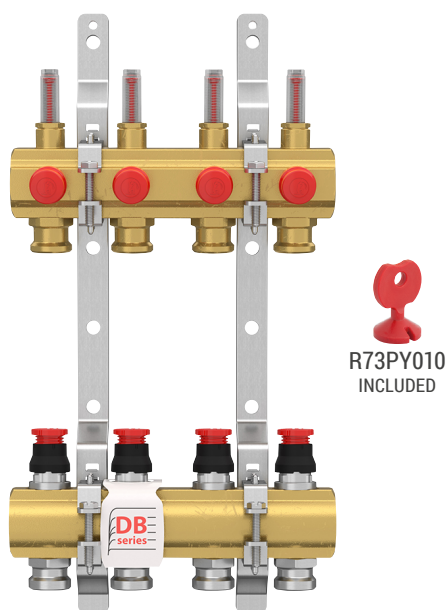


Brass manifold with dynamic flow balancing

Datasheet
1167EN 02/2025



Brass manifold for HVAC systems with dynamic flow balancing and independent setting for each individual circuit, consisting of:

- supply manifold with flow meters and lockshields for fluid shut-off function;
- return manifold with dynamic flow balancing valves and manual handwheel, pre-arranged for thermo-electric command via R473/R473M actuators;
- R588Z metal brackets;
- R558Y001 key for lockshields shut-off;
- R73PY010 key for presetting.



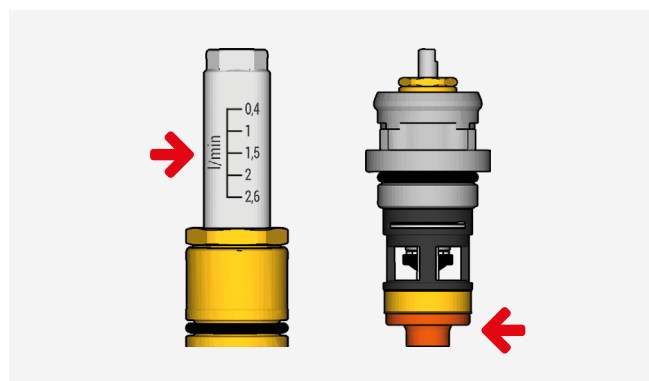
NOTE. Manifolds with dynamic flow balancing are equipped with a data-tag with the "DB series" identification, the flow and Δp characteristics.

The R553FDB manifolds are available in the Low Flow version

Low Flow version

- Flow meters scale: 0,4÷2,6 L/min
- Internal membrane of the bonnet: red color (visible only in case of bonnet replacement)

▲ Working differential pressure range: 20÷60 kPa



➤ Versions and product codes

Low Flow version: Δp 20÷60 kPa

PRODUCT CODE	CONNECTIONS: MANIFOLD x OUTLETS	NO. OUTLETS	CABINET R500-2* L x H x D
R553FDB142	G 1" x 3/4"E	2	R500Y221 400x650x85÷130 mm
R553FDB143		3	
R553FDB144		4	
R553FDB145		5	R500Y222 600x650x85÷130 mm
R553FDB146		6	
R553FDB147		7	
R553FDB148		8	R500Y223 800x650x85÷130 mm
R553FDB149		9	
R553FDB150		10	
R553FDB151		11	R500Y224 1000x650x85÷130 mm
R553FDB152		12	

 **NOTE.** * The cabinet is chosen keeping in consideration the size of the R554D intermediate fitting and R259D ball valve.

