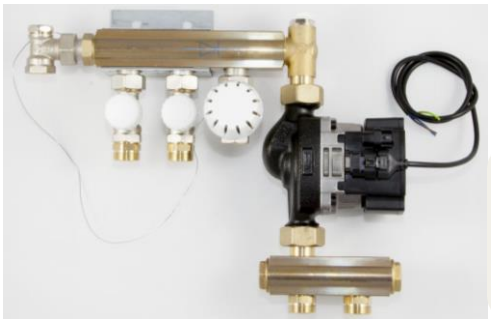


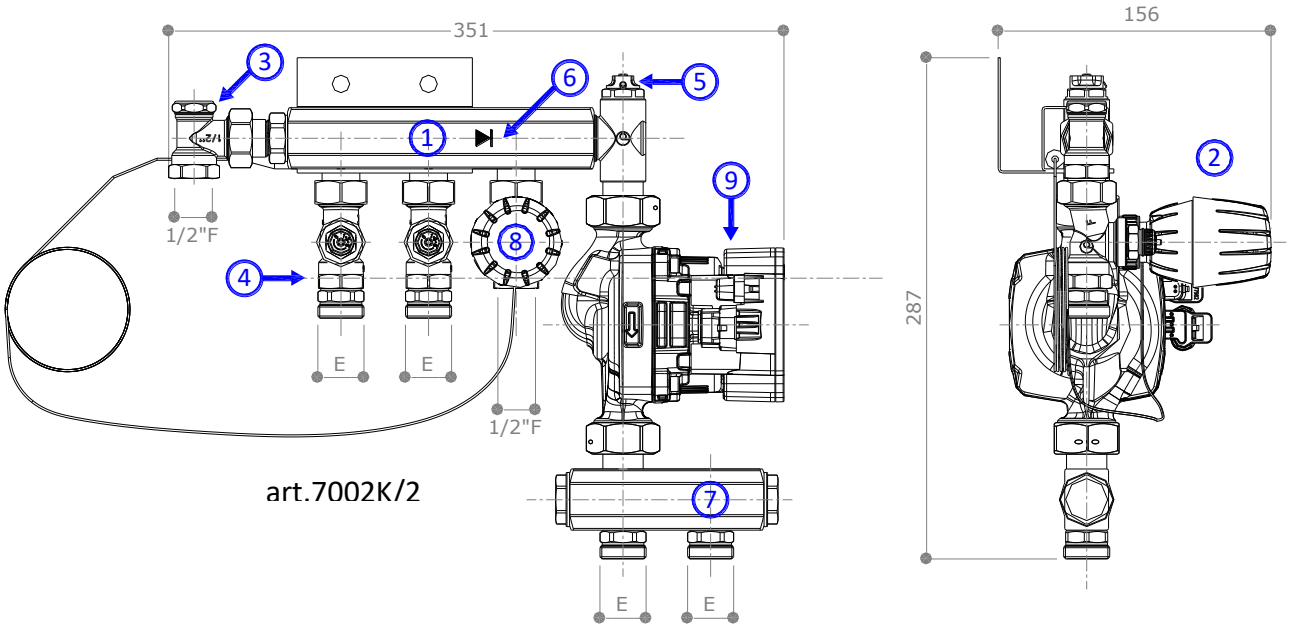
ErP READY 641/2009/EC 622/2012/EC

DESCRIPTION

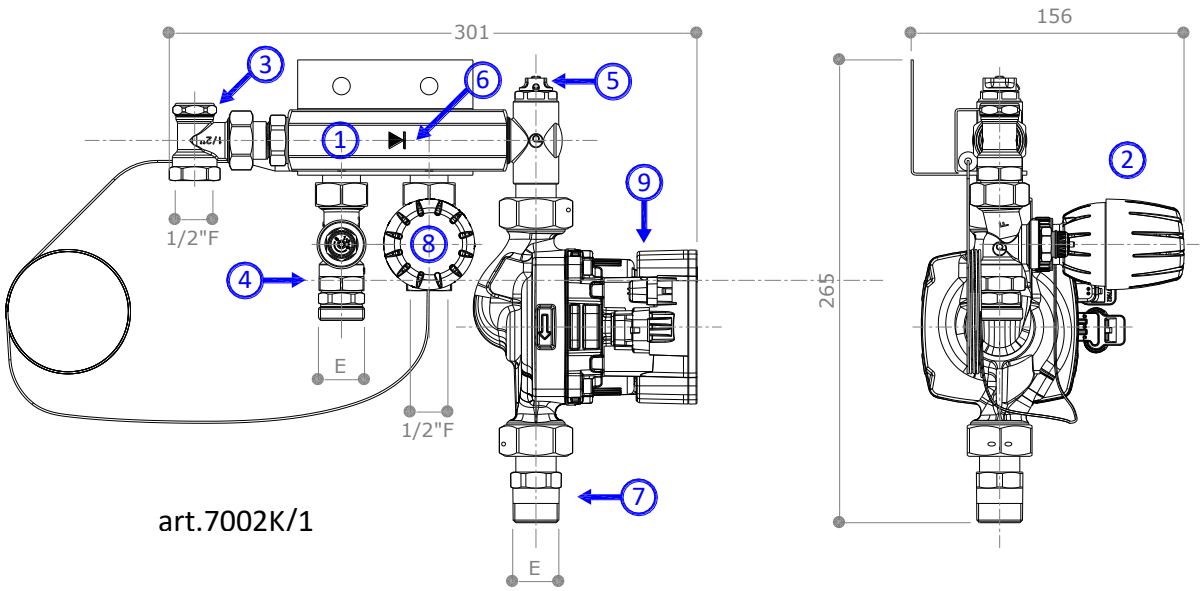
7002K

Complete mixing kit with circulation pump (ErP Ready - 641/2009/EC - 622/2012/EC), thermostatic valve with remote sensor, non-return valve and balancing valve for balancing of return flow. The mixing kit 7002K are designed for renovation etc., where can replace the radiators with floor heating circuits.

DIMENSIONS



art.7002K/2



art.7002K/1

FIELDS OF APPLICATIONS

The new 7021C Pettinaroli mixing kit with single temperature setting point can solve simply and cheaply the problem of mixed temperature heating systems for a small installations. I.E. The mixing kit 7002K could be used on the renovation to replace the radiators with floor heating circuits.
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.

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FRATELLI PETTINAROLI S.p.A. CLIMATE SYSTEMS TECHNOLOGY

Thanks to the thermostatic head's remote sensor, the 7002K it's able to takes fluid from the primary heating circuit at high temperature (>55°C) and to mix it with the return to be able to supplies the secondary circuit with fluid at the right temperature (20-45°).

Thanks to the mixing kit 7002K it's possible to manage different installation as describe as follow

		Pipe 16x2 Pitch 10 cm (*)	Pipe 16x2 Pitch 10 cm (*)	Pipe 20x2 Pitch 20 cm(*)
7002K/1	1 circuit	10 m^2	15 m^2	20 m^2
7002K/2	2 circuits	20 m^2	30 m^2	40 m^2

(*)100 m max circuit's lenght

On the group 7002K the mixing is managed by the thermostatic head (8); each circuit is managed/balanced by thermostatic valve with presetting (4). The use of thermoelectrical actuators 230 V (for example A542O2 or A542O4) or 24 V (for example A544O2 or A544O4) controlled by room thermostats can manage the temperature of individual rooms.

