

Pre-assembled manifold unit 1"

K013-K014-K023-K025-K026-K031-K032



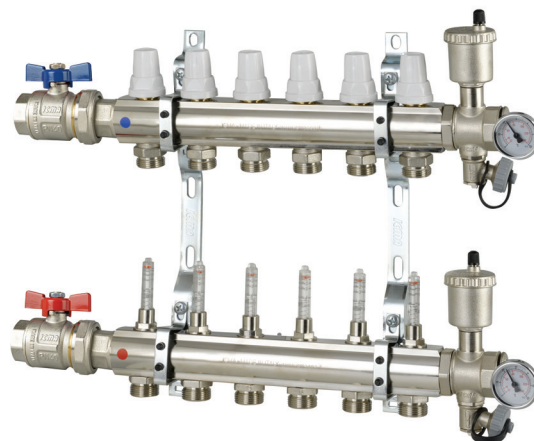
ST.K0XX.06.26.EN (NC 1598, NC 2175)

/ Function

ICMA's pre-assembled manifold units aim to optimise the distribution of the heat transfer fluid in underfloor heating systems. It's object is to improve the control of the thermal emission in every single area of the plant.

The units are supplied with all the accessories required for the installation, filling and management of low-temperature underfloor heating systems. Furthermore, they guarantee a simple and precise adjustment of the flow rates of the heat transfer fluid in every loop of the circuit, as well as the possibility of carrying out individual shut-offs.

The unit's particular structure is due to the shape of the fixing brackets. It facilitates connection operations with the pipes in the installation phase. Thanks to this compact structure and its dimensions, the units can easily be employed and installed in small spaces, even at a quite significant depth.



/ Products

Manifold units with manual/thermostatable shut-off and adjustment, with flow meters

K013-K014	Flow and return units equipped with brackets and anti-vibration gaskets
Go to the product page	
Go to the diagrams page	
K025-K026	Flow and return units with ball valves, automatic air vent valves, separate and revolving drain cocks.
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Go to the diagrams page	
K031-K032	Flow and return units with ball valves, automatic air vent valves, separate and revolving drain cocks.
Go to the product page	
Go to the diagrams page	
K024	Flow and return units with manual air vent valves on manifolds.
Go to the product page	
Go to the diagrams page	

/ Technical specifications

Materials

Flow manifold

Manifold: Brass CW617N - UNI EN 12165

Flowmeters

Headwork: Brass CW617N - UNI EN 12165

Bottom connection: Brass CW617N - UNI EN 12165

Glass: PA12 transparent

Measurement stem: PA12

Inner tube: PPE

Spring: Stainless steel

Hydraulic seals: Perox EPDM

Return manifold

Manifold: Brass CW617N - UNI EN 12165

Thermostatable valve:

Headwork: Brass CW617N - UNI EN 12165

Bottom connection: Brass CW617N - UNI EN 12165

Inner stem and spring: Stainless steel

Knob: ABS White

Hydraulic seals: Perox EPDM

Shut-off ball valves

Body: Brass CW617N - UNI EN 12165

Cap and pipe union: Brass CW617N - UNI EN 12165

Sphere and coupling: Brass CW617N - UNI EN 12164

Knob: Aluminium EN AB 46100

Ball gaskets: PTFE

Hydraulic seals: NBR, FKM

For the following articles, please find the specific technical data sheets:

Automatic air vent valves G1/2"	Articles 700-707
Manual air vent valves G1/2"	Article 705
Fill/drain cocks G1/2"	Article 172
M-F Intermediate fitting M-F G1"	Article 204
Thermometer cap with gasket for manifold connections G1"	Article 185
Termometers 0÷60 °C	Article 206
Brackets for installation	Article 208

Performance

Working fluids: Water and glycol solutions

Max. percentage of glycol: 30 %

Max. working pressure: 10 bar

Working temperature range: 5÷80 °C

Thermometers scale: 0÷60 °C

Manifold dimensions: G 1" / G 1" 1/4

Flowmeters

Flowmeters scale x manifolds G1": 0÷4 l/min

Flowmeters scale x manifolds G1" 1/4: 0÷8 l/min

Connections

Main connections: G1" F / G1 1/4" F (ISO 228-1)

Centre distance main connections: 207 mm

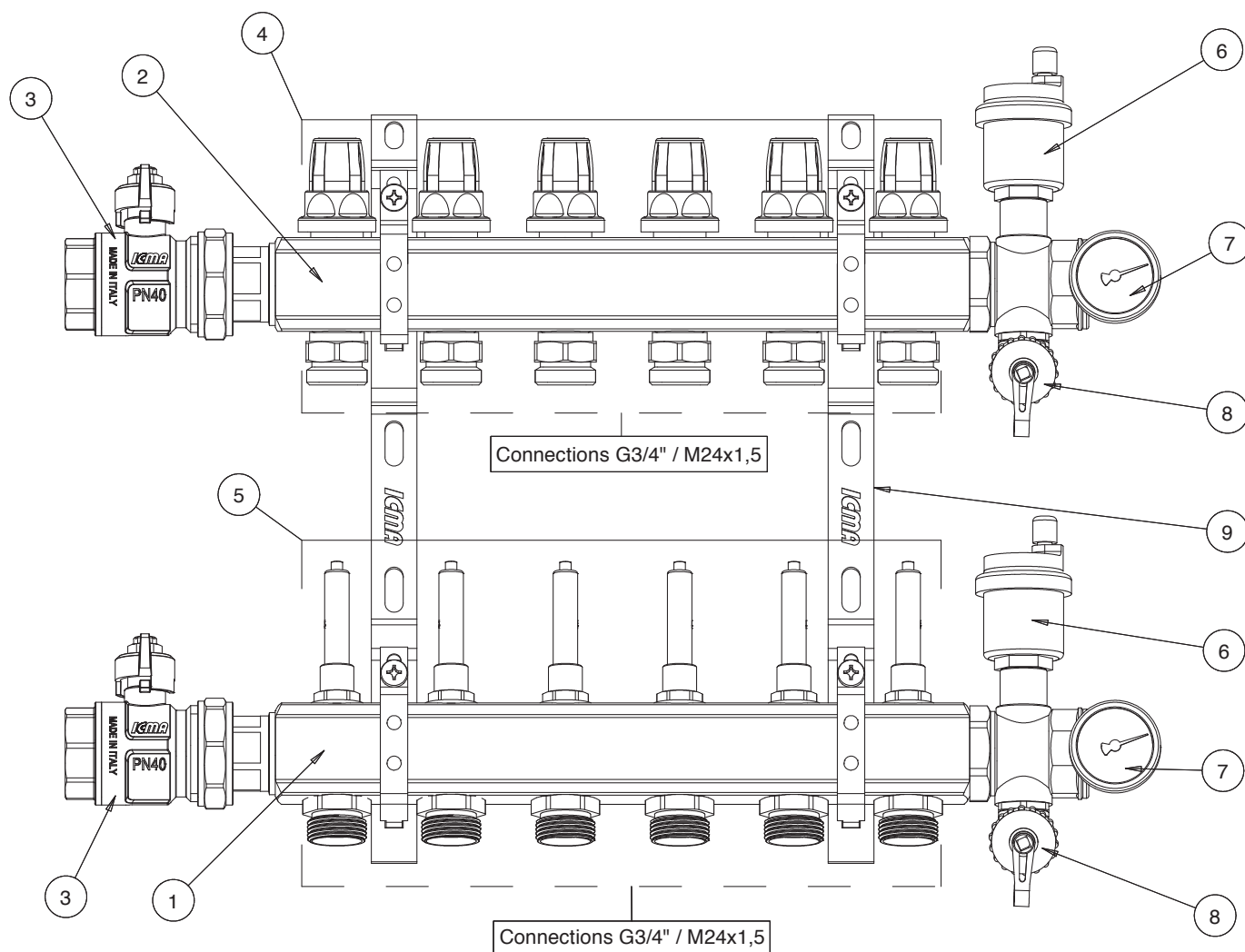
Derivations – connections: G3/4" M / M24x1,5 M

Derivations – hub spacing: 50 mm

Pre-assembled manifold unit 1"

