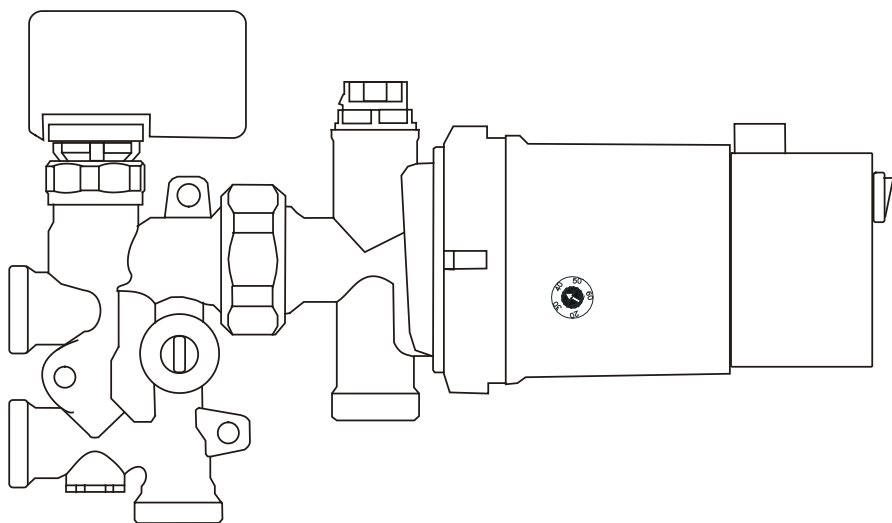


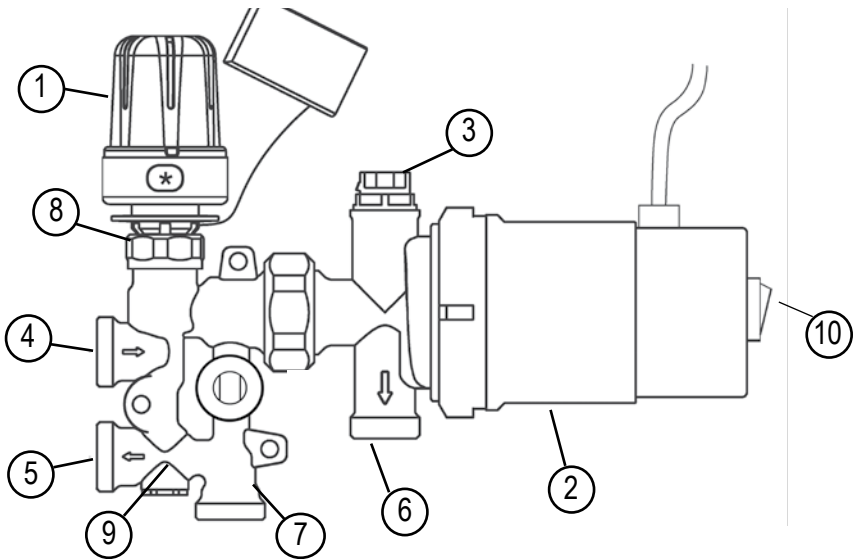
Installation and operation manual for single or dual zone mixing module MOH1



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Installation and operation manual MOH1



1. Version KF = Remote sensor thermostat (50-79°F, 16 ft)
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 (68-158°F) for the connection of a room thermostat (not included in delivery)
2. Laing circulating pump with spherical motor SM-303-MOH
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
10. ON-OFF-switch for pump

Technical Data

Max. system pressure	145 PSI
Max. system temperature	230°F (boiler circuit), 131°F (floor heating)
Max. differential pressure	14.5 PSI in the radiator-/boiler circuit
Supply voltage	1 x 120 V / 60 Hz
Power consumption	25 Watt (circulating pump)

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Installation and operation manual MOH1

Application

- The MOH1 is designed to supply floor heating areas up to approx. 400 Sq. Ft. (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:
 - MOH1 KF:** Mixing set with room temperature guided control, made of thermostat (50-79°F + frost protection) with remote sensor (16 Ft.).
 - MOH1 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).
 - MOH1 KR:** Mixing set with integrated constant temperature control (68-158°F) for the connection of a room thermostat (room thermostat not included in delivery-see accessories in product range).
- The MOH1 is provided with a temperature protection system that restricts the supply temperature in the floor heating circuit to max. 131°F.

