BOOSTER UNITS FOR TEMPERATURE REGULATION

Art. 2170
Booster unit complete with:
- modulating mixing valve with 3-point actuator
- 3-speed pump
- shut-off valves with built-in temperature gauges
- insulation

Art. 2171
Booster unit for high temperature complete with:
- 3-speed pump
- shut-off valves with built-in temperature gauges
- insulation

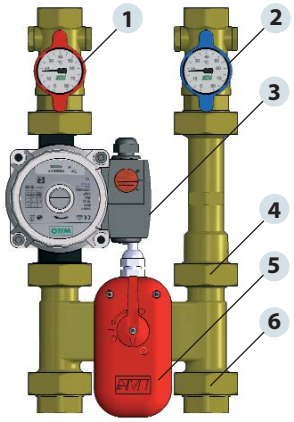
1. DESCRIPTION

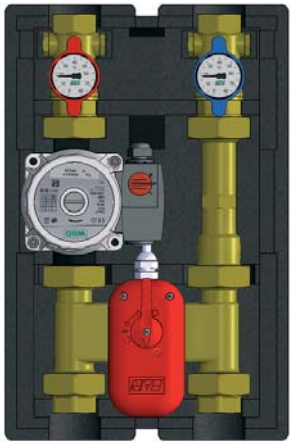
The booster unit is suitable for temperature control and water distribution in multi-storey or multi-zone applications. It is usually installed in central heating plant, after the boiler and the hydraulic separator, and can be incorporated into distribution manifolds supplying low water temperature systems, provided a mixing valve is used. It is also suitable for high water temperature systems.

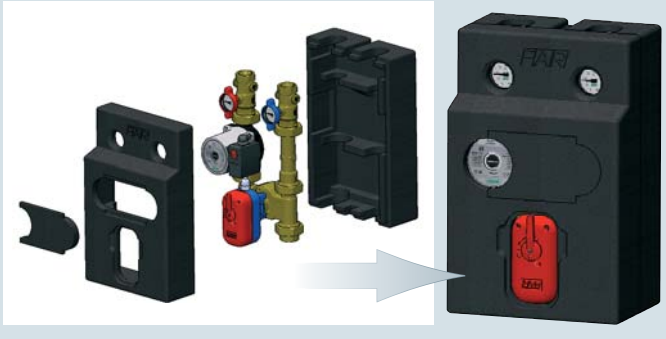
2. BOOSTER UNIT WITH MIXING VALVE FOR LOW WATER TEMPERATURE SYSTEMS

Unit is provided with insulation. Pump plug is reversible in the event of pump displacement.

1. 1" ball valve with temperature gauge 0÷80°C with red handle for connection to supply pipeline
2. 1" ball valve with temperature gauge 0÷80°C with blue handle for connection to return pipeline
3. 3-speed pump with connection to 1"1/2 unions. Pump centre distance: 130mm
4. Brass extension with built-in non-return valve (for possible pump displacement)
5. Modulating actuator for mixing valve control
6. 1" mixing valve





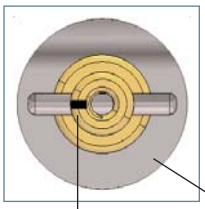


With Art. 2170 water distribution can be regulated as follows:
- **Fix point control:** steady temperature using a control unit (art. **9612**) and delivery probe with seat.
- **Modulating control:** variable temperature using a control unit (art. **9613**) together with delivery probe with seat and external probe.

The regulating unit is supplied with insulation comprising front and back shells and a plug for the pump.

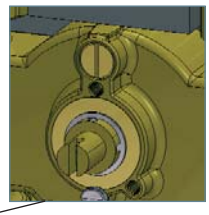
2.1 OPERATION IN STANDARD CONFIGURATION (WITH LEFT-HAND SIDE SUPPLY)

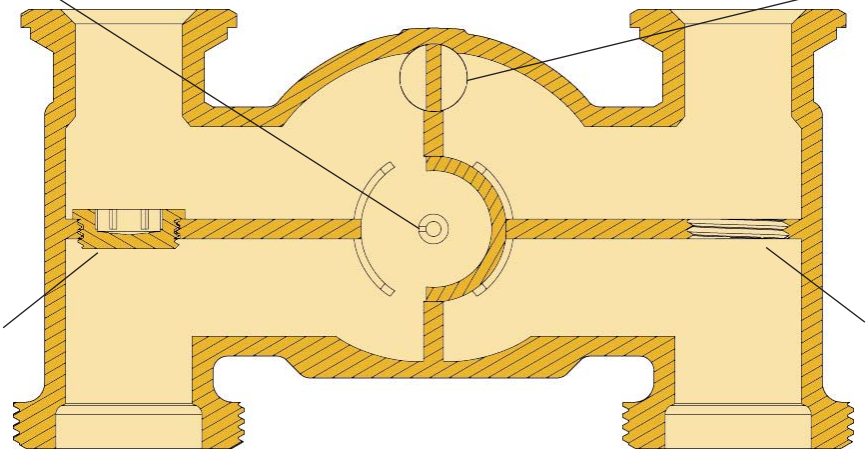
Operation of the mixing valve is shown below. The position of the internal shutter is identified by the position of the manual release on the actuator. Opening, regulation and closing are controlled by a control unit.



