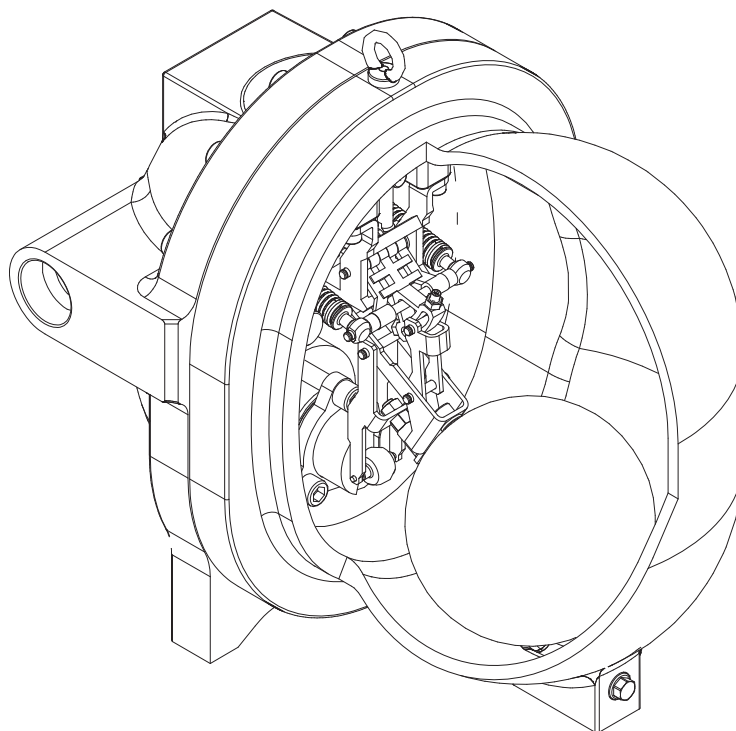


Operating and installation instructions

In accordance with EC Directive 2014/68/EU on Pressure Equipment

Pump trap (mechanical)

CONA[®] P (PN16)



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1.0 General information on operating instructions

These operating instructions provide information on how to install safely operate, maintain and assemble pump condensate trap. They are binding for transport, storage, installation, commissioning, operation, maintenance and repair.

The pump trap was designed in accordance with the generally accepted rules of sound engineering practice. It is the owner's responsibility to ensure that the system is operated in conformity with relevant local regulations.

Please read these operating instructions prior to installing and / or commissioning the pump trap and before carrying out maintenance and repair work on it. You must pay attention to and comply with the information, warnings and instructions. The notices and warnings must be observed and adhered to at all times. All work must be carried out by expert personnel or all activities supervised and checked. For the purpose of these operating instructions, expert personnel are defined as persons who are:

- Familiar with the procedures for installing, commissioning, operating and maintaining the pump trap as well as with the contents of these operating instructions
- Qualified to perform the functions and activities entrusted to them
- Familiar with all local or in-house regulations which are relevant for operation and safety.

Please contact the supplier or the manufacturer in case of problems which cannot be solved by reference to these operating instructions.

The manufacturer reserves the right to introduce technical modifications or improvements at any time. Please make sure these operating instructions are up to date prior to carrying out any work on the pump trap.

2.0 Notes on possible dangers

2.1 Significance of symbols



Warning of general danger.

2.2 Explanatory notes on safety information

In these operating and installation instructions dangers, risks and items of safety information are highlighted to attract special attention.

Information marked with the above symbol and “**ATTENTION!**” describe practices, a failure to comply with which can result in serious injury or danger of death for users or third parties or in material damage to the system or the environment. It is vital to comply with these practices and to monitor compliance.

All other information not specifically emphasised such as transport, installation, operating and maintenance instructions as well as technical data (in the operating instructions, product documentation and on the device itself) must also be complied with to the fullest extent in order to avoid faults which in turn can cause serious injury to persons or damage to property.

3.0 Storage and transport



ATTENTION!

- Protect against external force (like impacts, vibrations, etc.):
- Pump trap must not be used to take up external forces that they are not designed for, e.g. do not use them as climbing aids, or as connecting points for lifting gear.
- Suitable materials handling and lifting equipment must be used.
Pay attention to the maximum load-bearing capacity of the lifting eye bolt:
140 kg
Remove any additional parts attached to the main connections such as stop valves, strainers, etc. prior to transporting the equipment.
- Empty weight of fitting: 75 - 81 kg

- At -20 °C to +65 °C, dry, free of dirt.

- The paint is a base coat to protect against corrosion during transportation and storage. Do not damage paint protection.