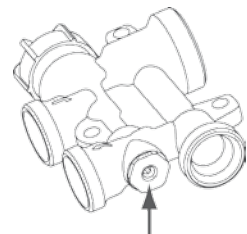
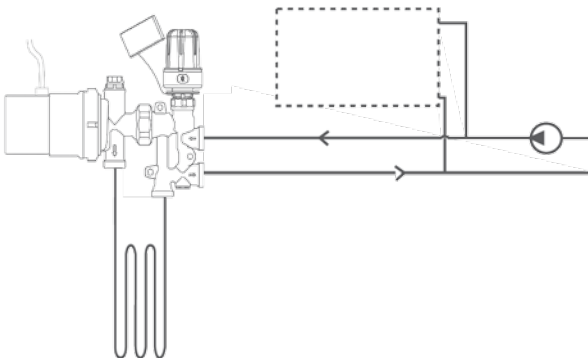
Mounting instructions

- MOH1 will be connected directly to the existing radiator-/boiler circuit.
- When two circuits are connected to the MOH1, the shortest circuit must be balanced by using an adjustable return screw connection.
- The MOH1 must be mounted in a horizontal position (see page 2). Left or right connection to the radiator-/boiler circuit is possible (see page 9).
- The MOH1 has to be installed on a higher level than the floor heating installation.
- Ensure that the pre-pressure to the MOH1 from the radiator-/vessel circuit is minimum 1.45 PSI
- Before running the MOH1 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 MOH1 should be placed away from noise sensitive areas (i.e. bedrooms).
 - The water temperature in the supply radiator-/boiler circuit should be at least 18°F (=10 K) higher than in the floor heating supply.
 - The maximum length of each pipe must not be longer than 328 Ft. for floor heating design with spread of 18°F (=10 K) when using pipes 0.47" i.d. (i.e. pipe 16x2mm). Smaller diameter pipe results in a shorter pipe length.
- **MOH1 KF:** Assemble the thermostatic head and mount the sensor in an appropriate position in the room and about 5.6 Ft above the floor. Use a vacant pipe if possible.
- **MOH1 RT:** Wiring of the electrical actuator and the room thermostat
- MOH1 KR:** only by a qualified electrician.

Hydraulic connection

- Hydraulic connection of one-pipe-system is no longer state-of-the-art. Connection scheme on request.
- This scheme shows the hydraulic connection of two-pipe-system:



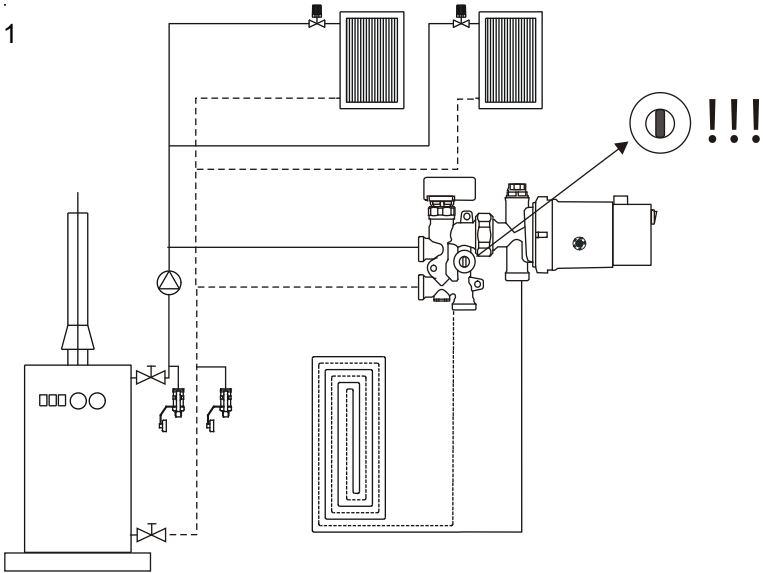
Bypass valve closed.
Allen key 0.1"

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.

