Technik für Umweltschutz

Messen. Regeln. Überwachen.

Operating instructions

Heating pump assembly

PrimoTherm®

Type: K 180-1 DN 32 without mixer
Type: K 180-2 DN 32 with 3-way mixer and actuator

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1 About these operating instructions

These operating instructions describe the heating pump assemblies PrimoTherm® "K 180-1 DN 32" and "K 180-2 DN 32" (also referred to as "product" in these operating instructions). These operating instructions are part of the product.

- You may only use the product if you have fully read and understood these operating instructions.
- Verify that these operating instructions are always accessible for any type of work performed on or with the product.
- Pass these operating instructions as well as all other product-related documents on to all owners of the product.
- If you feel that these operating instructions contain errors, inconsistencies, ambiguities or other issues, contact the manufacturer prior to using the product.

The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe these operating instructions or from failure to comply with directives, regulations and standards and any other statutory requirements applicable at the installation site of the product.

2 Information on safety

2.1 Safety messages and hazard categories

These operating instructions contain safety messages to alert you to potential hazards and risks. In addition to the instructions provided in these operating instructions, you must comply with all directives, standards and safety regulations applicable at the installation site of the product. Verify that you are familiar with all directives, standards and safety regulations and ensure compliance with them prior to using the product.

Safety messages in these operating instructions are highlighted with warning symbols and warning words. Depending on the severity of a hazard, the safety messages are classified according to different hazard categories.

DANGER

DANGER indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, can result in serious injury or equipment damage.

NOTICE

NOTICE indicates a hazardous situation, which, if not avoided, can result in equipment damage.

In addition, the following symbols are used in these operating instructions:

This is the general safety alert symbol. It alerts to injury hazards or equipment damage. Comply with all safety instructions in conjunction with this symbol to help avoid possible death, injury or equipment damage.

This symbol alerts to hazardous electrical voltage. If this symbol is used in a safety message, there is a hazard of electric shock.

2.2 Intended use

This product may only be used to circulate the following liquids in intrinsically safe, sealed, thermal heating systems.

- Heating circuit water as per VDI 2035
- Water/glycol mixtures with a maximum admixture of 50 %

Any use other than the application explicitly permitted in these operating instructions is not permitted and causes hazards.

Verify that the product is suitable for the application planned by you prior to using the product. In doing so, take into account at least the following:

- All directives, standards and safety regulations applicable at the installation site of the product
- All conditions and data specified for the product
- The conditions of the planned application

In addition, perform a risk assessment in view of the planned application, according to an approved risk assessment method, and implement the appropriate safety measures, based on the results of the risk assessment. Take into account the consequences of installing or integrating the product into a system or a plant.

When using the product, perform all work and all other activities in conjunction with the product in compliance with the conditions specified in the operating instructions and on the nameplate, as well as with all directives, standards and safety regulations applicable at the installation site of the product.

2.3 Predictable incorrect application

The product must never be used in the following cases and for the following purposes:

- Use with drinking water
- Use with adherent, corrosive or flammable fluids
- Operation with vapour or with corrosive media or media containing oil
- Operation in systems with temperatures exceeding 110 °C (for example, solar systems)
- Hazardous area (EX)
  - If the product is operated in hazardous areas, sparks may cause deflagrations, fires or explosions

2.4 Qualification of personnel

Only appropriately trained persons who are familiar with and understand the contents of these operating instructions and all other pertinent product documentation are authorized to work on and with this product.

These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may be caused by using the product.

All persons working on and with the product must be fully familiar with all directives, standards and safety regulations that must be observed for performing such work.

2.5 Personal protective equipment

Always wear the required personal protective equipment. When performing work on and with the product, take into account that hazards may be present at the installation site which do not directly result from the product itself.

2.6 Modifications to the product

Only perform work on and with the product which is explicitly described in these operating instructions. Do not make any modifications to the product which are not described in these operating instructions.

3 Transport and storage

The product may be damaged as a result of improper transport or storage.

NOTICE

INCORRECT HANDLING

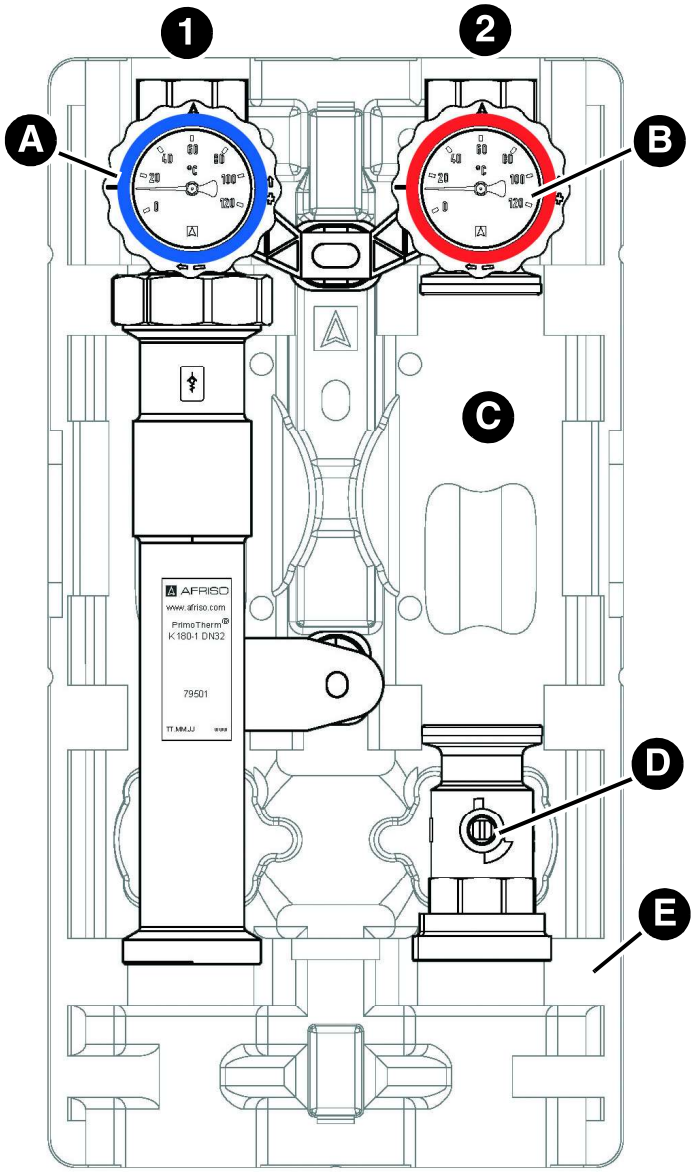
- Verify compliance with the specified ambient conditions during transport or storage of the product.
- Use the original packaging when transporting the product.
- Store the product in a clean and dry environment.
- Verify that the product is protected against shocks and impact during transport and storage.

Failure to follow these instructions can result in equipment damage.

4 Product description

The product is a pre-assembled, tightness-tested and heat-insulated heating pump assembly which allows for the installation of standard pumps DN 32 (with G2 connection and a length of 180 mm). The flow can be connected at the left or the right side. Optional temperature probes can be mounted to all ball valves.

