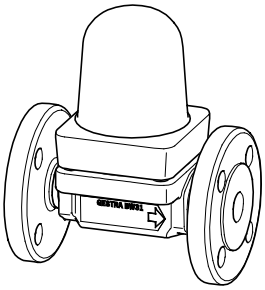
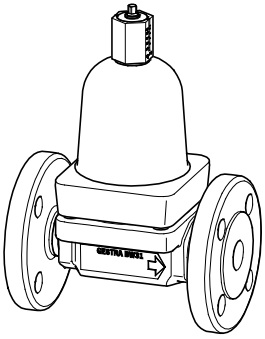
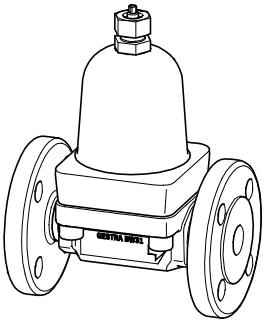
GESTRA

Return-Temperature Control Valve

BW 31
BW 31A







EN
English

Original Installation Instructions

819026-02

Contents

Foreword

This installation & operating manual will help you use the return-temperature control valve KALORIMAT BW 31/BW 31A (referred to as "equipment" in this document) safely and efficiently for its intended purpose.

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.

Safety

Use for the intended purpose

The return-temperature control valve KALORIMAT BW 31/BW 31A, hereinafter called "equipment", is installed in fluid return lines. It regulates the return temperature of the fluid as a function of temperature.

- Equipment type BW 31 is only designed for use with hot water.
- Equipment type BW 31A is only designed for use with hot oil.

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.

In particular the use as shut-off valve for the return line is not permitted.

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.

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.
- Incorrect temperature settings can affect the proper performance of the installation. Consequently, parts of the installaton could be damaged.
  - Make sure that only qualified and trained personnel change the closing temperature setting.
  - Do not adjust a closing temperature that is below the factory setting. For more information on default factory settings see chapter *"Adjusting the closing temperature"* on page 11.
- An inclined installation position can lead to increased wear on the equipment. Please contact the manufacturer if the equipment cannot be installed with the cover pointing vertically upwards or hanging downwards.

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

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

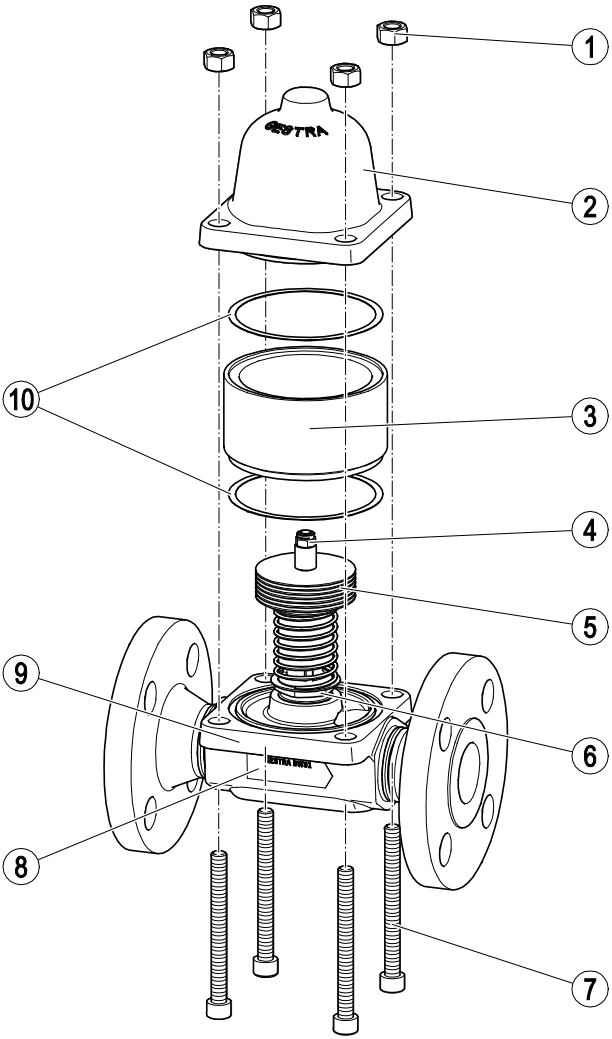
Our equipment is delivered packed and ready for assembly.

Equipment specification

The equipment consists of the following main components:

- Body,
- Cover and
- Regulator.

For the designation of the individual component parts please refer to the following pages.