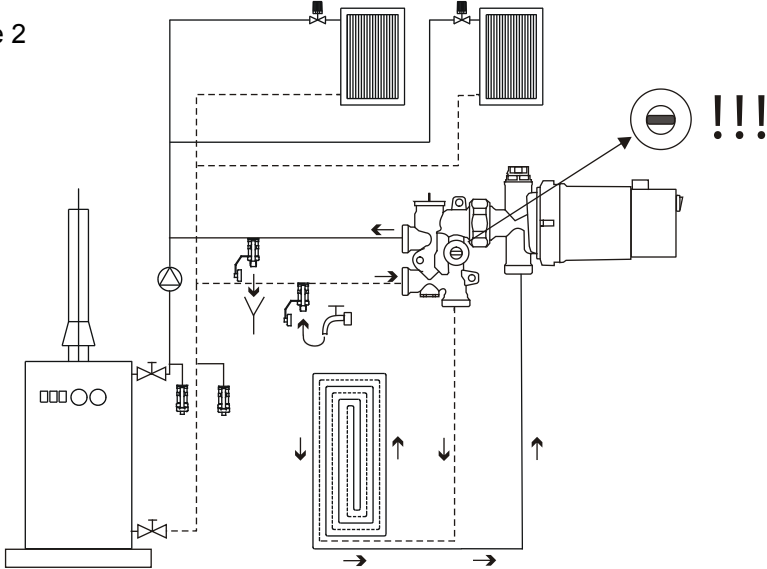
To fill the floor heating loops from the heating loop side, this ball valve must be closed (horizontal) – see pictures 2 through 6. After filling, the valve must be opened again (vertical position). Please observe that when filling from the primary side radiator valves on that side should be closed in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

Picture 1



Normal operation. Ball valve position open (vertical)

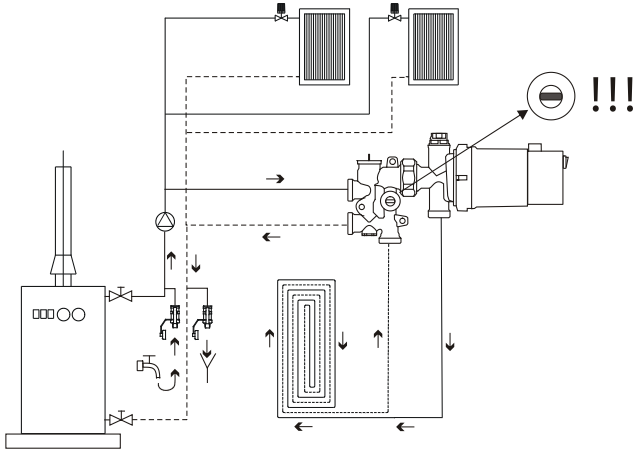
Picture 2



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).

