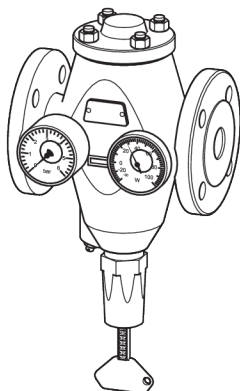


Gestramat Cooling-Water Control
Valve

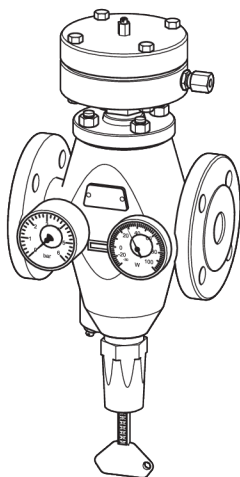


CW 41

CW 41/4

MCW 41

MCW 41/4



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Foreword

This installation & operating manual will help you use the following types of equipment safely and efficiently for their intended purpose.

- CW 41
- CW 41/4
- MCW 41
- MCW 41/4

These steam traps will be called equipment in this document.

This installation & operating manual is intended for anyone commissioning, using, operating, servicing, cleaning or disposing of this equipment and, in particular, for professional after-sales service technicians, qualified personnel and authorised and trained staff.

All of these persons must read and understand the content of this installation & operating manual.

Following the instructions given in this installation & operating manual helps avoiding danger and increases the reliability and service life of the equipment. Please note that in addition to the instructions given in this installation & operating manual you must also observe all locally applicable rules and regulations concerning the prevention of accidents as well as approved safety guidelines for good professional practice.

Availability

Keep this installation & operating manual together with the plant documentation for future reference. Make sure that this installation & operating manual is available to the operator.

The installation & operating manual is part of the equipment. Please hand over this installation & operating manual when selling the equipment or passing it on.

Formatting features in the document

Certain text elements of this installation & operating manual feature a specific typographic design. You can easily distinguish the following text elements:

Standard text

Cross-reference

- Listing
 - Sub-items in listings
- Steps for action.



Here you will find additional useful information and tips serving to assist you in using the equipment to its fullest potential.

Directions in this manual

The following directions are used in this manual:

- The "front" of the equipment is the side of the body that bears the name plate.
- The "underside" of the equipment is where the adjuster is fitted.
- The medium inlet is on the "left" of the body, the medium outlet on the "right".

Safety

Use for the intended purpose

The following types of cooling-water control valve are employed in the cooling-circuit return, in order to maintain a constant return temperature:

- CW 41
- CW 41/4
- MCW 41
- MCW 41/4

The equipment must only be used within the allowable pressure and temperature limits and only if the chemical and corrosive influences on the equipment are taken into account.

Correct use includes compliance with the instructions given in this installation & operating

manual, in particular obedience to all safety instructions.

Any other use of the equipment is considered to be improper.

Note that the equipment is also used incorrectly if the materials of the equipment are not suitable for the fluid.

Basic safety notes

Risk of severe injuries

- ▶ The equipment is under pressure during operation and may be hot. Before carrying out any work on the equipment make sure that the following requirements are met:
 - ▶ The pipes must be depressurized (0 bar).
 - ▶ The fluid must be completely removed from the pipes and the equipment.
 - ▶ During work on the equipment the installation must be switched off and protected against unauthorised or unintended activation.
 - ▶ The pipes and the equipment must have cooled down to room temperature (approx. 20 °C).
- ▶ If the equipment is used in contaminated areas there is a risk of severe injuries or death caused by harmful substances in or on the equipment. Before working on the equipment make sure that it is completely decontaminated. Always wear the protective clothing prescribed for contaminated areas when working on the equipment.
- ▶ The equipment must only be used with fluids that do not attack the material and the gaskets and sealings of the equipment. Otherwise leaks may occur and hot or toxic fluid could escape.
- ▶ The equipment and its component parts must only be mounted or removed by qualified personnel. A qualified person must be acquainted with and experienced in the following:
 - ▶ Making pipe connections.
 - ▶ Selecting suitable lifting gear and understanding the rules for its safe use.

- ▶ Working with dangerous (contaminated, hot or pressurized) fluids.

- ▶ If the admissible temperature and pressure limits are exceeded the equipment may be destroyed and hot or pressurized fluid may escape. Make sure that the equipment is only operated within the admissible service range and limits.

For more information on limits and pressure & temperature ratings see name plate and the section "*Technical Data*".

Risk of minor injuries

- ▶ Sharp edges on internals present the danger of cuts to hands. Always wear industrial gloves when servicing the equipment.
- ▶ If the support of the equipment during installation is insufficient the equipment might fall down, thereby causing bruises or injuries. Make sure the equipment is safely held in place during installation and cannot fall down. Wear protective safety footwear.

Information on property damage or malfunctions

- ▶ Malfunctions will occur if the equipment is installed in a wrong position or with the flow arrow pointing in the opposite direction of the fluid flow. This may result in damage to the equipment or the installation. Make sure that the flow arrow on the equipment body matches the indicated direction of the fluid flow in the pipe.
- ▶ If the material is unsuitable for the fluid, increased wear may occur and fluid may escape. Make sure that the material is suitable for the fluid used in your installation.

Qualification of personnel

A qualified person must be acquainted with and experienced in the following:

- ▶ the pertinent on-site rules and regulations for preventing fire and explosions as well as industrial safety regulations
- ▶ working on pressure equipment
- ▶ making pipe connections
- ▶ working with dangerous (hot or pressurized) fluids
- ▶ lifting and transporting loads
- ▶ observing all notes and instructions in this installation & operating manual and the applicable documents

Protective gear

The operator must ensure that anyone working on the equipment must wear the required protective clothing and safety gear stipulated for the site of installation. The protective clothing must be suitable for the used media and must protect the wearer against safety and health hazards associated with a particular job to be carried out at the site of installation. Protective clothing & equipment must provide protection from potential hazards, in particular from injuries to:

- ▶ Head
- ▶ Eyes
- ▶ Body
- ▶ Hand
- ▶ Feet
- ▶ Hearing

Note that this list is not exhaustive. The operator must establish personal protective equipment guidelines and specify any additional protective gear that is required if the worker is exposed to a specific risk at the site of installation.

Typographic features of warning notes



DANGER

Notes with the heading DANGER warn against imminent dangerous situations that can lead to death or serious injuries.



WARNING

Notes with the heading WARNING warn against possibly dangerous situations that could lead to death or serious injuries.



CAUTION

Notes with the heading CAUTION warn against dangerous situations that could lead to minor or moderate injuries.

Formatting features for warnings of property damage

Attention!

This information warns of a situation leading to property damage.

