

HDB (LF) valves



Energy
Management

Radiator valves with thermostatic option with dynamic flow balancing

Datasheet
1063EN  12/2021



R401HDB
IRON PIPE CONNECTION



R402HDB
IRON PIPE CONNECTION



R415HDB
IRON PIPE CONNECTION



PATENTED



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HDB radiator valves with thermostatic option are equipped with an integrated cartridge to control and limit the flow rate through preset values.

The preset flow rate is never exceeded, even in case of load variations within the system when other valves close or during start up. This operation is completely independent from the differential pressure when the value is included between a minimum and maximum range.

The required flow rate is set directly on the cartridge with a regulation key, so complicated calculations for pressure losses and balancing are no longer required and commissioning times are reduced.

These characteristics are crucial in new systems and even more so in renovation works where planners and installers are often unaware of important parameters.

The maximum differential pressure is an additional important characteristic as HDB valves are designed to work up to 60 kPa, making them suitable for a wide range of applications.

Thanks to the 60 kPa maximum differential pressure, the valve can be used to replace existing ones without installing a differential pressure controller upstream of the distribution line.

➤ Versions and product codes

SERIES	PRODUCT CODE	CONNECTIONS	TYPE
R401HDB	R401HDBX102	3/8" x 3/8"	Angle
	R401HDBX103	1/2" x 1/2"	
	R401HDBX104	3/4" x 3/4"	
R402HDB	R402HDBX102	3/8" x 3/8"	Straight
	R402HDBX103	1/2" x 1/2"	
	R402HDBX104	3/4" x 3/4"	
R415HDB	R415HDBX103	1/2" x 1/2"	Reverse angle

DIN tail piece, without self-sealing

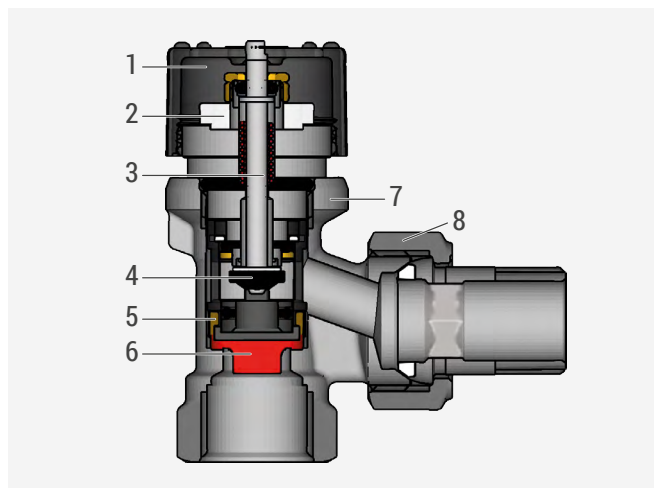
Accessories

- R73PY010: regulation key for presetting
- R400DBX001: kit for bonnet replacement
- R460H: thermostatic head with M30 x 1,5 mm connection

Spare parts

- P12HDBX001: bonnet with dynamic balancing

➤ Components



- | | |
|---|--|
| 1 | Worksite protection cover |
| 2 | Indicator ring |
| 3 | Command stem |
| 4 | Stopper |
| 5 | Regulation sleeves |
| 6 | Balancing membrane with controlled deformation |
| 7 | Valve body |
| 8 | Tail piece and nut |

Technical data

Performance

- Fluids: water and glycol-based solutions (max. 30 %)
- Temperature range: 5+95 °C
- Max. working pressure:
 - 16 bar with manual handwheel
 - 10 bar in combination with thermostatic heads
- Max. differential pressure: 0,6 bar (60 kPa)

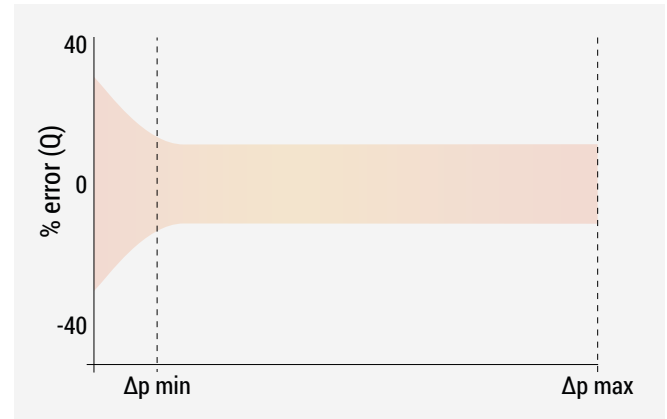
Materials


- Body and main parts:
 - chrome-plated brass UNI EN 12165 CW617N
- Seals: EPDM
- Worksite protection cover: PP-H
- Internal bonnet:
 - monoblock stem: stainless steel
 - bonnet body: brass UNI EN 12164 CW617N
 - sleeve: plastic
 - membrane: EPDM
 - O-Ring: EPDM

⚠ WARNINGS.