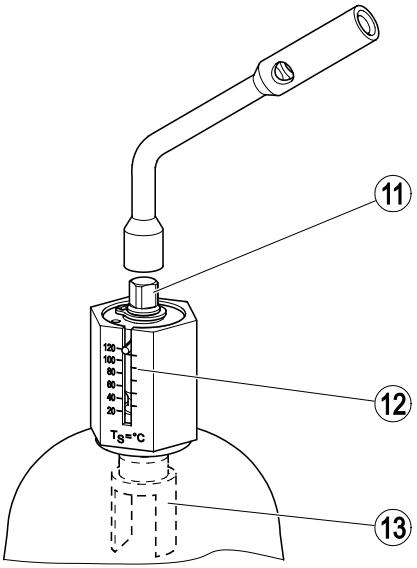


No.	Designation
1	Nuts (only DN 40)
2	Cover
3	Distance sleeve (only DN 40)
4	Adjustment nut
5	Bimetallic regulator plates

No.	Designation
6	Thermovit regulator
7	Socket-head bolts
8	Name plate with flow direction arrow
9	Body
10	Gaskets (2 for DN 40)

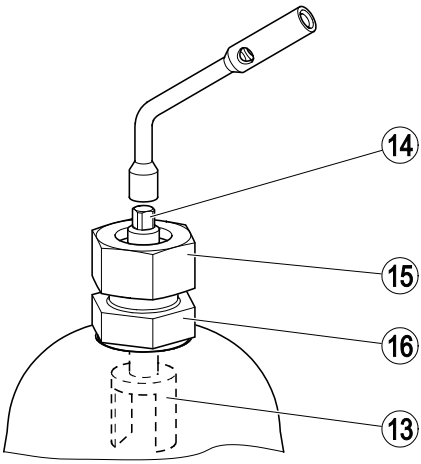
As an option, an external setting device (AV) may be used. You can use this to adjust the closing temperature during operation without removing the cover. Different external setting devices are available for different types of equipment.

External setting device for BW 31



No.	Designation
11	Square (used with socket wrench)
12	Temperature scale
13	Forked adjustment piece

External setting device for BW 31A



No.	Designation
13	Forked adjustment piece
14	Square (used with socket wrench)
15	Locknut
16	Twin nipple

In equipment with external setting device, a square nut is installed in place of the adjusting nut.

End connections

The equipment is available with the following end connections:

- Butt-weld ends
- Butt-weld ends via transition pieces
- Socket-weld ends
- Flanges
- Screwed sockets

Name plate

The following items are indicated on the name plate:

- Manufacturer
- Type designation
- Design
- Nominal size
- Pressure rating
- Max. service temperature
- Max. admissible differential pressure
- Direction of flow

The name plate is pointed on one side. This serves as an additional indication of the flow direction.

In addition, you will find the following information on the body or cover:

- Material

Design

- Controller: L setting range or closing temperature
- Controller: H setting range or closing temperature
- Controller: SL

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:

BW 31

- Fluids of group 2

BW 31A

- Fluids of group 1
- Fluids of group 2

ATEX Directive

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.

Task and function

Purpose

The equipment regulates and controls distribution processes in industrial heating systems. As the fluid temperature falls the equipment increases the fluid flow in the return line. The fluid will only flow off if its temperature is below the closing temperature. Consequently, the flowrate, pressure and temperature of the fluid are maintained at a fairly constant level and heat loss is minimized.

The closing temperature is set at our factory. You can change these default settings within the adjustable temperature range. For more information see chapter *"Adjusting the closing temperature"* on page 11.

Function

The equipment regulates the flow of the fluid by means of a Thermovit regulator and the force of a spring.

As the fluid temperature falls the orifice opens. More fluid can flow through. As the fluid temperature rises the orifice of the Thermovit regulator closes. Less fluid can flow through.

The orifice always remains slightly open,thereby allowing a small flowrate ("bleed flow") to pass through. The Thermovit regulator is therefore always surrounded by fluid and can react instantaneously if the temperature changes.

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

DANGER

Risk of bruises if the equipment or component parts fall down.

- ➢ Use suitable lifting gear when moving or lifting the equipment and/or component parts.
- ➢ Make sure that the equipment cannot topple over.
- ➢ Make sure that nobody is standing below the lifted equipment.

- ➢ 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.

Connecting the equipment

DANGER

Incorrectly connected equipment can result in accidents with extremely severe injuries or death.

- Make sure that only specialist personnel connect the equipment to the pipe.
- Make sure that the direction of flow in the pipe matches the flow direction arrow on the equipment.
- Make sure that the connected pipe does not subject the body to any stress (forces or torques) during installation and operation.

Specialist personnel must have knowledge and experience of the type of pipe connection used.

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.

- The equipment should be fitted in a horizontal pipe with the cover in a vertical position.

In exceptional cases the equipment can also be installed with the cover in an inclined plane.

Attention!

An inclined installation position of the cover can affect the performance of the equipment and increase wear on the Thermovit regulator.

- Please contact the manufacturer if an installation with the cover in a vertical position is not possible in your plant.

- Install the equipment in the desired, permitted installation position.
- Make sure that the equipment is safely mounted and that all connections are made correctly.

To remove residues from the pipes and the equipment after installation purge the pipes with the fluid to be used. For more information see chapter *"Rinse the equipment"* on page 17.

Adjusting the closing temperature

When delivered, the equipment features a factory-set closing temperature in accordance with the design data.