Description

Scope of supply and equipment specification

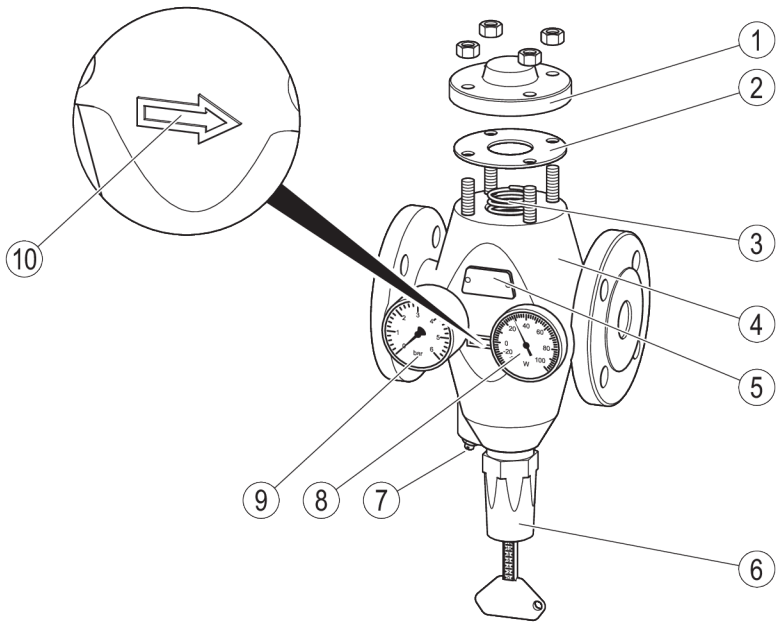
Scope of supply

The following equipment parts are not installed on delivery, and must be fitted before assembly:

Equipment specification

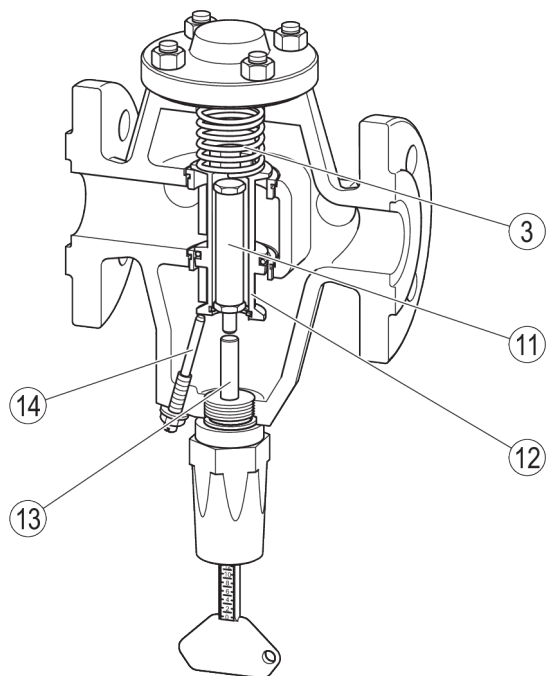
- ▶ Thermometer with sealing ring
- ▶ Pressure gauge
- ▶ Adjusting key

i The diagrams below show a type CW 41 DN25 device.



No.	Designation
1	Lid
2	Body gasket
3	Spring
4	Body
5	Name plate

No.	Designation
6	Adjuster with adjusting key
7	Setting screw for bleed flow
8	Thermometer
9	Pressure gauge
10	Direction of flow arrow



No.	Designation
3	Spring
11	Thermostat (diagram shows model DN25 with one thermostat)

No.	Designation
12	Double cone
13	Pin of adjuster
14	Pin for setting the bleed flow

Optional extras

The following items are available as optional extra:

The double cone is available in two versions:

- s-cone for high flow rates
- r-cone for reduced flow rates, with holes and additional groove with O-ring

The control unit consists of one (DN25), two (DN40, DN50) or three (DN80, DN100) solids thermostats, depending on the size of the equipment.

There are three types of solids thermostat for different outlet temperatures:

- ▶ n-thermostat with rubber elastic expansion material for an outlet temperature from +3 to +100 °C
- ▶ k-thermostat with rubber elastic expansion material for an outlet temperature from -32 to +74 °C
- ▶ w-thermostat with expansion wax for an outlet temperature from +20 to +60 °C

i The combination of double cone and thermostat types used in the equipment is stated on the name plate.

i In this manual, thermostats are always mentioned in the singular, regardless of the number of thermostats actually installed in the equipment. All the information in this manual applies to all installed thermostats.

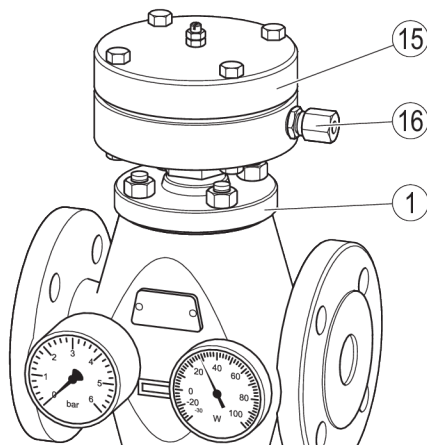
In addition to the standard version, the equipment can also be supplied in the following versions:

- ▶ MCW 41 and MCW 41/4 with diaphragm actuator (see section below)
- ▶ CW 41/4 with inner parts suitable for saline media, cooling water containing ammonia, and chlorinated hydrocarbons

Type CW 41/4 units differ only in the type of materials used for the standard equipment. For CW 41/4 models, adapters for the adjuster, thermometer and pressure gauge are available as optional extras. These adapters increase the distance from the body, making it possible to read and operate the equipment after the fitting of insulation on-site. A thermometer with an extended length of 105 mm is also available as an optional extra.

MCW 41 and MCW 41/4 with diaphragm actuator

The diaphragm actuator (15) is mounted on the lid (1). Via the compressed air connection on the side, a compressed air line supplies the diaphragm actuator (16) with compressed air provided by the customer. The compressed air connection has an ERMETO GE 6-L coupling.



You can also retrofit a diaphragm actuator on all equipment. To do this, remove the lid and replace by a lid with diaphragm actuator.

End connections

The equipment is available with the following end connections:

- ▶ Flanges

Name plate

The following items are indicated on the name plate:

- ▶ Manufacturer
- ▶ Type designation
- ▶ Design
- ▶ Pressure rating
- ▶ Max. admissible differential pressure

The following items are indicated on the equipment body:

- ▶ Date of manufacturing
- ▶ Nominal size
- ▶ Material
- ▶ Direction of flow
- ▶ Batch code

The name plate also contains a code for the control unit used for the equipment. This code indicates the combination of double cone and thermostat types.

Application of European Directives

Pressure Equipment Directive

The equipment conforms to this directive (see "Manufacturer's Declaration" section) and can be used for the following media:

CW 41

- ▶ Fluids of group 2
(for fluid media only)

CW 41/4

- ▶ Fluids of group 1
- ▶ Fluids of group 2
(for fluid media only)

ATEX Directive

CW 41 and CW 41/4

The equipment does not have its own potential ignition source and is not subject to this directive (see "Manufacturer's Declaration" section).

When installed, static electricity may arise between the equipment and the connected system.

When used in potentially explosive atmospheres, the plant manufacturer or plant operator is responsible for discharging or preventing possible static charge.

If it is possible for medium to escape, e.g. through actuating mechanisms or leaks in threaded joints, the plant manufacturer or plant operator must take this into consideration when dividing the area into zones.

MCW 41 and MCW 41/4

The equipment has classification: CE Ex II 2G/D c X.

For use in potentially explosive atmospheres in zones (surrounding atmosphere to Directive 1999/92/EC) 1, 2, 21 and 22, please read and observe the following information:

The sign "X" in the Ex label signifies that operation at an excessive surface temperature caused by the medium must be avoided. The equipment itself does not generate additional surface temperatures.

Once installed, static electricity may arise between the equipment and the connected system. During use in potentially explosive atmospheres, the discharge or prevention of possible electrostatic charging is the responsibility of the manufacturer or owner of the system. If there is a possibility that medium might escape, e.g. via actuating devices or leaks in screwed couplings, the manufacturer or owner of the system must take this into consideration when dividing the area into zones.

If the MCW has a pneumatic drive, if incorrectly discharged the exhaust air (compressed air) required for operation can lead to swirls of potentially explosive dust.

Task and function

Purpose

Cooling-water control valves are directly actuated proportional controllers. They are used to maintain a constant return temperature in a cooling-water or cooling-solution return. The return temperature can be adjusted.

This enables a higher return temperature and therefore increased heat absorption by the cooling water or cooling solution. The consumption of coolant and energy is therefore reduced.