With the actuator and actuator plate removed, the mark on the rotation pin gives an external indication of the position of the shutter.

By-pass screw
In some valve configurations, the by-pass regulation ensures against too high a head of water to the pump when the valve is totally closed.
The valve is provided with a closed by-pass screw - an externally view is shown in the illustration on the right.





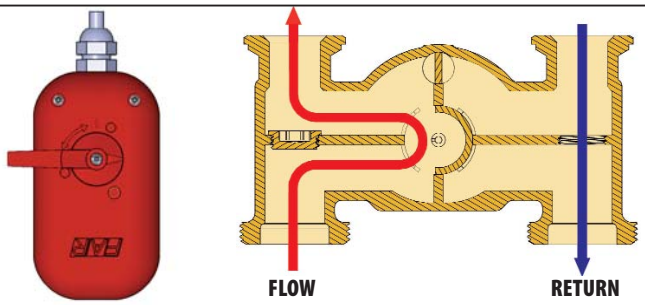
Inside the valve there is a screw to be used if it is necessary to move the supply side (and thus the pump) from left to right.

Slot for screw in the event of pump displacement on the right side.

To manually operate the valve equipped with an actuator, press the red button on the actuator cover and turn the red handle - as shown in the illustrations below - while pressing the red button. Once the desired position is reached, release the button and the actuator will return to automatic operation.

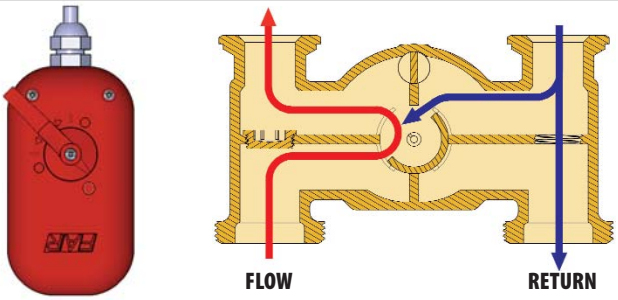
1. Completely open position

The completely open position is reached when the manual release is in a horizontal position, as shown in the picture on the right. The water coming from the boiler flows directly into the system.



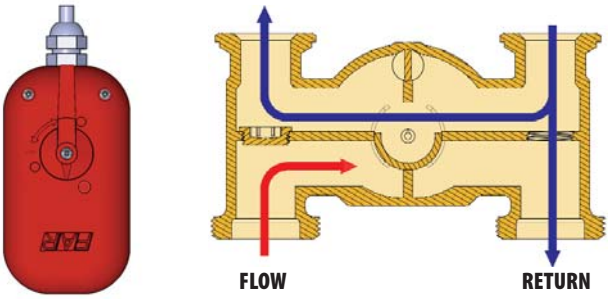
2. Regulation position

To regulate the mixing valve, place the manual release on the same position shown in the picture on the side. Water from the boiler is mixed with return water coming back from the system.



3. Closing position

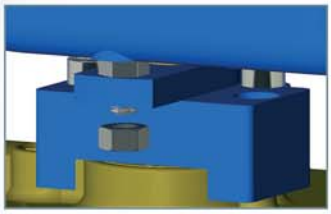
When the manual release is in a vertical position, the delivery flow is completely shut down and water coming from the return circuit continues to circulate within the system.



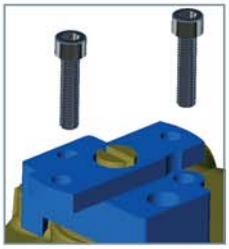
2.2 MIXING VALVE OPERATION WITH RIGHT-HAND SIDE SUPPLY

If necessary, the pump can be installed on the right hand side of the booster unit. In this case the working of the mixing valve has to be inverted, as follows:

1. Unscrew the nuts placed under the flange and remove the actuator



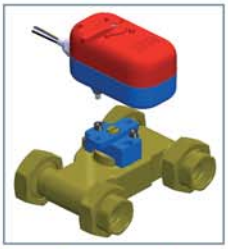
2. Unscrew the screws with a 5 mm key and remove the plastic support



