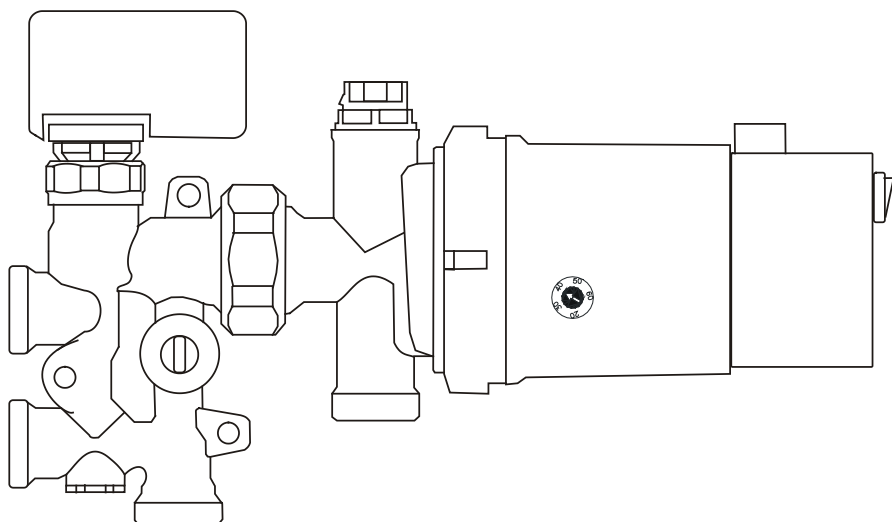


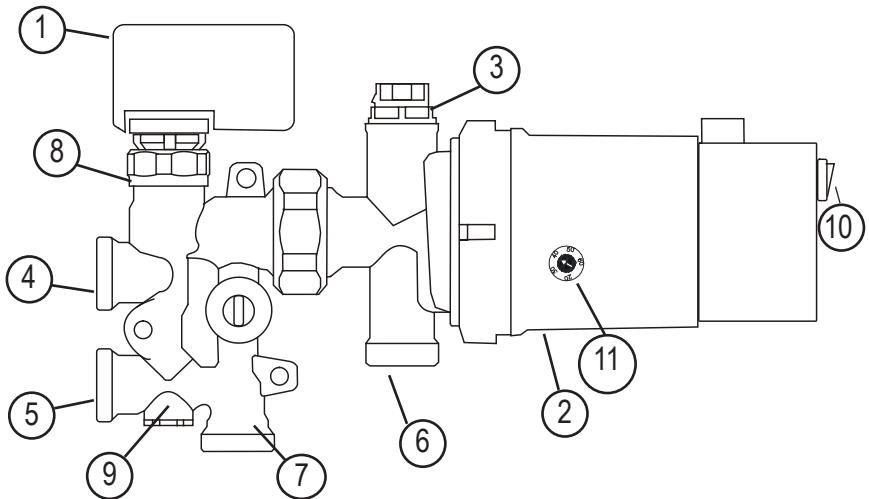
Installation and operation manual for mixing set BM mini



LAING

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Design BM mini



1. Version KF = Remote sensor thermostat (8-26°C, 5 m) or
Version RT = thermoelectric drive for the connection of a room
thermostat (not included in delivery) or
Version KR = thermoelectric drive, pre-wired with pump including
a constant temperature control (A1-121 R, 20-70°C) for the
connection of a room thermostat (not included in delivery)
2. Laing circulating pump with spherical motor A1-121 resp. A1-121 R
3. Venting device
4. Supply radiator-/boiler circuit
5. Return radiator-/boiler circuit
6. Supply floor heating circuit
7. Return floor heating circuit
8. Adjustable mixing valve
9. Adjustable bypass for the radiator-/boiler circuit
(recommended to be closed)
10. ON-OFF-switch for pump
11. Flow temperature setting (KR version only)

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Technical Data

Max. system pressure	1 Mpa (10 bar)
Max. system temperature	110°C (boiler circuit), 55°C (floor heating)
Max. differential pressure	100 kPa (1 bar) in the radiator-/boiler circuit
Electrical connection	1 x 230 V / 50 Hz
Power consumption	25 Watt (circulating pump)

Application

- The BM mini is designed to supply floor heating areas up to approx. 40 sqm (from pipe 16x2 mm onwards) in one- or two-pipe-systems. The connection of up to 2 floor heating circuits is possible.
- Three versions are available:
 - BM mini KF:** Mixing set with room temperature guided control, made of thermostat (10-26°C + frost protection) with remote sensor (5 m).
 - BM mini RT:** Mixing set for temperature guided control, made of thermoelectric drive for the connection of a room thermostat (room thermostat not included in delivery- see accessories in product range).
 - BM mini KR:** Mixing set with integrated constant temperature control (20-70°C) for the connection of a room thermostat (room thermostat not included in delivery- see accessories in product range).
- The BM mini is provided with a temperature protection system that restricts the supply temperature in the floor heating circuit to max. 55°C.

