Rev. 05/2014

MODULAR MANIFOLDS IN ANTI-CONDENSATE POLYMER

Floor heating.

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PRODUCTION RANGE

N. Routes	Single manifold code			System side connection	Bridged connection
	Thermostatic valves with manual knob	Micrometric regulation lockshield valves with graduated knob	Incorporated flow meter and regulation valve Full-scale: 1÷4 l/min		
2	**948.02.30**	**948.02.10**	**948.02.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
3	**948.03.30**	**948.03.10**	**948.03.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
4	**948.04.30**	**948.04.10**	**948.04.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
5	**948.05.30**	**948.05.10**	**948.05.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
6	**948.06.30**	**948.06.10**	**948.06.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
7	**948.07.30**	**948.07.10**	**948.07.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
8	**948.08.30**	**948.08.10**	**948.08.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
9	**948.09.30**	**948.09.10**	**948.09.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
10	**948.10.30**	**948.10.10**	**948.10.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
11	**948.11.30**	**948.11.10**	**948.11.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
12	**948.12.30**	**948.12.10**	**948.12.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS
13	**948.13.30**	**948.13.10**	**948.13.00**	1" F UNI-EN-ISO 228	3/4" M EUROCONUS

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

Single manifolds

Multiple-route compact manifold in polymer complete with thermostatic valves and manual knob.	Multiple-route compact manifold in polymer complete with micrometric regulation lockshield valves and graduated knob.	Multiple-route compact manifold in polymer complete with flow meters **TO BE USED ONLY ON SYSTEM SUPPLY**
		

DESCRIPTION

THE PURPOSE

RBM polymer distribution manifolds allow to supply terminal fluid circuits in parallel with the following objectives and advantages:

- Reduced dimensions allowing them to be inserted in housing boxes even fitted in partition walls.
- Manual or automatic switching on-off of individual circuits by applying, on thermostatic valves, electrothermal controls driven by room thermostats and programmable thermostats.
- Micrometric adjustment of flow in transit for balancing between various circuits.
- Indication of calibration revs performed by directly reading the numerical value on the lockshield valve body.
- Adjustment of flow in transit for balancing between various circuits by means of flow meters fitted on the manifold and equipped with built-in regulation valve.
- Direct reading on flow meter of flow rate value in transit in single circuit.
- Possibility of checking performance of circuits by inserting thermometers and flow meters.

THE PRODUCT

RBM polymer distribution manifolds are supplied complete with the following preassembled accessories:

- Thermostatic shut-off valves.
- Micrometric regulation lockshield valves with calibration knob.
- Flow meters for reading flow rate with built-in regulation valve.

USE

Thanks to the inner gaps acting as thermal and anti-condensation insulation, they are particularly suitable to supply low temperature circuits supplying:

- radiant floor heating and cooling systems
- double pipe fan coil supply systems, with or without seasonal fluid inversion.

They can also be used perfectly to supply the most common radiator heating systems.

NB: For the correct installation of the polymer manifold equipped with flow meter, refer to the specific section "Installation" of this file.

ACCESSORIES

The versions of the **RBM polymer distribution manifolds** can be equipped with a series of accessories, chosen according to the specific requirements of the designer and installer.

The paragraph "Accessories" shows the various ways of connecting to the terminal circuits.

It should be kept in mind that during calibration and testing, but above all in the case of controversies and disputes, the presence of reading tools like the flow meter and thermometers can allow the functional design parameters to be checked quickly.

There are also a series of insulated housings available for the manifold. If the polymer manifold is used in the cooling system, these housings make it possible to insulate metal accessories of the manifold, such as the bypass unit, vasa tre and ball valves, from the outside environment thus keeping dew from forming on the metal parts.