4.1 Overview



1. Return
2. Flow

A. Ball valve, can be shut off, with thermometer blue

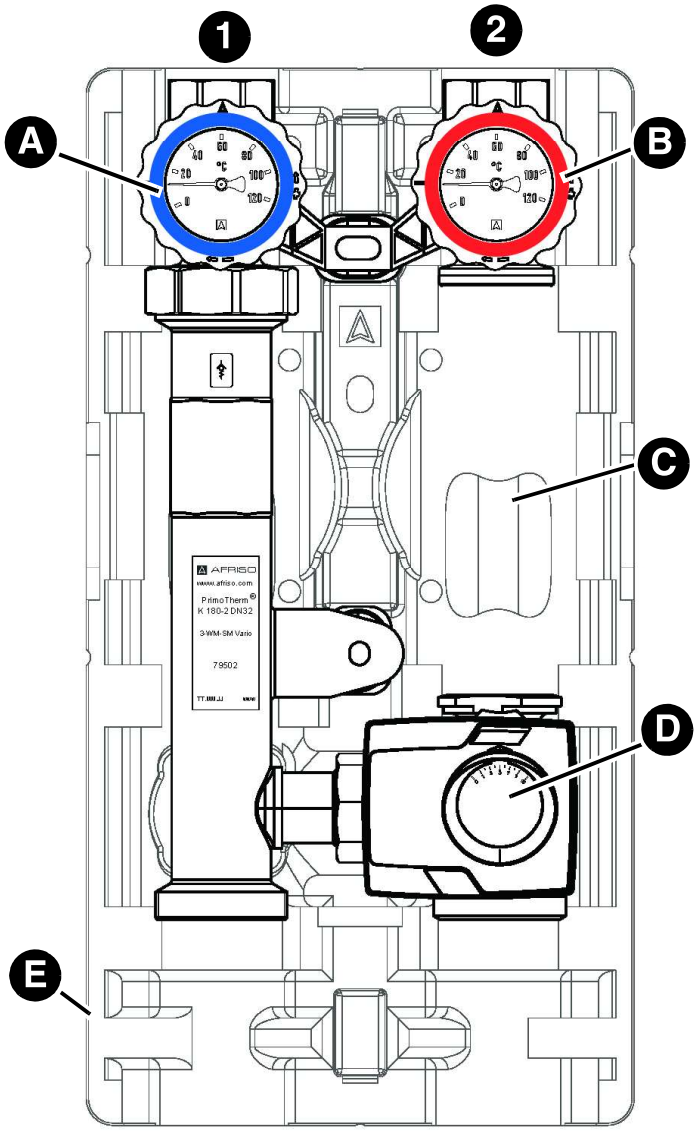
B. Ball valve, can be shut off, with thermometer red

C. Space for optional circulation pump

D. Additional ball valve

E. Heat insulation

Fig. 1: PrimoTherm® K 180-1 DN 32



1. Return
2. Flow

A. Ball valve, can be shut off, with thermometer blue

B. Ball valve, can be shut off, with thermometer red

C. Space for optional circulation pump

D. 3-way mixer with actuator

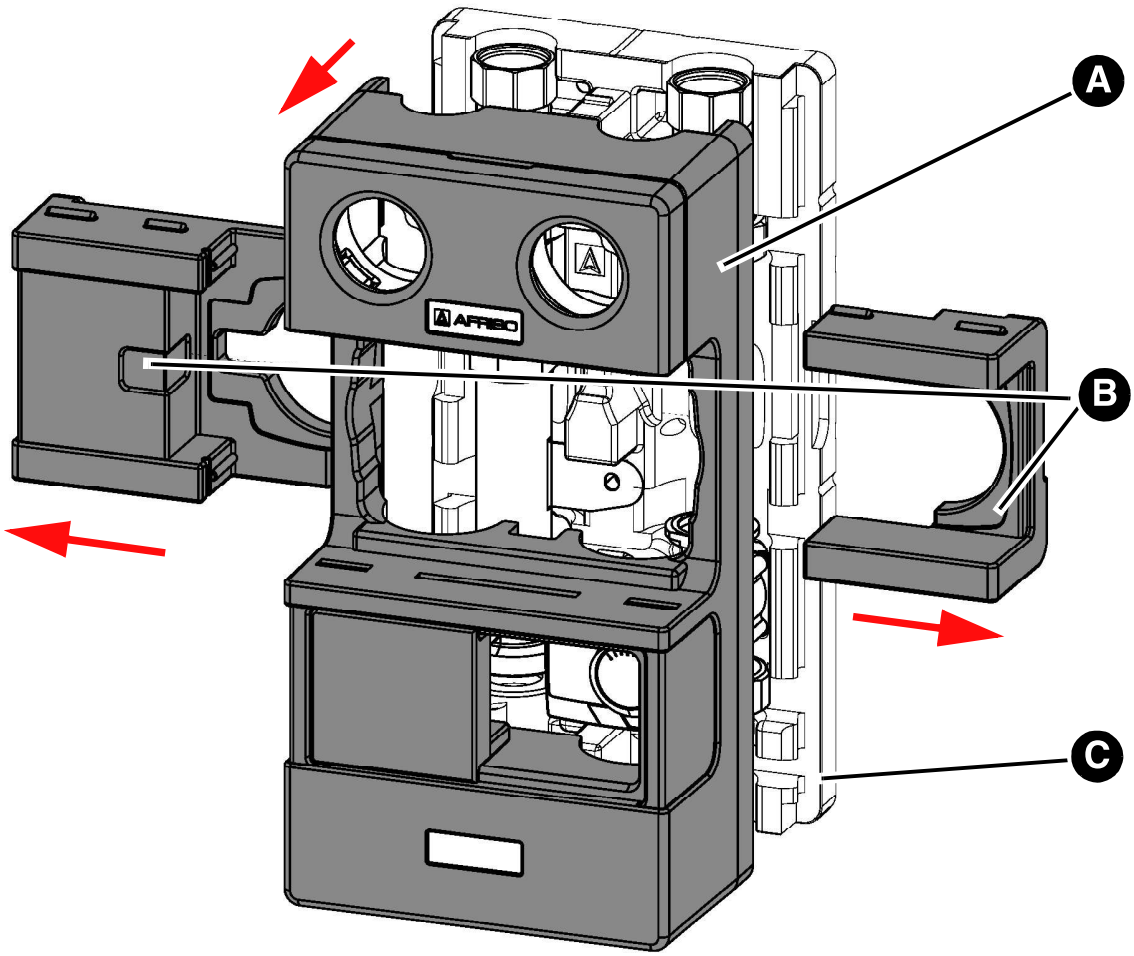
E. Heat insulation

Fig. 2: PrimoTherm® K 180-2 Vario with 3-way mixer and actuator

Heat insulation

The upper shell of the heat insulation consists of four parts. The parts can be be removed separately.

