



Energy
Management

DOCEE0017  NOV2023



PATENTED

Pressure Independent Control Valve (PICV)

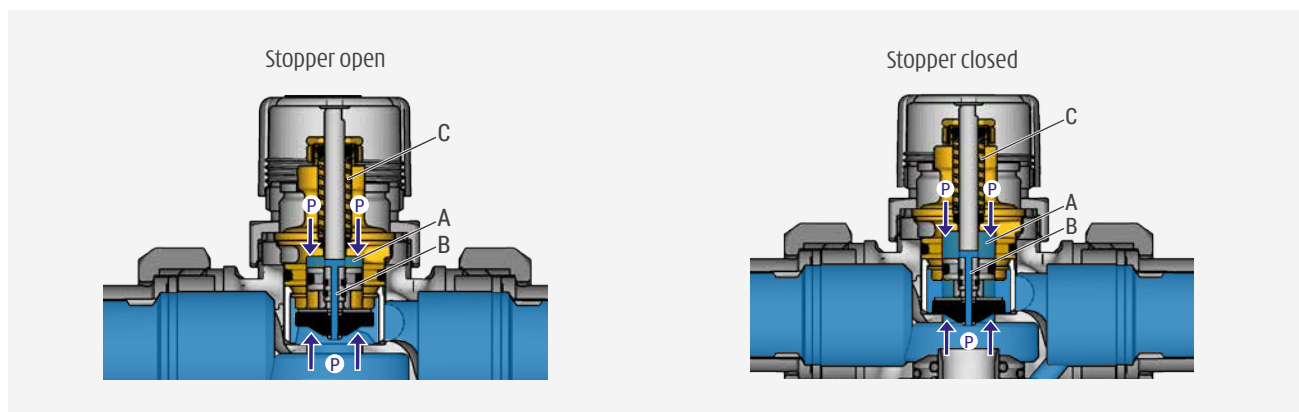
The solution that makes designers and installers' work easier assuring at the same time comfort and energy efficiency as well.

➤ *Pressure compensation system: the benefits*

Inside the R206A PICV there is a bonnet with a pressure compensation system. Giacomini patented this device which offers great advantages when using the PICV.

First, thanks to the balancing chamber (A) built inside the bonnet, the valve requires less strength to close even at very high differential pressure. The balancing chamber (A) is exposed to the pressure on the stopper through

the perforated stem (B) of the bonnet. This allows the actuators installed on the valve to function with less strength while providing a state-of-the-art hydraulic seal of the housing. In addition to that, the counter-spring (C) with a sealed chamber prevents possible blockages caused by water and the formation of limestone on the spring seat.



Dual regulation scale: two valves in one

The dual flow regulation scale is Giacomini's second patent for the R206A PICV: Low setting for low flow rates, High setting for high flow rates. The PICV designed by Giacomini basically consists of two valves built in the same body and makes it possible to select the required flow rate without replacing the valve.

This is not the only advantage offered by this valve: the shift from one regulation scale to the other can

be implemented any time, even when the system is running.

The dual scale makes engineers and installers' work much easier: it assures great precision setting the flow rate as the range of the controlled flow rate is smaller; it sensibly reduces the number of models required in catalogue or stock; it limits the risk of errors when ordering, installing and commissioning the valve.