Cooling-water control valves also ensure the demand-based supply of coolant to heat exchangers connected in parallel.

The optional diaphragm actuator provides the additional function of removing impurities. This enables the equipment to be used with dirty or untreated cooling water. The diaphragm actuator can also be operated centrally. This way, you can switch the diaphragm actuator on and off from a control stand, for example .

Function

CW 41 and CW 41/4

The control unit consists of one (DN25), two (DN40, DN50) or three (DN80, DN100) solids thermostats, depending on the size of the equipment.

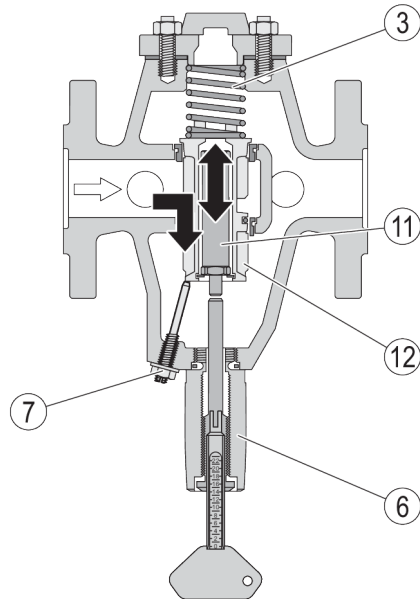
When the equipment becomes hot, the expansion material in the thermostat (11) expands in volume. When the return temperature increases, a pin is pushed out of the thermostat. This lifts and therefore opens the double cone (12) against the pressure of the spring (3). The flow rate increases. When the return temperature falls, the expansion material in the thermostat shrinks in volume. The spring pressure closes the double cone. The flow rate falls.

A bleed flow is continually present, even when the equipment is closed. The bleed flow enables the equipment to react quickly to changes in return temperature. You can regulate the bleed flow rate using a setting screw (7).

In models with r-cone, the bleed flow is directed through two holes in the double cone. In models

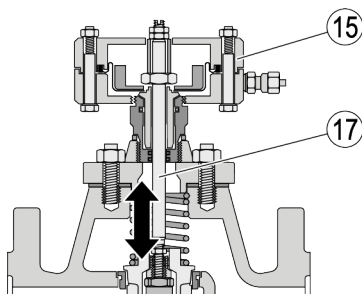
with s-cone, the bleed flow is directed via the lower seat.

To set the desired return temperature, use the adjuster (6). The currently set return temperature is displayed on a scale on the adjusting key.



MCW 41 and MCW 41/4

The diaphragm actuator (15) is driven by compressed air. When operated, the diaphragm actuator lifts a spindle (17). The spindle completely opens the double cone. Impurities are therefore flushed out of the equipment. After the flushing process, the double cone is closed by spring pressure as soon as the diaphragm actuator is switched off.



Storing and transporting the equipment

Attention!

Equipment can be damaged if stored or transported improperly.

- Close all openings with the sealing plugs or covers supplied with the equipment or use similar sealing covers.
- Protect the equipment against moisture and corrosive atmospheres.
- Please contact the manufacturer if the specified transport and/or storage requirements cannot be met.

Storing the equipment

- Please observe the following items when storing the equipment:
 - Do not store the equipment for more than 12 months.
 - Use the supplied sealing plugs or other suitable seal caps in order to seal off all openings of the equipment.
 - Protect the sealing surfaces and contact areas against mechanical damage.
 - Protect the equipment and all components against hard shocks and impacts.
 - Store the equipment only in closed rooms that meet the following environmental conditions:
 - Air humidity below 50 %, not condensing
 - Indoor air: clean, salt-free and non-corrosive
 - Temperature 5–40 °C.
- Make sure that all these requirements are always met when storing the equipment.
- Please contact the manufacturer if you cannot comply with the recommended storage conditions.

Transporting the equipment



CAUTION

Do not drop the equipment. If it falls down it may cause bruises and injuries.

- To transport and mount the equipment safely use suitable lifting gear.
- Connect the noose strap of the lifting gear to the body.
- Provide sufficient support for the equipment during transport and installation.
- Wear protective safety footwear.

Lightweight equipment may be transported and mounted without using any lifting gear.

To lift equipment the weight of which exceeds approx. 25 kg, you need the help of a second person or suitable lifting gear.

Your physical strength and on-site regulations and conditions determine what weight can be lifted and if support is required.

- Meet the requirements for storage also when transporting the equipment.
- Prior to transport seal off connections with sealing plugs.



If you do not have the sealing plugs supplied with the equipment use appropriate seal caps to seal off the connections.

- For short distances (only a few metres) you can transport the equipment unpacked.
- When transporting the equipment over larger distances use the original packaging.
- If you do not have the original packaging use a box that protects the equipment adequately against corrosion and physical damage.



For a short period of time the equipment may be transported even if the temperature is below 0 °C, provided that the equipment is completely empty and dry.

Mounting and connecting the equipment

Preparing installation

- Take the equipment out of the transport packaging.
- Check the equipment for transport damage.
- Contact the manufacturer if you detect any kind of shipping damage.

When supplied by the factory, the connections may be sealed off with sealing plugs.

- Remove sealing plugs before mounting the equipment.
- Keep the sealing plugs and the packing for further use.



DANGER

Personnel working on pipes are exposed to safety risks and may suffer severe injuries, poisoning or even loss of life.

- Make sure that no hot or hazardous fluid is in the equipment or the pipes.
- Make sure that the pipes upstream and downstream of the equipment are depressurised.
- Make sure that the installation is switched off and protected against unauthorised or unintended activation.
- Make sure that the equipment and the pipes have cooled down to room temperatures.
- Wear protective clothing that is suitable for the fluid and, if necessary, wear protective gear.

For more information on suitable protective clothing and safety gear refer to the safety data sheet of the fluid in question.

- Drain pipes until they are empty.
- Switch the installation off and protect it against unauthorised or unintended re-activation.

The following tools are required for working on the equipment:

- ▶ Torque wrench 10–100 Nm to DIN ISO 6789
- ▶ Open-ended spanner size 8 (hex nuts on diaphragm actuator)
- ▶ Open-ended spanner size 13 (hex nuts on models with DN25 to DN50 and hex nut on setting screw)
- ▶ Open-ended spanner size 14 (pressure gauge)
- ▶ Open-ended spanner size 16 (hex nuts in models from DN80 onwards)
- ▶ Open-ended spanner size 17 (hex nuts on older models from DN80 onwards)
- ▶ Open-ended spanner size 19 (thermometer and setting screw)
- ▶ Open-ended spanner size 32 (adjuster)

To operate a diaphragm actuator on an MCW 41, a compressed air connection with a pressure from 3 to 10 barg is required.

- ▶ Ensure an adequate supply of compressed air at the installation site.

- ▶ Lubricate all threads and the contact surfaces of nuts and bolts with temperature-resistant lubricant.

The lubricant must have the same properties as OKS®217.

- ▶ Screw the thermometer onto the hex nut of the right-hand connection on the body using a size 19 open-ended spanner.
- ▶ Tighten the thermometer fastening to a torque of 64 Nm.

To attach the pressure gauge (9), proceed as follows:

- ▶ Remove the screw plug and sealing ring from the left-hand connection (20).
- ▶ Wind PTFE sealing tape (19) tightly around the thread of the pressure gauge.
- ▶ Screw the pressure gauge onto the hex nut of the left-hand connection (20) on the body using a size 14 open-ended spanner.
- ▶ Tighten the pressure gauge fastening to a torque of 65 Nm.

Attaching parts to the equipment

Important!