CONSTRUCTION FEATURES

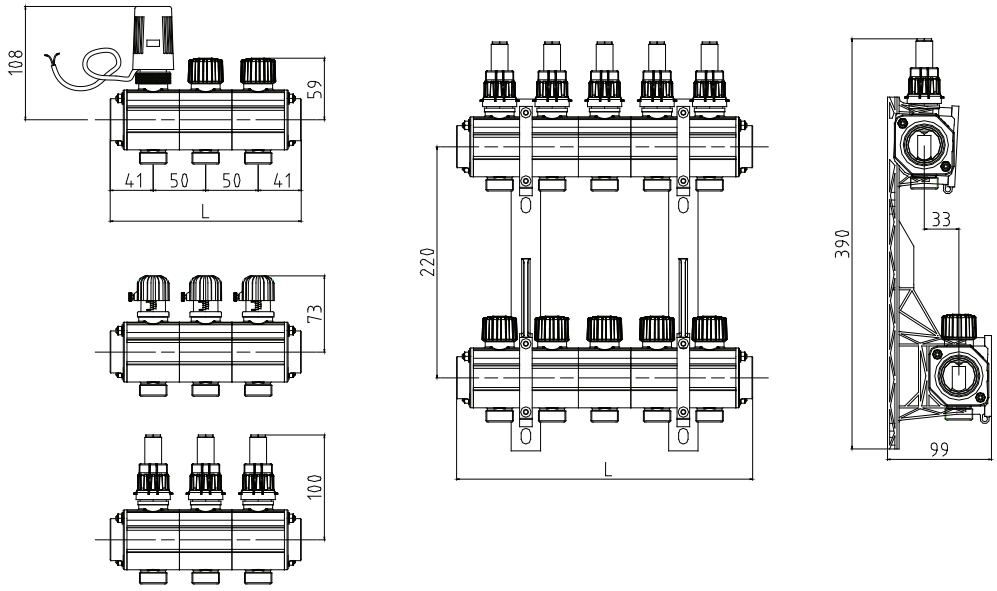
Body	In polymer (Pa66 + 30%FV) with brass inserts on the threaded parts.
Knobs and caps	ABS
In-line connections	1" F UNI EN ISO 228
Bridged connections	3/4" M EUROCONUS

TECHNICAL FEATURES

Max. working pressure	800 kPa
Differential pressure Δp_{max} (only for thermostatic manifolds)	100 kPa
Use temperature	+5 ÷ +80 °C
Flow meter	1 ÷ 4 l/min.
Flow meter accuracy	± 10%
Permitted fluid	Water; Water + glycol* 50%