Versions and product codes

Versions with tail pieces

PRODUCT CODE	DN VALVE BODY SIZE	CONNECTIONS	INDICATOR COLOUR	HANDWHEEL COLOUR	WORKING FLOW RATE RANGE [l/h]		WORKING DIFFERENTIAL PRESSURE RANGE [kPa]	
					L (LOW)	H (HIGH)	WITH R473 THERMO-ELECTRIC ACTUATOR	WITH K281 ACTUATOR OR WITHOUT ACTUATOR
R206AY113	15	G 1/2"M	RED	GREY	35÷520		25÷400	25÷800
R206AY103	15	G 1/2"M	BLUE	RED	150÷380	180÷630	25÷400	25÷800
R206AY104	20	G 3/4"M	BLACK	RED	320÷910	700÷1175	25÷400	25÷800
R206AY105	20	G 1"M	GREEN	BLUE	290÷1000	860÷1500	25÷400	25÷800
R206AY125	25	G 1"M	BLUE	RED	600÷3500		N/A	25÷400
R206AY106	25	G 1-1/4"M	BLACK	BLUE	800÷4700		N/A	25÷400
R206AY107	50	G 1-1/2"M	Brass indicator	N/A	5200÷14000		N/A	25÷400
R206AY108	50	G 2"M	Brass indicator	N/A	5200÷14000		N/A	25÷400

Versions without tail pieces

PRODUCT CODE	DN VALVE BODY SIZE	CONNECTIONS	INDICATOR COLOUR	HANDWHEEL COLOUR	WORKING FLOW RATE RANGE [l/h]		WORKING DIFFERENTIAL PRESSURE RANGE [kPa]	
					L (LOW)	H (HIGH)	WITH R473 THERMO-ELECTRIC ACTUATOR	WITH K281 ACTUATOR OR WITHOUT ACTUATOR
R206AMY103	15	G 3/4"M	BLUE	RED	150÷380	180÷630	25÷400	25÷800
R206AMY104	20	G 1"M	BLACK	RED	320÷910	700÷1175	25÷400	25÷800
R206AMY114	20	G 1"M	GREEN	BLUE	290÷1000	860÷1500	25÷400	25÷800

Dual regulation scale (High and Low), water-tight seal, highly reliable, extremely compact: these are the exclusive characteristics of the new R206A PICV (Pressure Independent Control Valve) patented by Giacomini. Fit for use in HVAC systems, residential or commercial installations, the R206A PICV can set and control the flow rate when the differential pressure

within the hydraulic circuit of the installation varies, assuring high energy efficiency and perfect comfort in every room. The valve features two different working modes while the dual regulation scale makes engineers and installers' work easier and faster; it offers greater precision in flow control, and makes it easier to choose the most suitable product.



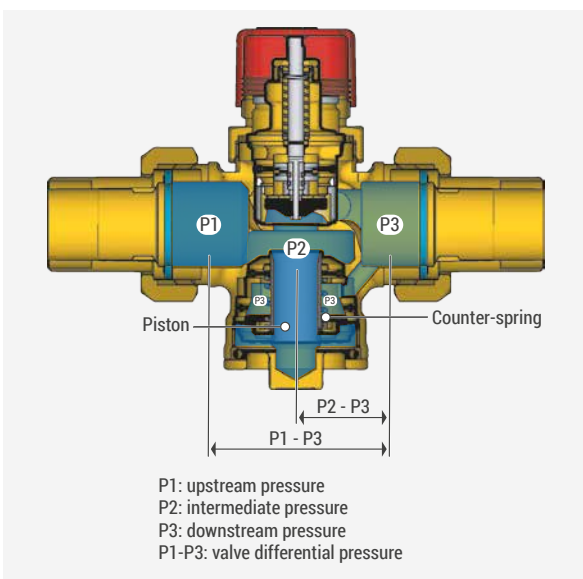
PICV product range

PICV applications

The R206A PICV by Giacomini features two different working modes based on needs. To achieve independent pressure control according to the thermal load required for the interested circuit section, a proportional linear actuator must be installed.

The second mode enables to automatically set the maximum flow rate and/or shut off the flow, manually, without an actuator, using the handwheel, or automatically, installing an On/Off thermo-electric actuator

➤ Operation



The valve differential pressure P1-P3 must be within 25÷400 kPa or 25÷800 kPa range, depending on whether actuators are installed or not, to ensure the valve keeps the flow rate constant.