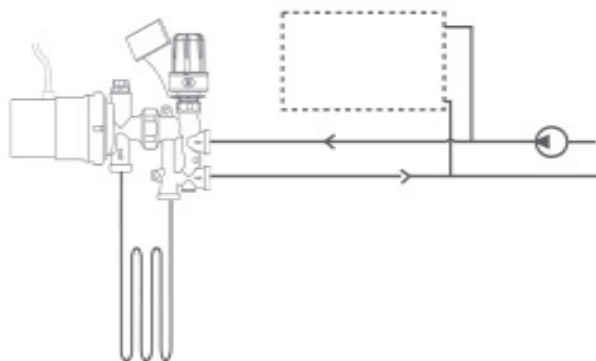
Mounting instructions

- BM mini will be connected directly to the existing radiator-/boiler circuit.
- When two circuits are connected to the BM mini, the shortest circuit must be balanced by using an adjustable return screw connection.
- The BM mini has to be mounted in a horizontal position (see page 2). Left or right connection to the radiator-/boiler circuit is possible (see page 9).
- The BM mini has to be installed on a higher level than the floor heating installation.

Installation and operation manual BM mini

- Ensure that the pre-pressure to the BM mini from the radiator-/vessel circuit is minimum 10 kPa (1 m).
- Before running the BM mini please check, that the floor heating system is filled, completely vented, and proved against leakage.
- Since the circulation pump might create under certain circumstances some flow noise, the BMmini should be placed away from noise sensitive areas (i.e. sleeping rooms).
- The water temperature in the supply radiator-/boiler circuit should be at least 10 K higher than in the floor heating supply.
- The maximum length of each pipe must not be longer than 100 m for floor heating design with spread of 10 K when using pipes 12 mm i.d. (i.e. pipe 16x2). Smaller diameter pipe results in a shorter pipe length.
- **BM mini KF:** Assemble the thermostatic head and mount the sensor in an appropriate position in the room and about 1,7 m above the floor. Use a vacant pipe if possible.
- **BM mini RT:** Wiring of the electrical actuator and the room thermostat
- **BM mini KR:** only by a qualified electrician.

Hydraulic connection of two-pipe systems



Bypass valve closed.
Allen key 2,5mm.

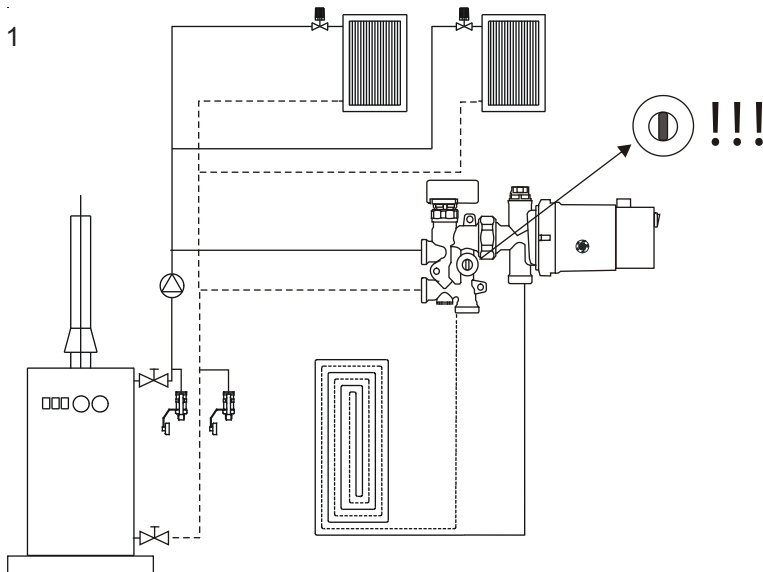
Filling of the system

It is mandatory to flush the floor heating loops before putting the system in operation, because otherwise malfunction or damage to the pump may result. We recommend using two fill valves on the primary side of the BM mini as shown in picture 2. Alternatively, the system can be filled using fill valves installed elsewhere in the system. In any case, it is necessary to positively flush the system since otherwise the air in the system will not be purged completely. Filling the system via the integrated manual air vent (see picture 7) is not possible! Please observe the position of the ball valve in the bypass. If this is in the vertical position, the floor heating loops are hydraulically uncoupled from the boiler loop. This position is ideal for normal operation (see picture 1) since the pump in the heating loop does not influence the floor heating loop. With the valve in this position, however, the floor heating system cannot be filled from the primary side.