1. Note the direction when removing the heat insulation parts.



A. Upper part of the heat insulation
B. Centre part of heat insulation
C. Bottom part of heat insulation

Fig. 3: Parts of the heat insulation

4.2 Dimensions and connections

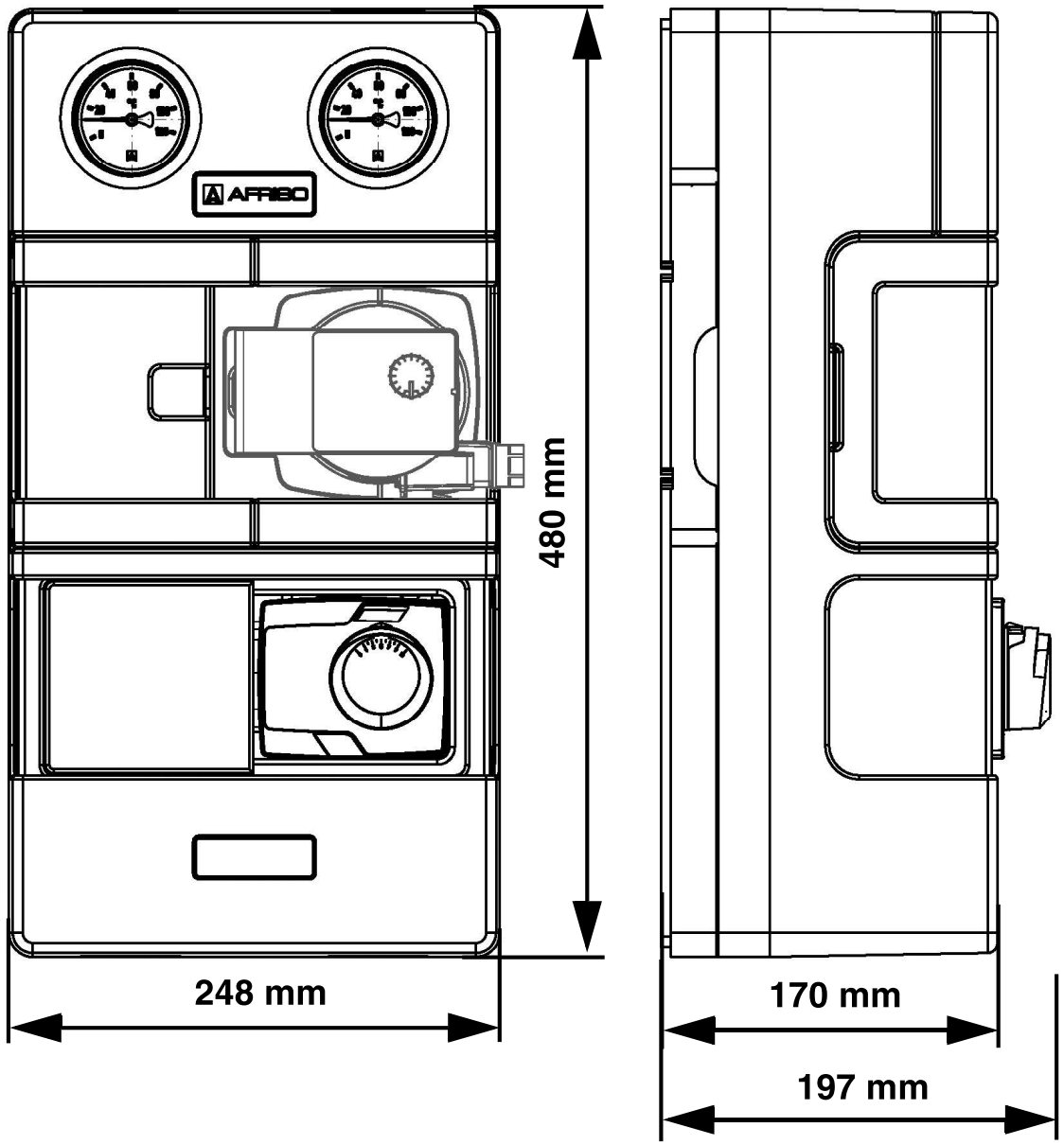
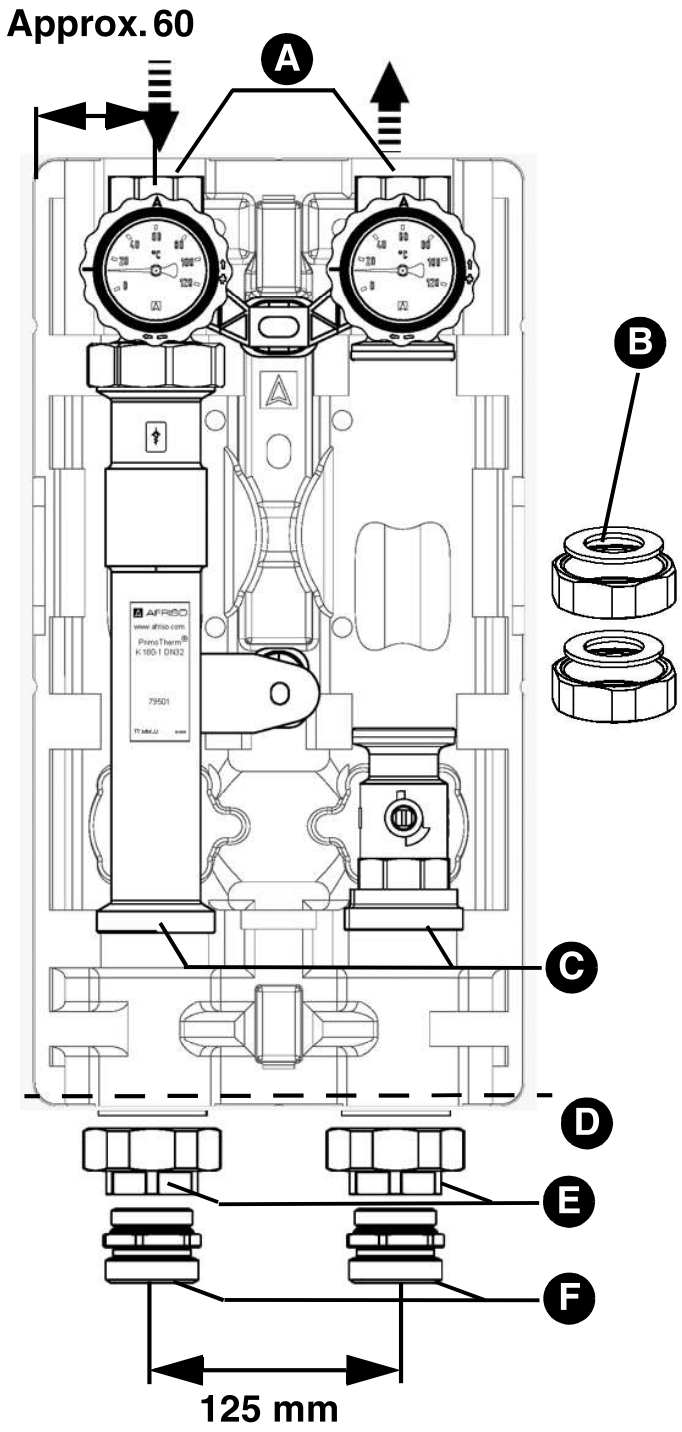


Fig. 4: Dimensions PrimoTherm® K 180-1 and K 180-2 (with mixer)

Product description



A. G1¼i

B. Union nuts and flat gaskets (for pump installation)

C. G2 male

D. Screw connector kit

E. Screw connection for wall mounting G1¼ female

F. Screw connection for mounting to boiler manifold G1½ male

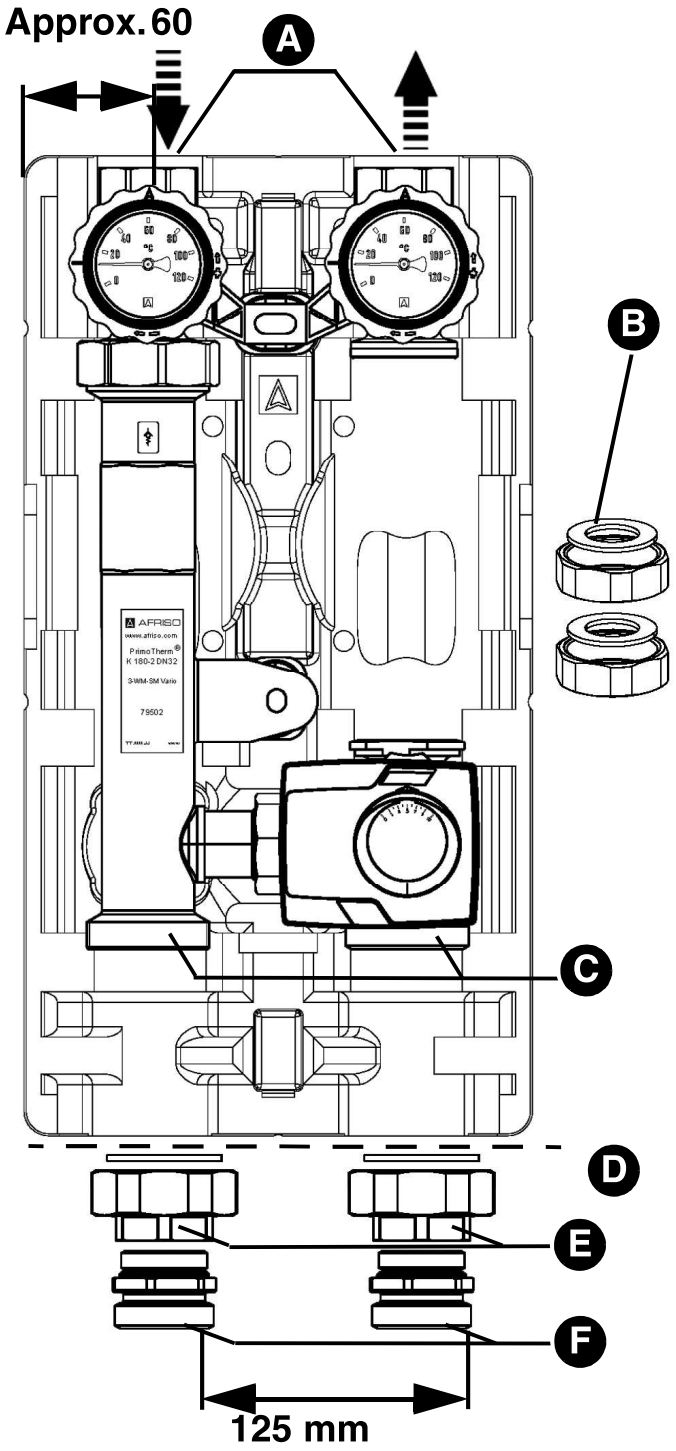
Distances from the lower edge of the heat insulation to the connection with the accessories installed.

