

Mixing and circulation group

R002

ICMA[®]

ST.R002.10.22.EN

/ Description

The mixing and circulation groups are used to adjust distribution and temperature of the heat carrying fluid in multi-storey and/or multi-zone systems.

They are ideal for underfloor heating systems. The groups R002 can be installed on a special "inlet-outlet" distribution manifold (art. 785), after the hydraulic separator.

The groups are supplied with insulation shells and fastening brackets.

Group advantages:

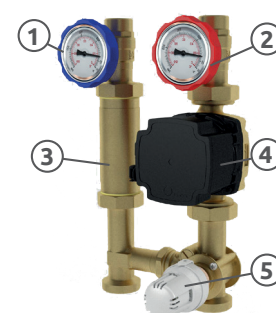
- Right/Left adaptability.
- Compatible with every 125mm axis manifold (With shell type 93).



/ Components List

Mixing group with fixed point regulation unit complete with:

1. Ball valve G3/4" or G 1" M with blue hand-wheel for connection to the return pipes, thermometer 0-120°C and incorporated check valve.
2. Ball valve G3/4" or G 1" M with red hand-wheel and thermometer 0-120°C for connection to the return pipes.
3. Steel pipe with ends threaded G1"1/2M.
4. 3-Speed circulating unit or variable speed electronic circulating unit, class "A", with union connection G1"1/2 and 130 mm. distance between centers.
5. Thermostatic head, with remote sensor, regulation range 20-50°C (to be combined with the pit our art. 87189AD06).



/ Technical features

TECHNICAL DATA:

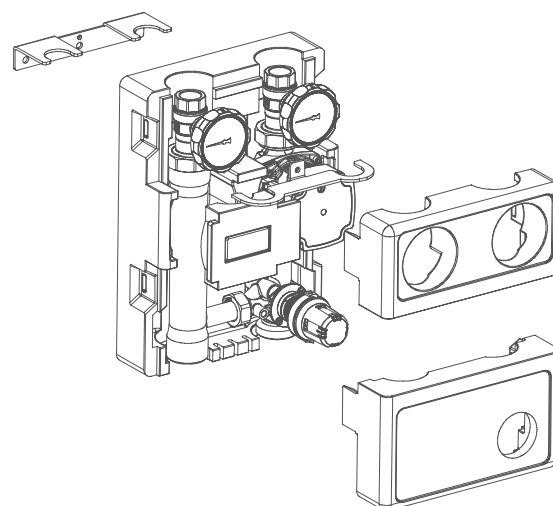
Fluids used:	Water and glycol based solutions
Maximum percentage of glicole:	30%
Maximum operating pressure:	10 bar
Working range:	5 °C ÷ 95° C
Thermometers scale:	0÷120 °C
Circulators:	See specifications on page 3

MATERIALS:

Bodies:	Brass CW617N - EN 12165
Caps and unions:	Brass CW617N - EN 12165
Stub:	Tropicalized steel
Thermometer:	Steel/Aluminium
Locking brackets:	Galvanized steel
Flat gaskets:	EPDM Perox
Sealing gaskets:	PTFE
Sealing components:	EPDM Perox
Insulation shell:	EPP
Density Ver. 93:	40 kg/m3
Density Ver. 94:	60 kg/m3
Conducibility of shell λ (ΔT) Ver. 93:	0,036 W/(m·k) at 10°C
Conducibility of shell λ (ΔT) Ver. 94:	0,039 W/(m·k) at 10°C

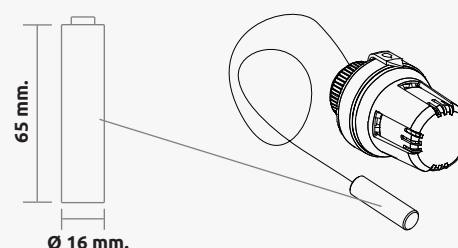
CONNECTIONS:

Upper connections:	G 3/4" F - 1" M
Lower connections:	G 1"1/2 M



THERMOSTATIC HEAD (Art. 995):