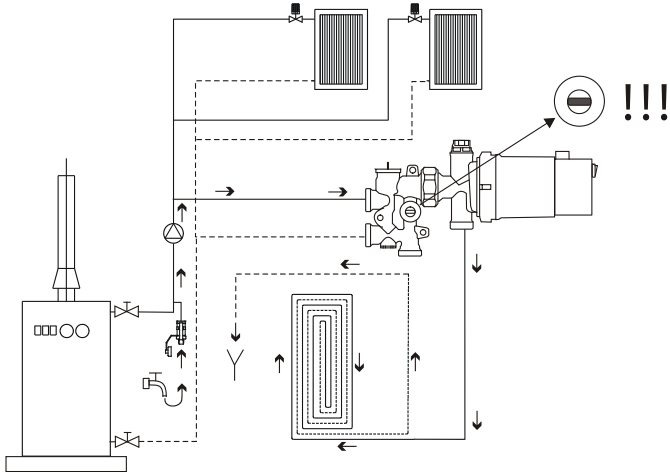
Installation and operation manual MOH1

Picture 3



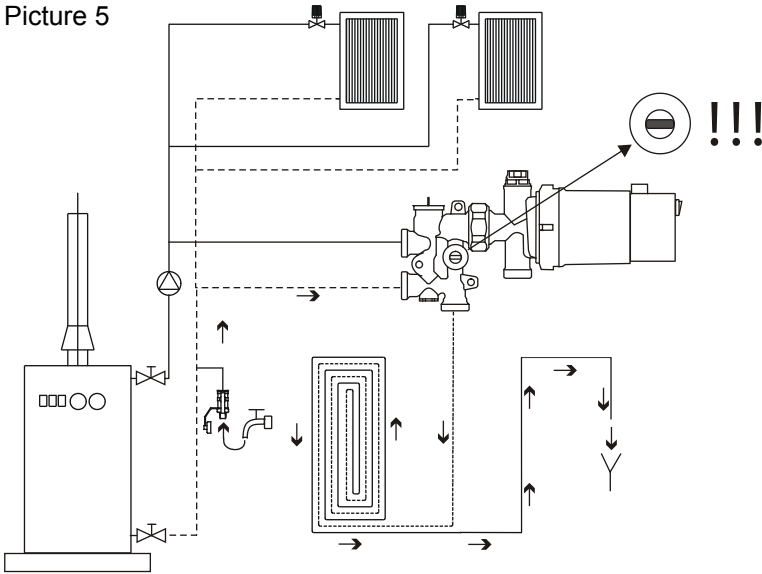
Good filling option. Two existing fill valves on the primary side allow for good filling and air purging. The ball valve position must be closed (horizontal).

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.

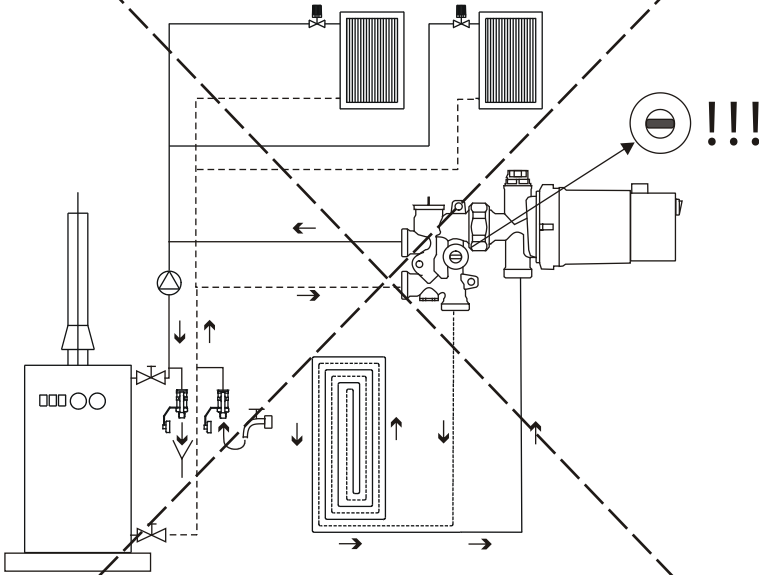
Picture 5



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.