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

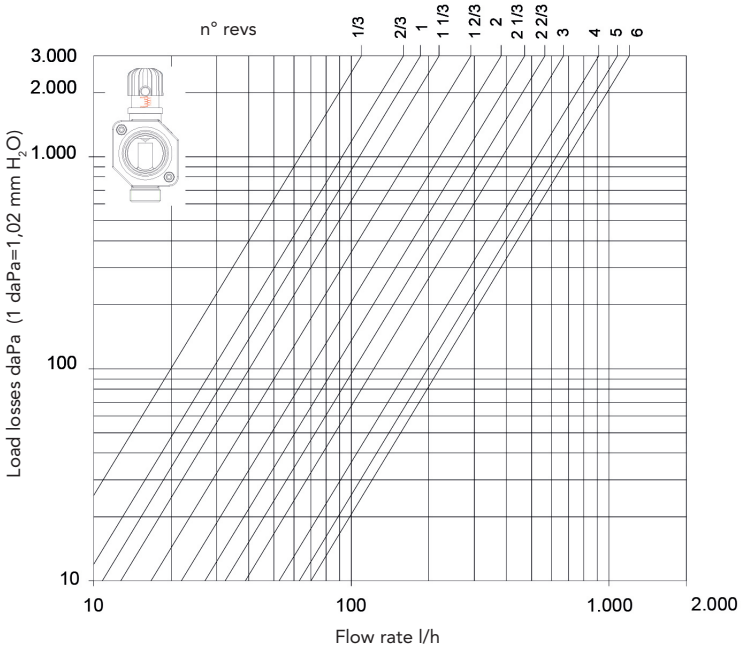
DIMENSIONAL FEATURES



N. routes	2	3	4	5	6	7	8	9	10	11	12	13
L [mm]	132	182	232	282	332	382	432	482	532	582	642	692

FLUID DYNAMIC FEATURES

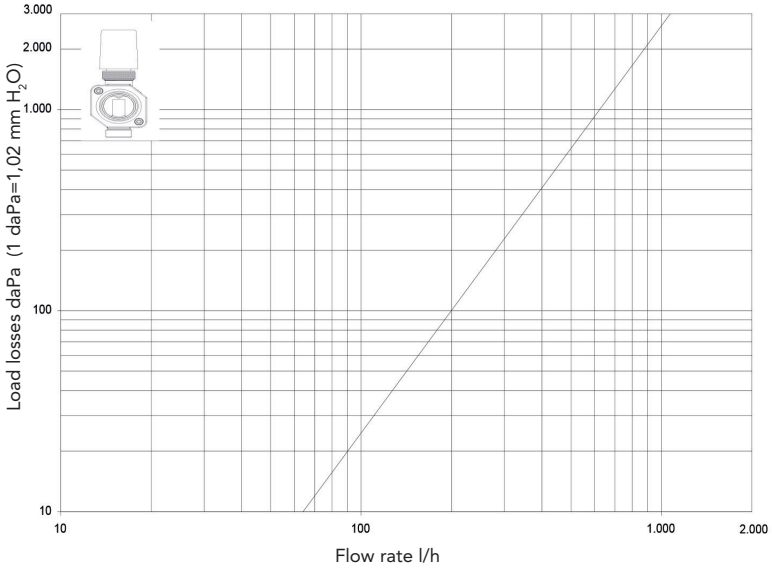
LOCKSHIELD VALVE PRESSURE DROP



Lockshield valve	
n° revs	Kv [m³/h]
1/3	0,200
2/3	0,290
1	**0,339**
1 1/3	0,400
1 2/3	0,530
2	**0,695**
2 1/3	0,856
2 2/3	1,029
3	**1,224**
3 1/3	1,357
3 2/3	1,538
4	**1,658**
4 1/3	1,814
4 2/3	1,898
5	**1,980**
5 1/3	2,033
5 2/3	2,116
6	**2,204**
6 1/3	2,220
6 2/3	2,213

7 valve open

THERMOSTATIC VALVE AND SERVOMOTOR PRESSURE DROP



Electrothermal servomotor
Kvs [m³/h]
1,98

Analytic process to determine the regulation value of the lockshield valve valid for liquids with ρ ≃ 1 kg/dm³

$$Kvs = Q * \left(\frac{10000}{\Delta P}\right)^{0,5}$$

valid for water at Temp. from 0 to 30 °C

correction of Δρ for fluids with ρ other than 1 kg/dm³

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

Analytic process to determine the pressure drop for liquids with ρ ≃ 1 kg/dm³

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

valid for water at Temp. from 0 to 30 °C

correction of ΔP for fluids with ρ other than 1 kg/dm³

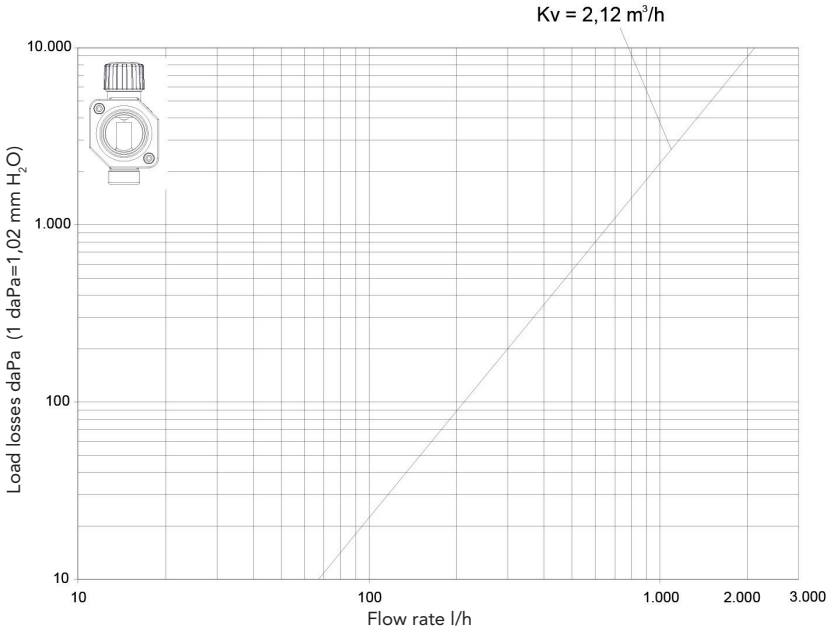
ΔP' = ΔP x ρ'

