M2 FIX3

2-WAY PUMP UNIT WITH FIXED TEMPERATURE THERMOSTATIC MIXING VALVE

The unit for 1" (180 mm) circulating pumps consists of:

Supply
- Connection.
- Adjustable thermostatic mixing valve, models F1, F2, F3 and F4.
- High efficiency synchronous pre-wired circulating pump (for the models that include it).
- Flanged ball valve supplied with in-handle thermometer (red ring, range 0°C-120°C).

Return
- Flanged ball valve with 20 mbar check valve (which can be excluded by rotating the handle by 45°) supplied with in-handle thermometer (blue ring; 0°C-120°C).
- "T" Connection for mixing valve.
- Connection.

Centre distance 125 mm. EPP insulation box (Dimensions: 250x380x170 mm).
PN 10, max temperature 110°C (unit without pump).
External connections: 1" Female.

FIELD OF USE
For power up to 35 kW (with Δt 20 K) and maximum flow rate 1500 l/h.
Kvs Value: please refer to the table below. For an accurate sizing or higher flow rates, please refer to the curves shown in the technical section.

Code: **20355R-(F1/F2/F3/F4)**
With circulating pump:
20355R-(F1/F2/F3/F4)-(P6/A6/P8)

Available circulating pumps:
Wilo Para 25/6 SC **(P6)**
Grundfos UPM3S Auto 25-60 **(A6)**
Wilo Para 25/8 SC **(P8)**

Available thermostatic mixing valves:
Setting range: 20-45°C **(F1-F3)**
Setting range: 45-70°C **(F2-F4)**

Approximate data for underfloor and radiator heating systems

Model	Setting range	Δt	Kvs	Approximate power and flow rate of the application	Recommended circulating pump	Residual head	Approximate surface of the underfloor heating system
F1	20-45°C	8 K	2,2	4,5 kW - 500 l/h	Wilo Para 25/6 SC	5 mH_2O	Up to 50 m^2
F2	45-70°C	20 K	2,2	11 kW - 500 l/h	Wilo Para 25/6 SC	5 mH_2O	-
F3	20-45°C	8 K	3,3	14 kW - 1500 l/h	Wilo Para 25/8 SC	5 mH_2O	From 50 m^2 up to 150 m^2
F4	45-70°C	20 K	3,3	35 kW - 1500 l/h	Wilo Para 25/8 SC	5 mH_2O	-

Thanks to the **Multimix** thermostatic mixing valve the pump unit can deliver the maximum supply temperature, the same as the one of the inlet hot water. If lower temperatures are requested, to allow a regular and continuous mixing, it is necessary that the inlet hot water temperature is 3÷5 K higher than the requested value of the outlet mixed temperature. Reference temperatures: **F1** and **F3** models: Th: 55°C ; Tc: 24°C ; Tmix: 32°C - **F2** and **F4** models: Th: 75°C ; Tc: 40°C ; Tmix: 55°C.

! **Note:** The use in a cooling circuit inhibits thermostatic regulation, therefore for this application the functionality will be equivalent to that of an unmixed group.

It is recommended to install two isolating valves **Art. 552 (see the section "DN25 Zone manifolds")** with nut and gasket before the pump unit to allow an easy service or replacement of the components of the unit.

Code 1": **0266/M**

Optional: safety bimetallic thermostat

Supplied in the group by adding "**-T**"
(see section "Actuators and Room Thermostats"). Code example: **20355R-F3-P6-T**

Optional check valve with seat holder washer

Check valve to be installed into the connection of the mixing valve on the return way. It prevents back flow rate of energy in presence of complex installations (e.g. different circulating pumps and/or several mixing valves on the zone manifold). Minimum opening pressure: 20 mbar. Kvs 8.8. Max Temperature 110°C.

Code: **SET10101**

M3 FIX3

3-WAY PUMP UNIT WITH BY-PASS AND FIXED TEMPERATURE THERMOSTATIC MIXING VALVE

The unit for 1" (180 mm) circulating pumps is the same as the model M2 FIX3. **It is also equipped with a balancing by-pass valve (0-0.5 bar).**

Code 1": **20358R-(F1/F2/F3/F4)**
With circulating pump:
20358R-(F1/F2/F3/F4)-(P6/A6/P8)