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/ Components



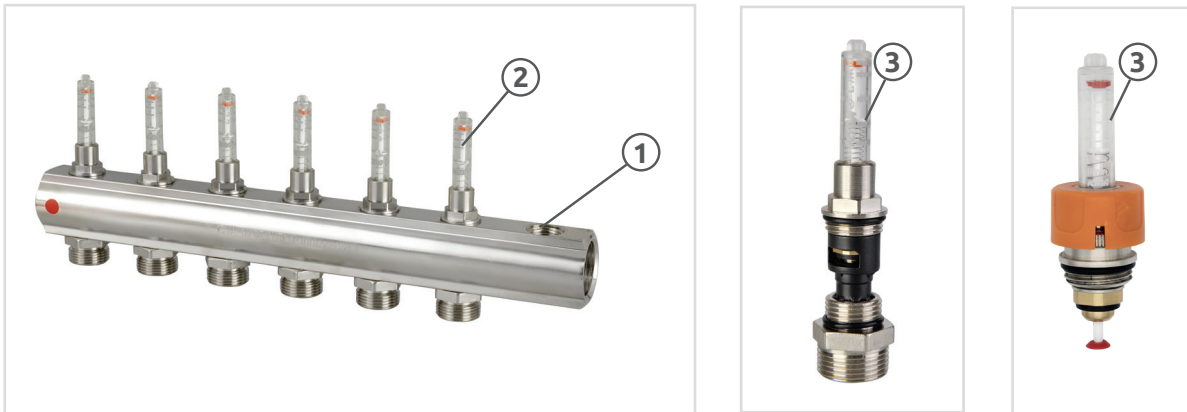
1. Flow manifold
2. Return manifold
3. Shut-off ball valves with o-ring seat pipe tail on manifold
4. Shut-off thermostatable ball valves for electrothermic actuators
5. Flowmeter with built-in flow rate balancing valves.
Adjustment range:
 - 0/4 L/Min in G1" manifolds
 - 0/8 L/Min in G1"½ manifolds
6. Air vent valves:
 - automatic floating valves in articles K025-K026 e K031-K032
 - manual air vent valves with revolving drain knob in articles K023-K024.
7. Thermometer caps with seat gaskets on manifold (equipped with 0-60° thermometers)
8. Water fill/drain cocks
9. Mounting brackets with anti-vibration gaskets

/ Components description

Flow manifold

The flow manifold consists of an extruded and perforated nickel-plated brass bar (1) and of a variable number of flowmeters equipped with flow rate balancing valves (2). On the transparent graded glass (3) that is placed in the upper part of the flowmeter, the flow rate measure of every loop of the plant can be read in real time. (The flowmeters reading scale depends on the manifold: for G1" manifolds the scale is 0÷4 l/min, for G1"¼ manifolds it is 0÷8 l/min). Through the balancing valve it is possible to adjust precisely the flow rate of the individual loops. This considerably facilitates and speeds up the circuit setting process.

Moreover, in case of need, the same valve allows shutting off every single circuit, isolating it from the plant. For the description of the valve's balancing operation, please look at it's specific chapter at page 7.



Return manifold

The return manifold consists of an extruded and perforated nickel-plated brass bar (1) and of a variable number of shut-off thermostatable valves (2), as well. The thermostatable valves allow to open and close manually every single derivation loop, according to need.

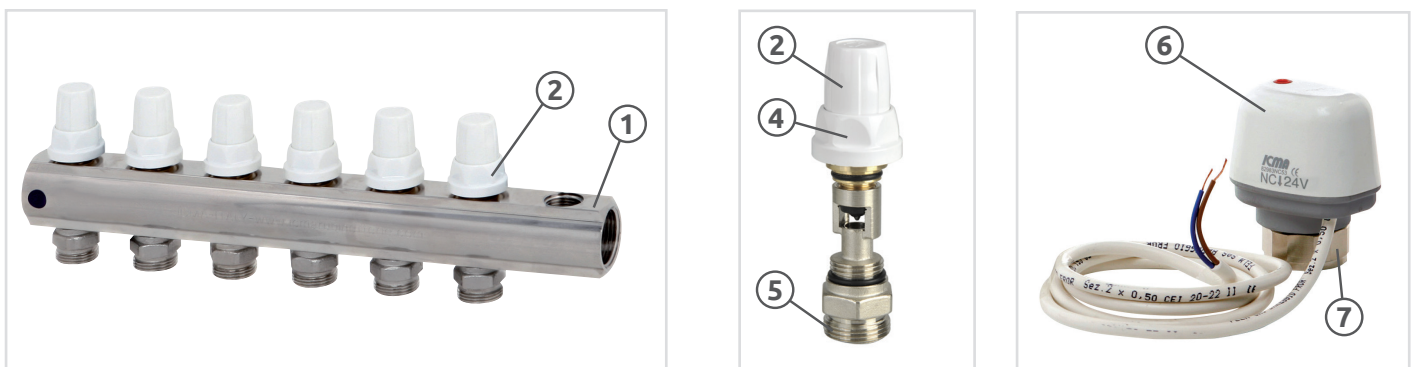
By completely rotating clockwise the upper part of the white cap (3) placed on the valve, it is possible to block the fluid's flow in its derivation loop (5), thus isolating it from the whole circuit.

Furthermore, the shut-off valves are suitable for the installation of electrothermic actuators (6) which allow to maintain the set temperature in the various spaces, if connected correctly to a room thermostat.

This operation requires removing both of the parts of the white knob (3 & 4) from the valve's body. After that lock the installation loop (7), then the actuator.

It will still be possible to remove the installed actuator and put back the white knob to its place for manual control at any time. This will bring the shut-off valve to its prior condition.

For the operations of installation of the actuators, please find the specific instruction sheet in their package.



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/ Accessories

Shut-off valves



Art. 215 - Full bore ball valve with pipe tail, red/blue coated Aluminum T-handle, flat seat connection. Anti-blow out stem. Thread ISO 228.

Art.	Size	Color	Code
215	1"	Red	87251AF11
215	1"	Blue	87251AF12



Art. 225 - Full bore angle ball valve, red/blue coated Aluminum T-handle, M/F connection thread, Double O-ring, anti-blow out stem. Thread ISO 228.

Art.	Size	Color	Code
225	1"	Red	87225AF11
225	1"	Blue	87225AF12



Art. 216 - Full bore ball valve with revolving connection. Tail with O-ring seat. With thermometer (thermometer art. 206 0-60° included). Thread ISO 228.

Art.	Size	Color	Code
216	1"	Red	87216AF11
216	1"	Blue	87216AF12
216	1"1/4	Red	87216AF11
216	1"1/4	Blue	87216AF12



Art. 226 - Full bore angle ball valve. Revolving connection. Tail with plane seat. With thermometer (thermometer art. 206 0-60° included). Thread ISO 228.

Art.	Size	Color	Code
216	1"	Red	87216AF11
216	1"	Blue	87216AF12
216	1"1/4	Red	87216AF11
216	1"1/4	Blue	87216AF12

Air vent valves



Art. 700 - Automatic floating air vent. Compact model

Art.	Size	Code
700	1/2"	82700AD06



Art. 705 - Manual air vent with revolving drain knob with O-ring seat

Art.	Size	Code
705	1/2"	82705AD06

Taps



Art. 185
Thermometer cap with gasket for manifold connections.

Art.	Size	Code
185	1"	87185AF06



Art. 173 - End cap with O-ring to close exits of manifolds

Art.	Size	Code
173	3/4"	87173AE05
173	1"	87173AF06
173	1"1/4	87173AG06



Art. 209 - Revolving terminal connection with automatic air vent and drain cock

Art.	Size	Code
209	1"	87209AF06
209	1"1/4	87209AG06



Art. 269 - Terminal connection with anti-leakage gasket with Automatic or manual valve for air vent and drain cock

Art.	Size	Code
209	1"	87209AF06
209	1"1/4	87209AG06



Art. 205 - Male-female intermediate fitting. Revolving connection, automatic air vent, thermometer and drain cock

Art.	Size	Code
205	1"	87205AF06

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Drain cock



Art. 172 - Water discharger rotating tap with latch and possibility of rotation of the drain.

Art.	Size	Code
172	1/2"	87172AD06

Mounting bracket



Art. 208 - Bracket complete with anti-vibration supports. Interaxe between the 2 manifolds: 210 mm.

Art.	Size	Code
208	1"	87208AF06
208	1"1/4	87208AG06

Electrothermic actuators



Art. 982 - Electrothermic actuator with micro switch for potential-free contact. Normally closed

Art.	Size	Voltage	Code
982	28x1,5	24 volt	82982NC54
982	28x1,5	230 volt	82982NC53



Art. 983 - Electrothermic on-off actuator normally closed.

Art.	Size	Voltage	Code
983	28x1,5	24 volt	82983NC54
983	28x1,5	230 volt	82983NC53

Fittings for multilayer pipe



Fittings for pipes in simple plastic material or multilayer

Art. 100 - connection thread for fitting on M24x1,5 manifold

Art. 101 - connection thread for fitting on G3/4" Euroconus manifold

They guarantee a safe and simple connection of the multilayer pipe to the derivation of the flow and return manifolds. The seals on the pipe and on the manifold are made with Perox EPDM O-Ring rings. Thanks to their reduces roughness on the internal surface, they guarantee low head losses.