4.0 Description

4.1 Area of application

The ARI-CONA[®] P float-controlled pump condensate trap is a combination of a classical condensate trap and a condensate pump. It is used to dewater completely heat exchangers and unventilated vessels under challenging pressure conditions.

In the case of a positive differential pressure, the pump condensate trap works as a normal condensate trap; with negative differential pressure, it works as a condensate pump.

Switching between the operating modes is carried out automatically.

This means that you can use the pump condensate trap to dewater heat exchangers and vessels at high levels of pressure all the way down to a vacuum.

In this connection, use is restricted to fluids of fluid group 2 with a density of 850 - 1150 kg/m³.



ATTENTION!

- Refer to the data sheet and this operating instructions for applications, limits on use and possibilities.
- The pump trap may only be pressurised up to the maximum allowable operating pressure indicated on the nameplate. The maximum allowable differential pressure (DP) should also be observed (see also 4.4 Operating data).
- If necessary, the connecting pipes should be protected against excess pressure.
- If the equipment is used in hazardous areas, the expected surface temperatures, which are generally dependent on the fluid pumped and the motive medium, should be observed.

The information complies to the Pressure Equipment Directive 2014/68/EU.

It is the responsibility of the system planner to ensure compliance.


The special markings on the valve must be taken into account.

Refer to the catalogue sheet to see which materials are used in standard versions.

Please contact the supplier or the manufacturer if you have any questions.

4.2 Design data

Temperature (°C)	-10 item 100	150	200	250	300
Pressure (bar)	16	15.5	14.7	13.9	12.8



ATTENTION!
 - The design data is not the same as the operating data. The specified operating limits (PS, TS, ΔPMX) must not be exceeded. Exceeding the operating data can.

4.3 Test pressure


The maximum test pressure for the shell strength and seat tightness tests is 32 bar at room temperature.

4.4 Operating data

Figure	Nominal pressure	Material	Nominal diameter	Operating pressure * PS	Operating temperature TS	Allowable diff. pressure ** ΔPMX	for Controller
22,694	PN16	EN-GJS-400-18-LT	1 1/2" (25, 40, 50)	min. -0,8 bar max. 8,0 bar	min. -10°C max. 200°C	5,0 bar	R5
				min. -0,8 bar max. 13,0 bar	min. -10°C max. 200°C	8,0 bar	R8
				min. -0,8 bar max. 13,0 bar	min. -10°C max. 200°C	13,0 bar	R13

* The operating pressure refers both to the maximum pressure of the motive medium and to the maximum pressure of the condensate upstream of the pump trap.

** The allowable differential pressure refers to the difference between the maximum pressure of the condensate upstream of the pump trap and the minimum possible back pressure.



ATTENTION!
 The maximum permissible back pressure (pressure at the outlet of the pump condensate trap for the controller) is:
 - 5.0 bar
 - If the pump condensate trap is to be used for higher back pressures, you must consult with the manufacturer first.

4.5 Technical data – remarks

Refer to the catalogue sheet for the main dimensions, service dimensions and weights. You can determine the flow and the pumping capacity using the calculation module in myValve[®].

4.6 Operating principles

In normal operation (positive differential pressure, admission pressure > back pressure), the pump condensate trap works as a conventional float condensate drain. As soon as condensate flows into the housing, the water level in the housing rises. As the water level rises so too does the float in the housing and it opens the shut-off element by means of a lever. Due to the positive differential pressure, the condensate is evacuated on a continuous and congestion-free basis in normal operation.

If the admission pressure upstream of the pump condensate trap falls to the extent that the differential pressure becomes negative, it is no longer possible for the condensate to drain from the pump condensate trap. Due to the gravitational pressure that is still present (pay attention to the minimum suction head), condensate continues to flow towards the pump condensate trap. This means that the water level in the housing continues to rise. If the water level reaches the top switching point in the housing, the pump condensate trap automatically switches to pump mode. When doing this, the system opens the motive steam valve in the top section of the housing and closes the venting valve at the same time. The motive steam that now flows in increases the internal pressure in the housing such that the condensate that is in the housing is expelled. The check valve that is integrated in the inflow prevents the condensate from flowing back into the system while this is taking place.

As the condensate flows out, the float in the housing drops again. When the float reaches the bottom switching point, the system closes the motive steam valve again and opens the venting valve at the same time. This means that the internal pressure is reduced and condensate can flow into the housing again. The pumping process starts again from the beginning.

The pump condensate trap continues to work in pump mode until the admission pressure upstream of the condensate drain exceeds the back pressure again and then switches back to normal operation automatically.

