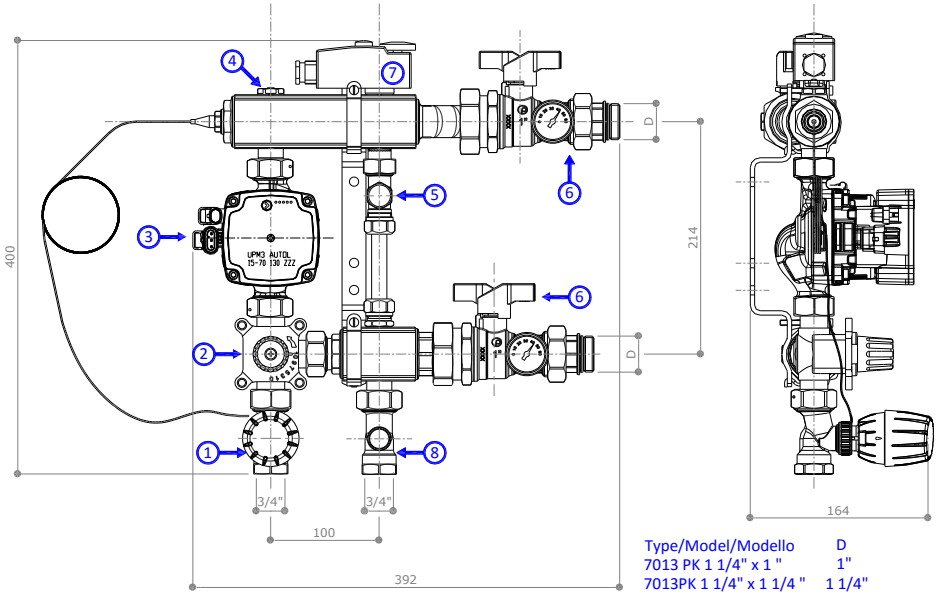
ErP READY
641/2009/EC
622/2012/EC

DESCRIPTION

7013PKK (& 7013PK)

Complete mixing kit with circulation pump (ErP Ready - 641/2009/EC - 622/2012/EC), thermostatic valve with remote sensor and balancing valve for balancing of return flow.
The mixing kit 7013PKK can solve simply and cheaply the problem of mixed temperature heating systems. It allows supply to both radiators and under-floor heating systems using only one boiler. The kit takes fluid from the primary heating circuit at high temperature and supplies a secondary circuit with fluid at a lower temperature.

DIMENSIONS



Type/Model/Modello	D
7013 PK 1 1/4" x 1 "	1"
7013PK 1 1/4" x 1 1/4 "	1 1/4"

COMPONENTS

1. Thermostatic valve 3/4” (#)
2. Three way mixing valve 3/4”
3. Pump Grundfos UPM3 Auto L 15/70
4. Manual air vent 1/2”
5. Micrometric lockshield 1/2”
6. Ball Valve with thermometer 1”1/4
7. Safety thermostat (40 – 60°C)
8. Micrometric lockshield 3/4”

(#) On the 7013PK the thermostatic heads is not included, must be order separately - art. 107LKIT

COMPONENTS

Thermostatic valve	Art. **761P** – 3/4”
Micrometric lockshield	Art. **751N** – 3/4”
Remote sensor thermostatic head	Art.**107LKIT**
By-pass balancing valve	1/2”
Pump	Grundfos **UPM3 AUTO L 15/70**
EEI Part2 or 3	≤ 0.20
$P_{L,Avg}$	≤ 25 W
P_{MAX}	≤ 52 W
Connecting Cable	1 m

TECHNICAL CHARACTERISTICS

Max. liquid temperature	80°C
Max. system pressure	10 bar
Flow temperature range:	20-50 °C
Pump port-to-port length	130 mm
Pump ports diameter	G1’’
Manifold inlet/outlet	G1’’ or G 1 ¼’’

