

COMPACT UFH REGULATING GROUP WITH THERMOSTATIC MIXING VALVE

Description



Compact pre-assembled pump group for fixed point regulation and circulation of mixed fluid. Allows the circulation of the thermal fluid, coming from the primary circuit, by keeping the temperature at a pre-set value (fixed point) through the help of a mixing valve with thermostatic element. Designed for the expansion of heating systems where a new room is added (room, conservatory, extension etc) connecting it to the existing system, typically with radiators, keeping the same heat generator. It is used in heating systems in general and radiant panel systems. The group is composed of a pump, thermostatic mixing valve, control thermostat, connection T-fittings with ball shut-off valve, wall mounting bracket. Flow and return can be easily exchanged from right to left by rotating the thermostatic mixing valve together with the connected T-fittings.

Range of products

Compact regulating group with thermostatic mixing valve	28B	XXX	X	X	X
Pump threaded connections G 1 1/2		040			
Nickel plated finish			N		
Temperature adjustment range 30–65 °C				2	
Pump Grundfos UPM3 AUTO 25-70 130					T

Features

Working temperature range: **5–90 °C**
 Max working pressure: **10 bar**
 Threaded connections: **G 3/4 M (ISO 228-1) eurocone, 15 mm compression ends**
 Primary side connection centre distance: **125 mm**
 Pump: **Grundfos UPM3 AUTO 25-70 130**
 Suitable fluids: **water, glycol solutions (max 30%)**
 Temperature adjustment range: **30–65 °C**
 Accuracy: **±2 °C**
 Factory setting: **MIN (=30 °C)**

Materials

T-fittings: **brass EN 12165 CW602N, nickel plated**
 Fitting for secondary circuit:

- Body: **brass EN 12164 CW617N, nickel plated**
- Gasket: **EPDM**

Thermostatic mixing valve

- Body: **brass EN 12165 CW617N, nickel plated**
- Gaskets: **EPDM**
- Headwork: **brass EN 12164 CW602N**
- Spring: **stainless steel AISI 302**
- Thermostatic sensor: **wax**
- Knob: **ABS**

Pump

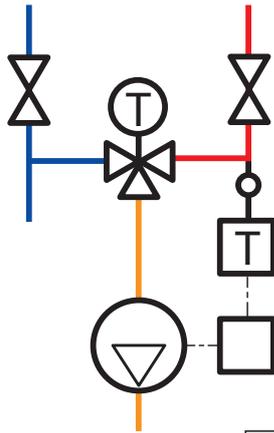
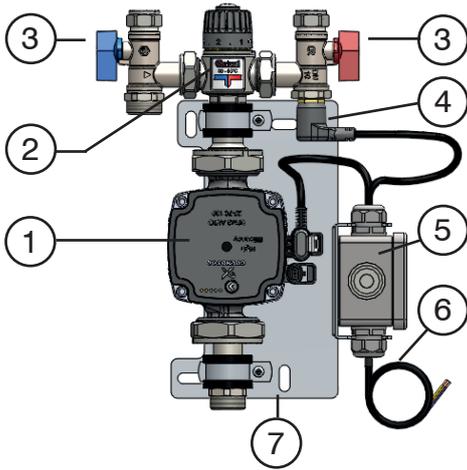
- Body: **cast iron**
- Electric supply: **230 V-50/60 Hz**
- Protection class: **IP 44**
- Centre distance: **130 mm**
- Connections: **G 1 1/2 M (ISO 228-1)**
- Gaskets: **EPDM**

Control thermostat

- Body: **brass**
- Factory setting: **42 °C**
- Accuracy: **±3 °C**
- Hysteresis: **7 °C**
- Threaded connection: **M4**
- Contact rating: **16(3) A**