Optionals

- R500-2: flush-mounting metal cabinet, with adjustable depth
- R473, R473M: normally closed thermo-electric actuators equipped with R453Y002 plastic ring nut
- R178E, R179E: 3/4"E adaptors

Spare parts

- P12ADBx001: Low Flow bonnet with dynamic balancing (red internal membrane)
- P78MY002: flow meter with scale 0,4÷2,6 l/min
- R453Y002: plastic ring nut for thermo-electric actuators installation
- R588ZY001: metal bracket with supports
- R73PY010: key for presetting

► Dati tecnici

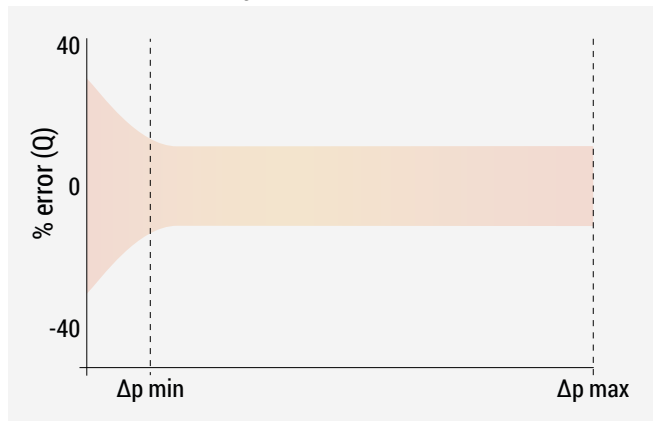
Low Flow Performances

- Fluids: water, glycol solutions (max. 30 %)
- Center distance between the outlets: 50 mm
- Temperature range: 5÷95 °C
- Max. working pressure: 10 bar
- Max. working pressure for air vent valves: 7 bar
- Flow rate setting range for each individual circuit: 20÷160 L/h
- Working differential pressure range: 20÷60 kPa
- Flow meters: scale 0,4÷2,6 L/min

Materials

- Supply and return manifolds: brass
- Manifold brackets: galvanised steel
- Manual handwheel: plastic material
- Bonnet with dynamic balancing on return manifold:
 - command stem: stainless steel
 - bonnet body: UNI EN 12164 CW617N brass
 - sleeve and indicator ring: plastic material
 - O-Ring and stopper: EPDM
 - membrane: elastomeric material

Adjustment accuracy

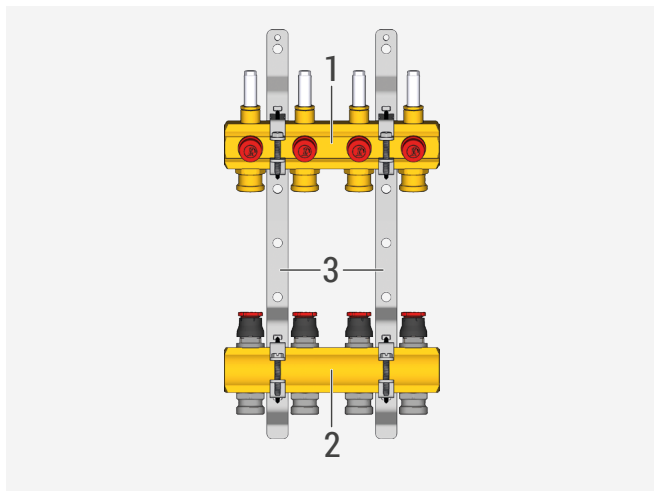


▲ WARNINGS.

- R553FDB manifolds are suitable for use in closed circuit systems and with non-aggressive fluids (water or water-glycol mix in compliance with VDI 2035/ONORM 5195).
- Mineral oils or mineral oil based lubricants in the heat transfer fluid may cause swelling and damage to EPDM gaskets.
- In case of using nitrite-free, ethylene glycol-based antifreeze and anti-corrosion products, observe the instructions in the documentation provided by the manufacturer and, in particular, the instructions concerning concentration and the use of specific additives.
- In case of high levels of sludge and other contaminants in the system water, it is recommended flushing the system using a chemical cleaning product before installing the manifolds.

