

EVOPICV

Pressure Independent Control Valve

Technical manual

R 8.2

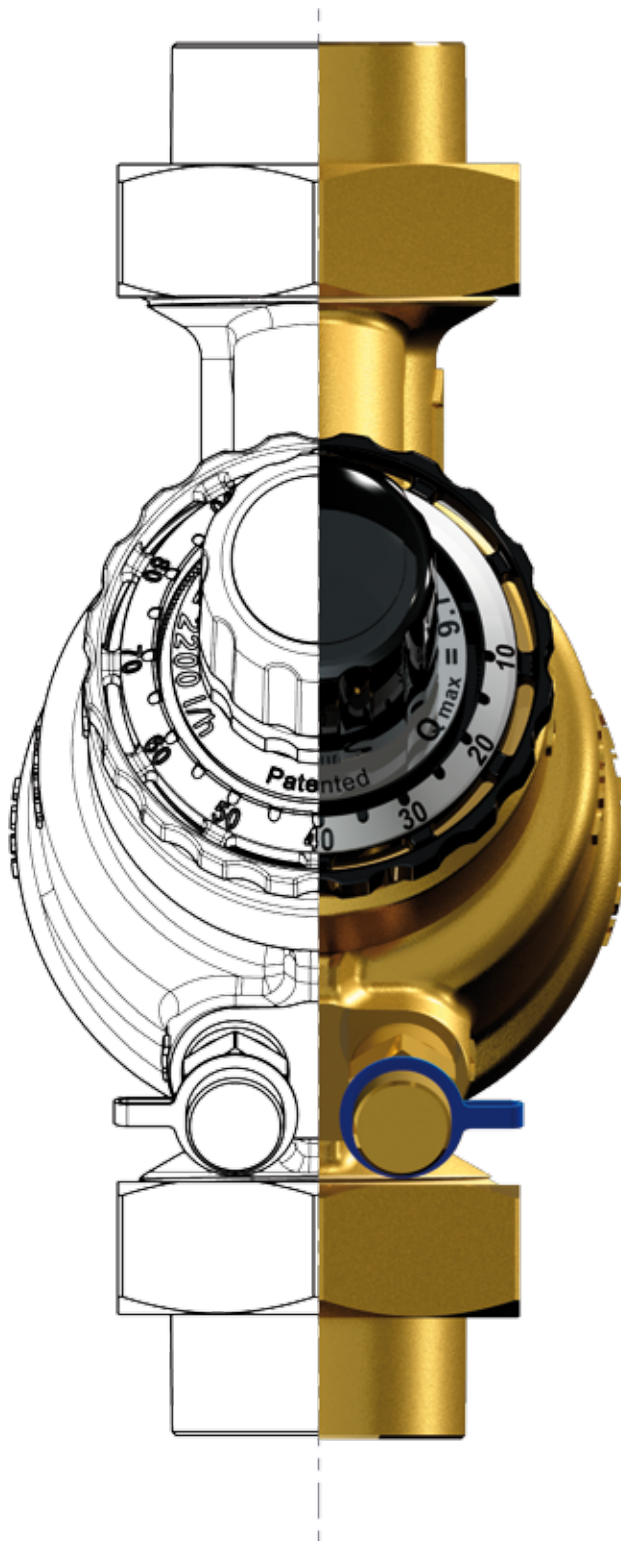


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Introduction

The **EvoPICV** Pressure Independent Control Valve "PICV" is a combined constant flow limiter and full stroke, full authority equal percentage temperature control valve.

The **EvoPICV** is suitable for use in variable and constant temperature systems and may be used as constant flow limiter in constant volume systems (without an actuator head) or as a true PICV in variable volume systems.

Operating principle

EvoPICV valve is made by three main parts:

1. differential pressure regulator
2. regulating valve for flow adjustment
3. flow pre-setting knob

1. Differential pressure regulator

The differential pressure regulator is the heart of the pressure independent control valve. By keeping a constant differential pressure across the valve seats constant flow and full authority temperature control can be achieved.