4.7 Marking

Details of the CE marking on the type plate:

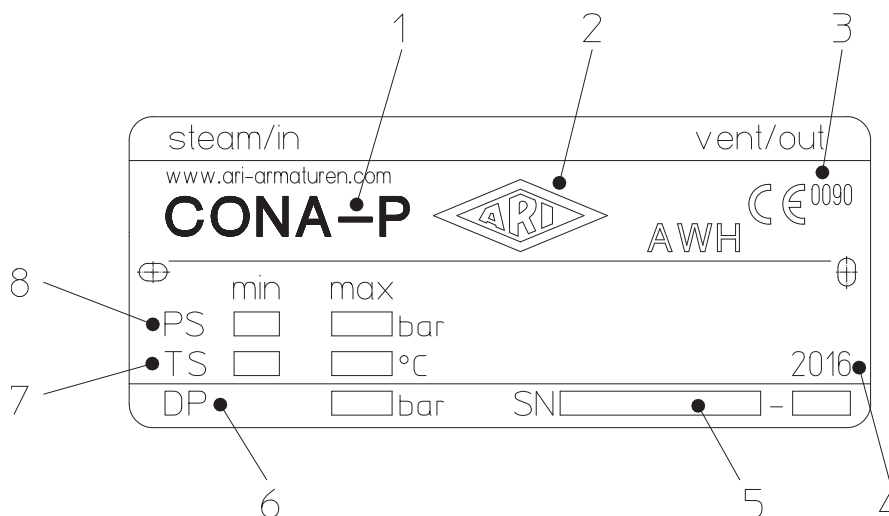


Fig. 1

- 1 Product description
- 2 Manufacturer
- 3 CE marking, Notified body
- 4 Year of manufacture
- 5 Serial number
- 6 DP max. = max. permissible differential pressure
- 7 TS min. = min. permissible temperature
TS max. = max. permissible temperature
- 8 PS min. = min. permissible pressure
PS max. = max. permissible pressure

For address of manufacturer,
refer to Point 11.0 Warranty /
Guarantee

Flow direction is marked on the housing by a direction arrow.

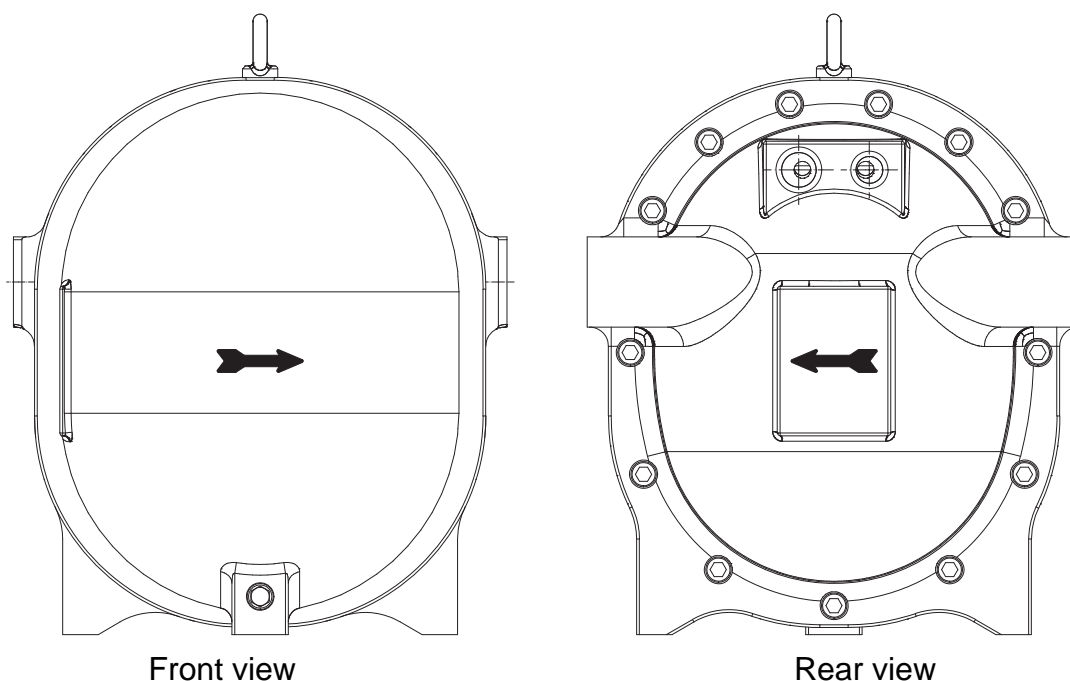


Fig. 2

5.0 Installation

5.1 General remarks on installation

The following points should be taken into account in addition to the general principles governing installation work:



ATTENTION!

