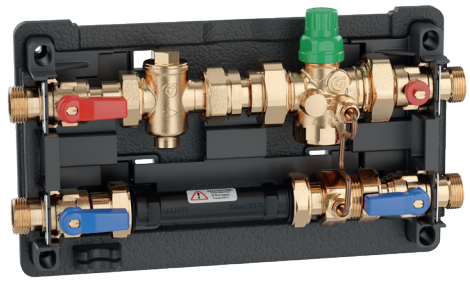
PLURIMOD® XM user module

7004 series

01409/26 EN



Technical specifications

700475 002 Module for low flow rates, max. flow rate 0,340 m³/h
700485 002 Module for high flow rates, max. flow rate 1,050 m³/h

Specifications

The 7004 series user module serves to perform user thermoregulation during both heating and cooling in low and high flow rate systems. The user module is a solution that hydraulically balances itself by means of a built-in differential pressure limiter valve with flow rate pre-adjustment.

Basic function

- ON/OFF control with two-way zone valve.
- Direct heat metering option.
- All-over insulation incorporating shut-off valves.
- Dynamic balancing by means of differential pressure limiter.
- Flow rate limiting by means of a pre-adjustment device.

The insulation supplied as standard guarantees low heat loss and adequate anti-condensation protection, thanks to the complete absence of thermal bridges.

Characteristic components

Hydraulic module consisting of:
- zone unit with 2 pairs of 3/4" M ball valves;
- settable differential pressure limiter valve;
- technopolymer template for volume meter;
- inspectable strainer with probe holder;
- technopolymer mounting bracket with thermal break;
- first washing filter;
- PPE insulation behind and in front of the template.

Technical specifications

Materials

Components:	brass EN 12165 CW614N brass EN 12165 CW617N

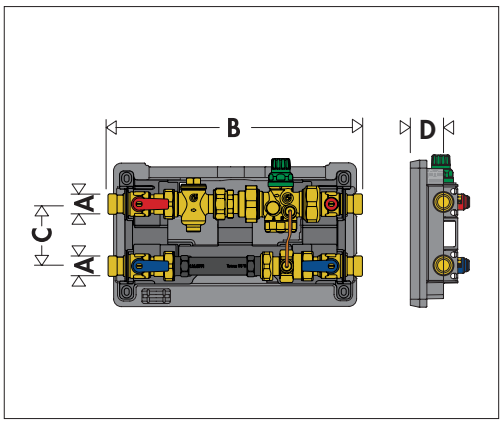
Performance

Max. working pressure	10 bar
Δp primary side, minimum:	25 kPa (code 700475 002) 35 kPa (code 700485 002)
Δp primary side, maximum:	4 bar (400 kPa)
Flow rate range with Δp_{user} 15 kPa:	
	0,040 m³/h – 0,340 m³/h (code 700475 002)
	0,2 m³/h – 1,050 m³/h (code 700485 002)
Working temperature range:	3–90 °C
Medium:	water, glycol solutions
Max. percentage of glycol:	30 %
Connections:	3/4" M
First flush strainer mesh:	0,31 mm
Normal operation strainer mesh:	0,41 mm

Insulation

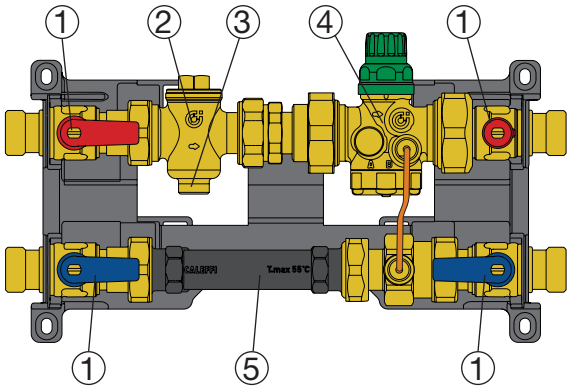
Materials:	expanded EPE
Minimum thickness:	~ 10 mm
Maximum thickness:	~ 15 mm
Density:	50 kg/m³
Thermal conductivity:	0,037 W/(m·K)(@ 10 °C)
Reaction to fire class (UL94):	HBF class

