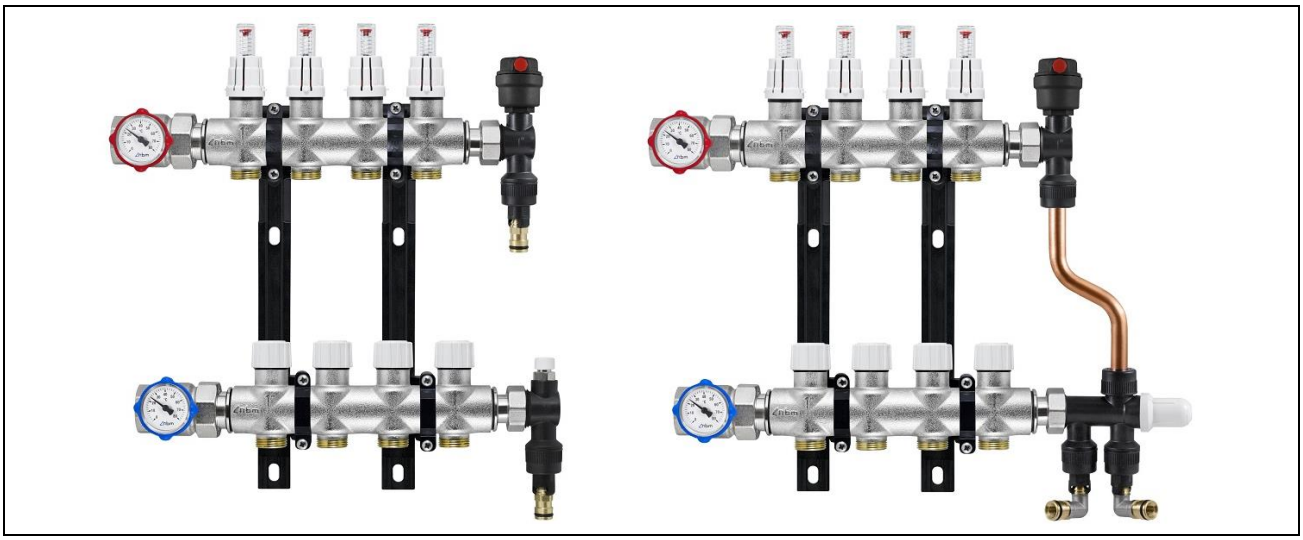
UNDERFLOOR HEATING

COMPACT BRASS MANIFOLDS

CT0829.0_09
EN
July 2016



PRODUCTION RANGE

Single manifold code			No. of ways	Possible application range* (radiating underfloor system)	
Valves with thermostat option and with manual hand-wheel	Micrometric Lockshield valves with graduated hand-wheel	Flow-meter - regulation valve incorporated		Nominal flow rate l/h	Heating kW interchang Δt 10°C
829.26.30	829.26.10	829.26.00	2	380	4,4
829.06.30	829.06.10	829.06.00	3	570	6,6
830.06.30	830.06.10	830.06.00	4	760	8,8
831.06.30	831.06.10	831.06.00	5	950	11,0
832.06.30	832.06.10	832.06.00	6	1.140	13,3
833.06.30	833.06.10	833.06.00	7	1.330	15,5
834.06.30	834.06.10	834.06.00	8	1.520	17,7
835.06.30	835.06.10	835.06.00	9	1.710	19,9
836.06.30	836.06.10	836.06.00	10	1.900	22,1
837.06.30	837.06.10	837.06.00	11	2.090	24,3
837.12.30	837.12.10	837.12.00	12	2.280	26,5
837.13.30	837.13.10	837.13.00	13	2.470	28,7

For the complete range of compositions available, refer to the instructions provided in the section "List Compositions" on page 10 and 11 of this technical data sheet.

Single manifolds

Multi-way collector, complete with valves with thermostat option and manual hand-wheel.

Multi-way manifold, complete with micrometric Lockshield valves and graduated hand-wheel.

Multi-way manifold, complete with flow-metres and incorporated regulation valve. Full-scale: 1÷4 l/min.

* The table concerning the *Possible field of application* aims at giving technicians a quick general reference in order to make it possible for them to choose the element most suitable for the size of a certain heating system. The suggestions given can be used, for example, when making an offer where no specific data is available or when making budget estimates.

DESCRIPTION

PURPOSE

The RBM *Manifolds for underfloor systems* make the parallel supply of terminal fluid circuits possible, with the following objectives and advantages:

- limited dimensions which make it possible to fit the manifolds in wall-boxes, even in partition walls.
- Manual or automatic switching on and off of individual circuits. This is made possible by fitting electrothermal controls controlled by room thermostats and timer-thermostats on the valves with thermostat option.
- Micrometric flow passage regulation in order to balance the various circuits.
- The calibration turns made are shown in numeric values on the body of the valve.
- Possibility of checking the performance of circuits by fitting thermometers and flow-meters.

THE PRODUCT

The RBM *Manifolds for underfloor systems* are supplied complete with the following pre-fitted accessories:

- Interception valves with thermostat option
- micrometric Lockshield valves with or without calibration hand-wheel
- flow-metres for reading the flow rate, with incorporated reading valve
- pair of brackets for fixing the manifolds in housing boxes (assemblies shown in the price-list only: see relevant section in this sheet).

