

# Pump Mixing Unit for Radiant Panel Heating/Cooling

Article No. 12433g



III. 1

## Scope of application

The pump mixing unit is used in systems with combined radiant panel heating/cooling. In heating mode, the pump mixing unit keeps the supply temperature constant and supplies the heating circuits with hot water. It is used in heating systems whose heat output is provided by consumers with a high supply temperature (e. g. radiators, air heaters or similar), on the one hand, and by low-temperature heating surfaces, such as underfloor or wall heating, on the other hand.

In cooling mode, it ensures the supply of cooling water to the cooling circuits.

The supply temperature is adjustable between 20 °C and 70 °C on the selector dial of the thermostat head. It is possible to limit the setting range with a minimum and a maximum temperature. The thermometer of the pump mixing unit indicates the supply temperature.

The pump mixing unit is designed for direct assembly to the heating manifold. One-inch male thread connections are provided for this purpose. The pump mixing unit is fitted with one-inch spigot nuts. It is suitable for use in dry rooms for the residential and industrial sector.

### Notices, symbols, abbreviations

MT	male thread	FT	female thread
RPH	radiant panel heating (general)	FF&D	flush, fill and drain unit
TL	temperature limiter	BP	backflow preventer
HCC	heating circuit control unit	HG	heat generator
HM	heating manifold	SN	spigot nut
	Hazard warning notice or important functional notice		

### Safety notices

 Disconnect the system from the power supply prior to the commencement of work! Make sure that you perform any assembly and wiring work on the pump mixing unit only in the disconnected state. Only skilled personnel shall connect or commission the unit. All relevant safety regulations must be observed. The pump mixing unit is not protected against splashing or dripping water. Therefore, make sure that you install it in a dry place.

### Technical Data

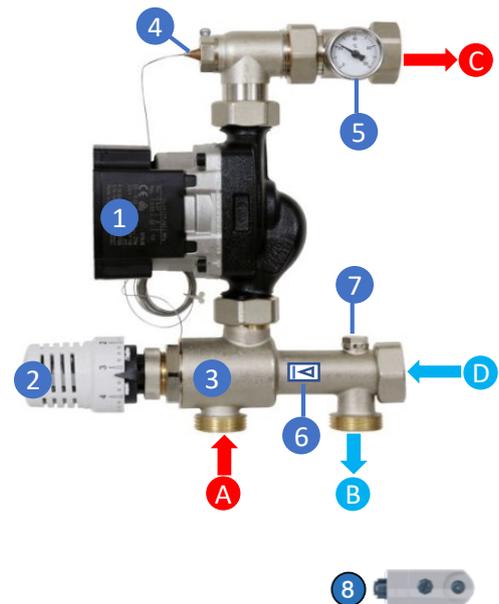
Permissible ambient temperature:	0 to 40 °C
Permissible media operating temperature:	0 to 80°C
Max operating pressure:	10 bars
Control range of the supply temperature:	20 to 70°C
Thermal rating:	approx. 14 kW, $\Delta = 10$ K
Operating voltage:	230 V, 50 Hz
Flow coefficient of mixing valve:	3.2
Differential pressure:	500 mbar max.
Primary pipe connection (WH):	1" male thread, flat gasket
Secondary pipe connection (UFH):	1" spigot nut, flat gasket
Media:	water/water-glycol mixtures according to VDI 2035/ÖNORM 5195
Tightening torque of screw connection 1":	35 Nm
Tightening torque of screw connection 3/4":	55 Nm

### Materials

Valves and fittings:	brass CW617 N, nickel-plated
Gaskets and O-rings:	AFM34/2 and EPDM
Plastic materials:	impact and temperature resistant

## Structure

- 1 Circulation pump 130 mm
  - 2 Thermostat head
  - 3 3-way mixing valve
  - 4 Immersion sleeve for temperature sensor with capillary tube
  - 5 Eccentric screw fitting with thermometer 0 to 60 °C
  - 6 Backflow preventer
  - 7 Connection for return temperature sensor 1/8" (optional)
  - 8 Temperature limiter (optional)
- A** Primary supply connection 1" MT, flat gasket
- B** Primary return connection 1" MT, flat gasket
- C** Supply connection of radiant panel heating/cooling, 1" spigot nut
- D** Return connection of radiant panel heating/cooling, 1" spigot nut



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## Functional principle

The mixing valve (3) of the pump mixing unit is designed as a proportional controller and is controlled via a thermostat head (2) with capillary tube and sensor element (4) on the supply line of the heating circuit.

