

INSTRUCTIONS

REHAU PRO-BALANCE[®] MIXING MODULE

SPECIFICATIONS.....	1
OVERVIEW	2
PRECAUTIONS	2
MOUNTING LOCATION	2
CONNECTION TO BOILER PRIMARY PIPING:.....	3
ELECTRICAL CONNECTION.....	4
FLUSHING THE HEATING CIRCUITS	4
ADJUSTMENT OF THE FLOOR HEATING FLOW TEMPERATURE.....	4
OPERATION OF THE WATER FLOOR HEATING CONTROL UNIT	5
PUMP INFORMATION:.....	5

Specifications

Maximum working temperature:	230°F (110°C)
Maximum acceptable working pressure:	145 psi (10 bar)
Temperature regulation range:	68 –158° F (20 - 70 °C)
Nominal heat output:	47.800 BTU /HR**
Pump:	Grundfos UPS 15-58-130 mm 1" BSPM connections. 3 speed. 3 Speed-Cast Iron Integral Check Valve 115 VAC, 2 Pole, Single Phase Flow range: 0 - 17.5 U.S. GPM Head range: 0 - 19 FEET
Min. fluid temperature:	36°F (2°C)
Fittings:	Brass Ms 58
Pipe systems:	Brass Ms 63
O-Rings:	EPDM
Flat gaskets:	AFM 34 or EPDM
Plastic:	Impact-resistant and temperature-resistant

***For the achievement of the maximum heat output, the pressure in the boiler primary loop should be at minimum 2 psi / 150 mbar higher than the "secondary" floor heating circuit and the temperature of the primary should be ~ 25 °F (15 °C) higher than the desired radiant design temperature.*

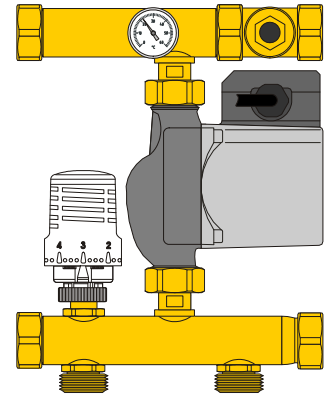
Overview

The REHAU PRO-BALANCE MIXING MODULE is intended for **Supply & Return Header boiler supply configurations only. This unit will not function properly in a “closely spaced Tee” configuration or with the use of a “hydro separator”.**

The REHAU PRO-BALANCE MIXING MODULE is intended for relatively small radiant heating applications using a fixed “set point” temperature supply. The module is designed to fit directly to the left or right of the REHAU PRO-BALANCE manifold.

The supply temperature to the manifold may be adjusted gradually between 70°F and 160°F, by means of temperature controlled injection valve. The injection valve has features that can limit the manual adjustment of the valve to prevent tampering and/or over-heating.

The module pump would be typically energized by the room thermostat via a relay. The relay could be energized by the thermostat or via the end of the actuator of one of the REHAU electronic boxes.



Precautions

Before starting work the installer must carefully read, understand and adhere to these instructions.

The REHAU PRO-BALANCE MIXING MODULE may be mounted, operated and maintained only by trained hydronic personnel familiar with hydronic systems. Personnel undergoing training may only work on the product under the supervision of an experienced fitter. Only when these conditions are fulfilled, the manufacture is responsible for the equipment as provided in the legal regulations.

All instructions in this assembly and operation manual must be observed when working with the water floor heating control unit. Any other application is not in compliance. The manufacturer shall not be responsible for incompetent use of the water floor heating control unit. Reconstructions and changes are not acceptable for reasons of safety. The water floor heating control unit may be repaired only by services approved by the manufacturer.

Mounting Location

The hydraulic connections are to be made as shown in fig.2.

The control unit is supplied for connecting to the left of the Pro Balance manifold. If you want to mount it to the right of manifold, all you have to do is to rotate the eccentric-fitting and re-plug the thermometer on the supply of the unit.

Depending on space limitations and dimensions of the manifold, it may be necessary to rotate the pump in the axis of the screw connections. To do this, loosen the two union nuts on the pump, rotate the pump into the required position, and then tighten the screw connections while holding both the pump and the screw connection element in place.

On the supply inlet of the control unit the installation of a strainer with a mesh size of smaller 0.8 mm is recommended. This strainer should be maintained in regular intervals and cleaned if necessary. (This is a recommendation for the installer to keep the system clean.)