Incoming pressure P_1 is transmitted to the top face of the diaphragm, outgoing pressure P_3 is transmitted to the underside of this same diaphragm. A constant effective differential pressure is maintained between P_2 and P_3 . As P_1 increases relative to P_3 it acts on the diaphragm closing the shutter (A) against a seat (B) thereby lowering the effective differential pressure. As P_1 decreases relative to P_3 the diaphragm acts to open the shutter (A) from the seat (B) thus increasing the effective differential pressure. The diaphragm acts against a spring in order to balance the pressure control and stop the diaphragm oscillating.

2. Regulation valve

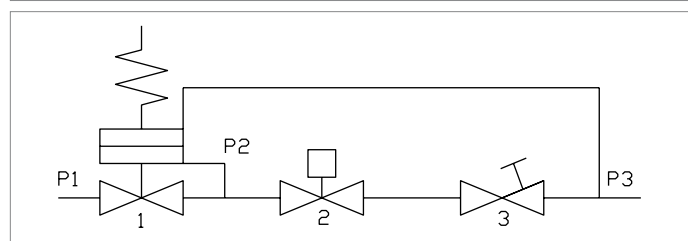
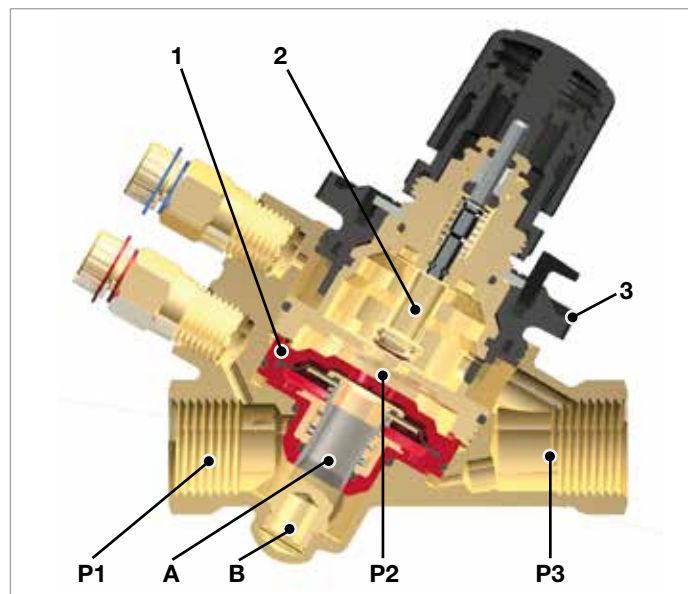
Water flow through a valve varies as a function of the area of passage and the pressure differential across that valve. Due to the incorporation of the differential pressure regulator the differential across the valve seats $P_2 - P_3$ is constant meaning that flow is now only a function of area of passage.

Setting any flow rate value and maintaining it stable is also possible. The regulation valve presents an equal percentage characteristic.

Advantages and user-friendliness

1. Advantages

- **EvoPICV** is a full authority temperature control valve. This means that each individual terminal receives on the flow required even in part load conditions.
- The regulator corrects any differential pressure variation. This leads to a considerable reduction in temperature variations and adjustment movements and to the extension of the life of the moving devices connected to it.
- **EvoPICV** valves offer a remarkable adjustment flexibility. They can be accurately set to a specific flow rate value and they allow precise modulating control.
- The valves always guarantee a suitable flow rate, therefore avoiding too high energy consumption.
- Since **EvoPICV** valve performs the functions of two valves (balancing and adjustment), the installation costs are considerably reduced.
- The automatic flow rate limitation eliminates system commissioning costs.
- Since commissioning is very easy to perform, design 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



Functional schematic

3. Adjustment knob

The maximum value of the flow can be preset, choking the outlet section of the control valve, using the graduated adjustment knob.

The percentage value, indicated on the scale, matches the maximum flow rate percentage. This value can be changed turning the adjustment knob until it reaches the selected position (matching the percentage indicated on the scale). A locking mechanism avoids the valve set values from being changed inadvertently.

finished.

2. User-friendliness

In order to adjust the flow rate, just set the selected value using the adjustment knob.

Since flow rate is the only parameter to be considered, choosing the suitable valve is easy and fast.