USE

These manifolds are particularly suitable for supplying low temperature circuits serving:

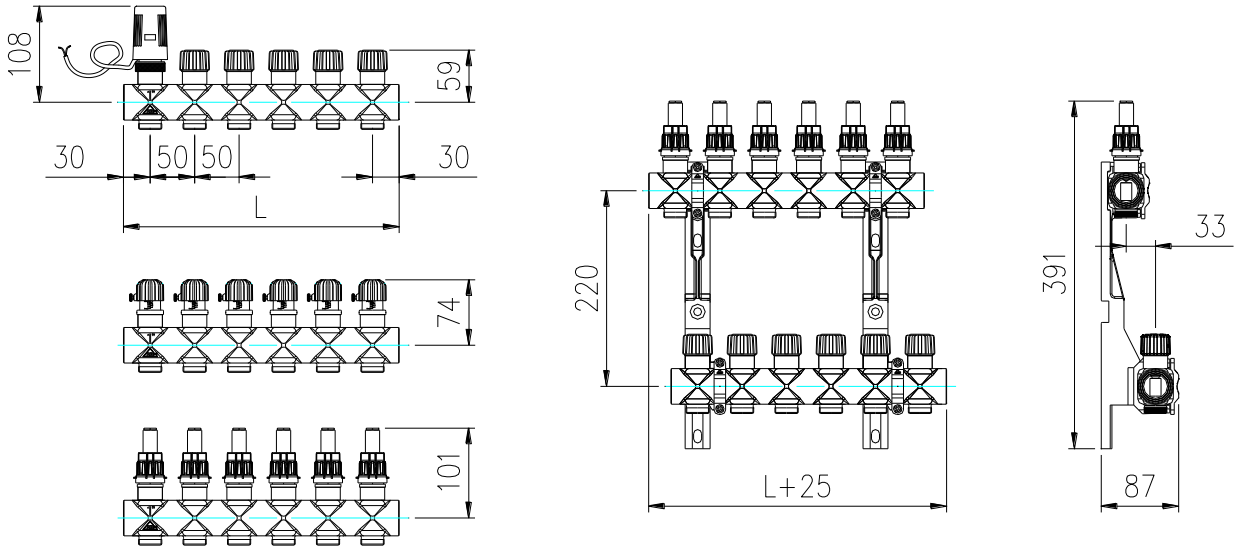
- radiating underfloor heating systems.
- fan-coil supplì systems with two pipes, with or without seasonal fluid inversion.

These manifolds can be used perfectly also for traditional heating systems using radiators.

ACCESSORIES

The different versions of *Manifolds for underfloor systems* can be equipped with various accessories chosen according to the specific requirements of designers or installers.
The various possibilities of connection to the terminal circuits are shown under the "*Accessories*" paragraph.
It is important to keep in mind that the availability of accessories such as flow-meters and thermometers allows quick control of the design functional parameters during calibration and commissioning and, *above all, in the case of controversies and disputes.*

DIMENSIONAL CHARACTERISTICS



No. of ways	2	3	4	5	6	7	8	9	10	11	12	13	14
L [mm]	110	160	210	260	310	360	410	460	510	585	635	685	735

CONSTRUCTION CHARACTERISTICS

Body	:	Nickel plated brass
Valve seals	:	EPDM
Hand-wheels and caps	:	ABS
Junction fittings	:	Euroconus (G 3/4" UNI-EN-ISO 228)
In-line fittings	:	F 1" UNI-EN-ISO 228

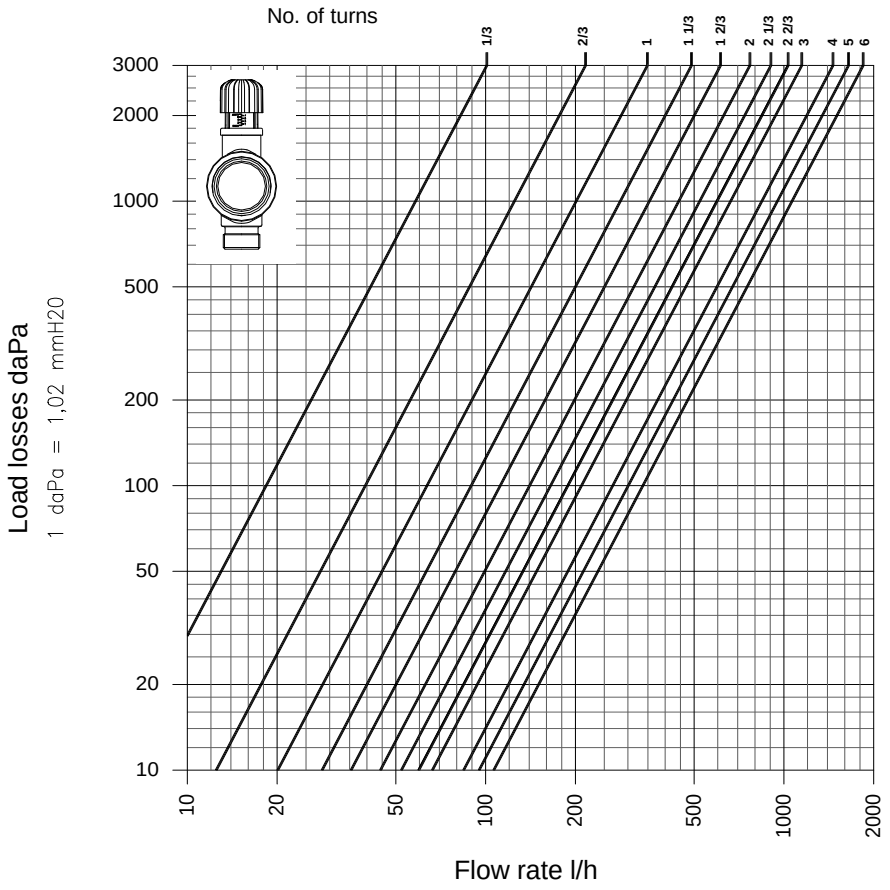
TECHNICAL CHARACTERISTICS

Maximum operating pressure	: 1000 KPa
Differential pressure Δp_{max} (only for manifolds with thermostat option)	: 100 KPa
Max. permitted temperature	
- Manifold kit with Lockshield valves:	+5 ÷ +100°C
- Manifold kit with flow-meters	: +5 ÷ +80°C
Fluid permitted	: water; water + glycol* 50%
Flow-meter	: 1 ÷ 4 l/min.
Flow-meter precision	: ± 10%

* Make sure that the antifreeze fluid or glycol used is not aggressive towards the O-rings, flow meters and construction materials of the manifold.