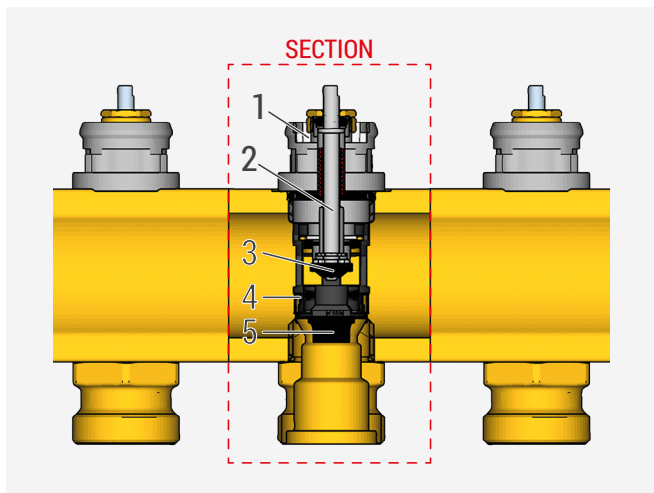
Components

Preassembled manifold



- | | |
|---|---|
| 1 | Supply manifold with outlets equipped with flow meters |
| 2 | Return manifold with outlets with dynamic flow balancing valves |
| 3 | Metal brackets |

Bonnet with dynamic flow balancing



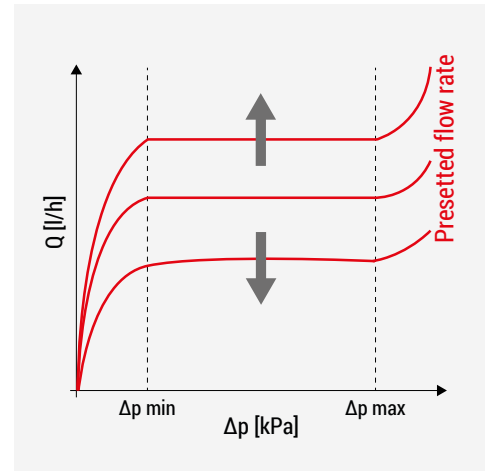
- | | |
|---|--|
| 1 | Indicator ring |
| 2 | Command stem |
| 3 | Stopper |
| 4 | Regulator sleeves |
| 5 | Balancing membrane with controlled deformation |

Operation

The R553FDB manifold controls the flow rate in each individual circuit of the system, within a minimum and maximum value of differential pressure, independently of the operating conditions of the other circuits.

The manifold may be used in combination with the thermo-electric actuators to perform different functions:

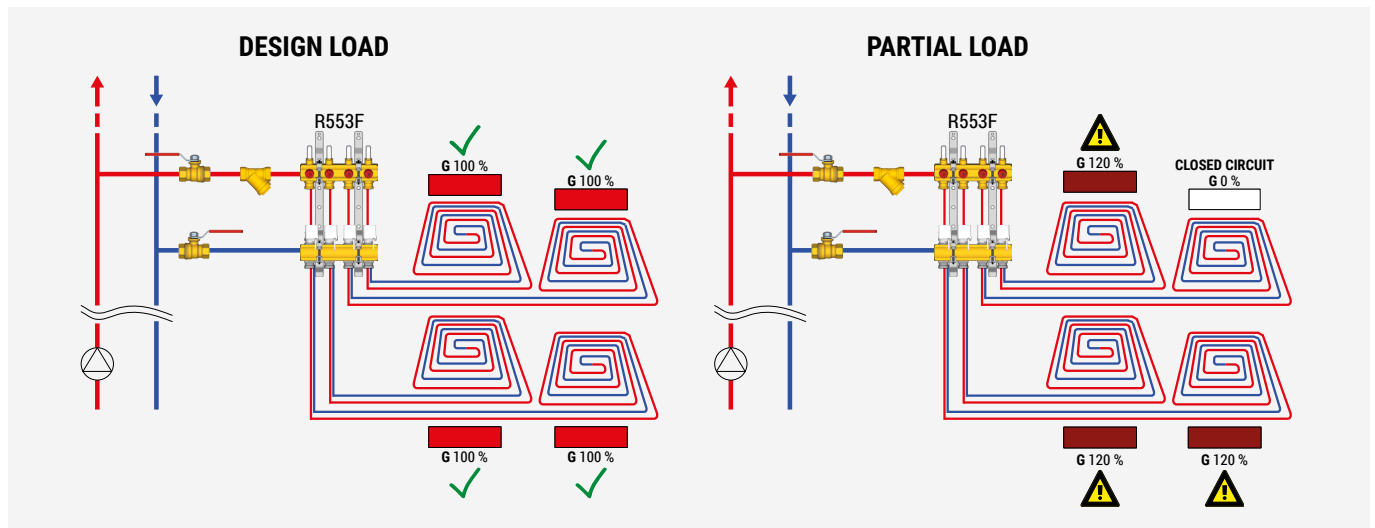
- **flow rate regulator:** when the pressure changes, due to the opening or closing of some other circuits, the membrane of the bonnet cartridge deforms to alter the cross section of the fluid passage through the membrane itself and keep the flow rate at the preset value, even with high differential pressures: **up to 60 kPa for the Low Flow version.**
- **presetting flow rate:** the maximum design flow rate for each individual circuit may be set and maintained accurately at all times.
- **optimising room temperature:** the manifold may be used in combination with thermo-electric actuators and thermostats to allow more effective and efficient temperature control in multiple interior rooms.



