PCMTV50-150

Pressure independent control valves, DN50-DN150 with integrated flow limiter (setting via actuator) and differential pressure regulator for thermal emitters

Valves intended for control of heating, cooling and air handling in larger-scale heating and cooling applications where pressure independent control valves are preferred, such as high-rise buildings, supermarkets, factories, etc.

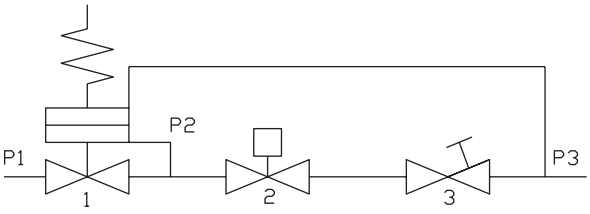
The PCMTV DN50-150 valves are temperature control valves with full authority over the entire flow range and measuring ports. This means that each individual terminal receives the flow required even in part load conditions. The PCMTV valves do not require any setting ratio calculation or valve authority calculation.

Function

The PCMTV valves offer remarkable adjustment flexibility. They can be accurately set to a specific flow rate value and allow precise modulating control.

Water flow through a valve varies as a function of the area of passage and the pressure differential across that valve. Thanks to the integrated differential pressure regulator (4) the differential pressure across the valve seats remains constant, meaning that the flow is only dependent of the area of passage. The valve flow characteristics (linear and equal percentage) can be selected using the actuator (1). It is also possible to set any flow rate value and to maintain it stable. Since flow rate is the only parameter to be considered, choosing the suitable valve is easy and fast.

As the differential pressure variations are instantly corrected, temperature variations and adjustment movements are considerably reduced while the valve and moving devices' lifespans are improved.

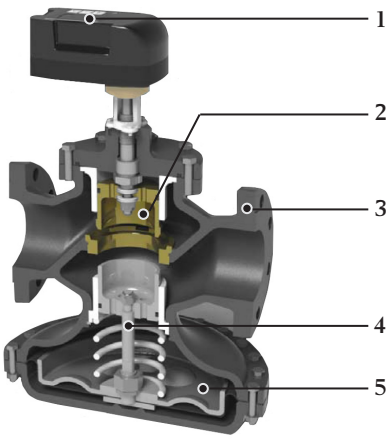


The valves' maximum adjustment matches the maximum flow rate allowed by the pipe size, on the basis of the values established by international standards.

The maximum and minimum flow of the valves can be set using the actuator.

Short facts

- Precise hydronic balance gives increased comfort and reduced energy consumption
- Accurate flow control, stable maximum flow rate and compensated variations in differential pressure result in a steady and enduring system
- Smart actuator offers remarkable adjustment flexibility
- Easy selection as no authority or ratio calculations are needed



1. actuator and pre-setting, 2. control valve, 3. body, 4. differential pressure regulator, 5. cartridge

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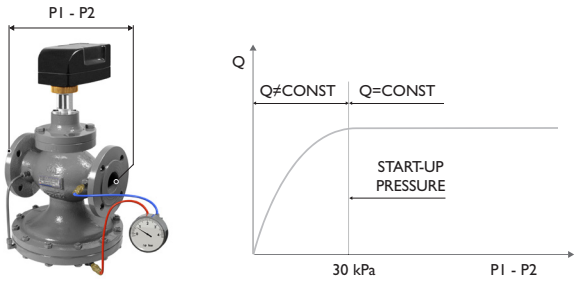
Application

The valves are used to control hot and cold water in heating and cooling systems. Typical applications are in heating and cooling, e.g. air handling units and plate heat exchangers. The large flows enable the valves to control flow and pressure in larger-scale heating and cooling units, such as in high-rise buildings, supermarkets, factories, etc.

Start-up pressure



Using a differential pressure gauge to measure the pressure drop the valve absorbs allows checking whether the valve is in the operating range (and, therefore, whether the flow is constant) by simply verifying that the measured value P1 - P2 is higher than the start-up value.

If the ΔP measured value is lower than the start-up value, then the valve works as a fixed orifice valve.

The start-up value varies with the flow setting of the valve.