FLUID DYNAMIC CHARACTERISTICS

Lockshield valve pressure drop



Lockshield valve	
No. of turns	Kv m^3/h
1/3	0,184
2/3	0,395
1	**0,637**
1 1/3	0,895
1 2/3	1,120
2	**1,405**
2 1/3	1,652
2 2/3	1,887
3	**2,097**
3 1/3	2,316
3 2/3	2,527
4	**2,668**
4 1/3	2,792
4 2/3	2,932
5	**3,008**
5 1/3	3,115
5 2/3	3,232
6	**3,367**
7 valve open	

Analytical procedure for determining the adjustment value of the lockshield valve, valid for liquids with $\rho \cong 1$ kg/dm^3

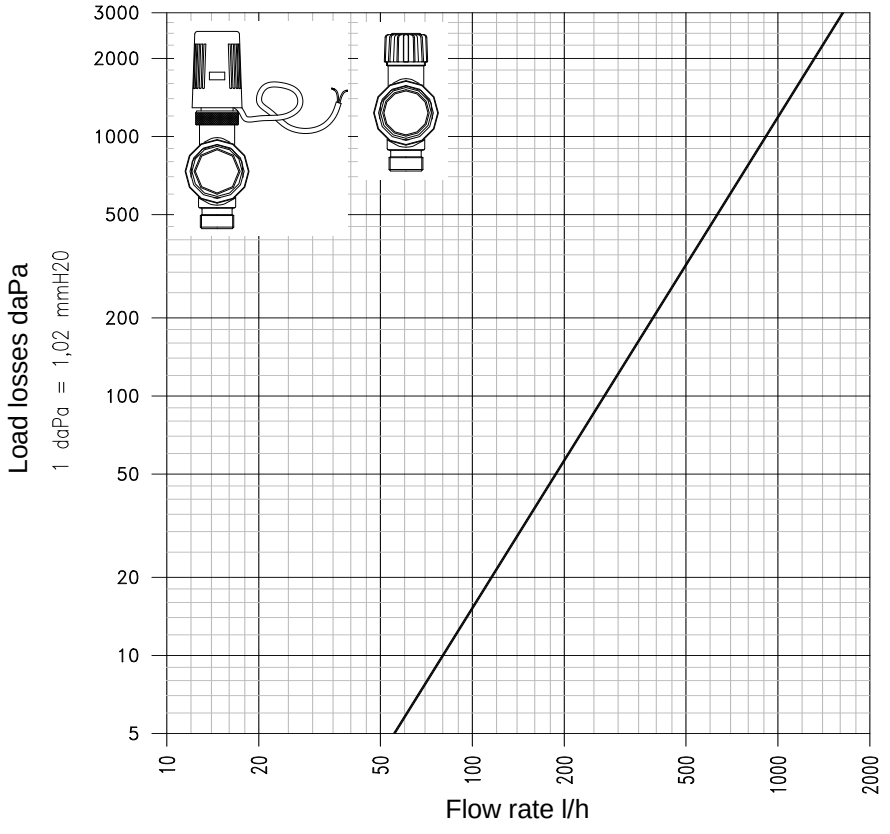
$$Kv = Q \times \left(\frac{10.000}{\Delta P} \right)^{0,5}$$

Valid for water having a temperature from 0 to 30 °C

Correction of the ΔP for fluids with ρ different from 1 kg/dm^3

$$Kv' = \frac{Kv}{\sqrt{\rho'}}$$

Pressure drop of the valve with thermostat option and servo-motor



KEY
- ΔP = pressure drop in daPa
- $\Delta P'$ = correct pressure drop in daPa
- Q = flow rate in m^3/h
- Kvs = hydraulic characteristic in m^3/h when the valve is open
- Kv = hydraulic characteristic in m^3/h with individual turns
- ρ' = density of the liquid in kg/dm^3

Analytical procedure for determining the pressure drop in liquids having $\rho \cong 1$ kg/dm^3

$$\Delta P = \left(\frac{Q}{Kvs} \right)^2 \times 10.000$$

valido per water con Temp. da 0 a 30 °C

correction of ΔP for fluids having ρ different from 1 kg/dm^3

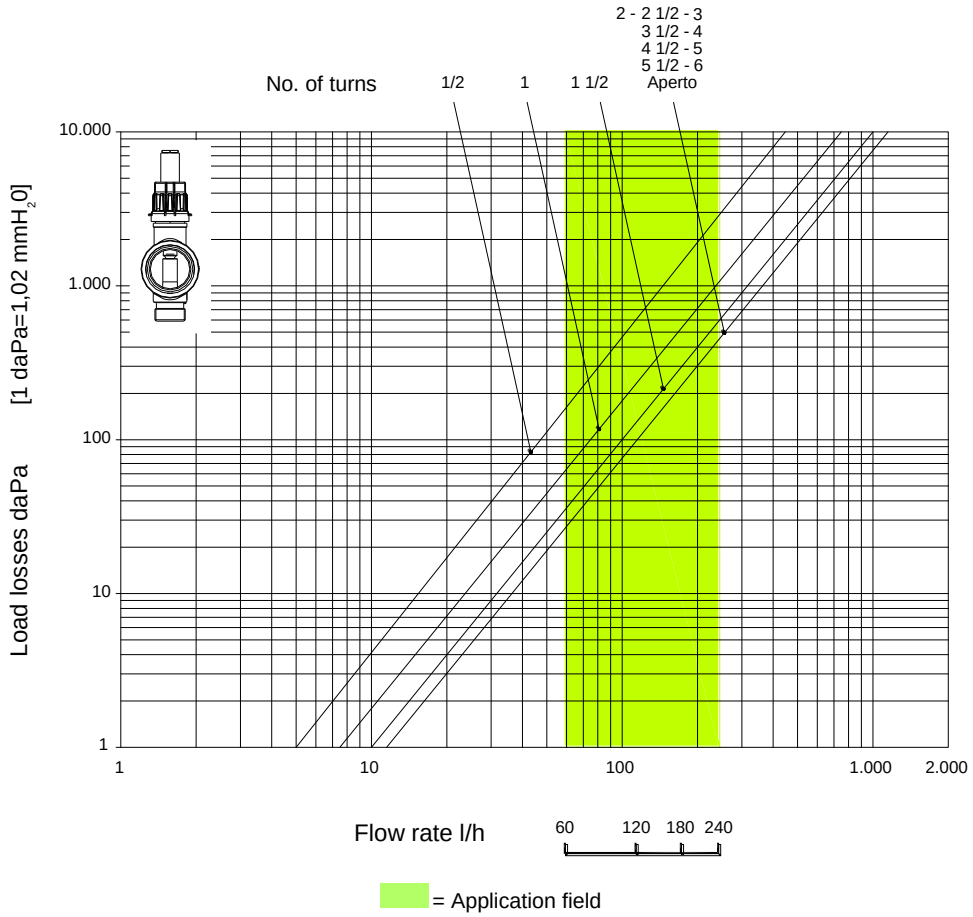
$$\Delta P' = \Delta P \times \rho'$$

Valve with thermostat option and servomotor	
ΔP_{max} kPa (bar)	Kvs m^3/h
400 (4)	**2,832**

ΔP_{max}: Max. pressure difference inkPa. Value within which the electrothermal actuator guarantees a perfect seal in the closed position.

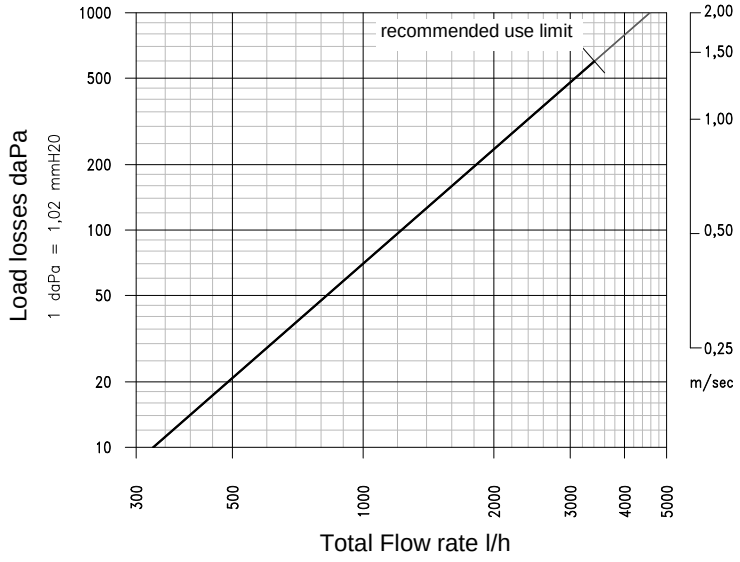
FLUID DYNAMIC CHARACTERISTICS

Flow-meter pressure drop



No. of turns	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	open
Kv[m^3/h]	0,45	0,75	1,00	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20

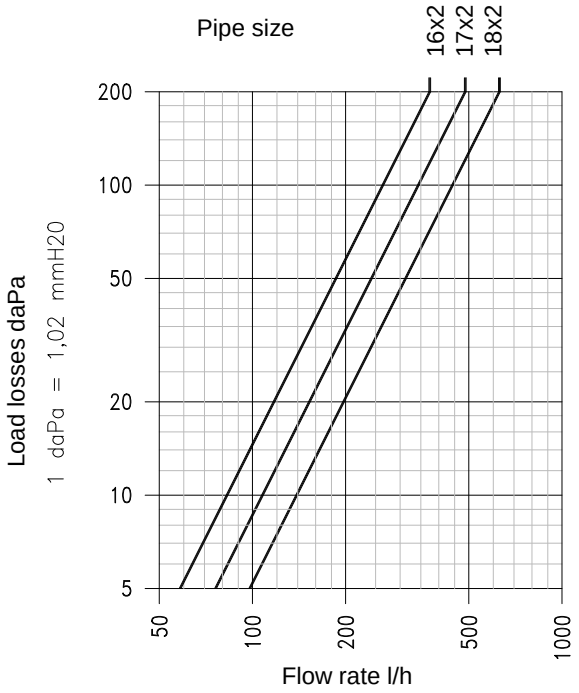
Manifold pressure drop



Pressure drop valid for collectors having 2÷14 ways (feed + return)

FLUID DYNAMIC CHARACTERISTICS

Fitting pressure drop



Pressure drop of a pair of fittings for PE pipes.
(Not to be considered for annealed copper pipes. The fittings used for these pipes do not generate significant pressure drops).

NOTE:

When balancing circuits, avoid excessive constriction of the lockshield adjustment valves and of the flow-meters.
The turbulence which could arise from such constrictions could cause irritating noise and vibrations and an excessive dissolution of gases, which is the main cause of occlusion of particularly tortuous circuits (radiating underfloor systems).

In these cases, reduce the gap between hydraulically more favoured circuits and the circuit which is less so, by distributing the flow rate of the latter between two or more circuits.

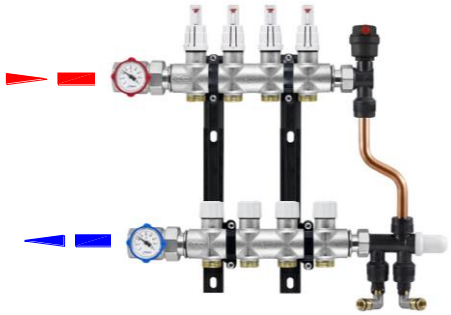
In order to determine the total pressure drop, add the pressure drop generated by the lockshield valve, the valve, the flow-meter and the fittings to the passage of the flow rate of each individual circuit. The pressure drop generated by the manifold at the time of passage of the overall flow rate can be considered negligible in comparison with the pressure drop generated by lockshield valves, flow-meters and valves.