KEY

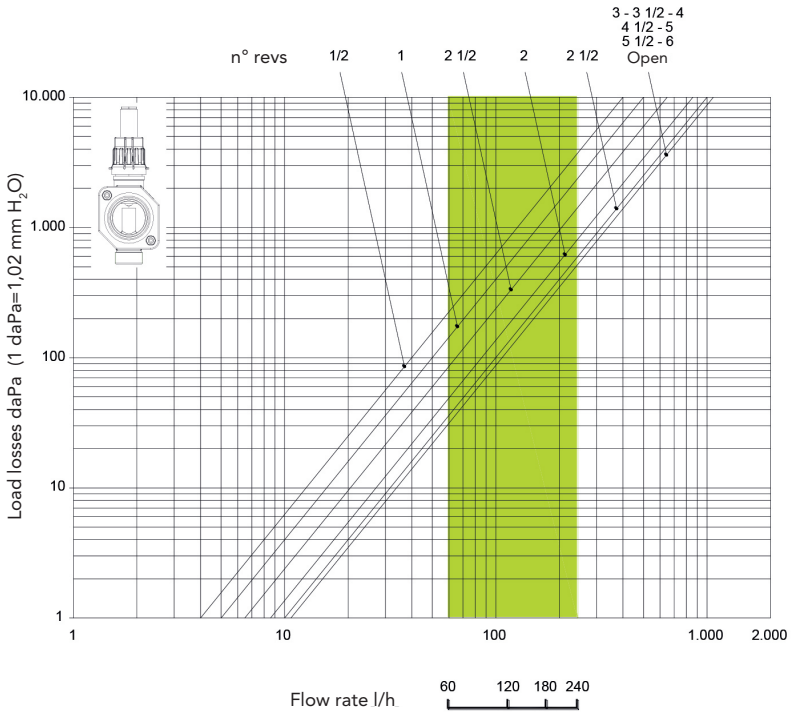
ΔP	pressure drop in daPa
ΔP'	correct pressure drop in daPa
ΔP_{max}	max pressure difference in kPa. Value within which the electrothermal actuator guarantees perfect closing sealing.
Q	flow rate in m³/h
Kvs	hydraulic feature in m³/h with valve open
Kv	hydraulic feature in m³/h at single revs
ρ'	liquid density in kg/dm³

FLUID DYNAMIC FEATURES

THERMOSTATIC VALVE PRESSURE DROP



FLOW METER PRESSURE DROP



Application field

Flow meter	
n° revs	Kv [m³/h]
1/2	0,40
1	0,50
1 1/2	0,65
2	0,86
2 1/2	1,00
3	1,10
3 1/2	1,10
4	1,10
4 1/2	1,10
5	1,10
5 1/2	1,10
6	1,10

Flow meter open

NOTES: When balancing the circuits, avoid excessive throttling of the regulation lockshield valves and of the flow meters.

The turbulence generated in this condition can cause bothersome noise and vibrations, together with excessive gas dissolution, the main cause of obstruction of particularly winding circuits (radiating floor systems).

In these cases, reduce the gap between the circuits more favoured hydraulically and those less favoured by sharing the flow rate of the latter between two or more circuits.

To determine the overall pressure drop, add the pressure drops generated by the lockshield valve, by the valve, by the flow meter and by the fittings at the transit of the flow rate of the single circuit. The pressure drop generated by the manifold at the overall flow rate transit can be considered negligible respect to the pressure drops generated by the lockshield valves, flow meters and valves.

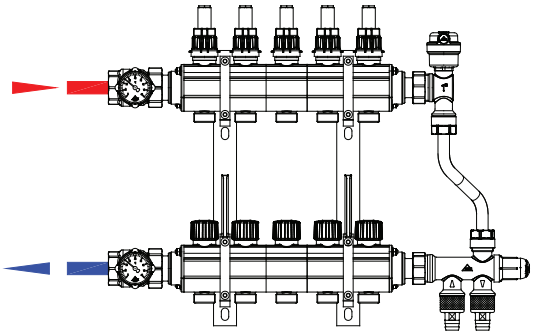
INSTALLATION ADVICE

We recommend complying with the following installation instructions of the **RBM polymer distribution manifolds**:

- Before connecting the **RBM polymer distribution manifolds**, thoroughly wash all the upstream and downstream pipes of the plant in order to eliminate residue from threading, welding, lubricating oils and solvents which could be present in the various components of the heating circuit.
- Respect the flow direction printed on the individual accessories.
- Place the thermostatic valves, lockshield valves and flow meters in the ''all open" position.
- Pay special attention when filling the circuits. Fill and bleed only one circuit at a time. For floor systems, strictly follow the instructions issued by the manufacturers.
- The circulating fluid must be clear and without any suspensions or impurities which could deteriorate the sealing housings of the shutters and/or settle inside the manifolds and in the floor pipes.
  If possible, apply a suitable removable basket strainer before the **RBM polymer distribution manifold**.
- It is recommended to protect the inspection door of the containment box to avoid deteriorating the surface when plastering.

NB: The polymer manifold equipped with flow meter must be fitted on the hydraulic circuit supply so that the flow meter operates in the best possible conditions.

NOTES: For further information, see the technical files of the optional accessories and comply with the installation, use and maintenance instructions attached to the supplied components.



Correct installation of manifold with flow meter

USING THE FLOW METER

The **polymer manifold** is supplied in the version with flow meters and built-in flow rate regulation valves.
The flow meter on the manifold can perform the following operations:

- Measure the flow rate: direct reading of flow rate value.
- Shut-off and regulation of flow: possible thanks to the built-in regulation valve.

USE

By means of the regulation valves built into the flow meter, the flow rate of the individual circuits can be adjusted by the operator at the desired value, read directly on the flow meter rod by acting directly on it.
Flow meter has a full-scale of 1÷4 l/min (60 ÷ 240 l/h).

The same valve can close the concerned offtake route. By means of the "memory stop" function, when the circuit reopens, the stroke can stop at the exact position as the initial setting (design value).
To set the "memory-stop", see the specific section of this file ""memory-stop regulation/function", below.
The polymer manifold with the flow meter **must be positioned on the supply side of the connected hydraulic system**. Incorrect positioning of the manifold will cause the flow meter to malfunction.
The regulation valve and flow meter unit can be disassembled and replaced with the specific spare part (code **2250.00.12**).

"MEMORY-STOP" REGULATION/FUNCTION

Blocking system capable of opening the flow meter and, when the circuit reopens, allowing the stroke to stop at the exact position as the initial setting (design value).

1. **Set the flow meter regulation at the design value. The white knob must be removed during this operation;**
2. **Screw the "Memory-Stop" ring nut anti-clockwise (left-hand thread) to the end of travel;**
3. **Reposition the white knob. By turning the knob clockwise, it is possible to close the individual circuit. By turning it the opposite way until it locks, the circuit can be reopened to the set design value.**

The two slots on the knob make it possible to seal the flow meter, to keep the set regulation from being tampered with.

Attention: DO NOT use tools to manoeuvre/adjust the flow meter to avoid jeopardising its correct operation.

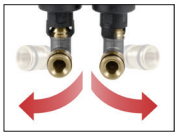
1. **White Knob**
2. **Upper adjustment body**
3. **"Memory-Stop" Ring nut**

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.

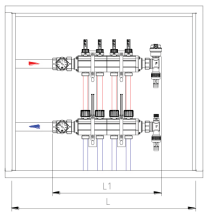


By-pass unit with rotatable elbow fittings to facilitate loading / unloading the system.

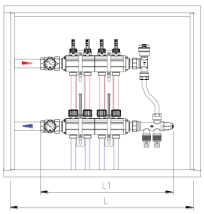
EXAMPLES OF COMBINATIONS OF MANIFOLDS AND HOUSING BOXES

Product	METAL BOX WITH PLASTIC COVER	Code	L x H
	"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). NOTE: The minimum anti-condensate manifold depth is 100 mm.	**2606.40.02**	400x500
		2606.60.02	600x500
		2606.80.02	800x500
		2606.10.02	1000x500