Attention!

Risk of malfunctions or damage due to incorrect setting of Thermovit regulator.

- Make sure that only qualified personnel change the closing temperature setting.
- Do not adjust a closing temperature that is below the factory-set closing temperature.

Note that closing temperatures below the factory setting may damage the Thermovit regulator.

- If you want to set a lower closing temperature you have to use different equipment.

To re-set the factory setting of the closing temperature use the set value indicated in the table in chapter *"Adjusting the closing temperating without external setting device"*.

Adjusting the closing temperature via external setting device

The external setting device enables you to change the closing temperature without having to remove the cover.

You can therefore change the closing temperature setting also during operation.

The are different procedures for BW 31 and BW 31A.

Adjusting the closing temperature for BW 31

You can set the setting dimension to the desired value using the external setting device and a socket wrench. The current closing temperature is shown on the scale. On delivery, the closing temperature is set to the lowest value.

Attention!

Risk of malfunctions or damage due to incorrect setting of Thermovit regulator.

- Make sure that only qualified personnel change the closing temperature setting.
- Do not adjust a closing temperature that is below the factory-set closing temperature.

- To reduce the closing temperature, turn the socket wrench clockwise, as seen from above.
- To increase the closing temperature, turn the socket wrench anticlockwise, as seen from above.
- To check the setting measure the return temperature of the fluid downstream of the equipment.
- Repeat the setting procedure if the return temperature does not meet the set value.

Adjusting the closing temperature for BW 31A

The closing temperature is set via the slide lift. When the equipment is delivered, the following temperature settings as a function of nominal size are possible:

Factory setting for BW 31A with external setting device

Nominal size	Closing temperature [°C]	Set value X [mm]	Lift Y [mm]
DN15	90	27.0	4.6
DN20, DN25	70	27.6	4.0
DN40	70	48.4	6.6

These factory settings are calculated for ambient temperatures of 18 – 21 °C.

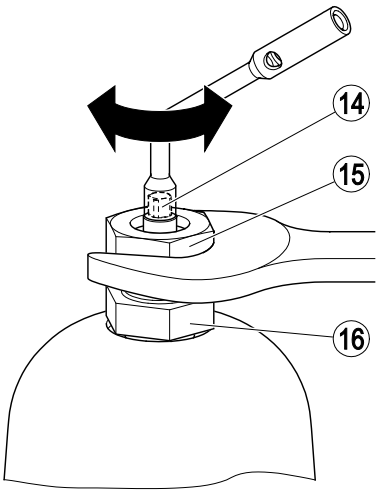
To change the settings proceed as follows:

WARNING

Injuries such as burns or poisoning may occur if fluid escapes through the external setting device.

- ➢ Make sure that the twin nipple of the external setting device is fixed and cannot work loose.

- ➢ Use an open-end spanner (US: wrench) to secure the twin nipple (16) against inadvertent misadjustment.
- ➢ To loosen the locknut (15) turn it anticlockwise.
- ➢ To raise the closing temperature turn the adjustment stem (14) anticlockwise.



Attention!

Risk of malfunctions or damage due to incorrect setting of Thermovit regulator.

- ➢ Make sure that only qualified personnel change the closing temperature setting.
- ➢ Do not adjust a closing temperature that is below the factory-set closing temperature.

- ➢ To lower the closing temperature turn the adjustment stem (14) clockwise.

The following table indicates the closing temperature that will be set by giving the adjustment stem a certain number of full turns. Note that the indicated values are based on the factory setting.

Number of turns	DN15	DN20 DN25	DN40
1	104	83	80
2	120	95	90
3	137	109	102
4	156	123	116
5	180	137	136
6	210	158	165
7	260	180	196
8	–	210	237
9	–	255	–

To set the max. closing temperature of 280 °C turn the adjustment stem as often as indicated in the following table.

Nominal size	Number of full turns
DN15	7.2
DN20, DN25	9.4
DN40	8.7

Attention!

Incorrect settings can be made if the adjustment stem is inadvertently turned when the locknut is tightened.

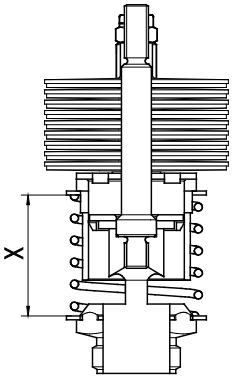
- Using the socket wrench, secure the adjustment stem so that it cannot turn when you tighten the locknut.

- To prevent the adjustment stem from shifting, hand-tighten the locknut, keeping the adjustment stem in place with the socket wrench.
- To check the setting measure the return temperature of the fluid downstream of the equipment.
- Repeat the setting procedure if the return temperature does not meet the set value.

Adjusting the closing temperating without external setting device

Remove cover to change the closing temperature without using the external setting device. When delivered, the equipment features the closing temperature setting specified in the order.

There is a set value for each closing temperature. The set value X is measured between the upper and the lower spring plate.