To fill the floor heating loops from the heating loop side, this ball valve must be closed (horizontal) – see pictures 2 through 6. After filling, the valve must be opened again (vertical position). Please observe that when filling from the primary side radiator valves on that side should be closed in order to have maximum pump pressure available for purging the floor heating loops.

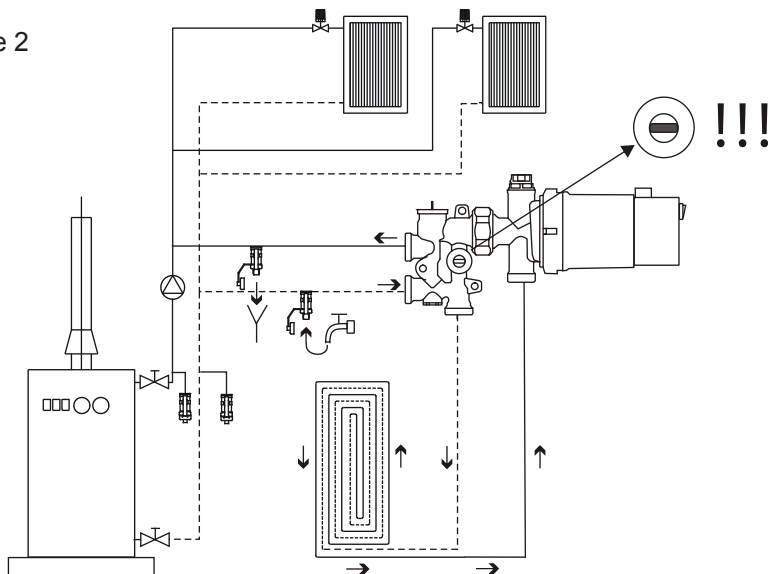
Installation and operation manual BM mini

Picture 1



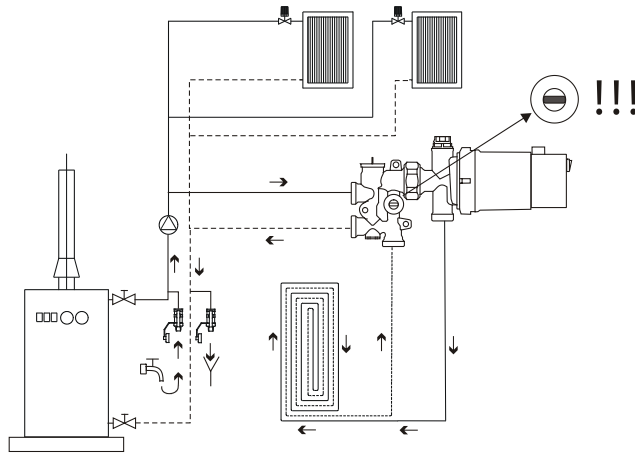
Normal operation. Ball valve position open (vertical)

Picture 2



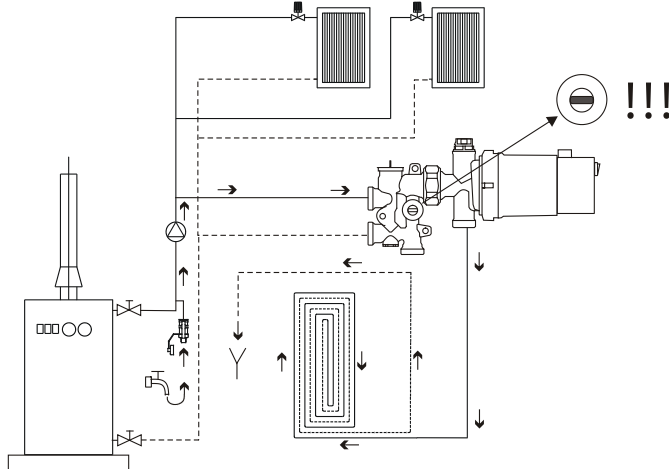
Recommended filling of the system. Two fill valves on the primary side of the BM mini allow for an easy filling and purging of air in the floor heating loops. The ball valve position must be closed (horizontal).

Picture 3



Good filling option. Two existing fill valves on the primary side allow for good filling and air purging. The ball valve position must be closed (horizontal).