Max working temperature:	110°C
Max working pressure:	10bar
Temperature setting range:	20°C-50°C
Body:	Nylon66 F.G. 30%
Spring:	Stainless steel
Ferrule:	Brass CW 614 N UNI EN 12164
Element :	Composite
Maximum differential pressure (Mixed valve):	0,2 - 0,25 bar



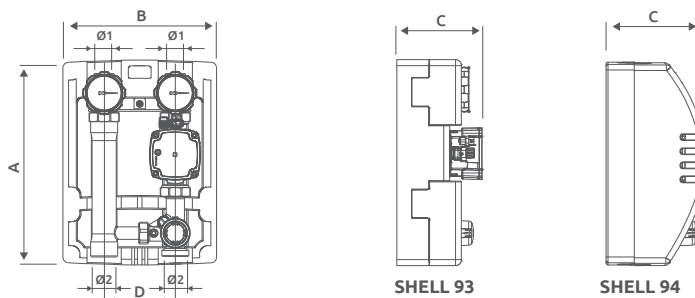
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Dimensions

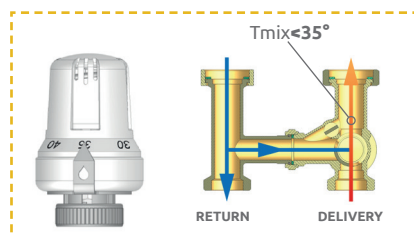


ART.	A		B		C		D	Ø 1		Ø 2
	93	94	93	94	93	94		93	94	
R002	350	360	248	270	200	180	125	3/4" F	G 1" M	G 1 1/2 M

Functioning

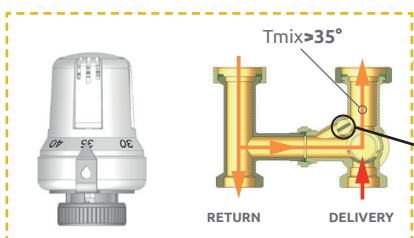
The **Fixed point mixing and circulation group art. R002**, in combination with the thermostat RT, switches on the pump directly, starting the system only when the room temperature is lower than the set temperature. The thermostatic head with remote sensor adjusts the mixer valve and works continuously to maintain the set temperature of the heat-transfer fluid stable. The remote sensor RS measures the temperature of the water going outside the group, therefore it must be installed on the delivery pipe straight after the mixer valve. (A right-configuration R002 is shown as example below).

The three-way valve can work in two different positions during its operation:



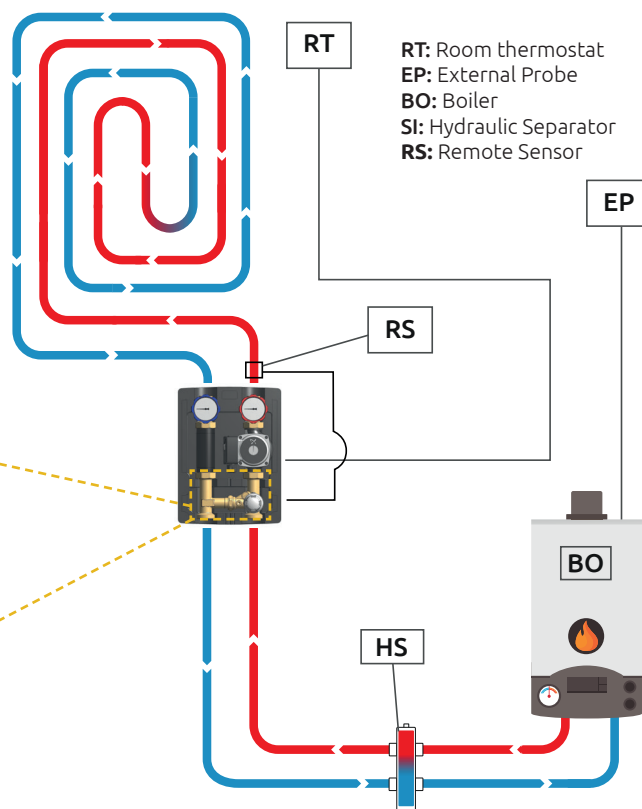
REGULATION POSITION:

In case of thermostatic head set on 35°C and $T_{mix} < 35^\circ$, the 3 way valve let the heat-carrying fluid coming from the boiler in and mixes it with the underfloor heating system return fluid.