Dimensions

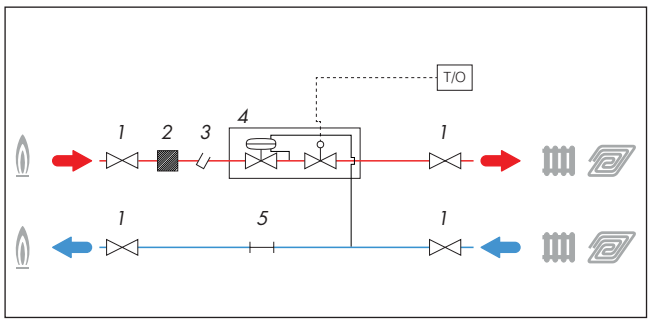


A	B	C	D
3/4" M	328	80	42

Construction details



Hydraulic - operational diagram



1. Ball shut-off valves
2. Strainer
3. Flow probe connection M10 x 1
4. Settable differential pressure limiter valve
5. 1" M heat meter template L = 130 mm

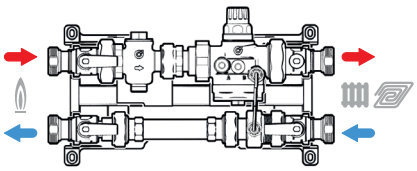
T/C: Chrono-thermostat/Clock (not supplied)

Installation diagrams

The module can be installed in a horizontal position and in a vertical position. In its horizontal position, the module cannot be installed with the valve facing downwards.

HORIZONTAL INSTALLATION

PERMITTED



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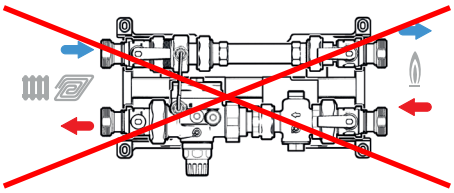
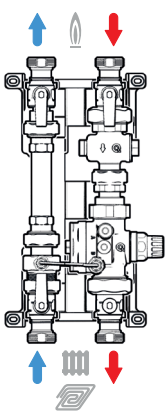


VERTICAL INSTALLATION

PERMITTED



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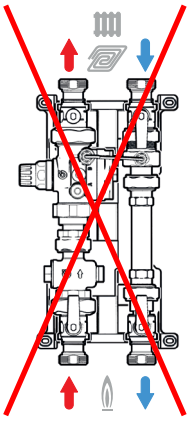


Hydraulic characteristics

The head to be supplied to the connections upstream of the module can be calculated with the formula:

$H = \Delta p_{module} + \Delta p_{meter} + \Delta p_{min} + \Delta p_{user}$

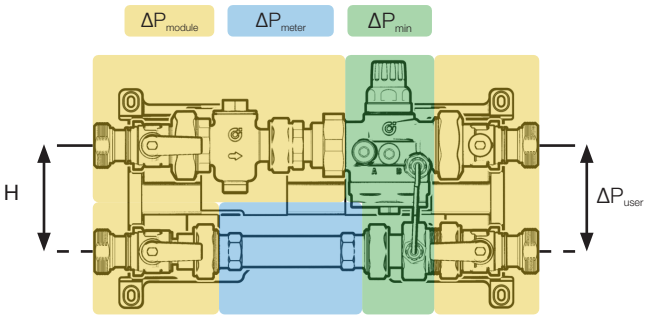
where:

Δp_{module} : pressure drop of the user module excluding the meter and differential pressure limiter valve pressure drops. To calculate it, refer to the graph for the **User module pressure drop.**

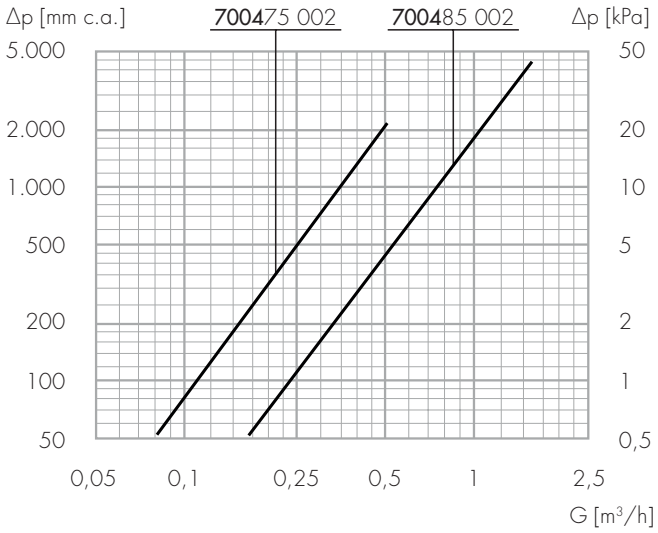
Δp_{min} : minimum pressure difference for operation of the differential pressure limiter valve with a value of: 25 kPa (code 700475 002) and 35 kPa (code 700485 002).

