Drawing 11
Disassemble sequence



Drawing 12



Drawing 13