FULLY CLOSED POSITION:

In case of thermostatic head set on 35°C and $T_{mix} > 35^\circ$, the 3 way valve excludes the heat-carrying fluid coming from the boiler completely, to let the underfloor heating return fluid recirculate.



RT: Room thermostat
EP: External Probe
BO: Boiler
SI: Hydraulic Separator
RS: Remote Sensor



BY-PASS OPEN
Kv 4.8 (Angled way)



BY-PASS 50%
Kv 3.7 (Angled way)



BY-PASS CLOSED
Kv 3.5 (Angled way)

The 3-way valve has an adjustable BY-PASS. Its main function is to keep the temperature in the system not too high, connecting the system return flow with the mixed flow. The by-pass makes the regulation more stable and prevent possible damages to the system.

/ Group customization

Shells



Version 93



Version 94

Circulation pumps (Saleable in Extra-EU countries only)

Art. P321 - Synchronous circulation pump with 3 speeds:



CARATTERISTICHE TECNICHE:

Brand:	Grundfos
Model:	UPSO 25 – 65 130 mm
Centre to centre distance:	130 mm
Connections:	G 1"1/2 M
Electrical power supply:	230V – 50Hz
Operating temperature:	+2°C ÷ 110°C.
Max operating pressure:	10 bar
Minimum pressure on the intake side:	85°C = 0,049 bar 90°C = 0,27 bar 110°C = 1,08 bar
Max. percentage of glycol:	50%
Protection level:	IP44

Circulation pumps (Saleable in UE countries)



Art. P326 - Circulation pump with PWM:

TECHNICAL SPECIFICATIONS:

Brand:	Grundfos
Model:	UMP4 PWM 25/70 130
Centre to centre distance:	130 mm
Connections:	G 1"1/2 M
Electrical power supply:	230V – 50Hz
Operating temperature:	+2°÷110°C.
Temp. ambiente max.:	70°C
Max operating pressure:	10 bar
Minimum pressure on the intake side:	75°C = 0,05 bar 95°C = 0,5 bar 110°C = 1,08 bar
Max. percentage of glycol:	50%
Protection level:	IP44
Energy class (EEI):	≤0.20



Art. P327 - Circulator with ΔP constant and ΔP variable:

TECHNICAL SPECIFICATIONS:

Brand:	Wilo
Model:	PARA RS 25/8 130
Centre to centre distance:	130 mm
Connections:	G 1"1/2 M
Electrical power supply:	230V – 50/60Hz
Operating temperature:	Ambient. temp. 50°C = 2 ÷ 105°C Ambient. temp. 55°C = 2 ÷ 90°C Ambient. temp. 60°C = 2 ÷ 77°C Ambient. temp. 65°C = 2 ÷ 66°C
Max operating pressure:	10 bar
Minimum pressure on the intake side:	0,5 bar
Max. percentage of glycol:	50%
Protection level:	IPx4D
Energy class (EEI):	≤0.21



Art. P328 - Circulator with PP (proportional pressure), CP (constant pressure) CC (constant curves), PWM (profile A o C), AA (auto adapt):

TECHNICAL SPECIFICATIONS:

Brand:	Grundfos
Model:	UPM3 hybrid 25/70 130
Centre to centre distance:	130 mm
Connections:	G 1"1/2 M
Electrical power supply:	230V – 50/60Hz
Operating temperature:	+2°C ÷ 110°C
Max. ambient temperature:	70°C
Max operating pressure:	10 bar
Minimum pressure on the intake side:	75°C = 0,05 bar 95°C = 0,5 bar 110°C = 1,08 bar
Max. percentage of glycol:	50%
Protection level:	IP44
Energy Class (EEI):	≤0.20