Δp_{meter} : heat volume meter pressure drop (contact the meter manufacturer).

Δp_{user} : available head at the downstream connections. To calculate it, refer to the section for **Pre-adjustment.**



User module pressure drop



Pre-adjustment

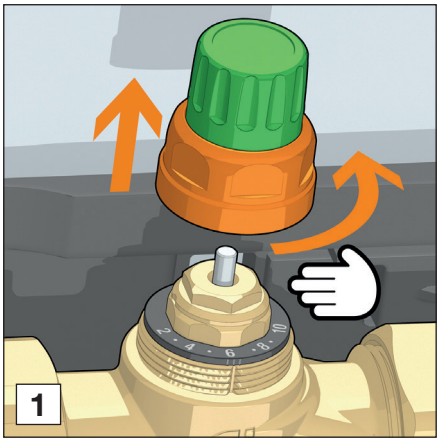
To guarantee the design flow rate and the head required at the user connections, the differential pressure limiter valve must be adjusted to the correct setting value. This value can be calculated according to two pre-adjustment strategies:

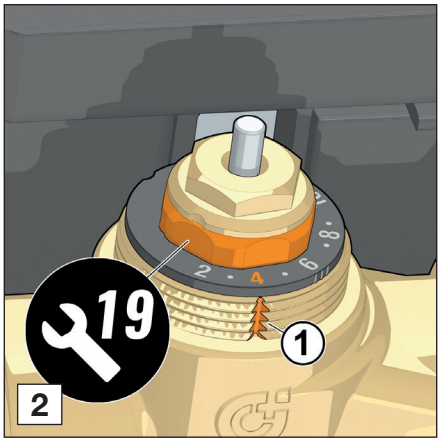
- ***Pre-adjustment using design data***
- ***Pre-adjustment using the heat meter***

Setting operation

To set the differential pressure limiter valve, proceed as follows:

- Unscrew the protective cap by hand and remove it (fig. 1).
- Use a 19 mm hexagonal spanner to perform the setting (fig. 2). The slot (1) on the valve body is the physical positioning reference. If the cap is refitted at the end of the procedure, the top should be completely open.