Insulators



Art. 177 -Insulators for 1" and 1"1/4 manifolds. For manifolds 1" up to 12 outlets, for manifolds 1"1/4 up to 15 outlets. The insulators can be cut, to insulate the manifolds carrying a lower outlet number. Holes on both sides with 50 mm interaxe.

Art.	Size head connections	Code Euroconus
177	1"	87177AF66
177	1"1/4	87177AG66

Boxes for manifolds



Art. 196 - box for underfloor heating systems with lock. Adjustable height (from 630 mm to 930 mm) and depth (from 90 mm to 110 mm). It is possible to regulate the internal position of the manifold (up-down and laterally).

For manifolds without circulating pump. Sheet frame and cover thickness 1 mm for a high constructive solidity.

Art.	Width	Code
196	500	87196OE09
196	700	87196OF09
196	850	87196OK09
196	1000	87196OG09
196	1200	87196OH09



Art. 197 - Art. 197 - box for underfloor heating systems with lock. Adjustable height (from 630 mm to 930 mm) and depth (from 110 mm to 130 mm). It is possible to regulate the internal position of the manifold (up-down and laterally).

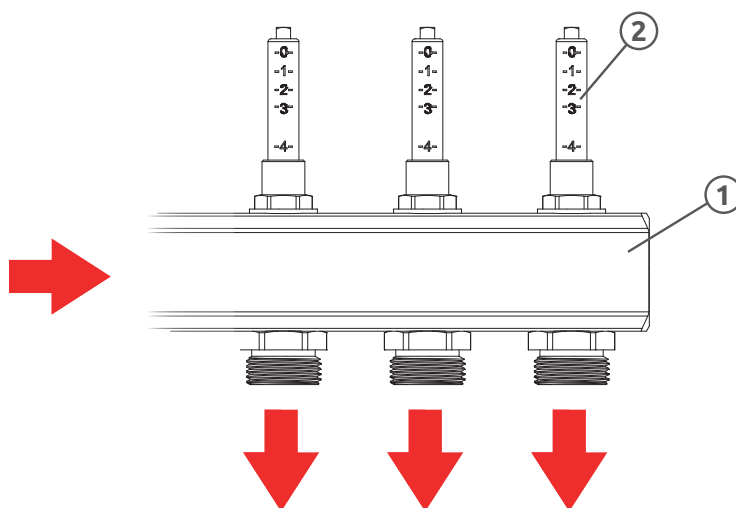
For manifolds with circulating pump. Sheet frame and cover thickness 1 mm for a high constructive solidity.

Art.	Width	Code
196	600	87197OC09
196	700	87197OF09
196	850	87197OK09
196	1000	87197OG09
196	1200	87197OH09

/ Use of flowmeters with built-in balancing valve

The flow manifold, like previously explained, consists of an extruded and perforated nickel-plated brass bar (1) on which flowmeters with flow rate balancing valves are built.

Flowmeters have the job to indicate the measures of the flow rate of every single loop of the plant in real time, while the built-in balancing valves allow the adjustment in a simple and precise way. This facilitates and speeds up the operation of adjustment of the internal circuit. Additionally, the accuracy of the flowmeter allows the calibration of the flow of the thermal medium even at really low flow rates.



Balancing of the flow rate

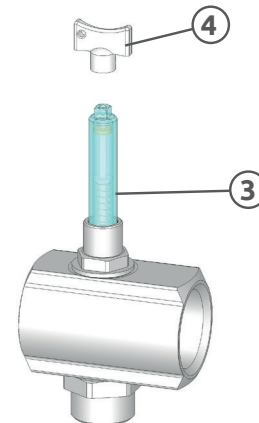
To adjust the flow rate, simply rotate the transparent glass (3) placed in the upper part of the flowmeter.

To simplify this operation, a special key (4) is supplied in the package. This key must be inserted on the upper part of the glass.

- By rotating the glass clockwise, the flow rate decreases

- By rotating the glass counter clockwise, the flow rate increases

By completely closing the balancing valve, it is possible to block every single loop, thus isolating it from the circuit.



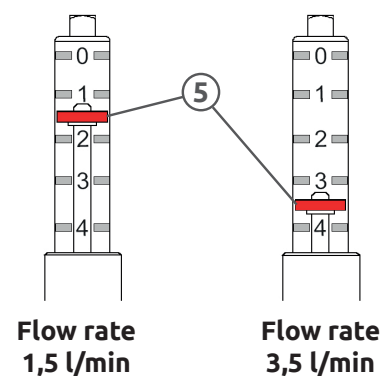
Flow rate reading

On the outside of the transparent glass there is a measuring scale, while inside of it there is a white stem with an orange plate. These two components rise and lower inside the glass, depending on the variations of the flow rate of the fluid in the flowmeter. The position of the orange plate compared to the measuring scale on the glass indicates the real measure of the fluid's flow rate. The fluid measured flows in the flowmeter and consequently in the corresponding loop of the underfloor heating system. The flowmeters reading range is the following:

0÷4 l/min in G1" manifolds

0÷8 l/min in G1" ¼ manifolds

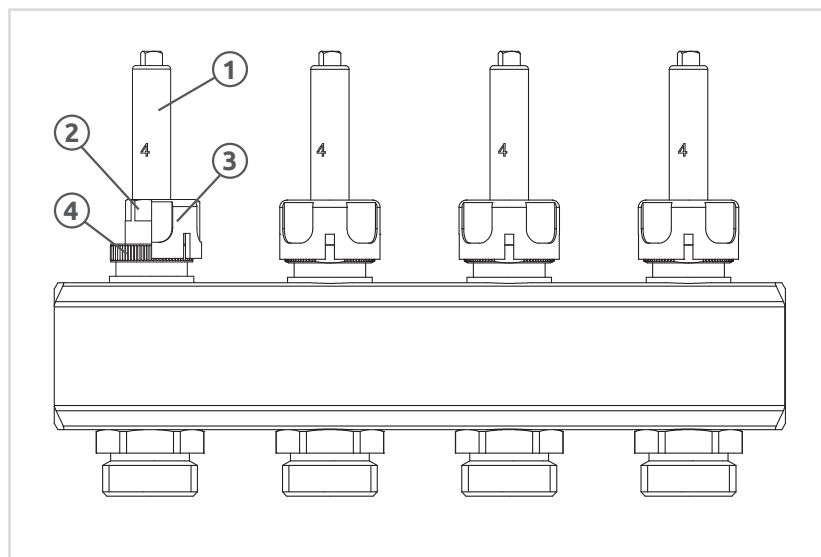
Reading examples



/ Use of flowmeters with memory-plus system

The flow manifold, like previously explained, consists of an extruded and perforated nickel-plated brass bar (1) on which flowmeters with flow rate balancing valves are built.

Flowmeters have the job to indicate the flow rate measures of every single loop of the plant in real time, while the built-in balancing valves allow the adjustment in a simple and precise way. This facilitates and speeds up the operation of adjustment of the internal circuit. Additionally, the accuracy of the flowmeter allows the calibration of the flow of the thermal medium even at really low flow rates.



Use

The Memory-Plus flowmeter is installed on flow manifolds for underfloor radiant panel systems. This device allows to view the exact flow rate in every circuit in real time. The accuracy of the flowmeter allows the calibration of the water flow even at really low flow rates. Available for flow rates: 0-4l/min and 0-8 l/min.

Operation

The Memory-Plus flowmeter is able to memorise the required flow rate and to open and close the meter without losing the calibration set previously.