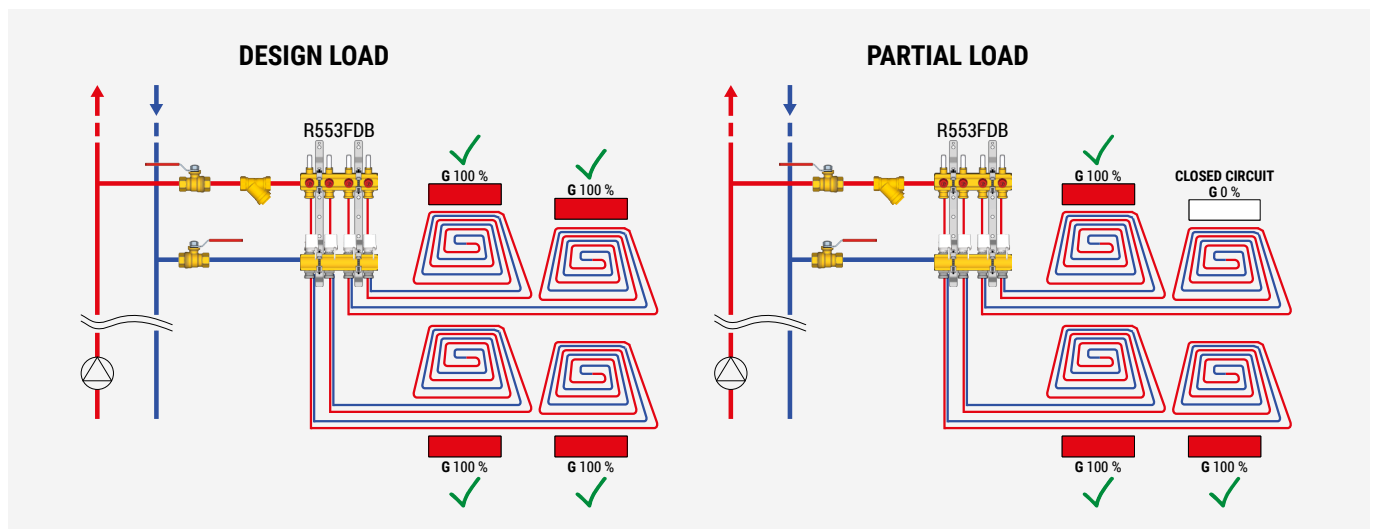
Manifolds with dynamic flow balancing are used primarily in radiant systems.

As can be seen in the example installation diagrams shown below, a system using DB manifolds series with dynamic flow balancing is capable to maintain the flow rates always balanced in all the circuits of the system.