INSTALLATION ADVICE

We advise complying with the following prescriptions when installing RBM *Brass distribution manifolds.*

- Before connecting the RBM *Brass distribution manifold,* wash all the tubes of the system upstream and downstream in order to remove any threading, welding, lubricant and solvent residue remaining in the heating circuit.
- Keep to the flow direction stamped on the individual accessories.
- Move the thermostatic valves and the flowmeters into the “all open” position.
- Pay particular attention to the filling of the circuit operations. Fill and remove air from one circuit at a time. For floor systems carefully follow the instructions provided by the manufacturer.
- The fluid circulating must be limpid and without suspensions which could damage the sealing seats of the plugs and/or deposit inside the manifolds and in the floor piping.
  If possible insert a suitable extractable well filter before the RBM *Brass distribution manifold.*
- We recommend applying the protection of the inspection hole of the container boxes so as to avoid the deterioration of the surface covering during the plastering operations.

NB: It is mandatory to mount the brass manifold complete with flowmeter on the hydraulic feed circuit.



Correct installation of manifold with flowmeter

☞ ***For additional information consult the optional accessories technical sheets, and comply with the installation instructions, use and maintenance provided in the enclosed instructions with the components supplied.***

USE OF FLOWMETER

The polymer manifold is present in the version with flowmeters and delivery adjustment valves incorporated.
The flowmeter present on the manifold is able to carry out the following operations:

- Measure the delivery: direct reading of the delivery quantity.
- Interception and adjustment of the delivery: possible thanks to the incorporated adjustment valve.

USE

Using the incorporated adjustment valve in the flowmeter, the delivery of the individual circuits can be adjusted by the operator to the amount required, read directly on the indicator rod of the flowmeter, and by direct use of the same.
The flowmeter has a scale limit of 1 ÷ 4 l/min (60 ÷ 240 l/h).

Following the adjustment, the valve can be blocked in the position it is in by means of the blocking cover that acts also as a knob to adjust the flow, it is equipped for**.** The same valve enables the derivation way in question to be closed.

The polymer manifold with flowmeter **must always be positioned on the delivery side of the connected hydraulic system.** Incorrect positioning of the manifold causes malfunction of the flowmeter.

The adjustment valve group and flowmeter is dismountable and replaceable with appropriate spare part (cod. **2250.00.12**).

ADJUSTMENT – FUNCTION “MEMORY-STOP” FLOWMETER

Locking system of the degree of opening of the flow meter, allowing at the re-opening of the circuit, the lock of the stroke at the exact position of initial setting (project value).

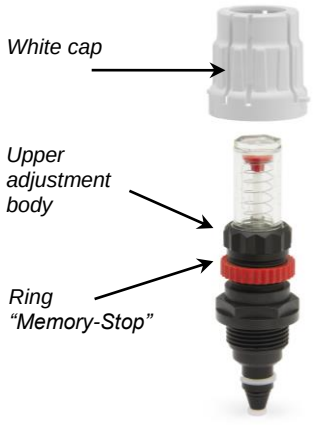
1) Set the regulation of the flow meter to the project value. The white handwheel has to be removed during this operation;

2) Screw the ring of "Memory-Stop" counter-clockwise (left thread) until you reach the stop stroke;

3) Replace the white handwheel. Operating on the handwheel (clockwise), you can close the single circuit. Turning on the opposite direction until its locking, you can open the circuit, until the setting of the project value.

Through the two holes on the handwheel, you can plunge the flow meter, in order to avoid the tampering of the setting adjustment.

Warning: DO NOT use tools for operation / adjustment of the flow meter, in order to undermine the correct working of it.



SYSTEM LOADING / UNLOADING

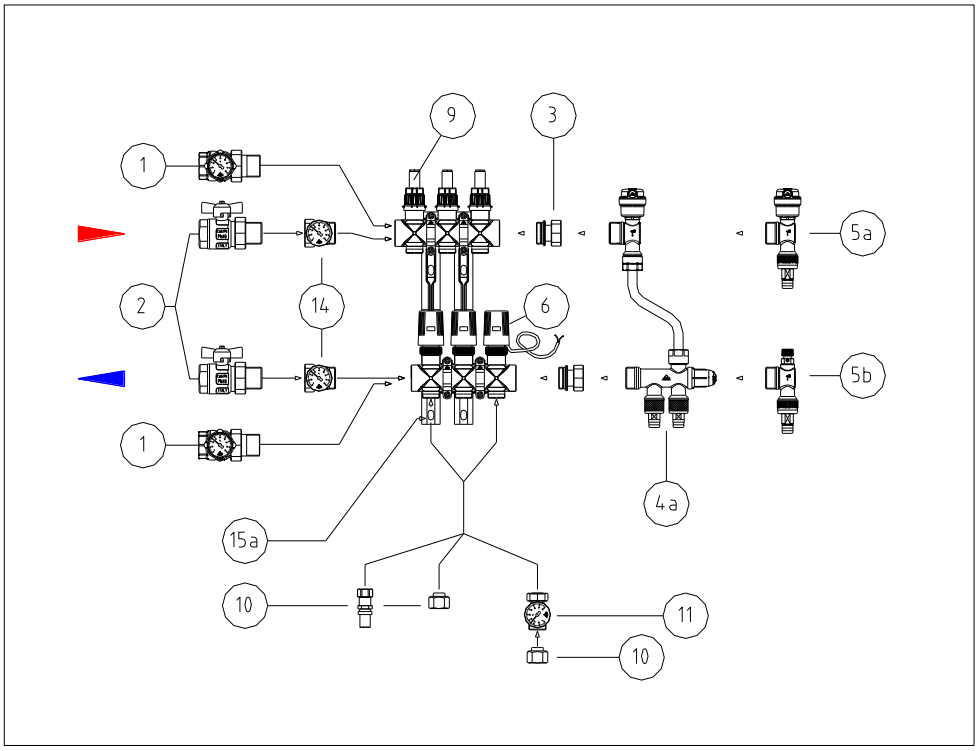
The terminal units and the by-pass unit are equipped with a filling unit with threaded pressure gauge holder connection F G 1/8".