For a proper calibration of the flow rate please do as follows:

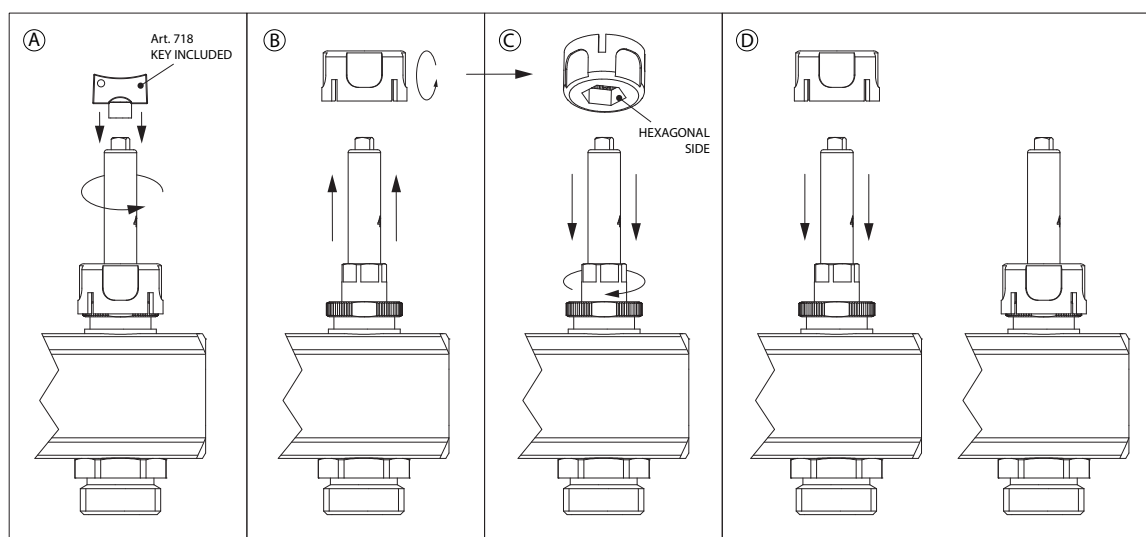
Completely rotate counter clockwise the glass (1), using the opening and closing key included in art. 718. Essential condition to obtain a proper adjustment.

Remove the blocking ring (3).

Slowly rotate clockwise the balancing headwork (2) until the wished flow rate is viewed on the glass.

For this operation turn upside down the blocking ring (3) and use it from its hexagonal side to carry out a proper adjustment. To ensure that the flow rate remains unaltered, please put back the blocking ring (3) on the headwork (2) and on the part in knurled brass underneath (4).

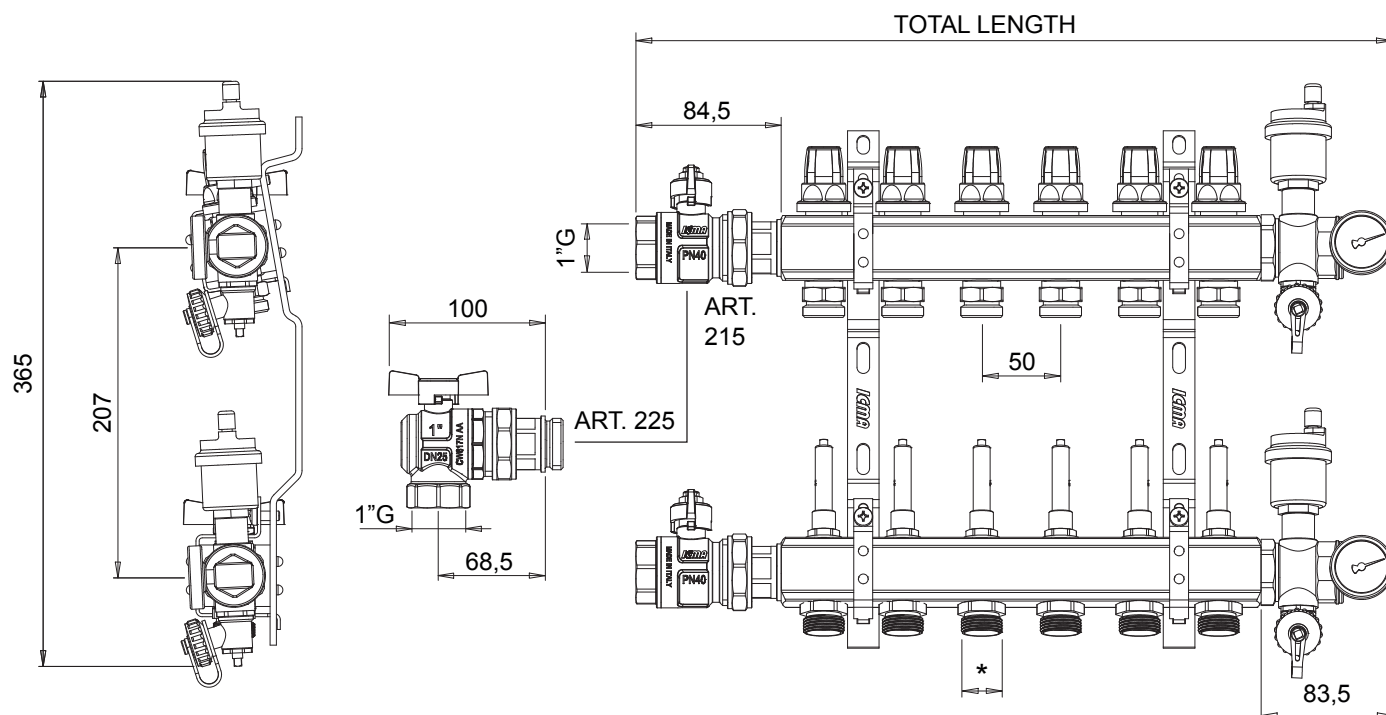
After this operation of blocking and calibration, it will be possible to close and reopen the meter by rotating the glass (1) without losing the previously set calibration. When the device is operating normally, the glass should always be fully opened.



Pre-assembled manifold unit 1"

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Dimensions



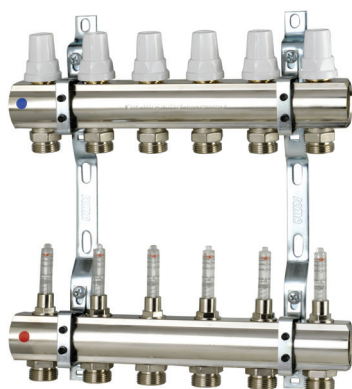
PLEASE NOTE: For the total length and the manifold codes, please find the tables "codes and dimensions" in the following pages.

K013-K014 Manifolds

Manifold with manual/thermostatable shut-off and adjustment, with flow meters. Brackets with anti-vibration supports (Art. 208). The flow regulators allow to close and regulate the flow.

Suitable for 3/4" Euroconus or M24x1,5 fittings.

Choose electrothermic actuators with 28x1,5 connection thread.



Art.	Head connection size	Outlets	Code Euroconus	Code M24X1,5	Manifold total length
K013/K014	1"	2	87K013PG06	87K014PG06	104 mm
K013/K014	1"	3	87K013PH06	87K014PH06	154 mm
K013/K014	1"	4	87K013PJ06	87K014PJ06	204 mm
K013/K014	1"	5	87K013PQ06	87K014PQ06	254 mm
K013/K014	1"	6	87K013PK06	87K014PK06	304 mm
K013/K014	1"	7	87K013PR06	87K014PR06	354 mm
K013/K014	1"	8	87K013PL06	87K014PL06	404 mm
K013/K014	1"	9	87K013PS06	87K014PS06	454 mm
K013/K014	1"	10	87K013PM06	87K014PM06	504 mm
K013/K014	1"	11	87K013PT06	87K014PT06	554 mm
K013/K014	1"	12	87K013PU06	87K014PU06	604 mm
K013/K014	1"	13	87K013PV06	87K014PV06	654 mm
K013/K014	1"	14	87K013PW06	87K014PW06	704 mm
K013/K014	1"	15	87K013PY06	87K014PY06	754 mm

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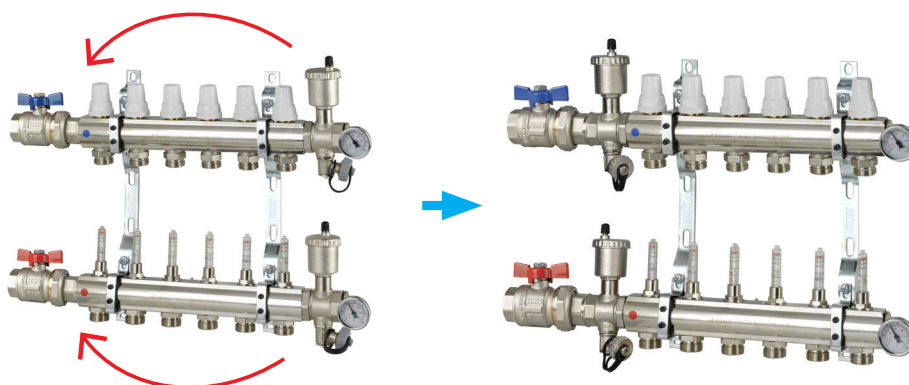
/ K025-K026 Manifolds

Manifolds unit with manual/thermostatable shut-off and adjustment, with flow meters. It includes:

- 2 ball valves (art. 215 o art. 225);
- Connection to the ball valve with gasket with plane seat and o-ring;
- 2 brackets (art.208) with anti-vibration supports;
- 2 1" male/female intermediate fittings with revolving connection (Art. 204*).
- 2 3/8" automatic air vents (art. 700);
- 2 1/2" drain cocks (art. 172);
- 2 1" thermometer caps with o-ring (Art. 185);
- 2 0-60° thermometers (art. 206).