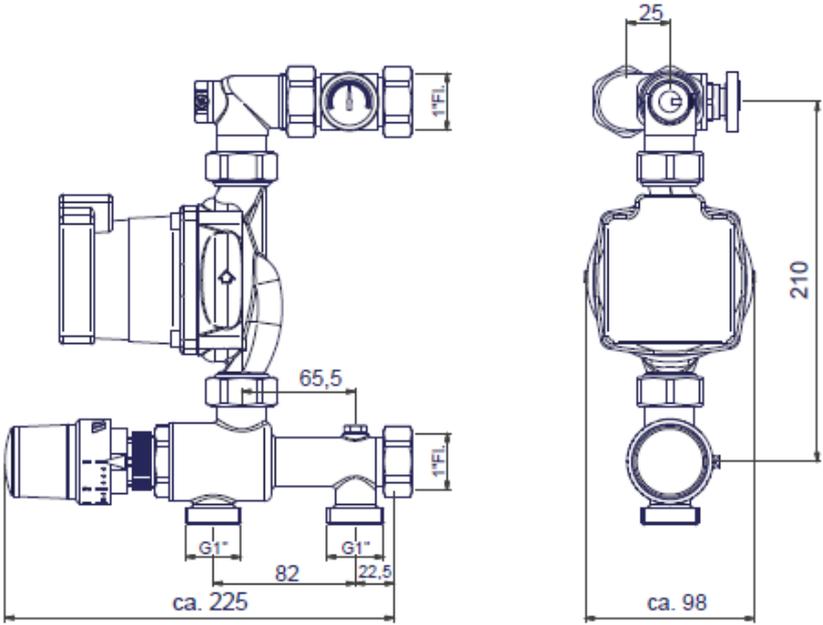
If the actual temperature deviates from the setpoint adjusted on the thermostat head (2), the valve position changes immediately to adjust the amount of hot water injected from the primary supply (A) into the circuit. The injected water mixes with the return water from the heating circuit (D) and thus keeps the supply temperature constant within a narrow temperature range. The actual value can be checked on the thermometer (5).

The backflow preventer (6) prevents bypass flows in the primary circuit.

The temperature limiter (8) (optional) switches off the circulation pump (1) when the supply temperature is exceeded, thus avoiding overheating of the radiant panel heating.

The thermostat head opens the mixing valve in cooling mode.

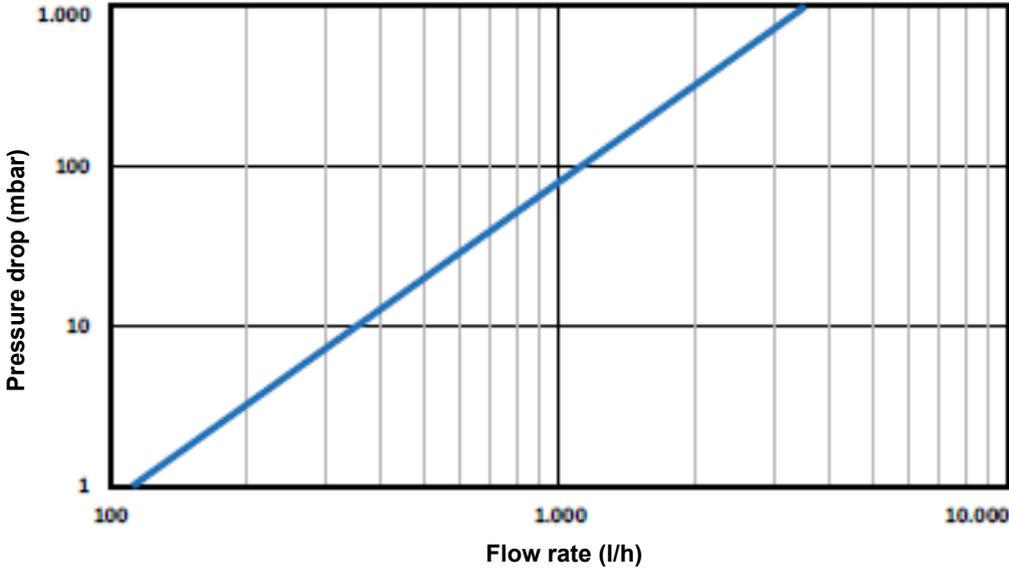
**Dimensions of the Pump Mixing Unit (mm)**