Equipment of size DN 15 does not have a lower spring plate. With this equipment you have to measure the set value between the upper spring plate and the top edge of the hexagon part.

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.

- Remove the cover as described on page 17.

Attention!

Risk of malfunctions or damage due to incorrect setting of Thermovit regulator.

- Make sure that only qualified personnel change the closing temperature setting.
- Do not adjust a closing temperature that is below the factory-set closing temperature.

Ascertaining set value

The set value depends on the type of equipment and the desired closing temperature.

➢ Refer to the following tables for the required set value.

Ascertaining the set value for BW 31

Attention!

Risk of malfunctions or damage due to incorrect setting of Thermovit regulator.

Only the correct number of plate pairs ensures that the set value yields the correct closing temperature.

➢ Before adjusting the set value make sure that the correct number of plate pairs is used.

➢ If necessary mount a Thermovit regulator with the correct number of plate pairs.

The set value is based on ambient temperatures of 18 – 21 °C. If the ambient temperature is higher or lower use the following table to adjust the set value.

Ambient temperature [°C]	Correction value [mm]		
	DN15	DN20, DN25	DN40
9–12	+0.75	+0.9	+1.5
12–15	+0.5	+0.6	+1.0
15–18	+0.25	+0.3	+0.5
18–21	0		
21–24	–0.25	–0,3	–0.5
24–27	–0.5	–0.6	–1.0
27–30	–0.75	–0.9	–1.5

Please contact the manufacturer if the ambient temperature passes outside the indicated temperature range.

Closing temperature [°C]	Setting dimension [mm]		
	DN15	DN20, DN25	DN40
20	22.4	23.6	41.8
25	22.8	24.2	42.7
30	23.2	24.8	43.6
35	23.6	25.3	44.4
40	24.0	25.8	45.2
45	24.4	26.4	46.0
50	24.8	26.9	46.8
55	25.2	27.4	47.6
60	25.6	28.0	48.5
65	26.0	28.5	49.3
70	26.4	29.0	50.1
75	26.7	29.5	50.9
80	27.1	30.1	51.7
85	27.5	30.7	52.4
90	27.9	31.3	53.0
95	28.3	31.8	53.5
100	28.7	32.3	54.0
105	29.0	32.8	54.4
110	29.4	33.3	54.8
115	29.8	33.8	–
120	30.2	–	–
125	30.6	–	–
130	30.9	–	–

Ascertaining the set value for BW 31A

Closing temperature [°C]	Setting dimension [mm]		
	DN15	DN20, DN25	DN40
20	–	–	41.8
30	–	24.4	43.1
40	–	25.2	44.4
50	–	26.0	45.7
60	25.0	26.8	47.1
70	25.7	27.6	48.4
80	26.4	28.4	49.7
90	27.0	29.2	50.9
100	27.7	30.0	52.0
110	28.4	30.7	52.9
120	29.0	31.4	53.6
130	29.6	32.1	54.2
140	30.2	32.7	54.8
150	30.7	33.2	55.3
160	31.2	33.7	55.7
170	31.6	34.2	56.1
180	32.0	34.6	56.5
190	32.4	35.0	56.9
200	32.7	35.3	57.3
210	33.0	35.6	57.6
220	33.2	35.8	57.9
230	33.4	36.1	58.2
240	33.6	36.3	58.5
250	33.8	36.5	58.7
260	34.0	36.7	59.0
270	34.1	36.9	59.2
280	–	37.0	–

The set value is based on ambient temperatures of 18 – 21 °C. If the ambient temperature is higher or lower use the following table to adjust the set value.

Ambient temperature [°C]	Correction value [mm]		
	DN15	DN20, DN25	DN40
9–12	+0.6	+0.75	+1.2
12–15	+0.4	+0.5	+0.8
15–18	+0.2	+0.25	+0.4
18–21	0		
21–24	–0.2	–0.25	–0.4
24–27	–0.4	–0.5	–0.8
27–30	–0.6	–0.75	–1.2

Changing set value

Attention!

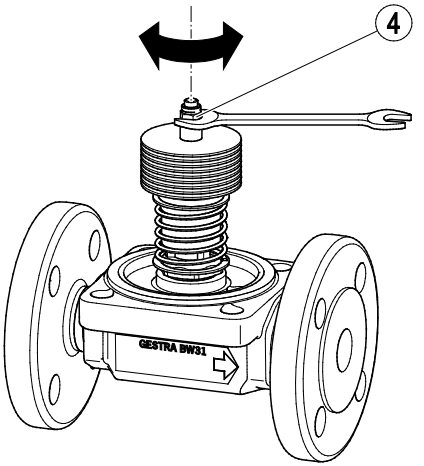
Risk of malfunctions or damage due to incorrect setting of Thermovit regulator.

Only the correct number of plate pairs ensures that the set value yields the correct closing temperature.

- ➢ Before adjusting the set value make sure that the correct number of plate pairs is used.
- ➢ If necessary mount a Thermovit regulator with the correct number of plate pairs.