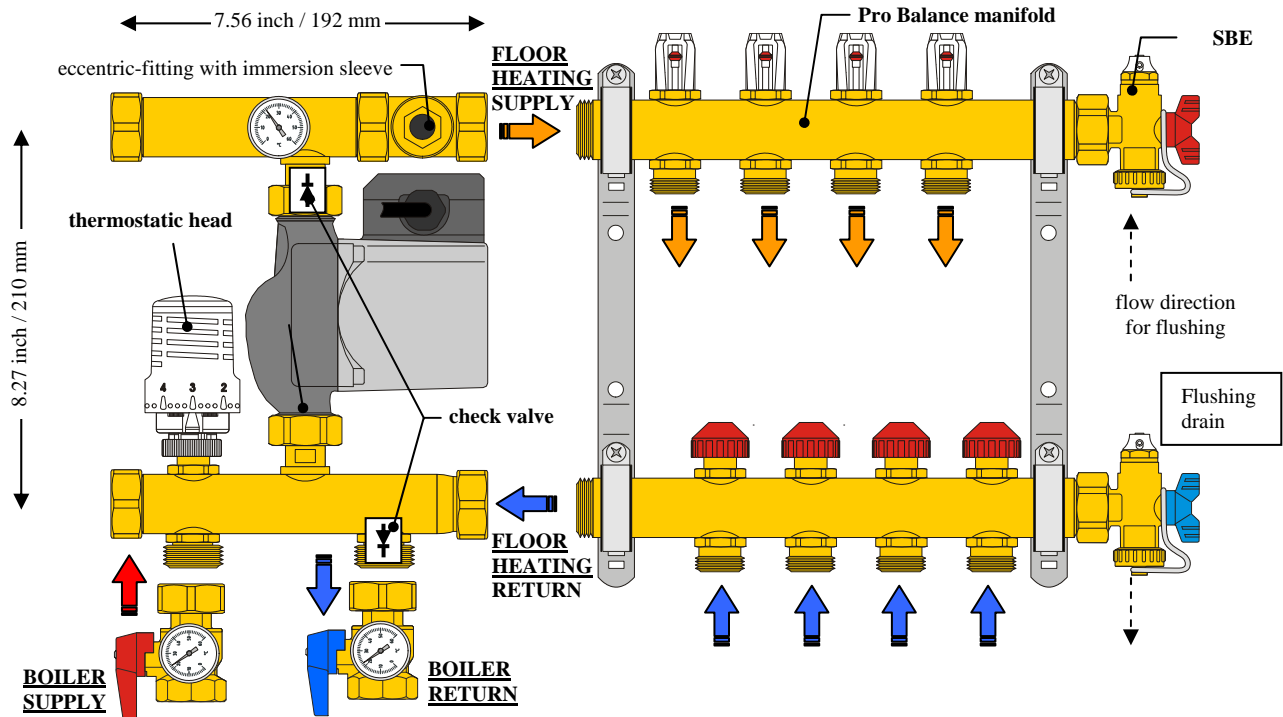


Fig.2

The module can be mounted either to the right or left of the 1" PRO-BALANCE manifold (1" BSP male threads). The Mixing Module has union nuts (G 1" BSP) and requires 1" flat gaskets. The Mixing Module can also be used with REHAU's HLB Brass manifolds (valveless style).

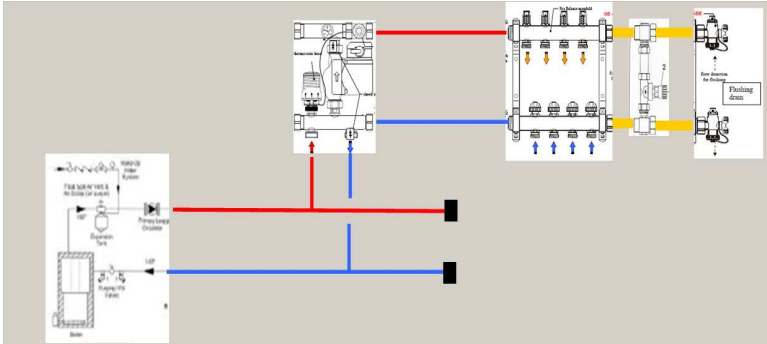
The existing isolation – ball valves from the PRO-BALANCE manifold - would normally be transferred to the boiler supply / boiler return of the module.

Connection to Boiler Primary Piping:

Closely Spaced Tee Configuration: The configuration of this unit does not suit such installations and should not be used as a piping strategy.

Hydro Separator Configuration: The configuration of this unit does not suit such installations and should not be used as a piping strategy.

Supply & Return Header Configuration: In such a configuration, sufficient positive pressure (2 psig minimum) differential exists between primary supply to the module and the module return to the primary return header ensure proper flow characteristics.



Electrical Connection

All electrical connections must be performed by an authorized specialist in accordance with the local regulations governing electrical installation work. The electrical cables must not come into contact with any hot parts.