EvoPICV valve maximum adjustment matches the maximum flow rate allowed by the pipe size, on the basis of the values established by international standards.

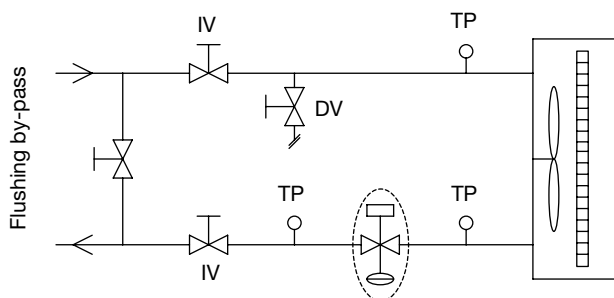
- Setting ratio calculation is not necessary.
- Valve authority calculation is not required.
- Specific devices or knowledge are not necessary.
- Compact design that allows installing the valve also in small spaces such as fan-coils or narrow supply spaces.
- The special adjustment knob allows the flow rate to be set without disassembling the actuator.

Applications examples

1. Systems with variable thermal power

The use of a motorised control valve that automatically limits the flow rate, ensures stable energy supply, independently from the available pressures and, at the same time, thanks to the possibility of controlling the flow rate regulator, it allows effective adjustment of ambient temperature.

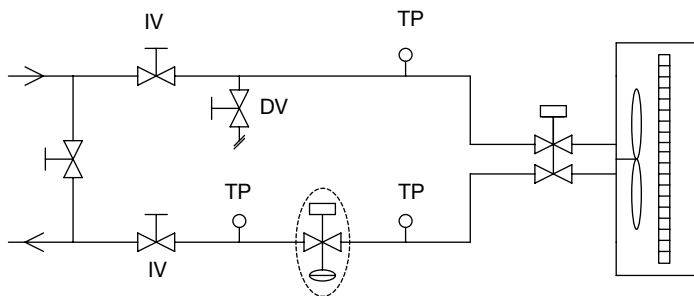
PICV is used as a constant flow limiter and control valve.



2. Systems with constant thermal power

If the valve is used to adjust fan-coil flow, it ensures the required flow rate to the equipment and it favours the hydraulic balance of the system. The exchanger always works in the best conditions possible with any differential pressure and the system is split into hydraulically separated areas.

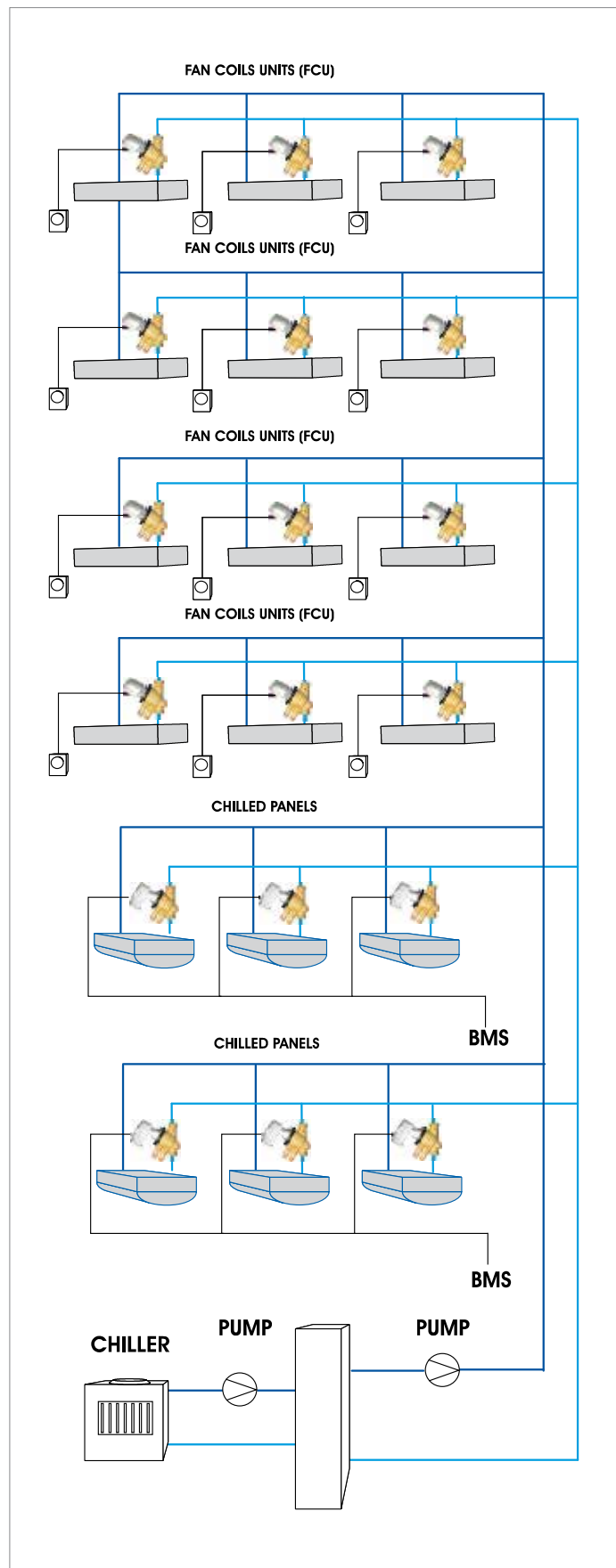
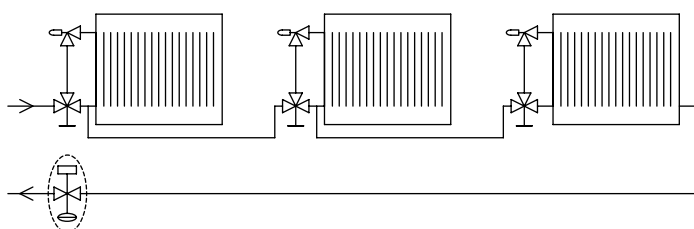
PICV is used as a constant flow limiter.



