BOOSTER UNIT COMPLETE
BYPASS DIFFERENTIAL VALVE

Art. 2177
Booster unit for high temperature complete with:
- Bypass differential valve with 0.1÷0.6 bar setting range
- Pump
- Shut-off valves
- No. 2 temperature gauges with 0÷80°C scale
- PPE insulation
- 1″ connections

Art. 2178
Fixed point booster unit complete with:
- Fixed point thermostatic mixer
- Bypass differential valve with 0.1÷0.6 bar setting range
- Pump
- Shut-off valves
- No. 2 temperature gauges with 0÷80°C scale
- PPE insulation
- 1″ connections

Art. 2179
Booster unit complete with:
- Mixing valve with 3-point actuator
- Bypass differential valve with 0.1÷0.6 bar setting range
- Pump
- Shut-off valves
- No. 2 temperature gauges with 0÷80°C scale
- PPE insulation
- 1″ connections

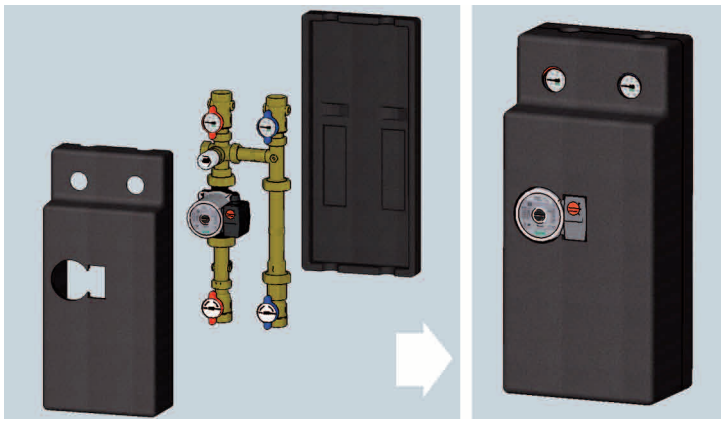
1. DESCRIPTION

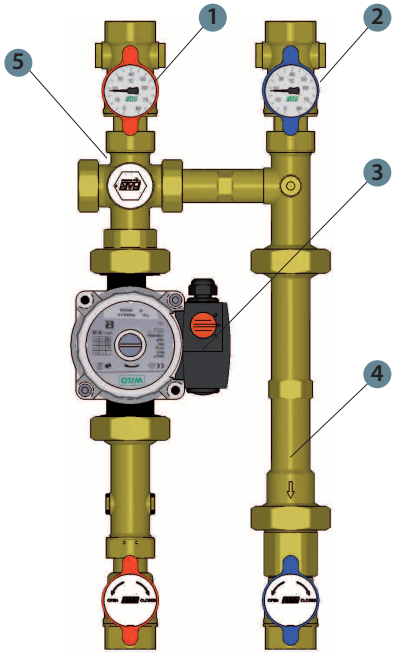
The booster units –temperature regulating units- are suitable for temperature control and water distribution in multi-storey or multi-zone applications. They are usually installed in central heating plant, after the boiler and the hydraulic separator, and can be incorporated into distribution manifolds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

2. BOOSTER UNIT FOR HIGH TEMPERATURE COMPLETE WITH BYPASS DIFFERENTIAL VALVE

The booster unit art. 2177 controls the water distribution at the same temperature as the supply from the boiler or chiller