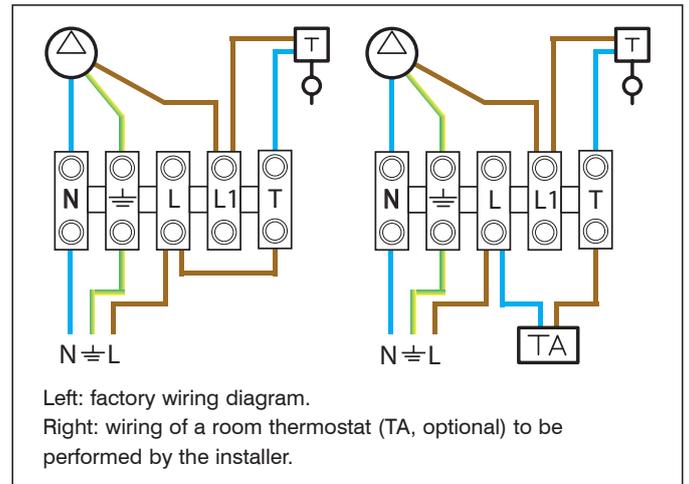
Wall bracket: **galvanized steel**

Components

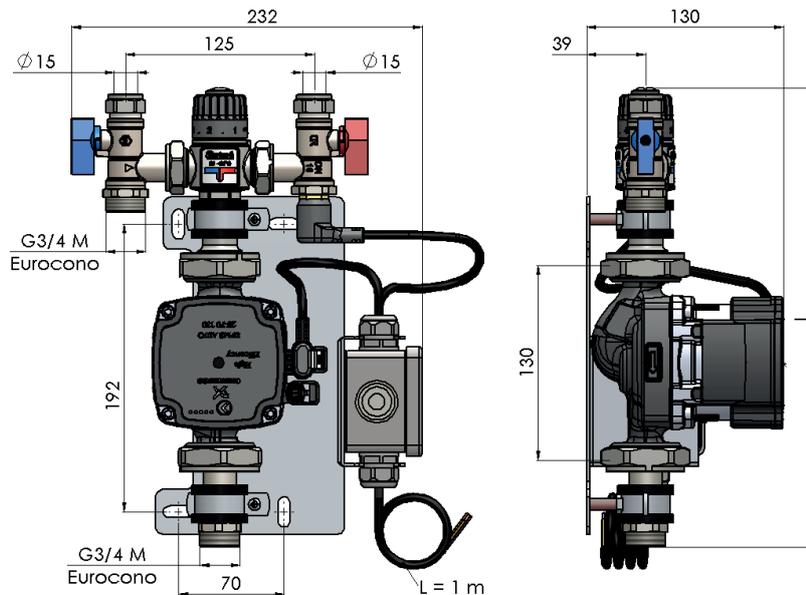


28B.N		
1	Pump	Grundfos UPM3 AUTO
2	Thermostatic mixing valve	
3	T-fitting with built-in shut-off valve	
4	Control thermostat	
5	Wiring box	
6	Electric supply cable	
7	Wall mounting bracket	

- Pump
- Thermostatic mixing valve
- Control thermostat
- Ball shut-off valve
- Wiring box



Dimensions



Code	P [bar]	L [mm]	Pump	Weight [kg]	N. P/B	N. P/C
28B040N2T	10	306-312	Grundfos UPM3 AUTO 25-70 130	3,72	-	1

N. P/B: number of pieces in box - N. P/C: number of pieces in carton
Other pump types should be evaluated

Working way and sizing diagrams

Heating of an expansion (new single room)

The compact group allows the expansion of a heating system by adding a further room: hall, greenhouse, conservatory etc.

The requirements of the preexisting system should be:

- **heat generator with an oversized power output of about 3 kW** to be used to heat the added room. We suppose to keep the same generator, adding in parallel a new circuit containing the compact group;
- **two pipe type radiator system**: we consider to add a new zone, heated by radiant panels, to a preexisting high temperature circuit. This allows to supply the mixing valve of the group at a temperature which is higher than the valve set, in order to obtain a stable mixing. The two pipe system (independent flow and return for each preexisting terminal) makes it possible a connection in parallel of the new system zone;
- **proximity of the preexisting pipes to the new room**. This makes the installation in parallel easier and allows the pump of the upstream system to supply water also to the compact group. The control thermostat (4) is therefore able to detect a hot water inlet at a temperature value hot enough to activate the group pump (1).

The requirements for making the added system work are:

- **preexisting system already working (switched on)**, with its pump activated by a main room thermostat (TA_a). In this way, the compact group pump (1) is switched on only by the control thermostat (4) supplied with the group;
- **we suggest to install a thermostat also in the added room (TA_b)**, in order to activate the compact group pump (1) only when it's really necessary to heat the room;
- **evaluate the use of zone valves** to shut-off both the systems (preexisting and added one).

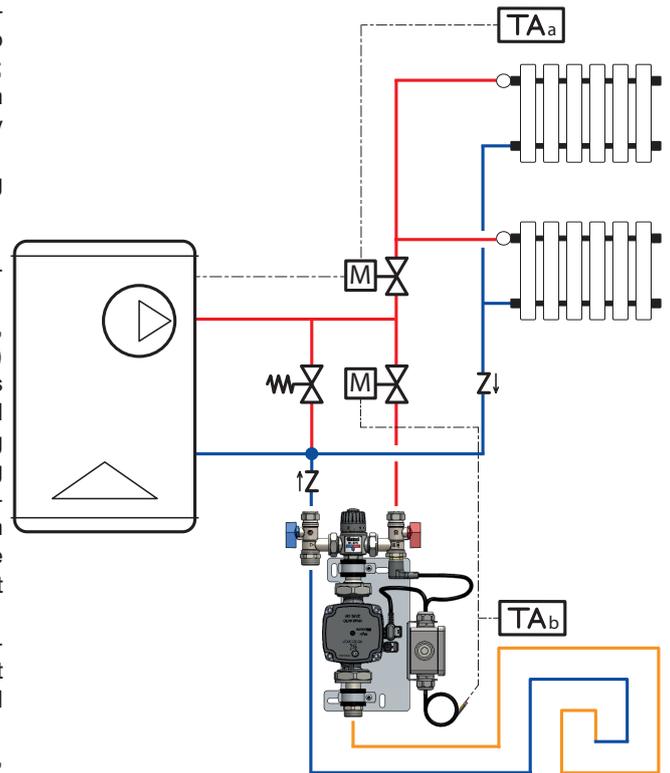
The hot water, withdrawn from the flow line towards a terminal of the preexisting system, is kept under control by two devices of the group:

- **control thermostat (4) for pump activation**: it's a normally open thermostat, with fixed setting at 42 °C. It allows the activation of the group pump (1) only if the temperature of the water, arriving from the preexisting system, is higher than its setting (42 °C), otherwise it opens the electric contact and switches the pump off. In this way, the water withdrawn from the preexisting system flows at a temperature value high enough to obtain a stable mixing and avoid the cooling of the new room circuit. We suggest to keep the preexisting system at a temperature of 45 °C at least. The group is supplied with the control thermostat and the pump supply cable already pre-wired to the wiring box. The box itself allows the connection also of a room thermostat (TA_b, not supplied in the package);
- **thermostatic mixing valve (2)**: it keeps the temperature of the water, supplied to the added system, at the design value. Temperature should be set by considering the different characteristics of the floor surface (standard EN 1264).

Since the maximum temperature of a radiant floor is 29 °C for living rooms, 33 °C for bathrooms and 35 °C for peripheral areas, with a maximum emitted surface power output of 100 W/m², the flow temperature varies according to the centre distance of the pipe laying, type and thickness of slab and floor material (tiles, wood etc).

Common values can be 28-40 °C for tiles, 32-50 °C for wood floors according to the power to be emitted (these example values take into account a 5 K temperature delta with a usual slab thickness): if we increase both the emitted power output (W/m²) and the pipe centre distance (cm), the higher should be the flow temperature. We suggest anyway an accurate design in cooperation with producers of slabs, additives, floor surfaces etc.

Supposing to provide the new room with 3 kW, we can consider to heat a surface of about 40 m² at 70 W/m².



Group sizing (operation for specialized/authorized technical personnel).

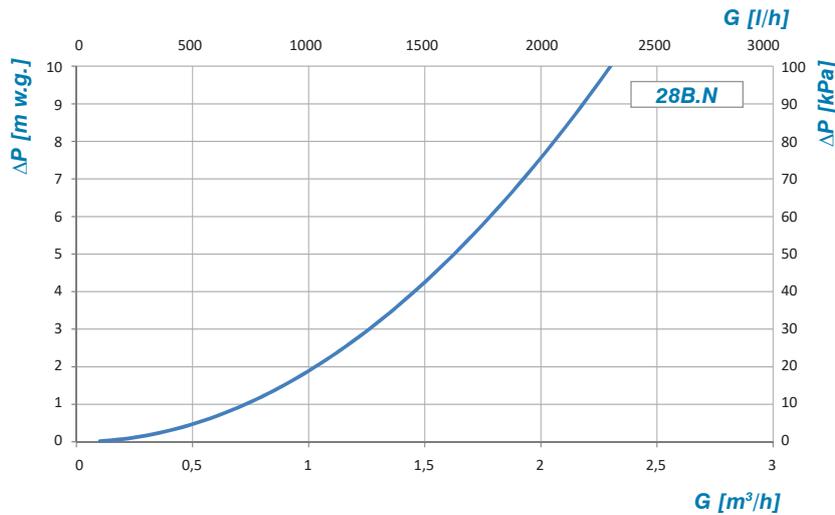
For a precise sizing, here follow the hydraulic characteristics of the group, without pump, and the pump working curves.

Step 1: head losses of the group without pump. Enter on the x-axis of the first diagram with the design flow rate value. Cross the curve of the group and read the corresponding head losses of the group (without pump) on the y-axis.