Each valve has its own start-up pressure. This is the differential pressure that is needed by the valve in order to be able to function properly as a PICV (pressure independent control valve).

Before installation

Before filling the terminal unit system with water, make sure the main pipeline has been flushed and most of the dirt and debris have been flushed away. Always comply with local or applicable flushing, however, in order to get the longest life and the best performance from a PICV, Regin does not accept any liability for improper or wrong use of this product.

Always protect the pressure regulator by using strainers upstream of the valve and making sure the water quality complies with UNI 8065 standards (Fe < 0.5 mg/kg and Cu < 0.1 mg/kg).

Furthermore, the iron oxide in the water passing through the control valve (PICV) should not exceed 25 mg/kg (25 ppm).

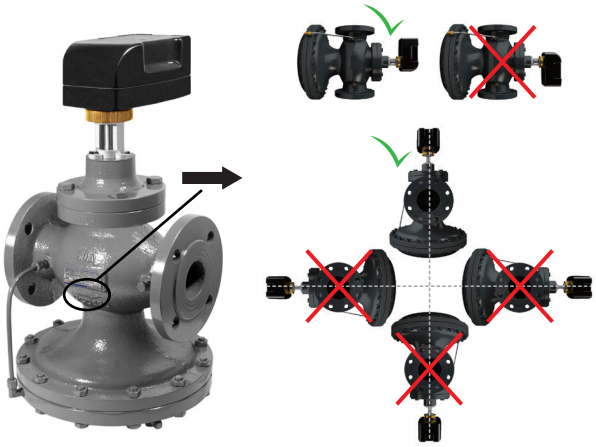
To ensure that the main pipework is cleaned appropriately, flushing bypasses should be used without flushing through the pressure regulator of the PICV, thereby preventing debris that might clog the valve.

Maintenance and cleaning

During valve cleaning operations, use a damp cloth. DO NOT use any detergent or chemical product that may seriously damage or compromise the proper functioning and the reliability of the valve.

Installation

The valve has to be mounted with the arrow in the direction of the flow.



Mounting it in the wrong direction may damage the system and the valve itself.

If flow reversal is possible, a non-return valve should be mounted.

Commissioning

Commissioning is very easy to perform, preset flow rates can be modified at any time and at low costs.

Since it is not necessary to commission the valve after its installation, the valve can work immediately after it has been assembled, for example, on the floors where works are already finished.

It is however necessary to be sure that the valve is actually working in the operating range. In order to verify this, just measure the differential pressure across the valve, as shown in the picture.

If the measured differential pressure is higher than the start-up pressure, the valve is keeping the flow constant at the set value.

In order to adjust the flow rate, just set the selected value by using the built-in actuator (see overleaf).

Flow preset

Flow is preset using the built-in actuator. When first powered on, "GO 0" is displayed in the LCD display. At this point, wait for "0" to appear. Pressing the MODE button for 2 seconds or longer will switch to setting mode. From here, it is then possible to select the detail indication suitable for your on-site installation.

When in "set" mode, pressing the button again will permit you to select another set mode (S-01 - S-12).

1	Display
2	UP (⌒) button
3	MODE button
4	DOWN (⌣) button

Actuator settings

Set	Setting	Indication	Definition	Operation	Explanation
S-01	Select input / indication type	FLo	Flow input	Finish by pressing MODE button after selection	Control by INT mode volume
		PErc	% input		Control by INT mode %
S-02	Input tool selection	0-10	Voltage input	Set by voltage JOG	Pin3-Pin1 voltage: 0...10 V
		2-10	Voltage input	Set by voltage JOG	Pin3-Pin1 voltage: 2...10 V
		0-20	Current input	Set by current JOG	Pin3-Pin1 current: 0...20 mA
		4-20	Current input	Set by current JOG	Pin3-Pin1 current: 4...20 mA
		on-F	On/ Off input	24 V: Open 0 V: Close	Pin3-Pin1 voltage. 24 V: Open Open or 0 V: Close
		3-FL	3-point floating input	P3 24 V: Open P4 24 V: Close	Pin3-Pin1 voltage. 24 V: Open Pin4-Pin1 voltage. 24 V: Close
		P-05	PWM 5 s.	PWM 0.1...5.0 s	0.1 s: 0 %, 5 s: 100 %
		P-25	PWM 25 s.	PWM 0.1...25 s	0.1 s: 0 %, 25 s: 100 %
		Int	Internal input	Set using buttons	Set via buttons on actuator
S-03	Min. flow setting	Minimum flow setting to display	Min. flow setting	Finish by pressing MODE button after selection	Min. flow should be lower than max. flow
S-04	Max. flow setting	Maximum flow setting to display	Max. flow setting	Finish by pressing MODE button after selection	Max. flow should be higher than min. flow
S-05	Check settings / current values	Fd-F	Flow feedback	Finish by pressing MODE button after selection	Settings should be identical to feedback values
		Fd-P	% feedback		
		St-F	Flow settings		
		St-P	% settings		
S-06	Rotation angle compensation	Max. pulse value to be displayed for valve	Max. pulse compensation	Finish by pressing MODE button after selection	Change only if necessary