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



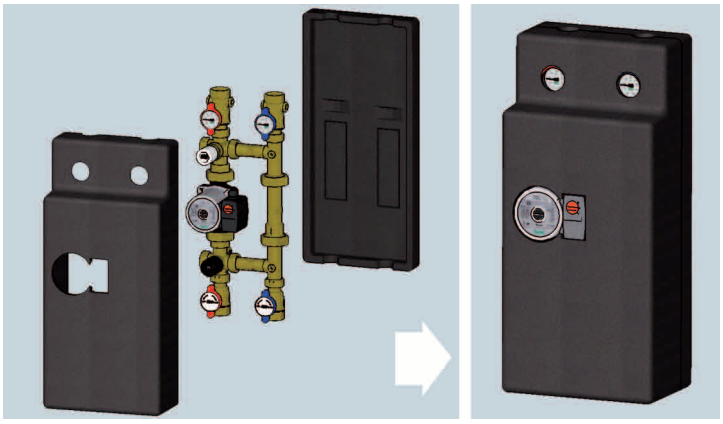


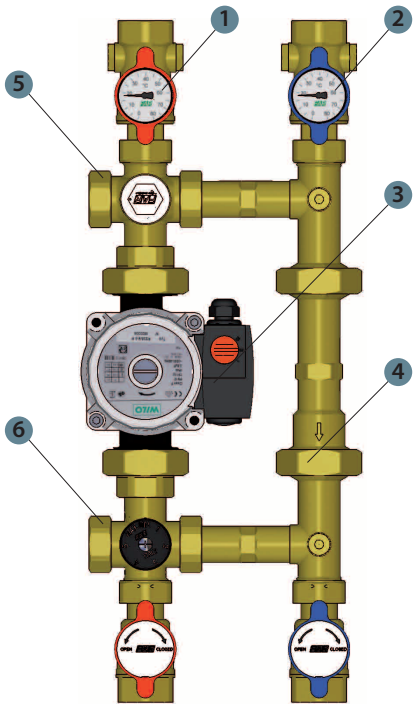
The regulating unit is supplied with insulation comprising front and back shells.

3. FIXED POINT BOOSTER UNIT COMPLETE WITH THERMOSTATIC MIXER AND BYPASS DIFFERENTIAL VALVE

The booster unit art. 2178 permits a fixed point regulation by means of a thermostatic mixer.
Suitable for regulation of distribution temperature in underfloor heating systems.

1. 1" ball valve with 0÷80°C temperature gauge and red handle, for connection to supply pipeline
2. 1" ball valve with 0÷80°C temperature gauge and blue handle, for connection to return pipeline
3. Pump with connection to 1"1/2 unions. Pump centre distance: 130 mm
4. Brass extension with built-in non-return valve for possible pump displacement
5. Adjustable bypass differential valve
6. Thermostatic mixer with graduated handle



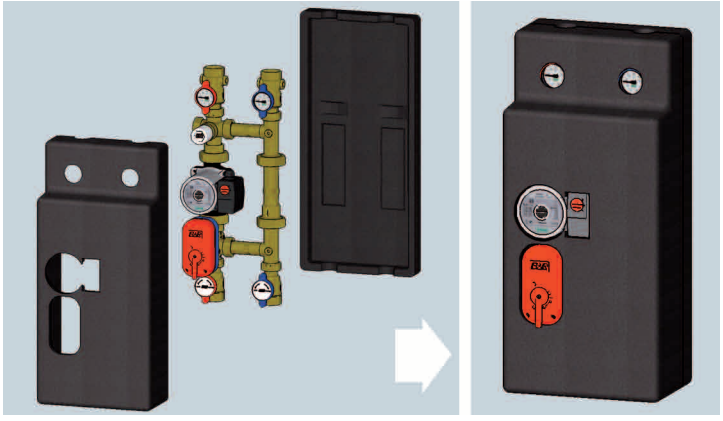


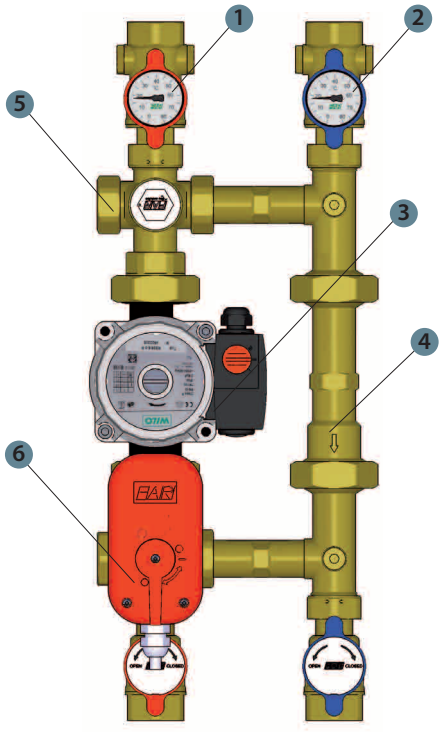
The regulating unit is supplied with insulation comprising front and back shells.

4. BOOSTER UNIT COMPLETE WITH MIXING VALVE AND BYPASS DIFFERENTIAL VALVE

The booster unit art. 2179 controls the water distribution through two different types of regulation:
- fixed point functioning: with constant temperature, using the control unit art.9612 complete with supply probe
- temperature control: with variable temperature, using the control unit art.9611 complete with supply and external probe

1. 1" ball valve with 0÷80°C temperature gauge and red handle, for connection to supply pipeline
2. 1" ball valve with 0÷80°C temperature gauge and blue handle, for connection to return pipeline
3. 3-speed pump with connection to 1"1/2 unions. Pump centre distance: 130 mm
4. Brass extension with built-in non-return valve for possible pump displacement
5. Adjustable bypass differential valve
6. Mixing valve with 1" connections and modulating actuator for automatic regulation





The regulating unit is supplied with insulation comprising front and back shells.