The valve controls and maintains differential pressure P2-P3 constant through the piston movement, resulting from the force generated by the pressure difference and the counter-spring. When the valve differential pressure P1-P3 increases, the piston rises and squeezes the port to maintain P2-P3 constant; under such conditions, flow rate Q will always be constant as the valve flow coefficient Kv decreases.

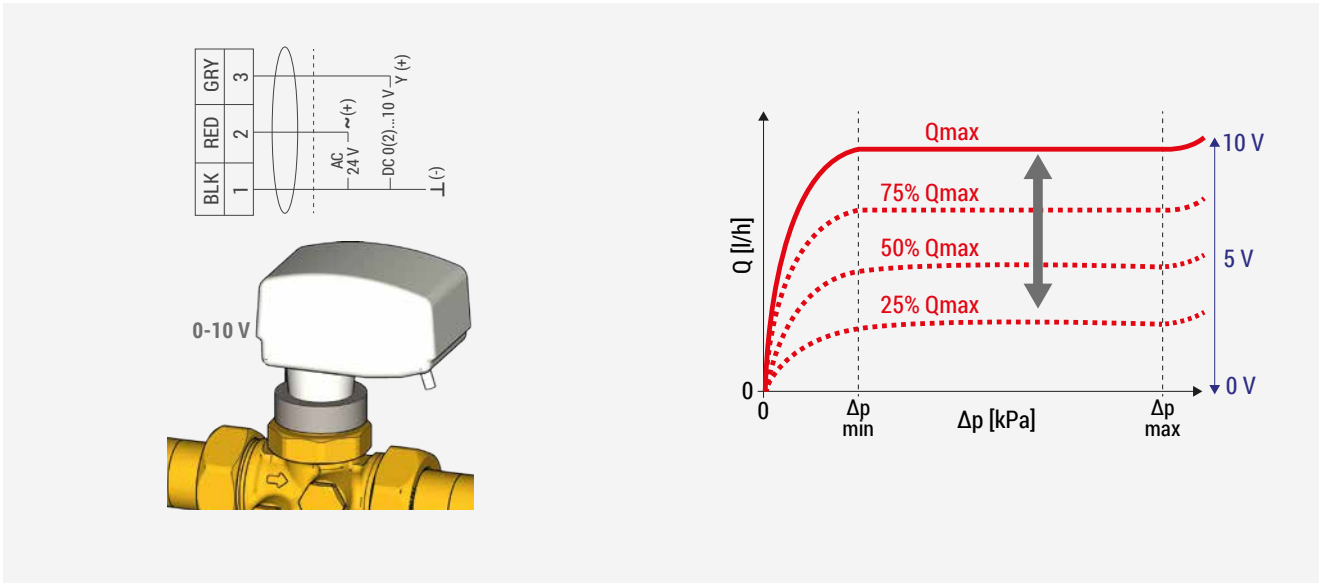
$$Q = K_v \cdot \sqrt{\Delta p}$$

Q constant	$\Delta p \uparrow$	$K_v \downarrow$
	$\Delta p \downarrow$	$K_v \uparrow$

➤ Pressure independent control

The R206A valve works at its best in combination with a proportional linear actuator. When combined to an electronic unit, it can control the flow automatically