- *Do not remove flange covers and nozzle caps until immediately prior to installing the equipment, in order to prevent the ingress of dirt or foreign particles.*
- *The interior of the pump trap and the pipeline must be free of foreign particles.*
- *Note the flow direction of the pump trap.*
- *The pump trap must stand securely on a level surface.*
- *You must dewater the motive steam line before the pump condensate trap.*
- *The flow rate is largely determined by filling head of the condensate pump. For the minimum filling head, refer to the data sheet.*
- *The motive steam pressure should not be more than 4 bar above the overall back pressure and may not exceed the operating pressure printed on the type plate. A pressure reducing device should be provided if necessary.*
- *All installation work must be carried out by specialist personnel.*
- *Lay pipelines such that damaging transverse, bending and torsional forces are avoided.*
- *Suitable materials handling and lifting equipment should be used for assembly work. See catalogue sheet for weights.*
- *Centre the gaskets between the flanges.*
- *In principle, you must take precautions to prevent any systems at risk from frost from freezing.*

- Planners / construction companies or the owner are responsible for positioning and installing products.
- The valves are designed for deployment in systems that are not affected by the weather.
- For applications out of doors or in adverse environments like corrosion-promoting conditions (sea water, chemical vapours, etc.), special designs or protective measures are recommended.

5.2 Place of installation

The place of installation should be easily accessible and provide ample space for maintenance and removing the hood of the pump trap. For the servicing dimensions, refer to the data sheet.

5.3 Installation diagram

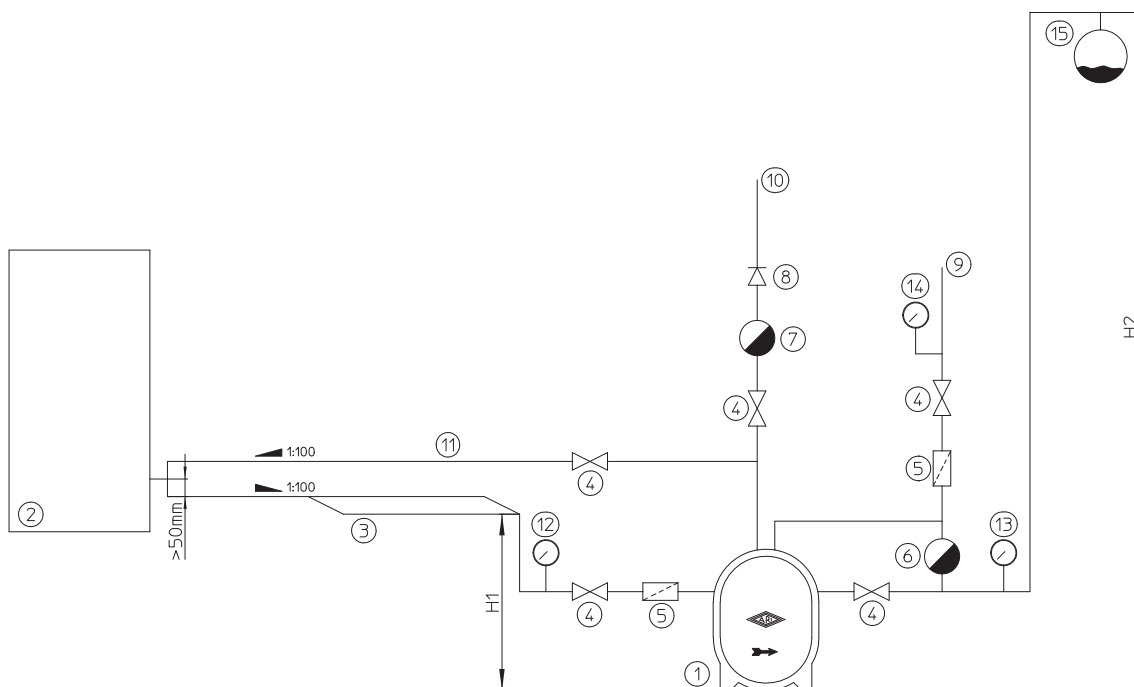


Fig. 3

- | | | | |
|---|---------------------------|----|--|
| 1 | ARI-CONA [®] P | 10 | Vent line |
| 2 | Steam consumer | 11 | Blow-out line |
| 3 | Collecting tank/reservoir | 12 | Pressure gauge (admission pressure) |
| 4 | Stop valve | 13 | Pressure gauge (back pressure) |
| 5 | Strainer | 14 | Pressure gauge (motive steam pressure) |
| 6 | Steam trap | 15 | Condensate manifold |
| 7 | Steam trap | H1 | Suction head |
| 8 | Check valve | H2 | Discharge head |
| 9 | Motive steam line | | |

6.0 Commissioning



ATTENTION!