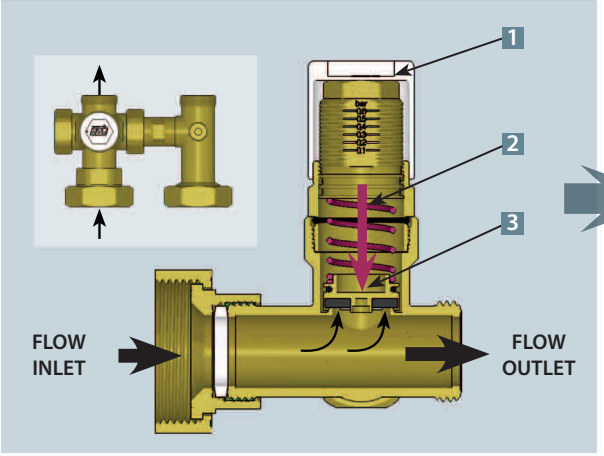
5. COMPONENTS

5.1 BYPASS DIFFERENTIAL VALVE

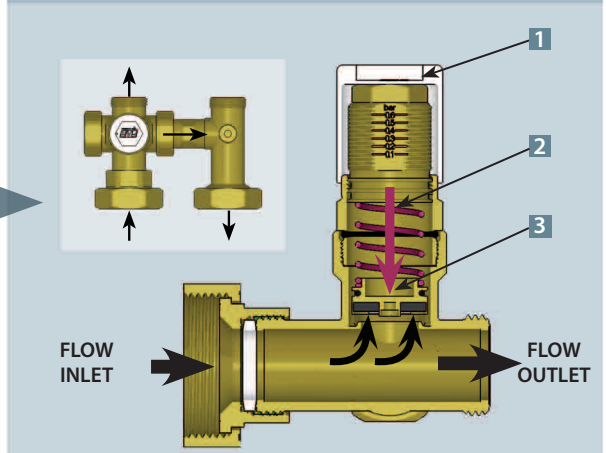
The bypass differential valve is suitable for use in systems with flow variations caused by users' demands, allowing the excess flow to be re-directed to the boiler. The re-directed flow increases with flow resistance increase and therefore increases with the number of valves that are closed on the circuit. It is particularly suitable for systems with thermostatic valves, so that automatic valve closing increases the bypass flow, keeping the design head almost constant and avoiding noise in the system.

By turning the handle (1) you can regulate the spring adjustment (2), modifying the thrust on the shutter (3).

When pressure inside the circuit is lower than the calibration value, the valve is closed. In this condition there is no water passage into the bypass.

