

## PM controller



### Application

The Danfoss Redan PM controller is used for controlling the domestic hot water temperature in combination with a plate heat exchanger.

### Capacity

The capacity of the controller corresponds to the domestic hot water need of a dwelling.

### Function

The controller is pressure-controlled, ensuring that district heating water is led to the instantaneous water heater only when hot water is being tapped. Due to the construction of the controller proportionality exists between the district heating water flow and the domestic hot water consumption. By this a constant domestic hot water temperature is guaranteed for big and small tap loads.

### Standby losses

Due to the functionality of the controller standby losses are avoided. When the tapping of domestic hot water ends, the controller immediately shuts off the flow of district heating water into the heat exchanger. This means that energy (district heating) is needed only, when hot water is being tapped.

### Lime scale deposits in the heat exchanger

Normally no lime scale will occur when the heat exchanger is used in combination with the PM controller. When hot water is not consumed,

the district heating flow is also shut off and the temperature in the secondary side of the heat exchanger does not exceed the temperature (approx. 55°C), at which lime scale is deposited.

### Materials

The controller is made of materials, which have been approved for fresh water purposes. The controller housing is made of dezincification-free brass. The spindle is made of stainless steel. All O-rings and the membrane are made of EPDM rubber.

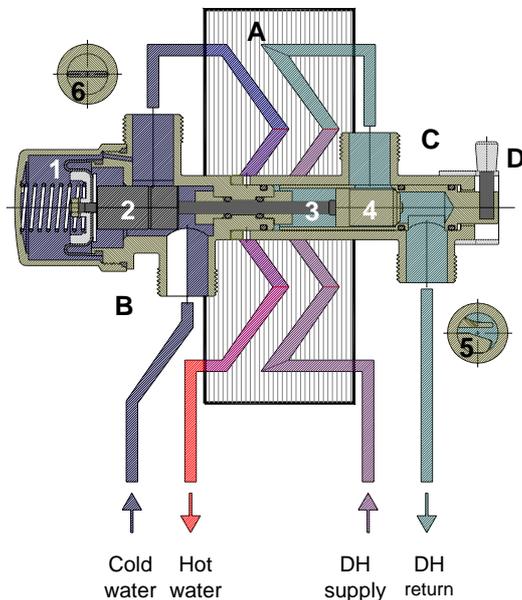
### Options

If the domestic water installation is made with circulation it is recommended to establish a bypass above the district heating part of the controller. By means of a return flow thermostat and the connecting capillary tubes separate control of the circulation and domestic hot water temperature is made possible.

### Installation

The controller must be installed in a way that allows the medium to flow in the direction indicated by the arrows. The insertion position is optional, as the PM controller is pressure-controlled and is not based on an air or liquid filling. The PM controller is typically installed in the district heating return of the water heater.

### Flow diagram:



- A. Plate heat exchanger / water heater
- B. Cold water part of the PM controller
- C. District heating part of the PM controller
- D. Temperature controller

- 1. Membrane housing with revolving membrane
- 2. Cold water piston
- 3. Spindel (through-going)
- 4. District heating piston
- 5. District heating opening
- 6. Cold water opening

The controller consists of two parts:

The domestic water regulating part B (the primary side) and the district heating part C (the secondary side).

A double stuffing box separates district heating water from domestic water. A spindle made of stainless steel is led through the stuffing box 3. The piston, which closes the oblong opening 6 on standstill, is mounted on the spindle. Cold water is led into the cold water inlet and passes below the piston 2 through the opening 6 and into the water heater.

When water is being tapped, a pressure loss will arise behind the piston. This pressure loss is transmitted through a channel to the membrane housing 1. As the water pressure is still unchanged on the underside of the rolling membrane, a difference in pressure will arise, i.e. a power, which presses the revolving membrane with the piston 2, the spindle 3 and the domestic water piston 4 upwards. In this way the regulator turns on the district heating and the return from the water heater passes through the opening 5. The more water is being tapped, the higher the revolving membrane, the piston and thereby also the district heating piston is lifted (the travel is approx. 1 mm per litre domestic water being tapped). Proportionality exists between the domestic hot water flow and the district heating water flow. By this a constant domestic hot water temperature is guaranteed for big and small tap loads. By means of the temperature controller D the stuffing box in the opening 5 is adjustable, enabling the district heating water flow to be set according to the wanted domestic hot water temperature.

### Data for Danfoss Redan PM controller:

#### Dimensions, weight

Size of packaging: H60 x W90 x L230 mm.  
Weight: 1,32 kg. (incl. packaging).

#### Materials

Controller housing: Dezincification-free brass  
Piston (district heating) Dezincification-free brass  
Piston (cold water): Noryl  
Spindle / guide: Stainless, acid-resisting steel / Teflon  
O-rings / membrane: EPDM rubber

#### Pressure, temperatures, $K_{vs}$

$K_{vs}$ : 2,5  
Pressure level: PN 16  
Max. differential pressure: 2,0 bar  
Max. temp. (primary): 90°C  
Min. cold water pressure: 2,0 bar  
Hot water flow.: 3 - 16 l/min.

Setting area: The controller has 3 setting areas (basic settings). Selection of basic setting must always be based on the actual operating conditions (district heating flow temperature and differential pressure). The setting must be made according to the setting diagram on the enclosed troubleshooting / information sheet for the PM controller.

### Dimensioned sketch:

