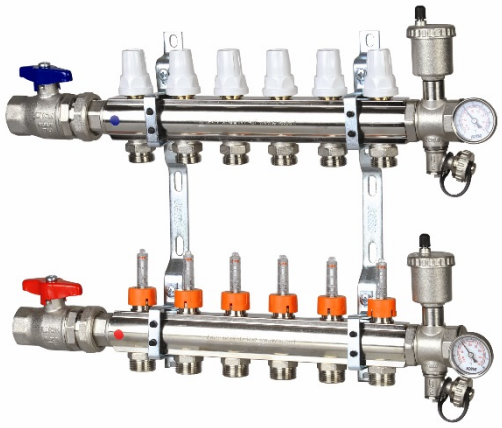
PRE-ASSEMBLED MANIFOLD KIT 1”

TECHNICAL DATA SHEET 09/2017 - ENG

FUNCTION

The pre-assembled ICMA collector kits have the function of optimizing the distribution of heat transfer fluid to floor heating systems in order to improve the control of the thermal emission in every single area of the plant.
They are supplied complete with all the accessories required for the installation, filling and handling of low temperature underfloor heating systems; They also guarantee a simple and precise regulation of the flow rates of the heat transfer fluid in each individual circuit ring, as well as the possibility of individual interceptions.
Their particular shape, due to the shape of the fixing brackets, facilitates connection operations with the pipes in the installation phase, ensuring compact dimensions especially deep and allowing installation even in very small spaces.



PRODUCT RANGE

Manifold / Thermostatable collector kit with flow rate gauges

K013-K014 - Return and delivery kit including brackets and anti-vibration gaskets.

K025-K026 - Return and return kit with ball valves, automatic air vent valves and taps separate and rotating filling

K031-K032 - Return and return kit with automatic air vent valves on manifolds

K023-K024 - Return and return kit with manual air vent valves on manifolds

TECHNICAL FEATURES

METERIALS

Delivery manifold	
Manifold:	Brass CW617N - UNI EN 12165
Flowmeter:	
Adjustable nut:	Brass CW614N - UNI EN 12164
Bottom connection:	Brass CW617N - UNI EN 12165
Glass:	Grilamid TR90 Transparent
Measurement rod:	Grilamid TR90
Inner tube:	Noryl Black
Spring:	Stainless Steel
Hydraulical seal:	EPDM Perox
Return manifold	
Manifold:	Brass CW617N - UNI EN 12165
Thermostat valve:	
Adjustable nut:	Brass CW614N - UNI EN 12164
Bottom connection:	Brass CW617N - UNI EN 12165
Inner rod and spring:	Stainless steel
Knob:	ABS White
Hydraulical seal:	EPDM Perox
Interception sphere valves	
Body:	Brass CW617N - UNI EN 12165
Cap and pipe union:	Brass CW617N - UNI EN 12165
Sphere and coupling:	Brass CW614N - UNI EN 12164
Knob:	Nylon PA6 C.V.30%
Sphere gasket:	PTFE
Hydraulical seal:	EPDM Perox

See related technical data sheet for items below:	
Automatic valves for air vent G3/8”	Art. 700-707
Manual valves for air vent G1/2”	Art. 705
Charge/discharge system tap G1/2”	Art. 172
Turnable junction M-F G1”	Art. 204
Thermometer cap G1”	Art. 185
Thermometer 0÷60 °C	Art. 206
Support	Art. 208

PERFORMANCES

Working fluids:	water and glycol solutions
Glycol max percentage:	30 %
Max working pressure:	10 bar
Working temperature:	5÷80 °C
Thermometer range:	0÷60 °C
Manifold dimensions:	G 1” / G 1”¼
Flowmeter	
Flowmeter range for G1” manifold	0÷4 l/min
Flowmeter range for G1”¼ manifold	0÷8 l/min
Flowmeter precision	±10 %
Connections	
Main connections:	G1” F / G1¼” F (ISO 228-1)
Main connection hub spacing:	207 mm
Derivations – connections:	G3/4” F / M24x1,5 F
Derivations – hub spacing:	50 mm

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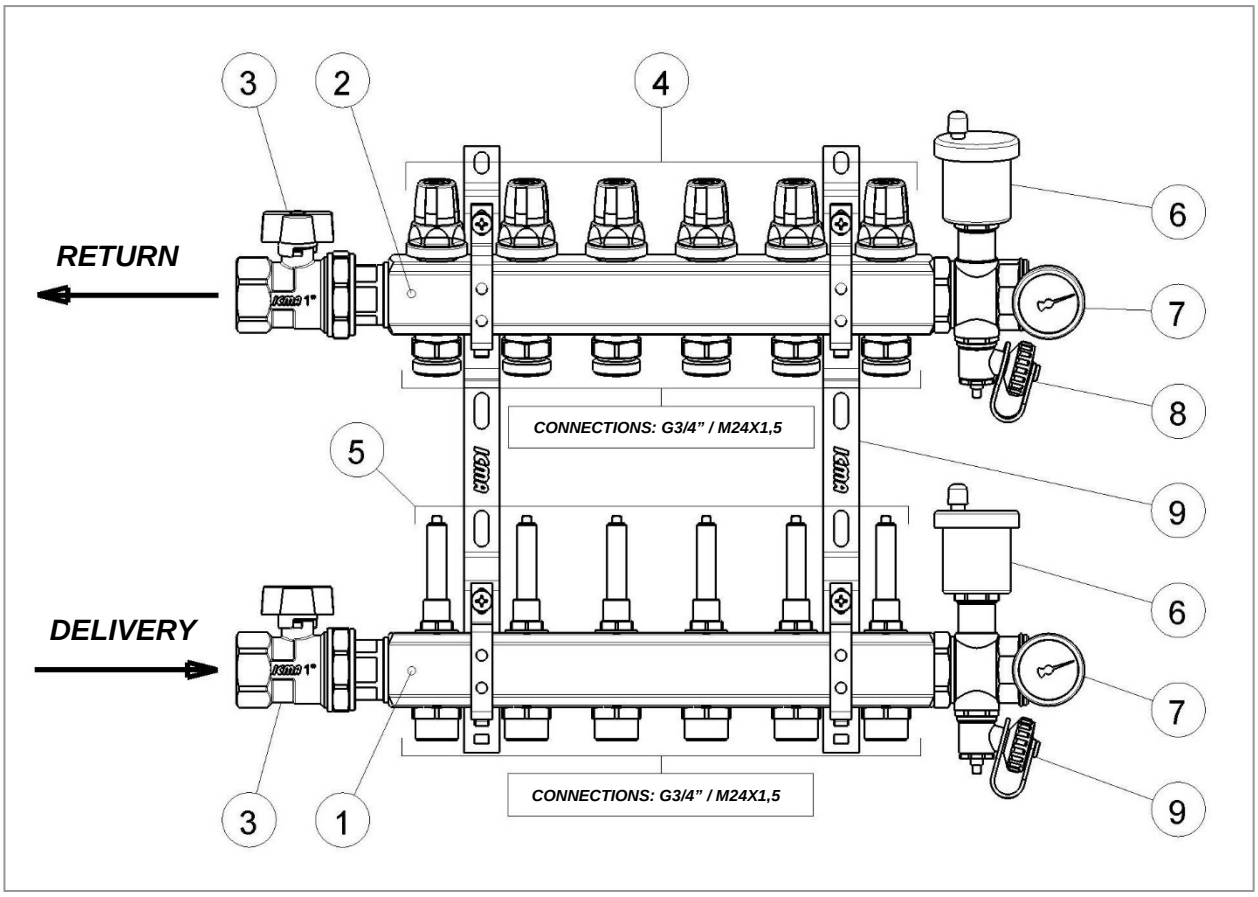
COMPONENTS



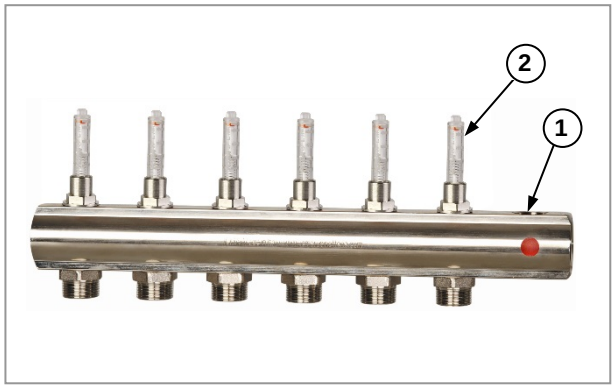
PART LIST:

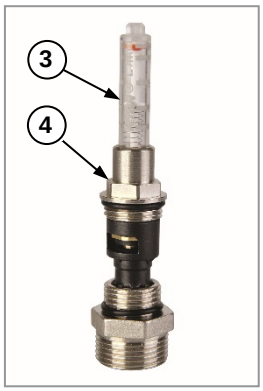
1) Delivery manifold
2) Return manifold
3) Interception sphere valves with O-ring seal pipe union on manifold
4) Interception thermostat valves arranged for electrothermic control devices
5) Flowmeter with integrated flow adjustment valves
   Adjustment range: - 0/4 L/Min for manifold G1”
   - 0/8 L/Min for manifold G1”¼
6) Air vent valves: - automatic with float for art. K025-K026 e K031-K032
   - manual turnable for art. K023-K024.
7) Thermometer holder caps with gasket on manifold (thermometer 0-60° included)
8) Water charge/vent taps
9) Supports with anti-vibration gasket

PART DESCRIPTION

DELIVERY MANIFOLD

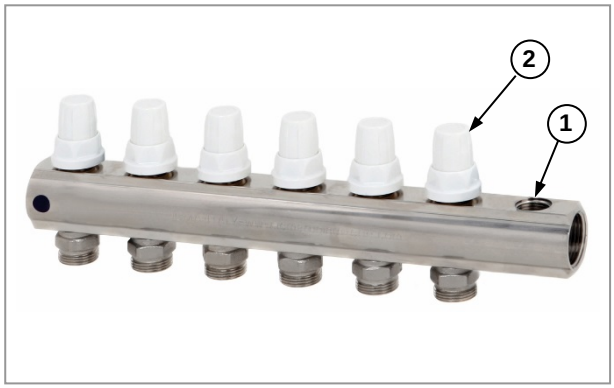
The delivery manifold consists of a perforated nickel plated brass bar (1) and a variable number of flow meters with built-in flow rate control valve (2).
On the transparent slide with graduated scale (3) located at the top of the meter, it is possible to read in real time the value of the flow rate of each single ring of the floor system, the reading range of the gauges is 0 ÷ 4 l / min section collectors G1 "and 0 ÷ 8 l / min for collectors from G1" ¼.
Thanks to the control valve, it is possible to precisely adjust the flow of the individual rings, which greatly simplifies and greatly speeds up the calibration of the circuit.
If necessary, the same valve allows intercepting each circuit, excluding it from the system.
For a description of the valve adjustment operations, see the specific chapter at the bottom of the technical sheet.

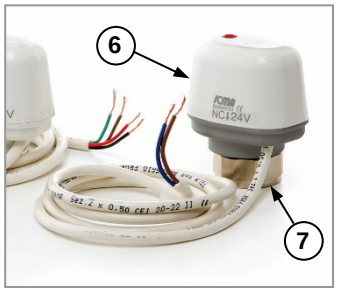




RETURN MANIFOLD

The return manifold is also made up of a nickel-plated brass drill bit (1) and a variable number of thermostatable shut-off valves (2).
Thermostatable valves give you the ability to manually open or close each branch ring according to your needs. By fully screwing (clockwise), the top of the white cap (3) above the valve can close the fluid passage to the respective loop ring (5), excluding the entire circuit.
The shut-off valves are also predisposed for the installation of electrothermal actuators (6) which are appropriately connected to the room thermostats, allowing to maintain the temperature in the various rooms at the set values.
To do this, simply unscrew both parts of the white knob (3 and 4) from the valve body and fasten the fastening ring (7) first and then the actuator.
However, you will still be able to remove the installed actuator and reassemble the white dial for manual control at any time by returning the shut-off valve to the initial condition.
For actuator installation operations, see the specific instruction sheet contained in each package.





INTERCEPTION SPHERE VALVE

Ball-tap valves with o-ring seal for mounting on the manifold bar. Installed on manifold kits is used to exclude the system from connecting to the boiler or centralized supply, facilitating any maintenance or repair operations.

AIR VENT VALVES

The air vent valves have the function of ejecting the air that accumulates inside the circuit. Depending on the product chosen, automatic or manual vent valves are installed. Valves are installed in K025-K026 and K031-K032, while manual valves are installed in K023-K024 articles.

The automatic air vent valves are equipped with an internal float that, connected via a shutter lever system, automatically adjusts the expulsion of the air that accumulates inside it.
They are also equipped with a hygroscopic safety cap which, once closed manually, prevents water spills in the event of a valve malfunction. The use of these valves avoids the occurrence of negative phenomena for the plant such as corrosion, localized air pockets and cavitation in circulation pumps.

The manual air vent valves have a micrometric opening, they are rotatable and are equipped with a special sealing gasket for mounting on the manifold.
They are mounted on collector kits to facilitate the loading and unloading of the plant.

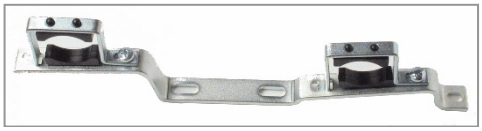
THERMOMETER HOLDER CAPS

They are specially designed for a simple and safe installation at the head of the manifold bars, they are equipped with a sealing gasket and have a hole for the housing of the thermometers.
The supplied thermometers have a reading range of 0 ÷ 60 ° C.