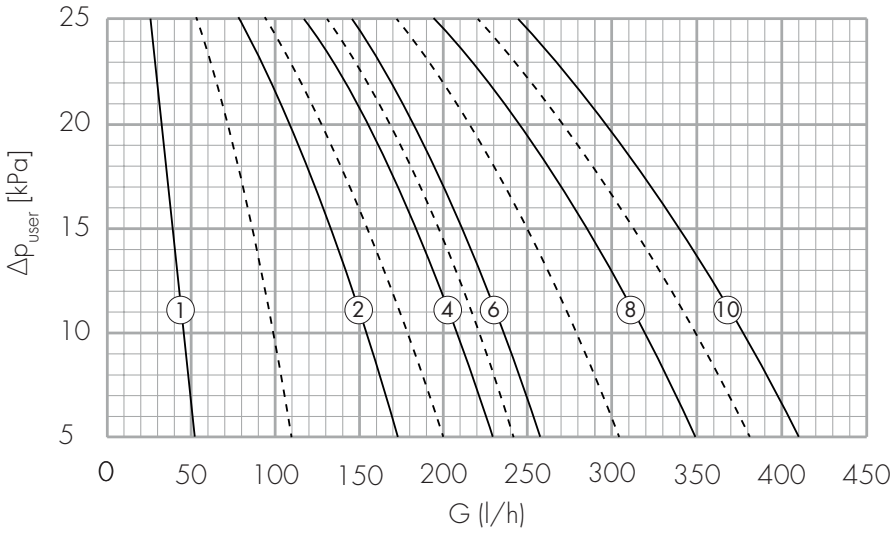




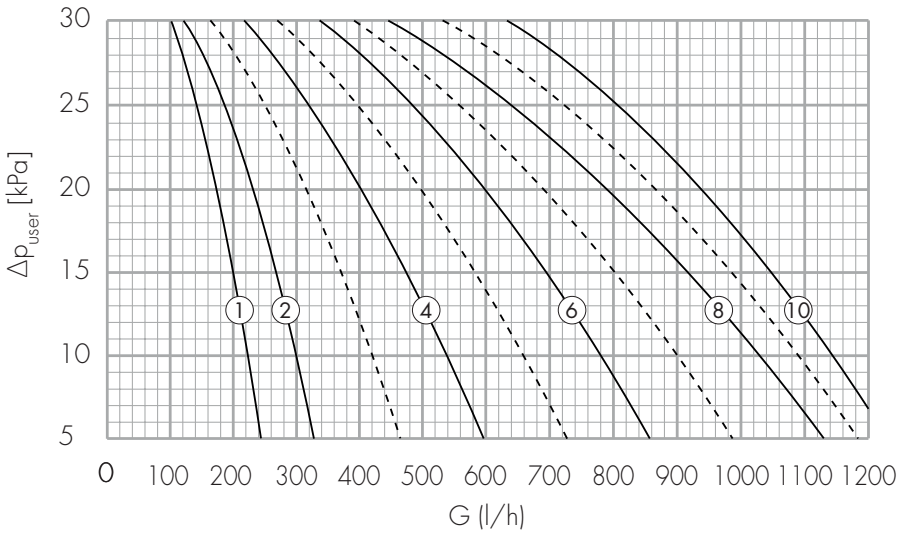
Pre-adjustment using design data

When the design data – namely the flow rate and system pressure drop (Δp_{user}) – is known, use the diagrams below, cross-referencing the flow rate and pressure drop values provided. Set the valve to the mark on the locking nut that corresponds to the curve closest to the crossing point.

700475 002



700485 002



Pre-adjustment using the heat meter

If the pressure drop of the heating system to be served is not known beforehand in precise terms, pre-adjustment can be set experimentally using the **flow rate information provided by the heat meter.** It is nevertheless **necessary to make sure that the PLURIMOD® XM** hydraulic characteristics are compatible with the system in which it will be used.

1 - Perform the following preliminary steps:

RADIATOR SYSTEMS

After balancing the radiators, use lockshield valves to set the thermostatic control heads to **the maximum opening position.**

RADIANT PANEL/FAN COIL SYSTEM

After balancing the individual radiators/loops in the underfloor system, make sure that any thermoregulation devices, e.g. thermo-electric control heads, **are in their fully opened position.**

2 - View the value relating to the flow rate on the heat meter.

3 - Turn the shaped locking nut and wait a few moments until the value on the heat meter has stabilised. Adjustment is continuous so all intermediate settings are available. The smaller the circulating flow rate, the longer the stabilisation time.

4 - Repeat the previous point until the required design flow rate is reached.

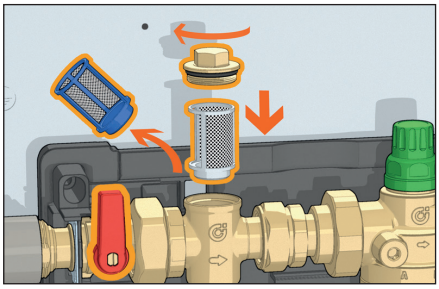
Construction details

Settable differential pressure limiter valve

The unit comes with a differential pressure limiter valve which maintains both the differential pressure downstream of the unit and the circulating flow rate, regardless of the upstream head. The valve can be calibrated as desired within the anticipated flow rate range.

First flush strainer

The packaged product includes a fine-mesh strainer with a blue frame which is exclusively for use during the first flushing procedure. After this it must be replaced with the strainer with a larger mesh, also supplied with the product.



Use with actuators

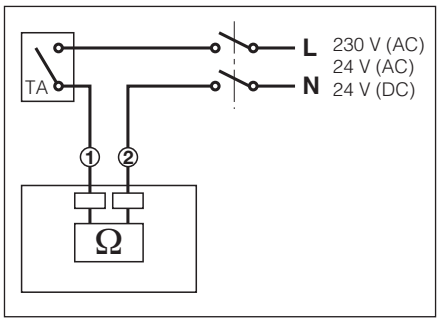
The unit is designed to work with a 6565-6566 series ON/OFF linear thermo-electric actuator. Allowing opening or closing is managed via room thermostat.