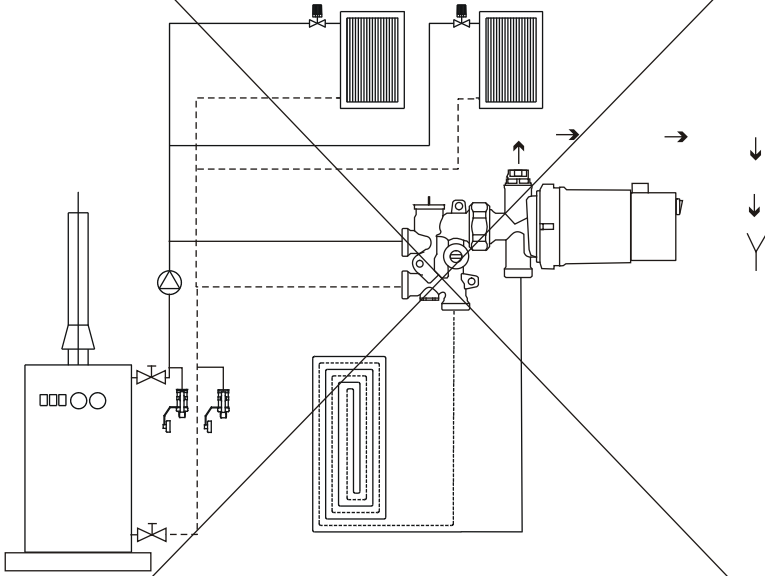
Installation and operation manual MOH1

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.

Starting of operation without given values

1. Remove protection cap / or thermostatic head / or electric drive from the MOH1 (see page 8 picture 1).
2. Increase the supply temperature from the radiator-/boiler circuit to the designed value (normally 131-140°F).
3. To perform the adjustment check, the room temperature has to be at least 68°F. 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 95-104°F. If it is too high, the flow from the primary supply has to be adjusted (reduced), see page 8 picture 3.
The MOH1 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 Watt.
Supply temperature of radiator-/boiler system	158°F.
Return temperature of underfloor heating system	104°F
therefore: dT of 104°F to 158°F = 10 Kelvin	
Difference pressure of the radiator-/boiler circuit	1.45 PSI
Specific heat capacity of water	1,163 $\frac{W}{(Kg \times K)}$

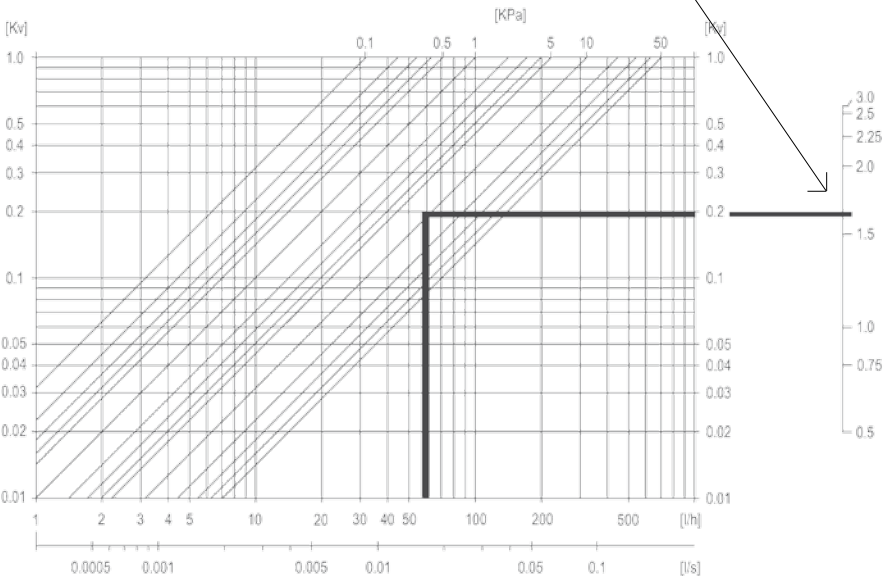
Wanted values:

Flow from the radiator-/boiler circuit =

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

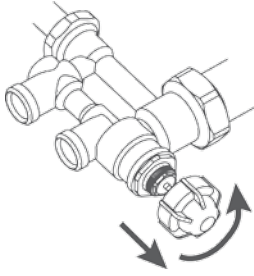
Pre-setting:

If the difference pressure from the radiator-/boiler circuit at the inlet and outlet of the MOH1 is 1.45 PSI and the flow requirement of the MOH1 is about 60 l, the mixing valve pre-setting has been opened by 1,6 turns.



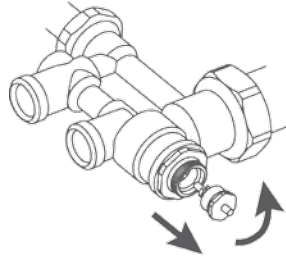
Installation and operation manual MOH1

1.