C = approx. 90 mm

D = approx. 67 mm

E = approx. 42 mm

Fig. 5: PrimoTherm® K 180-1 with screw connector kit



A. G1¼i

B. Union nuts and flat gaskets (for pump installation)

C. G2 male

D. Screw connector kit

E. Screw connection for wall mounting G1¼ female

F. Screw connection for mounting to boiler manifold G1½ male

Distances from the lower edge of the heat insulation to the connection with the accessories installed.

C = approx. 90 mm

D = approx. 67 mm

E = approx. 42 mm

Fig. 6: PrimoTherm® K 180-2 with screw connector kit

4.3 Function

Version K 180-1 DN 32

The product is used in non-mixed heating circuits, specially for storage tank charging.

The additional ball valve below the circulation pump allows you to replace the circulation pump without having to drain the system.

Version K 180-2 DN 32

The product features and additional 3-way mixer for controlling the flow temperature and an actuator. The flow coefficient Kvs of the mixer is adjustable.

⇨ If version K 180-2 is used, ensure that the mixer motor can be controlled by the boiler controller or by another controller.

1. Verify that the boiler used features a motor controller.

Version K 180-2 DN 32 can also be used to increase the return temperature in system with solid fuel boilers. The boiler controller must be able to control the actuator if this feature is to be used.

1. Verify that the boiler has a controller for increasing the return temperature.
2. Interchange the thermometers.
   - The colours must be assigned correctly.

4.4 Approvals, conformities, certifications

Refer to the operating instructions of the actuator. See operating instructions of the manufacturer of the circulation pump for versions with circulation pump.

4.5 Technical data

Parameter	Value
General specifications	
Dimensions with heat insulation (W x H x D)	248 x 480 x 170 mm
Weight K 180-1 DN 32 without circulation pump	Approx. 5.5 kg
Weight K 180-2 DN 32 without circulation pump	Approx. 7.0 kg
Material of fittings	Brass, steel, plastic
Material of seals	EPDM, PTFE
Insulation material	Polypropylene EPP
System pressure	Maximum 10 bar Observe maximum pressure of circulation pump used.
Axis distance	125 mm
System connections	From heat generator: G2, screw connections to G1¼ female and G1½ male To consumer: G1¼ female thread
Maximum temperature medium	110 °C (maximum malfunction temperature up to 2 hours: 120 °C)
Medium	Heating circuit water or heating circuit water with a glycol concentration of 50 %
Flow coefficient (l/h at one bar differential pressure)	
K 180-1	21
K 180-2	13

5 Mounting

Unless otherwise specified, all information on mounting relates to the installation type "**flow right**". Conversion is described in chapter “Interchanging flow/return” on page 15.

1. Remove the upper shell of the heat insulation (see “Heat insulation” on page 8).

The upper shell of the heat insulation is only reinstalled after completion of all mounting work.

5.1 Preparing mounting

Only mount the product after having completed all pipe assembly work, all welding work and all soldering work.

If you install the product in an existing system, observe the information in chapter “Retrofitting the product” on page 25.

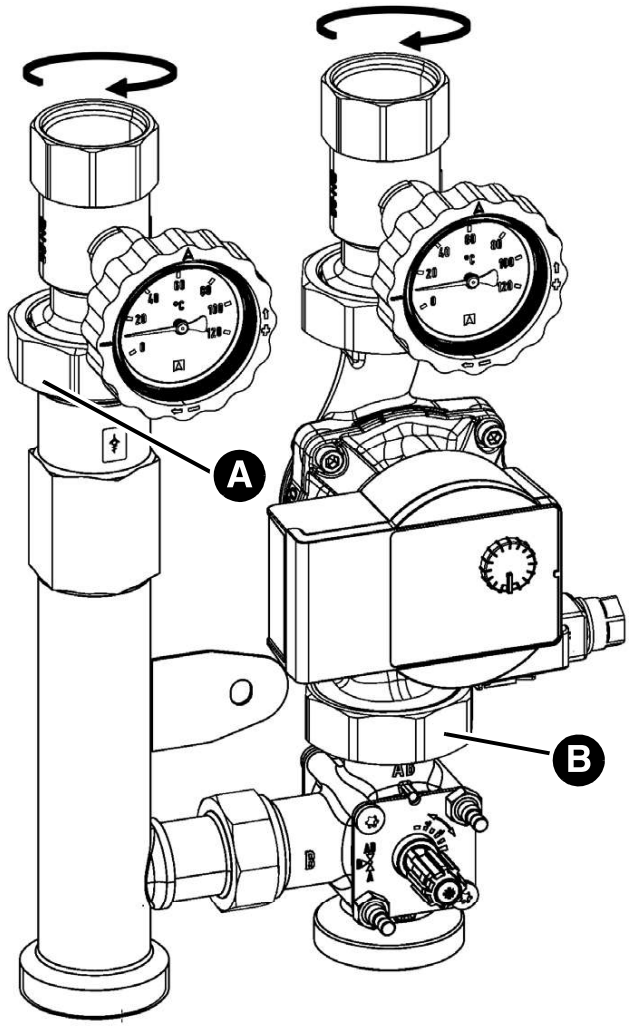
⇨ Verify that the nominal pressure of the product corresponds to the specification value of the system.

⇨ Verify that the liquid in the system and the application area of the product are compatible.

1. Flush the lines of the system before installing the product.

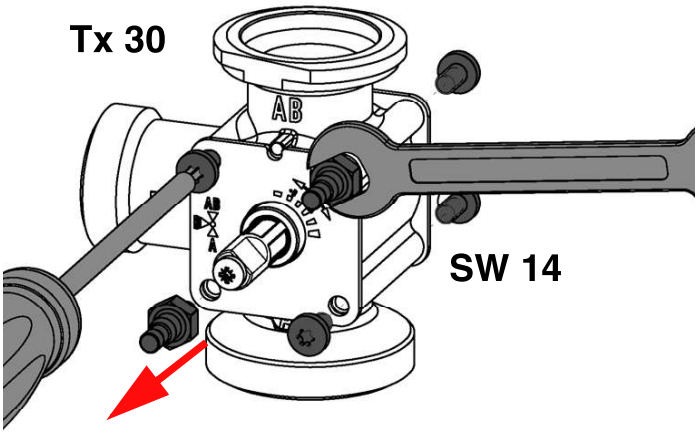
5.2 Interchanging flow/return

The flow is at the right side when the product is shipped.



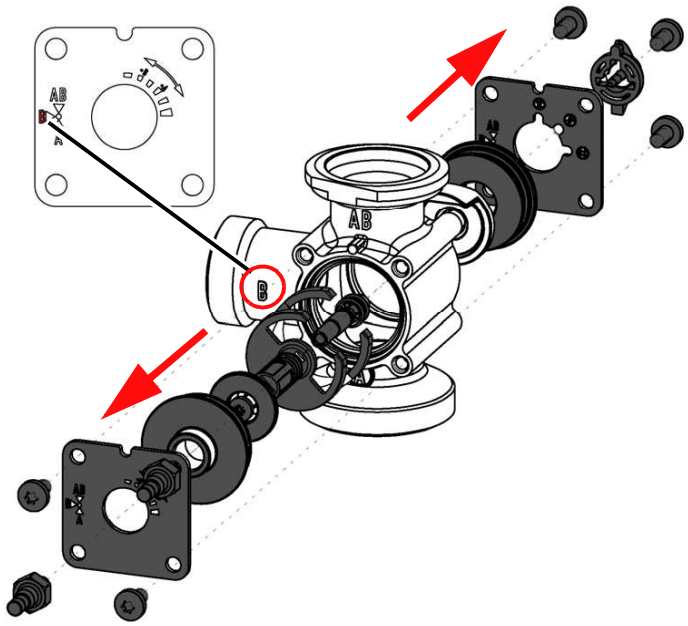
1. Loosen the union nut at the return ball valve (A).
2. Loosen the union nut at the mixer (B).
3. Turn the return ball valve by 180°.
4. Turn the pump with the flow ball valve by 180°.
5. Retighten the two union nuts.
6. Convert the mixer to flow left (see Page 15).