- Before commissioning the condensate pump, check the material, pressure, temperature and direction of flow.
- Regional safety instructions must be adhered to.
- Residues in piping and condensate pump (dirt, weld beads, etc.) inevitably lead to leakage. Flush the pipes and clean the strainer if necessary.
- Check that all connections are tight.
- The temperature of the surfaces can reach 200 °C during operation. Insulation and notes on possible dangers should be provided where necessary.
- Open any stop valves in the feed pipe downstream of the pump trap.
- Slowly open the shut-off valve in the motive steam pipe.
- Open the shut-off valve in the inlet pipe.
- Open the shut-off valves in the blow-out and vent pipes. As soon as enough condensate is flowing into the pump condensate trap, it starts working automatically.

Before commissioning a new plant or restarting it after repairs or modification, always ensure that:

- All work has been completed correctly!
- All the valves are in the correct position for its function.
- Safety devices have been attached.
- Check all bolting.
- Carry out a visual inspection for leaks.
- Possibly check the strainer.

7.0 Care and maintenance

The operator must define maintenance and maintenance-intervals to meet requirements.



ATTENTION!

- **read points 10.0 and 11.0 before carrying out installation and repair work !**
- **read point 6.0 before recommissioning**

Clean all threads and sealing faces with temperature stable lubricant (e.g. OKS Anti-Seize Paste, white / metal-free) prior to installing the equipment.

- *Shut off all pipes to and from the pump trap.*
- *Stop valves should be marked and if possible secured to prevent inadvertent opening.*
- *Allow the system to cool down.*
- *Make sure it has no pressure.*
- *Wear protective clothing and equipment and use suitable tools.*

7.1 Dismounting the hood

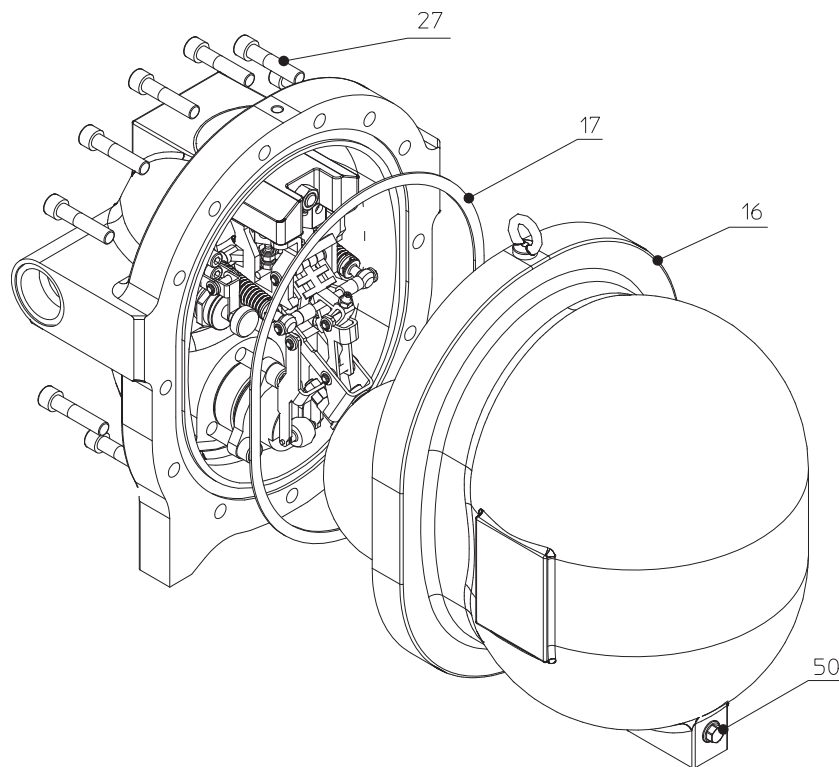


Fig. 4

- Depressurize the pump condensate trap.
- Vent the pump condensate trap using the drain plug (item 50).
- Remove the cheese-head screws (item 27).
- Take off the hood (item 16).
- Remove sealant residue from the housing and the hood and clean the sealing surfaces carefully.