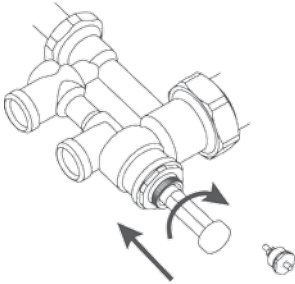
Remove protection cap

2.



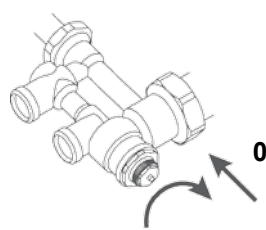
Remove valve insert

3.



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

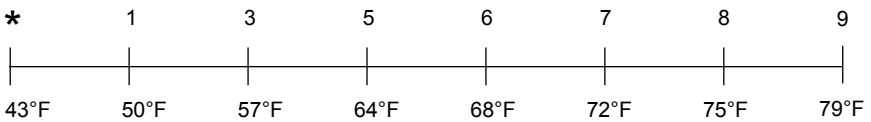
4.



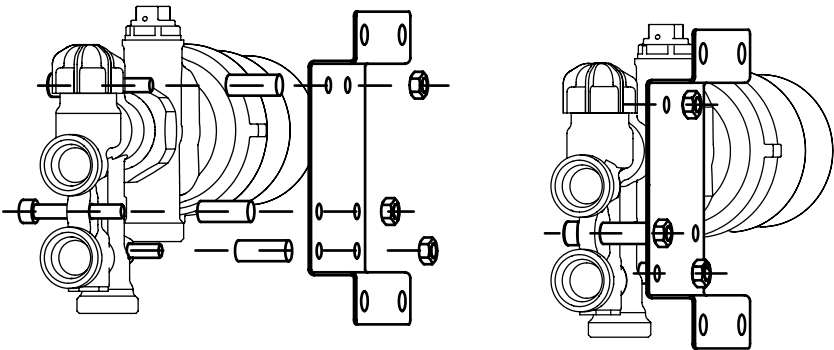
Screw valve insert in again

Room Temperature Setting

(approx. values for MOH1 KF only)

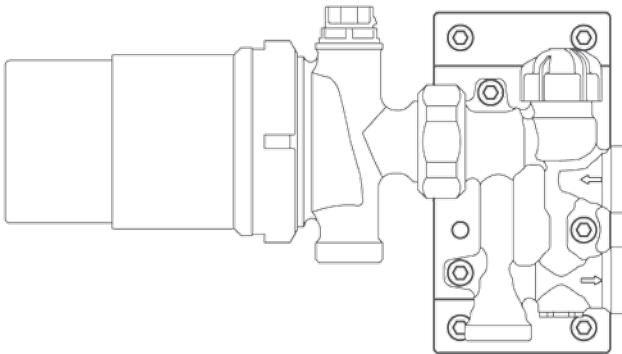


Assembling of wall bracket



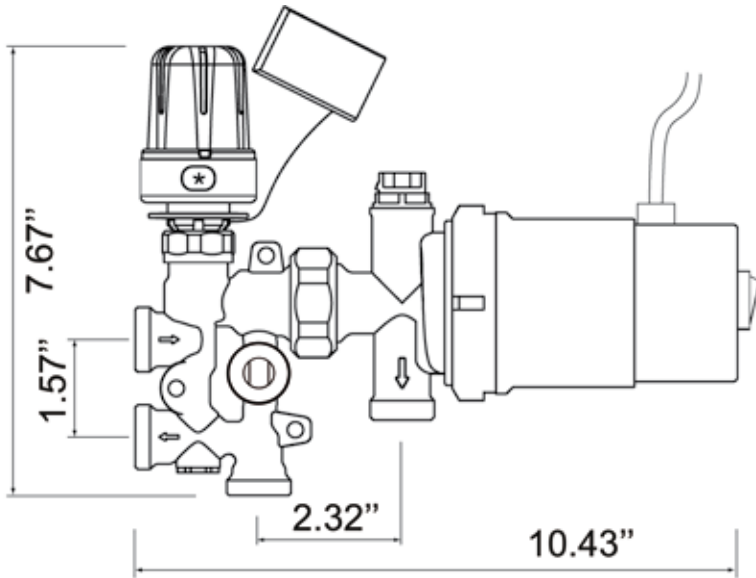
The MOH1 can be mounted to the wall bracket with radiator-/boiler connections to the left of to the right side. The screws for the mounting of the MOH1 to the wall bracket are enclosed.