5.2.1 Converting the mixer/bypass (K 180-2 DN 32 only)

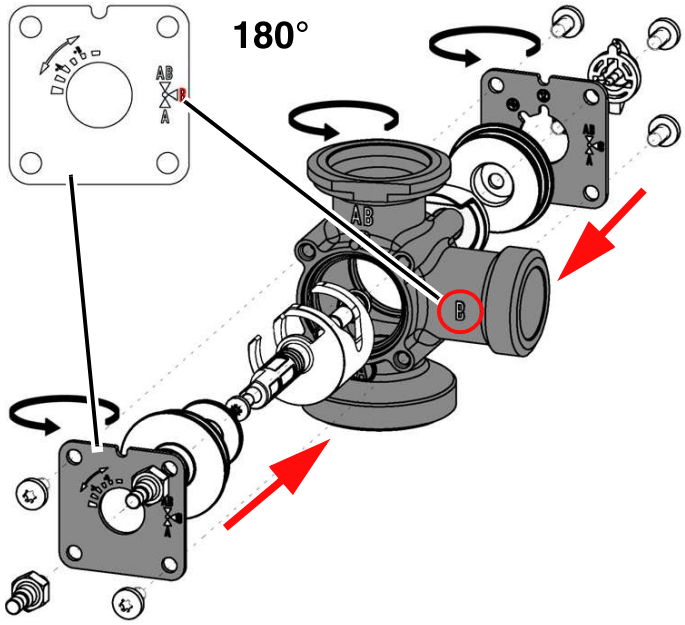


1. Remove the screws.

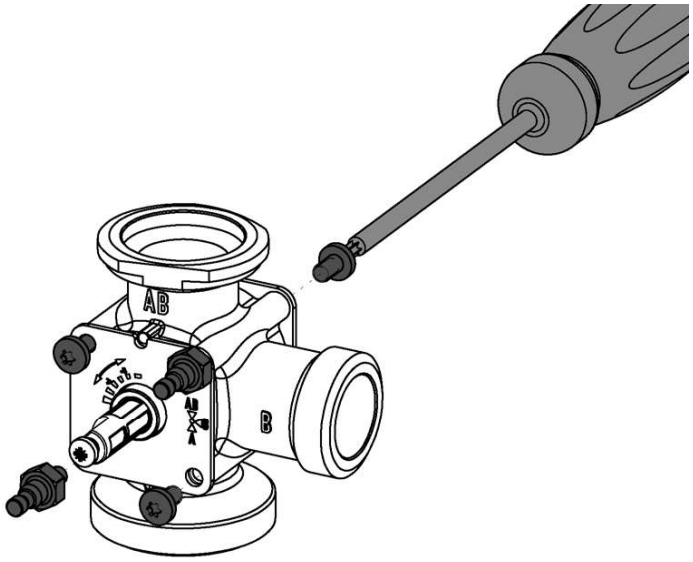
Mounting



2. Remove the components as shown in the illustration.



3. Turn the mixer by 180°.
4. Turn the two discs by 180°.
5. Mount the components back to the mixer.



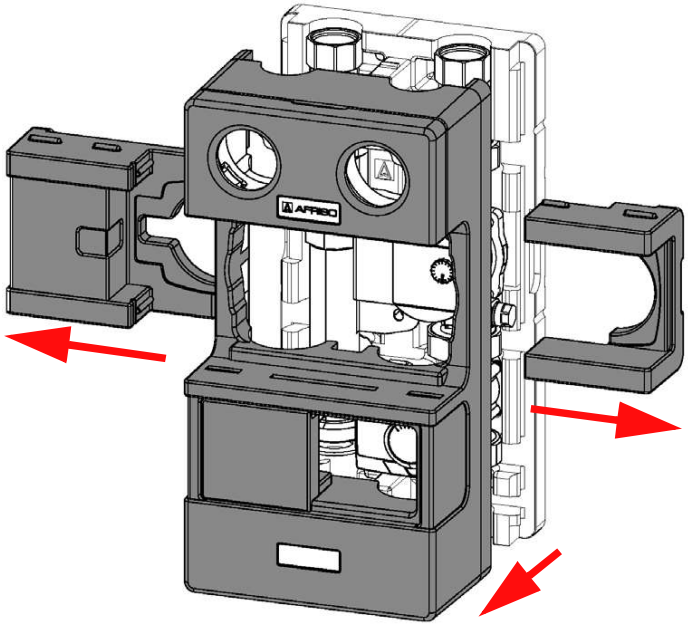
6. Install the screws.
   - Tightening torque 3 Nm

5.3 Installing the circulation pump

If you use a product version without pre-assembled circulation pump, you must install a suitable circulation pump with a length of 180 mm yourself.

⇨ Verify that you use the seals enclosed with the product.

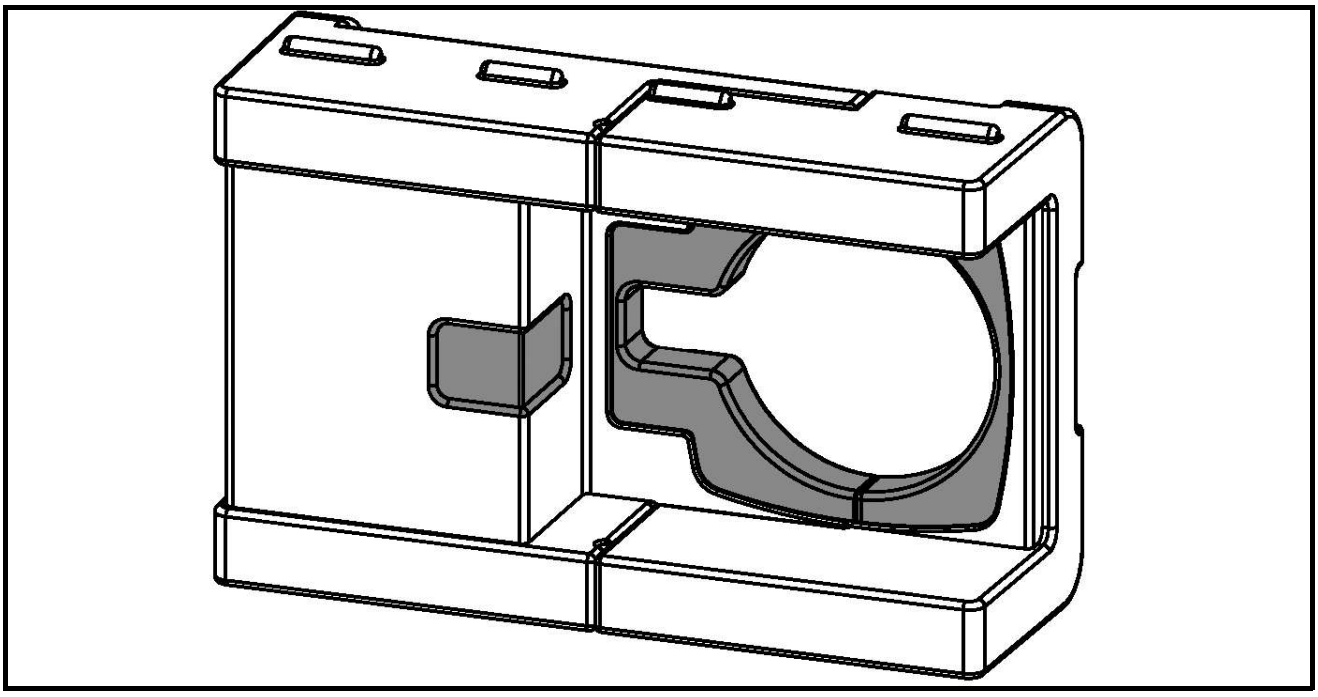
1. Observe the specifications of the pump manufacturer.