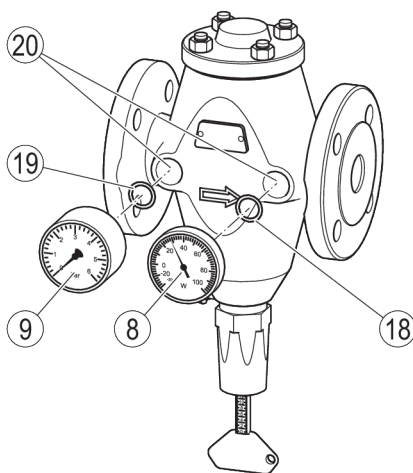
Incorrect assembly can damage measuring equipment.

- ▶ Make sure that assembly is performed by specialist personnel.
- ▶ Only apply the tool to the hex nut of the fastening.
- ▶ Do not apply the tool directly to the measuring equipment.

Attach parts supplied loose on delivery before assembling the equipment.

To attach the thermometer (8), proceed as follows:

- ▶ Remove the screw plug and sealing ring from the right-hand connection (20).
 - ▶ Insert the sealing ring (18) in the right-hand connection on the body.
- ▶ Push the adjusting key from underneath up into the hole of the adjuster as far as it will go.

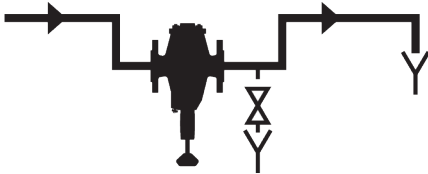


Connecting the equipment

The equipment can be connected in any installation position. Installation with a horizontal direction of flow and the adjuster hanging down ensures optimum function.

To ensure perfect function, make sure the following conditions are complied with:

- ▶ Install the equipment in the cooling-water return as close as possible to the heat exchanger.
- ▶ Install the equipment in a water pocket.
- ▶ If the medium is dirty or contains foreign bodies, install a dirt trap upstream of the equipment.
- ▶ If there are chalk deposits, use a water softener.
- ▶ If the equipment is being used as an end valve, make sure that it cannot run empty. Otherwise, drying out or deposits are possible.
- ▶ If there is a risk of freezing, install a drainage valve in the water pocket.



DANGER

Incorrectly connected equipment can cause fatal accidents or severe injuries.

- ▶ Make sure that only qualified skilled personnel connect the equipment to pipes.
- ▶ Make sure that the flow arrow on the equipment body matches the direction of flow in the pipe.

Specialist personnel must be highly qualified and fully experienced in making pipe connections for the respective type of end connection.



CAUTION

Do not drop the equipment. If it falls down it may cause bruises and injuries.

- ▶ To transport and mount the equipment safely use suitable lifting gear.
- ▶ Connect the noose strap of the lifting gear to the body.
- ▶ Provide sufficient support for the equipment during transport and installation.
- ▶ Wear protective safety footwear.

Lightweight equipment may be transported and mounted without using any lifting gear.

To lift equipment the weight of which exceeds approx. 25 kg, you need the help of a second person or suitable lifting gear.

Your physical strength and on-site regulations and conditions determine what weight can be lifted and if support is required.

Attention!

Equipment will be damaged if the end connections are undersized.

- ▶ Make sure that the connections are strong and rigid enough to support the weight of the equipment and to withstand the forces that occur during operation.

Consider space required for servicing the equipment and/or exchanging components and observe the necessary withdrawal distance to remove the cover. For more information on the required withdrawal distances see section "*Dimensions and weights*" on page 33.

- ▶ Make sure that the pipe system of the plant is clean.
- ▶ Make sure that the equipment is free from foreign matter.
- ▶ Mount the equipment in the desired installation position.
- ▶ Connect the end connections of the equipment properly to the pipes.

To operate the diaphragm actuator in an MCW 41 or MCW 41/4, the drive must be connected to a compressed air supply provided at the installation site. This compressed air supply must ensure a pressure of 3 to 10 barg. It is connected to the Ermeto GE 6-L coupling.

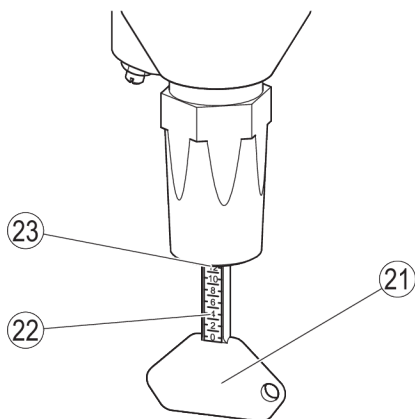
- Make sure that the on-site compressed air line is connected correctly.
- Make sure that the equipment is safely mounted and that all connections are made correctly.

Operation

Adjusting the cooling-water outlet temperature

You can set the desired cooling-water outlet temperature on the equipment to suit the operating conditions. To do so, proceed as follows:

- If necessary, push the adjusting key (21) from underneath up into the hole of the adjuster until it locks into place.
- Read the scale value (22) on the edge (23), as set by the adjusting key.



If the scale value does not match the desired outlet temperature, you can change the setting. The table

overleaf contains the scale values for the outlet temperatures of the various types of equipment.

- To lower the scale value, screw the adjusting key further into the body.
- To increase the scale value, screw the adjusting key further out of the body.
- The table below provides a rough guide for setting the desired outlet temperature during commissioning.
- To prevent unwanted adjustments, take out the adjusting key.
- Keep the adjusting key in a place accessible to authorised personnel.

You can adjust the outlet temperature precisely during commissioning. As the equipment requires approximately 10–15 minutes to adapt to the modified outlet temperature, you must always wait 15 minutes after changing the temperature setting.

- Read the current outlet temperature on the thermometer.
- To raise the outlet temperature, unscrew the adjusting key by about a quarter turn.
- To lower the outlet temperature, screw the adjusting key into the body by about a quarter turn.
- Wait 15 minutes until the system has adapted to the new setting.
- Read the current outlet temperature on the thermometer.
- Repeat the above steps until the desired outlet temperature is displayed.

Desired outlet temperature [°C]									Scale value on key gauge
DN25			DN40, DN50			DN80, DN100			
Equipment option									
wr ws	nr ns	kr ks	wr ws	nr ns	kr ks	wr ws	nr ns	kr ks	
—						63	109	74	— ¹
—						57	104	69	22
—						54	100	65	—
—						51	95	60	20
—						49	90	55	—
—			68	114	79	47	86	51	18
—			60	107	72	45	81	48	—
—			54	100	65	43	77	42	16
—			50	93	58	41	72	37	—
—			47	86	51	39	67	32	14
—			44	79	44	37	63	27	—
68	114	79	41	72	37	36	58	23	12
54	100	65	38	65	30	34	53	18	—
47	82	51	36	58	23	33	49	14	10
41	72	37	33	51	16	31	44	9	—
36	58	23	31	44	9	30	39	4	8
31	44	9	28	37	2	27	35	0	—
25	30	-5	25	30	-5	25	30	-5	6
18	16	-19	20	23	-12	20	25	-10	—
—	3	-32	—	16	-19	—	21	-14	4
—				9	-26	—	16	-19	—
—				3	-32	—	11	-24	2
—							7	-28	—
—							3	-32	0

1 The odd values in between are not indicated on the gauge.

Setting the bleed flow

On delivery, the bleed flow setting screw is set in such a way that the double cone is not lifted.

To set a higher bleed flow, proceed as follows:

- Turn the adjusting key (21) anticlockwise as far as it will go.

The double cone is closed. No bleed flow is present. The pressure gauge displays the upstream pressure of the equipment.