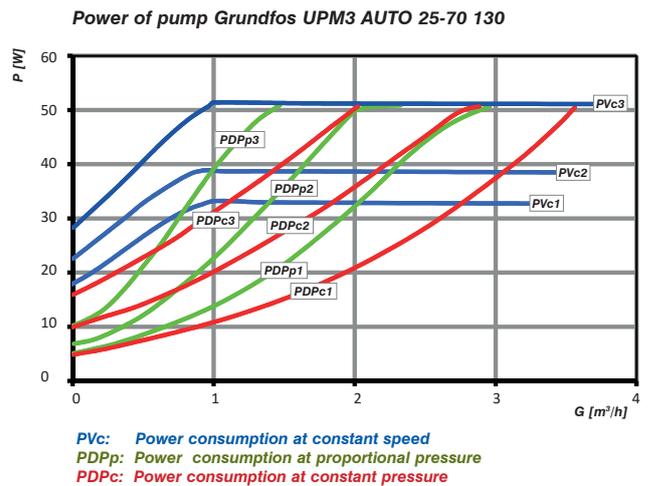
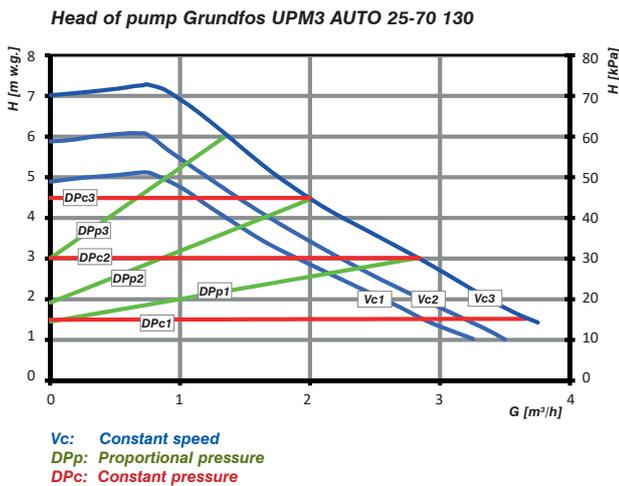
Step 2: available head of the pump. With the same design flow rate value, enter on the x-axis of the selected pump diagram ("Head of pump"). Cross the curve of the selected working mode (Constant velocity, Proportional pressure, Constant pressure) and read the corresponding available head of the pump on the y-axis.

Step 3: pump validation. Calculate the difference between the available head of the pump and the head losses of the group without pump. The remaining pump head should be higher than the head losses of the rest of the system: if so, the selected pump is suitable to supply water to the rest of the system, otherwise a different pump working mode or pump size or different group size or a system resizing could be necessary.

Hydraulic characteristics: head losses of the thermostatic regulating group without pump



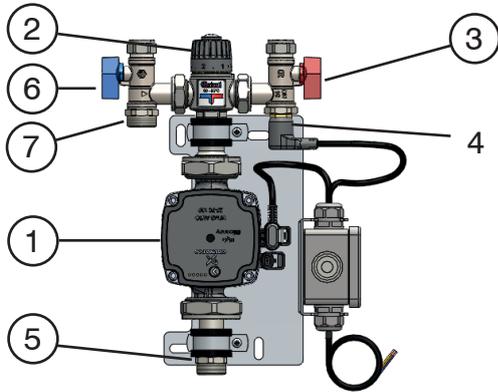
Head and power consumption of the pump



Features

The thermostatic regulating group consists of:

- Thermostatic mixing valve (2);
- Flow line including T-fitting (3) with built-in shut-off valve (red knob) and control thermostat (4), pump (1), eurocone connection for system flow pipe (radiant panels or radiators, 5)
- Return line including T-fitting (6) with built-in shut-off valve (blue knob) and eurocone connection (7).



Advantages

House and system expansion. Given a preexisting boiler, oversized by 3 kW, the group is able to heat through radiant panels an additional room with an average surface of about 40 m² at 70 w/m². Precise sizing by specialized/authorized personnel is strongly recommended.

Immediate installation. The group is already screwed to the mounting bracket which can be used as drilling template on the wall (fig. A).

The electric supply, control thermostat supply and pump supply cables are factory pre-wired to the wiring box to make the installation faster.

Nuts and control thermostat are already screwed and ready to use.

Reversibility. The group “mixing valve + two T-fittings” can be turned around its vertical axis to exchange the hot water inlet from right to left (fig. B).

Control thermostat. This thermostat controls the hot water temperature at the inlet and activates the pump.

Flexibility of installation. The group can be installed on wall, in box or recessed (fig. C).

Thermostatic regulation. The fixed point thermostatic regulation (30–65 °C) makes it possible to use the group both for radiant panel and radiator systems.

Anti-tamper device. The device, placed within the mixing valve knob, avoids undesired variations of the setting. Slightly unscrewing the knob screw, the device is deactivated to allow the valve setting. By tightening the knob screw again, the anti-tamper is restored (fig. D).