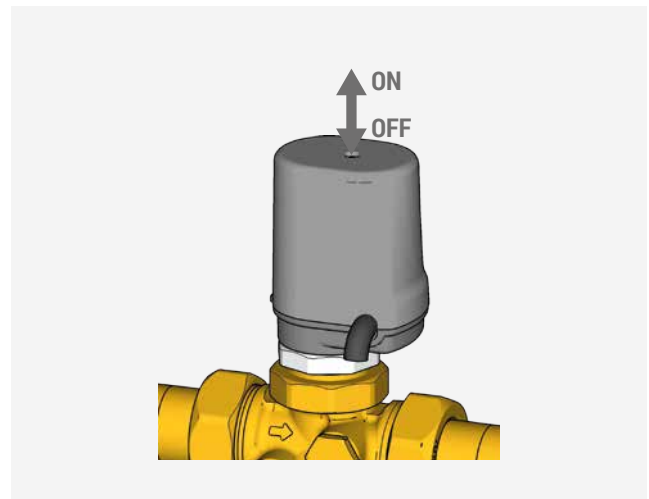
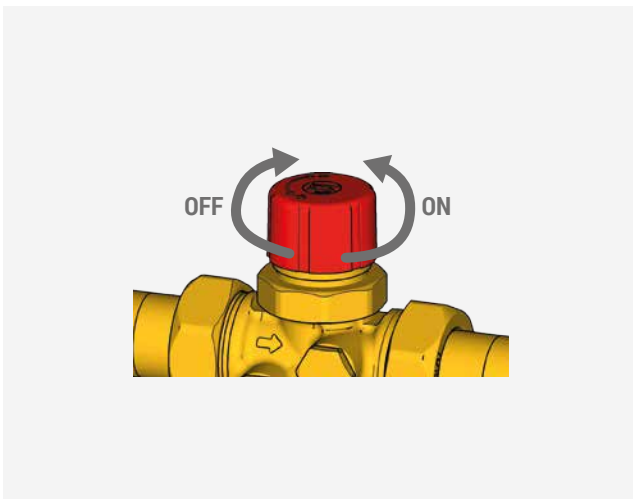
from the maximum value set Q_{max} (see "Flow rate presetting") up to the minimum value, depending on the thermal requirements.



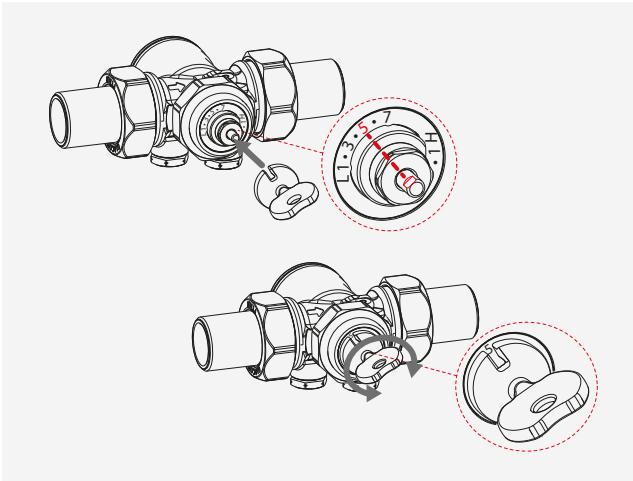
➤ Flow rate limitation and/or shut-off feature

The circuit controlled by the valve can be shut off by turning the knob clockwise to close the handwheel and counterclockwise to open it. The valve is completely shut off when the handwheel is closed while the flow rate is maintained to the preset value when the handwheel is open.

This can be achieved also automatically by installing an ON/OFF thermo-electric actuator properly wired. Once again, the valve is completely shut off when the thermo-electric actuator is closed and the flow rate is maintained to the preset value when the thermo-electric actuator is open.