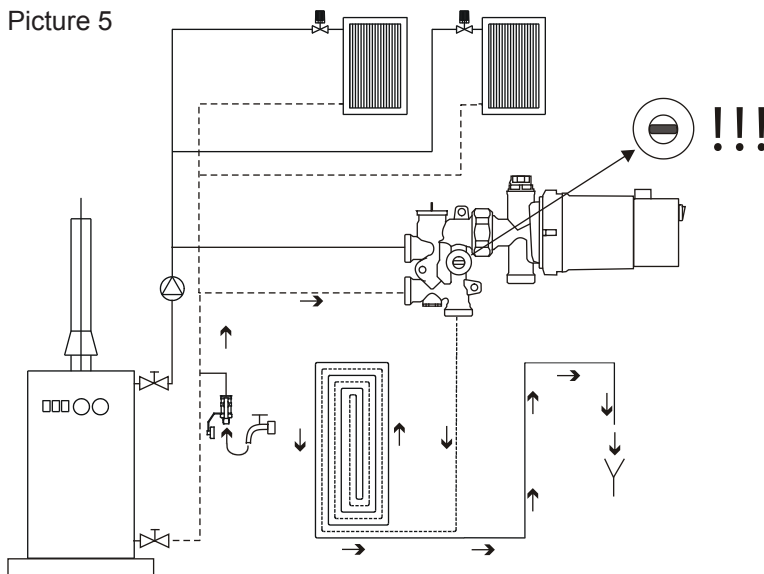
Picture 4



Possible filling option, albeit a little complicated. One fill valve on the primary flow side allows for filling and air purging. The integrated ball valve must be closed (horizontal). **Caution:** The floor heating return at the BM mini must be closed during the fill operation. Filling a wall heating loop is impossible in this way.

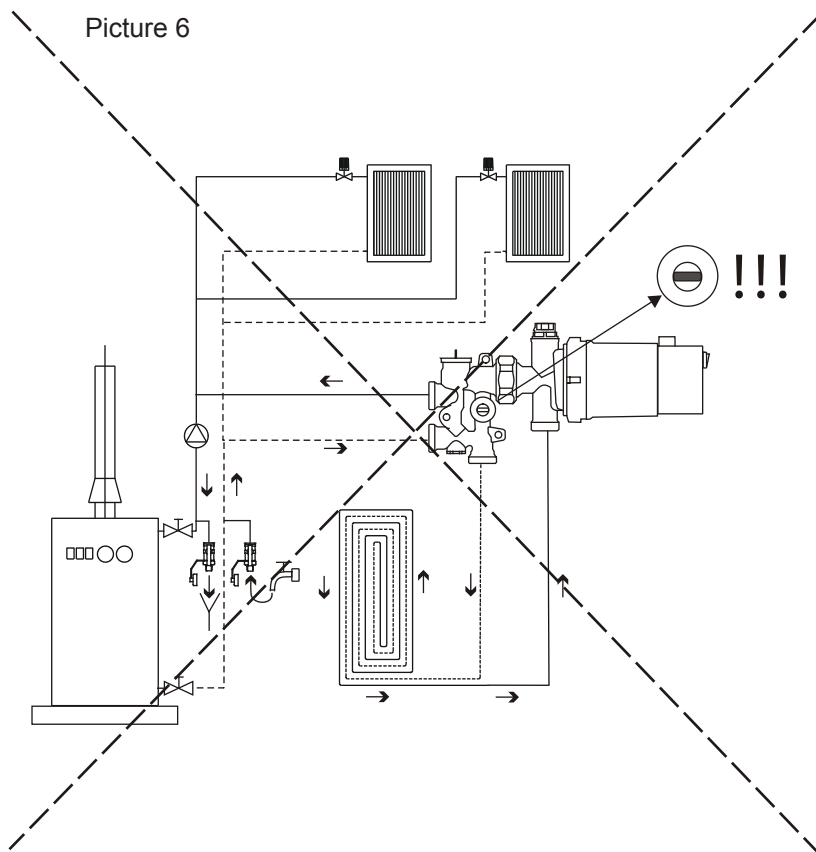
Installation and operation manual BM mini