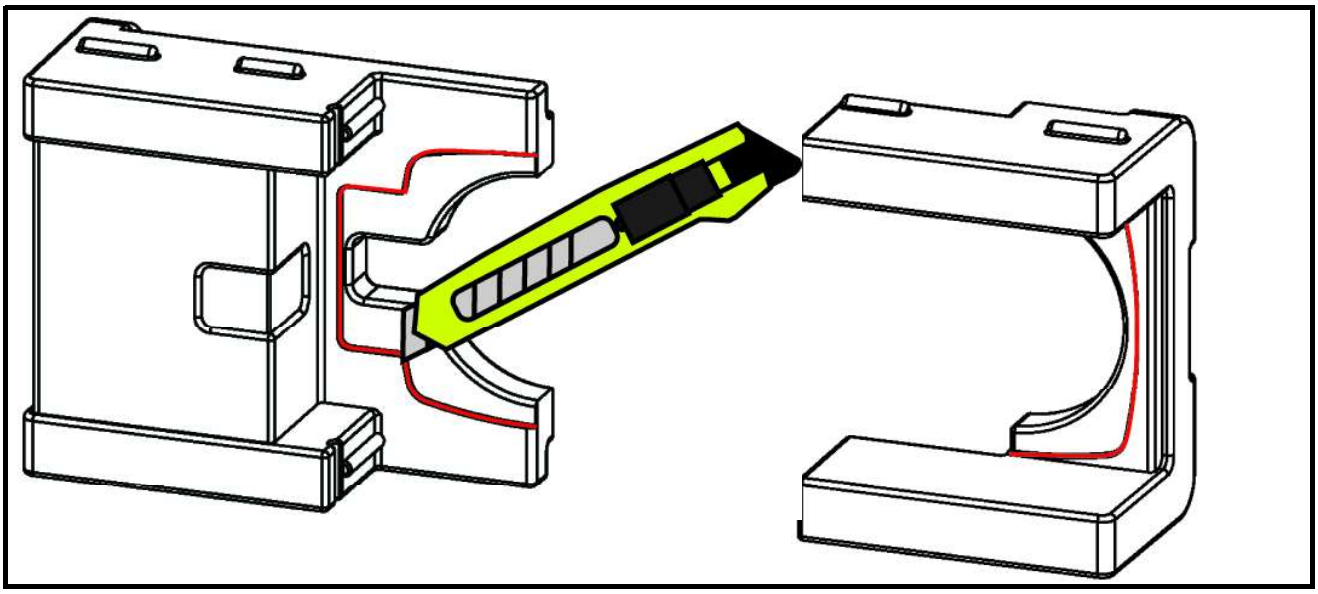
2. Pull the two centre parts of the heat insulation to the sides.
3. Remove the upper part of the heat insulation.
4. Mount the pump with the enclosed flat gaskets and the union nuts G2.
   - Connection thread G2, tightening torque 80 Nm.

5.4 Installing a larger circulation pump

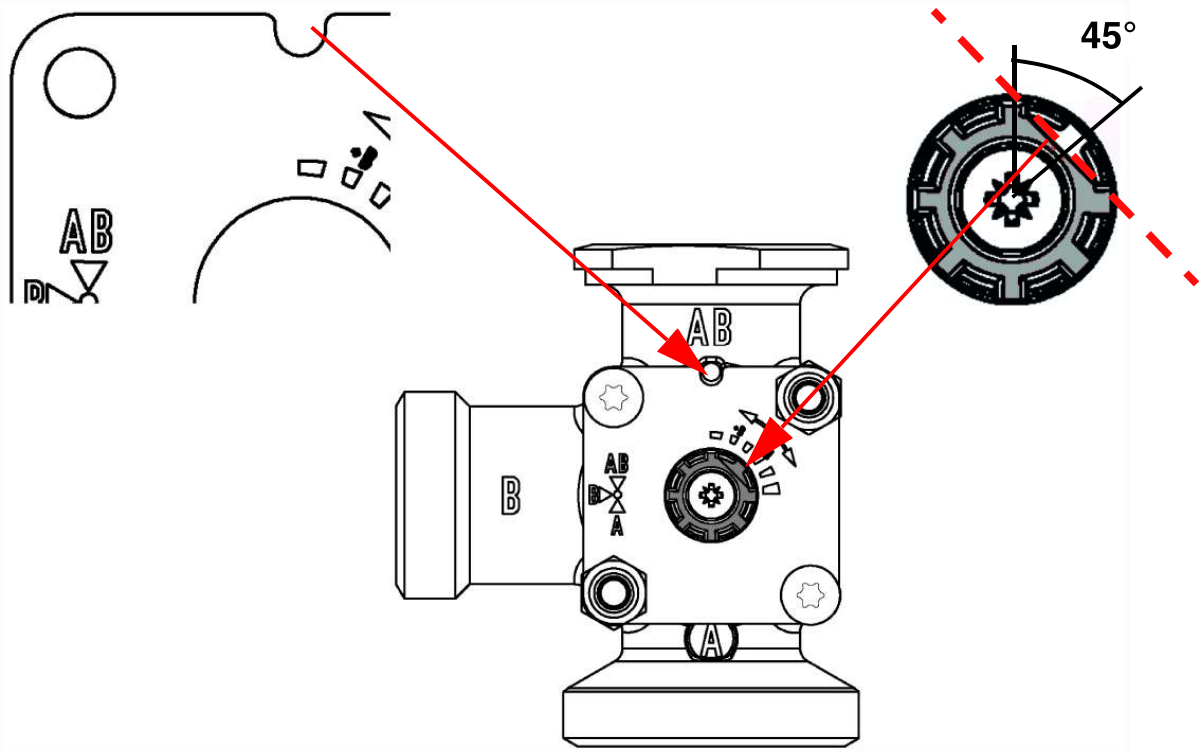
If you install a larger circulation pump in the product, you can cut out a part of the heat insulation (marked grey in the illustration).

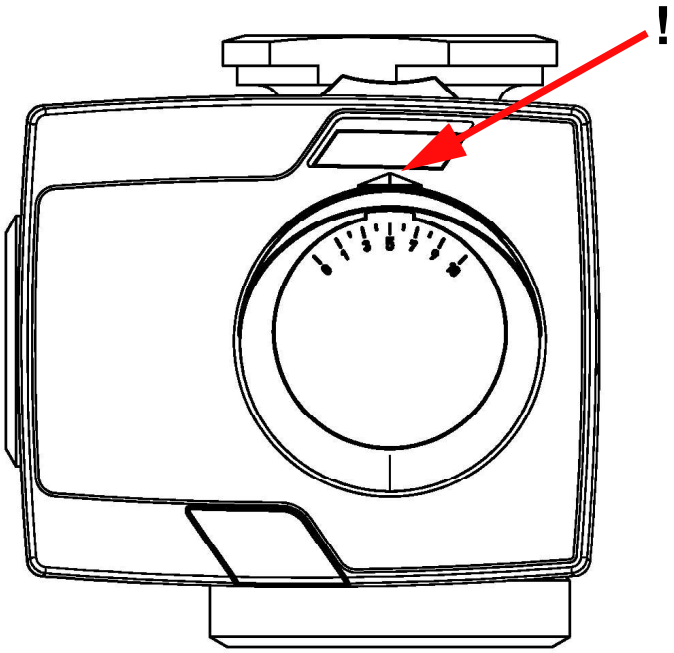


1. Pull the two centre parts of the heat insulation to the sides.
2. Provide a cut-out of the required size in the heat insulation.
3. Install the pump.
4. Refit the two centre parts of the heat insulation.