CHARGE/VENT TAPS

Micrometric opening orientable taps are equipped with sealing gasket for mounting on the manifold and a seal with seal for a safety closure.
They are mounted on collector kits to facilitate the loading and unloading of the plant.

SUPPORTS



Along with the collector kits, galvanized steel fixing brackets are provided with their anti-vibration gaskets.
These are brackets designed to facilitate the installation of the manifolds and to limit the dimensions, can be fixed directly to the wall or in the appropriate floor heating systems.

ACCESSORIES

ELECTROTHERMICAL ACTUATORS

Normally closed electrothermal commands with M28x1.5 connection
Article 982 - with micro-switch for normally closed closed-end signal
Article 983 - simple command on / off
The electrothermal actuators installed on the thermostatable return manifold shut-off valves have the function of automatically intercepting the thermovoltaic fluid on the control of the room thermostat and other electrical circuit breaker.
It is possible to install an electrothermal actuation of each of the shut-off valves so as to best control and regulate each single branch of the floor system.
The installation is simple and fast and is done via a quick coupling and a threaded nut.
The ICMA electrothermal actuators are in compliance with Directives 73/23 / EEC - 89/336 / EEC.

FITTINGS FOR MULTILAYER PIPE

Fittings for simple or multilayer plastic tubes
Article 100 - connection thread on manifold M24x1.5
Article 101 - Connection thread on the G3 / 4 "Euroconus manifold
They ensure a simple and secure connection of the multilayer pipe to the outlet and return manifolds.
The seals on the pipe and the manifold are made of peroxide EPDM O-Ring rings.
Thanks to their reduced internal surface roughness, low load losses are guaranteed.

INSULATION SHIELDS

Article 177 - Insulation shields for manifolds G1 "and G1" ¼

They are made up of a pair of thermoformed shells made of closed cellular polyethylene foam, particularly suitable for thermal insulation and condensation formation.
Drilled on both sides with a distance between holes of 50 mm.
For G1 manifolds "are provided with a length suitable for manifolds with max. 12 outputs, while for manifolds G1" ¼ the length is suitable for collectors with max 15 outputs.
It is possible to cut the cups to fit them with manifolds with a lower number of outputs.

MANIFOLD BOXES

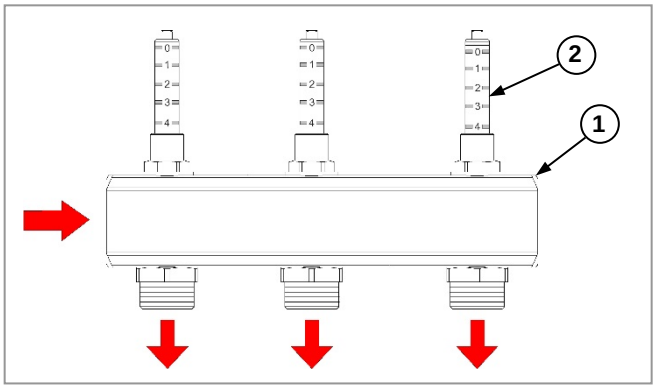
Article 196 - Boxes for underfloor heating systems

Containers with depth and height adjustable, made of white painted sheet metal RAL 9010 complete with lock and supports for floor installation. The thickness of the sheet of 1 mm, with which the frame and the door are made, guarantees a remarkable build-up.
- Adjustable height from 630 to 930 mm.
- Adjustable depth from 90 to 110 mm.

It is also possible to adjust the inside position of the manifold both in height and sideways. Suitable for collectors without circulation pump.
For the choice of cassettes, refer to the total lengths of the manifolds and the recommended cassettes indicated in the "codes and dimensions" tables of the respective collector kits.

USE OF FLOW MEASUREMENTS WITH INCORPORATED ADJUSTMENT VALVE

The delivery manifold, as described above, consists of a perforated pull bar (1) on which flow meters are fitted with the built-in flow control valve (2).
Flow meters have the function of indicating the value of the flow of each single ring of the system in real time, while the built-in control valves allow it to be calibrated in a simple and accurate way, this simplifies and greatly speeds up the calibration operation of the whole circuit.
The precision of the gauge also allows calibration of the flow of the thermal fluid to the lowest flow rates.

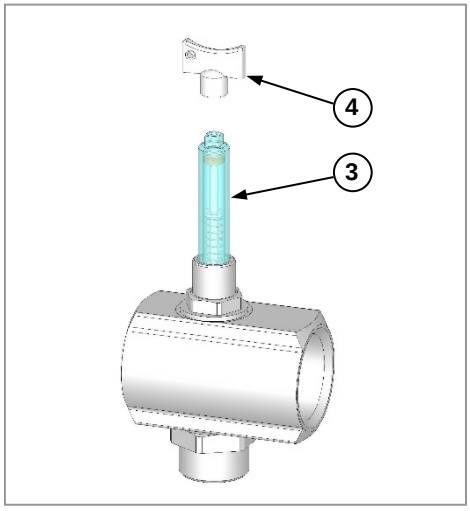


FLOW ADJUSTMENT

To adjust the flowrate, simply rotate the transparent slide (3) at the top of the meter.
To facilitate this operation, a special key (4) is supplied, which must be inserted on the frame obtained at the top of the slide.

- **Screwing the slide (rotate clockwise) the flow rate decreases**
- **Uncoupling the slide (turning counterclockwise) the flow rate increases**

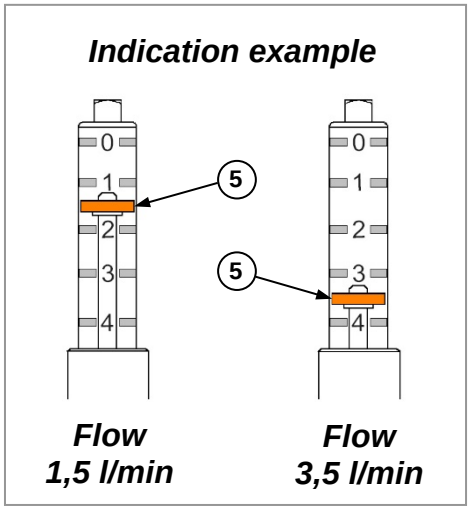
Completely closing the control valve, it is possible to intercept each single ring, excluding it from the system.



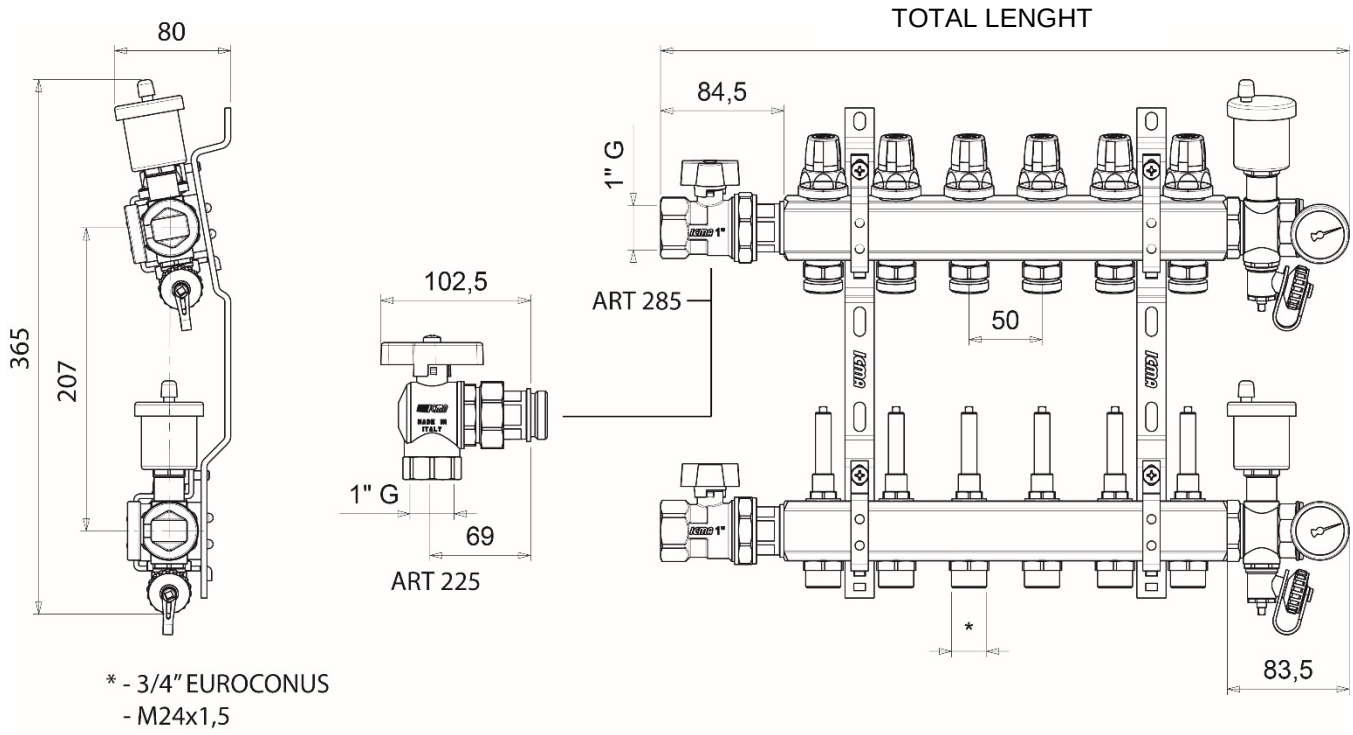
FLOW INDICATION

On the transparent slide is shown a graduated while inside it there is a white rod with an orange plate (5), these two elements rise and lower in the slide depending on the variations in the flow rate of the flowing fluid, inside the meter.
The position of the orange plate on the graduated scale of the slide indicates the actual value of the flow rate of the fluid passing through the meter and, consequently, to the corresponding floor ring ring,
The reading range of the meters is as follows:

0÷4 l/min for manifold G1”
0÷8 l/min for manifold G1”¼.



DIMENSIONS



ATTENTION: For total length and collector codes, refer to the "codes and dimensions" tables listed on the following pages.

MANIFOLD K013-K014

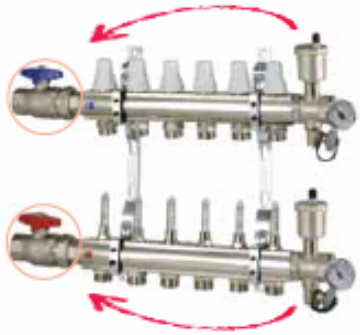
Manually adjustable / thermostatable collector kit with measuring gauges reach. Fixing brackets with anti-vibration gaskets (Article 208).
The flow regulators allow you to close and adjust the passage.
Thread for 3/4 Euroconus or M24x1.5 fittings.
Choose electrothermal commands with 28x1.5 connection.

ART.	HEAD CONNECT.	OUTLETS	CODE EUROCONUS	CODE M 24 X 1,5	PACKAGING	LENGTH TOTAL COLLECTOR
K013/K014	1"	2	87K013PG06	87K014PG06	1	104 mm
K013/K014	1"	3	87K013PH06	87K014PH06	1	154 mm
K013/K014	1"	4	87K013PJ06	87K014PJ06	1	204 mm
K013/K014	1"	5	87K013PQ06	87K014PQ06	1	254 mm
K013/K014	1"	6	87K013PK06	87K014PK06	1	304 mm
K013/K014	1"	7	87K013PR06	87K014PR06	1	354 mm
K013/K014	1"	8	87K013PL06	87K014PL06	1	404 mm
K013/K014	1"	9	87K013PS06	87K014PS06	1	454 mm
K013/K014	1"	10	87K013PM06	87K014PM06	1	504 mm
K013/K014	1"	11	87K013PT06	87K014PT06	1	554 mm
K013/K014	1"	12	87K013PU06	87K014PU06	1	604 mm
K013/K014	1"	13	87K013PV06	87K014PV06	1	654 mm
K013/K014	1"	14	87K013PW06	87K014PW06	1	704 mm
K013/K014	1"	15	87K013PY06	87K013PY06	1	754 mm

MANIFOLD K025-K026

Manifolds unit with memory flowmeters and valves with thermostatic option. It includes:
- 2 ball valves (art.215)
- Connection to the ball valve with gasket with plane seat and o-ring
- 2 brackets (art.208)
- 2 1” male/female intermediate fittings **with revolving connection** (art.204). Conical sealing gasket. Art.204 can be assembled between manifold and ball valve.
- 2 3/8” automatic air vents (art.707)
- 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.