Art. P329 - Circulator with nr. 2 proportional-pressure curves, nr. 2 constant-pressure curves, min-max mode – Fixed speed

TECHNICAL SPECIFICATIONS:

Brand:	Taco
Model:	ES2 25-70/130
Centre to centre distance:	130 mm
Connections:	G 1"1/2 M
Electrical power supply:	230V – 50/60Hz
Operating temperature:	Ambient. temp. 30°C = 30 ÷ 95°C Ambient. temp. 35°C = 35 ÷ 90°C Ambient. temp.
Max operating pressure:	6 bar
Minimum pressure on the intake side:	50°C = 0,3 bar 95°C = 1,0 bar
Max. percentage of glycol:	30%
Protection level:	IP44
Energy Class (EEI):	≤0.21



Art. P330 - Circulator with fixed ΔP , variable ΔP and 3 costant speed:

TECHNICAL SPECIFICATIONS:

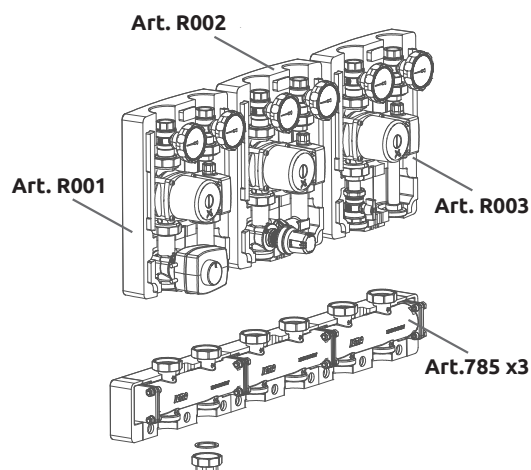
Brand:	Wilo
Model:	PARA RS 25/7 130
Centre to centre distance:	130 mm
Connections:	G 1"1/2 M
Electrical power supply:	230V – 50/60Hz
Operating temperature:	Ambient. temp. 50°C = 2 ÷ 105°C Ambient. temp. 55°C = 2 ÷ 90°C Ambient. temp. 60°C = 2 ÷ 77°C Ambient. temp. 65°C = 2 ÷ 60°C
Max operating pressure:	10 bar
Minimum pressure on the intake side:	0,5 bar
Max. percentage of glycol:	50%
Protection level:	IPx4D
Energy Class (EEI):	≤0.21

Accessories



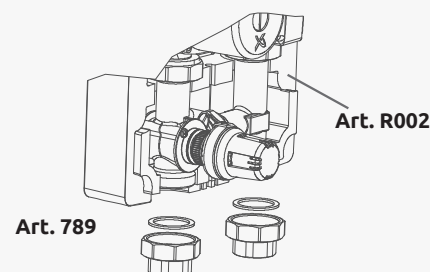
Art. 785

Modular brass double chamber manifold equipped with black EPP insulation shell, suitable for circulation modules art. R001-R002-R003-R004. Manifolds art. 785 can be used as single units or connected in series up to a maximum of 6 (Nuts, bolts and two O-ring included in the package)



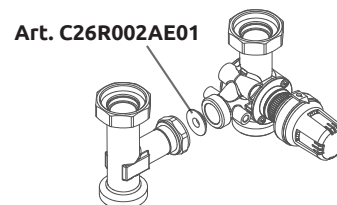
Art. 789

G 1" F X G 1" 1/2 F plane seat union with nut and gasket. It reduces from G 1" 1/2 F to G 1" F.



Art. C26R002AE01

Bypass reduction washer for systems with low prevalence on the primary side. Recommended in case the **mixing temperature** remains low and doesn't reach the **set point T**.