3. Remove the pin and rotate it 90°

4. Put the pin on the valve

5. Assemble the plastic support and the actuator



6. Unscrew the inner plug and screw it on the other side using a size 10 Allen key

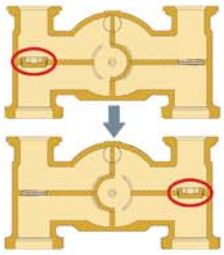


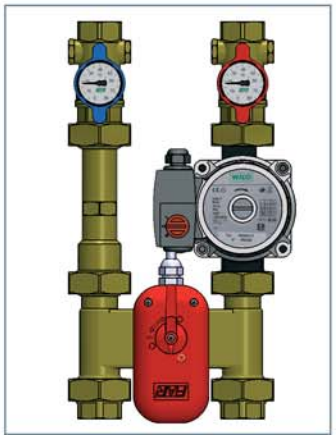
fig. a

fig. b

fig. c

7. When the pump is installed on the right side, it is also necessary to rotate the cable connector. Please follow the instructions detailed above to achieve this configuration: remove the Allen screws (***fig. A***) and turn the grey actuator lock (***Fig. B***) in order to bring the electrical connections box to the indicated position (***Fig. C***), also moving the cable connector and plastic end closure plug. Now move the ball valves - placing the valve with the red handle in line with the pump and the valve with the blue handle in line with the brass extension piece. Check also that the arrow printed on the extension piece is in the correct position, as in the inside a non-return valve is placed.

On the right you can see the configuration with pump on the right side. Once the unit has been installed you can assemble the insulation in the same way for pump on left side. Turn the pump plug - it is reversible - in order to ensure constant easy access to the plug for maintenance or cleaning.

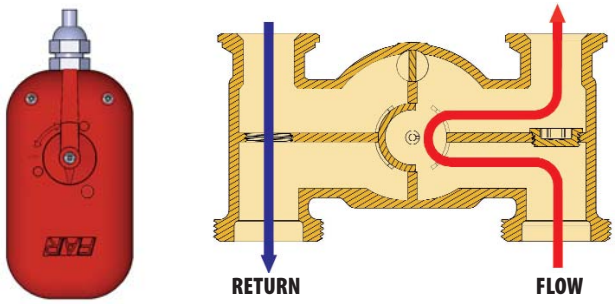


2.3 OPERATION WITH PUMP ON THE RIGHT SIDE

In right-hand side supply configuration the 'completely open' position is reached when the manual release is vertical, as shown in the picture. Before doing so please check that all the instructions detailed above have been correctly followed.

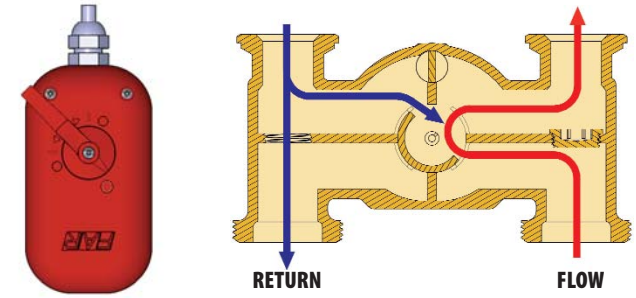
1. Completely open position

The completely open position is reached when the manual release is in a vertical position, as shown in the picture on the right. The water coming from the boiler flows directly into the system.



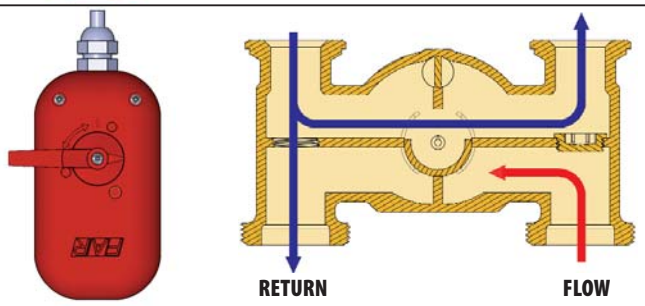
2. Regulation position

To regulate the mixing valve, place the manual release on the same position shown in the picture on the side. Water from the boiler is mixed with return water coming back from the system.



3. Closing position

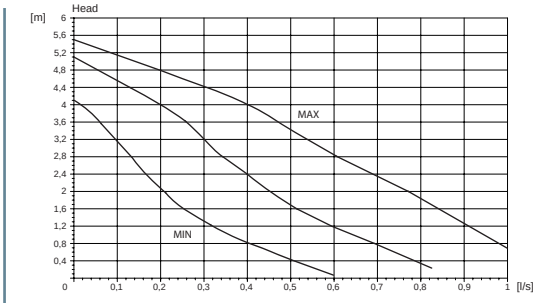
When the manual release is in a horizontal position, the delivery flow is completely shut down and water coming from the return circuit continues to circulate within the system.