III. 3

III. 4

**Pressure drop diagram**



III. 5

## Installation

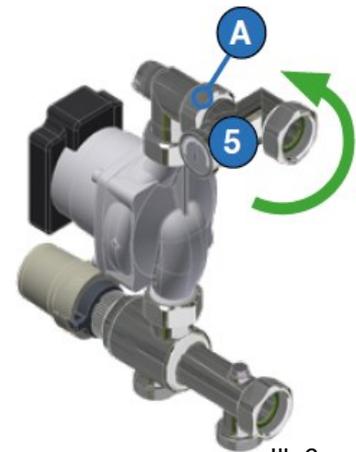
Before the assembly and the initial commissioning, check all screw connections and tighten them if necessary! (For tightening torques of the screw connections see page 2, section “Technical data”.)

The ready-to-install, compact pump mixing unit can be used for a heat output requirement of up to 14 kW. The pump mixing unit is designed for direct mounting on the WEM Heating Manifold.

During the assembly, make sure not to damage or kink the cables of the pump and the temperature limiter or the capillary tube of the sensor. Also avoid tensile stress on the cables. Ensure that the supply and return pipes are connected correctly (III. 2).

1. Mount the pump mixing unit to the manifold using the 1-inch-nuts and the corresponding gaskets. Adapters for the connection to manifolds with profiled pipes are enclosed in the delivery.

You can mount the pump mixing unit on the right or left side of the manifold by turning the eccentric screw connection (5, III. 1), also upside down mounting is possible.



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2. Optional: Mount the temperature limiter on the supply line of the manifold.
3. Connect the pump mixing unit to the power supply.
4. Optional: Set the temperature on the temperature limiter to approx. 55 °C.

## Electrical connection

The pump and the optional temperature limiter are already wired at the factory. The power supply must be provided by the customer. To ensure that the pump only runs when heating is required, we recommend connecting it to a pump relay (e.g. WEM Master Wiring Module, article no. 12612). All electrical connecting work shall be performed by an authorised electrician in accordance with locally applicable regulations on electrical installations. The electrical cables must not come into contact with hot parts.

## Commissioning

### Flushing the heating circuits

Connect the pump mixing unit to the pipe network and isolate it (by means of the ball valves included in the scope of the heating manifold (HM) or by any shut-off device made available on site). Switch off the pump and shut off all heating circuits on the manifold (it is sufficient to close the valves in the return flow manifold with the protection caps). Connect the flush and drain pipe to the flush, fill and drain unit (FF&D) fitted to the manifold. Open the heating circuit to be flushed and flush it in the flow direction until the air and any impurities have been completely removed from the circuit. The backflow preventer upstream of the pump prevents any bypass flows that might affect the orderly flushing and filling process of the heating circuits. Repeat the process for all heating circuits. Important notice: Always observe the flow direction, i. e. make sure that the water flows into the circuit at the supply bar and flows out of it at the return bar! The drain must always be open to prevent excessive water pressure that might damage the heating system. The instructions concerning flushing in the operating manual of the heating manifold shall also be observed.