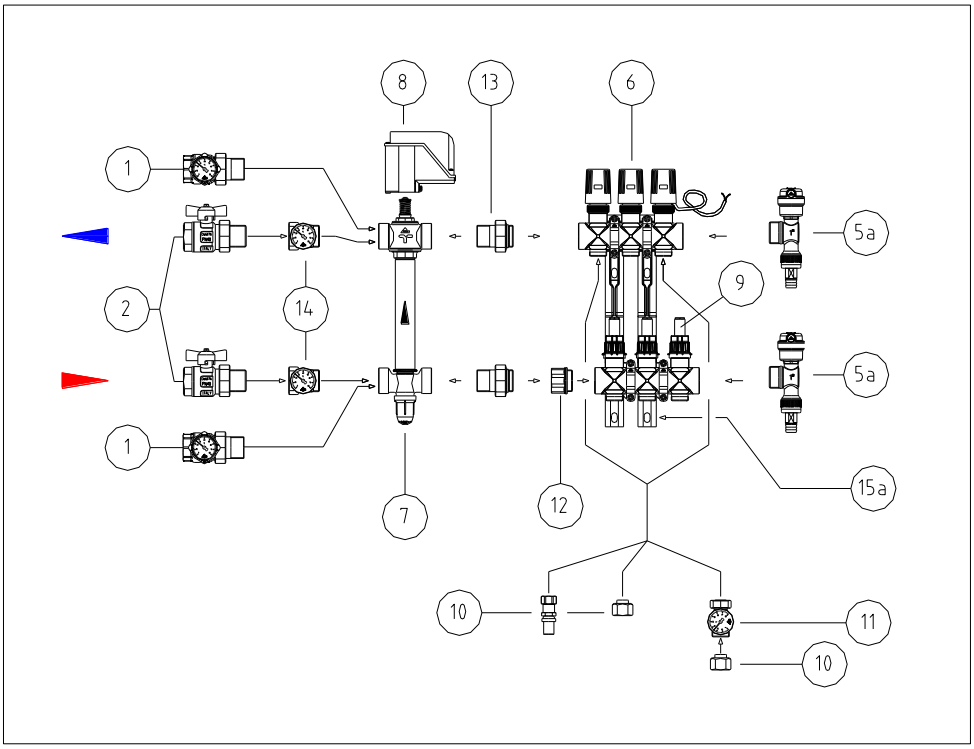
- Use a manometer Ø 40 with a 16 bar G1/8" radial coupling code **7469.005** for connection to automatic/manual thermal units.

- Use a Ø 40 pressure gauge with a 10 bar G1/8" axial coupling code **832.005** for connection to the by-pass unit.

By-pass unit with rotatable elbow fittings to facilitate loading / unloading the system.

MAIN ACCESSORIES





Pos.	Code	Accessory	
1	67.06.80 (B) 67.06.90 (R)		Ball valve with total passage, FM 1" union fitting, with hand-wheel complete with dial thermometer scale (0...80 °C) with OR seal fitting. B = Blue butterfly valve / R = Red butterfly valve
2	67.06.12 (B) 67.06.02 (R)		Ball valve with total passage, FM 1" union fitting. B = Blue butterfly valve / R = Red butterfly valve
3	930.06.00		Junction fitting.
4b	1529.06.00		Fixed By-Pass group. Union 1" M
5a	449.06.50		End group for automatic discharge of air and water. Mounted on return manifold Union 1" M
5b	450.06.50		End group for manual discharge of air and water. Mounted on delivery side manifold. Union 1" M
6	306.00.X2		Servomotor for electro-thermal control for thermostatic valves, with or without micro limit switch. Valve position Normally Closed in the absence of power. Power supply 230 V AC or 24 V AC.
7	114.06.30		4-way zone valve which can be motorised, Normally Closed with adjustable by-pass, in-line FF 1" connections, fitting centre distance 220 mm.
8	373.00.X0		Electro-mechanical servomotor for zone valve, complete with auxiliary micro-switch. Three wire on-off control, IP42 protection, power supply 230 or 24 V AC.
8	360.00.X0		Electro-thermal servomotor for zone valve with optional auxiliary micro-switch. Two wire on-off control, IP31 protection, power supply 230 V AC or 24 V AC.
8	313.00.02		Auxiliary switch for electro-thermal servomotor.
9	2250.00.12		Flow meter with regulation valve and flow rate indicator function. 1 ÷ 4 l/min (60 ÷ 240 l/h).
10	263.1X.20 361.1X.00		Fitting for copper pipe ø10 ÷ 18 mm, thickness 1 mm. F ¾" Euroconus threaded connection.
10	217.XX.X0 123.XX.00		Fitting for polyethylene pipe, ø12 ÷ 21 mm, thickness 1.1 ÷ 2,5 mm. F ¾" Euroconus threaded connection.
10	224.XX.X0		Fitting for multi-layer polyethylene pipe, ø14 ÷ 20 mm, thickness 2 ÷ 2,5 mm. F 3/4" Euroconus threaded connection.
10	963.XX.X0		Press-fit union for multi-layer polyethylene tube ø14 ÷ 26 mm, thickness 2 ÷ 3 mm. Threaded union F 3/4" Euroconus.
11	314.05.50		Fitting in line with the thermometric pocket and the dial thermometer, scale 0...80 °C, in-line MF ¾" Euroconus connections.
12	793.06.00		Junction fitting for by-pass valve alignment. FM 1" connections.
13	72.06.00 1100.06.00		Manifold junction fitting made up of three pieces, MM 1" connections.
14	451.06.00		Connection fitting with thermometric pocket and dial thermometer, scale 0...80 °C. MF 1" in-line connections.
15a	792.06.00		Pair of polymer brackets for offset fixing of manifolds, complete with small collar. Centre distance 220 mm.

EXAMPLES OF COMBINATIONS OF MANIFOLDS AND HOUSING BOXES

Code	L x H
2606.40.02	400x500
2606.60.02	600x500
2606.80.02	800x500
2606.10.02	1000x500

METAL BOX WITH PLASTIC COVER

"Box1" Manifold in galvanised steel sheet containment and inspection box with bottom and side closures, complete with universal mobile bracket guides and removable cover in paintable plastic.