COMPONENTS

1.	Return manifold	¾"
2.	Thermostatic valve	761K – ½"
3.	Micrometric lockshield	750K – ½"
4.	Thermostatic valve with preset	Art. 761PK – ½''
5.	Manual air vent	½''
6.	Non return valve	POM – DN20
7.	Flow manifold	¾"
8.	Remote sensor thermostatic head	Art.107LKIT
9.	Pump	Grundfos UPM3 AUTO L 15/50
	EEI Part2 or 3	≤ 0.20
	$P_{L,Avg}$	≤ 25 W
	P_{MAX}	≤ 52 W
	Connecting Cable	1 m
10.	Connection	E = (¾''x18)

TECHNICAL CHARACTERISTICS

Max. liquid tempeature	80°C
Max. system pressure	10 bar
Flow temperature range:	20-50°c
Pump port-to-port length	130mm
Pump ports diameter	G1"

BALANCING

In order to obtain optimal function of the floor heating circuit it is important that THE mixing kit 7002K is balanced both in the primary circuit (heating plant) and the secondary circuit (floor heating circuits).

Primary circuit balancing.

The starting point is the thermal load required for the room. If this info is not available the following formula could be are being used:

$$Q = \left(\frac{A \times 50 \times 0{,}86}{\Delta T} \right)$$

where :

Q = primary circuit flow rate (l/h)

A = Room surface (m^2)

50 = thermal load for unit surface (W/m^2)

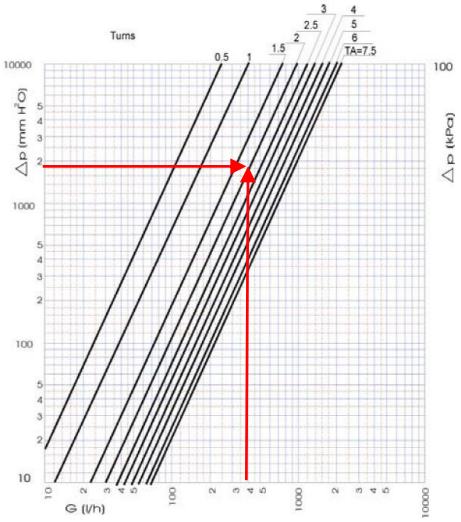
ΔT = flow –return temperature gap (°C) (usually 5°C)

Micrometric lockshield (3) could be regulated by an allen key to the presetting required.

The pressure drop diagram must be used as described follow:

- entering with the calculated water flow (l/h) value
- entering with the maximum admitted pressure loss value above the micrometric lockshield (3)

Adopt as regulating position the characteristic line nearest to the intersection obtained.



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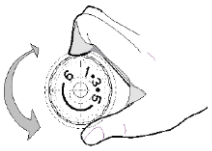
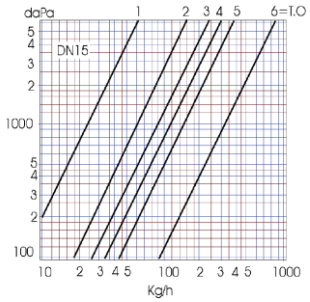
Secondary circuit balancing.

The total flow to the floor heating circuits could be calculated as follow:

$$Q = (A \times 8{,}6)$$

However could be not forgotten to take into account the pressure drop trough the thermostatic valves complete of presetting (diagram on the right) and the pressure drop trough the pipes on the floor heating installation. Below few examples to clarify it.





Secondary circuit balancing on the Art.7002K/1 (one circuit)

As usual the sum of ΔP_C (pressure drop on the circuit) and ΔP_V (pressure drop trough the valve) must be less than the pump head.