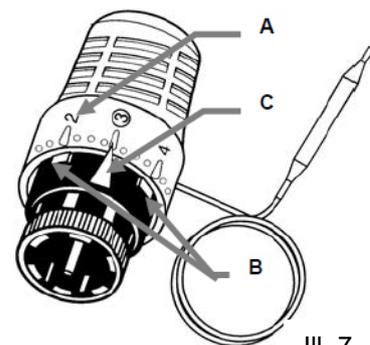
### Adjusting the supply temperature

The supply temperature is continuously adjustable between 20 °C and 70 °C. The dial of the thermostat head offers seven positions. (III. 7). The associated temperature is given in the table below:

1	2	3	4	5	6	7
20 °C	28 °C	37 °C	45 °C	53 °C	62 °C	70 °C

### Limiting the supply temperature

In general, the supply temperatures in radiant panel heating systems do not exceed 50 °C. The system temperature is often considerably lower than the max. value on the dial of the thermostat head. To avoid overtemperature, the supply temperature setpoint can be limited and locked at the thermostat head.



1. To do this, first adjust the desired value and check it during the operation of the panel heating on the thermometer.
2. If it is correct, place one of the locks (III 7; B) directly in front of and one behind the marking arrow (III. 7; C).

**Trouble-shooting**

	<b>Possible cause</b>	<b>Remedy</b>
1	<u>The heating circuits do not become warm</u>	
1.1	<p>The temperature limiter (TL) switches off the circulation pump of the pump mixing unit. Cause: The value set on the TL is too low.</p>	<p>Increase the wall heating supply temperature on the TL by approx. 10 K.            ⚠ Observe the permissible maximum temperature!            ⚠ The differential gap of the TL is 5 K approx.            The pump mixing unit returns faster to the operational state when you remove the TL briefly to cool it down to the switch-on temperature.</p>
1.2	<p>The TL switches off the pump of the pump mixing unit. Cause: The pump remains switched on despite closed heating circuits. The water inside the pump mixing unit is heated by the waste heat from the pump. The TL switches off the pump when the maximum temperature is reached!</p>	<p>Remove the TL from the pump mixing unit and mount it on the supply line of the heating manifold. Use an electrical control distributor with pump logic (e. g. WEM connection module Master). The pump logic ensures that the pump only runs when at least one heating circuit is open.</p>
1.3	<p>The pump is connected to a room thermostat or an electrical control distributor. When all actuators close, the pump is switched off. The supply flow cools down during longer times of inactivity. Therefore, the controller causes the 3-way mixing valve to open. Hot water is injected from the primary circuit. This heats up the pump mixing unit. When the maximum temperature of the TL is reached, the contact opens. The pump is not switched on again.</p>	<p>Remove the TL from the pump mixing unit and mount it on the supply line of the heating manifold (<i>also observe item 1.1</i>).</p>

	Possible cause	Remedy
2	<u>The supply temperature cannot be set to the desired value or the supply temperature varies strongly</u>	
2.1	The supply and return lines of the pump mixing unit are connected the wrong way round.	Check all connections of the pump mixing unit for correct connection.
2.2	The pump head/pump stage is adjusted to an insufficient level.	Change the settings of the pump (see separate pump instructions).
2.3	The differential pressure of the primary pump is too high (> 500 mbar).	Change the settings of the pump (see separate pump instructions) or fit a differential pressure controller.
2.4	The heating load is too high for the pump mixing unit, i. e. the heat consumption exceeds the nominal output of the pump mixing unit. This condition might occur temporarily, e. g. when heating up a "cold" surface.	Determine the maximum heat demand and compare it to the nominal output. It may be necessary to split the heating circuits to a second pump mixing unit with a corresponding heating manifold. If the cause is the initial heating of a panel heating, normal function may still be achieved after the heating-up phase (after 2 to 3 days). This is especially the case when operating the heating system at the upper nominal level.
2.5	The thermostat head is defective.	Replace the thermostat head.