7.2 Replacing the pump controller

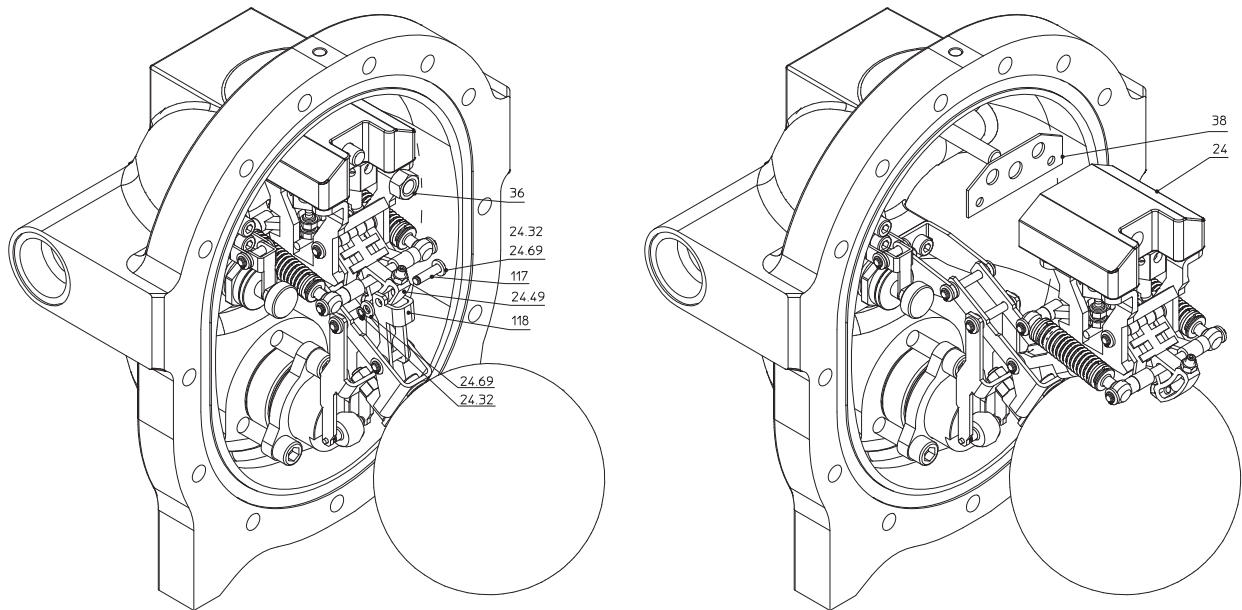


Fig. 5

- Remove the hood as described in point 7.1.
- Remove the retaining ring (item 24.32) and the washer (item 24.69) on one side of the connecting pin (item 117) between the bridge (item 118) and the release lever (item 24.49).
- Remove the connecting pin (item 117), check it for wear and replace it if necessary.
- Remove the hex nut (item 36).
- Pull the pump controller (item 24) out of the housing.
- Remove sealant residue from the housing and clean the sealing surfaces carefully.
- Insert a new flat gasket (item 38) into the housing.
- Insert a new pump controller (item 24) into the housing and fasten it using the hex nut (item 36). Tightening torque of 70Nm.
- Insert the connecting pin (item 117) between the bridge (item 118) and the release lever (item 24.49). Secure the connecting pin with a washer (item 24.69) and a **new** retaining ring (item 24.32).
- Mount the hood as per point 7.4.

To replace the pump controller, you need the following spare parts:

Designation	Position	Part number	Quantity
Hood seal	17		1
Flat gasket	38		1
Pump controller	24		1
Connecting pin	117		1 *
Retaining ring	24.32		1 (2 *)