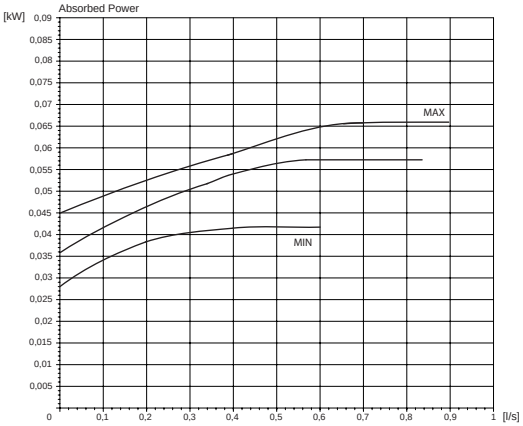


3. FLUID DYNAMIC FEATURES

The diagram shows flow resistance of mixing valve in completely open position with open and closed by-pass.

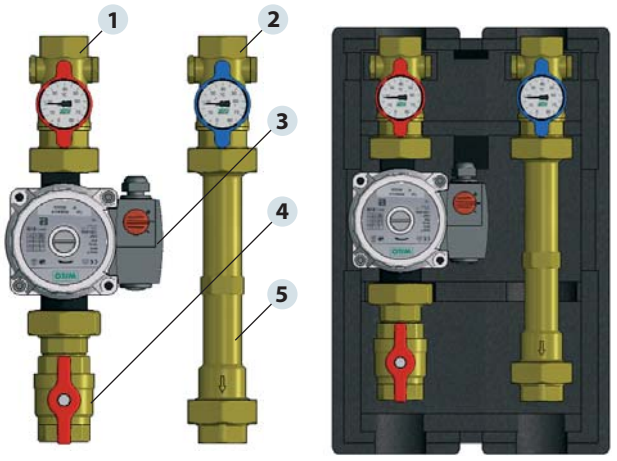
3-speed diagrams for pump is shown here below. The first diagram shows the head of the pump in function to the circulating water, the second one shows the absorbed power.

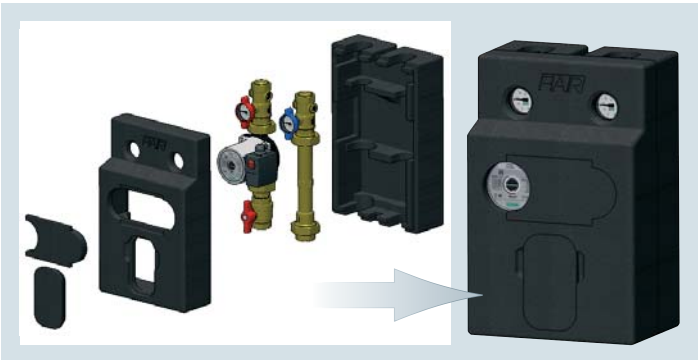




4. BOOSTER UNIT FOR HIGH TEMPERATURE SYSTEM

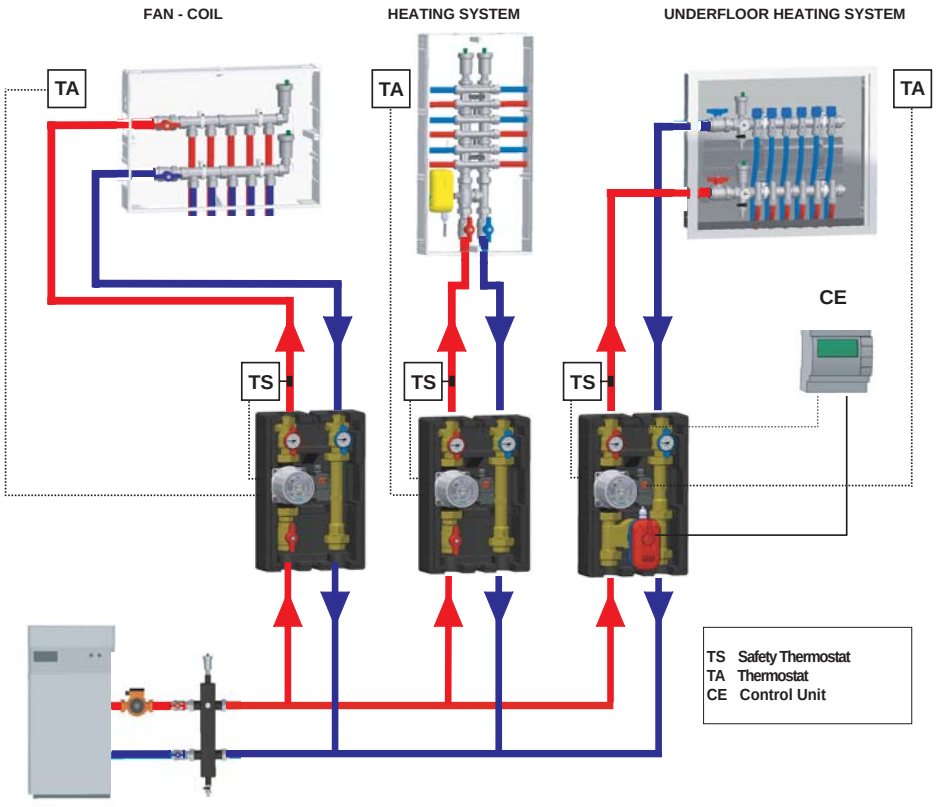
1. 1" ball valve with temperature gauge 0÷80°C with red handle for connection to supply pipeline
2. 1" ball valve with temperature gauge 0÷80°C with blue handle for connection to return pipeline
3. 3-speed pump with connection to 1"1/2 unions. Pump centre distance: 130 mm
4. 1" mixing valve
5. Brass extension with built-in non-return valve for possible pump displacement