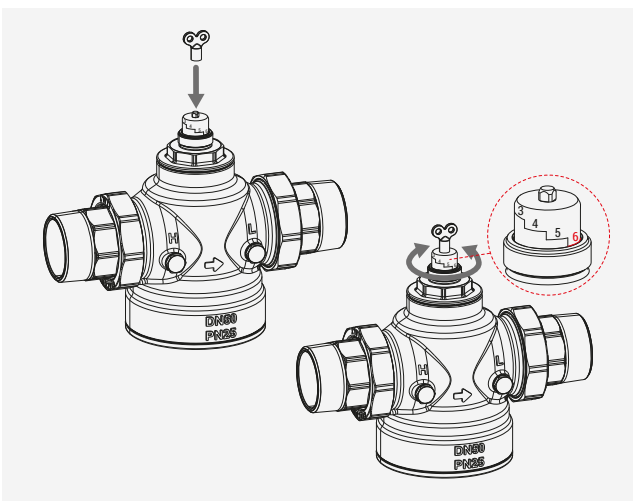


Flow rate presetting



Versions DN15, DN20, DN25

The R73PY010 key (included with the PICV) can be used to set the valve, based on the desired flow rate, by turning the valve stem clockwise or counterclockwise to reach the required value (1-7) printed on the plastic disk of the bonnet, as shown in the table below. The shift from one scale to the other, can be carried out any time, even when the system is running: this makes it possible to select the required flow rate value without replacing the valve. In addition to that, the dual scale limits the range of the controlled flow, allowing to adjust the flow with greater precision.



Versions DN50

The R206AY107/108 valves are equipped with a single regulation scale of the flow rate.

To set the valve adjustment based on the desired flow rate, use the regulation key **R74Y001** (included in the package) and turn the valve stem clockwise or counterclockwise until reaching the desired value written on the brass sleeve of the bonnet (in the example, the adjustment value "6" has been set).

The transition from one flow rate to the other is possible at any time, even during the operation of the system; in this way it is possible to choose the desired flow rate value without having to replace the valve.

PRODUCT CODE	DN	WORKING DIFFERENTIAL PRESSURE RANGE [kPa]	
		WITH R473 THERMO-ELECTRIC ACTUATOR	WITH K281 ACTUATOR OR WITHOUT ACTUATOR
R206AY113	15	25÷400	25÷800
R206AY103 R206AMY103	15	25÷400	25÷800
R206AY104 R206AMY104	20	25÷400	25÷800
R206AY105 R206AMY114	20	25÷400	25÷800
R206AY125	25	N/A	25÷400
R206AY106	25	N/A	25÷400
R206AY107	50	N/A	25÷400
R206AY108	50	N/A	25÷400

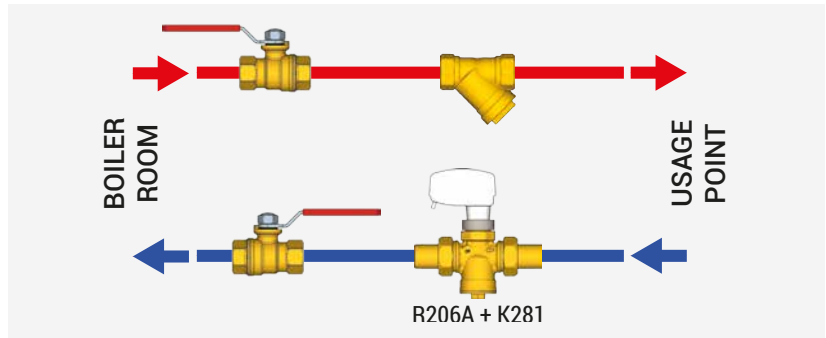
REGULATION SCALE	WORKING FLOW RATE RANGE [l/h]									
	MIN	1	2	3	4	5	6	7	8	9
SINGLE	35	95	120	230	310	400	460	520	-	-
L (LOW)	-	150	175	200	250	300	340	380	-	-
H (HIGH)	-	180	250	350	440	500	570	630	-	-
L (LOW)	-	320	400	520	640	770	870	910	-	-
H (HIGH)	-	700	820	910	970	1030	1100	1175	-	-
L (LOW)	-	290	400	500	640	730	900	1000	-	-
H (HIGH)	-	860	900	940	1110	1270	1330	1500	-	-
SINGLE	-	600	1000	1200	1600	2000	2300	2800	3100	3500
SINGLE	-	800	1000	1300	1900	2500	3100	3800	4300	4700
SINGLE	-	5200	6300	8500	10300	12000	13000	14000	-	-
SINGLE	-	5200	6300	8500	10300	12000	13000	14000	-	-