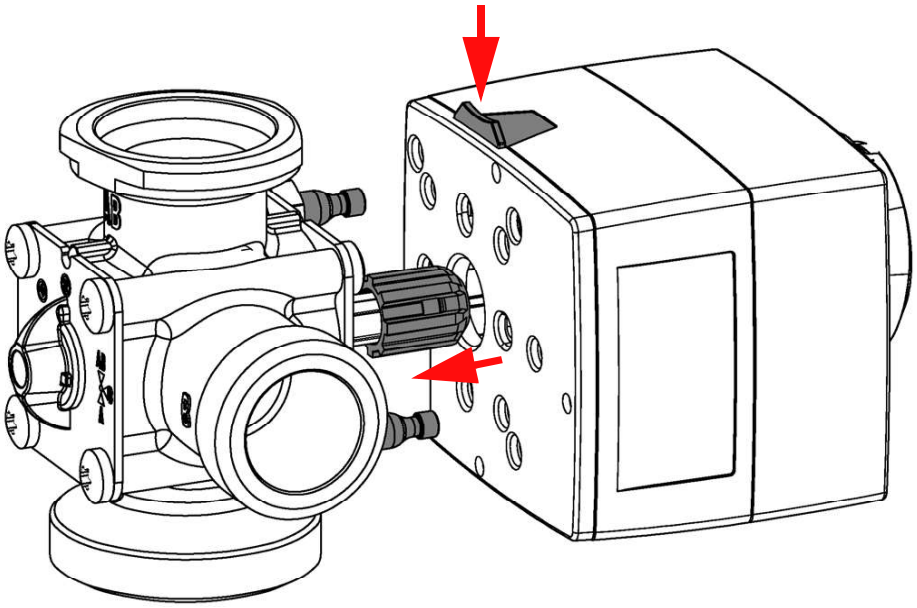


5.4.1 Mounting the actuator



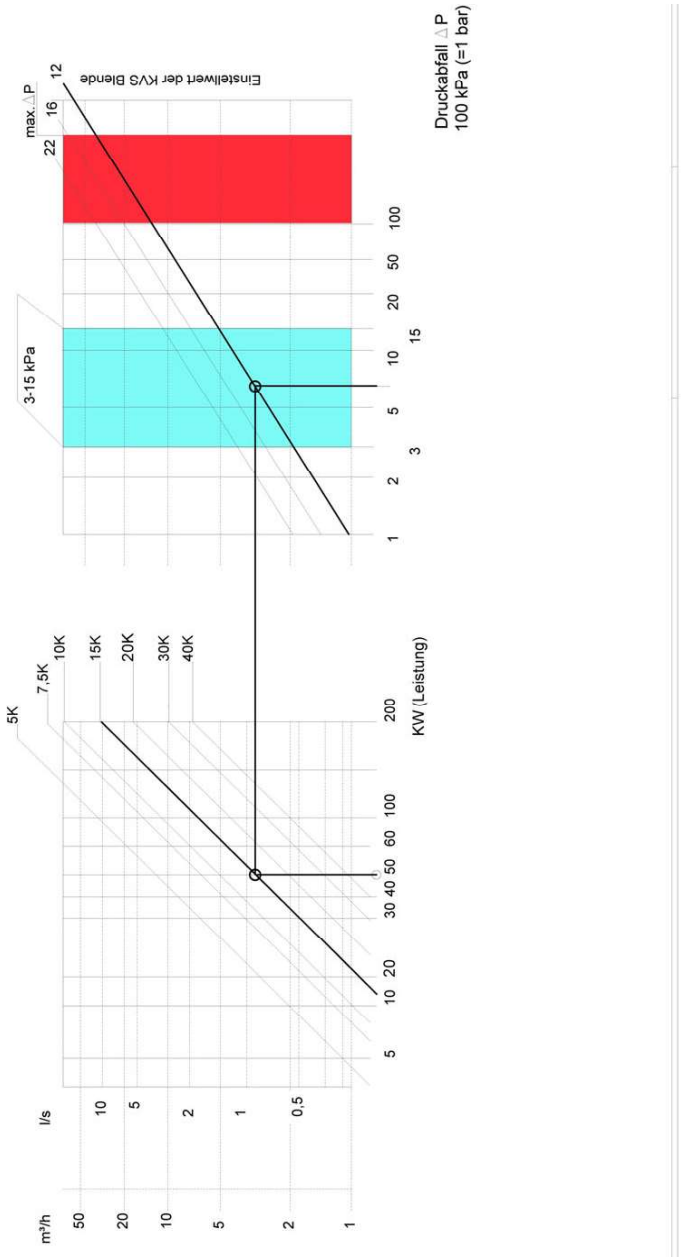


Mounting



5.5 Determining the Kvs flow coefficient value

The adjustment value for the flow efficient Kvs of the orifice is determined on the basis of the power of the heating circuit (KW) and the temperature spread between flow and return (K corresponds to °C); refer to the following table.



Example:

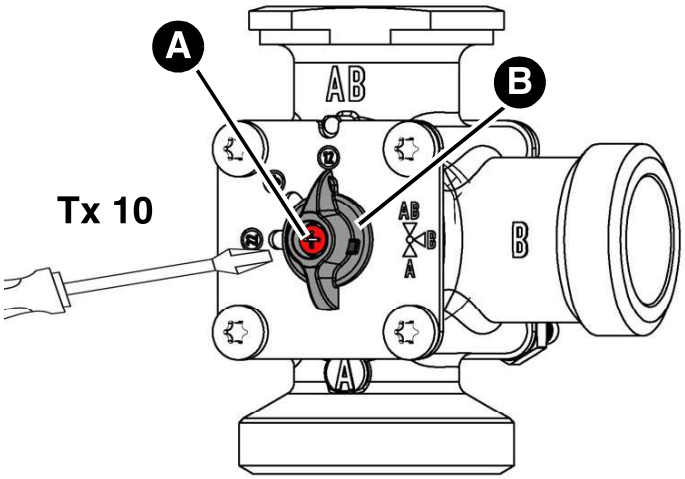
A. Capacity: 50 KW

B. Temperature spread: 15 K

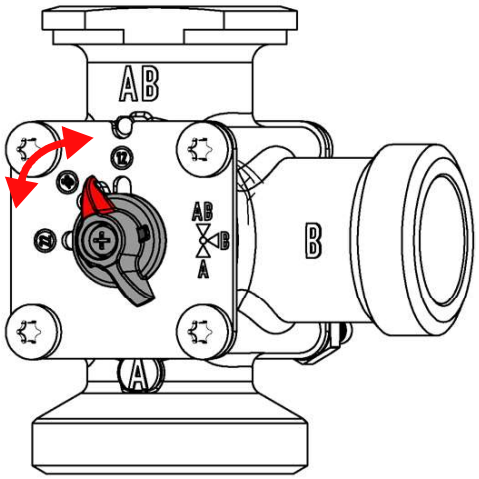
C. Point of intersection in the centre of the optimum range 3-15 kPa

D. Read adjustment value: 12 (in m³/h at a differential pressure of 1 bar)

5.6 Adjusting the Kvs flow coefficient



1. Loosen the screw (A) with a screwdriver.
   - The screw does not need to be fully removed.
2. Slightly pull the handwheel (B) away from the scale.
   - The hand wheel releases itself from the grid hole.



3. Turn the hand wheel to the required adjustment value Kvs.
   - The hand wheel snaps in at the selected grid position.
4. Retighten the screw.

5.7 Mounting the product

NOTICE

MECHANICAL LOADS AND STRESS

- Verify that the product is not subjected to mechanical loads and stress when connecting the product.
- If necessary, install a corrugated pipe compensator to compensate for mechanical stress or tension.

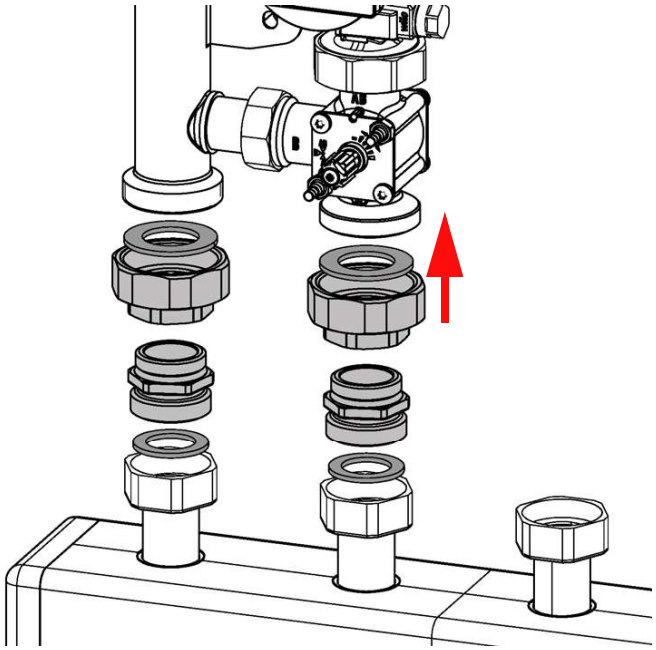
Failure to follow these instructions can result in equipment damage.

5.7.1 Mounting the product to a boiler manifold KSV

If you want to mount the product to the boiler manifold, use the screw connector kit included in the scope of delivery.

⇨Verify that you use the seals enclosed with the screw connector kit.