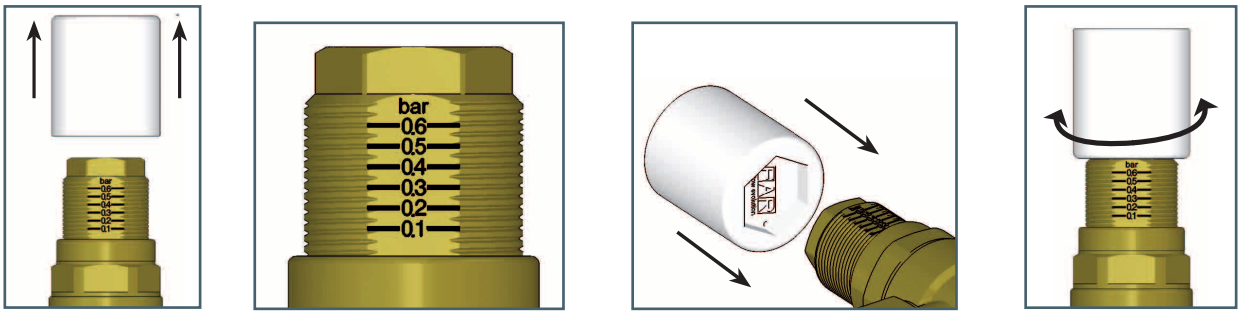


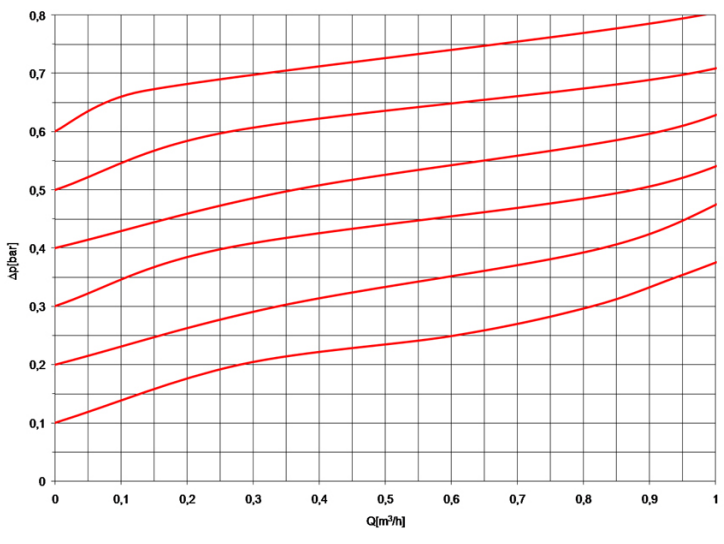
As pressure increases in the circuit, the valve opens and drains the excess flow on the return circuit.



VALVE CALIBRATION

It is possible to read the calibration scale on the handle by removing the valve cap. In order to carry out valve calibration fit the cap hexagon on the handle, then rotate upwards to the desired calibration value.





The diagram shows how drainage flows are dependent on the calibration pressure of the valve.

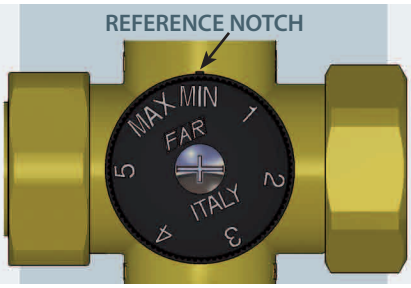
Technical Features

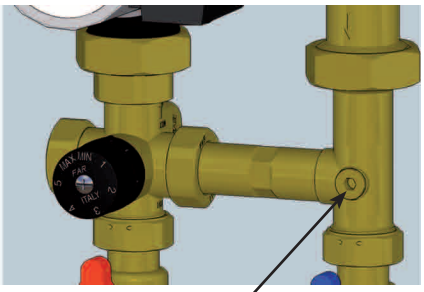
Valve materials:	CW617N brass
Max. working temperature:	110°C
Nominal pressure:	10 bar
Setting range:	0,1 - 0,6 bar

5.2 THERMOSTATIC MIXER

The thermostatic mixer is designed to keep constant temperature in the system. Temperature setting must be carried out when system is operating and in relation to the design heads. An approximate setting can be effected by considering the following correspondence between the numbering on the mixer and the outgoing water temperature.

POSITION	t [°C]
MIN	18 ± 2
1	20 ± 2
2	22 ± 2
3	30 ± 2
4	40 ± 2
5	50 ± 2
MAX	55 ± 2





Once the mixer handle position has been set, the system is calibrated.
The values indicated in the table above can vary (±2°C tolerance), depending on the characteristics of the system where the unit is installed. Final adjustment can be made by referring to the value indicated on the ball valve temperature gauge.

The return connection is provided with a 1/4"" seating , suitable for the installation of a probe or a pressure gauge.

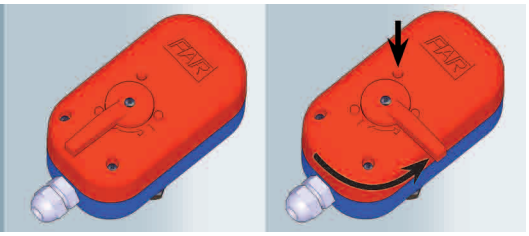
5.3 3-POINT ACTUATOR FOR MIXING VALVE

CODE	VOLTAGE	ABSORBED POWER	ROTATION ANGLE	ROTATION TIME	TORQUE	WORKING TEMPERATURE	PROTECTION LEVEL	COLOUR
3010 40	230 V-50Hz	4,5 VA	90°	180 S	10 Nm	-10° + 50°C	IP54	RED/BLUE

The actuator incorporates a servomotor, which permits automatic operation of the mixing valve. It operates in response to a signal from a control unit.

MANUAL RELEASE

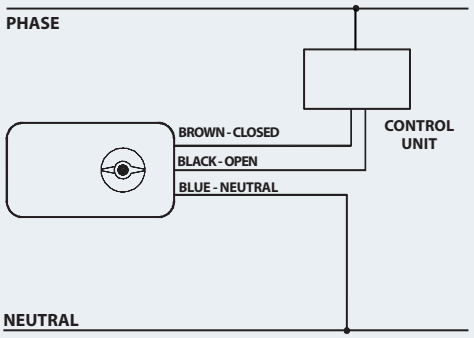
In order to position the actuator as desired, press the red key for a few seconds and simultaneously rotate the position indicator connected to the drive shaft through 90°C, clockwise or counterclockwise. Normal functioning will return automatically



WIRING

Before connecting the actuator make sure that the selected model is fully compatible with the available network voltage. All connections must be made by qualified personnel and with respect for the overall electrical system (also shown on actuator) - taking care that the electricity supply is switched off. Incorrect connections may endanger both persons and equipment.
All actuators have been designed with an additional auxiliary micro-switch, i.e. exchange contacts without voltage, for low-tension signals (max 230 V) and/or to supply applications with low electrical input (max 2A).