Use the Thermag nut (4) to adjust the desired set value.

The Thermag nut used in equipment DN 15 to DN 25 is a nut type M6 and in equipment DN 40 a nut M8. It is locked and sealed with Loctite 222.



➢ To reduce the set value fasten the Thermag nut.

The closing temperature is reduced.

➢ To increase the set value loosen the adjustment nut.

The closing temperature is increased.

➢ Use Loctite 222 to lock and seal the Thermag nut against inadvertent misadjustment.

➢ Attach cover to the equipment as described on page 18.

➢ To check the setting measure the return temperature of the fluid downstream of the equipment.

➢ Repeat the setting procedure if the return temperature does not meet the set value.

After operation

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.

Removing external dirt deposits

- Use fresh water and a cloth to remove dirt and contaminants from the equipment body.

Rinse the equipment

Rinse the equipment in order to remove any dirt particles or fluid residues inside the equipment.

When fixing the cover onto the equipment body the gasket will be compressed. As a result the gasket can no longer seal properly if the cover is taken off again. It is therefore essential that you always insert a new gasket whenever you remove and re-attach the cover.

Attention!

Malfunctions due to dirt deposits on Thermovit regulator.

- Remove Thermovit regulator before rinsing the equipment.

To remove the Thermovit regulator proceed as follows:

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.

Removing cover

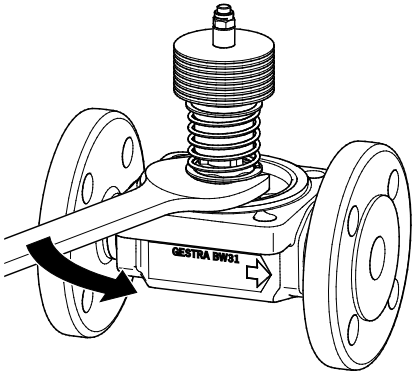
The cover of equipment DN 15 to DN 25 is fixed in place by means of four 8 mm socket-head cap screws. The cover of equipment DN 40 is fixed in place by means of four hexagon-head bolts M13 and nuts.

- Slacken the four cover screws or bolts.
- Take the four nuts off the equipment (DN 40).
- Lift the cover off the body.

Removing Thermovit regulator

The Thermovit regulator is screwed to the body via a hexagon piece A. F. 24 mm (DN 40: A. F. 36 mm).

➢ Unscrew the Thermovit regulator off the body at the hexagon piece.



Mounting cover

Attention!

Equipment may leak if the gasket is damaged.

➢ It is therefore essential that you always insert a new gasket before re-attaching the cover.

➢ Make sure that the cover is not tilted or skewed when refitted.

➢ Fix cover to equipment body.

➢ Fasten screws / nuts and bolts with the following tightening torque:

◗ DN15 to DN25: 35 Nm

◗ DN40: 45 Nm

Purging pipes

Attention!

Equipment may be damaged by unsuitable cleaning fluid.

➢ Rinse the pipe with the same fluid that is used during normal operation.

➢ Make sure that the cleaning fluid does not damage the equipment material if you use a different fluid for cleaning than the normal operating fluid.

➢ Make sure that the cleaning fluid does not come into contact with the fluid used during normal operation.

➢ Switch on the installation and rinse the pipes.

➢ Check connections for leaks.

➢ After rinsing keep the installation switched on until the pipes are completely empty.

➢ Switch the installation off and protect it against unauthorised or unintended re-activation.

Mounting Thermovit regulator after purging

➢ Remove the cover as described on page 17.

Attention!

Malfunctions due to inadvertent misadjustment of Thermovit regulator.

➢ Make sure that the setting of the Thermovit regulator is not changed when mounting or servicing the equipment.

➢ Fasten the Thermovit regulator with the following tightening torque:

◗ DN15 to DN25: 90 Nm

◗ DN40: 140 Nm.

➢ Attach cover to the equipment as described on page 18.

Maintaining the equipment

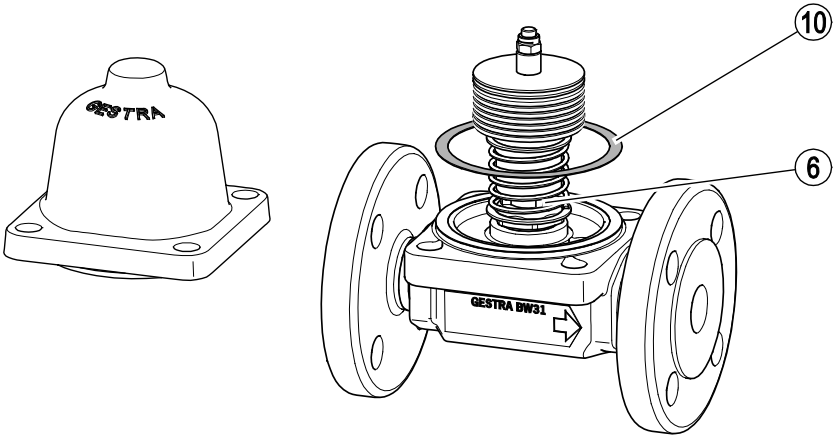
The equipment does not require any particular maintenance.