The booster unit (**Art. 2171**) controls the water distribution at the same temperature as the supply from the boiler or chiller. It is supplied with front and rear insulation shells, a plug for the pump and one for the actuator (**the actuator and the mixing valve are not included in art. 2171**).

5. INSTALLATION



The illustration above shows an installation overview of three booster units in a heating system, where connections from a distribution manifold - located downstream of a hydraulic separator - distribute flow to units in the areas to be heated. The first two units, shown on the left in the illustration, are Art. **2171** without mixing valve, which distribute flow to terminal units at boiler output temperature. The third unit is Art. **2170**, with mixing valve and 3 point actuator which supplies terminal units with a modulating flow temperature by means of a control unit.

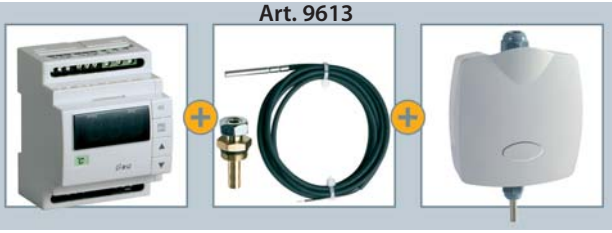
When using the modulating mixing valve it is necessary to include the control unit, complete with probes, depending on the kind of function required:

Fix point functioning:
delivery probe complete with 3/8" seat **art. 9612**

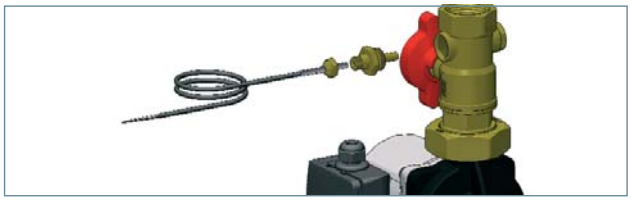
Temperature control:
delivery probe **art. 9613** and external probe

Art. 9612

Art. 9613



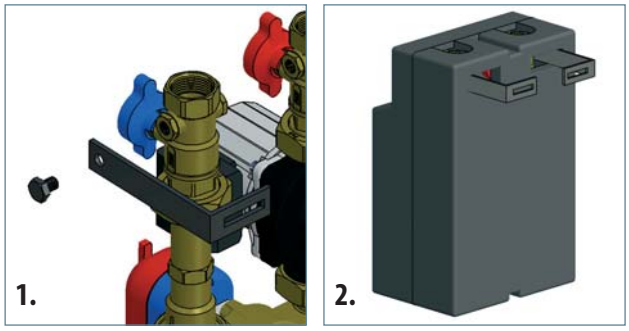
To install the seat first remove the lateral plug from the temperature gauge holder valve, as shown on the right. Then insert the delivery probe and fix in place, using a plug already located on the seat.
To complete installation it is recommended that a safety thermostat (**art. 7951**) be located on the flow pipeline - minimum requirement thermostat (**art. 7946**).