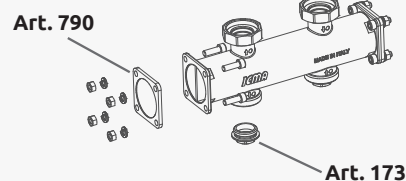
Art. 790

Head cap for manifold art. 785.



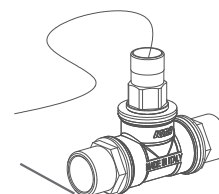
Art. 173

End cap with O-ring to close 1" exits of manifold art. 785.



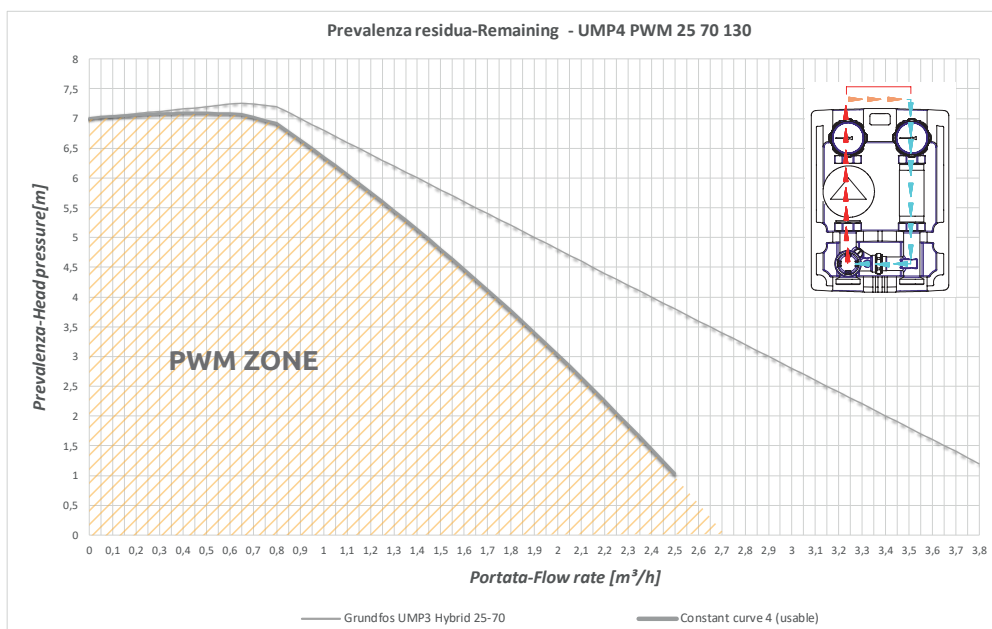
Art. 784

Housing kit for bulb art. 995. With 3/4" M - 1" connections.