Picture 5



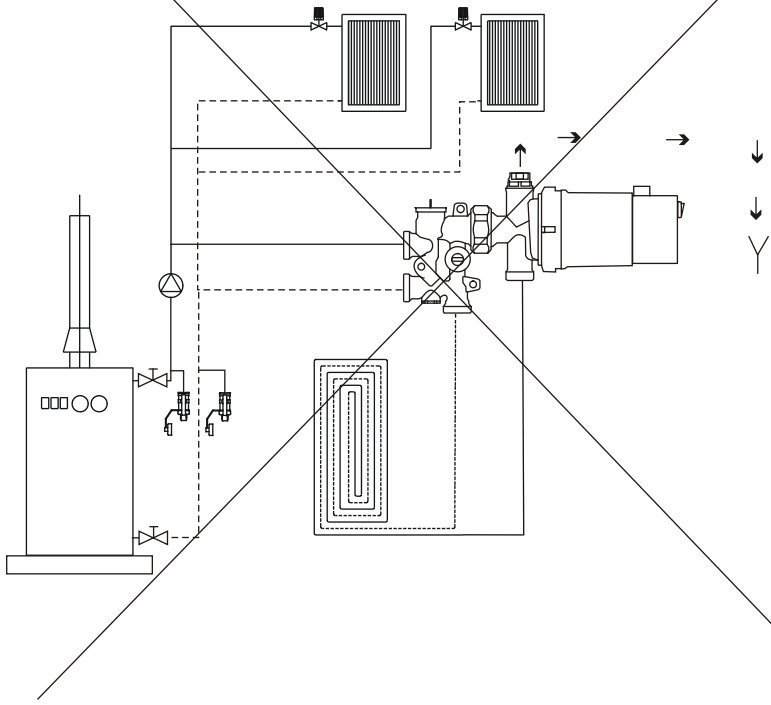
Possible filling option, albeit a little complicated. One fill valve on the primary return side allows for filling and air purging. The integrated ball valve must be closed (horizontal). **Caution:** The floor heating flow at the BM mini must be closed during the fill operation. Filling a wall heating loop is impossible in this way.

Picture 6



The direction of flow shown is only possible if there is no check valve installed at the primary heating circulator. If a check valve is present, filling in accordance with picture 3 is recommended.

Picture 7



Filling the system in this way is impossible since no forced flushing can be assured.

Hydraulic connection of one-pipe systems

This pipe system is not longer standard. Connection scheme on request.

Starting of operation without given values

1. Remove protection cap / or thermostatic head / or electric drive from the BM mini (see page 14, picture 1).
2. Increase the supply temperature from the radiator-/boiler circuit to the designed value (normally 55-60°C).
3. To perform the adjustment check, the room temperature has to be at least 20°C. If it is not, the system has to be run until the temperature increases.
4. Check the floor heating supply temperature. It should be about 35-40°C. If it is too high, the flow from the primary supply has to be adjusted (reduced), see page 14 picture 3.

The BM mini will be delivered from factory with fully opened mixing valve. We recommend an adjustment in small steps (1/2 turn). After each adjustment the floor heating supply temperature should be checked after an appropriate waiting period.

Starting of operation with given values (pre-setting)

E.g. Given values:

Heat requirement of underfloor heating system	2000 W
Supply temperature of radiator-/boiler system	70°C.
Return temperature of underfloor heating system	40°C
Difference pressure of the radiator-/boiler circuit	10 kPa
Specific heat capacity of water	1,163 $\frac{\text{W}}{(\text{kg} \times \text{K})}$

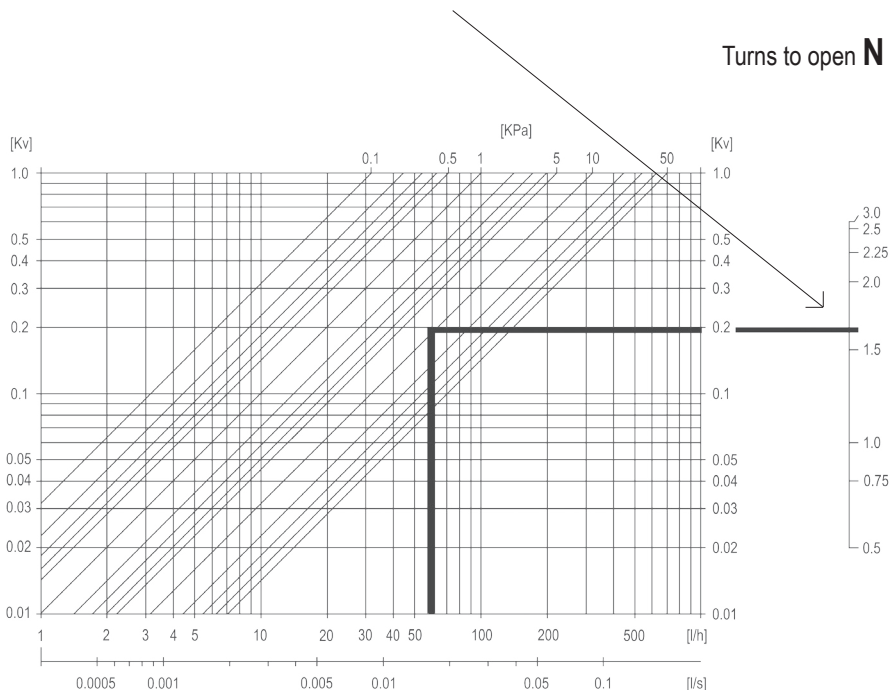
Wanted values:

Flow from the radiator-/boiler circuit =

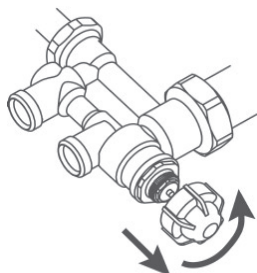
$$m = Q / (c \times \Delta T) = 2000 \text{ W} / (1,163 \frac{\text{W}}{(\text{kg} \times \text{K})} \times 30 \text{ K}) = 58 \text{ l/h}$$

Pre-setting:

If the difference pressure from the radiator-/boiler circuit at the inlet and outlet of the BM mini is 10 kPa and the flow requirement of the BM mini is about 60 l, the mixing valve pre-setting has been opened by 1,6 turns.

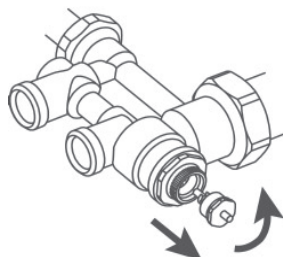


1.



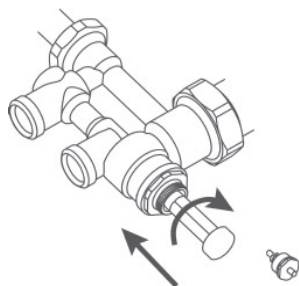
Remove protection cap

2.



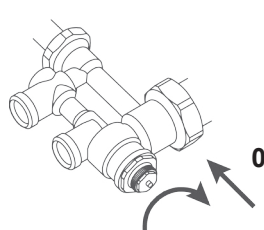
Remove valve insert

3.



Use enclosed tool to adjust the pre-setting of the mixing valve

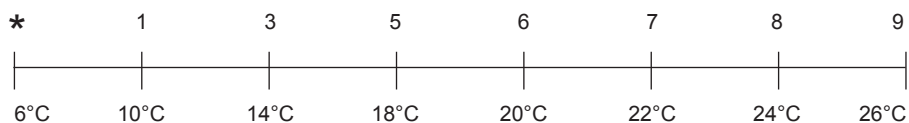
4.



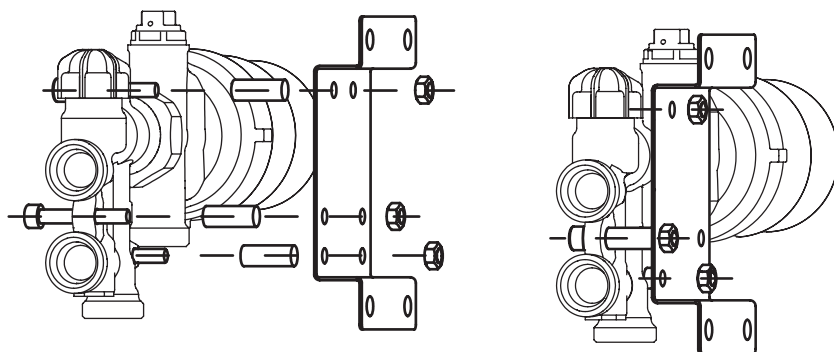
Screw valve insert in again

Room Temperature Setting

(approx. values for BM mini KF only)