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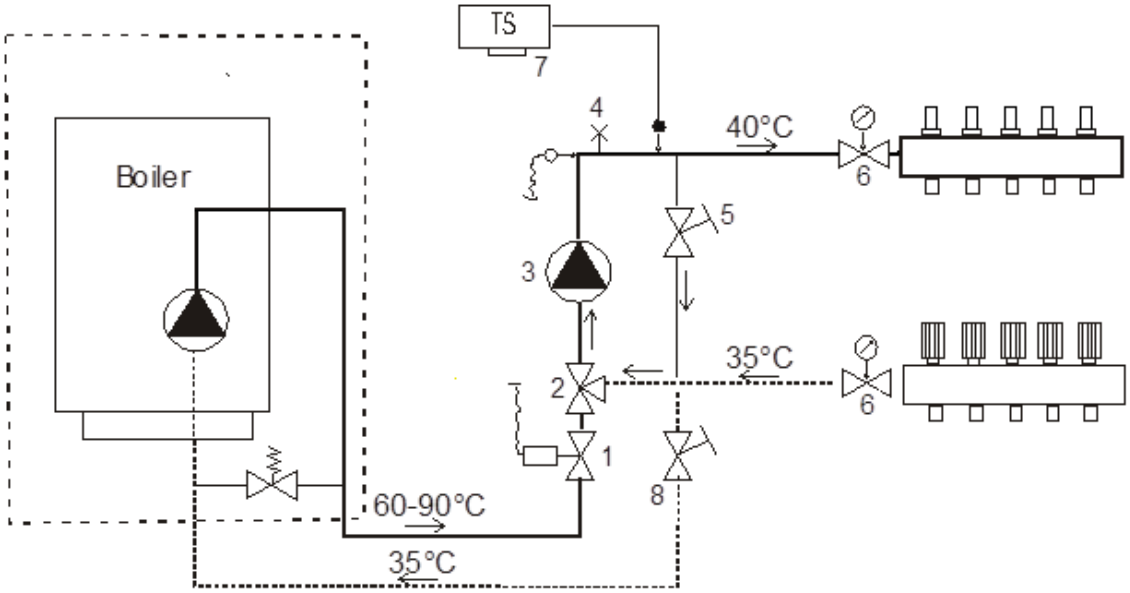
PRINCIPLE SCHEMA



1. Thermostatic valve - 3/4"

Thermostatic valve controlled by remote immersion sensor. This head can maintain the input temperature of the plant in the range 30 - 50 °C. It is easy to precisely regulate the temperature of the circuit, in real time, with the graduated scale on the head. The quantity of the flow through the valve, in working condition is about 25% of the total flow in the secondary circuit

2. 3 way mixing valve - 3/4"

Mixing valve used to balance the flow of the two circuits. Easy to transform the unit from fixed point mixing, to variable point mixing, with an actuator.

3. Pump - Grundfos UPM3 Auto L 15/70

The UPM3 AUTO L pump (ErP Ready - 641/2009/EC - 622/2012/EC), is an electronic circulator, so is able to adjust himself the performances to the installation requirements. The end user can choose 10 different mode to use it:

3.1. Proportional Pressure mode: 3 curves. The lower the flow demand, the lower head (pressure); the higher the heat demand, the higher the pump head. The duty point of the circulator will move up or down on the selected proportional-pressure curve, depending on the heat demand in the system.

3.2. Constant pressure mode: 3 curves. The head (pressure) is kept constant, irrespective of the heat demand

3.3. Constant curve mode: 4 curves. The pump runs on a constant curve which means that it runs at a constant speed or power

4. Manual air vent - ½''

It is useful in case of air in the plant.

5. Micrometric lockshield - ½''

Lockshield used to set the bypass of the unit, in this way you can have a minimum quantity of water in the secondary circuits, also if you close same of the ring of the floor heating plant.

6. Ball valve with thermometer- 1 ¼''

Used to close the secondary circuits in case of malfunction, thanks to the thermometer you can control the inlet and outlet temperature of the secondary circuits

7. Safety thermostat (40°-60°C)

In case of malfunction of the thermostatic head this limits the temperature of the under floor heating circuit and cuts the power supply both to the pump

8. Micrometric lockshield ¾''

Used to set the maximum flow from the primary circuits

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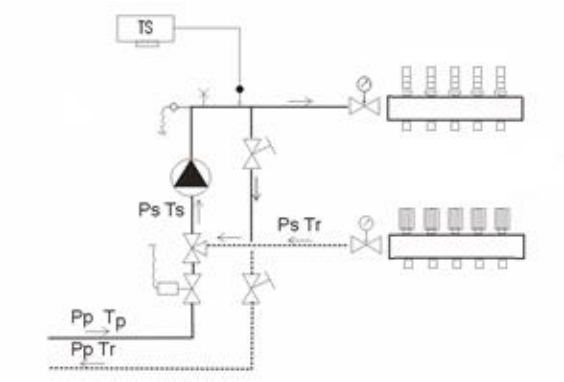
EXAMPLE



The function of the kit can be described as follows:

$$(P_s \times T_r) + (P_p \times T_p) - (P_p \times T_r) = (P_s \times T_s)$$

Where:

P_s = Secondary flow

Ts = Mixed Temperature

P_p = Primary flow

T_r = Return Temperature

T_p = Primary loop Temperature

It is very easy to calculate the calorific supply of the plant:

$$\dot{Q_w} = P_p \times c_p \times (T_p - T_r)$$

If we supply 8000 Kcal/h (≈ 9300 watt) to an underfloor heating circuit with 5°C of design ΔT, and boiler feed water at 80°C, we can easily calculate the quantity of hot water flowing through the thermostatic valve to maintain the required water temperature and energy supply.

$$P_p = \frac{\dot{Q_w}}{c_p \times (T_p - T_r)} = \frac{8000}{1 \times (80 - 35)} = 178\frac{kg}{h} = 178\frac{l}{h}$$

So is possible to evaluate the flow rate for the radiant heating system

$$P_s = P_p \times \frac{(T_p - T_r)}{(T_s - T_r)} = 178\frac{(80 - 35)}{(40 - 35)} = 1602\frac{l}{h}$$

Flow will be shared in the various circuits according to the floor zone layout

COMMISSIONING

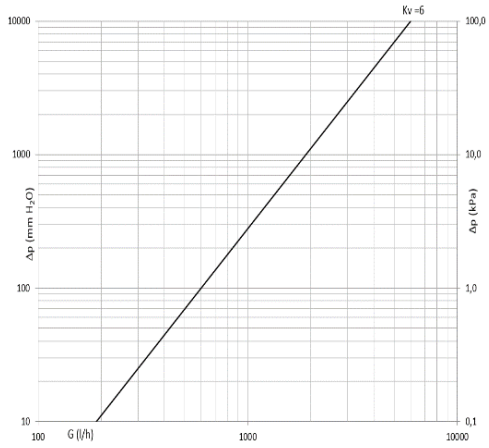
The circuits have to be filled with cold water to avoid the close down of the thermostatic valve that would prevent fast filling. Do not start the pump until all circuits are full of water and air has been purged out.

INSTALLATION

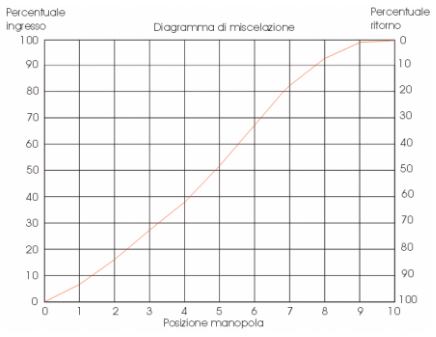
It is very simple assemble the mixing unit with the following Pettinaroli's articles:

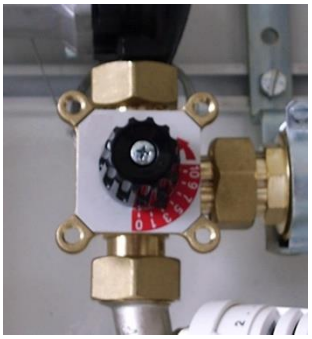
- Pre-assembled manifold for floor heating plant art. **7035TDM** / art. **7035TO** / art. **7035F** / art. **K7500P** / art. **K7500TO**;
- Zinc painted stove-enamelled wall box art. **C80**.

3 WAY MIXING VALVE - ART. 156/3



In working condition is recommended set the valve in position 3, (the quantity of water in the primary and secondary circuits will be respectively 27% e 73% of the total)





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SETTING OF 3-WAY VALVE

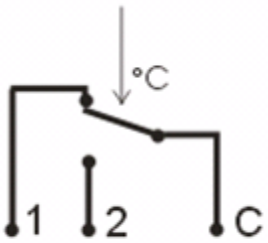
To set the 3-way valve with plant in working condition:

1. Set the thermostatic head on the temperature request; control the accuracy of the thermostatic head with the thermometer on the inlet ballvalve.
2. Set the 3-way valve on position 2.
3. Control if the temperature on the inlet thermometer is the same of the temperature set on the thermostatic valve.

   3.a. If the temperature is lower move lightly the 3-way valve towards position 3, repeat the operation until you have the request temperature on the thermometer. With this operation, we decrease the maximum flow on the secondary circuits and we increase the flow from the primary circuits.

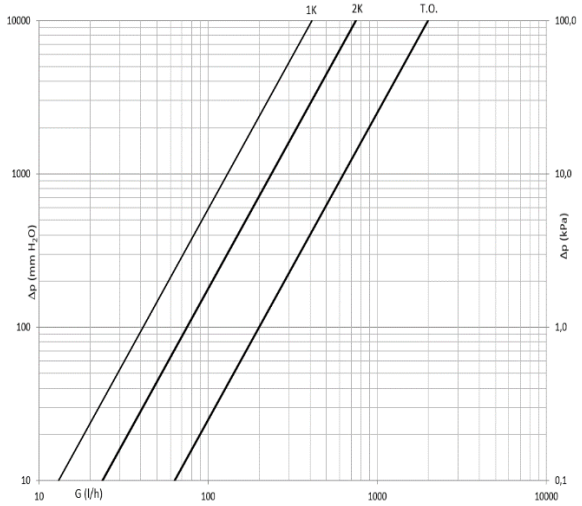
   3.b. If the temperature is the same, move lightly the 3-way valve towards position 1, until the inlet temperature decrease. With this operation, we increase the maximum flow on the secondary circuits and we decrease the flow from the primary circuits. In this way we increase the output of the plant by increasing the maximum flow on the secondary circuit.

SAFETY THERMOSTAT CHARACTERISTIC - TGC1



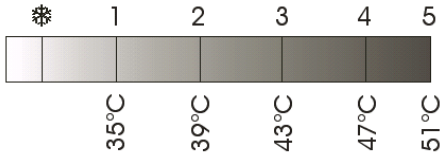
Plastic material	ABS UL94 V0
Metallic material	Plated iron
Index Protection	IP40
Load	16(4)A 250V 6 (1)A 400V
Temperature range	40÷80°C
Factory setting	50°C

THERMOSTATIC HEAD



q_{mNH} = 240Kg/h

ΔT (°C)	Kv
S-1	0.41
S-2	0.75
T.O.	2



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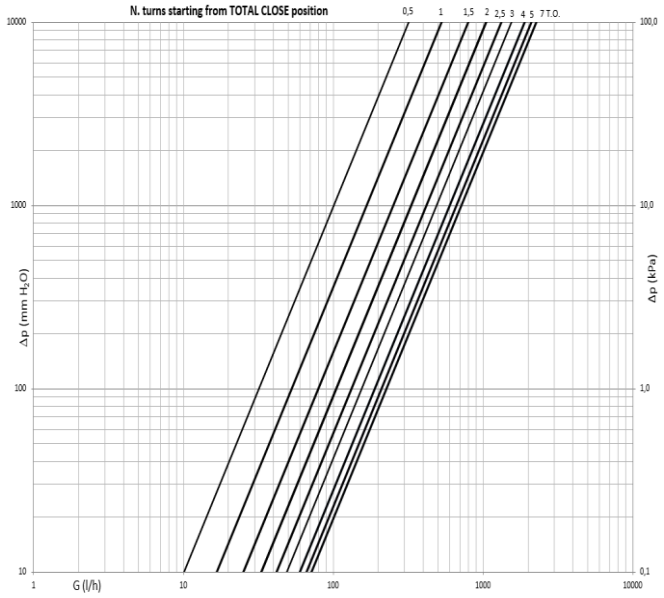
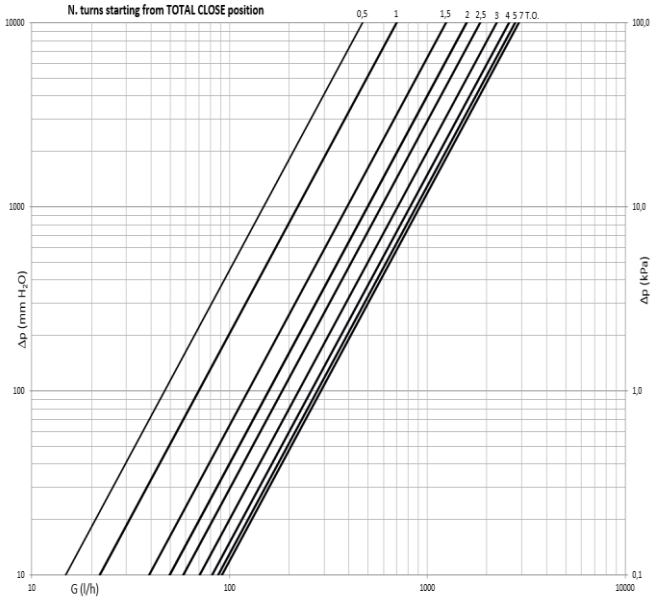
BYPASS: MICROMETRIC LOCKSHIELD 1/2”