N°	COLOUR	CONNECTION	DESCRIPTION
1	GREY	MICRO-SWITCH COMMON CONTACT	CONNECTED TO THE MICRO-SWITCH COMMON CONTACT
2	WHITE	N.O. OF THE MICRO-SWITCH	CONNECTED TO THE NORMALLY OPEN CONTACT OF THE MICRO-SWITCH
3		SIGNAL INDICATOR	PRESENCE OF PHASE ON TERMINAL WITH VALVE OPEN
N	BLUE	NEUTRAL	CONNECTION TO NEUTRAL
5	BROWN	PHASE-CLOSE	VALVE CLOSING
6	BLACK	PHASE-OPEN	VALVE OPENING
7		SIGNAL INDICATOR	PRESENCE OF PHASE ON TERMINAL WITH VALVE CLOSED

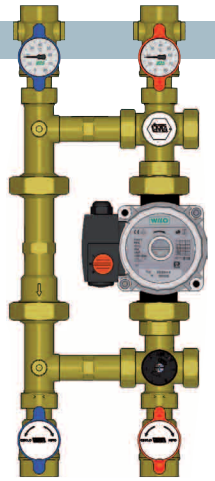


The actuator features double isolation, with no need for earthing.

WIRING CONNECTION: CONTROL THROUGH AN ELECTRONIC UNIT

To control opening and closing of a zone valve via an actuator, connect the blue wire to the neutral and the brown and the black to the control unit. In the presence of phase on the black wire the valve opens, while with phase on the brown wire the actuator closes.

6. PUMP CONFIGURATION WITH RIGHT-HAND SIDE SUPPLY



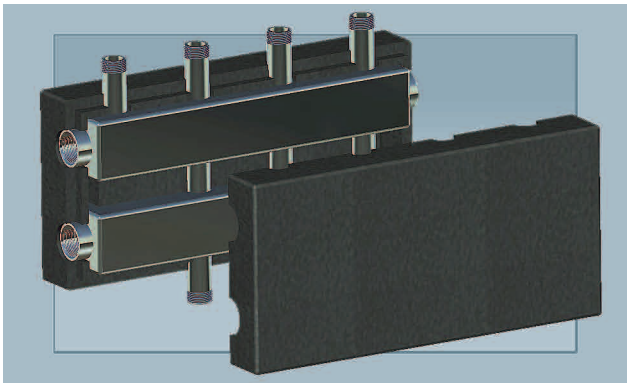
When the pump is installed on the right side, it is also necessary to rotate the cable connector. Please follow the instructions detailed below to achieve this configuration: remove the Allen screws (**Fig a**) and turn the grey actuator lock (**Fig b**) in order to bring the electrical connections box 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.

fig. a

fig. b

fig. c

7. MANIFOLDS FOR CENTRAL HEATING



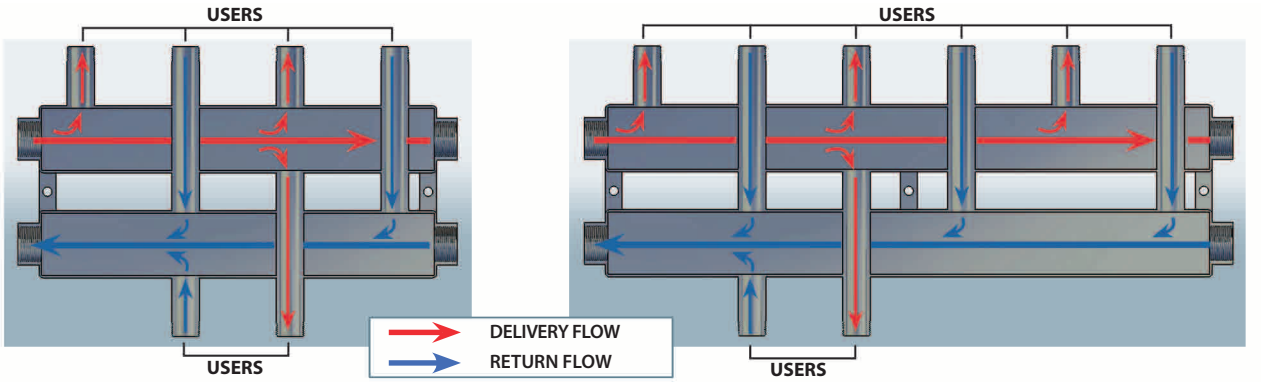
To install booster units in a central heating system, FAR offers a range of painted steel manifolds
Art. 2191 11402 (2 +1 port) and **Art. 2191 11403 (3+1 port)**

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 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 stem.