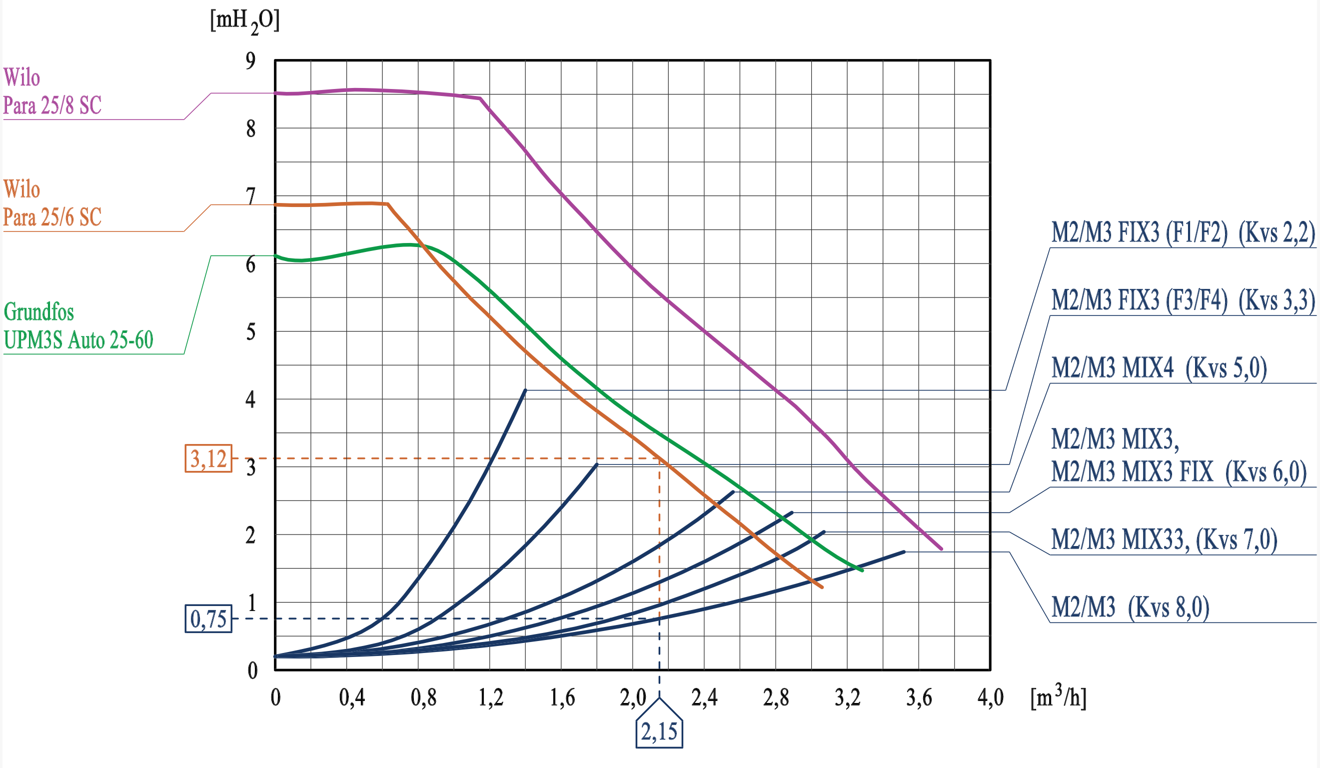
Standard version: right supply. Left supply version available with extra price: look at price list.

Method to select the circulating pump

The selection of the right circulating pump is determined by the need to provide the installation with a flow suitable to develop the power fixed in the planning stage. Knowing this datum and taking into consideration the temperature difference Δt between the supply and the return, we can calculate the flow in **kg/h**. It is also important to take into consideration the kind of pump unit that is used, that is known in advance because it has been selected on the basis of the kind of installation to be realized. **Example:** For an installation with a **M2** pump unit that requires a power **P = 50 kW** with a temperature difference **Dt = 20 K** the flow is calculated as follows:

$$\frac{50kW \times 860}{20K} = 2150\ kg/h$$

Now we have to claculate the total head loss of the installation, to be able to select a circulating pump that is not under-sized. As concerns the pump unit we know the head losses looking to the diagram the curve of the used model. In this case we found that, for the model **M2** with a flow rate of **2150 kg/h (2.15 m³/h)** the head loss is 0.75 m of water column.



To this head loss we have to add the total head loss of the installation (pipes, connections, radiant elements, etc): this is a datum given by the planner. As we can see from the diagram the circulating pump **Wilo Para 25/6 SC** at a flow rate of **2.15 m³/h** has a head of **3.12 m.**: taking into consideration that the pump unit absorbs **0.75 m** il will left **2.37 m (as 3.12 - 0.75 = 2.37 m)** of water column available to compensate the head losses of the installation. Therefore we have to see if this datum is sufficient, in that case we can use the **Wilo Para 25/6 SC**, otherwise we have to use another circulating pump provided with a bigger head.

NOTE: if necessary it is possible to calculate by a mathematical calculus the head losses (at the required flow rate) produced by the presence of an hydraulic device, if we know its Kvs; therefore, with a good approximation, assuming a standard temperature of 20°C and overlooking the effects of viscosity of the fluid, it follows that:

$$Kvs = \frac{Q}{\sqrt{h}}$$

where the flow **Q** is expressed in m³/h and **h**, the pressure difference at the outlets of the device (head loss), is expressed in bar. Then, reversing the previous formula, we obtain:

$$h = \left(\frac{Q}{Kvs}\right)^2$$

in the example above:

$$\left(\frac{2,15}{8}\right)^2 = 0,072\ bar$$

as 1 bar is about 10.198 mH_2O, then the head loss is 0.73 mH_2O, value that, taking into consideration the approximations, corresponds to the value shown in the diagram.