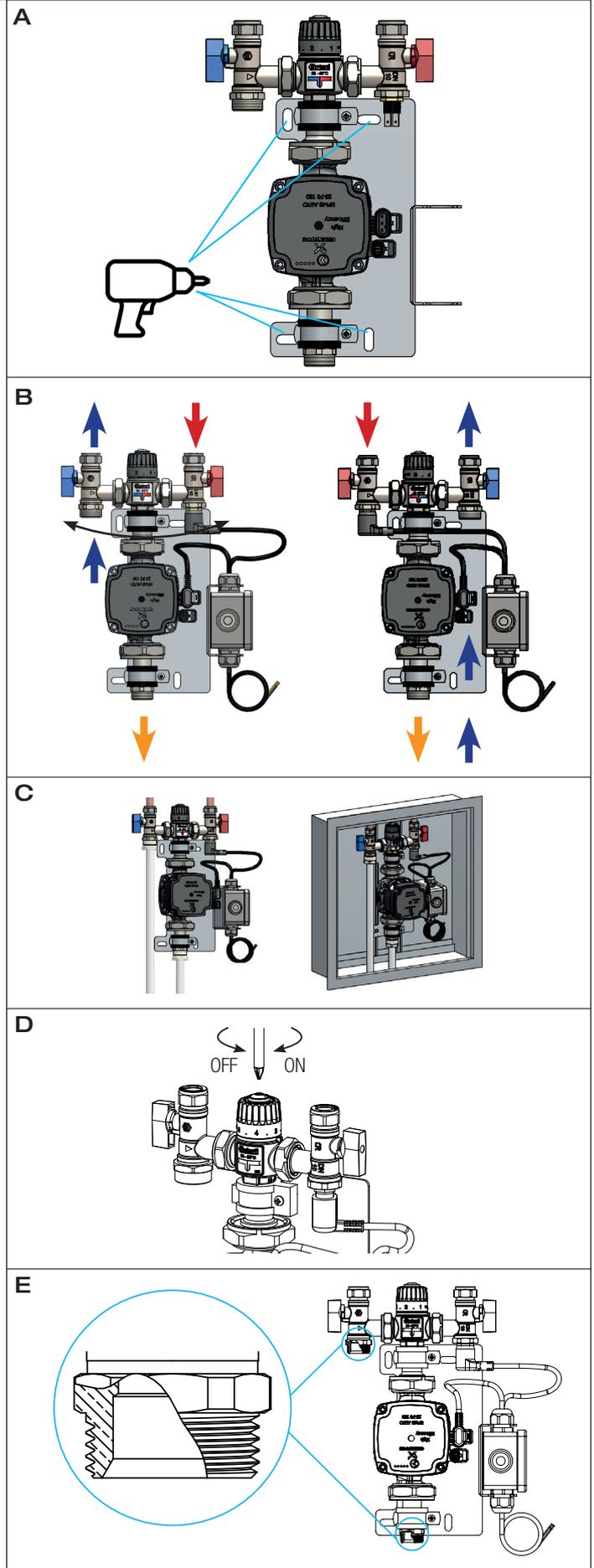
Eurocone connections. The connections on the system side (radiant panels) are the same as those of the most common manifolds on the market (fig. E).

Anti-vibration pipe clamps. The supports between the group and the bracket are rubber coated to eliminate possible vibrations arriving from the pump.

Pump range. The groups are available with one pump model. For the use of other models and/or manufacturers, it is advisable to contact Barberi for verification.

Flat gaskets. The various components of the groups are connected to each other by means of flat seal fittings. This makes the installation faster by avoiding the use of hemp or other sealants.

The group is provided with all the nuts already fully screwed. Check however all the nut tightening and the water tightness of all the joints after the installation.

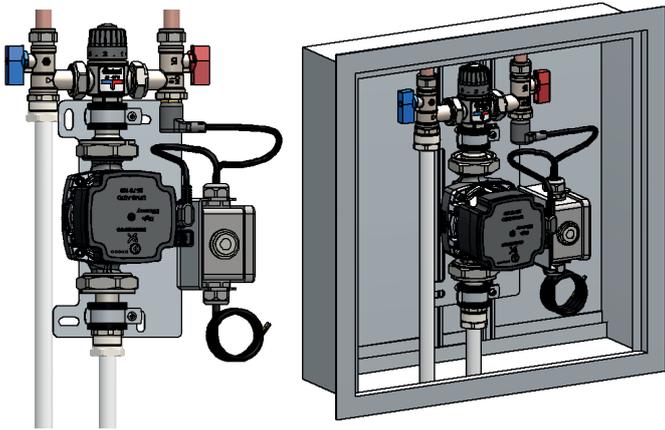


Installation

The mounting options of the group are:

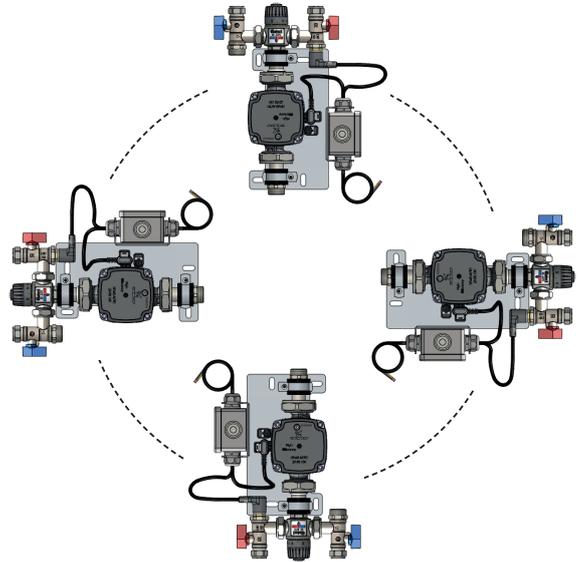
- wall installation
- recessed installation
- box installation.