Servicing the equipment and installing spare parts

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

- Thermovit regulator
- Gasket between cover and body
- External setting device (if available)
- Sealing ring for external setting device (if available)
- Socket wrench for external setting device (if available)

Spare parts for BW 31 without external setting device

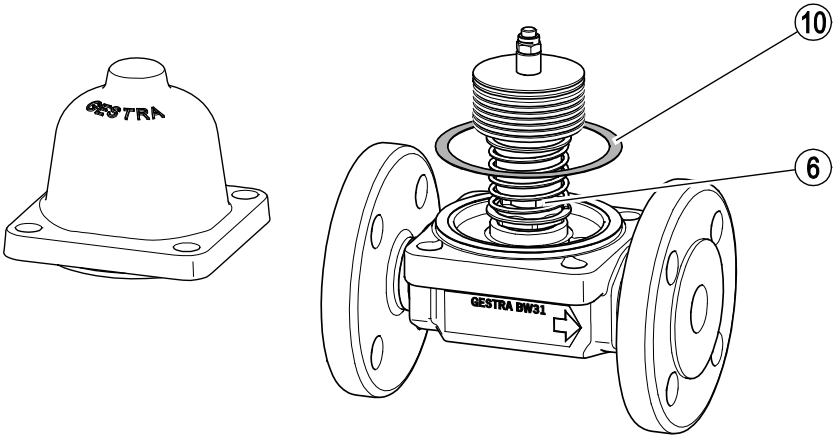


No.	Designation	DN	Area of application [°C]	Qty.	Stock code
6, 10	Thermovit regulator, complete, with gasket	15	L: 20–90	1	355630
			H: 60–130	1	355631
		20, 25	L: 20–90	1	355632
			H: 40–115	1	355633
		40	L: 20–65	1	355634
			H: 50–110	1	355635
10	Gasket	15, 20, 25		20*	560493
		40		20**	375699

* One required

** Two required

Spare parts for BW 31A without external setting device

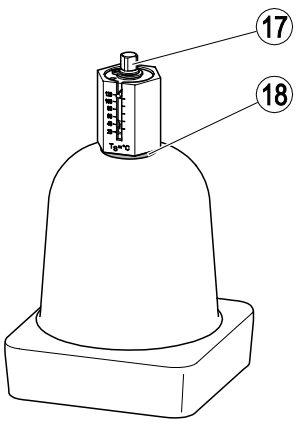


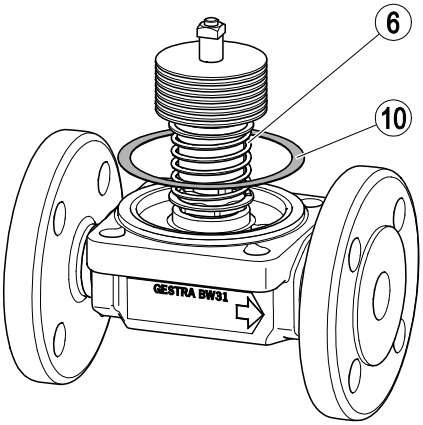
No.	Designation	DN	Area of application [°C]	Qty.	Stock code
6, 10	Thermovit regulator, complete, with gasket	15	L: 60–120	1	355645
			H: 120–270	1	355646
		20, 25	L: 30–120	1	355647
			H: 100–280	1	355648
		40	L: 30–80	1	355649
			H: 100–270	1	355650
10	Gasket	15, 20, 25		20*	560493
		40		20**	375699

* One required

** Two required

Spare parts for BW 31 with external setting device



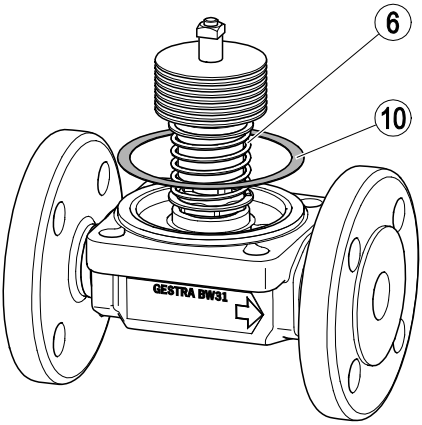


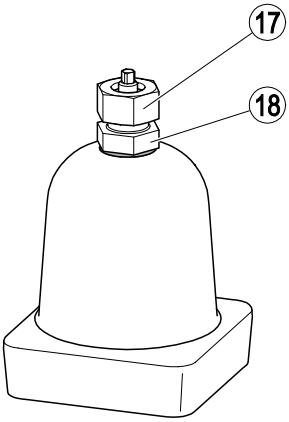
No.	Designation	DN	Area of application [°C]	Qty.	Stock code
6, 10	Thermovit regulator, complete, with gasket	15	L:20–110	1	355636
			H: 60-130	1	355637
		20, 25	L: 20–90	1	355638
			H: 40–115	1	355639
		40	L: 20–75	1	355640
			H: 50–110	1	355641
10	Gasket	15, 20, 25		20*	560493
		40		20**	375699
10, 17, 18	External setting device with gasket and sealing ring	15	20–130	1	355642
		20, 25	20–120	1	355643
		40	20–110	1	355644
–	Socket wrench	–	–	1	560700