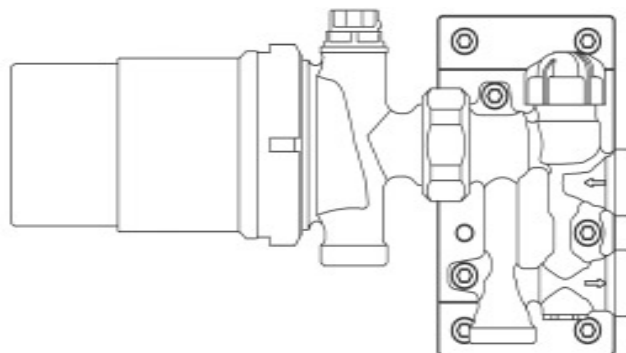


Assembling of wall bracket



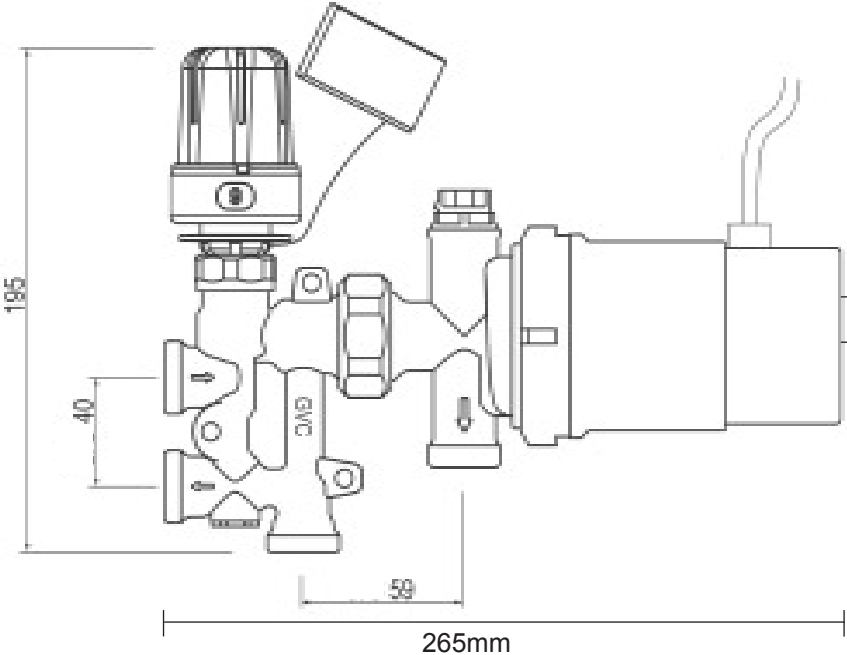
The BM mini can be mounted to the wall bracket with radiator-/boiler connections to the left of to the right side. The screws for the mounting of the BM mini to the wall bracket are enclosed.

Installation of the BM mini only with horizontal pump. Mixing valve and venting device have to show upwards.



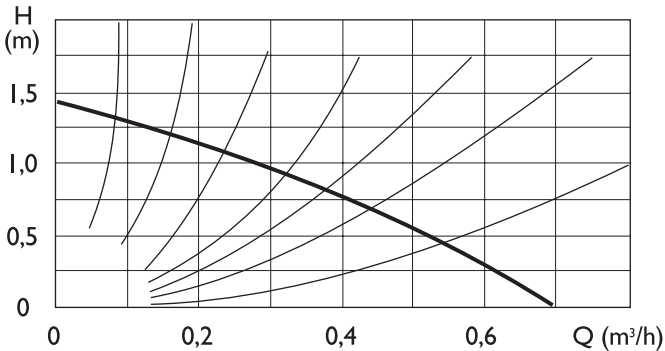
For a silencing of the sound the enclosed rubber bumpers have to be used between mounting bracket and wall, or - if mounted in a cabinet - between mounting bracket and fixation rails.

Dimensional drawing

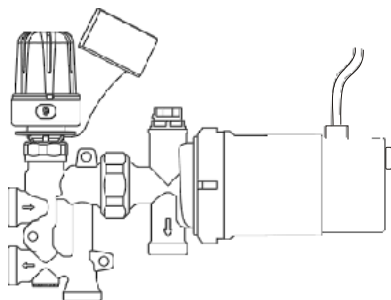
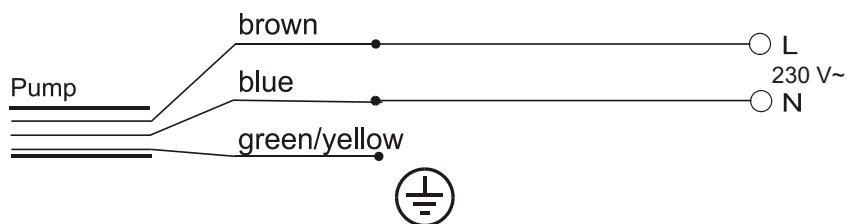