Suitable for 3/4" Euroconus or M24x1,5 fittings. Choose thermostatic and electrothermic actuators with 28x1,5 connection thread.

*Art. 204 can be assembled between manifold and ball valve.



With straight ball valve

Art.	Head connection size	Outlets	Code Euroconus	Code M24X1,5	Manifold total length	Suggested box art. 196
K025/K026	1"	2	87K025PG06	87K026PG06	295 mm	500 mm
K025/K026	1"	3	87K025PH06	87K026PH06	345 mm	500 mm
K025/K026	1"	4	87K025PJ06	87K026PJ06	395 mm	500 mm
K025/K026	1"	5	87K025PQ06	87K026PQ06	445 mm	700 mm
K025/K026	1"	6	87K025PK06	87K026PK06	495 mm	700 mm
K025/K026	1"	7	87K025PR06	87K026PR06	545 mm	700 mm
K025/K026	1"	8	87K025PL06	87K026PL06	595 mm	700 mm
K025/K026	1"	9	87K025PS06	87K026PS06	645 mm	850 mm
K025/K026	1"	10	87K025PM06	87K026PM06	695 mm	850 mm
K025/K026	1"	11	87K025PT06	87K026PT06	745 mm	850 mm
K025/K026	1"	12	87K025PU06	87K026PU06	795 mm	1000 mm
K025/K026	1"	13	87K025PV06	87K026PV06	845 mm	1000 mm
K025/K026	1"	14	87K025PW06	87K026PW06	895 mm	1200 mm
K025/K026	1"	15	87K025PY06	87K026PY06	945 mm	1200 mm



With angle ball valve

Art.	Head connection size	Outlets	Code Euroconus	Code M24X1,5	Manifold total length	Suggested box art. 196
K025/K026	1"	2	87K025PG06 225	87K026PG06 225	295 mm	500 mm
K025/K026	1"	3	87K025PH06 225	87K026PH06 225	345 mm	500 mm
K025/K026	1"	4	87K025PJ06 225	87K026PJ06 225	395 mm	500 mm
K025/K026	1"	5	87K025PQ06 225	87K026PQ06 225	445 mm	700 mm
K025/K026	1"	6	87K025PK06 225	87K026PK06 225	495 mm	700 mm
K025/K026	1"	7	87K025PR06 225	87K026PR06 225	545 mm	700 mm
K025/K026	1"	8	87K025PL06 225	87K026PL06 225	595 mm	700 mm
K025/K026	1"	9	87K025PS06 225	87K026PS06 225	645 mm	850 mm
K025/K026	1"	10	87K025PM06 225	87K026PM06 225	695 mm	850 mm
K025/K026	1"	11	87K025PT06 225	87K026PT06 225	745 mm	850 mm
K025/K026	1"	12	87K025PU06 225	87K026PU06 225	795 mm	1000 mm
K025/K026	1"	13	87K025PV06 225	87K026PV06 225	845 mm	1000 mm
K025/K026	1"	14	87K025PW06 225	87K026PW06 225	895 mm	1200 mm
K025/K026	1"	15	87K025PY06 225	87K026PY06 225	945 mm	1200 mm

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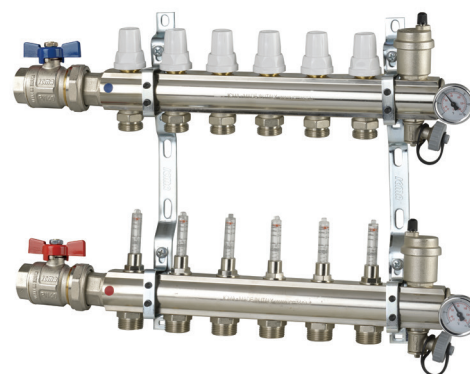
/ K031-K032 Manifolds

Manifolds unit with manual/thermostatable shut-off and adjustment, with flow meters. It includes:

- 2 ball valves (art. 215 o art. 225);
- Connection to the ball valve with gasket with plane seat and o-ring;
- 2 brackets (art.208) with anti-vibration supports;
- 2 1/2" automatic air vents (art.700);
- 2 1/2" drain cocks (art.172);
- 2 1" thermometer caps with o-ring (art.185);
- 2 0-60° thermometers (art.206).

Suitable for 3/4" Euroconus or M24x1,5 fittings.

Choose thermostatic and electrothermic actuators with 28x1,5 connection thread



With straight ball valve

Art.	Head connection size	Outlets	Code Euroconus	Code M24X1,5	Manifold total length	Suggested box art. 196
K031/K032	1"	2	87K031PG06	87K032PG06	295 mm	500 mm
K031/K032	1"	3	87K031PH06	87K032PH06	345 mm	500 mm
K031/K032	1"	4	87K031PJ06	87K032PJ06	395 mm	500 mm
K031/K032	1"	5	87K031PQ06	87K032PQ06	445 mm	700 mm
K031/K032	1"	6	87K031PK06	87K032PK06	495 mm	700 mm
K031/K032	1"	7	87K031PR06	87K032PR06	545 mm	700 mm
K031/K032	1"	8	87K031PL06	87K032PL06	595 mm	700 mm
K031/K032	1"	9	87K031PS06	87K032PS06	645 mm	850 mm
K031/K032	1"	10	87K031PM06	87K032PM06	695 mm	850 mm
K031/K032	1"	11	87K031PT06	87K032PT06	745 mm	850 mm
K031/K032	1"	12	87K031PU06	87K032PU06	795 mm	1000 mm
K031/K032	1"	13	87K031PV06	87K032PV06	845 mm	1000 mm
K031/K032	1"	14	87K031PW06	87K032PW06	895 mm	1200 mm



With angle ball valve

Art.	Head connection size	Outlets	Code Euroconus	Code M24X1,5	Manifold total length	Suggested box art. 196
K031/K032	1"	2	87K031PG06 226	87K032PG06 226	295 mm	500 mm
K031/K032	1"	3	87K031PH06 226	87K032PH06 226	345 mm	500 mm
K031/K032	1"	4	87K031PJ06 226	87K032PJ06 226	395 mm	500 mm
K031/K032	1"	5	87K031PQ06 226	87K032PQ06 226	445 mm	700 mm
K031/K032	1"	6	87K031PK06 226	87K032PK06 226	495 mm	700 mm
K031/K032	1"	7	87K031PR06 226	87K032PR06 226	545 mm	700 mm
K031/K032	1"	8	87K031PL06 226	87K032PL06 226	595 mm	700 mm
K031/K032	1"	9	87K031PS06 226	87K032PS06 226	645 mm	850 mm
K031/K032	1"	10	87K031PM06 226	87K032PM06 226	695 mm	850 mm
K031/K032	1"	11	87K031PT06 226	87K032PT06 226	745 mm	850 mm
K031/K032	1"	12	87K031PU06 226	87K032PU06 226	795 mm	1000 mm
K031/K032	1"	13	87K031PV06 226	87K032PV06 226	845 mm	1000 mm
K031/K032	1"	14	87K031PW06 226	87K032PW06 226	895 mm	1200 mm

Pre-assembled manifold unit 1"

K013-K014-K023-K025-K026-K031-K032



ST.K0XX.06.26.EN (NC 1598, NC 2175)

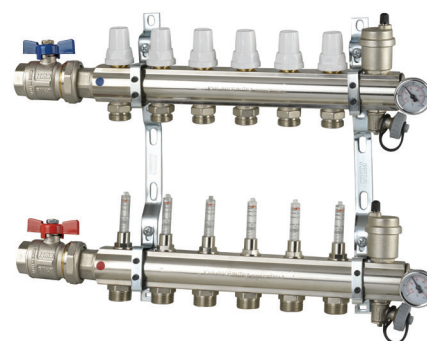
/ K031-K032 Manifolds with Memory Plus

Manifolds unit with manual/thermostatable shut-off and adjustment, with Memory Plus flowmeters. It includes:

- 2 ball valves (art.215 or 225);
- connection to the ball valve with gasket with plane seat and o-ring;
- 2 brackets (art.208) with anti-vibration supports;
- 2 1/2" automatic air vents (art.700);
- 2 1/2" drain cocks (art.172);
- 2 1" thermometer caps with o-ring (art.185);
- 2 0-60° thermometers (art.206).

Suitable for 3/4" Euroconus or M24x1,5 fittings.

Choose thermostatic and electrothermic actuators with 28x1,5 connection thread.