Radiant system with R553F manifolds, **without** dynamic flow balancing



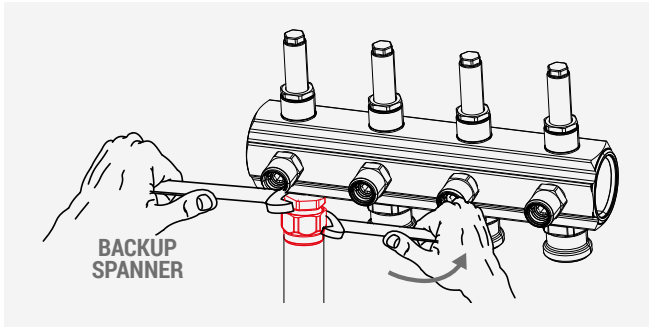
Radiant system with R553FDB manifolds, **with** dynamic flow balancing



➤ Installation

⚠ WARNING. Installation must be carried out by qualified personnel, following the instructions included in the packaging.

Connecting the system circuits



To connect the system circuit pipes use suitable adaptors for copper, plastic or multilayer pipes from the R178E, R179E series.

⚠ WARNING. When tightening the adaptor it is necessary to use a backup spanner to hold the manifold fitting in place.

➤ Regulating the system circuits

Supply manifold

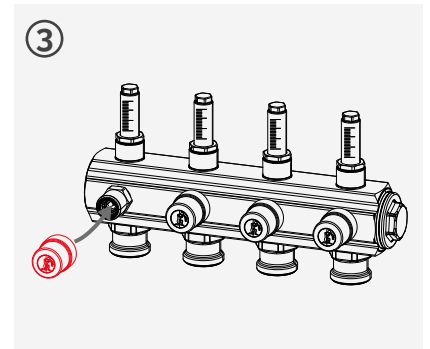
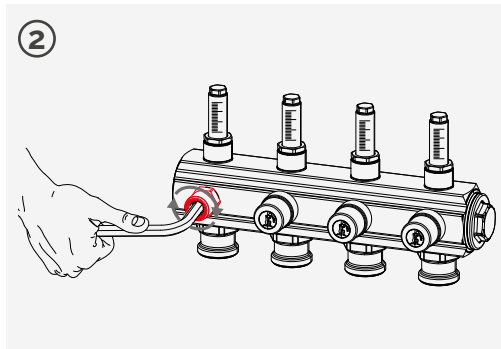
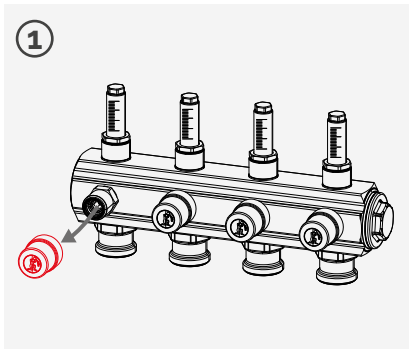
During normal operation, the lockshields on the supply manifold should be in the fully open position.

To shut off the flow of an individual circuit, close the respective lockshield completely.

To open or close a lockshield proceed as follow:

- 1) remove the protective red cap;
- 2) rotate the lockshield with the appropriate Allen wrench, clockwise to close the circuit or counterclockwise to open the circuit:
 - the flow is completely shut off when the lockshield is completely closed;
 - when the lockshield is completely opened, the flow rate set with the dynamic balancing bonnet (return manifold) is circulating within the circuit and indicated on the graduated scale of the flow meter;
- 3) when the setting is complete, refit the protective red cap.

⚠ WARNING. To ensure the correct functioning of the system, it is important that the lockshields are set to either the fully open position or, if it is necessary to shut off the respective circuit, the completely closed position. Do not set the lockshields to any position between fully open and fully closed.