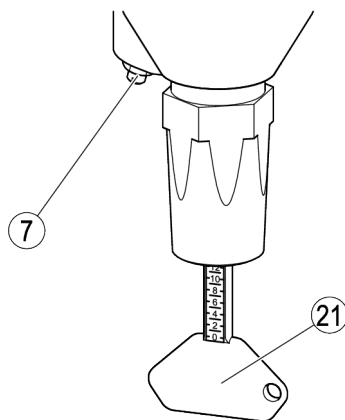
- Turn the setting screw (7) clockwise until the pressure gauge indicates a drop in pressure.

The double cone is now lifted slightly.

- Continue to turn the setting screw to set the desired bleed flow.

As a rule, no more than a quarter to a half turn is required. A full rotation lifts the double cone by approx. 1.2 mm.

- Set the outlet temperature as described on page 15.



After operation



DANGER

If fluid escapes personnel may suffer severe injuries, poisoning or even loss of life.

- After working on the equipment make sure that all connections and valves are tight.
- Make sure that the gaskets of the body are leakproof.



DANGER

Personnel working on pipes are exposed to safety risks and may suffer severe injuries, poisoning or even loss of life.

- Make sure that no hot or hazardous fluid is in the equipment or the pipes.
- Make sure that the pipes upstream and downstream of the equipment are depressurised.
- Make sure that the installation is switched off and protected against unauthorised or unintended activation.
- Make sure that the equipment and the pipes have cooled down to room temperatures.
- Wear protective clothing that is suitable for the fluid and, if necessary, wear protective gear.

For more information on suitable protective clothing and safety gear refer to the safety data sheet of the fluid in question.

When the equipment is closed, the higher-level system parts are under operating pressure. To let off pressure, proceed as follows:

- Block off the supply lines to the equipment.
- In the event of back pressure, you must also block off the drainage line downstream of the equipment.

The screw plugs opposite the thermometer and pressure gauge feature a hole. Through this, you can let off pressure with the screw plugs.

- Slacken one of the two screw plugs slightly.
- You can now hear the medium diverting through the hole. The display on the pressure gauge changes.
- Once the pressure has fully dissipated, close the screw plug.
 - Only commence work once the pressure gauge displays zero pressure.



DANGER

If the equipment is used in contaminated areas there is a risk of severe injuries or death caused by harmful substances in or on the equipment.

- Only qualified personnel are allowed to perform work on contaminated equipment.
- Always wear the protective clothing prescribed for contaminated areas when working on the equipment.
- Make sure that the equipment is completely decontaminated before carrying out any service work.
- Follow the pertinent instructions for handling the hazardous substances in question.

Attention!

Frost damage may occur when the installation is shut down.

- Drain the equipment if ambient temperatures below 0 °C (frost) are to be expected.



If there is a risk of freezing, you must completely drain the equipment after operation.

To do this, you can install a drainage valve in the water pocket.

To drain the equipment, proceed as follows:

- Make sure that medium exiting the system is caught.
- Unscrew the adjuster at the bottom out of the body.

Medium exits the system.

- Wait until the equipment has drained fully.
- Remove the sealing ring from the hole.
- Dispose of the sealing ring in accordance with regulations at the location of use.
- Insert a new sealing ring of the same type in the hole.
- Lubricate all threads and the contact surfaces of nuts and bolts with temperature-resistant lubricant.

The lubricant must have the same properties as OKS®217.

- Screw the adjuster into the body.
- Using the adjuster, tighten the size 32 hex nut to a torque of 80 Nm.

Removing external dirt deposits

- To remove dirt deposits rinse the equipment with fresh water and wipe it with a clean, lint-free cloth.
- To remove any persistent residues use a cleaning agent that is suitable for the material and carefully wipe the equipment with a clean, lint-free cloth.

Maintaining the equipment

The equipment does not require any particular maintenance.

You may exchange the following component parts in case of wear or damage:

This exploded view diagram illustrates the assembly of a pressure washer. The main body (2) is shown with various components being attached or aligned. Callout 2 points to the main body. Callout 3 points to the trigger gun. Callout 4 points to the spray lance. Callout 5 points to the spray lance. Callout 6 points to the spray lance. Callout 7 points to the spray lance. Callout 8 points to the spray lance. Callout 9 points to the spray lance. Callout 10 points to the spray lance. Callout 11 points to the spray lance. Callout 12 points to the spray lance. Callout 13 points to the spray lance. Callout 14 points to the spray lance. Callout 15 points to the spray lance. Callout 16 points to the spray lance. Callout 17 points to the spray lance. Callout 18 points to the spray lance. Callout 19 points to the spray lance. Callout 20 points to the spray lance. Callout 21 points to the spray lance. Callout 22 points to the spray lance. Callout 23 points to the spray lance. Callout 24 points to the spray lance. Callout 25 points to the spray lance. Callout 26 points to the spray lance.

No.	Nominal size	DN25	DN40, DN50	DN80, DN100
	Name	Order number		
2	Body gasket	184372	184373	184374
3	Spring	004950	004981	030001
6	Adjuster, complete	004953		
8	Thermometer	184596		
9	Pressure gauge	004704		
11	w-thermostat ¹	004941		
	n-thermostat ¹	030040		
	k-thermostat ¹	030042		
12	Double cone			
	s-cone	004940	004980	030000
	r-cone, complete with O-ring	184283	184288	184292
18	Sealing ring ²	000992		
21	Adjusting key	004962		
24	Sealing ring	DN25–50 order number 010333 DN 80–100 order number 010510		
25	Circlip	010332		
26	O-ring for r-double cone	030092	030093	031493

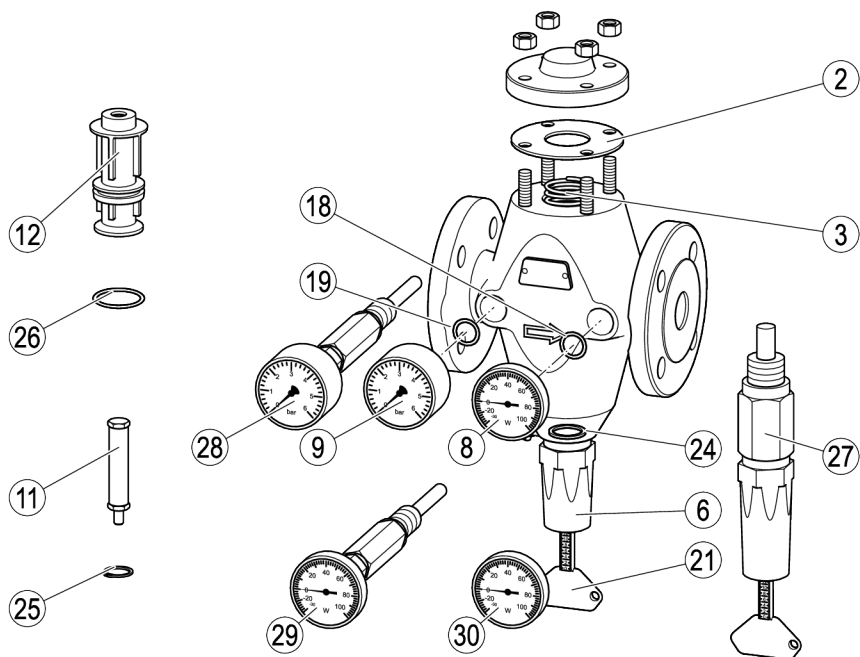
1 Required no. of parts dependent on type:

- DN25: 1x
- DN40, DN50: 2x
- DN80, DN100: 3x

2 For thermometers and screw plugs, 4x required

To install the pressure gauge, suitable sealing tape (19) is required in place of the sealing ring. PTFE sealing tape may be used, for example.