MICROMETRIC LOCKSHIELD 3/4”



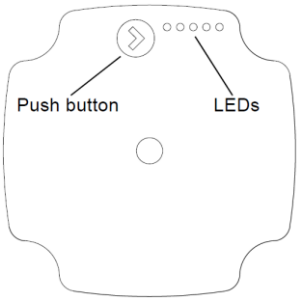
PUMP GRUNDFOS UPM3 AUTO L 15/70

The UPM3 AUTO L pump (ErP Ready - 641/2009/EC - 622/2012/EC), is an electronic circulator, so is able to adjust himself the performances to the installation requirements. So the energy consumption will be reduced. User interface with one push button and five LEDs to shows:

- performance view (during operation) [operation status and/or alarm status]
- settings view (after pressing the button).

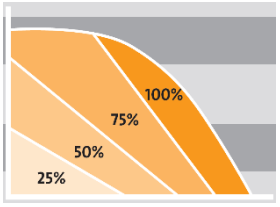
During operation, the display shows the performance view. If you press the button, the user interface switches the view or runs in the setting selection mode.

USER INTERFACE



Operation status

When the circulator is running, LED 1 is green. The four yellow LEDs indicate the current powerconsumption (P1) as shown in the table below. And on the diagram below. When the operation mode is active, all active LEDs are constantly on in order to differentiate this modefrom the select setting mode. If the circulator is stopped by an external signal, LED 1 flashes green.



Display	Indication	Performance in % of P1 max
	Standby (only externally controlled)	0
	Low performance	0-25
	Medium low performance	25-50
	Medium high performance	50-75
	High performance	75-100

Alarm status

If the circulator has detected one or more alarms, the bi-coloured LED 1 switches from green to red. When an alarm is active, the LEDs indicate the alarm type as defined in the table below. If multiple alarms are active at the same time, the LEDs only show the error with the highest priority. The priority is defined by the sequence of the table. When there is no active alarm anymore, the user interface switches back to operation mode

Display	Indication	Pump Operation	Counter Action
	Rotor is blocked	Trying to start again every 1.33 seconds.	Wait or de-block the shaft
	Supply voltage too low	Only warning, pump runs	Control the supply voltage
	Electrical error	Pump is stopped be-cause of low supply voltage or serious fail-ure	Control the supply voltage / Exchange the pump

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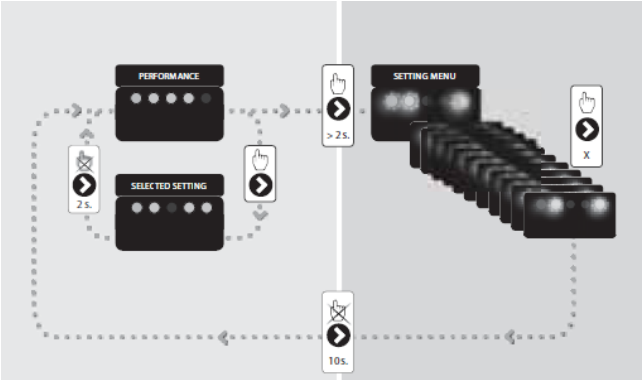
Settings view

You can switch from the performance view to the settings view by pressing the push button. The LEDs indicate the actual setting. The settings view shows which mode controls the circulator. No settings can be made at this stage. After 2 seconds, the display switches back to performance view
If LED 1 is green, it indicates operation or internal control. If LED 1 is red, it indicates alarm or external control. LED 2 and 3 indicate the different control modes and LED 4 and 5 indicate the different curves



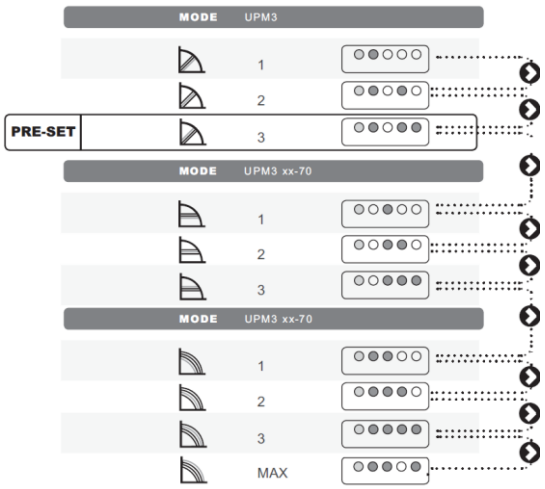
Navigation - Key lock function

The purpose of the key lock function is to avoid accidental change of settings and misuse.
When the key lock function is enabled, all long key presses will be ignored. This prevents the user from entering the "select setting mode" area and allows the user to see the "show setting mode" area.
If you press the key lock for more than 10 seconds, you can toggle between enabling/disabling the key lock function. When doing so, all LEDs, except for the red LED, will flash for a second indicating that lock is toggled.