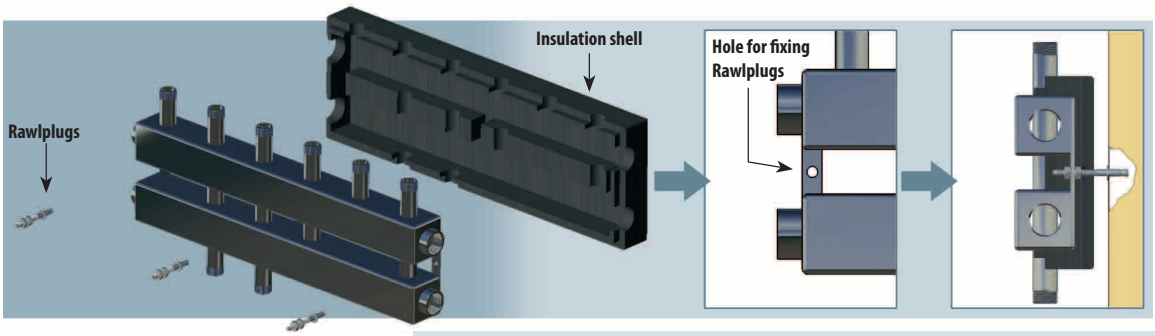
7.1 FLOW IN 2 AND 3 PORT MANIFOLDS

The scheme below shows the flows inside the manifolds.

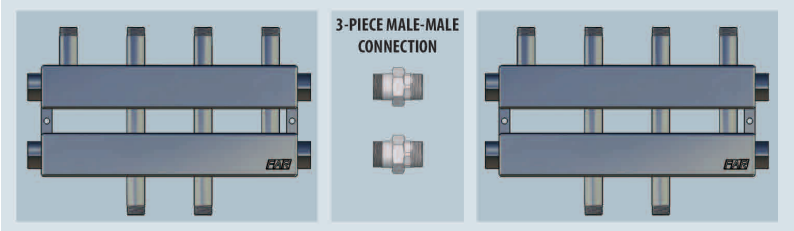


7.2 INSTALLATION

Manifolds must be installed on the wall by means of Rawlplugs and placed as illustrated below.
A hydraulic separator should be placed between the boiler and the manifold, thus creating independent circuits, in such a way as to avoid interferences to pumps installed in the system.
The manifold features 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 connect a series of manifolds using a 3-piece male-male connection **Art. 5163 114**

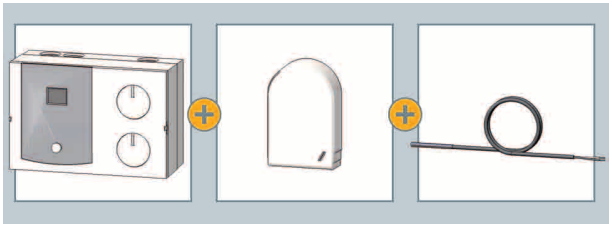


8. INSTALLATION

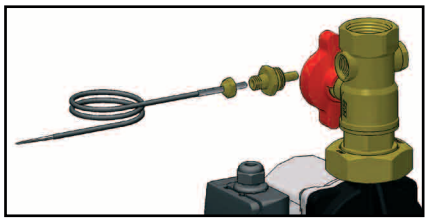
When using a modulating mixing valve it is necessary to include the control unit:

Fixed point functioning:
Art. 9612 complete with control unit and supply probe

Temperature control:
Art. 9611 complete with control unit and supply and external probe

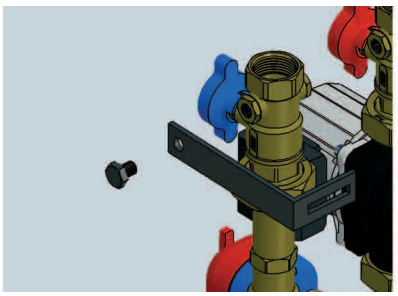


To install the seat on art. 9612, remove the side cap from the temperature gauge holder valve, as shown on the right. Then insert the supply probe, locking it by means of a cap with hole provided on the seat. For art.9611, the supply probe can be put on contact on pipeline.
To complete the installation we recommend inclusion of a safety thermostat, **art. 7951**, on the supply pipe - using thermostat **art.7946** as a minimum

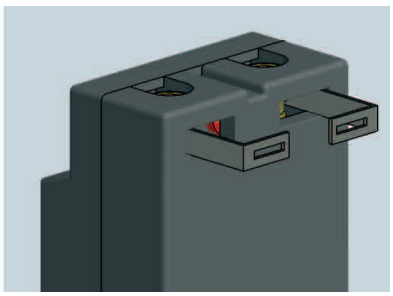


Brackets complete with screws, art.7478 can be used for wall installation.