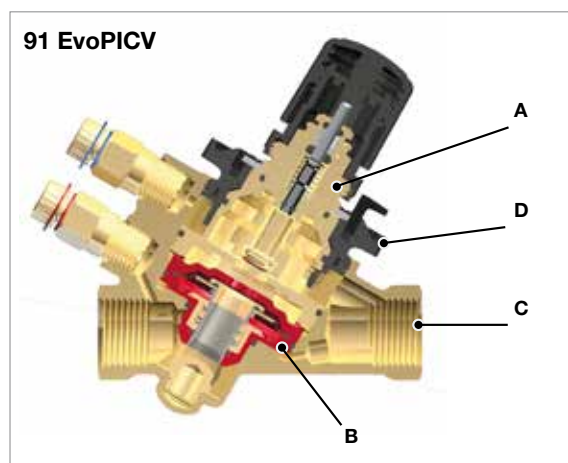
3. Single-pipe heating systems

An automatic valve placed on the system return line ensures a stable flow rate on the main branches at any thermostatic valve opening, thus reducing the possible sudden changes due to pressure variations in the system.

PICV is used as a constant flow limiter.



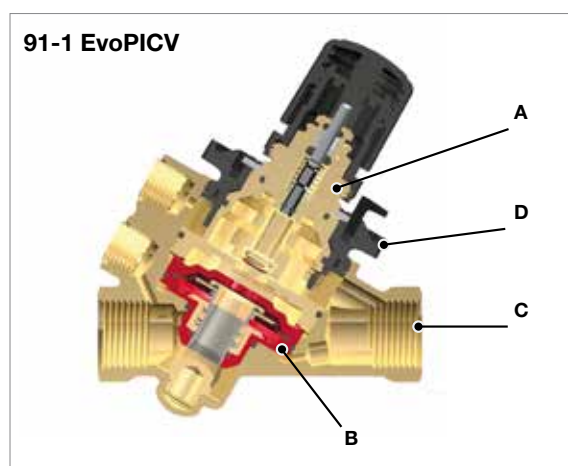
Technical specifications



	Material list
Regulating valve (A)	Brass CW614N Stainless steel 18/8
Cartridge (B)	High resistance polymer - EPDM Stainless steel AISI 303
Presetting (D)	High resistance polymer Brass CW614N
Body (C)	Corrosion resistant brass CW602N
Gaskets	EPDM-x