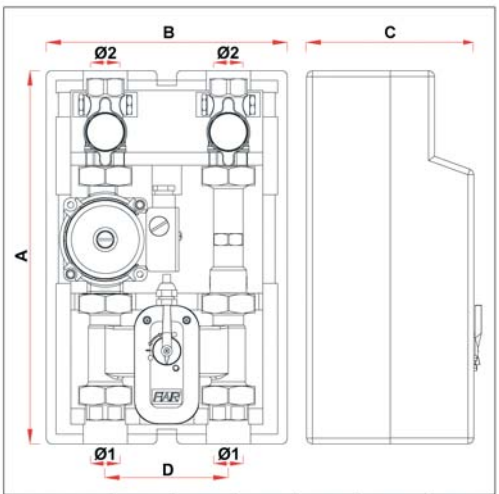
The booster unit can be fixed on the wall with brackets (art. 7478) complete with screws:

1. Position the brackets, as shown in the picture, and screw them onto the plug in the ball valve.

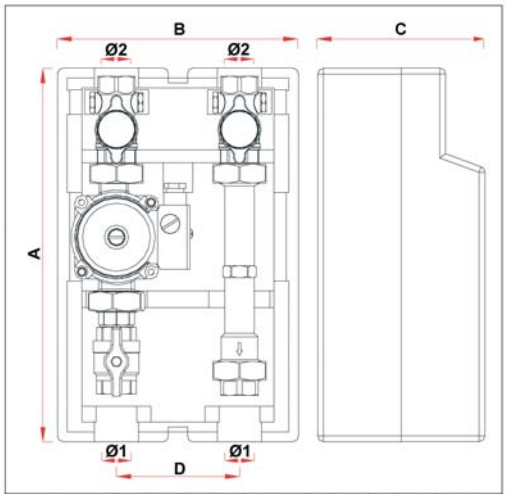
2. Insert the brackets on the insulation cutting the shell along the two grooves on the back shell and fix it with two plugs.



6. DIMENSIONAL FEATURES



CODE	A	B	C	D	Ø1	Ø2
2170 1130	379	245	170	125	G1	G1
2170 1180	429	245	170	125	G1	G1



CODE	A	B	C	D	Ø1	Ø2
2171 1130	379	245	170	125	G1	G1
2171 1180	429	245	170	125	G1	G1

7. TECHNICAL FEATURES

Nominal pressure:	10bar
Max. temperature:	95°C
Compatible media:	water, water with glycol
Temperature gauge scale:	0÷80°C

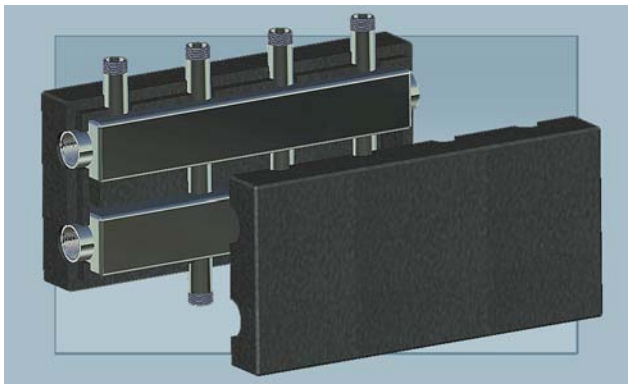
Materials:	
Insulation:	PPE
Fixing brackets:	galvanized steel
Mixing valve:	CB753S brass
Ball valve and temperature gauge holder:	CW617N brass
Extension piece with non-return valve:	CB753S brass

8. MANIFOLDS FOR CENTRAL HEATING

FAR offers a range of painted steel manifolds complete with insulation, Art. 2191 11402 (2+1 port) and Art. 2191 11403 (3+1 port) for the incorporation of booster units into central heating systems.

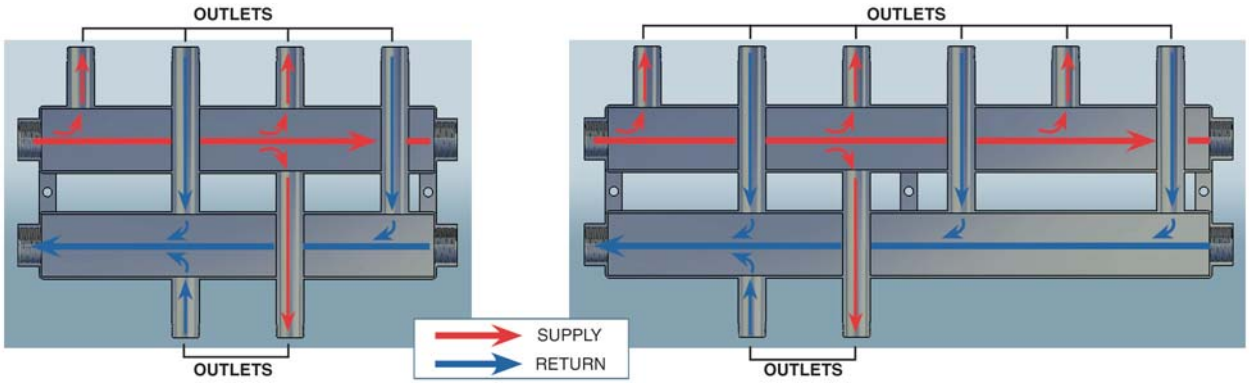
Central heating manifolds make it possible to have supply and return pipes at the same level, making it easier to integrate a booster unit into the heating system, thus reducing overall dimensions. They comprise of two rectangular sections: one for flow and the other for the return. They are thermally insulated by means of insulation shells.