With straight ball valve

Art.	Head connection size	Outlets	Code Euroconus	Code M24X1,5	Manifold total length	Suggested box art. 196
K031/K032	1"	2	FRK031PG06	FRK032PG06	295 mm	500 mm
K031/K032	1"	3	FRK031PH06	FRK032PH06	345 mm	500 mm
K031/K032	1"	4	FRK031PJ06	FRK032PJ06	395 mm	500 mm
K031/K032	1"	5	FRK031PQ06	FRK032PQ06	445 mm	700 mm
K031/K032	1"	6	FRK031PK06	FRK032PK06	495 mm	700 mm
K031/K032	1"	7	FRK031PR06	FRK032PR06	545 mm	700 mm
K031/K032	1"	8	FRK031PL06	FRK032PL06	595 mm	700 mm
K031/K032	1"	9	FRK031PS06	FRK032PS06	645 mm	850 mm
K031/K032	1"	10	FRK031PM06	FRK032PM06	695 mm	850 mm
K031/K032	1"	11	FRK031PT06	FRK032PT06	745 mm	850 mm
K031/K032	1"	12	FRK031PU06	FRK032PU06	795 mm	1000 mm
K031/K032	1"	13	FRK031PV06	FRK032PV06	845 mm	1000 mm
K031/K032	1"	14	FRK031PW06	FRK032PW06	895 mm	1200 mm



With angle ball valve

Art.	Head connection size	Outlets	Code Euroconus	Code M24X1,5	Manifold total length	Suggested box art. 196
K031/K032	1"	2	FRK031PG06 226	FRK032PG06 226	295 mm	500 mm
K031/K032	1"	3	FRK031PH06 226	FRK032PH06 226	345 mm	500 mm
K031/K032	1"	4	FRK031PJ06 226	FRK032PJ06 226	395 mm	500 mm
K031/K032	1"	5	FRK031PQ06 226	FRK032PQ06 226	445 mm	700 mm
K031/K032	1"	6	FRK031PK06 226	FRK032PK06 226	495 mm	700 mm
K031/K032	1"	7	FRK031PR06 226	FRK032PR06 226	545 mm	700 mm
K031/K032	1"	8	FRK031PL06 226	FRK032PL06 226	595 mm	700 mm
K031/K032	1"	9	FRK031PS06 226	FRK032PS06 226	645 mm	850 mm
K031/K032	1"	10	FRK031PM06 226	FRK032PM06 226	695 mm	850 mm
K031/K032	1"	11	FRK031PT06 226	FRK032PT06 226	745 mm	850 mm
K031/K032	1"	12	FRK031PU06 226	FRK032PU06 226	795 mm	1000 mm
K031/K032	1"	13	FRK031PV06 226	FRK032PV06 226	845 mm	1000 mm
K031/K032	1"	14	FRK031PW06 226	FRK032PW06 226	895 mm	1200 mm

Pre-assembled manifold unit 1"

K013-K014-K023-K025-K026-K031-K032

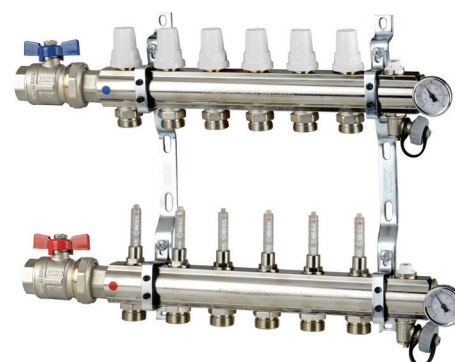
K023 Manifolds

Manifolds unit with manual/thermostatable shut-off and adjustment, with flowmeters. It includes:

- 2 ball valves (art.215 or 225);
- connection to the ball valve with gasket with flat seat and o-ring;
- 2 brackets (art.208) with anti-vibration supports;
- 2 built-in manual air vents with o-ring (art.705);
- 2 1/2" drain cocks (art.172);
- 2 1" thermometer caps with o-ring (art.185);
- 2 0-60° thermometers (art.206).

Suitable for 3/4" Euroconus.

Choose thermostatic and electrothermic actuators with 28×1,5 connection thread.



With straight ball valve

Art.	Head connection size	Outlets	Code Euroconus	Manifold total length	Suggested box art. 196
K023	1"	2	87K023PG06	295 mm	500 mm
K023	1"	3	87K023PH06	345 mm	500 mm
K023	1"	4	87K023PJ06	395 mm	500 mm
K023	1"	5	87K023PQ06	445 mm	700 mm
K023	1"	6	87K023PK06	495 mm	700 mm
K023	1"	7	87K023PR06	545 mm	700 mm
K023	1"	8	87K023PL06	595 mm	700 mm
K023	1"	9	87K023PS06	645 mm	850 mm
K023	1"	10	87K023PM06	695 mm	850 mm
K023	1"	11	87K023PT06	745 mm	850 mm
K023	1"	12	87K023PU06	795 mm	1000 mm
K023	1"	13	87K023PV06	845 mm	1000 mm
K023	1"	14	87K023PW06	895 mm	1200 mm
K023	1"	15	87K023PY06	945 mm	1200 mm



With angle ball valve

Art.	Head connection size	Outlets	Code Euroconus	Manifold total length	Suggested box art. 196
K023	1"	2	87K023PG06 226	295 mm	500 mm
K023	1"	3	87K023PH06 226	345 mm	500 mm
K023	1"	4	87K023PJ06 226	395 mm	500 mm
K023	1"	5	87K023PQ06 226	445 mm	700 mm
K023	1"	6	87K023PK06 226	495 mm	700 mm
K023	1"	7	87K023PR06 226	545 mm	700 mm
K023	1"	8	87K023PL06 226	595 mm	700 mm
K023	1"	9	87K023PS06 226	645 mm	850 mm
K023	1"	10	87K023PM06 226	695 mm	850 mm
K023	1"	11	87K023PT06 226	745 mm	850 mm
K023	1"	12	87K023PU06 226	795 mm	1000 mm
K023	1"	13	87K023PV06 226	845 mm	1000 mm
K023	1"	14	87K023PW06 226	895 mm	1200 mm
K023	1"	15	87K023PY06 226	945 mm	1200 mm

Pre-assembled manifold unit 1"

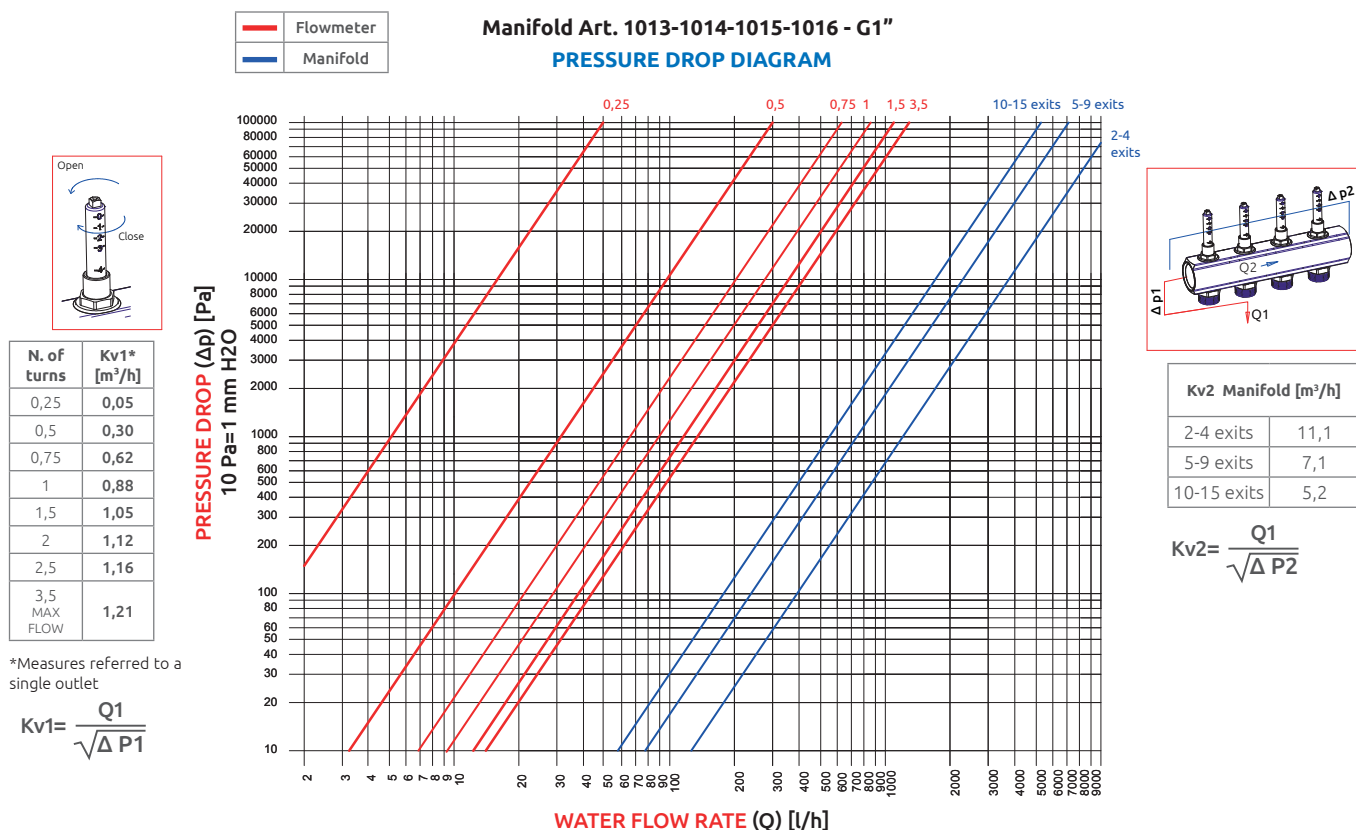
K013-K014-K023-K025-K026-K031-K032

/ Hydraulic characteristics

A radiant panel circuit with a manifolds unit such as the ones described in this technical data sheet, has specific hydraulic characteristics. They essentially correspond to the head losses of the circuit. By definition, the head loss is a loss of pressure due to a set of passive forces (curves, derivations, bottlenecks and roughness of materials).