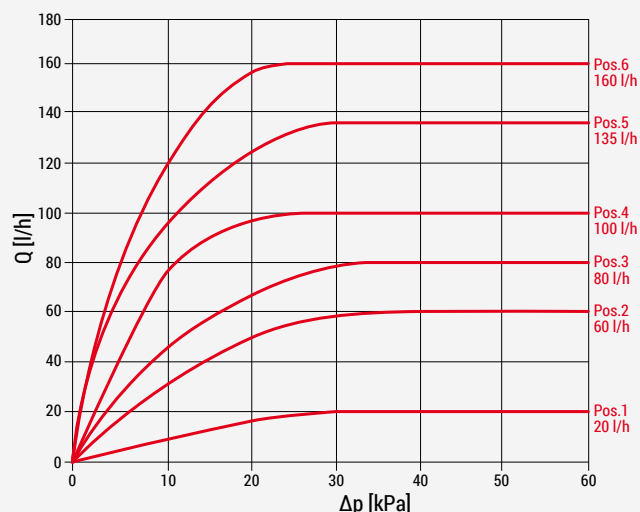
Return manifold: presetting flow rate

The flow rates of the individual circuits connected to the return outlets may be preset with the R73PY010 regulation key (included in package) within a setting range from 1 to 6, indicated on the cartridge of the bonnet.

To preset the flow rates of the individual circuits:

- 1) identify the cartridge position corresponding to the desired flow rate using the flow rate presetting diagrams or tables;
- 2) remove the manual handwheel from the bonnet and fit the regulation key onto the cartridge;
- 3) turn the regulation key till the desired position appears in the key slot;
- 4) remove the regulation key and refit the manual handwheel or the thermo-electric actuator.

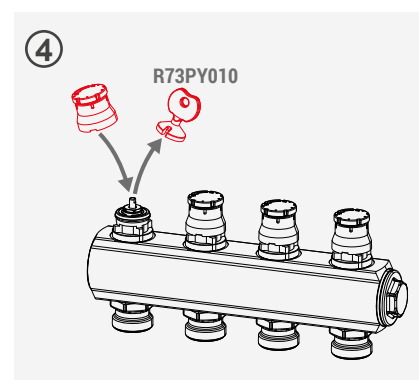
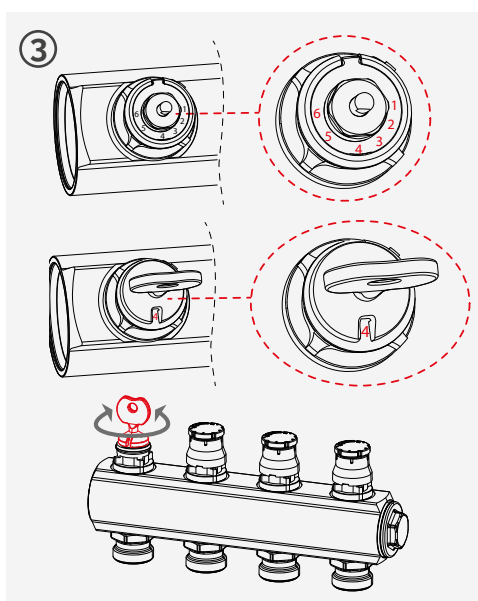
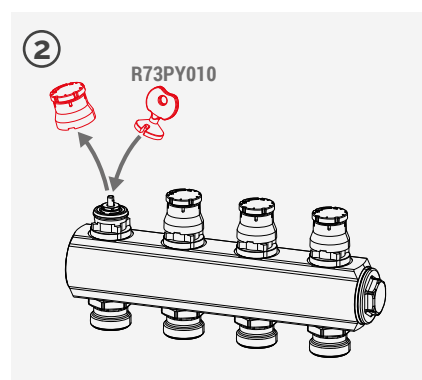
1 Low Flow version



Setting position	1	2	3	4	5	6 *
Flow rate [l/h]	20	60	80	100	135	160
Δp min [kPa]	20	20	20	20	20	20
Δp max [kPa]	60					

* Factory setting

NOTE. Δp min = Δp corresponding to a value ≥ 80 % of the preset flow rate.