Insulation shells are supplied with the manifolds: they are in PPE guaranteeing both thermal insulation and excellent resistance to steam.



8.1 FLOW INTO 2 AND 3 PORT MANIFOLDS

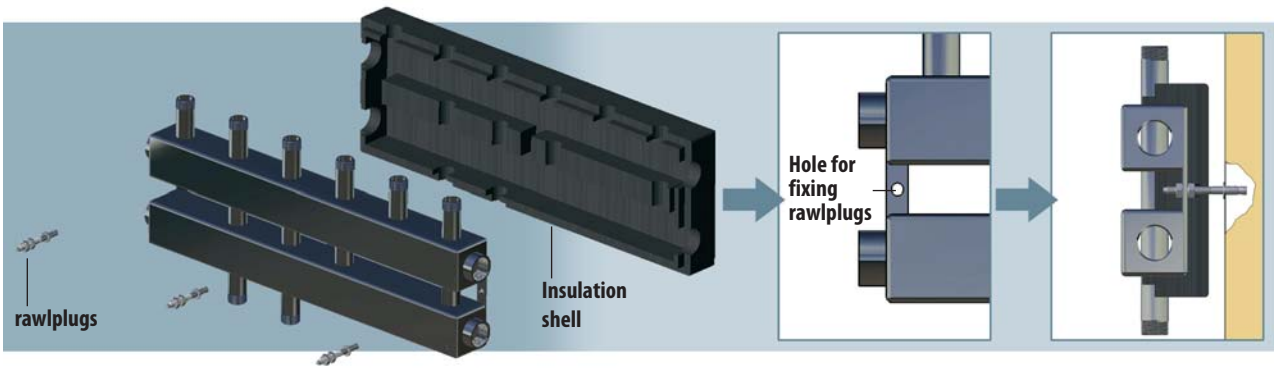
The illustrations below show flow direction into the manifolds as a schematic.



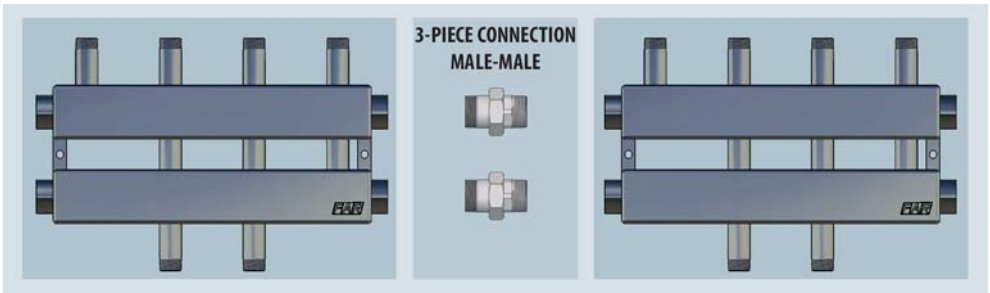
8.2 INSTALLATION

Manifolds need to be fixed onto the wall by means of Rawlplugs and should be located as shown below.
A hydraulic separator should be placed between the boiler and the manifold, thus creating independent circuits in such a way as to avoid interference to pumps installed in the system.
The manifolds feature side connections, which permit positioning of an expansion tank in order to absorb an increase in volume as the water heats up.

Manifolds must be installed on the wall by means of Rawlplugs (NOT SUPPLIED) located directly on the manifold brackets. Before this is done, the insulation shell should be positioned on the manifold, so as to sit between manifold and the wall.