### Notice

Read this assembly and operating manual completely before commencing any assembly or commissioning work. Make sure to understand and observe the instructions when performing this work. Only trained specialist personnel may install, adjust and repair the pump mixing unit of the manifold. For any work on the product carried out by trainees ensure supervision by experienced personnel. The manufacturer will only assume liability in accordance with legal regulations if compliance with the above-mentioned stipulations is ensured.

All instructions of this assembly and operating manual (A&OM) shall be observed when operating the pump mixing unit. Any other use is inappropriate. The manufacturer excludes any claims of warranty for damages on the pump mixing unit resulting from inappropriate use. Modifications are not permissible for reasons of safety. Repair work on the pump mixing unit may only be carried out by a repair shop recommended by the manufacturer.

# Insulating shell for the pump mixing unit

Article No.

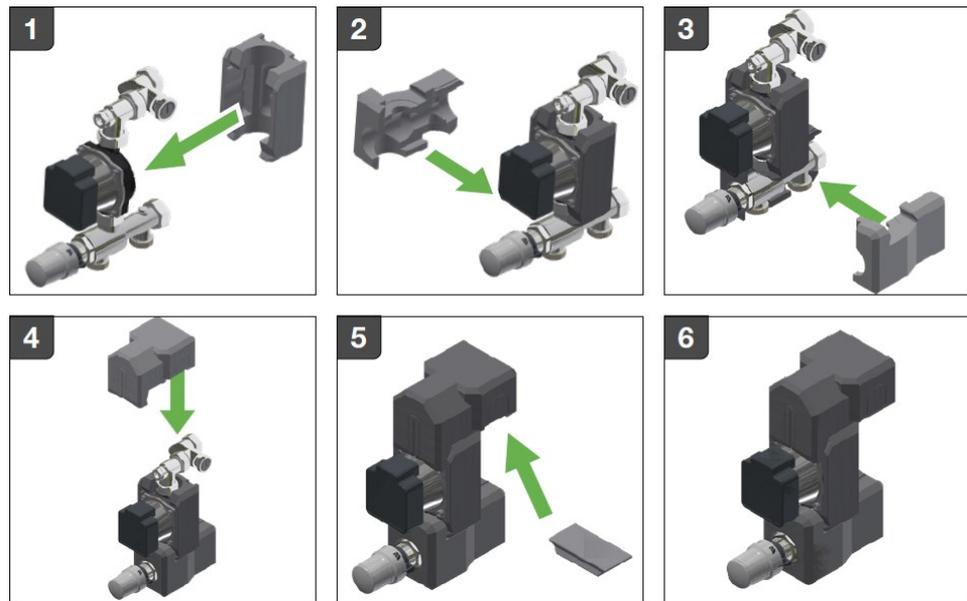
**Application range**

Five-part insulating shell to thermally insulate the WEM Pump Mixing Unit especially when using it in cooling mode.



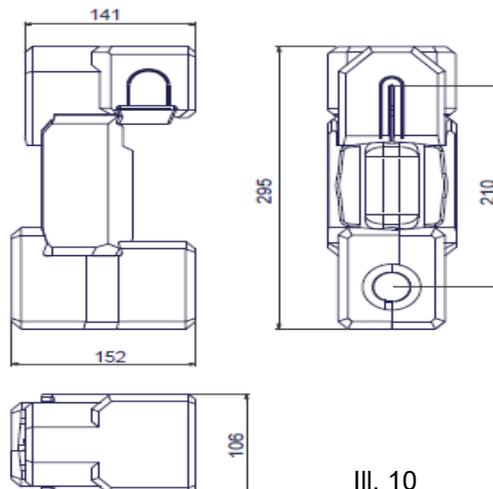
III. 8

**Installation**



III. 9 (1 to 6)

**Dimensions of the insulating shell (mm)**



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