* One required

** Two required

Spare parts for BW 31A with external setting device





No.	Designation	DN	Area of application [°C]	Qty.	Stock code
6.10	Thermovit regulator, complete, with gasket	15	L: 60–160	1	355651
			H: 90–270	1	355652
		20, 25	L: 30–170	1	355653
			H: 70–270	1	355654
		40	L: 25–85	1	355655
			H: 70–270	1	355656
10	Gasket	15, 20, 25		20*	560493
		40		20**	375699
10, 17, 18	External setting device with gasket and sealing ring	15		1	355657
		20, 25		1	355658
		40		1	355659
–	Socket wrench	–	–	1	560700

* One required

** Two required

Exchanging Thermovit regulator

Only the complete Thermovit regulator unit can be exchanged.

- ➢ Remove the cover as described on page 17.
- ➢ Unscrew the Thermovit regulator off the body as described on page 18.
- ➢ Fasten the Thermovit regulator with the tightening torque indicated on page 18.
- ◗ DN15 to DN25: 90 Nm
- ◗ DN40: 140 Nm.
- ➢ Attach cover to the equipment as described on page 18.

Exchanging gasket

- ➢ Remove the cover as described on page 17.
- ➢ Remove the gasket from the body.

Attention!

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

- ➢ Clean seating surfaces before inserting a new gasket.

- ➢ Clean gasket seating surfaces.
- ➢ Insert a new gasket in the body.
- ➢ Attach cover to the equipment as described on page 18.

Exchanging external setting device

To exchange the external setting device proceed as follows:

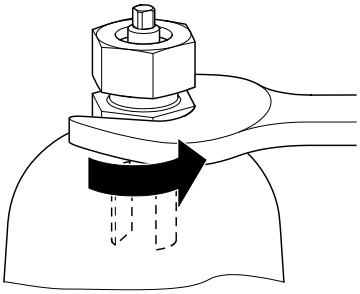
Attention!

The equipment can be damaged when the socket is applied to the scale.

In equipment type BW 31, the scale can be damaged by the wrench.

- ➢ Apply the wrench to the external setting device in such a way that the wrench does not touch the scale.

- ➢ Unscrew the external setting device from the cover.



Attention!

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

- ➢ Clean seating surfaces before inserting a new gasket.

Attention!

Equipment may leak if the gasket is damaged.

- ➢ If is therefore essential that you always insert a new gasket before re-attaching the external setting device.
- ➢ Make sure that the external setting device is not tilted or skewed when refitted.

- ➢ Put a new gasket onto the external setting device.

Attention!

Equipment may be damaged if the external setting device is tilted or skewed when fitted.

- ➢ When screwing the external setting device with the forked adjustment piece onto the square nut of the Thermovit regulator make sure that it is upright and correctly aligned.

➢ Put the external setting device with the forked ajdustment piece (13) over the square nut (4) through the bore of the cover (2). (step 1.)

Attention!

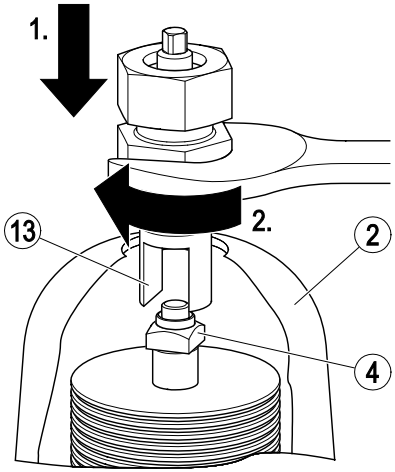
The equipment can be damaged when the socket is applied to the scale.

In equipment type BW 31, the scale can be damaged by the wrench.

➢ Apply the wrench to the external setting device in such a way that the wrench does not touch the scale.

➢ Fasten the external setting device with the following tightening torque: (step 2.)

- DN15 to DN25: 90 Nm
- DN40: 140 Nm.



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.
The return temperature is above the set closing temperature.	The bleed flowrate is too high. The size and design of the equipment differ from the equipment data.	Change the equipment settings. Check the size. Use equipment of a size that conforms to the system data.
The flowrate is too low. The equipment is cold or only lukewarm. Insufficient heat output of consumers.	Contamination in the inflow, outflow or equipment.	Clean the pipe. Clean all inner parts. Replace inner parts or equipment if damaged.
The equipment does not regulate the flow perfectly.	The control unit is damaged or worn.	Replace the control unit.