These forces resist water flow in a panel pipe or in a circuit. It is fundamental to know the measure of the total head loss in a circuit while designing a plant. This is because it is necessary to define the measure of the flow rate and, consequently, of the circulation pump head needed, as well.

To define the total head loss of a circuit, it is necessary to know and do the sum of all the head losses of every single device of the circuit



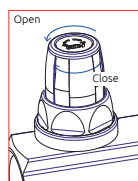
Pre-assembled manifold unit 1"

K013-K014-K023-K025-K026-K031-K032

—	Spindle
—	Manifold

Manifold Art. 1001-1002-1007-1008 - G1"

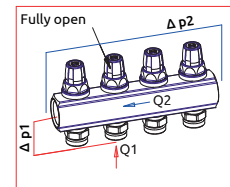
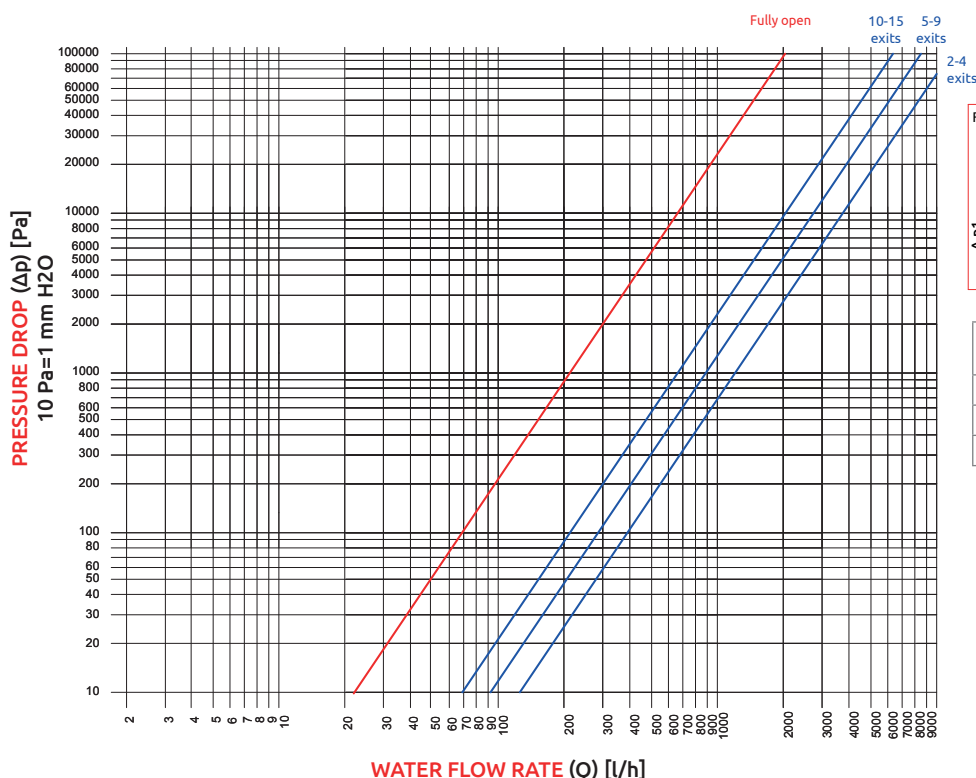
DIAGRAMMA PRESSURE DROP



N. of turns	Kv1* [m³/h]
FULLY OPEN	2,05

*Measures referred to a single outlet

$$Kv1 = \frac{Q1}{\sqrt{\Delta P1}}$$

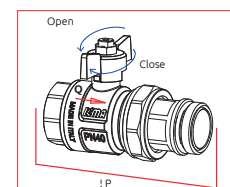
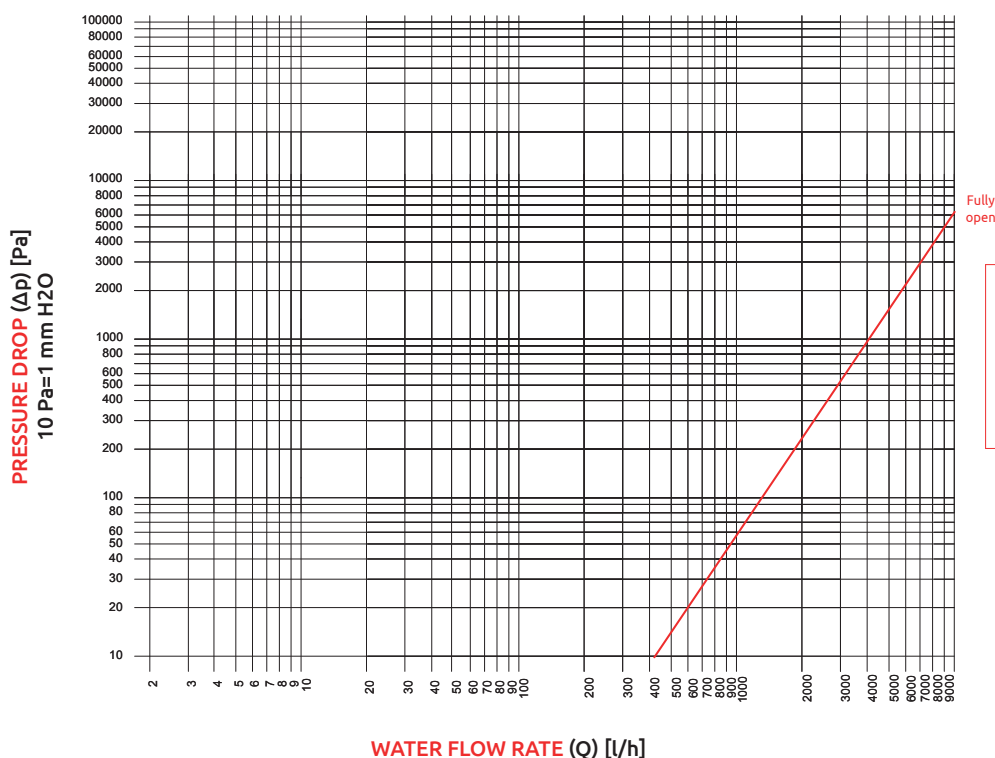