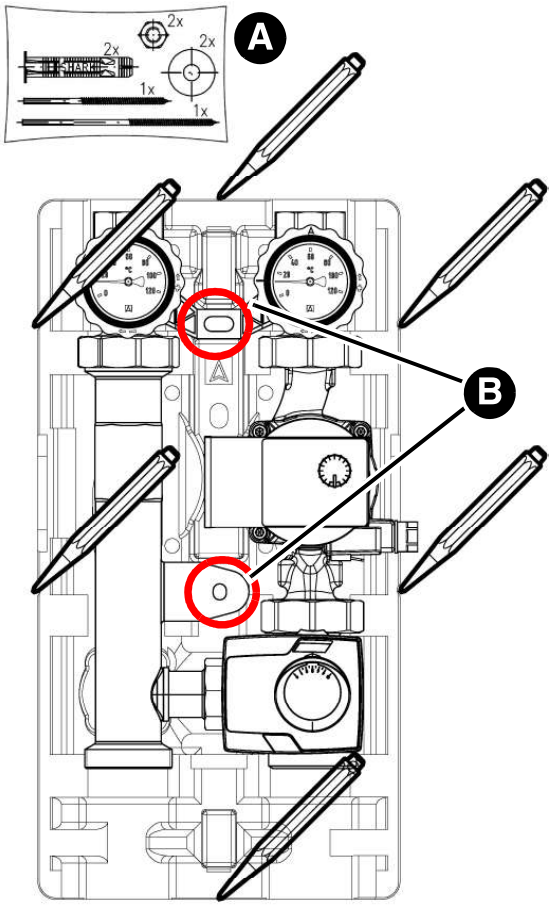
1. Remove the heat insulation (See "Parts of the heat insulation" on page 8.)



2. Screw the reducers (grey) to the product.
3. Tighten the screw connections.
4. Screw the product to the boiler manifold KSV.
5. Tighten the union nut of the boiler manifold KSV.
6. Screw the pipes of the heating circuit to the screw connections of the product.

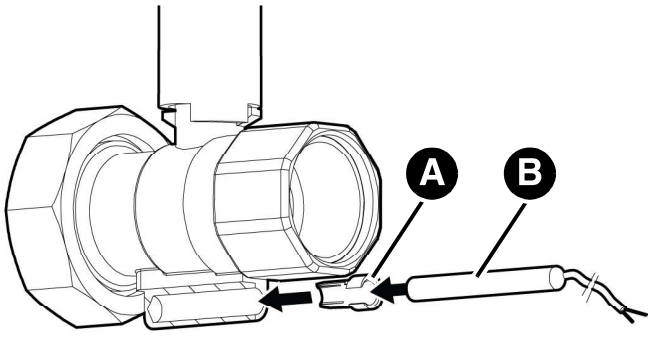
5.7.2 Wall mounting

⇨Verify that the enclosed dowels are suitable for the intended wall.



1. Verify that the wall can carry the product.
2. Remove the upper parts of the heat insulation.
3. Hold the product to the wall and align it with a level.
4. Draw six marks.
5. Interconnect the opposing marks.
6. Drill holes (Ø 10 mm) at the intersections (B).
7. Mount the product using the enclosed dowels and screws (A).
   - long hanger bolt at the top
   - short hanger bolt at the bottom
8. Screw the pipes of the heating circuit to the screw connections of the product.
9. Refit the upper shell of the heat insulation to the product (see “Heat insulation” on page 8).

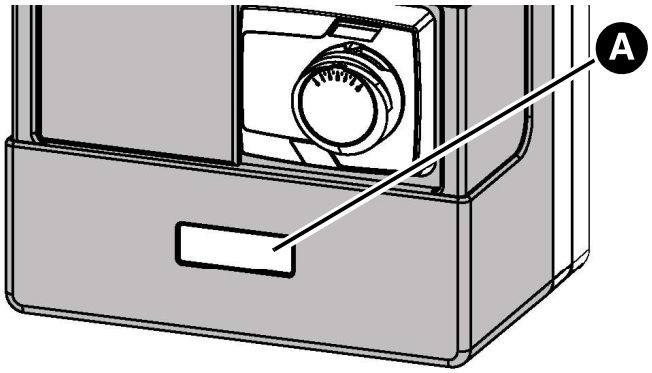
5.7.3 Mounting the temperature probe (optional)



Depending on the type of the temperature probe (B), it may be necessary to shorten the ferrule (A).

5.7.4 Marking the heating circuits

If several heating pump assemblies are installed, you can mark them. The labels are included in the scope of delivery.



1. Label the corresponding heating circuit designation on the label field (A).

5.8 Retrofitting the product

WARNING

HOT LIQUID

Water in heating systems is under high pressure and can have temperatures of more than 100 °C.

- Verify that the heating water has cooled down before opening the system and mounting the product.
- Verify that the system has been unpressurised and drained before mounting the product.

Failure to follow these instructions can result in death, serious injury or equipment damage.

⇨ Verify that the nominal pressure of the product corresponds to the specification value of the system.

⇨ Verify that the liquid in the system and the application area of the product are compatible.

When the system has cooled down and unpressurised, you can mount the product.

1. Drain the system.
2. Flush the lines of the system.
3. Mount the product as described in chapter "Mounting the product to a boiler manifold KSV" or in chapter "Wall mounting".

5.9 Electrical connection

DANGER

ELECTRIC SHOCK

- Verify that the degree of protection against electric shock (protection class, double insulation) is not reduced by the type of electrical installation.

Failure to follow these instructions will result in death or serious injury.

DANGER

ELECTRIC SHOCK CAUSED BY LIVE PARTS

- Disconnect the mains voltage supply before performing the work and ensure that it cannot be switched on.
- Verify that no hazards can be caused by electrically conductive objects or media.

Failure to follow these instructions will result in death or serious injury.

1. Connect the circulation pump and the actuator in accordance with the instructions of the manufacturer.

6 Commissioning

Prerequisite for commissioning is a complete installation of all hydraulic and electrical components.

⇨ Verify that the thermometer ball valves are fully open.

1. Perform a tightness test as per EN 14336.
2. Verify tightness of the components of the system.
   - Adapt the test pressure and the test duration to the corresponding installation and the corresponding operating pressure.
3. Fill the system with filtered water as per VDI 2035.
4. During filling, verify that all connections are tight.
5. Apply pressure to the system.
6. Vent the system.

7 Operation

During operation, the thermometer ball valves and the ball valves must be open.

8 Maintenance

Maintenance intervals

When	Activity
Monthly	Perform a visual inspection of the heating system and verify tightness.
If required	Replace the circulation pump.

9 Troubleshooting

Any malfunctions that cannot be removed by means of the measures described in this chapter may only be repaired by the manufacturer.

Also observe the corresponding instructions of the manufacturer in the case of malfunctions of the circulation pump or the actuator.

Problem	Possible reason	Repair
Noise in the system	Air in the system	Vent the system
	Circulation pump not properly adjusted	Verify correct adjustment of the circulation pump.
Circulation pump does not run	Pump defective	Replace the circulation pump
Other malfunctions	-	Contact the AFRISO service hotline.

9.1 Replacing the circulation pump

DANGER

ELECTRIC SHOCK CAUSED BY LIVE PARTS

- Disconnect the mains voltage supply before performing the work and ensure that it cannot be switched on.

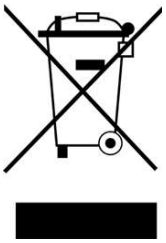
Failure to follow these instructions will result in death or serious injury.

1. Disconnect the mains voltage.
2. Close all ball valves and drain the affected system part.
   - In the case of versions with ball valve below the circulation pump, it is sufficient to close the two ball valves upstream and downstream of the circulation pump.
3. Replace the circulation pump. Use new seals and tighten the screw connections with 80 Nm.
4. Open all ball valves and perform a tightness test.
5. Fill and vent the system.
6. Connect the circulation pump to supply voltage.

10 Decommissioning, disposal

Dispose of the product in compliance with all applicable directives, standards and safety regulations.

Electronic components must not be disposed of together with the normal household waste.



1. Disconnect the product from mains.
2. Dismount the product (see chapter "Mounting", reverse sequence of steps).
3. Dispose of the product.

11 Returning the device

Get in touch with us before returning your product (service@afriso.de).

12 Warranty

See our terms and conditions at www.afriso.com or your purchase contract for information on warranty.

13 Spare parts and accessories

NOTICE

UNSUITABLE PARTS

- Only use genuine spare parts and accessories provided by the manufacturer.

Failure to follow these instructions can result in equipment damage.

Product

Product designation	Part no.	Figure
Heating pump assembly PrimoTherm K 180-1 DN 32	79501	
Heating pump assembly PrimoTherm K 180-2 DN 32	79502