Return manifold: installing thermo-electric actuators

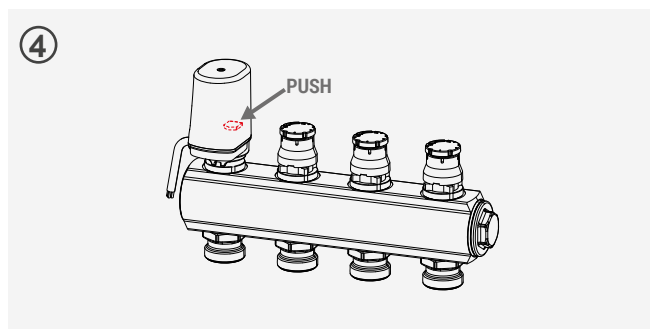
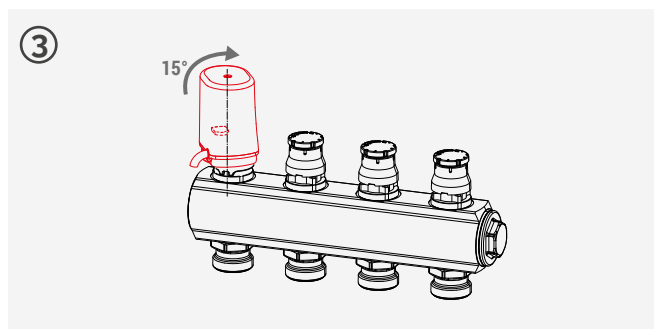
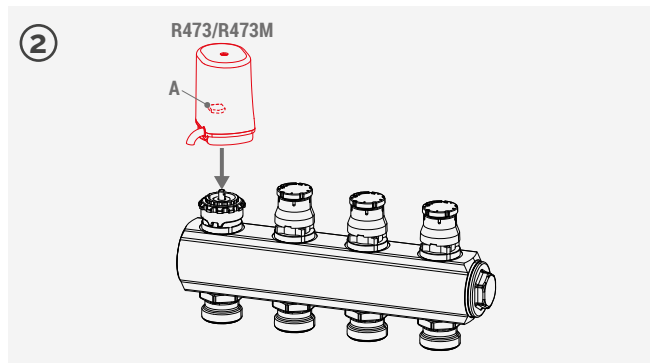
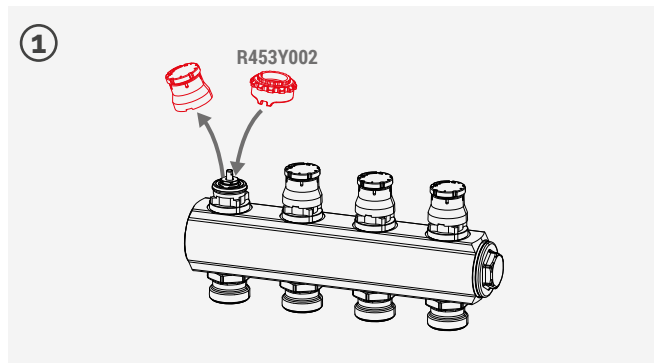
Using normally closed thermo-electric actuators (R473, R473M) installed on the return manifold outlets, in combination with room thermostats, allows the room temperature to be maintained at the value set on the thermostats.

The thermo-electric actuators must only be installed after presetting the flow rate on the dynamic balancing bonnet.

To install the thermo-electric actuators proceed as follows:

- 1) remove the manual handwheel and fit the R453Y002 ring nut (included with the actuators package);
- 2) assemble the thermo-electric actuator on the ring nut, pressing just enough to lock them together;
- 3) turn the actuator about 15° until a click is heard (max. torque 5 Nm);
To release the actuator, turn it again 15°;
- 4) press the red lockout button (A) and make the electrical connection of the actuator, following the wired diagram supplied with the actuator instructions.