Spare parts for CW 41/4



No.	Nominal size	DN25	DN40, DN50	DN80, DN100
	Name	Order number		
2	Body gasket	184372	184373	184374
3	Spring	004950	004981	030001
6	Adjuster, complete	004953		
8	Thermometer	184596		
9	Pressure gauge	004704		
11	w-Thermostat ¹	184427		
	n-Thermostat ¹	184428		
	k-Thermostat ¹	184429		
12	Double cone			
	s-cone	030984	030987	030990
	r-cone, complete with O-ring	184348	184351	184352
18	Sealing ring ²	000992		
21	Adjusting key	004962		
24	Sealing ring	DN25–50: Order number 010333 DN 80–100: Order number 010510		
25	Circlip	010332		
26	Sealing ring for r-double cone	030092	030093	031493
27	Adjuster, with adapter	DN25–50: Order number 031135 DN 80–100: Order number 184376		
28	Pressure gauge with adapter	031154		
29	Thermometer with installed length 105 mm	184597		
30	Thermometer with adapter	184598		

1 Required no. of parts dependent on type:

- DN25: 1x
- DN40, DN50: 2x
- DN80, DN100: 3x

2 For thermometers and screw plugs, 4x required

To install the pressure gauge, suitable sealing tape (19) is required in place of the sealing ring. PTFE sealing tape may be used, for example.

Spare parts for diaphragm actuator

No spare parts are available for the diaphragm actuator. In the event of damage, please replace the complete diaphragm actuator.

Nominal size	DN25	DN40, DN50	DN80, DN100
Diaphragm actuator order number	184984	184983	184975

Removing the equipment

You must remove the equipment prior to any maintenance or repair work.



DANGER

If the equipment is used in contaminated areas there is a risk of severe injuries or death caused by harmful substances in or on the equipment.

- Only qualified personnel are allowed to perform work on contaminated equipment.
- Always wear the protective clothing prescribed for contaminated areas when working on the equipment.
- Make sure that the equipment is completely decontaminated before carrying out any service work.
- Follow the pertinent instructions for handling the hazardous substances in question.



DANGER

Personnel working on pipes are exposed to safety risks and may suffer severe injuries, poisoning or even loss of life.

- Make sure that no hot or hazardous fluid is in the equipment or the pipes.
- Make sure that the pipes upstream and downstream of the equipment are depressurised.
- Make sure that the installation is switched off and protected against unauthorised or unintended activation.
- Make sure that the equipment and the pipes have cooled down to room temperatures.
- Wear protective clothing that is suitable for the fluid and, if necessary, wear protective gear.

For more information on suitable protective clothing and safety gear refer to the safety data sheet of the fluid in question.

When the equipment is closed, the higher-level system parts are under operating pressure. To let off pressure, proceed as follows:

- Block off the supply lines to the equipment.
- In the event of back pressure, you must also block off the drainage line downstream of the equipment.

The screw plugs opposite the thermometer and pressure gauge feature a hole. Through this, you can let off pressure with the screw plugs.

- Slacken one of the two screw plugs slightly.

You can now hear the medium diverting through the hole. The display on the pressure gauge changes.

- Once the pressure has fully dissipated, close the screw plug.
- Only commence work once the pressure gauge displays zero pressure.



DANGER

If fluid escapes personnel may suffer severe injuries, poisoning or even loss of life.

- After working on the equipment make sure that all connections and valves are tight.
- Make sure that the gaskets of the body are leakproof.



CAUTION

Do not drop the equipment. If it falls down it may cause bruises and injuries.

- To transport and mount the equipment safely use suitable lifting gear.
- Connect the noose strap of the lifting gear to the body.
- Provide sufficient support for the equipment during transport and installation.
- Wear protective safety footwear.

Lightweight equipment may be transported and mounted without using any lifting gear.

To lift equipment the weight of which exceeds approx. 25 kg, you need the help of a second person or suitable lifting gear.

Your physical strength and on-site regulations and conditions determine what weight can be lifted and if support is required.

To remove the equipment, proceed as follows:

- Drain the equipment.
- Undo the flange connection.
- Place the equipment on a level, clean and stable surface.

Removing the double cone



CAUTION

Risk of injury from lid under spring pressure.

- Before unscrewing the hex nuts, reduce the spring tension in the equipment by slackening the setting screw and adjuster.

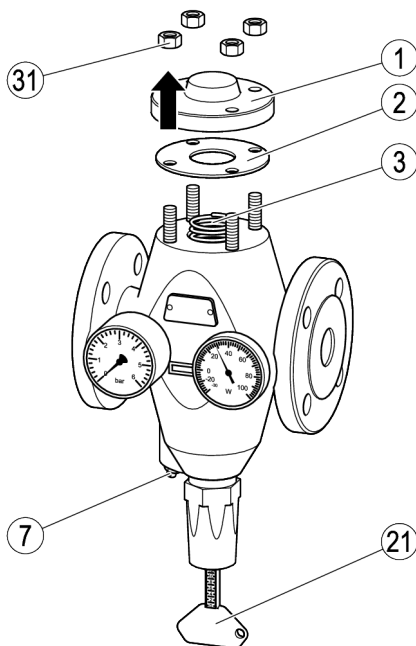
- Completely unscrew the setting screw (7).
- Unscrew the adjusting key (21) out of the adjuster completely.

The spring tension in the equipment has now been reduced, and you can take off the lid.

- Slacken the four hex nuts (31) in the body evenly crosswise.

The lid (1) lifts off due to spring tension.

- Remove the hex nuts.
- Remove the lid from the body.
- Remove the body gasket (2).
- Dispose of the body gasket in accordance with regulations at the location of use.
- Take the spring (3) out of the body.

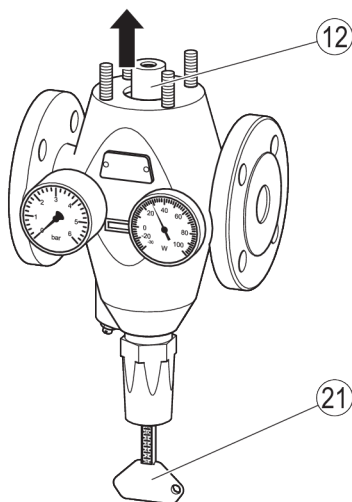


To remove the double cone from the body, proceed as follows:

- Screw the adjusting key (21) into the body completely.

The double cone is pressed upwards in the body.

- Lift the double cone (12) out of the body.
- Place the double cone on a level, clean surface.



In some models, the double cone is not lifted sufficiently far out of the body.

- In this case, turn the body so that the cone slides out of it.

Replacing the thermostat



This section describes and illustrates a model with DN25. Therefore, only one thermostat is shown and mentioned.

- Proceed in the same way for models with two or three thermostats.

To remove the thermostat from the double cone of the equipment, proceed as follows:

- Remove the double cone from the body as described on page 25.
- Using needle-nose pliers, squeeze the ends of the circlip (25) together.

- Take the circlip out of the grooves (32).
- Take the thermostat (11) out of the double cone.

To install the new thermostat, proceed as follows:

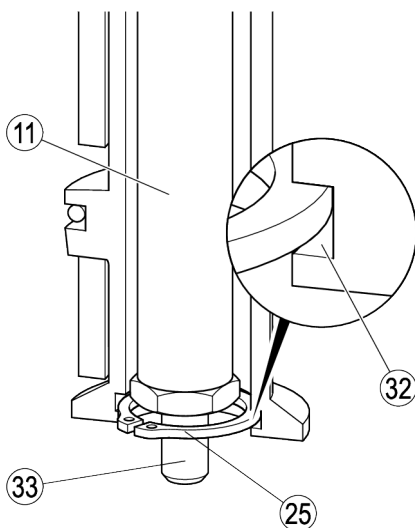
- Replace the thermostat with a new one of the same type.
- Check the condition of the circlip (25).
- Replace a damaged circlip with a new one.