DISTRIBUTION MANIFOLDS COMPOSITION WITH AIR VENT VALVES

	2	3	4	5	6	7	8	9	10	11	12	13
	L1 (mm) 285	L1 (mm) 335	L1 (mm) 385	L1 (mm) 435	L1 (mm) 485	L1 (mm) 535	L1 (mm) 585	L1 (mm) 635	L1 (mm) 685	L1 (mm) 735	L1 (mm) 800	L1 (mm) 850
	L=400 **2606.40.02**	L=600 **2606.60.02**				L=800 **2606.80.02**				L=1000 **2606.10.02**		

DISTRIBUTION MANIFOLDS COMPOSITION WITH BYPASS UNIT

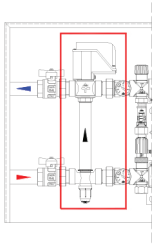
	2	3	4	5	6	7	8	9	10	11	12	13
	L1 (mm) 365	L1 (mm) 415	L1 (mm) 465	L1 (mm) 515	L1 (mm) 565	L1 (mm) 615	L1 (mm) 665	L1 (mm) 715	L1 (mm) 765	L1 (mm) 815	L1 (mm) 880	L1 (mm) 930
		L=600 **2606.60.02**				L=800 **2606.80.02**				L=1000 **2606.10.02**		

All measurements, where not indicated, must be considered in mm.

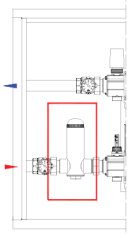
NOTES: To couple the manifold/containment boxes, a buffer area has been considered equal to:
- **30 mm** discharge/Bypass units side, to allow performing the required adjustments;
- **50 mm** ball valves side, required to allow installation of the multilayer pipe and fitting.

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.



Composition of manifold kit with zone valve:
L1 + 110 mm



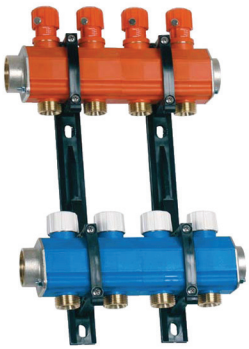
Composition of manifold kit with air trap:
L1 + 120mm

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

The compositions for the distribution with independent circuit controls can be made both with feed manifold positioned above the return one and vice versa (if a By-pass valve is used be careful to mount it correctly)
The compositions with zone valve must be made exclusively with return manifold positioned above the feed one because the electric servo-control valve cannot be mounted upside down.

COMPOSITIONS

Code	N° Routes	Composition 1
1002.06.60	2	
1003.06.60	3	
1004.06.60	4	
1005.06.60	5	
1006.06.60	6	
1007.06.60	7	
1008.06.60	8	
1009.06.60	9	
1010.06.60	10	
1011.06.60	11	
1012.06.60	12	
1013.06.60	13	



- 1 multiple-route manifold unit complete with micrometric regulation lockshield valves and graduated knob;
- 1 multiple-route manifold unit complete with thermostatic valves and manual knob;
- 1 pair of plastic brackets to secure manifolds.

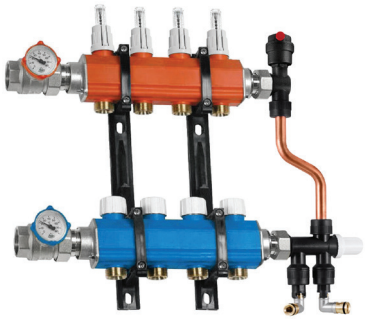
Code	N° Routes	Composition 2
1002.06.10	2	
1003.06.10	3	
1004.06.10	4	
1005.06.10	5	
1006.06.10	6	
1007.06.10	7	
1008.06.10	8	
1009.06.10	9	
1010.06.10	10	
1011.06.10	11	
1012.06.10	12	
1013.06.10	13	

- 1 multiple-route manifold unit complete with flow meters with lockshield valve and flow indicator function;
- 1 multiple-route manifold unit complete with thermostatic valves and manual knob;
- 1 pair of plastic brackets to secure manifolds.