Actuator settings, cont.

Set	Setting	Indication	Definition	Operation	Explanation
S-07	**Flow offset compensation**	0 (± 10 %)	Displayed in numerals	Finish by pressing MODE button after selection	Increase/decrease flow by ± 10 %
S-09	**Flow unit selection**	Int	SI unit	Finish by pressing MODE button after selection	l/h or l/min.
		GAL	GPM unit		gal/min.
S-10	**Flow curve selection***	L in	Control according to flow	Finish by pressing MODE button after selection	Linear curve (flow value conversion according to first graph)
		EPEr	Control according to curve		Equal percentage curve (flow value conversion according to second graph)
S-11	**Min. contol voltage calibration**	Min. voltage analogue value	Min. voltage calibration	Finish by pressing MODE button after selection	Enters set value as the min. voltage value
S-12	**Max. contol voltage calibration**	Max. voltage analogue value	Max. voltage calibration	Finish by pressing MODE button after selection	Enters set value as the max. voltage value

* See table below

Flow rate table for PCMTV DN50-DN150

Size (DN)		50	65	80	100	125	150	150HF
Flow rate (l/h)*	Qmin	3000	5000		15000	15000		15000
	Qmax	20000	30000		55000	90000		150000

* Where every step represents 1 %

Models

Valve	Nominal diameter	Start-up pressure	Max. flow rate	ΔP max.
PCMTV50-F20	DN50	30 kPa	20000 l/h	400 kPa
PCMTV65-F30	DN65	30 kPa	30000 l/h	400 kPa
PCMTV80-F30	DN80	30 kPa	30000 l/h	400 kPa
PCMTV100-F55	DN100	30 kPa	55000 l/h	400 kPa
PCMTV125-F90	DN125	35 kPa	90000 l/h	400 kPa
PCMTV150-F90	DN150	50 kPa	90000 l/h	400 kPa
PCMTV150-F150	DN150	50 kPa	150000 l/h	400 kPa

Technical data

Pressure class	PN16 (16 bar)
Flow characteristic	Equal percentage or linear (setting through actuator, see page 3)
Rangability	100 : 1
Media	Hot or cold water
Leakage	0.01 % of maximum flow, Class IV IEC 60534-4
Temperature range	-10...120°C
Connection	Flanged according to EN 1092-2 (PN16)