EXAMPLE.
Design flow rate: 300 l/h
Piping DN15

Valve required: R206AY103
Regulation scale: L (LOW)
Position: 5

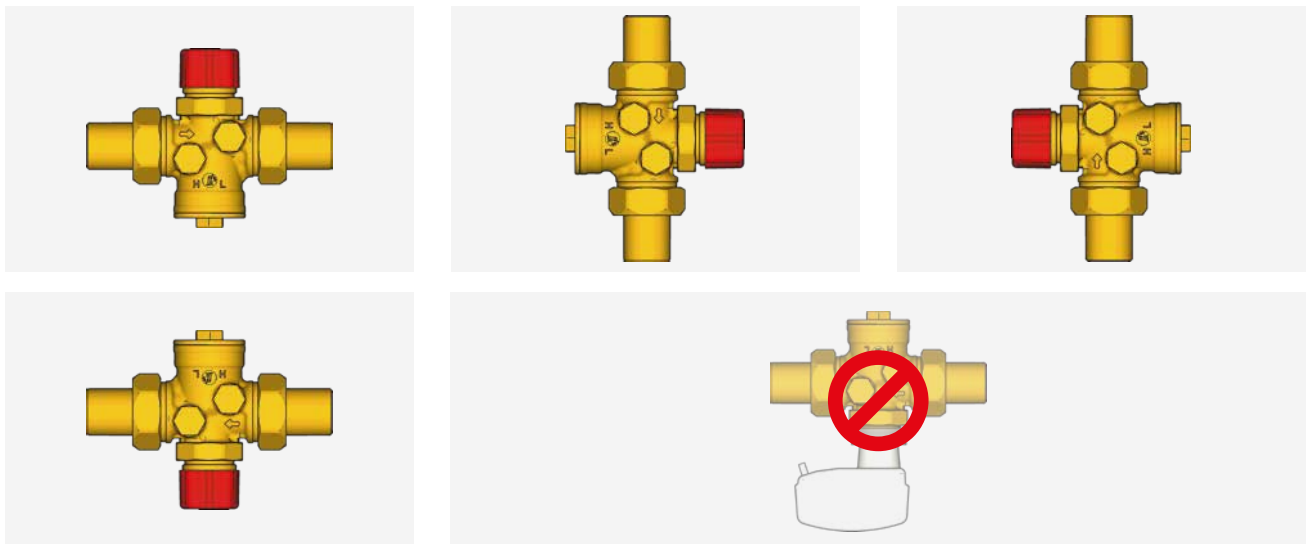
Installation

The R206A valve should be installed preferably on the system return circuit. We recommend installing a filter upstream the valve to prevent damages and blockages caused by debris.



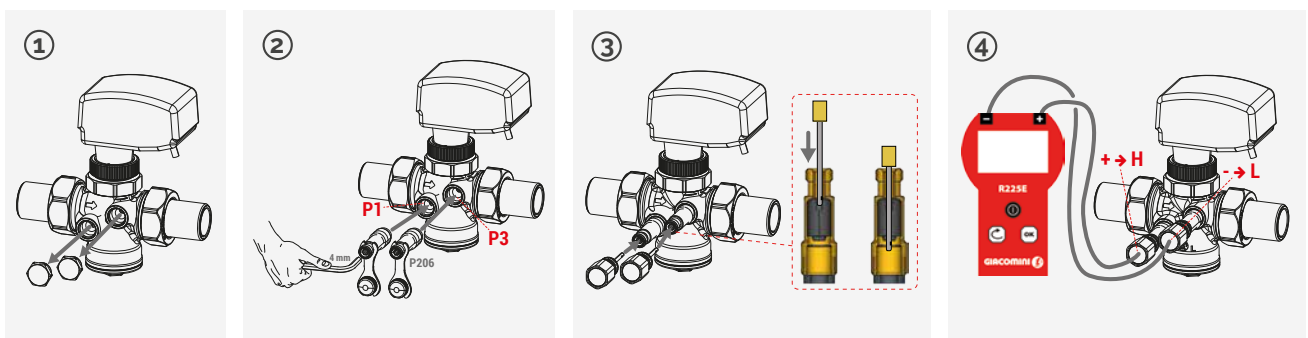
► Installation positions

The R206A valve can be installed in any position with no actuator; the only not allowed position for valves with actuator (R473 or K281) is the upside down position.