Display		Mode
		Proportional pressure 1
		Proportional pressure 2
		Proportional pressure 3
		Constant Pressure 1
		Constant Pressure 2
		Constant Pressure 3
		Constant Curve 1
		Constant Curve 2
		Constant Curve 3
		Constant Curve 4

Factory pre-setting

The circulator starts at the factory pre-setting. For standard UPM3 AUTO L this is proportional pressure, curve 3
In the "select setting" mode the circulator starts at this control mode.



Setting selection

You can choose between the performance view and settings view.
If you press the button for 2 to 10 seconds, the user interface switches to "setting selection" if the user interface is unlocked. You can change the settings as they appear. The settings appear in a particular order in a closed loop. When you release the button, the user interface switches back to the performance view and the last setting is stored.

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CONTROL MODE EXPLANATION

Proportional pressure

The head (pressure) is reduced at falling heat demand and increased at rising heat demand.

The duty point of the circulator will move up or down on the selected proportional-pressure curve, depending on the heat demand in the system.

PP1: lowest proportional pressure curve
PP2: intermediate proportional pressure curve
PP3: highest proportional-pressure curve

Constant pressure

The head (pressure) is kept constant, irrespective of the heat demand.

The duty point of the circulator will move out or in on the selected constant-pressure curve, depending on the heat demand in the system.

CP1: lowest constant-pressure curve
CP2: intermediate constant-pressure curve
CP3: highest constant-pressure curve

Constant curve

The circulator runs on a constant curve which means that it runs at a constant speed or power.

The duty point of the circulator will move up or down on the selected constant curve, depending on the heat demand in the system.

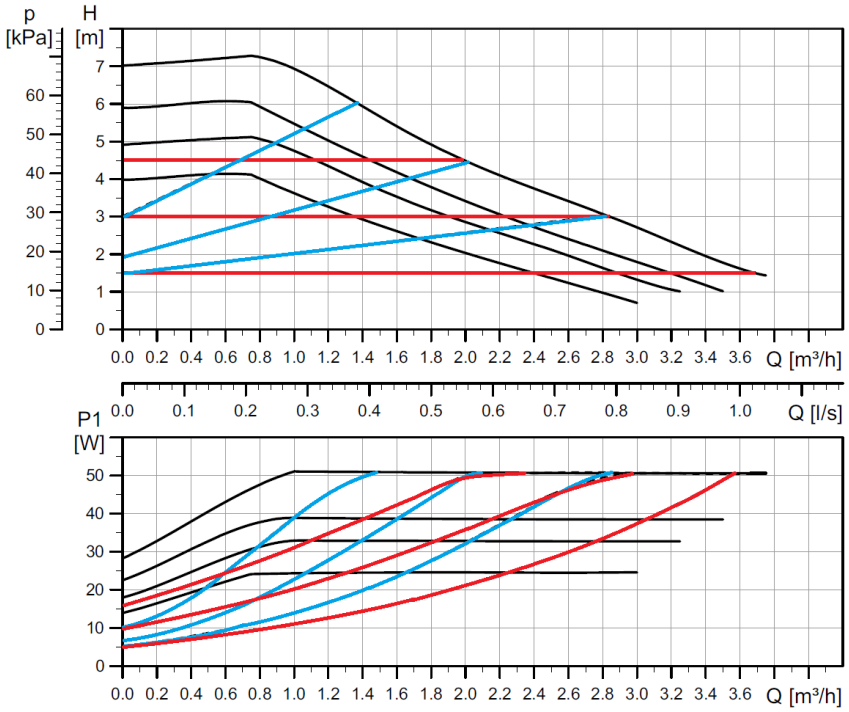
PUMP CHARACTERISTICS

Every setting is represented on the diagram (flow vs. pressure) with a specific line.

----- Constant Pressure Curve;
----- Proportional Pressure Curve
----- Constant Curve

Each line could be associated to a specific line on the 2nd diagram (power vs. flow rate) where is possible to read the electrical power adsorbed from the circulator.

For the underfloor heating installation is recommended to use the setting CP1 or CP2 or CP3 for which the pressure is constant.



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