You can find order numbers for the thermostat and circlip in the spare parts lists on page 19.

- Insert the thermostat with the flat side first into the sleeve of the double cone.

The pin (33) of the thermostat must point towards the grooves in the double cone.

- Squeeze the circlip so that it fits in the sleeve of the double cone.
- Insert the circlip in the sleeve in such a way that it is held securely in the grooves (32).
- Install the double cone in the body as described on page 27.



Installing the double cone

Attention!

Equipment may leak if the gasket is damaged.

- Replace all gaskets that you loosen during your work.
- Use only new gaskets of the same type.

Attention!

Dirt deposits on gasket seating surfaces may result in leaking of the equipment.

- Clean seating surfaces before inserting a new gasket.

- Replace all gaskets with new ones of the same type.

To install the double cone in the body, proceed as follows:

- Screw the adjusting key completely out of the body.



Models with r-cone are equipped with an additional O-ring on the double cone. You must also replace this O-ring before installing the double cone.

- Remove the old O-ring.
- Dispose of the O-ring in accordance with regulations at the location of use.
- Insert a new O-ring in the double cone from underneath.
- Push the new O-ring up until it is lying against the collar of the double cone.

You can now install the double cone in the body.

- Insert the double cone in the body with the opening facing downwards.
- Position the spring on the double cone.
- Fit a new body gasket on the four setscrews on the body opening.
- Lubricate all threads and the contact surfaces of nuts and bolts with temperature-resistant lubricant.

The lubricant must have the same properties as OKS®217.

- Mount the lid on the four setscrews on the body opening.
- Press the lid down sufficiently far to allow the hex nuts to fit onto the setscrews.
- Tighten the hex nuts crosswise,
- making sure that the lid and hex nuts do not become crooked.

The torque required to secure the hex nuts varies depending on type:

- ▶ For models with DN25, DN40 and DN50, a torque of 15 Nm is required.
- ▶ For models with DN80 and DN100, a torque of 25 Nm is required.
- Tighten the hex nuts crosswise to the specified torque.
- Set the cooling-water outlet temperature as described on page 15.
- Set the bleed flow as described on page 17.

Replacing the diaphragm actuator

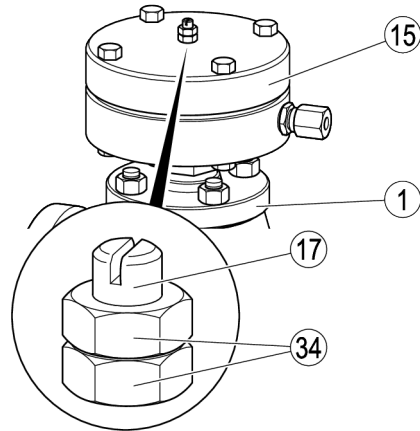
The diaphragm actuator must be removed or installed in the following cases:

- To replace a faulty diaphragm actuator
- To convert standard equipment to a diaphragm actuator.

Replacing the diaphragm actuator

- Remove the two hex nuts (34) from the spindle (17).
- Remove the lid (1) with the diaphragm actuator (15), as described on page 25.
- Take the double cone and spindle (17) out of the body.
- Remove the thermostats from the double cone, as described on page 26.
- Pull the spindle out of the double cone from underneath.
- Insert the new spindle into the double cone from underneath.
- Re-insert the thermostats in the double cone, as described on page 26.
- Insert the double cone with spindle in the body.
- Fit the lid with diaphragm actuator to the body, as described on page 27.
- Screw the two hex nuts (34) onto the spindle (17).
- Tighten the hex nuts hand-tight.

- Take the double cone out of the body.
- Take the thermostats out of the double cone, as described on page 26.
- Insert the spindle (17) into the double cone from underneath.
- Re-insert the thermostats in the double cone, as described on page 26.
- Insert the double cone with spindle in the body.
- Fit the lid with diaphragm actuator to the body, as described on page 27.
- Screw the two hex nuts (34) onto the spindle (17).
- Tighten the hex nuts hand-tight.



Converting standard equipment to diaphragm actuator

To convert the equipment to work with a diaphragm actuator, proceed as follows:

- Remove the lid (1), as described on page 25.

Installing the equipment following repairs

After repair work, re-install the equipment as described on page 14.

Troubleshooting

Problem	Cause	Remedy
The flow rate is too low. The planned return temperature is not reached.	The size and design of the equipment differs from the system data.	Change the equipment settings. Check the equipment size. Use equipment of a size that conforms to the system data.
Fluid escapes (equipment is leaking).	The equipment or the body is damaged.	Replace the equipment with a new one.
Fluid escapes (equipment is leaking).	A gasket is damaged.	Replace the gasket with a new one. Clean gasket seating surfaces.
The equipment does not regulate the flow perfectly.	The control unit is damaged or worn.	Replace the control unit.
The equipment is working irregularly. Inner parts open and close at intervals.	The pipe between the heat exchanger and the equipment is too long.	Increase the bleed flow. Install the equipment immediately downstream of the heat exchanger.
The flow rate is too high. The planned return temperature is not reached.	The equipment is incorrectly set.	Check the equipment settings. Reduce the bleed flow.
	The movement of inner parts is obstructed by deposits.	Check the equipment settings. Reduce the bleed flow. Clean the equipment. Make sure that the movement of inner parts is not obstructed.

- If faults occur that are not listed above or cannot be corrected, please contact our Technical Service or authorized agency in your country.

Putting the equipment out of operation

Removing harmful substances



DANGER

If the equipment is used in contaminated areas there is a risk of severe injuries or death caused by harmful substances in or on the equipment.

- Only qualified personnel are allowed to perform work on contaminated equipment.
- Always wear the protective clothing prescribed for contaminated areas when working on the equipment.
- Make sure that the equipment is completely decontaminated before carrying out any service work.
- Follow the pertinent instructions for handling the hazardous substances in question.

Qualified personnel must have extensive experience with and a working knowledge of:

- pertinent rules and regulations concerning handling hazardous substances
- special regulations for handling the hazardous substances encountered on site
- using the required personal protective equipment (PPE) and clothing



CAUTION

Environmental damage may be caused by poisonous fluid residues.

- Before disposing of the equipment make sure that it is clean and free of fluid residues.
- For the disposal of all materials observe the pertinent legal regulations concerning waste disposal.

- Remove all residues from the equipment.

- For the disposal of all residues observe the pertinent legal regulations concerning waste disposal.

Removing the equipment



DANGER

Personnel working on pipes are exposed to safety risks and may suffer severe injuries, poisoning or even loss of life.

- Make sure that no hot or hazardous fluid is in the equipment or the pipes.
- Make sure that the pipes upstream and downstream of the equipment are depressurised.
- Make sure that the installation is switched off and protected against unauthorised or unintended activation.
- Make sure that the equipment and the pipes have cooled down to room temperatures.
- Wear protective clothing that is suitable for the fluid and, if necessary, wear protective gear.

For more information on suitable protective clothing and safety gear refer to the safety data sheet of the fluid in question.



CAUTION

Risk of injuries if the equipment falls down.

- When removing the equipment make sure the it is safely held in place and cannot fall down.

Suitable measures are for instance:

- Equipment that is not too heavy may be supported by a second person.
- For heavy equipment use suitable lifting equipment of sufficient strength.
- Detach the end connections of the equipment from the pipes.
- Put the equipment onto a suitable base.
- Store the equipment as described on page 11.

Re-using equipment after storage

Observe the following instructions if you want to remove the equipment and use it again somewhere else:

- ▶ Make sure that the equipment is free of any fluid residues.
- ▶ Make sure that all connections are in good condition and leak-free.
- Use the equipment only for its intended purpose and the service conditions for which it was specified.