When used for a system expansion, the group is installed in parallel on a pre-existing line, evaluating the addition of zone valves (1) and a differential by-pass valve (2, the latter could already be within the boiler or added between the main flow and return lines).



Group position

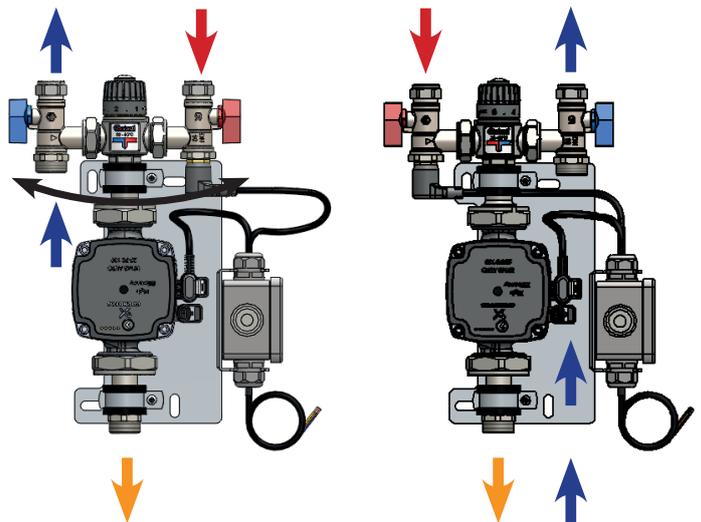
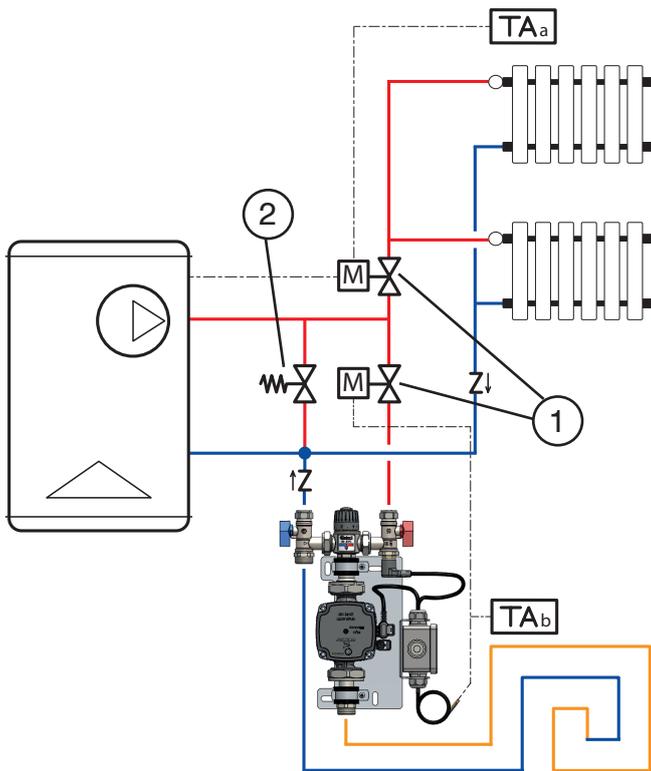
The group can be installed in one of the ways shown in the picture, with the pump rotation axis always horizontal.



Group reversibility

To reverse the group from right to left, exchanging the hot water inlet with the boiler and system returns, remove the "mixing valve+T-fittings" group, turn this group around its vertical axis and screw it again onto the pump.

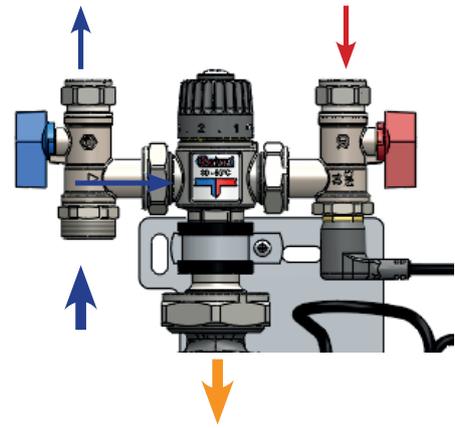
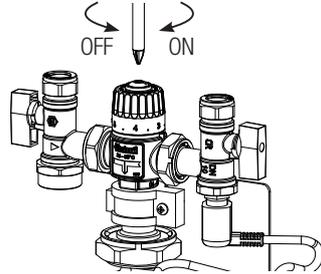
Fully screw the nuts before proceeding with the installation.



Adjustment of the thermostatic mixing valve

The thermostatic mixing valve keeps constant the temperature of the water supplied to the system. The fixed point regulation is achieved through a thermostatic sensor which moves thanks to the expansion of the wax inside of it. The sensor integrated within the valve is more precise and reliable than the thermostatic valves with external capillary.