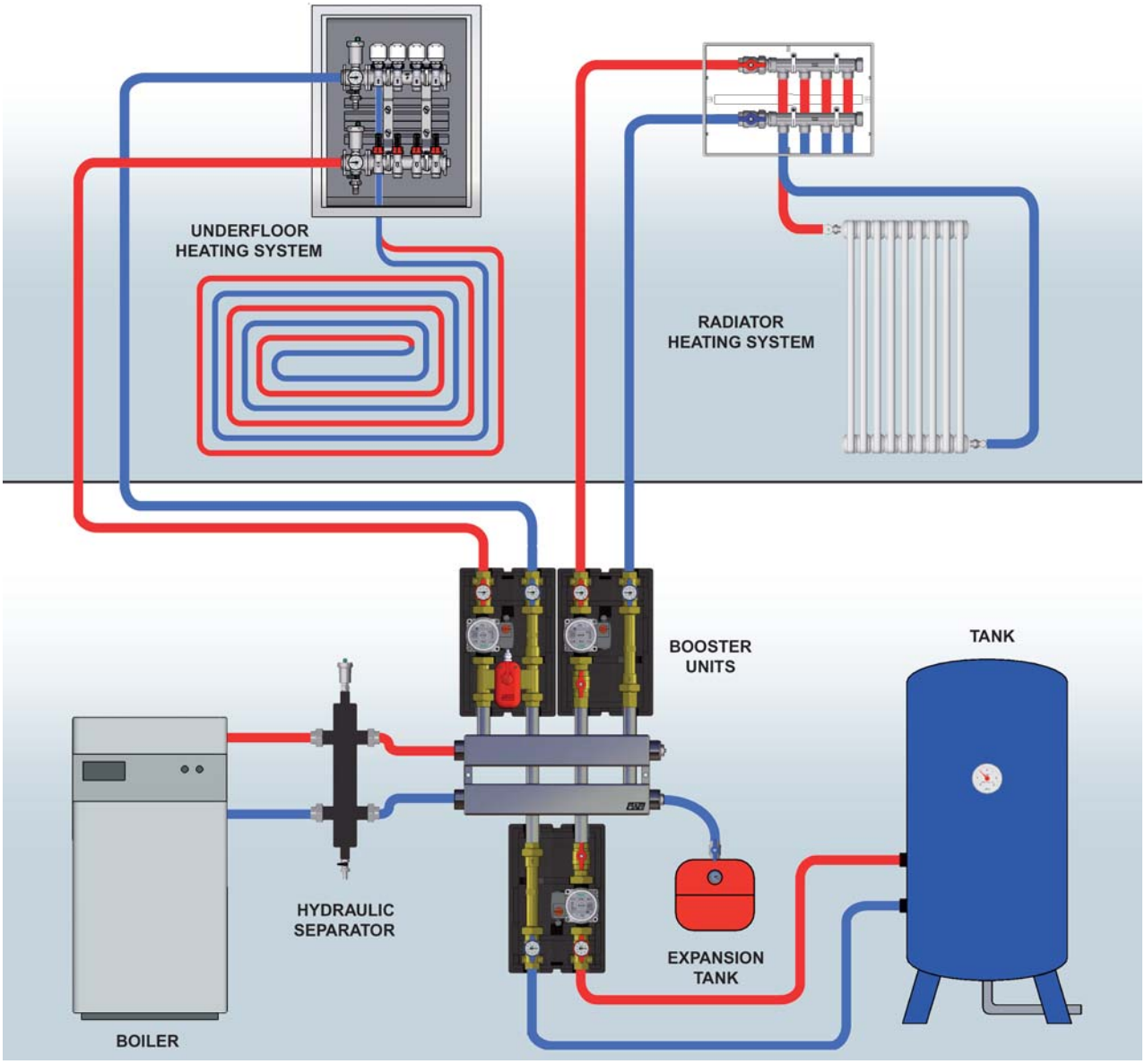


It is possible to install additional manifolds by means of male-male 3-piece connection, Art. 5163 114.



8.3 WIRING SCHEME

In the schematic you can see an installation overview of manifolds for central heating with three booster units. As shown, there is a hydraulic separator between the boiler and the manifold, which avoids possible interference to the units' pumps, thus ensuring correct heat transfer circulation within the circuits served.
The following are connected to the central heating manifold: a booster unit with mixing valve for supply to an underfloor heating system, a booster unit for a high temperature radiator heating system and another to heat domestic hot water.

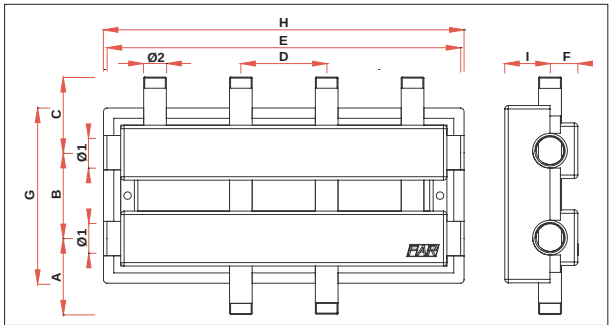


8.4 TECHNICAL AND DIMENSIONAL FEATURES

Technical features

Max. pressure:	8 bar
Max. working temperature:	95°C
Compatible media:	water
Manifold body:	painted steel
Insulation:	PPE

Dimensional features



CODE	Ø1	Ø2	A	B	C	D	E	F	G	H	I
2190-2191 11402	G1 1/4	G1	110	125	110	125	515	40	255	525	65
2190-2191 11403	G1 1/4	G1	110	125	110	125	765	40	255	775	65