CODE AND DIMENSIONS

WITH STRAIGHT BALL VALVE

ART.	HEAD CONNECT.	OUTLETS	CODE EUROCONUS	CODE M24X1,5	PACKAGING	LENGTH TOTAL COLLECTOR	BOX RECOMMENDED ART. 196
K025/K026	1”	2	87K025PG06	87K026PG06	1	295 mm	500 mm
K025/K026	1”	3	87K025PH06	87K026PH06	1	345 mm	500 mm
K025/K026	1”	4	87K025PJ06	87K026PJ06	1	395 mm	500 mm
K025/K026	1”	5	87K025PQ06	87K026PQ06	1	445 mm	700 mm
K025/K026	1”	6	87K025PK06	87K026PK06	1	495 mm	700 mm
K025/K026	1”	7	87K025PR06	87K026PR06	1	545 mm	700 mm
K025/K026	1”	8	87K025PL06	87K026PL06	1	595 mm	700 mm
K025/K026	1”	9	87K025PS06	87K026PS06	1	645 mm	850 mm
K025/K026	1”	10	87K025PM06	87K026PM06	1	695 mm	850 mm
K025/K026	1”	11	87K025PT06	87K026PT06	1	745 mm	850 mm
K025/K026	1”	12	87K025PU06	87K026PU06	1	795 mm	1000 mm
K025/K026	1”	13	87K025PV06	87K026PV06	1	845 mm	1000 mm
K025/K026	1”	14	87K025PW06	87K026PW06	1	895 mm	1200 mm
K025/K026	1”	15	87K025PY06	87K026PY06	1	945 mm	1200 mm

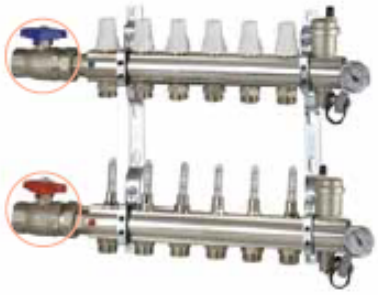
WITH ANGLE BALL VALVE

ART.	HEAD CONNECT.	OUTLETS	CODE EUROCONUS	CODE M24X1,5	PACKAGING	LENGTH TOTAL COLLECTOR	BOX RECOMMENDED ART. 196
K025/K026	1”	2	87K025PG06 225	87K026PG06 225	1	295 mm	500 mm
K025/K026	1”	3	87K025PH06 225	87K026PH06 225	1	345 mm	500 mm
K025/K026	1”	4	87K025PJ06 225	87K026PJ06 225	1	395 mm	500 mm
K025/K026	1”	5	87K025PQ06 225	87K026PQ06 225	1	445 mm	700 mm
K025/K026	1”	6	87K025PK06 225	87K026PK06 225	1	495 mm	700 mm
K025/K026	1”	7	87K025PR06 225	87K026PR06 225	1	545 mm	700 mm
K025/K026	1”	8	87K025PL06 225	87K026PL06 225	1	595 mm	700 mm
K025/K026	1”	9	87K025PS06 225	87K026PS06 225	1	645 mm	850 mm
K025/K026	1”	10	87K025PM06 225	87K026PM06 225	1	695 mm	850 mm
K025/K026	1”	11	87K025PT06 225	87K026PT06 225	1	745 mm	850 mm
K025/K026	1”	12	87K025PU06 225	87K026PU06 225	1	795 mm	1000 mm
K025/K026	1”	13	87K025PV06 225	87K026PV06 225	1	845 mm	1000 mm
K025/K026	1”	14	87K025PW06 225	87K026PW06 225	1	895 mm	1200 mm
K025/K026	1”	15	87K025PY06 225	87K026PY06 225	1	945 mm	1200 mm

MANIFOLD K031-K032

Manifolds unit with memory flowmeters and valves with thermostatic option.
It includes:
- 2 ball valves (art.215)
- Connection to the ball valve with gasket with plane seat and o-ring
- 2 brackets (art.208) with 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.



CODE AND DIMENSIONS

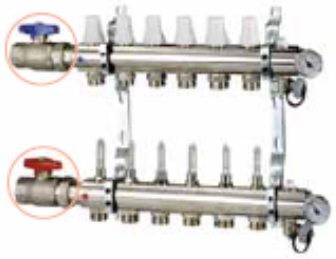
WITH STRAIGHT BALL VALVE

ART.	HEAD CONNECT.	OUTLETS	CODE EUROCONUS	CODE M24X1,5	PACKAGING	LENGTH TOTAL COLLECTO
K031/K032	1"	2	87K031PG06	87K032PG06	1	295 mm
K031/K032	1"	3	87K031PH06	87K032PH06	1	345 mm
K031/K032	1"	4	87K031PJ06	87K032PJ06	1	395 mm
K031/K032	1"	5	87K031PQ06	87K032PQ06	1	445 mm
K031/K032	1"	6	87K031PK06	87K032PK06	1	495 mm
K031/K032	1"	7	87K031PR06	87K032PR06	1	545 mm
K031/K032	1"	8	87K031PL06	87K032PL06	1	595 mm
K031/K032	1"	9	87K031PS06	87K032PS06	1	645 mm
K031/K032	1"	10	87K031PM06	87K032PM06	1	695 mm
K031/K032	1"	11	87K031PT06	87K032PT06	1	745 mm
K031/K032	1"	12	87K031PU06	87K032PU06	1	795 mm
K031/K032	1"	13	87K031PV06	87K032PV06	1	845 mm
K031/K032	1"	14	87K031PW06	87K032PW06	1	895 mm

WITH ANGLE BALL VALVE

ART.	HEAD CONNECT.	OUTLETS	CODE EUROCONUS	CODE M24X1,5	PACKAGING	LENGTH TOTAL COLLECTO
K031/K032	1"	2	87K031PG06 226	87K032PG06 226	1	295 mm
K031/K032	1"	3	87K031PH06 226	87K032PH06 226	1	345 mm
K031/K032	1"	4	87K031PJ06 226	87K032PJ06 226	1	395 mm
K031/K032	1"	5	87K031PQ06 226	87K032PQ06 226	1	445 mm
K031/K032	1"	6	87K031PK06 226	87K032PK06 226	1	495 mm
K031/K032	1"	7	87K031PR06 226	87K032PR06 226	1	545 mm
K031/K032	1"	8	87K031PL06 226	87K032PL06 226	1	595 mm
K031/K032	1"	9	87K031PS06 226	87K032PS06 226	1	645 mm
K031/K032	1"	10	87K031PM06 226	87K032PM06 226	1	695 mm
K031/K032	1"	11	87K031PT06 226	87K032PT06 226	1	745 mm
K031/K032	1"	12	87K031PU06 226	87K032PU06 226	1	795 mm
K031/K032	1"	13	87K031PV06 226	87K032PV06 226	1	845 mm
K031/K032	1"	14	87K031PW06 226	87K032PW06 226	1	895 mm

MANIFOLD K023-K024



Manifolds unit with memory flowmeters and valves with thermostatic option. It Includes:
- 2 ball valves with revolving connection and cockpit for thermometer (art.215)
- Connection to the ball valve with gasket with plane 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 or M24x1,5 fittings.
Choose thermostatic and electrothermic actuators with 28x1,5 connection thread.