➢ 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 9.

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.

◗ If necessary re-work welded connections in order to ensure that they are in good working condition.

➢ Use the equipment only for its intended purpose and the service conditions for which it was specified.

Disposing of the equipment

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.

The equipment is made from the following materials:

Component	EN	ASTM
Body	1.0460	A 105
Cover		
Body screws	1.7225	A 193 B7
Thermovit regulator	Stainless steel	
Body gasket	Graphite /CrNi	
External setting device for BW 31	1.4404	F 316 L
External setting device sealing ring for BW 31	EPDM	
External setting device gasket for BW 31 and BW 31A	St	
External setting device for BW 31A	1.4571	–
Stuffing box bush for BW 31A	Graphite	

Technical data

Dimensions and weights

BW 31

	Flange EN PN 40[1]				Flange ASME Class 150/Class 300				Screwed sockets, socket-weld ends				Butt-weld end			
Nominal size DN	**15**	**20**	**25**	**40**	**15**	**20**	**25**	**40**	**15**	**20**	**25**	**40**	**15**	**20**	**25**	**40**
Length [mm]	150		160	200	150		160	216/230[2]	95			130	200			250
Height without AV[3] [mm]	128			188	128			188	128			188	128			188
Height with AV[3] [mm]	170			230	170			230	170			230	170			230
Service dimension [mm]	110			70	110			70	110			70	110			70
Width of cover flange [mm]	85			115	85			115	85			115	85			115
Weight [kg]	4.4	5.3	5.7	12	4.4	5.3	5.7	12	2.4			8.0	2.9			8.5

1 DN40: PN25

2 Class 300: 230 mm

3 AV: External setting device,
equipment with fitted socket wrench requires an additional distance of 100 mm.

BW 31A

	Flange EN PN 40[1]				Flange ASME Class 150/Class 300				Screwed sockets, socket-weld ends				Butt-weld end			
Nominal size DN	**15**	**20**	**25**	**40**	**15**	**20**	**25**	**40**	**15**	**20**	**25**	**40**	**15**	**20**	**25**	**40**
Length [mm]	150		160	200	150		160	216/230[2]	95			130	200			250
Height without AV[3] [mm]	128			188	128			188	128			188	128			188
Height with AV[3] [mm]	165			225	165			225	165			225	165			225
Service dimension [mm]	110			70	110			70	110			70	110			70
Width of cover flange [mm]	85			115	85			115	85			115	85			115
Weight [kg]	4.4	5.3	5.7	12	4.4	5.3	5.7	12	2.4			8.0	2.9			8.5

1 DN40: PN25

2 Class 300: 230 mm

3 AV: External setting device,
equipment with fitted socket wrench requires an additional distance of 100 mm.

Pressure & temperature ratings

Limiting conditions DN 15, DN 20, DN 25

Max. differential pressure Δ PMX: 6 bar

Connection	**Flanged EN PN 40 (CL 300), screwed sockets, socket-weld ends, butt-weld ends via transition pieces**					
Operating pressure [barg]	40.0	37.1	33.3	27.6	25.7	23.8
Inlet temperature [°C]	–10/20	100	200	300	350	400
Connection	**Flanged ASME Class 150**					
Operating pressure [barg]	19.6	17.7	13.8	10.2	8.4	6.5
Inlet temperature [°C]	–29/38	100	200	300	350	400

Limiting conditions DN 40

Max. differential pressure Δ PMX: 6 bar

Connection	**Flanged EN PN 25 (CL 300), screwed sockets, socket-weld ends, butt-weld ends via transition pieces**					
Operating pressure [barg]	25.0	23.2	20.8	17.2	16.0	14.8
Inlet temperature [°C]	–10/20	100	200	300	350	400
Connection	**Flanged ASME Class 150**					
Operating pressure [barg]	19.6	17.7	13.8	10.2	8.4	6.5
Inlet temperature [°C]	–29/38	100	200	300	350	400

Closing temperatures

	Closing temperatures that can be set [°C]			
	DN 15 ½”	**DN 20 ¾”**	**DN 25 1”**	**DN 40 1½”**
BW 31	20–130	20–115		20–110
BW 31 with external setting device	60–130	40–115		50–110
BW 31 with special external setting device	20–110	20–90		20–75
BW 31A	120–270	100–280		100–270
BW 31A with external setting device	90–270	70–270		
BW 31A with special external setting device	60–160	30–170		25–85

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:

GESTRA AG
Münchener Straße 77
28215 Bremen
Germany
Telefon +49 421 3503-0
Telefax +49 421 3503-393
E-Mail info@de.gestra.com
Web www.gestra.de

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

Agencies all over the world: **www.gestra.de**

GESTRA AG

Münchener Strasse 77
28215 Bremen
Germany
Phone +49 421 3503-0
Fax +49 421 3503-393
e-mail info@de.gestra.com
Web www.gestra.com

819026-02/11-2019_kx_mm (808784-03)