Code	N° Routes	Composition 3
1002.06.40	2	
1003.06.40	3	
1004.06.40	4	
1005.06.40	5	
1006.06.40	6	
1007.06.40	7	
1008.06.40	8	
1009.06.40	9	
1010.06.40	10	
1011.06.40	11	
1012.06.40	12	
1013.06.40	13	

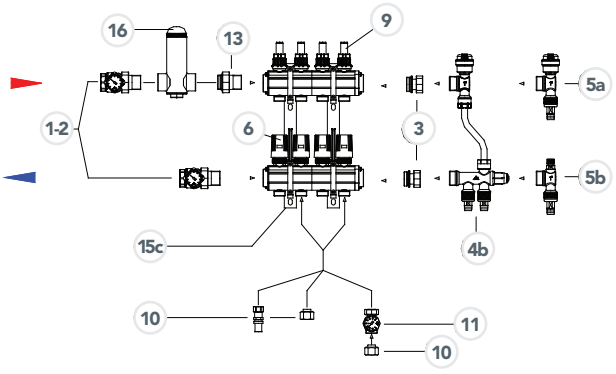
- 1 multiple-route manifold unit complete with flow meters with lockshield valve and flow indicator function;
- 1 multiple-route manifold unit complete with thermostatic valves and manual knob;
- 1 pair of plastic brackets to secure manifolds;
- 2 ball valves 1" with built-in thermometer 0-80 °C;
- 2 joint fittings;
- 1 automatic air / water discharge terminal unit 1".
- 1 manual air / water discharge terminal unit 1".

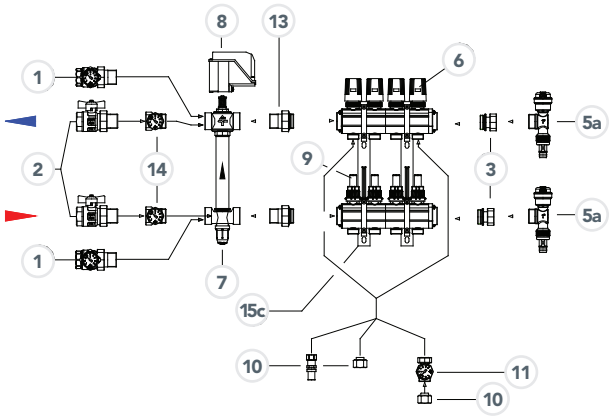
Code	N° Routes	Composition 4
1002.06.50	2	
1003.06.50	3	
1004.06.50	4	
1005.06.50	5	
1006.06.50	6	
1007.06.50	7	
1008.06.50	8	
1009.06.50	9	
1010.06.50	10	
1011.06.50	11	
1012.06.50	12	
1013.06.50	13	



- 1 multiple-route manifold unit complete with flow meters with lockshield valve and flow indicator function;
- 1 multiple-route manifold unit complete with thermostatic valves and manual knob;
- 1 pair of plastic brackets to secure manifolds;
- 2 ball valves 1" with built-in thermometer 0-80 °C;
- 2 joint fittings;
- 1 automatic air vent valve 3/8";
- 1 adjustable bypass valve complete with connections to fill system.

ACCESSORIES





Pos.	Product	Code	Accessory
1		**67.06.10 (B)** **67.06.40 (R)** **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. Full bore ball valve, FM 1" union connection, with OR seal fitting. Handwheel with dial thermometer scale 0... 80°C. B = Blue butterfly valve / R = Red butterfly valve
2		**67.06.00 (B)** **67.06.70 (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		**910.06.00**	Fixed By-Pass group. Union 1" M
5a		**449.06.053**	End group for automatic discharge of air and water. Mounted on return manifold Union 1" M
5b		**450.06.053**	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.