The knob is equipped with an anti-tamper mechanism which makes the rotation difficult, thus avoiding undesired set changes. The mechanism can be released with a screwdriver, slightly loosening the locking screw.



FIRST SYSTEM START UP. The fixed point temperature value can be set with the knob before installing the group or, after the installation, exclusively with the SYSTEM COLD. To set a temperature value different from the factory one, proceed as follows:

1) The graduated scale on the knob corresponds to the temperature values shown in the table.

2) With a screwdriver, slightly loosen the locking screw, holding the knob with your hand.

3) Set a mixed water temperature value slightly lower than the design temperature. Activate the generator and wait until it reaches its design working temperature (higher than the valve setting). Activate the pump of the preexisting system. The control thermostat automatically activates the pump of the group when the circuit temperature reaches at least its setting value (42 ± 3 °C). Wait until the mixed water temperature gets stable. Read its value with a digital thermometer (not supplied in the package) placed on the flow pipe.

4) Counterclockwise rotate step by step the knob to increase the temperature. Then wait until the temperature gets stable. Read its value with a digital thermometer placed on the flow pipe. Proceed in the same way until the design flow temperature is reached.

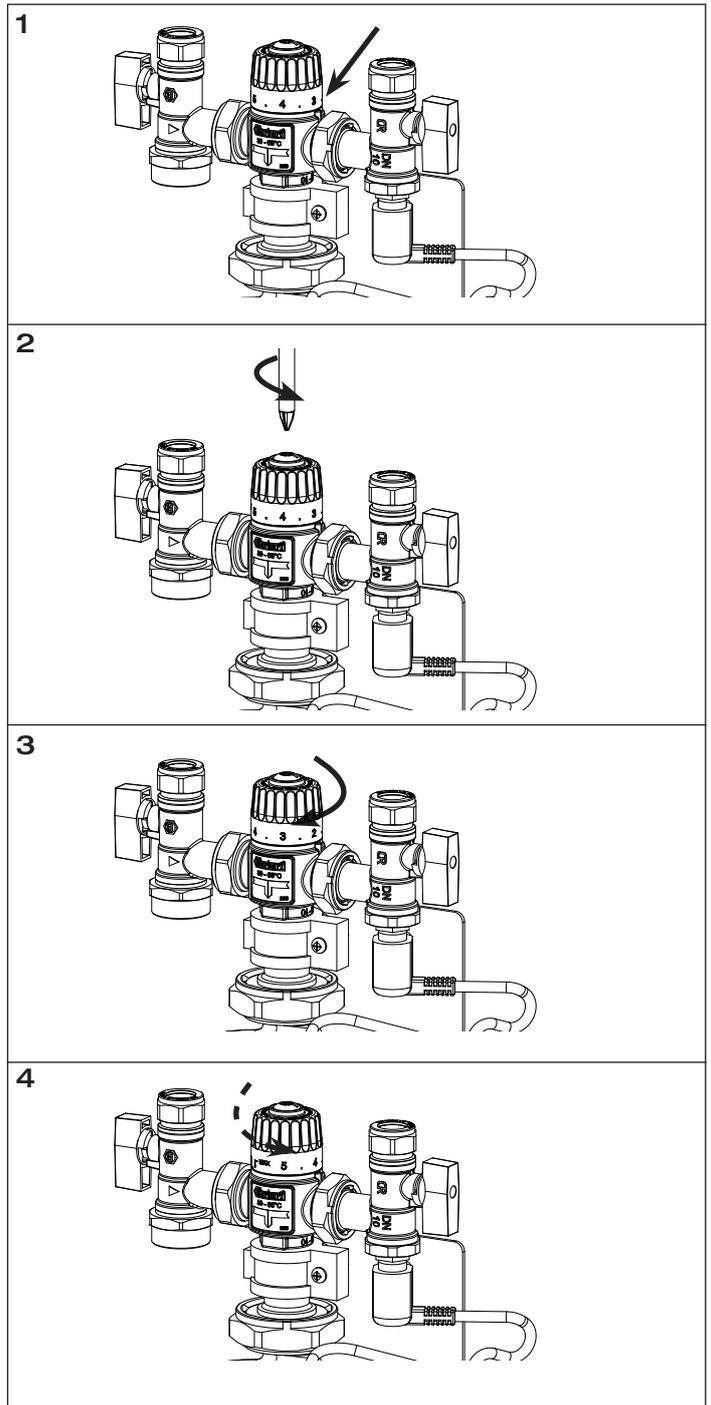
5) When the desired temperature is reached, close the locking screw, holding the knob with your hand.

	30-65 °C
	°C
Min	30
1	36
2	40
3	44
4	50
5	53
Max	65
	MIN

NEXT SETTING. If later a change should be needed in the valve setting, proceed as follows.