Depth 90 mm

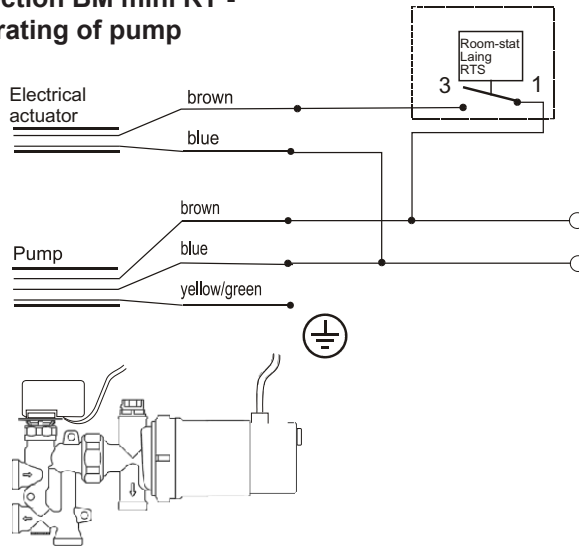
Pump curve



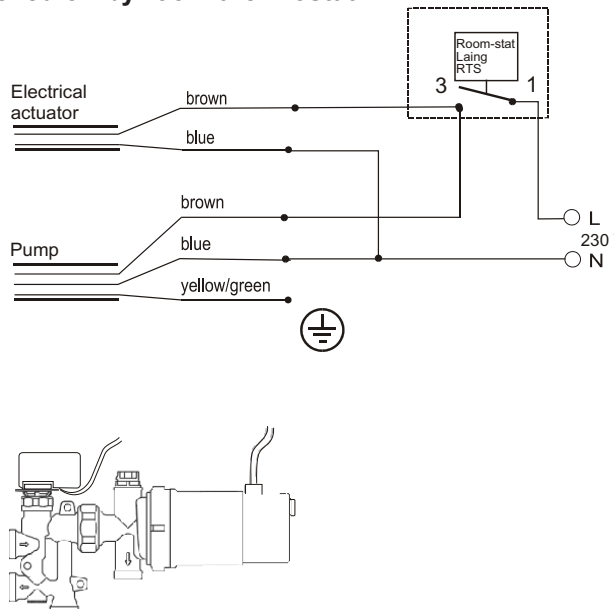
Electrical connection BM mini KF



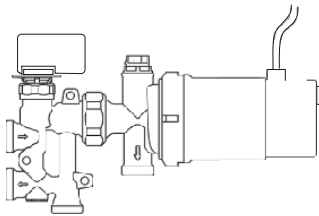
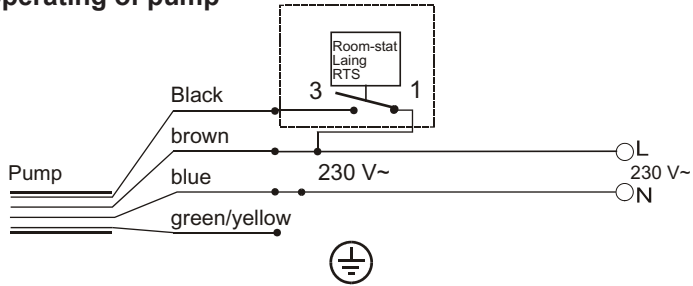
Electrical connection BM mini RT - continuous operating of pump



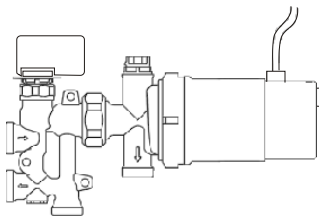
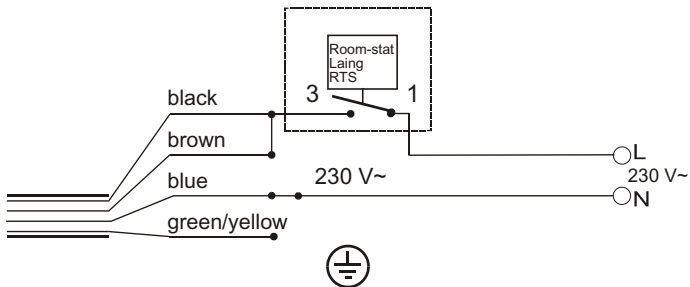
Electrical connection BM mini RT - pump also switched off by room thermostat



**Electrical connection BM mini KR -
continuous operating of pump**



**Electrical connection BM mini KR -
pump also switched off by room thermostat**



About us

Laing have been active since 1950 in the research and the development of pumps and heating products. More than 1000 patents have been registered world wide. The original R&D institute located in Southern Germany has over the years evolved into an international company with additional locations in the US, Japan and Hungary and with worldwide nearly 500 employees. Today, our production range includes:

- Pumps (shaftless spherical motor pumps)
- Floor heating system connection
- Special OEM-products
- Heating controls
- Electrical heaters

We are your flexible and competent partner for pumps and heating products. Try the high standard of our quality production.

The logo for Laing GmbH, featuring the word "LAING" in a bold, sans-serif font. A stylized circular graphic element is positioned between the 'I' and 'N'.

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