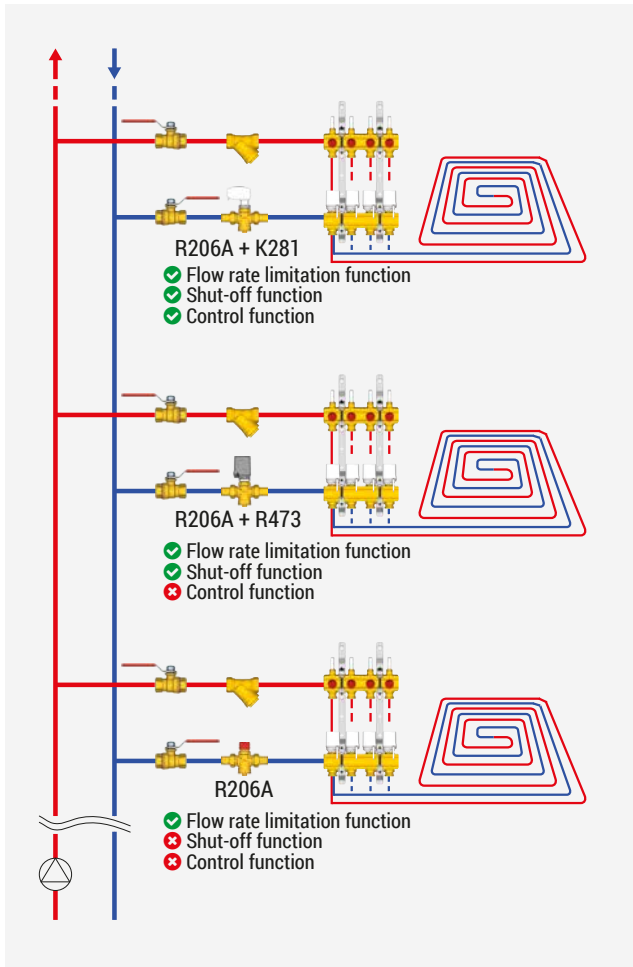


► Installation of P206 pressure outlets and flow rate testing through a differential pressure gauge R225E

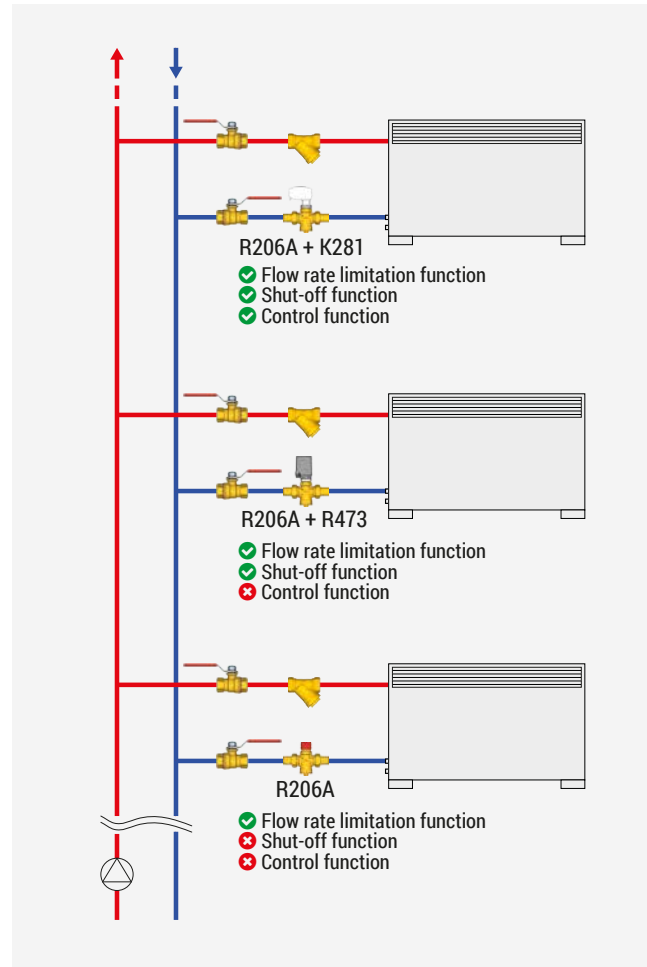
The valve is equipped with connections for installation of the P206 pressure outlets. The installation should be carried out when the system is OFF and not pressurized. The R225E differential pressure gauge with its probes properly seated inside the P206 pressure outlets allows to measure the valve differential pressure Δp (P1-P3) while the system is running. When the measured value is in the Δp operational range, it is possible to confirm that the actual flow rate of the valve is equal to the pre-set value (see "Flow rate setting").