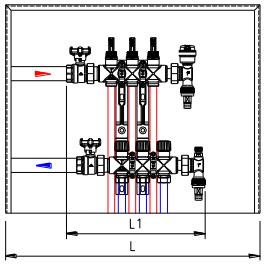
- Adjustable depth 80÷130 mm. (overall depth 80 ÷ 150 mm if considering the useful stroke of the screws used for fixing the plastic cover to the metal frame).
- Recessed assembly, even in walls with 80 mm box plastered on both sides.

Code	L x H
1972.55.00	550x450
1972.70.00	700x450
1972.85.00	850x450

PLASTIC BOX

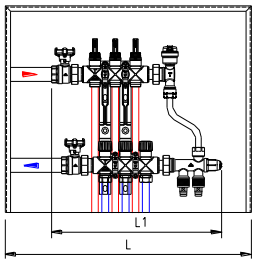
"Quickbox" Manifold in plastic containment and inspection box with bottom and side closures, complete with removable cover and independent collars running lengthwise inside the guides.Profondità regolabile 80÷100 mm.

- Adjustable depth 80÷100 mm.
- Recessed assembly, even in walls with 80 mm box plastered on both sides.



DISTRIBUTION MANIFOLDS **COMPOSITION WITH AIR VENT VALVES**

2	3	4	5	6	7	8	9	10	11	12	13	14
L1 (mm) 280	L1 (mm) 330	L1 (mm) 380	L1 (mm) 430	L1 (mm) 480	L1 (mm) 530	L1 (mm) 580	L1 (mm) 630	L1 (mm) 680	L1 (mm) 745	L1 (mm) 795	L1 (mm) 845	L1 (mm) 895
L=400 Code 2606.40.02		L=600 Code 2606.60.02			L=800 Code 2606.80.02				L=1000 Code 2606.10.02			
L=550 Cod. 1972.55.00*					L=700 Cod. 1972.70.00*			L=850 Cod. 1972.85.00*	NOT AVAILABLE BOX QUICKBOX			



DISTRIBUTION MANIFOLDS **COMPOSITION WITH BYPASS UNIT**

2	3	4	5	6	7	8	9	10	11	12	13
L1 (mm) 365	L1 (mm) 415	L1 (mm) 465	L1 (mm) 515	L1 (mm) 565	L1 (mm) 615	L1 (mm) 665	L1 (mm) 715	L1 (mm) 765	L1 (mm) 830	L1 (mm) 880	L1 (mm) 930
L=600 Code 2606.60.02				L=800 Code 2606.80.02				L=1000 Code 2606.10.02			
L=550 Code 1972.55.00*			L=700 Code 1972.70.00*			L=850 Code 1972.85.00*		NOT AVAILABLE BOX QUICKBOX			

Unless otherwise indicated, all measurements shown are to be understood in mm.

** For housing in the box, use the dedicated brackets.*
When ordering the manifolds kit, check that it can be installed in Quickbox.

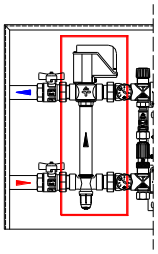
NOTES: To couple the manifold/containment boxes, a buffer area has been considered equal to:
- ***30 mm*** discharge/Bypass units side, to allow performing the required adjustments;
- ***50 mm*** ball valves side, required to allow installation of the multilayer pipe and fitting.

If these requirements are not met, the coupling will skip to the next box size.

The following are some measurements useful for clearances of compositions out of standard.

- 1) Composition of manifold kit with zone valve: **L1 + 110 mm**;

1



For clearances of compositions out the standard not provided here, please contact the Kilma Office.

The assemblies for the distribution with an independent circuit control can be created both with the delivery manifold located above the return manifold and vice versa (if you use a bypass-valve, please make sure that you fit it correctly).
The assemblies with a zone valve can be created only with the return manifold located above the return manifold because the electric servocontrol of the valve cannot be fitted upside down.

ASSEMBLIES IN THE PRICE-LIST

Code	NO. OF WAYS
608.26.10	2
608.06.10	3
609.06.10	4
610.06.10	5
611.06.10	6
612.06.10	7
613.06.10	8
614.06.10	9
615.06.10	10
616.06.10	11
616.12.10	12
616.13.10	13
616.14.10	14

ASSEMBLY 1

- 1 multi-way manifold group with flow-meters, lockshield and flow indicator function.
- 1 multi-way manifold group, complete with valves with thermostat option and with manual hand-wheel.
- 1 pair of polymer brackets for fixing.

Code	NO. OF WAYS
608.26.60	2
608.06.60	3
609.06.60	4
610.06.60	5
611.06.60	6
612.06.60	7
613.06.60	8
614.06.60	9
615.06.60	10
616.06.60	11
616.12.60	12
616.13.60	13
616.14.60	14

ASSEMBLY 2

- 1 multi-way manifold group, complete with micrometric adjustment valves with graduated hand-wheel.
- 1 multi-way manifold group, complete with valves with thermostat option, with manual hand-wheel.
- 1 pair of polymer brackets for fixing.

Code	NO. OF WAYS
608.26.20	2
608.06.20	3
609.06.20	4
610.06.20	5
611.06.20	6
612.06.20	7
613.06.20	8
614.06.20	9
615.06.20	10
616.06.20	11
616.12.20	12
616.13.20	13
616.14.20	14

ASSEMBLY 3

- 1 multi-way manifold group with flow-meters, lockshield and flow indicator function.
- 1 multi-way manifold group, complete with valves with thermostat option and with manual hand-wheel.
- 1 pair of polymer brackets for fixing.
- 2 1” ball valves with thermometer included 0-80°C.
- 1 automatic air / water discharge terminal unit 1”.
- 1 manual air / water discharge terminal unit 1”.
- 2 connection fittings.