1. Position the bracket as indicated and screw it on the ball valve plug.

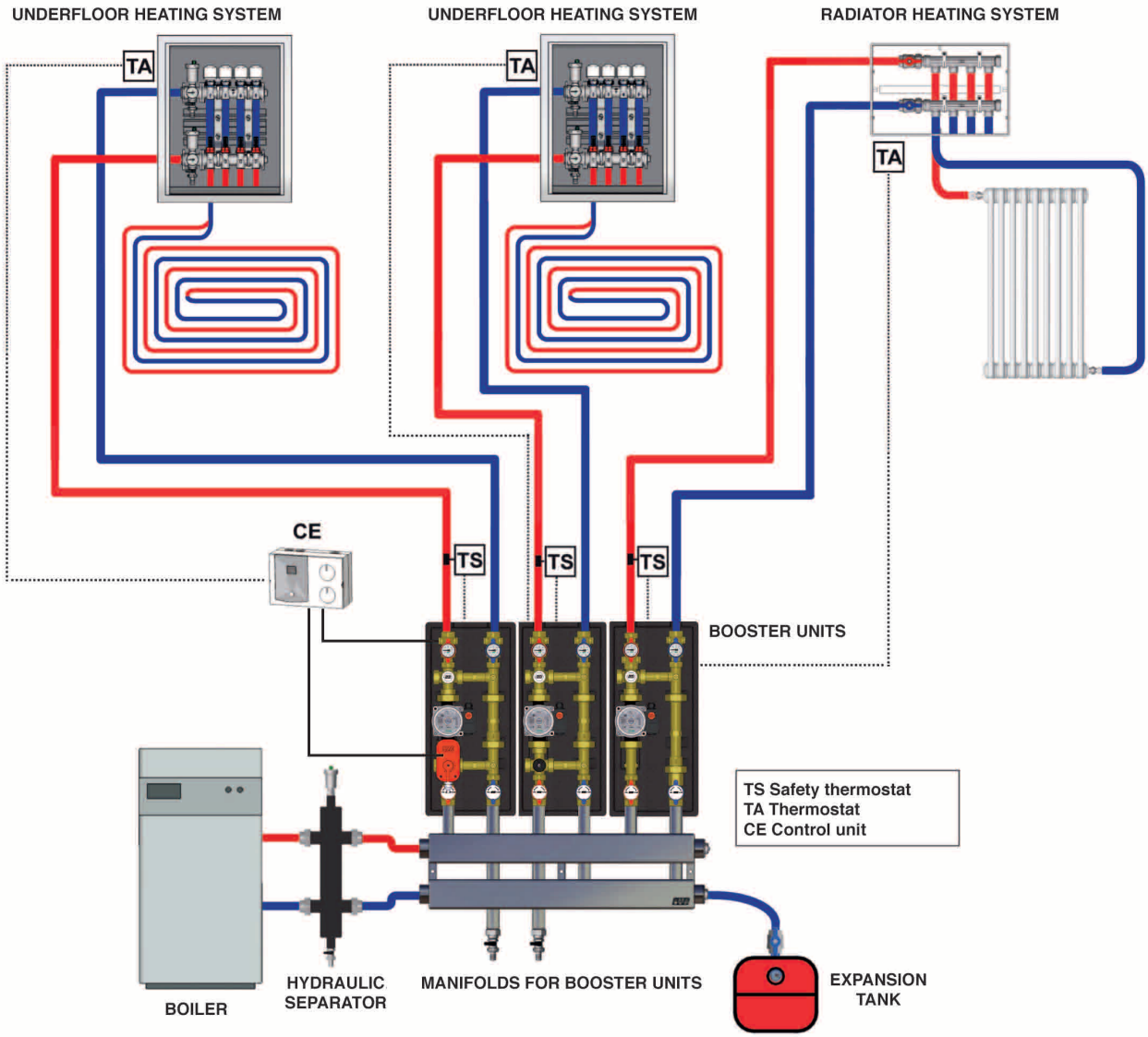


2. To insert the brackets in the insulation, cut along the splits on the back shell and fix using two Rawlplugs.



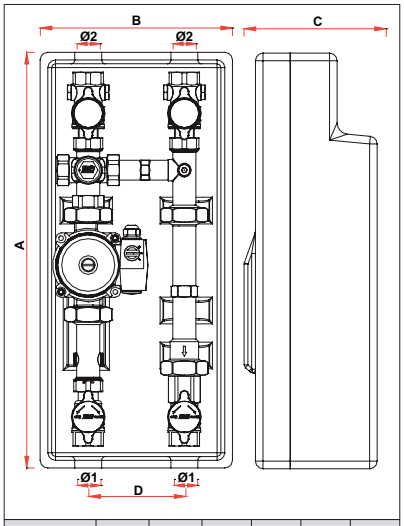
8.1 WIRING SCHEME

The scheme, to be considered purely indicative, shows an example of three different types of booster units with bypass valve connected into a central heating system.

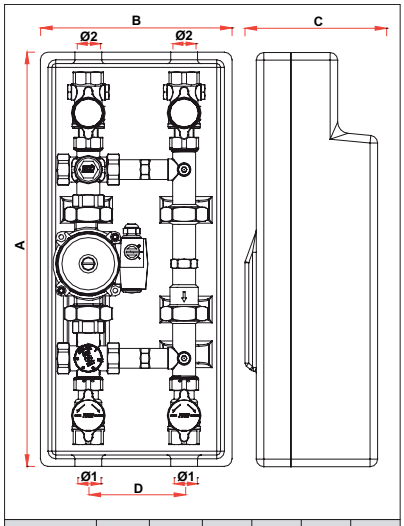


The presence of more pumps for flow distribution requires installation of a hydraulic separator before the manifold.
The unit with mixing valve can be regulated through an electronic controller- CE - with fixed point functioning or climatic operation.
The room thermostat must be connected to the control unit art.9611, which controls pump start-up.
The unit with thermostatic mixer is suitable for fixed point low temperature systems, where the room thermostat shall be connected to the pump.
The first unit on the right is for high temperature systems, where a room thermostat controls the pump.