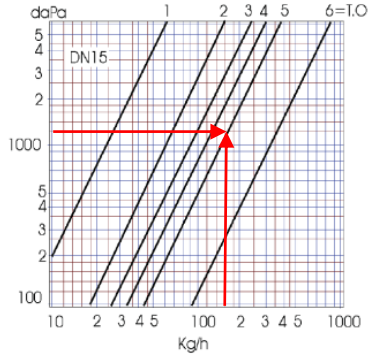
$$\Delta P_T = \Delta P_C + \Delta P_V < H_P$$

Example : 1 circuit - PEX pipe 20 x 2 mm (O.D. 20 mm, I.D. 16 mm)

	L = length	Q = flow rate	ΔP_c pressure drop on the circuit (*)
Circuit n° 1	80 m	180 l/h	0,737 wmc

(*) diagrams supply from the pipe's producer

So considering a pressure drop, trough the thermostatic valves complete of presetting, of 1,1 m hydraulic head with a 180 l/h flow rate the regulating valve shall be turned on to pos.n.5



Sot the total pressure drop will be:

$$\Delta P_T = \Delta P_C + \Delta P_V = 0{,}737 + 1{,}1 = 1{,}837 \text{ wmc.}$$

So the pump include on the 7002K/1 mixing kit (Grundfos UPM3 AUTO L 15/50) would be setted to be able to supply a head of 2 wmc and flow rate Q = 180 l/h (it corresponding to the intermedium constant pressure curve 2 wmc identified as CP2 also).

Regolazione del secondario Art.7002K/2:

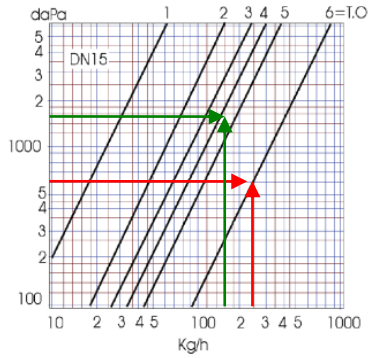
Also on the plant where is installed the 2 circuits version (7002k/2) for each circuit the sum of ΔP_C (pressure drop on the circuit) and ΔP_V (pressure drop trough the valve) must be less than the pump head.

The thermostatic valve with presetting (4) related to the longer circuit must be on fully open position (position n°6) while for the shorter circuit the presetting must be setted to be able to obtain the same value of total pressur drop obtainet for the longer circuit. Only after this operation could be operated the setting of the pump.

Example : 2 circuits - PEX pipe 20 x 2 mm (O.D. 20 mm, I.D. 16 mm)

	L = length	Q = flow rate	ΔP_c pressure drop on the circuit (*)
circuit n°1	60 m	154,8 l/h	0,320 wmc
circuit n°2	100 m	258,0 l/h	1,301 wmc

(*) diagrams supply from the pipe's producer



- For the longer circuit verify the pressure drop at Q= 258 l/h corresponding to the fully open position (position n°6): results ΔP_{v2}= 0,6 m.c.a. (red arrows).
- So the total pressure drop for the longer circuit will be:

$$\Delta P_{T2} = \Delta P_{C2} + \Delta P_{V2} = 1{,}301 + 0{,}6 = 1{,}901 \text{ wmc}$$

To be sure to have a ggod balancing and to insure the right flow rate to each of two circuts the shorter circuit must have the same valeu of total pressure drop

$$\Delta P_{T2} = \Delta P_{T12} = 1{,}901 \text{ wmc}$$

The pressure drop on this circuit is already defined ΔP_{c1} = 0,320 wmc so the presetting device must be able to produce an additional pressure drop as follow:

$$\Delta P_{v1} = \Delta P_{T1} - \Delta P_{c1} = 1{,}901 - 0{,}320 = 1{,}581 \text{ wmc}$$

So with the same pressure drop diagram with the Q_1 = 154,8 l/h and ΔP_{v1}= 1,581 wmc the resulting presetting position will be the n°4 (green arrows)

So the pump include on the 7002K/2 mixing kit (Grundfos UPM3 AUTO L 15/50) would be setted to be able to supply a head of 2 wmc and flow rate $Q_T = Q_1 + Q_2$ = 154,8 + 258,0 = 412,8l/h (it corresponding to the intermedium constant pressure curve 2 wmc identified as CP2 also).