CODE AND DIMENSIONS

WITH STRAIGHT BALL VALVE

ART.	HEAD CONNECT.	OUTLETS	CODE EUROCONUS	CODE M24X1,5	PACKAGING	LENGTH TOTAL	BOX ART. 196
K023/K024	1”	2	87K023PG06	87K024PG06	1	295 mm	500 mm
K023/K024	1”	3	87K023PH06	87K024PH06	1	345 mm	500 mm
K023/K024	1”	4	87K023PJ06	87K024PJ06	1	395 mm	500 mm
K023/K024	1”	5	87K023PQ06	87K024PQ06	1	445 mm	700 mm
K023/K024	1”	6	87K023PK06	87K024PK06	1	495 mm	700 mm
K023/K024	1”	7	87K023PR06	87K024PR06	1	545 mm	700 mm
K023/K024	1”	8	87K023PL06	87K024PL06	1	595 mm	700 mm
K023/K024	1”	9	87K023PS06	87K024PS06	1	645 mm	850 mm
K023/K024	1”	10	87K023PM06	87K024PM06	1	695 mm	850 mm
K023/K024	1”	11	87K023PT06	87K024PT06	1	745 mm	850 mm
K023/K024	1”	12	87K023PU06	87K024PU06	1	795 mm	1000 mm
K023/K024	1”	13	87K023PV06	87K024PV06	1	845 mm	1000 mm
K023/K024	1”	14	87K023PW06	87K024PW06	1	895 mm	1200 mm

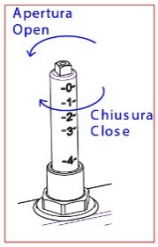
WITH ANGLE BALL VALVE

ART.	HEAD CONNECT.	OUTLETS	CODE EUROCONUS	CODE M24X1,5	PACKAGING	LENGTH TOTAL	BOX ART. 196
K023/K024	1”	2	87K023PG06 226	87K024PG06 226	1	295 mm	500 mm
K023/K024	1”	3	87K023PH06 226	87K024PH06 226	1	345 mm	500 mm
K023/K024	1”	4	87K023PJ06 226	87K024PJ06 226	1	395 mm	500 mm
K023/K024	1”	5	87K023PQ06 226	87K024PQ06 226	1	445 mm	700 mm
K023/K024	1”	6	87K023PK06 226	87K024PK06 226	1	495 mm	700 mm
K023/K024	1”	7	87K023PR06 226	87K024PR06 226	1	545 mm	700 mm
K023/K024	1”	8	87K023PL06 226	87K024PL06 226	1	595 mm	700 mm
K023/K024	1”	9	87K023PS06 226	87K024PS06 226	1	645 mm	850 mm
K023/K024	1”	10	87K023PM06 226	87K024PM06 226	1	695 mm	850 mm
K023/K024	1”	11	87K023PT06 226	87K024PT06 226	1	745 mm	850 mm
K023/K024	1”	12	87K023PU06 226	87K024PU06 226	1	795 mm	1000 mm
K023/K024	1”	13	87K023PV06 226	87K024PV06 226	1	845 mm	1000 mm
K023/K024	1”	14	87K023PW06 226	87K024PW06 226	1	895 mm	1200 mm

HYDRAULICAL FEATURES

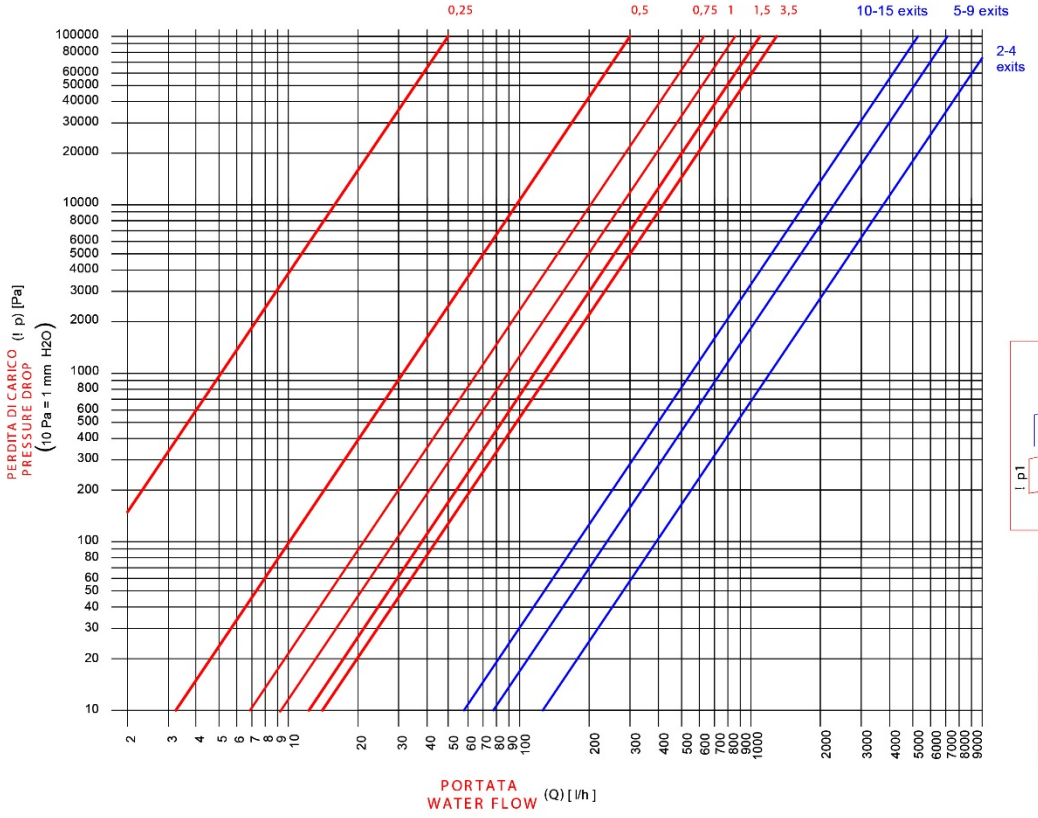
The hydraulic characteristics of a radiant panel circuit, served by a collector kit such as those described in this data sheet, are substantially represented by the load losses of the circuit itself.
The loss of load by its definition is the pressure loss due to all the passive forces (curves, branches, bottlenecks and shrubs of materials) that oppose water resistance in a pipe or circuit.
Knowing the value of the overall load loss of a circuit is critical at the time of designing a plant to determine the flow rate and consequently the prevalence that the circulation pump will provide.
In order to determine the overall loss of a circuit, it is necessary to know and add up all the load losses of the individual devices that compose it.