- HDB valves are suitable for closed-loop systems for use with non-aggressive fluids (water, glycol-based water complying with VDI 2035/ONORM 5195).
- Mineral oils or mineral oil-based lubricants contained in the heat transfer fluid may cause swelling and damaging of the EPDM gaskets.
- When using ethylene glycol-based anti-freeze and anti-rust products not containing nitrites, refer to the manufacturer's instructions, especially those concerning concentrations and specific additives.
- In case of muddy water or water containing impurities, we recommend carrying out a chemical flushing before installing the valves with thermostatic option.

Adjustment accuracy



VALVE SIZE	THERMOSTATIC HEAD	PRESETTING POSITIONS	NOMINAL FLOW RATE q_{mNH} WITH THERMOSTATIC HEAD [kg/h]	AUTHORITY "α" OF THE STOPPER
3/8", 1/2", 3/4" (R401HDB, R402HDB, R415HDB)		6	83	0,52
		5	75	0,31
		4	60	0,27
		3	40	0,21
		2	18	0,19
		1	6	0,64

KEYMARK (EN215) certification

PRODUCT CODE	DECLARED HYSTERESIS C_H	INFLUENCE OF THE DECLARED WATER TEMPERATURE W_H	DECLARED RESPONSE TIME Z_H	INFLUENCE OF THE DECLARED DIFFERENTIAL PRESSURE D_H	CONTROL ACCURACY CA_H	COMPLIES WITH DIRECTIVE RT2012 CERTITÀ CON VARIATION TEMPORELLE		TELL	
						FACTOR VT	VALUE VT_H	ENERGY EFFICIENCY CLASS	CLASSIFICATION
R460HX011	0,35 K	0,9 K	26 min.	0,4 K	0,6 K	0,56	0,6	0,5	

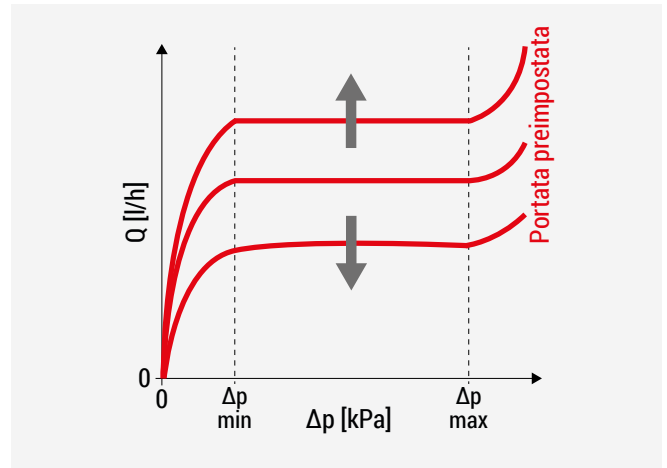
Operation

The desired flow rate is preset directly on the radiator valve with the special regulation key R73PY010 (see paragraph "Flow rate presetting").

If, for example, the flow rate tends to increase when other thermostatic valves close, the cartridge membrane will reduce the opening surface so that the flow rate is automatically limited to a preset value.

On the contrary, if the flow rate tends to decrease below the preset value, the cartridge membrane will extend the opening surface and the flow rate will return to the preset value.

The diagram shows the typical pressure drop of a HDB radiator valve: the curve slopes down when reducing the preset flow rate and slopes up when increasing it.



HDB radiator valves are used in rising twin-pipe heating systems.