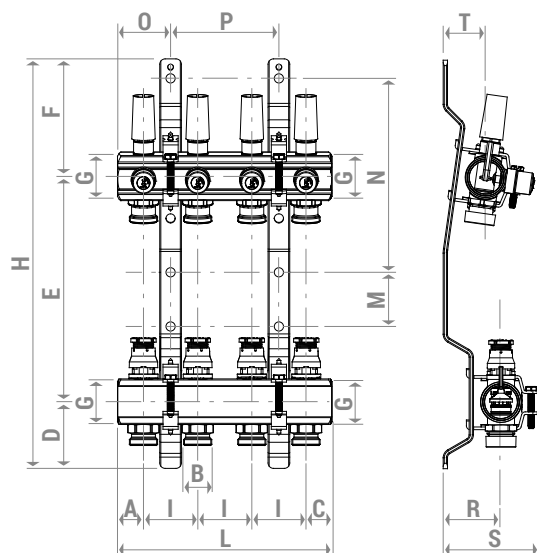
▲ WARNING. In case of use of R500-2 cabinets, to facilitate installation the thermo-electric actuators must be fitted with the red button (A) turned towards the interior of the cabinet. If required, the red button may be pressed before fitting the actuator onto the manifold. In this case, slightly more force will be necessary to subsequently connect the actuator.



© VIDEO TUTORIAL
FLUSHING AND FILLING PROCEDURE

▲ WARNING. The system flushing and filling procedure for manifolds with dynamic balancing is different from "standard" manifolds. Carefully follow the instructions with the product to avoid damage to people or property.

➤ Dimensions



R500Y221 (400x650x85÷130 mm)
R500Y222 (600x650x85÷130 mm)
R500Y223 (800x650x85÷130 mm)
R500Y224 (1000x650x85÷130 mm)


PRODUCT CODE	NO. OUTLETS	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	L [mm]	M [mm]	N [mm]	O [mm]	P [mm]	R [mm]	S [mm]	T [mm]	CABINET R500-2*
R553FDB142	2										98			-					R500Y221
R553FDB143	3										148			50					
R553FDB144	4										198			100					
R553FDB145	5										248			150					
R553FDB146	6										298			200					R500Y222
R553FDB147	7	24	3/4"E	24	62	208	108	G 1"	378	50	348	50	179	49	250	53	86	39	
R553FDB148	8										398			300					
R553FDB149	9										448			350					R500Y223
R553FDB150	10										498			400					
R553FDB151	11										548			450					
R553FDB152	12										598			500					R500Y224


NOTE. * The cabinet is chosen keeping in consideration the size of the R554D intermediate fitting and R259D ball valve.


Product specifications

R553FDB Low Flow

Preassembled manifold with dynamic flow balancing. Connections: G 1"F x 3/4"E. Consisting of: brass supply manifold with flow meters with 0,4÷2,6 l/min scale and lockshields for fluid shut-off function; brass return manifold with dynamic flow balancing valves (membrane with red color) and manual handwheel pre-arranged for thermo-electric actuators. EPDM gaskets. Galvanised steel brackets for manifolds. Fluids: water, glycol solutions (max. 30%). Center distance between outlets: 50 mm. Temperature range: 5÷95 °C. Max. working pressure: 10 bar. Max. working pressure of air vent valve: 7 bar. Flow rate setting range for each individual circuit: 20÷160 l/h. Working differential pressure range: 20÷60 kPa.

 **Safety Warning.** Installation, commissioning and periodical maintenance of the product must be carried out by qualified operators in compliance with national regulations and/or local standards. A qualified installer must take all required measures, including use of Individual Protection Devices, for his and others' safety. An improper installation may damage people, animals or objects towards which Giacomini S.p.A. may not be held liable.

 **Package Disposal.** Carton boxes: paper recycling. Plastic bags and bubble wrap: plastic recycling.

 **Additional information.** For more information, go to giacomini.com or contact our technical assistance service. This document provides only general indications. Giacomini S.p.A. may change at any time, without notice and for technical or commercial reasons, the items included herewith. The information included in this technical sheet do not exempt the user from strictly complying with the rules and good practice standards in force.

 **Product Disposal.** Do not dispose of product as municipal waste at the end of its life cycle. Dispose of product at a special recycling platform managed by local authorities or at retailers providing this type of service.