Code	NO. OF WAYS
608.26.50	2
608.06.50	3
609.06.50	4
610.06.50	5
611.06.50	6
612.06.50	7
613.06.50	8
614.06.50	9
615.06.50	10
616.06.50	11
616.12.50	12
616.13.50	13

ASSEMBLY 4

- 1 multi-way manifold group with flow-meters, lockshield and flow indicator function.
- 1 multi-way manifold group, complete with valves with thermostat option and with manual hand-wheel.
- 1 pair of polymer brackets for fixing.
- 2 1” ball valves with thermometer included, 0-80°C.
- 1 automatic air vent valve 3/8”;
- 1 adjustable bypass valve complete with connections to fill system.
- 2 connection fittings

COMPOSITION FOR MODULAR CONTROL UNITS KIT

The compositions shown below, without shut-off ball valves, can be used for the composition of the modular Kilma control units. Can be coupled to the mixing units Kilma EVO / ECO.

Code	NO. OF WAYS
2028.06.10	2
2029.06.10	3
2030.06.10	4
2031.06.10	5
2032.06.10	6
2033.06.10	7
2034.06.10	8
2035.06.10	9
2036.06.10	10
2037.06.10	11
2038.06.10	12
2038.13.10	13
2038.14.10	14

ASSEMBLY 1

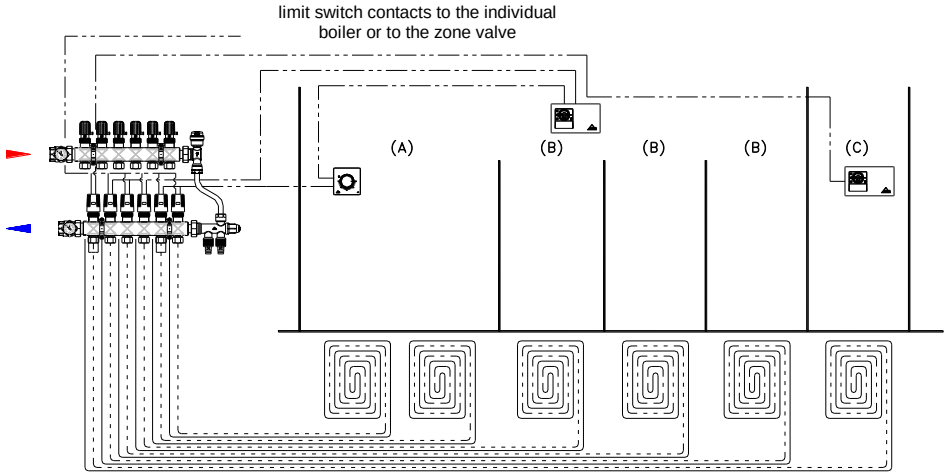
- 1 multi-way manifold group with flow-meters, lockshield and flow indicator function.
- 1 multi-way manifold group, complete with valves with thermostat option and with manual hand-wheel;
- 1 pair of polymer brackets for fixing;
- 1 automatic air / water discharge terminal unit 1";
- 1 manual air / water discharge terminal unit 1";
- 2 connection fittings;
- 2 thermometer 0-80°C.

Code	NO. OF WAYS
2028.06.60	2
2029.06.60	3
2030.06.60	4
2031.06.60	5
2032.06.60	6
2033.06.60	7
2034.06.60	8
2035.06.60	9
2036.06.60	10
2037.06.60	11
2038.06.60	12
2038.13.60	13

ASSEMBLY 2

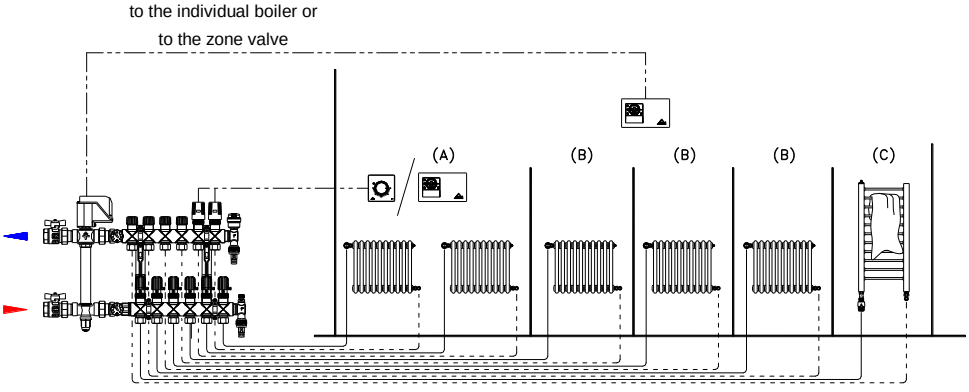
- 1 multi-way manifold group with flow-meters, lockshield and flow indicator function.
- 1 multi-way manifold group, complete with valves with thermostat option and with manual hand-wheel.
- 1 pair of polymer brackets for fixing;
- 1 automatic air vent valve 3/8";
- 1 adjustable bypass valve complete with connections to fill system;
- 2 connection fittings;
- 2 thermometer 0-80°C.

EXAMPLES OF POSSIBLE APPLICATION



Feeding a radiating underfloor system.
Thermal zone with thermally independent bathroom, even during operating times (e.g. sleeping zone attenuated, bathroom warm).

(A) Circuits thermally independent, but tied to the operation and attenuation of the thermal zone timer-thermostat.
(B) Areas controlled by the thermal zone timer-thermostat.
(C) Bathroom controlled by independent timer-thermostat.



Feeding a heating system using radiators.
Thermal zone controlled by room timer-thermostat with temperature regulation on two levels.

(A) Circuits controlled by room thermostat or timer-thermostat acting on electro-thermal commands (solution for premises with free internal and/or external loads).
(B) Circuits without automatic interception devices.
(C) Heated towel rail feed circuit with thermostatic valve.

RBM Spa
Via S.Giuseppe, 1
25075 Nave (Brescia) Italy
Tel. 030-2537211 Fax 030-2531798
E-mail: info@rbm.eu – www.rbm.eu