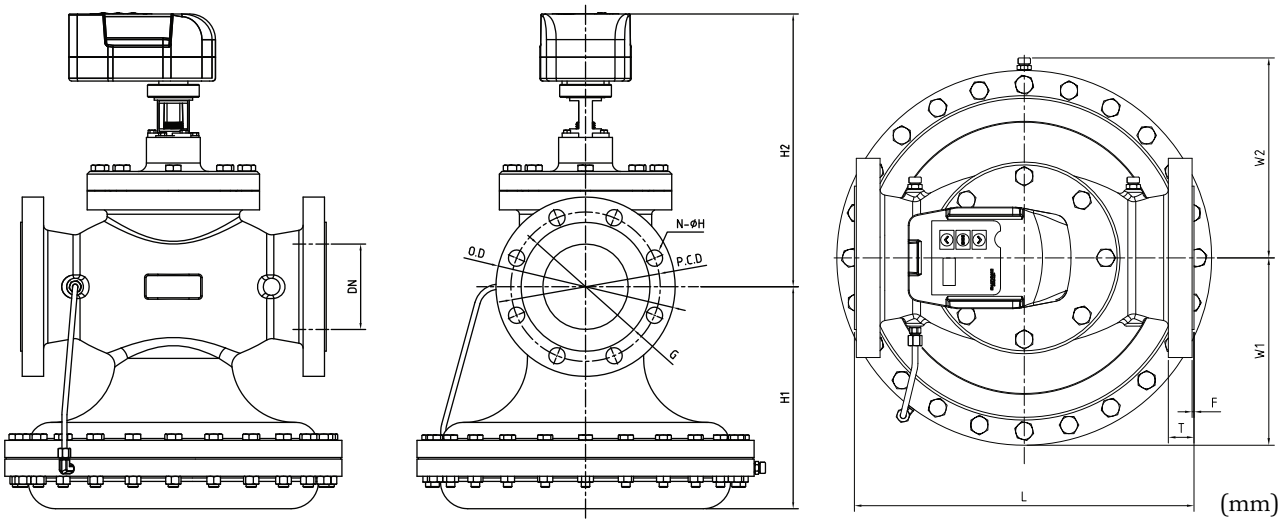
Material

Body	Ductile iron EN-JS1030
Plug	Gunmetal CC491K
Seat	Gunmetal CC491K
Stem	Stainless steel 1.4305
Stuffing box	Stainless steel 1.4305
Gaskets	EPDM
O-rings	EPDM
Diaphragm	EPDM

Actuator

Opening time	170 s
Torque	5 Nm
Ambient temp.	-20°C ~ 65°C
Wire	18AWG
Material, cover	Aluminum, plastic
Protection class	II (IP54)
Power supply	24 V AC/DC
Control input	PID Control (2...10 V DC : installed on external cable of 500Ω resistor) 4...20 mA (installed on external cable of 500Ω resistor) On/Off control mode (e.g. via thermostat) PWM control (0.1 ~ 5 sec/20ms or 25 sec/100ms depending on switch setting) Common switch – NPN transistor, SCR, triac or dry contact (max. current 50 mA)

Dimensions



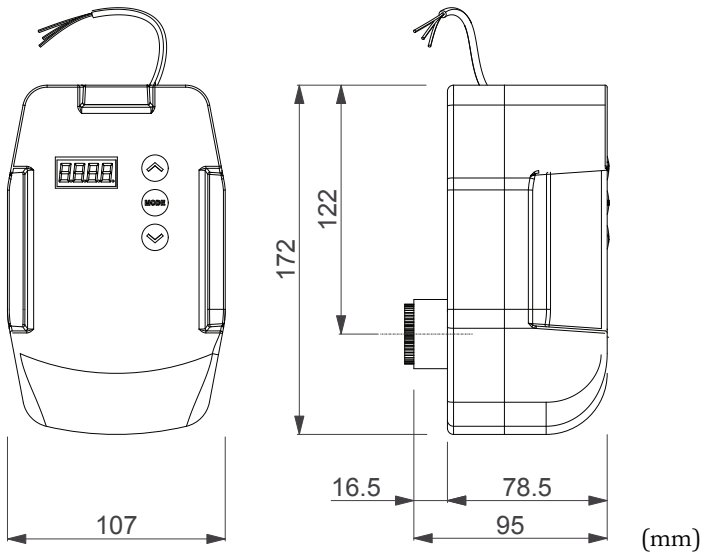
(mm)

Dimensions with actuator

Model	Flow rate (l/h)	H1 (mm)	H2 (mm)	W1 (mm)	W2 (mm)	L* (mm)	O.D (mm)	PCD (mm)	G (mm)	T (mm)	F (mm)	N-ØH (mm)
PCMTV50-F20	20000	191	291	139	154	254	165	125	102	18	3	4-19
PCMTV65-F30	30000	185	300	139	154	272	185	145	122	18	3	4-19
PCMTV80-F30	30000	185	300	139	154	272	200	160	138	20	3	4-19
PCMTV100-F55	55000	260	320	198	212	352	220	180	153	20	3	8-23
PCMTV125-F90	90000	266	346	198	212	400	250	210	188	23	3	8-19
PCMTV150-F90	90000	266	346	198	212	400	285	240	212	23	3	8-23
PCMTV150-F150	150000	350	400	198	212	451	285	240	212	23	3	8-23