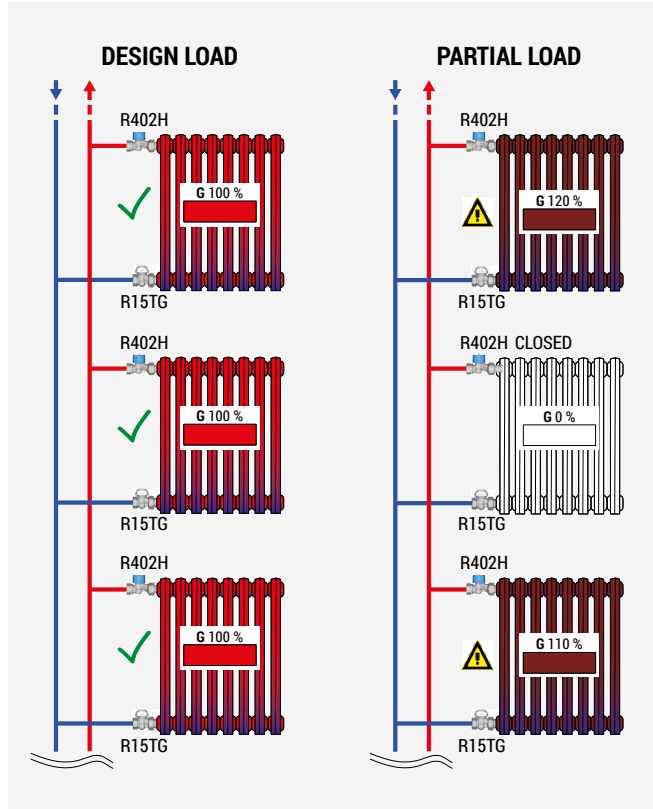
The valves control the flow rate through the radiators independently from the variations of the differential pressure, as long as this value is included between a minimum and maximum range.

The minimum differential pressure must be controlled with the most disadvantaged valve while the most advantaged one controls the maximum value.

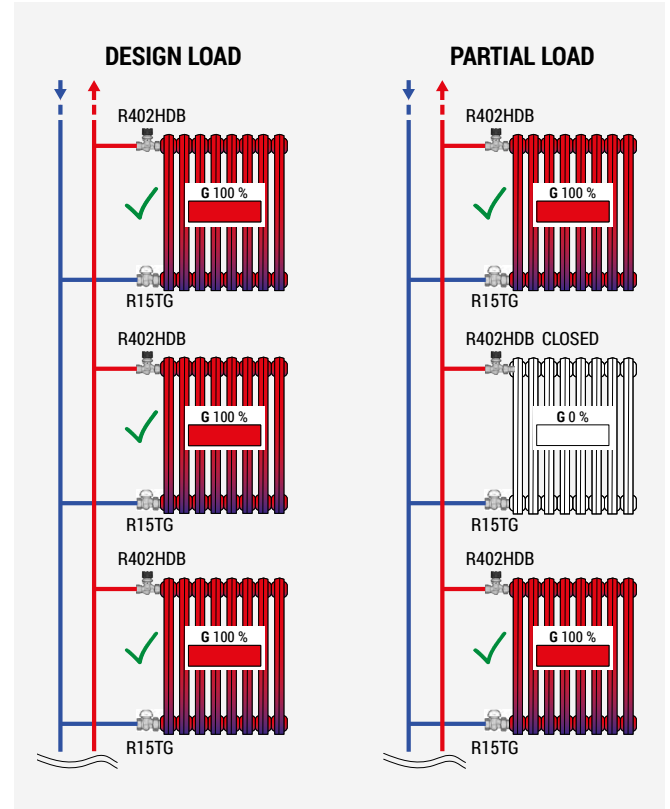
As shown in the application diagrams below, HDB valves keep the flow rate constantly balanced in every radiator of the system.

The H and HDB series valves can be equipped with thermostatic heads that work independently of the flow rate regulated by the valve with thermostatic option.