We recommend that a safety thermostat with contact probe is installed on the supply pipeline to prevent excessively hot water entering the system.

9. DIMENSIONAL FEATURES



CODE	Ø1	Ø2	A	B	C	D
2177 1130	G1	G1	545	250	161	125



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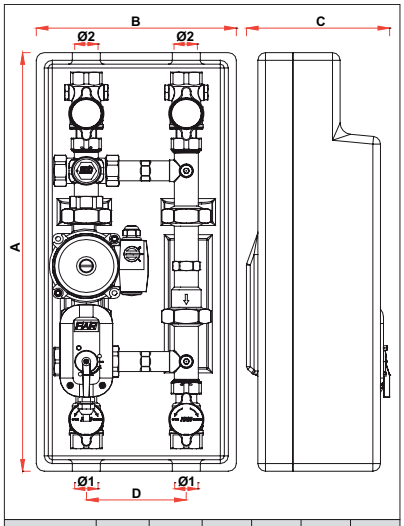
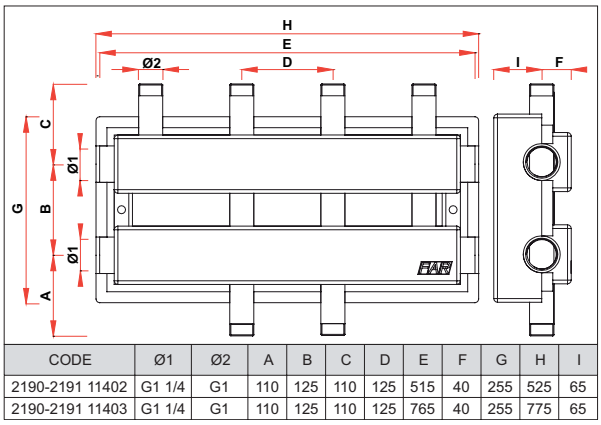


CODE	Ø1	Ø2	A	B	C	D
2179 1130	G1	G1	545	250	188	125



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

10. TECHNICAL FEATURES

Technical Features

Nominal pressure:	10 bar
Max. temperature:	95°C (without temperature gauges)
Compatible media:	water, water with glycol
Temperature gauge scale:	0÷80°C
Available pumps:	Art.2185 130 3-speed pump with 6m designed head Art.2185 130EA energy class A pump with 7m design head

Materials:

Insulation:	PPE
Fixing brackets:	zinc-coated steel
Mixing valve:	CB753S brass
Ball valves and T gauge holder:	CW617N brass
Extension with non-return valve:	CB753S brass
Bypass valve:	CB753S brass
Gaskets and O-ring:	EPDM