* EN558 (IEC 60534-3-2, table 1)

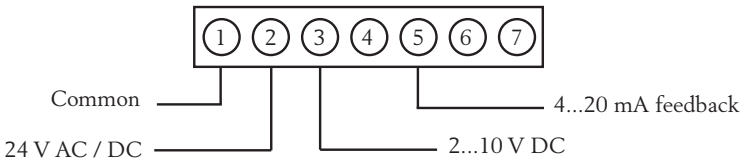
Dimensions, actuator



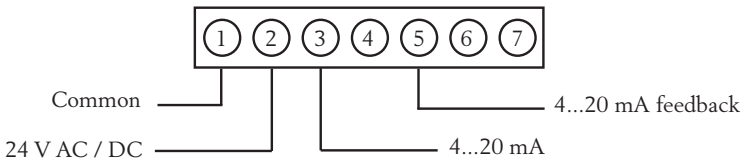
(mm)

Wiring, actuator

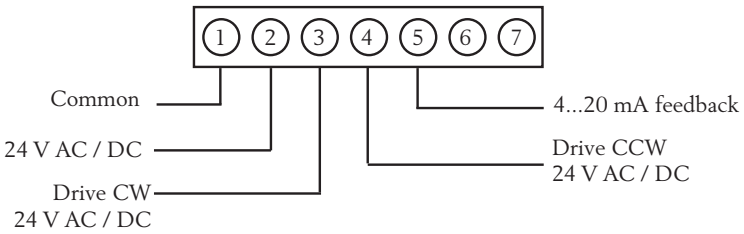
Analogue voltage control



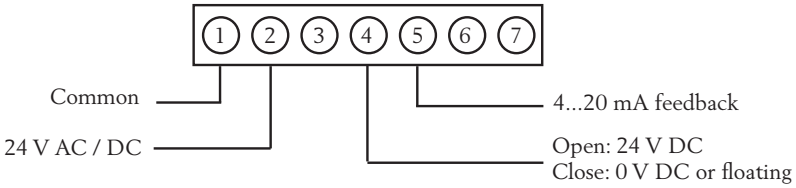
Analogue current control



3-point floating control

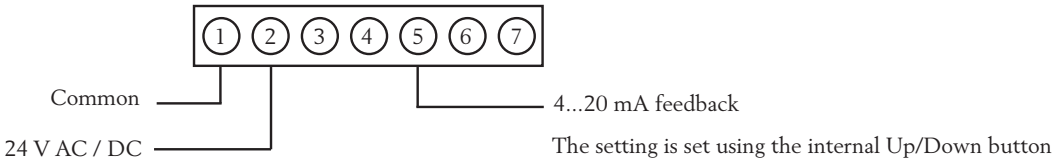


On/Off (2-point) control



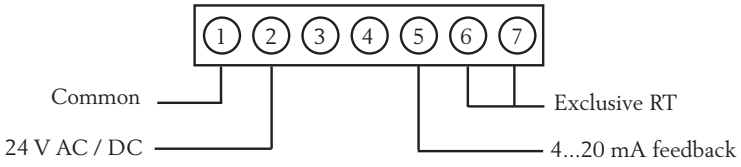
Wiring, actuator, cont.

Internal control

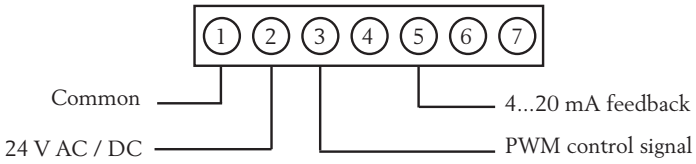


The setting is set using the internal Up/Down button

RT control



PWM control



PWM type 1: 0.1...5 s / 20 ms step
PWM type 2: 0.1...25 s / 100 ms step

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