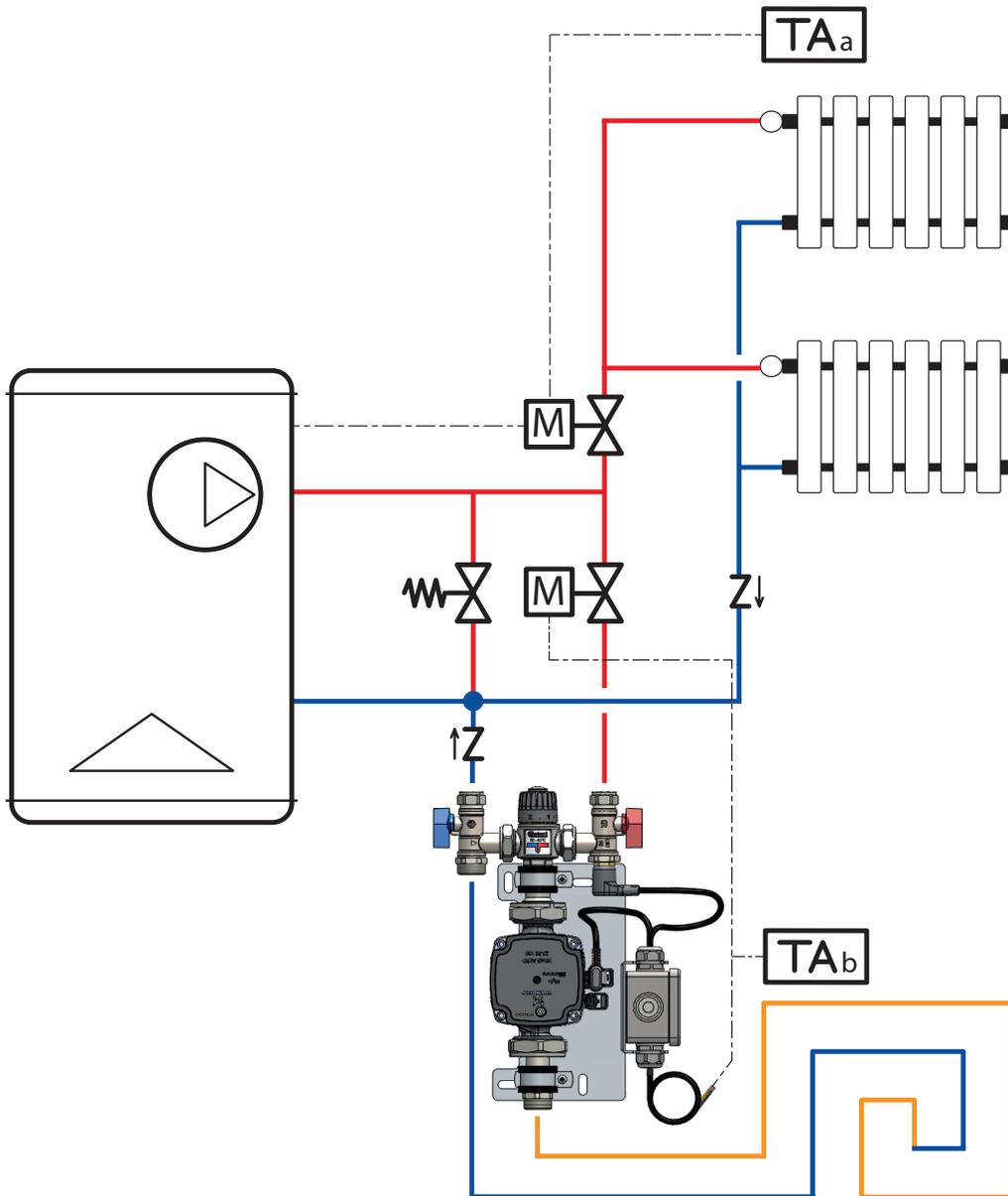
Case 1: temperature lower than the current setting. Let the system get cold to obtain at least a return temperature lower than the new valve setting. Follow points 1, 2, 3, 4 and 5.

Case 2: temperature higher than the current setting. In this case, the setting can be carried out also with the system running as well as with the system cold. Follow points 1, 2, 4 and 5.



System diagrams

28B.N: use as compact thermostatic group for system expansion



Specifications

Series 28B.N

Compact regulating group with thermostatic mixing valve for system expansion (single room). Primary side threaded connections 15 mm compression ends for copper pipe, secondary side threaded connections G 3/4 M eurocone. Primary side connection centre distance 125 mm. The group is composed of: brass thermostatic mixing valve with wax sensor, temperature adjustment range 30–65 °C; brass T-fittings with built-in ball shut-off valve; brass fitting to secondary circuit; control thermostat with brass body, setting 42 °C, threaded connection M4, contact rating 16(3) A; galvanized steel wall bracket; wiring box in plastic. High-efficiency pump Grundfos UPM3 Auto 25-70 130, electric supply 230 V/50-60 Hz. Working temperature range 5–90 °C; maximum working pressure 10 bar.