Rising pipe system with traditional H valves and static flow rate balancing



Rising pipe system with HDB valves and dynamic flow rate balancing

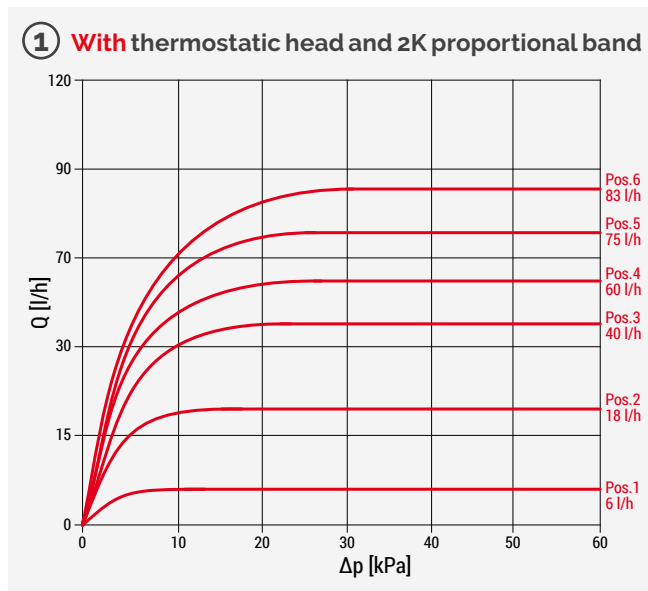
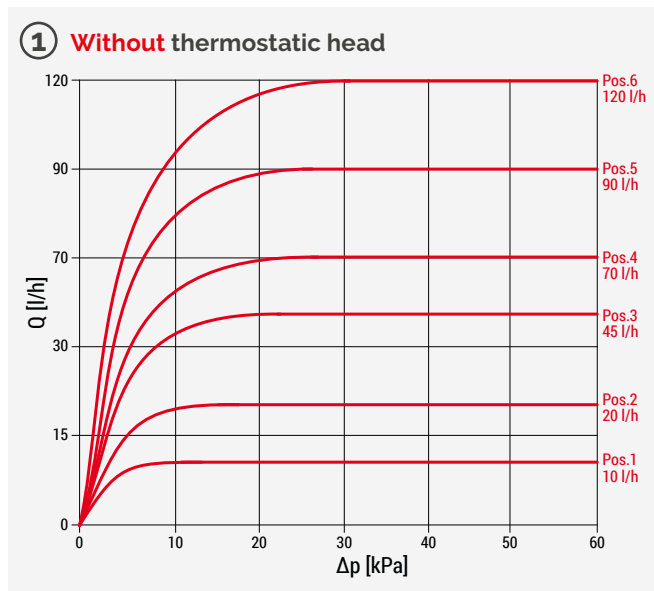


➤ Flow rate presetting

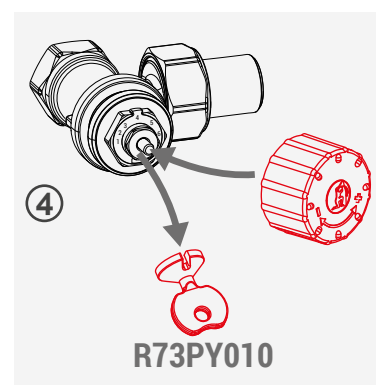
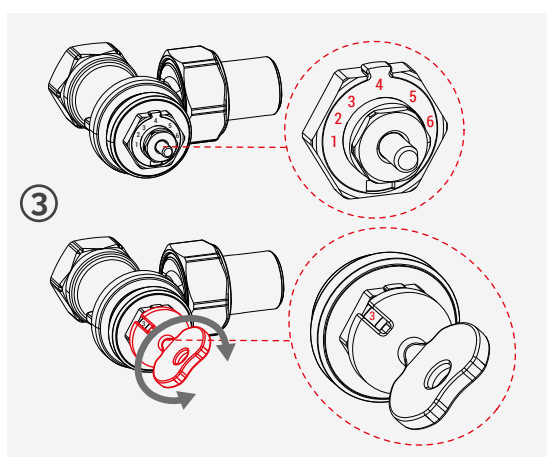
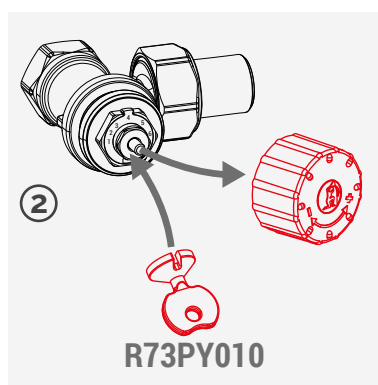
The flow rates of the valve may be preset with the R73PY010 regulation key (to be ordered separately) within a setting range from 1 to 6, indicated on the cartridge of the bonnet.

To preset the flow rates proceed as follow:

- 1) identify the cartridge position corresponding to the desired flow rate using the flow rate presetting diagrams or tables;
- 2) remove the handwheel or the thermostatic head 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 worksite protection cover or the thermostatic head.