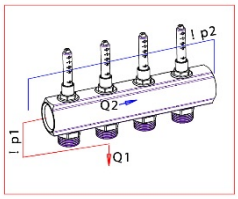
Collettore/Manifold Art. 1013-1014-1015-1016 – G 1”
DIAGRAMMA DELLE PERDITE DI CARICO
PRESSURE DROP DIAGRAM



n° giri opening turns	Kv1* [m³/h]
0,25	0,05
0,5	0,30
0,75	0,62
1	0,88
1,5	1,05
2	1,12
2,5	1,16
3,5 MAX FLOW	1,21

*Valori riferiti ad una singola uscita
values in reference to a single exit





Kv2 collettore Kv2 manifold [m³/h]	
2-4 exits	11,1
5-9 exits	7,1
10-15 exits	5,2

Flussimetro/flow meter
Collettore/manifold

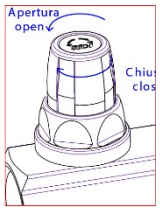
$$Kv1 = \frac{Q1}{\sqrt{\Delta P1}}$$

$$Kv2 = \frac{Q2}{\sqrt{\Delta P2}}$$

Collettore/Manifold Art. 1001-1002-1007-1008 – G 1”

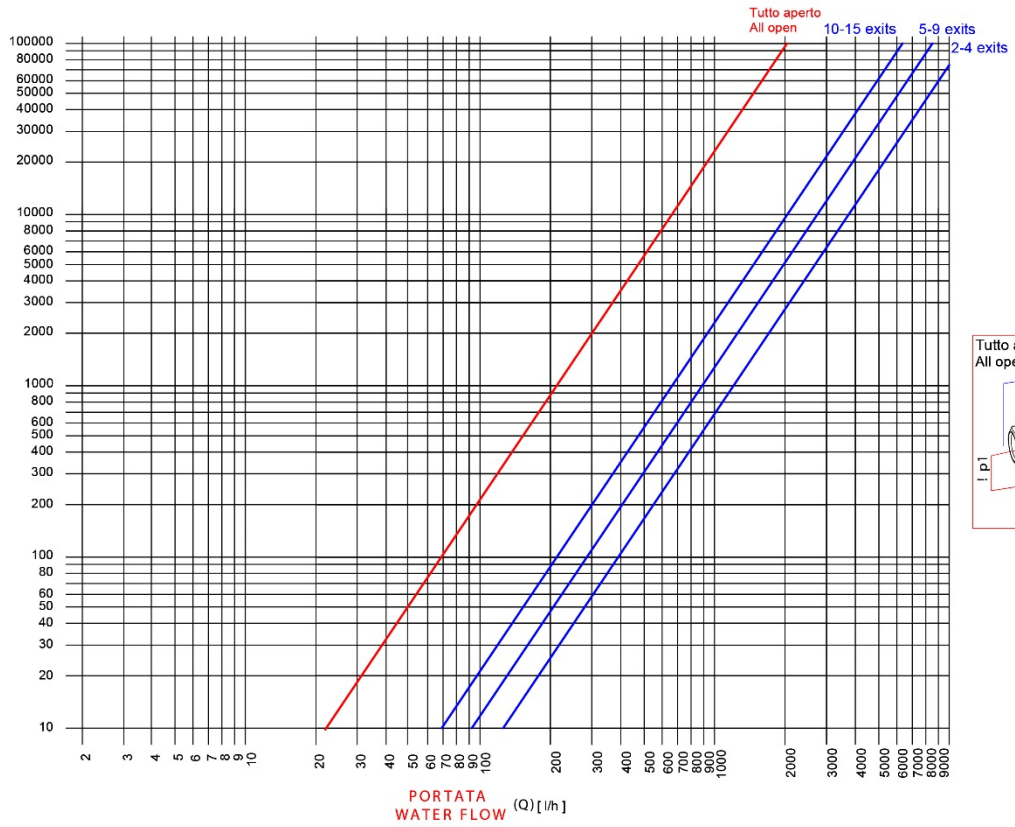
DIAGRAMMA DELLE PERDITE DI CARICO

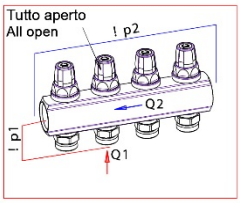
PRESSURE DROP DIAGRAM



n° giri/ turns	Kv1* [m³/h]
Tutto aperto All open	2,05

* Valori riferiti ad una singola uscita
values in reference to a single exit





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

- Vitone/spindle
- Collettore/manifold

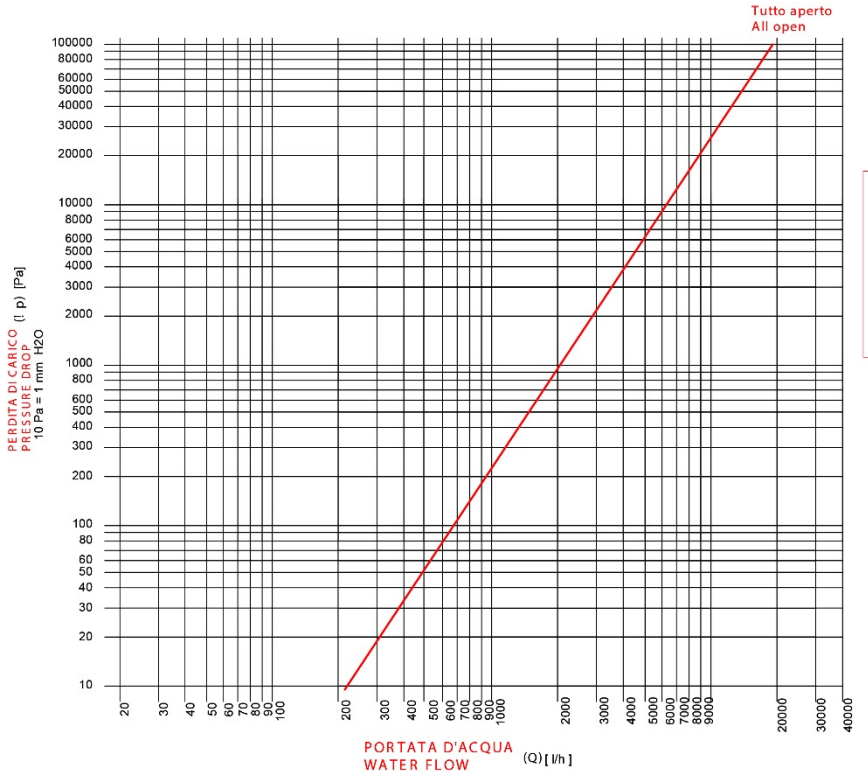
$$Kv1^{*} = \frac{Q1}{\sqrt{!\ P1}}$$

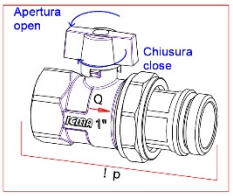
$$Kv2 = \frac{Q2}{\sqrt{!\ P2}}$$

Collettore/Manifold Art. 284 – G 1”