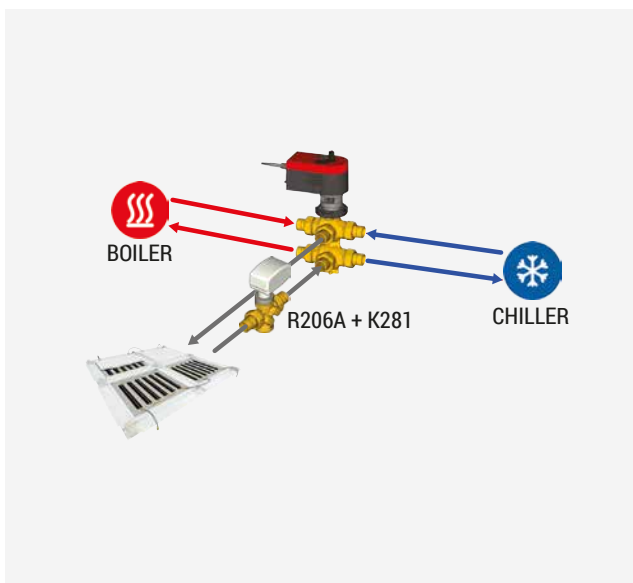
➤ Application diagrams



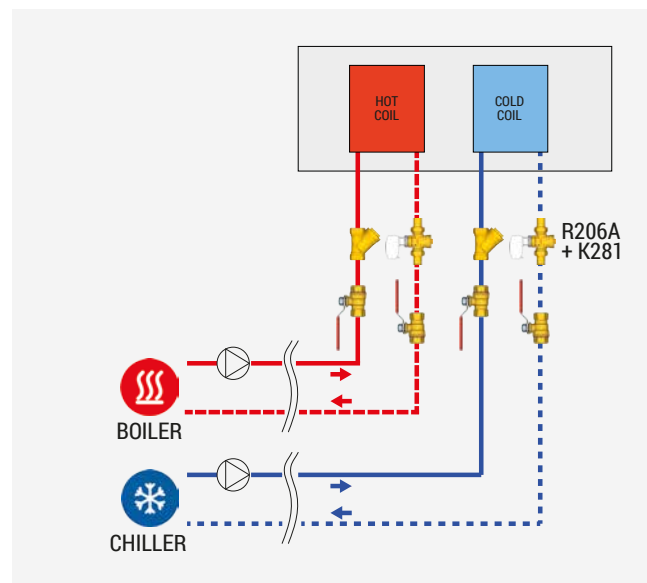
Example of application in radiant floor system



Example of application in fan-coil system



Example of application in 4-pipe radiant ceiling system with a 6-way valve



Example of application in air handling unit system (AHU)