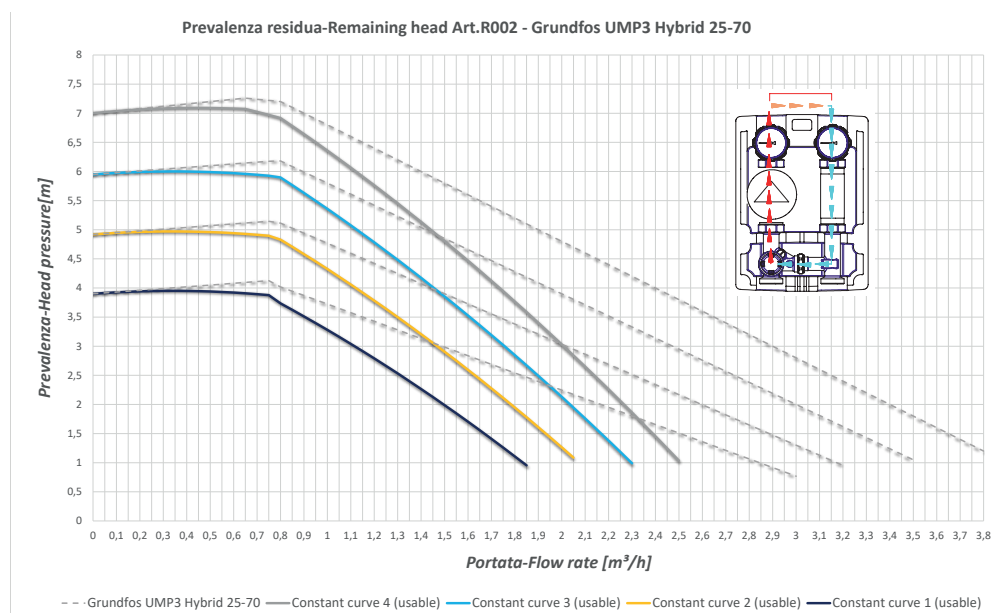


/ Hydraulic Specifications

Art. **P326**



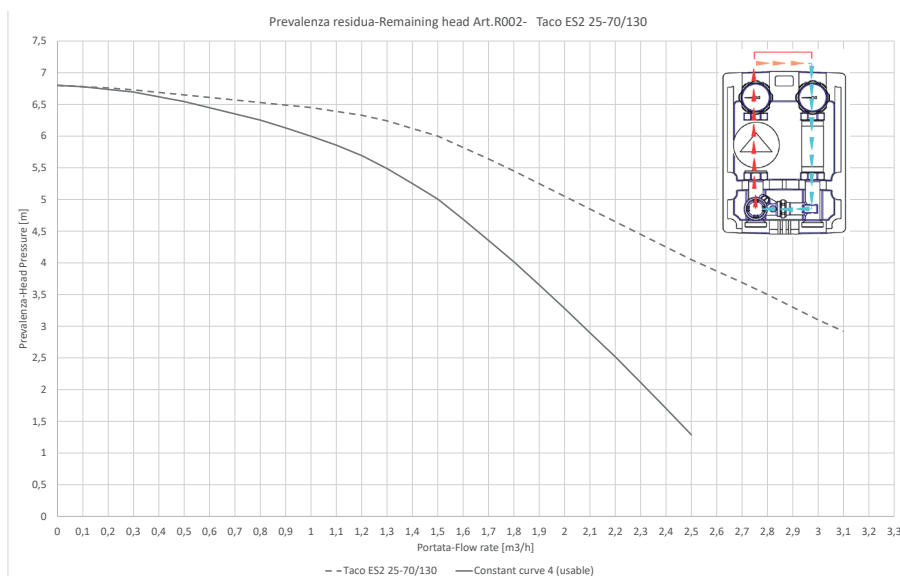
Art. **P328**



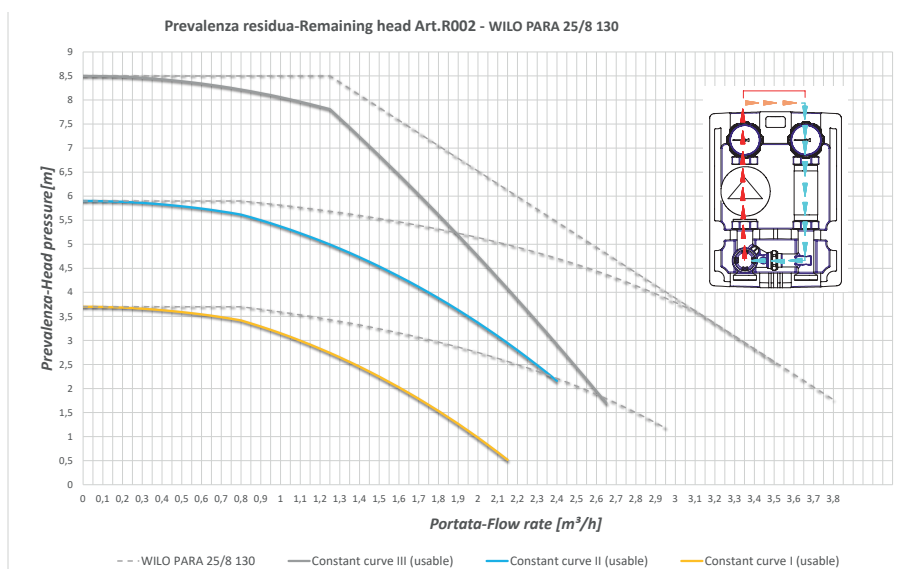