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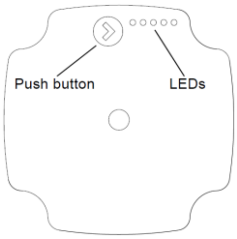
PUMP UPM3 AUTO L 15/50

User Interface



User interface with one push button and five LEDs to shows:

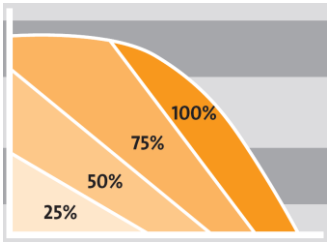
- performance view (during operation) [operation status and/or alarm status]
- settings view (after pressing the button).

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.

Operation status

When the circulator is running, LED 1 is green. The four yellow LEDs indicate the current power consumption (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 mode from 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-colored 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 because of low supply voltage or serious failure	Control the supply voltage / Exchange the pump

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.

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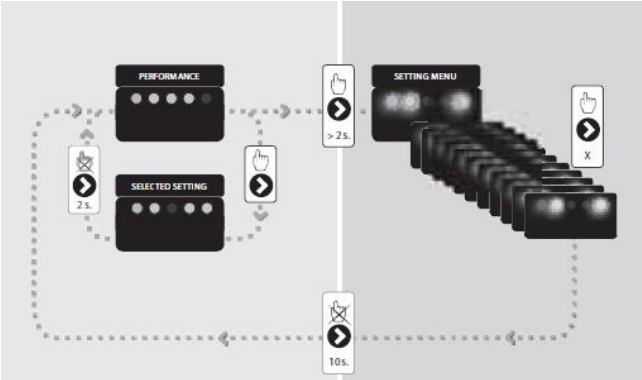
Factory presetting

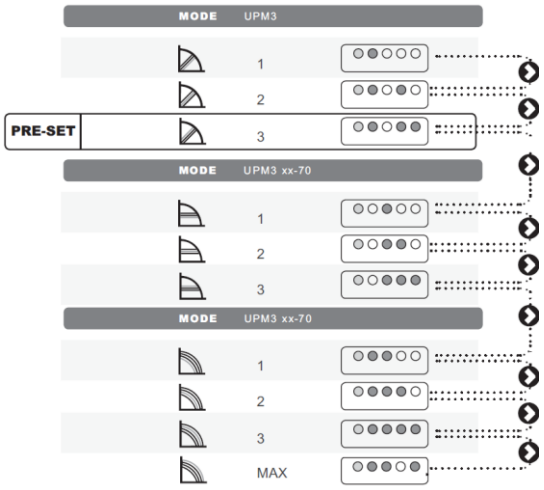
The circulator starts at the factory preset. For standard UPM3 AUTO L this is proportional pressure, curve 3.
In the "select setting" mode the circulator starts at this control mode.

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.



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



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.

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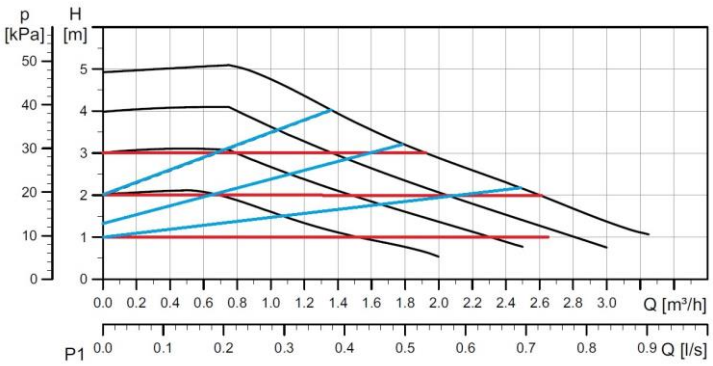
PUMP CHARACTERISTICS

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

NOTES

- Normally is recommended the installation of supplementary safety thermostat (as the TGC1)
- In a single pipe heating system a by-pass shall be established above the mini shunt

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