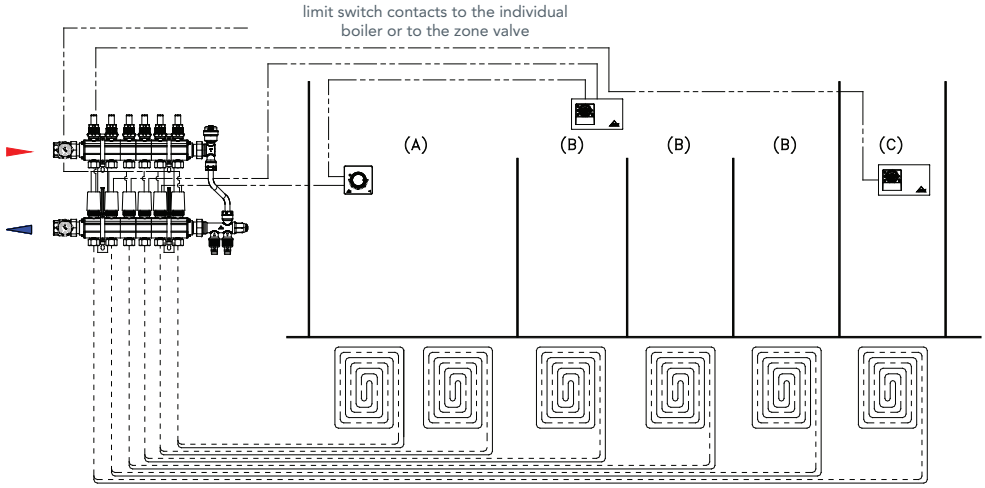
Pos.	Product	Code	Accessory
8		**373.00.X0**	Electro-mechanical servomotor for zone valve, complete with auxiliary micro-switch. Three wire on-off control, IP42 protection, power supply 230 or 24 V AC.
8		**2502.00.X2** **360.00.X0**	Electro-thermal servomotor for zone valve with optional auxiliary micro-switch. Two wire on-off control, IP31 protection, power supply 230 V AC or 24 V AC.
8		**2503.00.02** **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 annuale 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 0 14 ÷ 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.
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.
15c		**1002.06.00**	Pair of polymer brackets for offset fixing of manifolds complete with collar. Centre distance 220 mm

Pos.	Product	Code	Accessory
16		**192.06.60**	In-line air trap. Essential for wall and ceiling radiating systems; recommended for floor radiating systems. FF 1" in-line connections.
-		**1152.06.00**	By-pass unit thermal shell. Thermal insulation made up from expanded polyethylene half-shells with external anti-scratch coating. Fixing of half-shells with existing biadhesive tape.

SOME POSSIBLE APPLICATIONS

RADIATING FLOOR SYSTEM SUPPLY

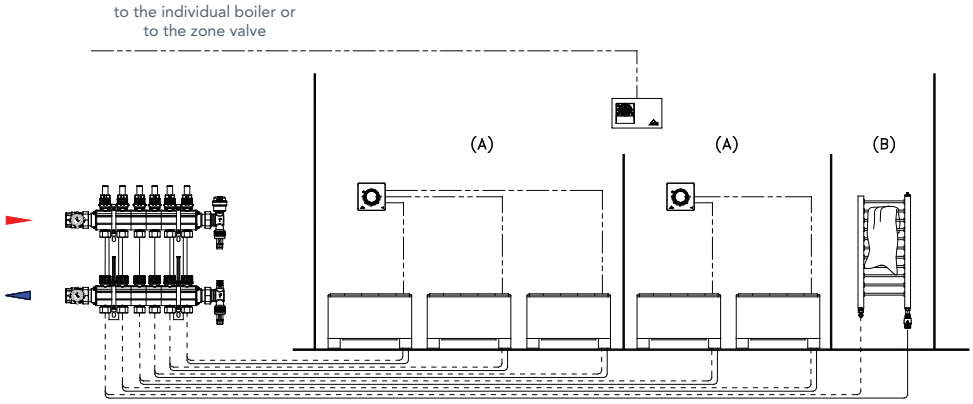
Thermal zone with bath thermally independent even when operating (e.g. attenuated sleeping zone, bath at temperature)



(A) Circuits thermally independent but linked to operating times and attenuation of programmable thermostat of thermal zone.
(B) Rooms controlled by programmable thermostat of thermal zone
(C) Bathroom controlled by independent programmable thermostat.

FANCOIL AIR CONDITIONING SYSTEM SUPPLIED

Thermal zone controlled by programmable room thermostat (normal or with radio waves) with two-level temperature control.



(A) Circuits without automatic shut-offs. Fan Coil command with room thermostat and one level temperature control.
(B) Bathroom radiator supply circuit with thermostatic valve. Manual radiator shut-off during summer season. In alternative, electrothermal control commanded by room thermostat with summer/winter selector.

RBM spa reserves the right to improve and change the described products and related technical data at any moment and without prior notice: always refer to the instructions attached with the supplied components; this sheet is an aid, should the instructions be extremely schematic. Our technical office is always at your disposal for any doubt, problem or explanation.

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