*The connecting pin is optional

7.3 Replacing the seat of the condensate outlet valve including the condensate outlet check valve

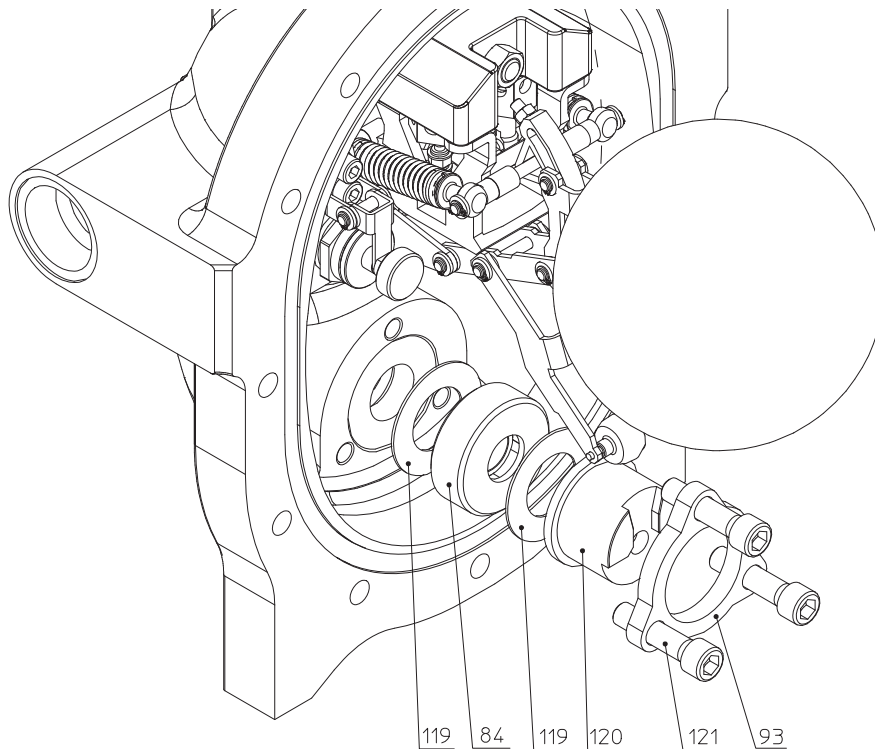


Fig. 6

- Remove the hood as described in point 7.1.
- Put the float in the topmost position and fix it there.
- Remove the cheese-head screws (item 121) on the loose-type flange (item 93).
- Remove the loose-type flange (item 93), the seat (item 120), the check valve (item 84) and the flat gaskets (item 119).
- Check the seat for damage and check easy movement of the check valve and whether it is damaged; if this is the case, replace this valve.
- Clean sealing surfaces carefully.
- Carry out assembly in the reverse order to disassembly
- Tightening torque of the cheese-head screws is 60 Nm.

7.4 Mounting the hood

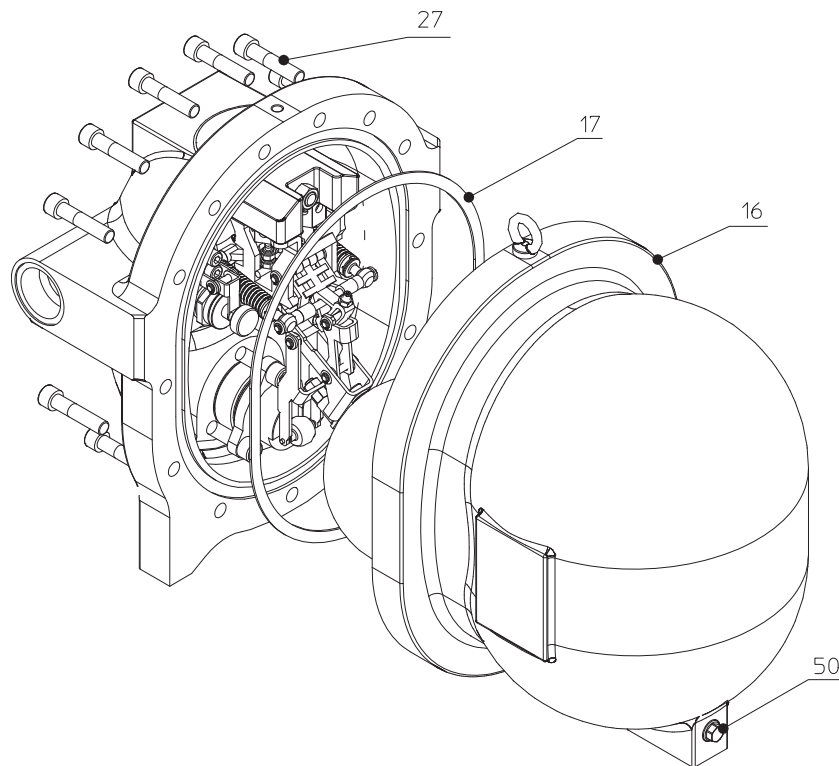


Fig. 7


- Inspect the sealing surfaces on the housing and the hood for damage and, if necessary, clean them carefully.
- Insert a new flat gasket (item 17) into the housing
- Put the hood (item 16) onto the housing such that the hood's spring is positive-locked in the groove of the housing.
- Tighten the cheese-head screws (item 27) finger-tight and then tighten them in the diagonally opposite sequence to a torque of 80Nm.

7.5 Tightening torques

Pos.	CONA [®] P PN16	Torque (Nm)
27	Cheese head screw M12	80
36	Hexagon nut	70
121	Cheese head screw M12	60
	Cheese head screw M8	20

8.0 Troubleshooting

In the event of malfunction or faulty operating performance check that the installation and adjustment work has been carried out and completed in accordance with these Operating Instructions.

	<p>ATTENTION ! <i>- It is essential that the safety regulations are observed when identifying faults.</i></p>
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If malfunctions cannot be eliminated with the help of the following table “9.0 Troubleshooting table”, the supplier or manufacturer should be consulted.