The circulation pump is supplied with a 3 wire 110VAC PVC shielded cord. In order to make sure that the pump only runs if heat requirement exists, it is recommended to connect the pump to a pump relay (e.g. pump logic of an electrical connection box, which activates the actuators). This can be achieved using the any of the REHAU electrical zone controls.

Flushing the Heating Circuits

After the REHAU PRO-BALANCE Mixing Module is connected to the heating system, isolate the mixing module using the ball valves supplied with the manifold or via a shut-off valves mounted elsewhere. Switch off the pump and close all heating circuits at the manifold. Closing the manifold circuits is typically assured because the REHAU actuators are normally closed (NC) actuators, however the actuators can also be removed.

Connect a flushing and draining hose to the SBE connections shown in fig.2. Open the heating circuit to be flushed and flush through until the air and any dirt are completely removed from the circuit. For easier flushing and/or filling of the heating circuits a check valve above the pump is placed preventing a short circuit.

Important: It should be flushed only in the flow direction. The drain connection must always be open; otherwise, the high water pressure could damage the heating system. Also read the instructions on flushing as outlined in the installation/operating instructions for the manifold.

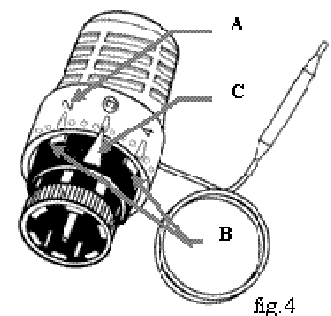
Flushing the Mixing Module / Manifold from the boiler room may also be practical and in this case, the thermostatic injection valve can be removed via the knurled nut allowing flow to pass.

Adjustment of the Floor Heating Flow Temperature

When maximum power is required (rated power) the supply temperature of the boiler must be at least 60°F higher than the required temperature of the flow temperature in the floor circuit.

The flow temperature may be adjusted gradually between 70°F and 160°F. The regulating hand wheel of the thermostat is supplied with a scale 1-7 (fig.4;A). Please see the temperatures set on the scale in the table below:

Regulating Hand Wheel Numeric Indication & Corresponding Temperature						
1	2	3	4	5	6	7
70°F	85°F	100°F	115°F	125°F	145°F	160°F
20°C	28°C	37°C	45°C	53°C	62°C	70°C



Notes:

- For future reference, the temperature table above should be posted / lanyard on or near the Mixing Module.
- Always verify the supply temperature when the system has reached a steady state to verify / correct the set temperature. Differences may occur depending on the temperature of the boiler water injected through the thermostatic valve. Use the mini-thermometer on the pump discharge side for supply temperature verification.
- During initial / cold start –up of the heating system, the operator must avoid the temptation to set the hand adjustment to its maximum setting. Only set & lock the hand wheel at its design temperature and allow the system to come up to temperature naturally. If the operator / installer incorrectly sets the temperature too high – attempting to accelerate the heat up period, there is no electrical or mechanical feed back to reduce the supply temperature other than the room thermostat (pump on / off). This Mixing Module is not equipped with an independent floor heating limiting device.

To avoid damage to the floor structure caused by unnecessarily high temperature, the flow temperature set value for the thermostat must be defined via traditional heat load calculation techniques. **Therefore, it is most important to set the determined temperature value and check it by means of thermometer during operation of the floor heating system. When you are certain that the temperatures are correct, then you can place blocking elements (B) immediately before and after the pointer (C).**

Operation of the Water Floor Heating Control Unit

The injection valve of the unit is designed as a proportional regulator and is controlled by a thermostat with capillary tube and sensor for the floor heating circuit supply. Any deviation from the set value causes an immediate change in the opening range of the valve thus proportionally changing the amount of hot water injected from the boiler circuit.

The injected amount of hot water is mixed with the water returned from the heating circuit, thus maintaining the flow temperature value constant within a narrow temperature range.

The respective temperature of the floor heating circuit supply may be read directly on the thermometer.

A check valve is placed at the connection to the boiler return. It prevents a back-flow of heating water from the boiler circuit return.

Pump Information:

Materials of Construction:	
Description	Material
Inlet Cone, Bearing Plate, Bearing Retainers, Rotor Can, Rotor Cladding, Shaft Retainer	304 Stainless Steel
Stator Housing	Aluminum
Shaft, Upper & Lower Radial Bearings	Aluminum Oxide Ceramic
Thrust Bearing	Metal Impregnated Carbon
Check Valve	ACETAL With 302 Stainless Steel Spring & Nitrile Rubber Seats
Pump Housing (Volute)	Cast Iron
O'Ring & Gaskets	EP (Ethylene Propylene Rubber)
Impeller	PES Composite (30% Glass Filled)
Terminal Box	Noryl®