DIAGRAMMA DELLE PERDITE DI CARICO

PRESSURE DROP DIAGRAM





Kv [m³/h]
19,1

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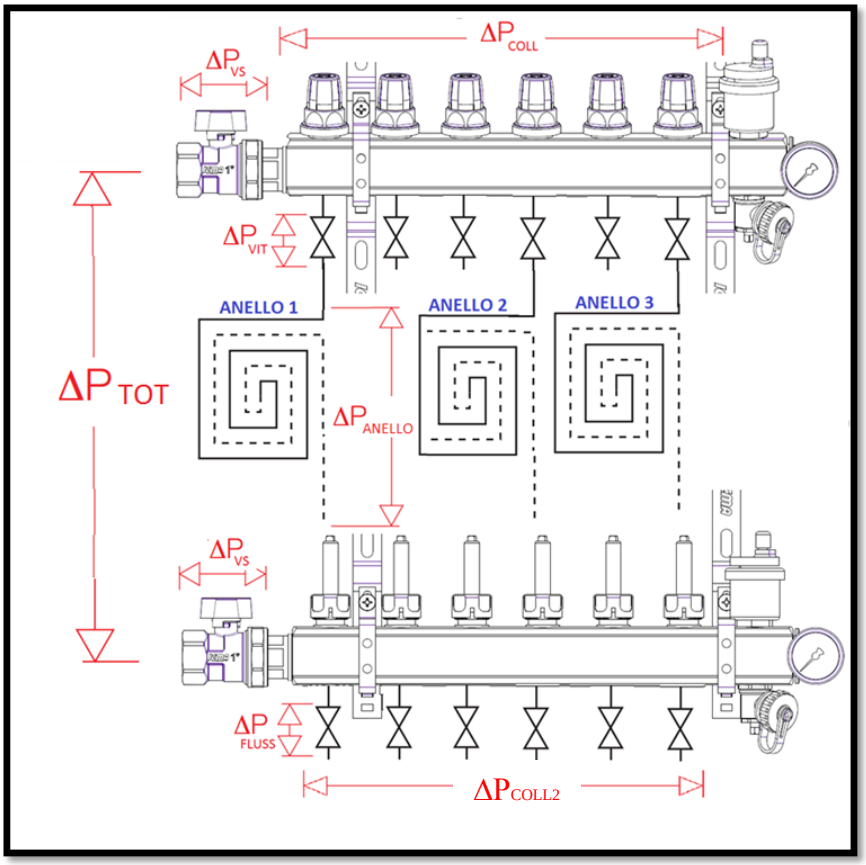
Practical example of calculating the total load loss of collector K025.



ΔP_{COLL1} = *distributed manifold discharge loss of Art.1001 collector*

ΔP_{COLL2} = *distributed manifold discharge loss of Art.1013*

ΔP_{VS} = *load loss generated by the ball valve Art.284*

ΔP_{FLUSS} = *load loss generated by the flowmeter of delivery*

ΔP_{VIT} = *load loss generated by the return vein*

ΔP_{ring} = *load loss generated by the radiant tube*

ΔP_{TOT} = *total load loss*

It is permissible to have the following planting requirements in a floor heating system, including a 3-outlet K025 manifold group:

1. $Ring\ Capacity\ 1: Q1 = 120\frac{l}{h}$
2. $Ring\ Capacity\ 2: Q2 = 150\frac{l}{h}$
3. $Ring\ Capacity\ 3: Q3 = 190\frac{l}{h}$

The hydraulic characteristics of the circuit components (to be obtained from the diagrams above) are:

1. Sphere valve Art.284: $Kv_{VS} = 19{,}1\frac{m^3}{h}$
2. Manifold Art. 1001: $Kv_{COLL1} = 12{,}6\frac{m^3}{h}$
3. Manifold Art. 1013: $Kv_{COLL2} = 11{,}1\frac{m^3}{h}$
4. Adjustment Nut 1001: $Kv_{VIT} = 2{,}05\frac{m^3}{h}$
5. Flowmeter 1013: $Kv_{FLUSS} = 1{,}21\frac{m^3}{h}$
6. Rings: $r_{RING} = 14\frac{mm\ c.a.}{m}$ (caratteristica dei tubi dell’impianto)
7. Ring Lenght: $l_{RING} = 100m$

The most disadvantaged circuit is always the circuit with multiple load losses. The latter corresponds, at the same length as the individual pipes, to the circuit in which it has to flow more flow. In this case it is ring 3.

Calculation of differential ΔP required for ring 3 to ensure $190\,\frac{l}{h}$:

$$\Delta P_{anello3} = r_{RING} * l_{RING} = 14\,\frac{mm\ c.a.}{m} * 100m = 1400\ mm\ c.a = 14Kpa$$

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

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

La pressione differenziale totale da garantire agli imbocchi dell’anello 3 è quindi:

$$\Delta P_{g3} = \Delta P_{ring3} + \Delta P_{ring3} + \Delta P_{ring3} = 14Kpa + 0{,}85Kpa + 2{,}45Kpa = 17{,}3Kpa$$

This loss of load must be added to the distributed manifold loss and the ball valve loss, the latter multiplied by 2 (being 2 ball valves). The scope to consider for calculation is this time the total flow rate of collectors. Then:

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

$$\Delta P_{COLL1} = \frac{Q_{TOT}{}^2}{Kv_{COLL1}{}^2} = \left(\frac{460}{1000}\right)^2 \frac{m^3}{h} * \frac{1}{12{,}6^2}\frac{bar * h}{m^3} = 1{,}33 * 10^{-3} bar\ = 0{,}13Kpa$$

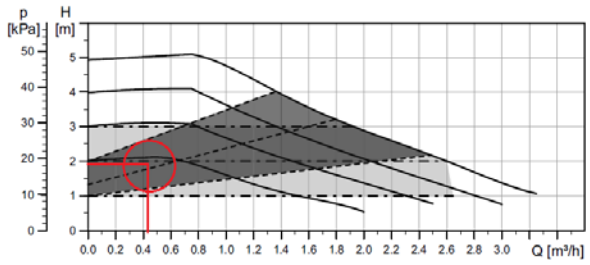
$$\Delta P_{COLL2} = \frac{Q_{TOT}{}^2}{Kv_{COLL2}{}^2} = \left(\frac{460}{1000}\right)^2 \frac{m^3}{h} * \frac{1}{11{,}1^2}\frac{bar * h}{m^3} = 1{,}71 * 10^{-3} bar\ = 0{,}17Kpa$$

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

For the correct sizing of the pump, it is important to obtain the ΔPTOT. It is therefore:

$$\Delta P_{TOT} = \Delta P_{g3} + \Delta P_{COLL1} + \Delta P_{COLL2} + 2 * \Delta P_{VS} = 17{,}3Kpa + 0{,}13Kpa + 0{,}17Kpa + 2 * 0{,}058Kpa = 17{,}71Kpa$$

PUMP DIMENSION



A properly dimensioned pump will have to guarantee at least 460 l / h with a prevalence of 17.71Kpa, or about 1.8m. Considering, for example, the curves characteristic of a UPM3 HYBRID 25-50 130:
The image shows the working point of the pump, obtained by intersecting the two flow data and loss of load. The pump in question is more than enough to ensure the desired flow rate. The workstation also falls within the Constant Pressure area; the pump can then operate by ensuring a constant ΔP.