9.0 Troubleshooting table

	<p>ATTENTION! <i>- read points 10.0 and 11.0 before carrying out installation and repair work !</i> <i>- read point 6.0 before recommissioning</i></p>
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9.1 Draining mode

Fault	Possible causes	Remedy
No flow	Installed in wrong flow direction	Check the flow direction, fit valve in direction of flow arrow.
	Flange covers / flange covers not removed	Remove completely flange covers or flange covers
	Ball float defective	Change ball float
	Line blocked.	Completely open the shut-off valves upstream and downstream of the pump condensate trap.
	Differential pressure is too high.	Select a regulator to match the maximum differential pressure.
Little flow	Wrong regulator size selected.	Select the correct regulator size according to the differential pressure and the regulator diagram
	Inadequate flow in the piping system.	Inspect the piping system, completely open the isolation valves; if necessary, clean the strainer, pay attention to the installation diagram.
Leakage in shut-off, loss of steam.	Seat of condensate drain is worn.	Replace seat of condensate drain valve; if necessary, install strainer in inlet pipe.
	Heavy contaminant deposits in housing/hood.	Remove contaminant deposits; if necessary, install strainer in inlet pipe.

9.2 Pumping operation

Fault	Possible causes	Remedy
Low, insufficient flow rate; pump trap works fast.	Check valve at inlet leaking or blocked in open position. Condensate flows back into manifold or heat exchanger during pumping.	Check and clean the check valve at the inlet and if necessary replace. If required, install a strainer in the condensate inlet pipe.
	Check valve at outlet leaking or blocked in open position. Condensate flows back from feed pipe into body of pump trap.	Check and clean the check valve at the outlet and if necessary replace. If required, install a strainer in the condensate inlet pipe. Be careful not to drop small parts into the body of the pump trap while carrying out maintenance work.
Low, insufficient flow rate; pump trap works slowly.	Condensate only fed slowly to pump trap. Flow resistance in inlet pipe too high.	Open the stop valves fully, check and clean the strainer.
	Filling head of pump trap too low.	Raise the filling head. If necessary, several condensate pumps in parallel.
	Motive steam pressure is too low or too high.	Increase the pressure of the drive medium or reduce it. Pay attention to the permissible motive steam parameters from MyValve. Completely open the isolation valves in the motive steam pipe.
	Flow resistance in feed pipe too high.	Use a shorter feed pipe or select a larger nominal diameter. Open the stop valves in the feed pipe fully.
Low, insufficient flow rate; pump trap works normally.	Condensate level too high.	Check the design data and the actual condensate level. If necessary, several condensate pumps in parallel.
	Condensate only occurs irregularly or intermittently.	Connect a buffer vessel upstream (select a larger manifold, etc.)
Pump trap does not work correctly or does not work at all.	One or more of the shut-off valves in the inlet and outlet pipes are blocked.	Check the shut-off valves in all the inlet and outlet lines and open them completely.
	Motive steam pressure is too low.	Increase the motive steam pressure. Attention! Pay attention to the permissible motive steam parameters from MyValve [®] .
	Motive steam pressure is too high.	Reduce the motive steam pressure below the maximum permissible pressure. Pay attention to the permissible motive steam parameters from MyValve [®] .
	Pump controller is defective, e.g. the spring or spindle is broken.	Replace the pump controller, see point 7.2
	Float ball is defective or leaking.	Replace the float.

10.0 Dismantling



ATTENTION!

The following points must be observed:

- *Pressureless pipe system.*
- *Medium must be cool.*
- *Plant must be drained.*

11.0 Warranty / Guarantee

The extent and period of warranty cover are specified in the "Standard Terms and Conditions of Albert Richter GmbH & Co. KG RTG-Regelungstechnik GmbH" valid at the time of delivery or, by way of departure, in the contract of sale itself.

We guarantee freedom of faults in compliance with state-of-the-art technology and the confirmed application.

No warranty claims can be made for any damage caused as the result of incorrect handling or disregard of operating and installation instructions, datasheets and relevant regulations.

This warranty also does not cover any damage which occurs during operation under conditions deviating from those laid down by specifications or other agreements.

Justified complaints will be eliminated by repair carried out by us or by a specialist appointed by us.

No claims will be accepted beyond the scope of this warranty. The right to replacement delivery is excluded.

The warranty shall not cover maintenance work, installation of external parts, design modifications or natural wear.

Any damage incurred during transport should not be reported to us but *rather* to the competent cargo-handling depot, the railway company or carrier company immediately or else claims for replacements from these companies will be invalidated.



Technology for the Future.
GERMAN QUALITY VALVES

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