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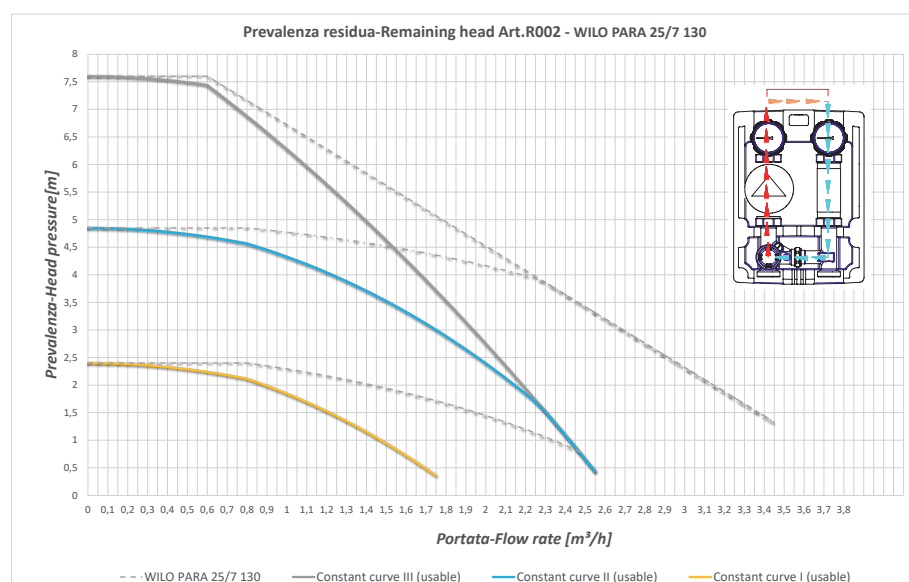
Art. P329



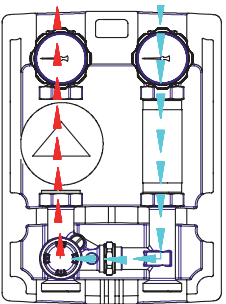
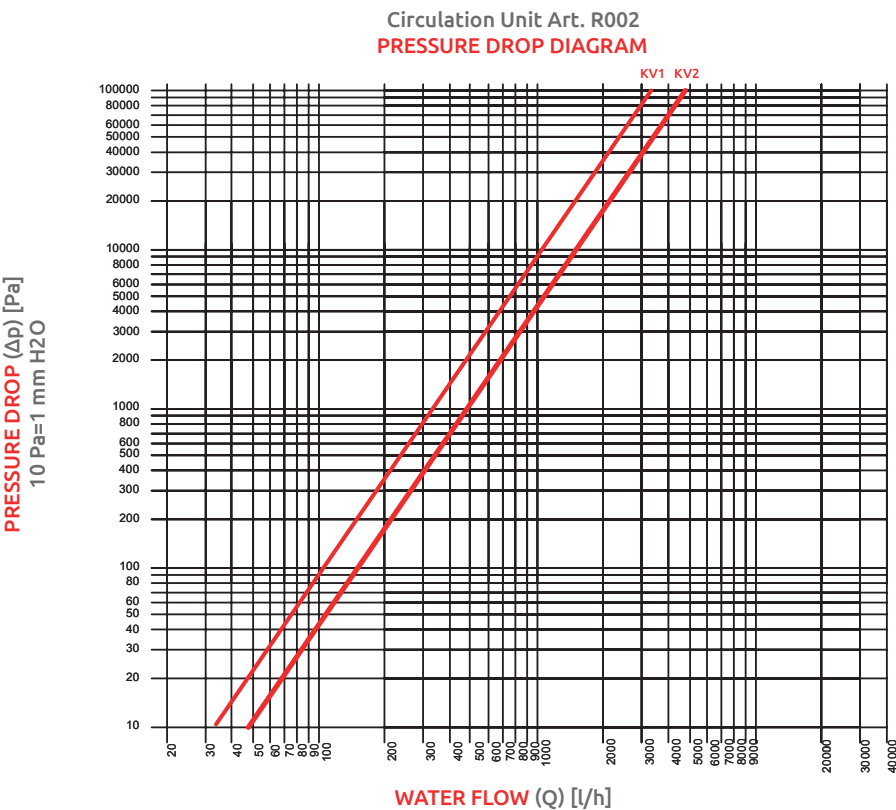
Art. P327