Presetting position	1	2	3	4 (factory setting)	5	6
Flow rate without thermostatic head [l/h]	10	20	45	70	90	120
Flow rate with thermostatic head [l/h] (Percentage tolerance on the flow rate value)	6 (80%)	18 (70%)	40 (50%)	60 (30%)	75 (20%)	83 (10%)
Δp min [kPa]	20	20	20	20	20	20
Δp max [kPa]	60					

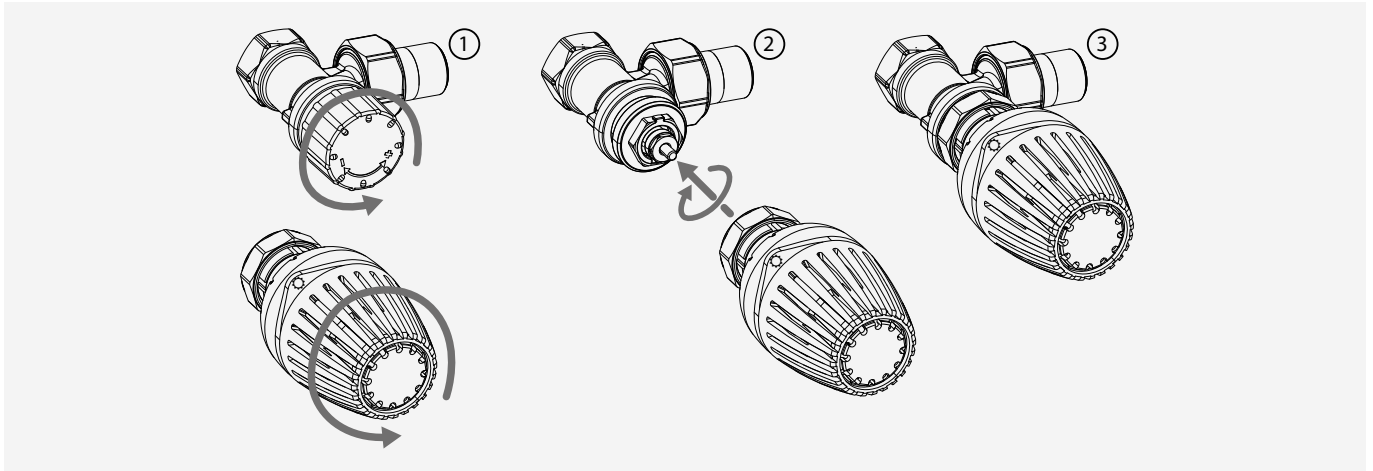


➤ Thermostatic heads installation

- Install the thermostatic heads horizontally.
- For correct reading of the temperature, do not install the thermostatic heads in niches, shutter boxes, behind curtains and do not expose to direct sunlight.
- R460H thermostatic heads with Clip Clap quick connection can be installed directly on the valve body after removing the manual handwheel.
- To remove the handwheel, unscrew it counterclockwise.

To install R460H thermostatic heads with M30 x 1,5 mm connection on the valve body, follow the steps below:

- 1) Fully open the thermostatic head moving the handle on position ☀.
- 2) Insert the thermostatic head on the hexagon of the valve body and turn the ring nut to tighten it.
- 3) The head is now installed to the valve and can be moved to the required adjustment position by turning the handwheel.



To remove the R460H thermostatic head from the valve body: fully open the head by turning the handwheel to position ☀. Unscrew the threaded ring nut. Unhook the thermostatic head with a light strength.

⚠ With thermostatic head installed on the valve body, to avoid excessive loads on the seal gasket of the thermostatic bonnet (with the resulting risk of jamming and locking) during the summer, it is recommended to place the handwheel of the thermostatic head in the fully open position, marked by the symbol ☀.

❗ In case of malfunction of the bonnet is possible to replace it, using the appropriate kit R400DB.

➤ Bonnet replacement with R400DB kit

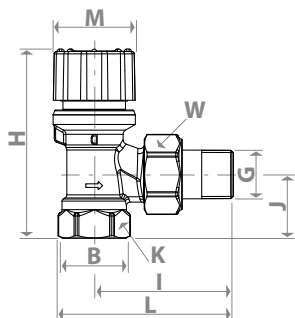


R400DB

- ❗ The bonnet of the HDB SERIES dynamic balancing valves is not compatible with the other Giacomini valves with thermostatic option.
- ❗ The replacement of the radiator valve bonnet can be done with the system running, using the R400DB replacement kit.
- ❗ Refer to the operating instructions of the R400DB replacement kit for the replacement procedure of the bonnet.