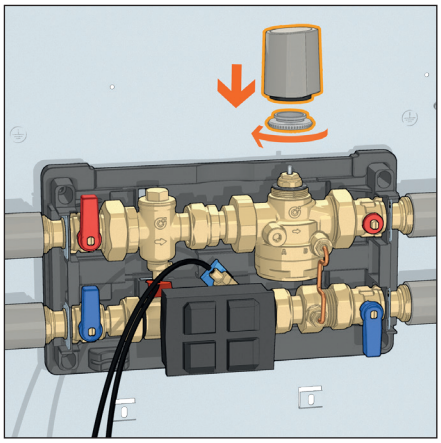
6565-6566 series thermo-electric actuator specifications

Operation:	normally open (6566 series)
	normally closed (6565 series)
Voltage:	230 V (AC) / 24 V (AC) (blue and brown wire)
Power consumption:	1 W
Ambient temperature range:	0–60 °C
Protection class:	IP54
Operating time:	approx. 240 s
Control signal:	ON / OFF

Note: For more information relating to the actuator, please refer to tech. broch. 01367

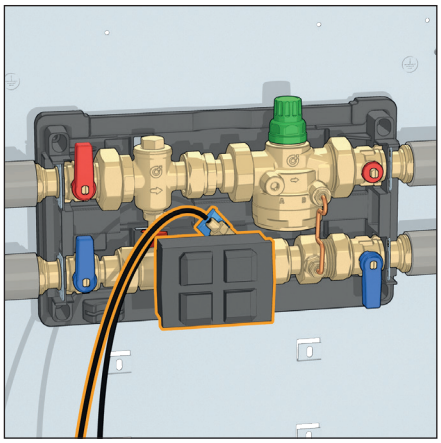
Actuator wiring diagram





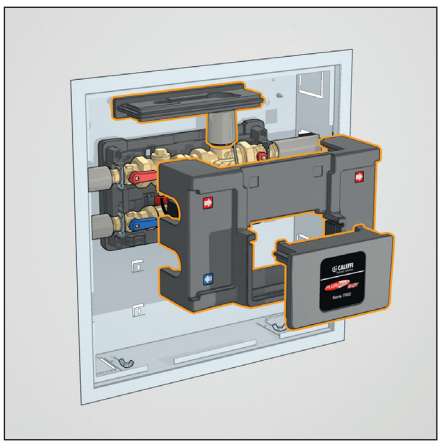
Heat meter installation option

The unit has a plastic template on the return line. This template can be removed and replaced with an ultrasonic or turbine volume meter. The template has a 130 mm centre distance and 1” M connections. There is a strainer pocket on the flow line which, from the bottom, can accommodate the flow temperature probe for the meter. The return probe, however, must be built into the volume meter.



Pre-formed shell insulation

A pre-formed insulating shell in expanded EPE, consisting of three sealed parts, is provided to cover the entire unit. The insulation combats heat dispersion during operation in heating mode and prevents condensation build-up during operation in cooling mode.



Sizing examples

Design data
Sizing the pump for a centralised system serving 10 apartments with radiators. The apartments are divided into two types according to the required thermal load.
The following design data is assumed:

Apartment A
- Q_A = 8,1 kW
- ΔT = 10 °C
- G_A = 700 l/h
- Δp_A = 20 kPa

Apartment B
- Q_B = 2,3 kW
- ΔT = 10 °C
- G_B = 200 l/h
- Δp_B = 15 kPa

where:
Q = apartment thermal load
ΔT = flow / return temperature difference
G = design flow rate
Δp = design pressure drop for the apartment circuit

Kit size selection
Each apartment is served by a unit for which you need to select the flow rate range and the corresponding flow rate pre-adjustment. Make sure the design flow rate falls within the flow rate range for the unit.
The following units should be selected:

Apartment A
- G_A = 700 l/h, 0,7 m³/h
- unit code 700485 002
- flow rate range 0,2 m³/h – 1,050 m³/h