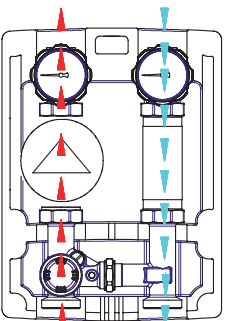
Art. P330



Hydraulic Specifications



Kv m3/h Angled way	4.8
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Kv m3/h Straight way	3.3
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/ Positioning

Right-Left Switching

The unit is supplied in two versions:

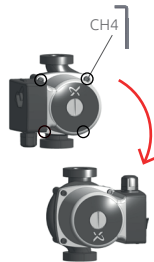
- **with right side delivery and upwards flow direction** (equivalent, if reversed, to a left side delivery and flow downwards)
- **with left side delivery and upwards flow direction** (equivalent, if reversed, to a right side delivery and flow downwards).

The delivery and return way can be easily reversed.

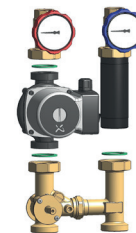
Below are the steps to be carried out in order to achieve a right-to-left delivery reversal.



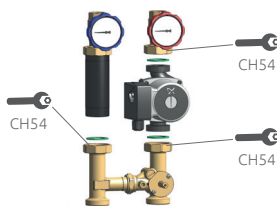
- 1)** Remove the insulation shells that are slightly paired to each other.



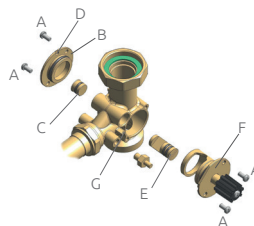
- 4)** Unscrew the marked screws on the picture, remove the impeller, rotate it by 180° and reassemble it on the pump body. Finally, rotate the pump body upside down.



- 6)** Assemble the unit according to the new layout with pump located on the left side, as shown in the picture. Tighten all the caps using suitable wrenches; carefully check the correct positioning of the gaskets.



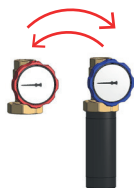
- 2)** Unscrew the nuts by using the wrenches shown in the picture. Be careful to avoid damages to the gaskets.



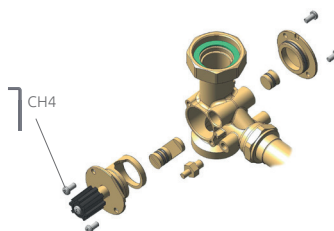
- 5)** The layout of the mixing valve must be reversed.
 6.1) Unscrew the 4 screws "A".
 6.2) Pull out the cap "B" and the regulation unit "F".
 6.3) Pull out the two elements of the by-pass "C" and "E".



- 7)** Finally replace the insulation shells by slotting them in to each other.



- 3)** Reverse the position of both on/off valves RED/BLU.



- 6.4) Reverse the elements "C" and "E"; be careful to avoid damages to the gaskets.
 6.5) Install the cap "B" and the regulation unit "F"; reverse the position of this unit, as well. Both elements are provided with a small reference slot "D" on the outer edge which must always match the notch on the valve body "G". Care must be taken in avoiding damages to the sealing O-Rings.
 6.6) Fasten the whole assembly with the 4 screws "A".

Group orientation