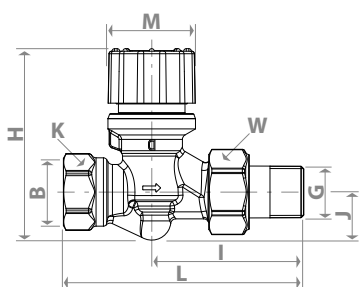
➤ Dimensions

R401HDB



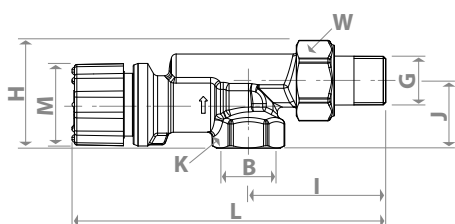
PRODUCT CODE	G x B	H [mm]	I [mm]	J [mm]	L [mm]	M [mm]	W [mm]	K [mm]
R401HDBX102	3/8" x 3/8"	74	52	22	69	34	27	22
R401HDBX103	1/2" x 1/2"	79	58	27	75	34	30	27
R401HDBX104	3/4" x 3/4"	79	66	29	84	34	37	32

R402HDB



PRODUCT CODE	G x B	H [mm]	I [mm]	J [mm]	L [mm]	M [mm]	W [mm]	K [mm]
R402HDBX102	3/8" x 3/8"	75	56	19	84	34	27	22
R402HDBX103	1/2" x 1/2"	75	59	19	94	34	30	27
R402HDBX104	3/4" x 3/4"	76	70	21	107	34	37	32

R415HDB



PRODUCT CODE	G x B	H [mm]	I [mm]	J [mm]	L [mm]	M [mm]	W [mm]	K [mm]
R415HDBX103	1/2" x 1/2"	45	57	28	130	34	30	27

➤ Product specifications

R401HDB (LF)

Angle chrome-plated valve with thermostatic option with flow rate dynamic balancing and iron pipe connection. Body made with chrome-plated brass UNI EN 12165 CW617N. PP-H manual handwheel. Stainless steel monoblock stem. Seal on control stem with EPDM O-Ring. Temperature range 5-95 °C. Max. working pressure 16 bar (with thermostatic head 10 bar). Δp min 20 kPa; Δp max 60 kPa. Flow rate presetting with 6 positions corresponding to 10, 20, 45, 70, 90, 120 l/h without thermostatic head installed. Flow rate presetting with 6 positions corresponding to 6, 18, 40, 60, 75, 83 l/h with thermostatic head installed and 2K proportional band. KEYMARK (EN215) certification.

R402HDB (LF)

Straight chrome-plated valve with thermostatic option with flow rate dynamic balancing and iron pipe connection. Body made with chrome-plated brass UNI EN 12165 CW617N. PP-H manual handwheel. Stainless steel monoblock stem. Seal on control stem with EPDM O-Ring. Temperature range 5-95 °C. Max. working pressure 16 bar (with thermostatic head 10 bar). Δp min 20 kPa; Δp max 60 kPa. Flow rate presetting with 6 positions corresponding to 10, 20, 45, 70, 90, 120 l/h without thermostatic head installed. Flow rate presetting with 6 positions corresponding to 6, 18, 40, 60, 75, 83 l/h with thermostatic head installed and 2K proportional band. KEYMARK (EN215) certification.

R415HDB (LF)

Reverse angle chrome-plated valve with thermostatic option with flow rate dynamic balancing and iron pipe connection. Body made with chrome-plated brass UNI EN 12165 CW617N. PP-H manual handwheel. Stainless steel monoblock stem. Seal on control stem with EPDM O-Ring. Temperature range 5-95 °C. Max. working pressure 16 bar (with thermostatic head 10 bar). Δp min 20 kPa; Δp max 60 kPa. Flow rate presetting with 6 positions corresponding to 10, 20, 45, 70, 90, 120 l/h without thermostatic head installed. Flow rate presetting with 6 positions corresponding to 6, 18, 40, 60, 75, 83 l/h with thermostatic head installed and 2K proportional band. KEYMARK (EN215) certification.

⚠ 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.

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