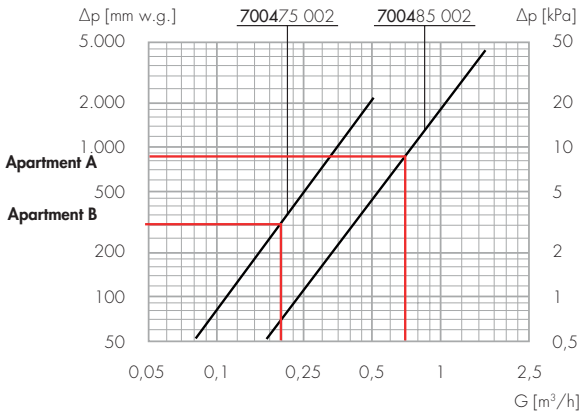
Apartment B
- G_B = 200 l/h, 0,2 m³/h
- unit code 700475 002
- flow rate range 0,040 m³/h – 0,340 m³/h

Calculating the head to supply upstream of the module
The head to be supplied to the connections upstream of the module can be calculated with the formula:

$H = \Delta p_{module} + \Delta p_{min} + \Delta p_{meter} + \Delta p_{user}$

where:

Δp_{module} = HP for the user module excluding the meter and differential pressure limiter valve pressure drops. Use the graph below to calculate it.



Δp_{min} = minimum pressure difference to be supplied for correct operation of the differential pressure limiter valve.
Δp_{meter} = HP for the heat meter. We assume 1 kPa (e.g. CONTECA® EASY 3/4" code 750405).
Δp_{user} = HP for the apartment system

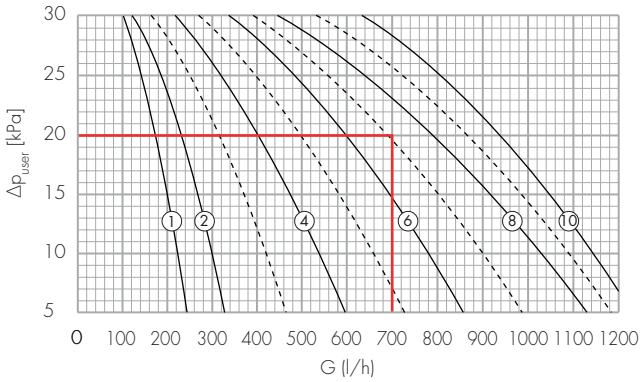
Apartment A
- G_A = 700 l/h
- Δp_{module} = 8,5 kPa
- Δp_{min} = 35 kPa
- Δp_{meter} = 1 kPa
- Δp_{user} = 20 kPa
- H_A = 64,5 kPa

Apartment B
- G_B = 200 l/h
- Δp_{module} = 3 kPa
- Δp_{min} = 25 kPa
- Δp_{meter} = 1 kPa
- Δp_{user} = 15 kPa
- H_B = 44 kPa

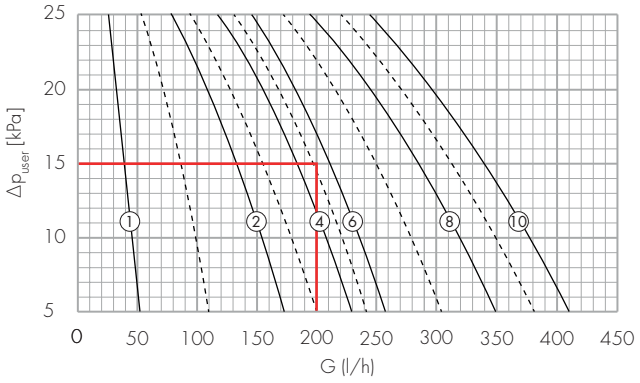
Determination of system flow rate and head
Considering that the unit stabilises the flow rate on all the branches and makes it independent from the various actions, the flow rates that cross the mesh are exactly the design ones. Once the flow rates in the various sections have been determined, the pressure drops of the pipes are calculated with the usual formulas.

Setting the modules
When the design data for each type of apartment is known (flow rate and system pressure drop), the setting for the differential pressure limiter valve can be calculated using the following graphs:

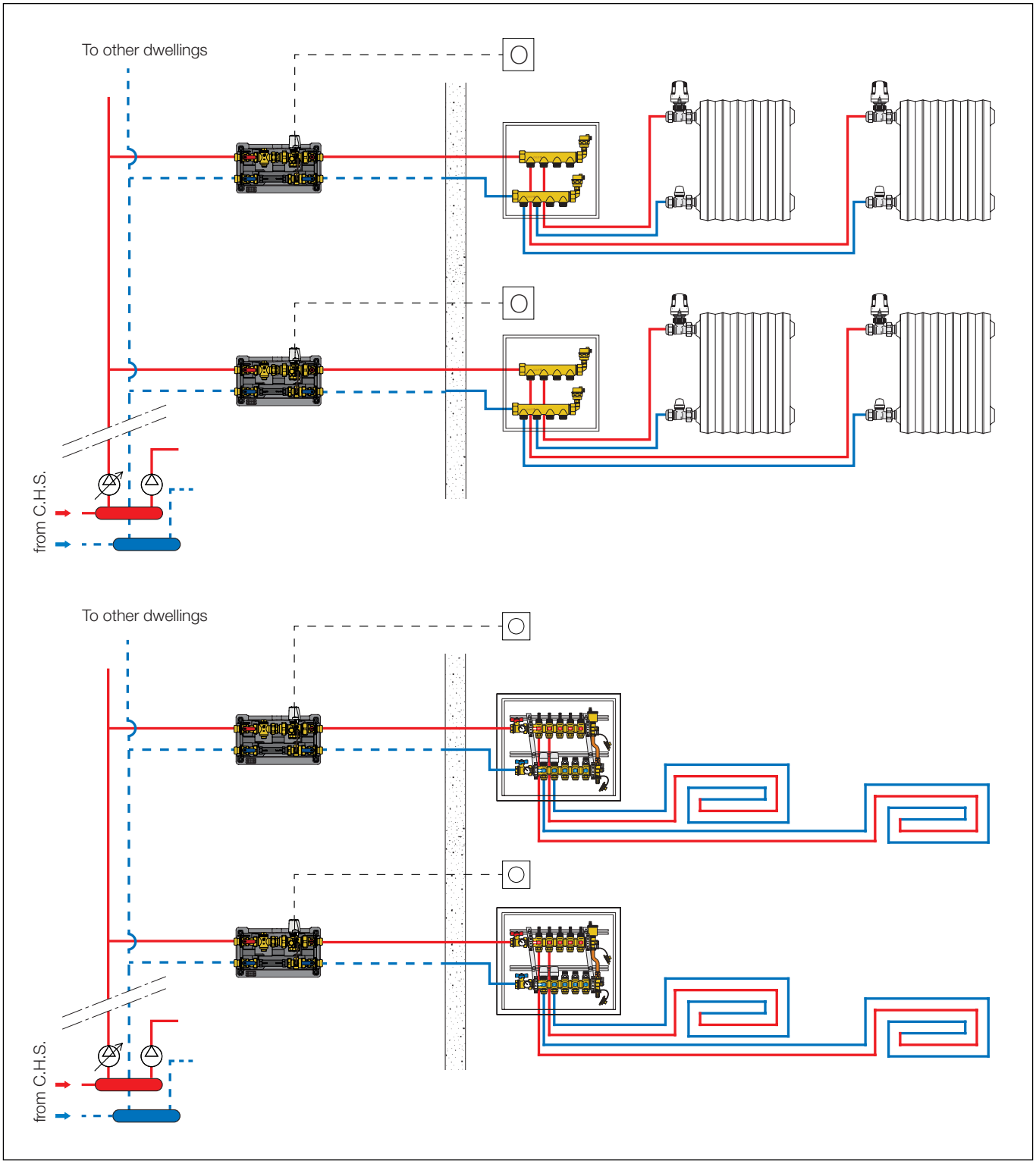
Apartment A
- G_A = 700 l/h
- Δp_A = 20 kPa
- Setting = POSITION 7



Apartment B
- G_B = 200 l/h
- Δp_B = 15 kPa
- Setting = POSITION 5



Application diagrams



SPECIFICATION SUMMARY

Code 700475 002 **- 7004**85 002
PLURIMOD® XM hydraulic module with variable setting differential pressure limiter valve, supplied with: - template (L 130 mm, 3/4") for heat meter, - pocket for direct immersion heat meter probes (flow pocket supplied with blue strainer mesh for initial washing, to be replaced with con the white strainer for normal module operation), - variable setting differential pressure limiter valve, - 2 pairs of 1" ball valves, - integral insulation, to the rear and at the front, in black PPE (density 50 g/l, thermal conductivity 0,037 W/(mK) at 10 °C), suitable for use in heating and cooling systems, - technopolymer support bracket with thermal break.

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