Installation of the MOH1 only with horizontal pump. Mixing valve and venting device have to show upwards.



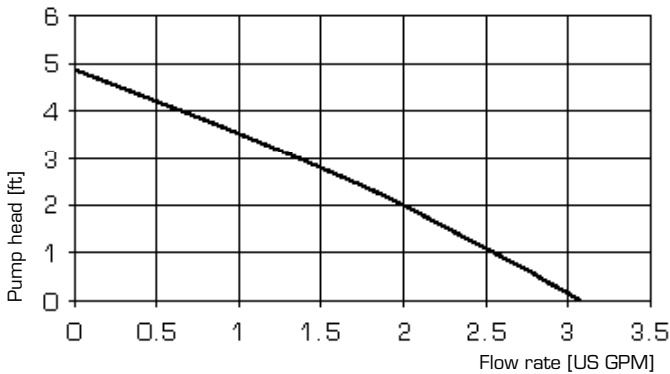
For a silencing of the sound the enclosed rubber bumpers have to be used between mounting bracket and wall, or - if mounted in a cabinet - between mounting bracket and fixation rails.

Dimensional drawing



Depth 3.5"

Pump curve

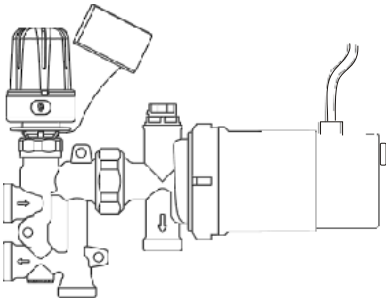
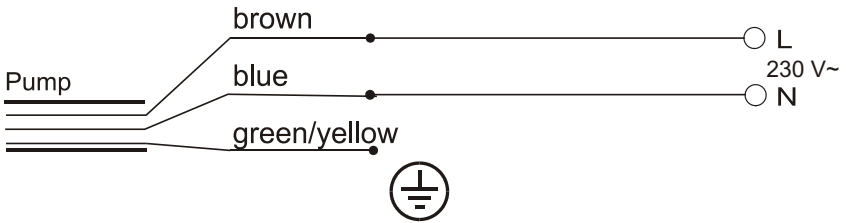


Product Range, Accessories

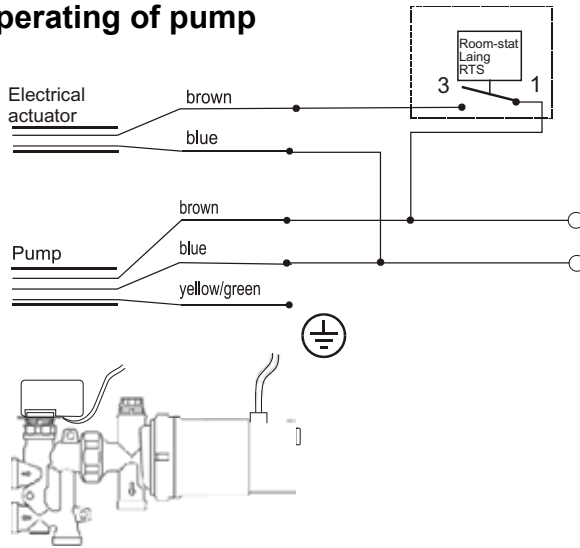
Model	Description
MOH1 KF	Mixing set with room temperature guided control, made of thermostat (50-79°F + frost protection) with remote sensor (16 Ft).
MOH1 RT	Mixing set for temperature guided control, made of thermoelectric drive for the connection of a room thermostat.
MOH1 KR	Mixing set with integrated constant temperature control (68-158°F) for the connection of a room thermostat.

Accessories	Description
DXG	Duplex manifold (supply and return with 2 loops).
S - MOH1 A	Steel cabinet for in wall-mounting (white colour) incl. 2 mounting brackets and fixing material.
S - MOH1 B	Steel cabinet for on wall-mounting (white colour) incl. 2 mounting brackets and fixing material.

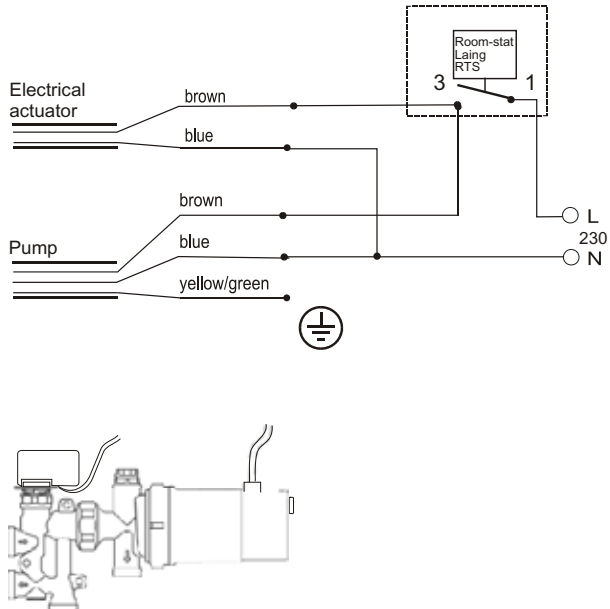
Electrical connection MOH1 KF



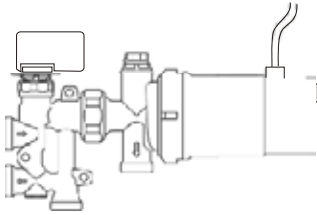
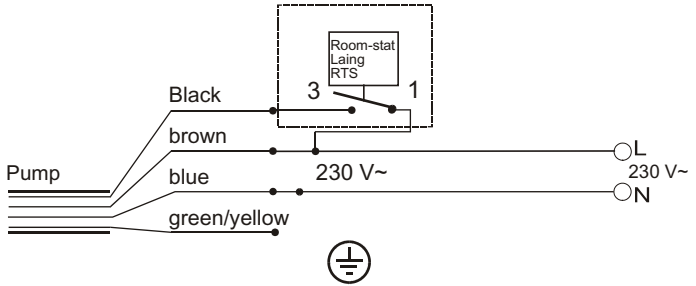
Electrical connection MOH1 RT - continuous operating of pump



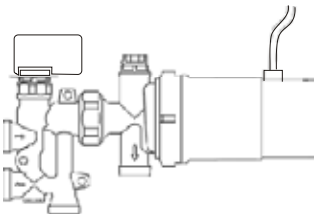
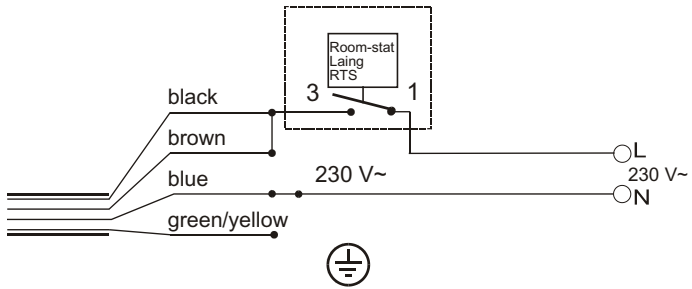
Electrical connection MOH1 RT - pump also switched off by room thermostat



Electrical connection MOH1 KR - continuous operating of pump



Electrical connection MOH1 KR - pump also switched off by room thermostat



Notes

Notes

Notes

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