Kv2 Manifold [m³/h]	
2-4 exits	12,6
5-9 exits	8,7
10-15 exits	6,45

$$Kv2 = \frac{Q1}{\sqrt{\Delta P2}}$$

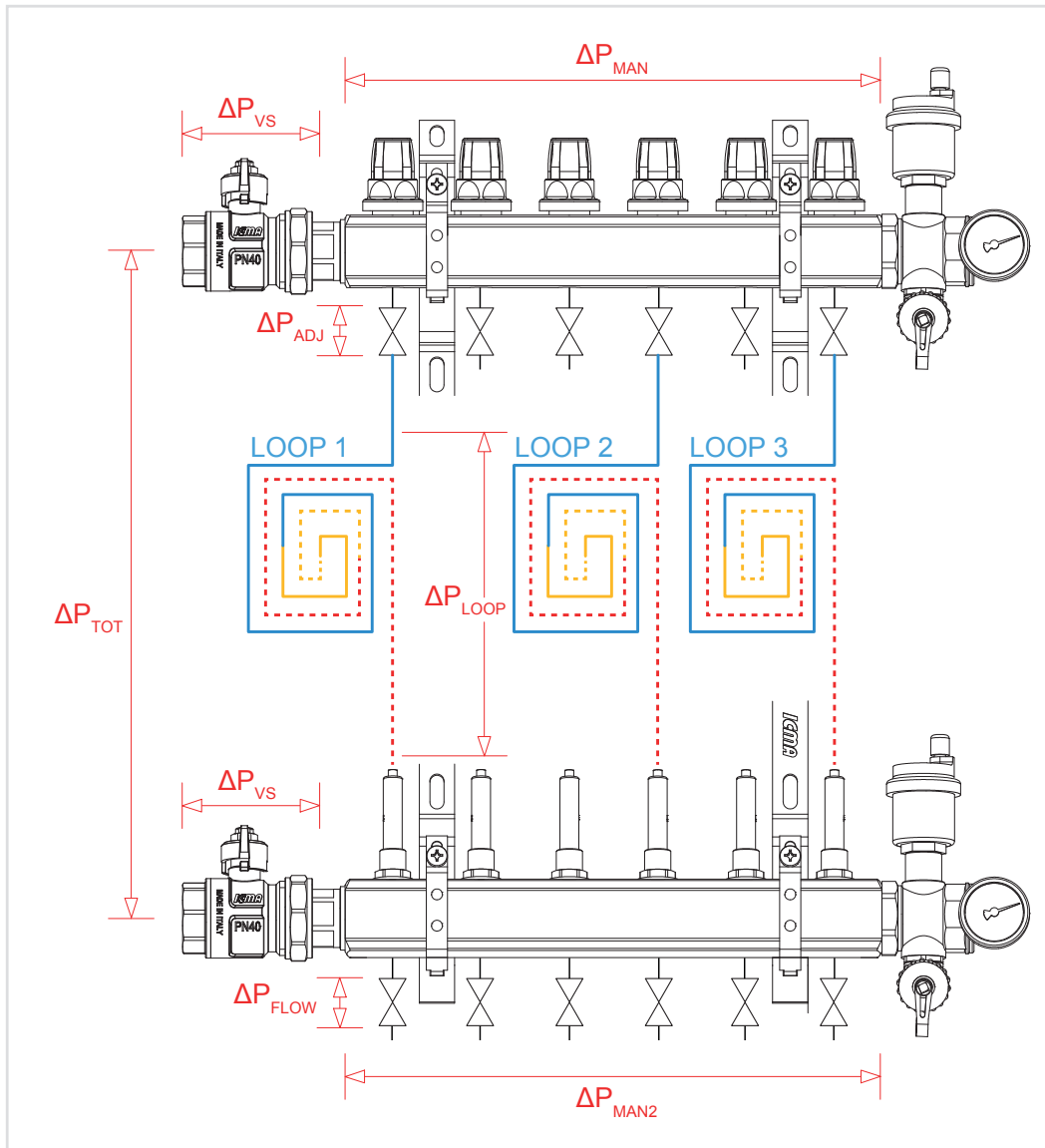
Ball valve Art. 215 - 225

DIAGRAMMA PRESSURE DROP



Kv [m³/h]
41,4

/ Example of total head loss calculation of K025 manifold



ΔP_{MAN1} = Distributed loss of the Art.1001 manifold

ΔP_{MAN2} = Distributed loss the Art.1013 manifold

ΔP_{VS} = Loss generated by ball valve Art.215

ΔP_{FLOW} = Loss generated by the flow flometer

ΔP_{ADJ} = Loss generated by the return headwork

ΔP_{LOOP} = Loss generated by the radiant pipe

ΔP_{TOT} = total head loss

Supposing we need to calculate the head loss of an underfloor heating system with a manifolds unit K025 with 3 outlets, we have the following requirements:

1. Loop 1 flow rate: $Q_1 = 120 \frac{l}{h}$

2. Loop 2 flow rate: $Q_2 = 150 \frac{l}{h}$

3. Loop 3 flow rate: $Q_3 = 190 \frac{l}{h}$

The hydraulic characteristics of the components of the circuit(to be found in the previous diagrams) are:

1. Ball valve Art.215/225: $Kv_{VS} = 41,4 \frac{m^3}{h}$
2. Manifold Art.1001: $Kv_{MAN1} = 12,6 \frac{m^3}{h}$
3. Manifold Art.1013: $Kv_{MAN2} = 11,1 \frac{m^3}{h}$
4. Spindle Art.1001: $Kv_{ADJ} = 2,05 \frac{m^3}{h}$
5. Flowmeter Art.1013: $Kv_{FLOW} = 1,21 \frac{m^3}{h}$
6. Loops: $r_{LOOP} = 14 \frac{mm \text{ c.a.}}{m}$ (typical of system's pipes)
6. Length of each loop: $l_{LOOP} = 100m$

The circuit with the highest number of head losses is always the most disadvantaged circuit. If the individual pipes have the same length, the flow rate of this circuit has to be higher than the others. In this case, the loop considered is loop 3

CDifferential ΔP required at loop 3 to guarantee $190 \frac{l}{h}$:

$$\Delta P_{LOOP3} = r_{LOOP} * l_{LOOP} = 14 \frac{mm \text{ c.a.}}{m} * 100m = 1400 \text{ mm c.a} = 14 \text{ Kpa}$$

$$\Delta P_{ADJ} = \frac{Q_3^2}{Kv_{ADJ}^2} = \left(\frac{190}{1000} \right)^2 \frac{m^3}{h} * \frac{1}{2,05^2} \frac{bar \cdot h}{m^3} = 8,5 * 10^{-3} \text{ bar} = 0,85 \text{ Kpa}$$

$$\Delta P_{FLOW} = \frac{Q_3^2}{Kv_{ADJ}^2} = \left(\frac{190}{1000} \right)^2 \frac{m^3}{h} * \frac{1}{2,21^2} \frac{bar \cdot h}{m^3} = 0,0246 \text{ bar} = 2,45 \text{ Kpa}$$

Therefore, the total differential pressure that needs to be guaranteed at loop 3 is:

$$\Delta P_{g3} = \Delta P_{LOOP3} + \Delta P_{LOOP3} + \Delta P_{LOOP3} = 14 \text{ Kpa} + 0,85 \text{ Kpa} + 2,45 \text{ Kpa} = 17,3 \text{ Kpa}$$

This head loss must be added to the manifolds distributed loss and to the ball valve loss (the ball valve loss must be multiplied by 2, since the valves are 2). The flow rate used in the calculation is the flow rate of the flowmeters. Therefore:

$$Q_{TOT} = Q_1 + Q_2 + Q_3 = 120 \frac{l}{h} + 150 \frac{l}{h} + 190 \frac{l}{h} = 460 \frac{l}{h}$$

$$\Delta P_{MAN1} = \frac{Q_{TOT}^2}{Kv_{MAN1}^2} = \left(\frac{460}{1000} \right)^2 \frac{m^3}{h} * \frac{1}{12,6^2} \frac{bar \cdot h}{m^3} = 1,33 * 10^{-3} \text{ bar} = 0,13 \text{ Kpa}$$

$$\Delta P_{MAN2} = \frac{Q_{TOT}^2}{Kv_{MAN2}^2} = \left(\frac{460}{1000} \right)^2 \frac{m^3}{h} * \frac{1}{11,1^2} \frac{bar \cdot h}{m^3} = 1,71 * 10^{-3} \text{ bar} = 0,17 \text{ Kpa}$$

$$\Delta P_{VS} = \frac{Q_{TOT}^2}{Kv_{MAN2}^2} = \left(\frac{460}{1000} \right)^2 \frac{m^3}{h} * \frac{1}{19,1^2} \frac{bar \cdot h}{m^3} = 5,8 * 10^{-4} \text{ bar} = 0,058 \text{ Kpa}$$

For a proper pump sizing, it is crucial to find the ΔP_{TOT} . Therefore it adds up to:

$$\Delta P_{TOT} = \Delta P_{g3} + \Delta P_{MAN1} + \Delta P_{MAN2} + 2 * \Delta P_{VS} = 17,3 \text{ Kpa} + 0,13 \text{ Kpa} + 0,17 \text{ Kpa} + 2 * 0,058 \text{ Kpa} = 17,71 \text{ Kpa}$$

Pre-assembled manifold unit 1"

K013-K014-K023-K025-K026-K031-K032

/ Pump sizing

A properly sized pump can guarantee at least 460 l/h with a pump head that equals to 17,71 Kpa, which correspond to 1,8m.

Considering the characteristic curve of a UPM3 HYBRID 25-50 130, for example:

The picture shows the working point of the pump, obtained by intersecting the two measures of flow rate and head loss. The relevant pump is more than enough to guarantee the required flow rate. Moreover, the working point falls within the Constant Pressure area. Therefore, the pump will be able to operate while ensuring a constant ΔP .