Disposing of the equipment

The equipment is made from the following materials:

**CAUTION**

Environmental damage may be caused by poisonous fluid residues.

- Before disposing of the equipment make sure that it is clean and free of fluid residues.
- For the disposal of all materials observe the pertinent legal regulations concerning waste disposal.

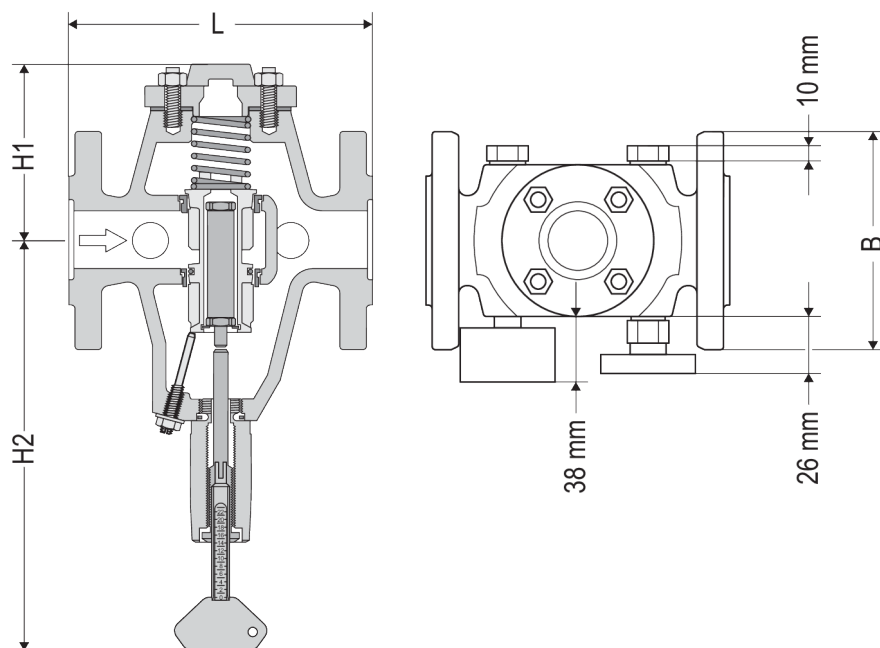
Component	CW 41	CW 41/4
Body	5.3103	
Inner parts	Brass/rust-proof steel	Stainless steel
Lid DN25–50	1.0460/A105	
Lid DN80–100	5.3103	
Setscrews on body	Steel	
Hex nuts	Steel, galvanised	
Body gasket	Graphite CrNi	
O-ring	EDPM	FPM

The diaphragm actuator is made of galvanised steel.

Technical data

Dimensions and weights

CW 41 and CW 41/4



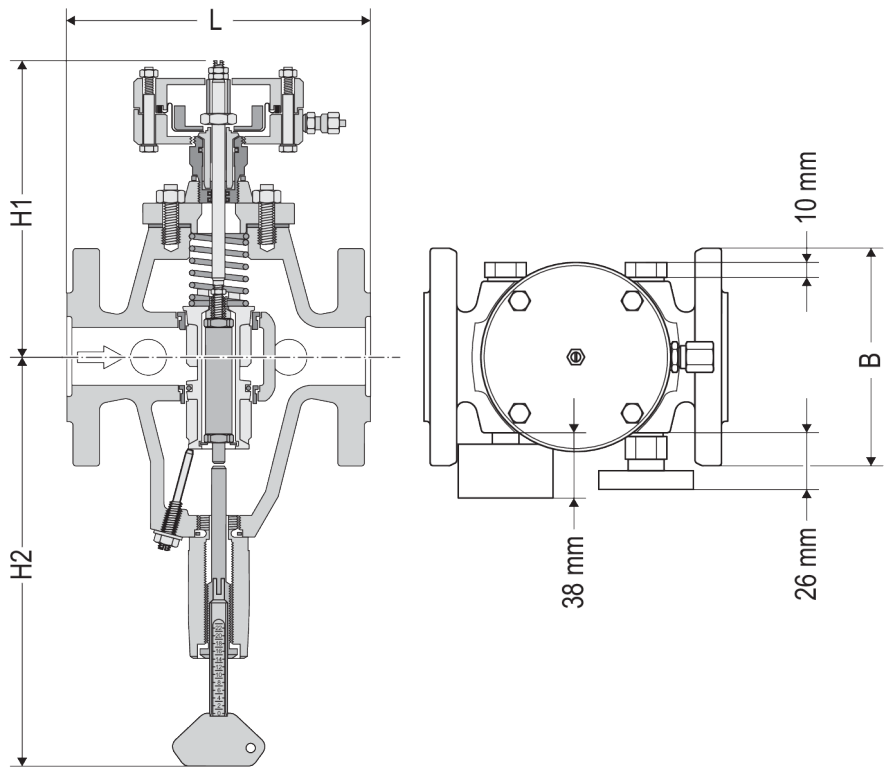
Weights and dimensions for flange connection PN 16/CL125:

Nominal size	DN25	DN40	DN50	DN80	DN100
L [mm]	160	200	230	310	350
W [mm]	80	95	95	145	145
H1 [mm]	97	128	128	166	166
H2 [mm]	216	255	255	316	316
Weight [kg]	7	12	14	33	34

Dimensions for flange connection PN 16/CL125, weights for flange connection EN PN 16:

Nominal size	1 "	1 ½ "	2 "	3 "	4 "
L [in]	6.3	7.9	9.1	12.2	13.8
W [in]	3.1	3.7	3.7	5.7	5.7
H1 [in]	3.8	5.0	5.0	6.5	6.5
H2 [in]	8.5	10.0	10.0	12.4	12.4
Weight [lb]	15.4	26.5	30.9	72.8	75.0

MCW 41 and MCW 41/4



Weights and dimensions for flange connection PN 16/CL125

Nominal size	DN25	DN40	DN50	DN80	DN100
L [mm]	160	200	230	310	350
W [mm]	80	95	95	145	145
H1 [mm]	165	165	165	227	227
H2 [mm]	216	255	255	316	316
Weight [kg]	10	15	17	36.5	37.5

Dimensions for flange connection PN 16/CL125, weights for flange connection EN PN 16:

Nominal size	1 "	1 ½ "	2 "	3 "	4 "
L [in]	6.3	7.9	9.1	12.2	13.8
W [in]	3.1	3.7	3.7	5.7	5.7
H1 [in]	6.5	6.5	6.5	8.9	8.9
H2 [in]	8.5	10.0	10.0	12.4	12.4
Weight [lb]	22	33.1	37.5	80.5	82.7

Pressure & temperature ratings

Operating limits for flange PN16 and drilled flange CL125

Pressure and temperature: Limit values for body/hood to EN 1092-2

Pressure	p [barg]	16	16
Temperature	T [°C]	−10/20	120
Maximum differential pressure	ΔPMX [bar]	6	
	ΔPMX [psi]	87	
Maximum allowable operating temperature	TMO [°C/°F]	n-thermostat: 100 °C/212 °F w-thermostat: 60 °C/140 °F k-thermostat: 74 °C/165 °F	
Pressure	p [psig]	232	232
Temperature	T [°F]	14/68	248

You can find further information in the equipment data sheet.

Manufacturer's declaration

For more information on the Conformity Assessment according to European rules refer to our Declaration of Conformity or our Declaration by Manufacturer.

To download the current Declaration of Conformity or Declaration by Manufacturer go to www.gestra.com/documents or contact:

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Web www.gestra.com

This declaration is no longer valid if modifications are made to the equipment without consultation with us.



You can find our authorized agents around the world at: www.gestra.com

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