ΔP max. *	Close off pressure	Temperature	Working pressure max.	Stroke	Rangeability	Leakage
600 kPa / 6 bar	600 kPa / 6 bar	-10 ÷ 120 °C	2500 kPa / 25 bar	3 mm	50÷100 IEC 60534-2-3	Class IV IEC 60534-4

	91VL 1/2"	91L 1/2"	91H 1/2"	91L 3/4"	91H 3/4"	91H 1"
Flow rate max.	150 l/h 0,042 l/s	600 l/h 0,167 l/s	780 l/h 0,217 l/s	1000 l/h 0,278 l/s	1500 l/h 0,417 l/s	1500 l/h 0,417 l/s
Start-up max.	20 kPa 0,20 bar	25 kPa 0,25 bar	35 kPa 0,35 bar	30 kPa 0,30 bar	35 kPa 0,35 bar	35 kPa 0,35 bar
Connections	Rp 1/2" F EN 10226-1	Rp 1/2" F EN 10226-1	Rp 1/2" F EN 10226-1	Rp 3/4" F EN 10226-1	Rp 3/4" F EN 10226-1	Rp 1" F EN 10226-1



	Material list
Regulating valve (A)	Brass CW614N Stainless steel 18/8
Cartridge (B)	High resistance polymer - EPDM Stainless steel AISI 303
Presetting (D)	High resistance polymer Brass CW614N
Body (C)	Corrosion resistant brass CW602N
Gaskets	EPDM-x

ΔP max. *	Close off pressure	Temperature	Working pressure max.	Stroke	Rangeability	Leakage
600 kPa / 6 bar	600 kPa / 6 bar	-10 ÷ 120 °C	2500 kPa / 25 bar	3 mm	50÷100 IEC 60534-2-3	Class IV IEC 60534-4

	91VL1 1/2"	91L1 1/2"	91H1 1/2"	91L1 3/4"	91H1 3/4"	91H1 1"
Flow rate max.	150 l/h 0,042 l/s	600 l/h 0,167 l/s	780 l/h 0,217 l/s	1000 l/h 0,278 l/s	1500 l/h 0,417 l/s	1500 l/h 0,417 l/s
Start-up max.	20 kPa 0,20 bar	25 kPa 0,25 bar	35 kPa 0,35 bar	30 kPa 0,30 bar	35 kPa 0,35 bar	35 kPa 0,35 bar
Connections	Rp 1/2" F EN 10226-1	Rp 1/2" F EN 10226-1	Rp 1/2" F EN 10226-1	Rp 3/4" F EN 10226-1	Rp 3/4" F EN 10226-1	Rp 1" F EN 10226-1

* see product instructions for further information.

91X EvoPICV


	Material list
Regulating valve	Brass CW614N Stainless steel 18/8
Cartridge	High resistance polymer - EPDM Stainless steel AISI 303
Presetting	High resistance polymer Brass CW614N
Body	Brass CW617N
Gaskets	EPDM-x

ΔP max. *	Close off pressure	Temperature	Working pressure max.	Stroke	Rangeability	Leakage
600 kPa / 6 bar	600 kPa / 6 bar	-10 ÷ 120 °C	2500 kPa / 25 bar	3 mm	50÷100 IEC 60534-2-3	Class IV IEC 60534-4

	91XVL 1/2"	91XL 1/2"	91XH 1/2"
Flow rate max.	150 l/h 0,042 l/s	600 l/h 0,167 l/s	900 l/h 0,250 l/s
Start-up max.	20 kPa 0,20 bar	25 kPa 0,25 bar	30 kPa 0,30 bar
Connections	Rp 1/2" F EN 10226-1	Rp 1/2" F EN 10226-1	Rp 1/2" F EN 10226-1

91X/2 EvoPICV


	Material list
Regulating valve	Brass CW614N Stainless steel 18/8
Cartridge	High resistance polymer - EPDM Stainless steel AISI 303
Presetting	High resistance polymer Brass CW614N
Body	Brass CW617N
Gaskets	EPDM-x

ΔP max. *	Close off pressure	Temperature	Working pressure max.	Stroke	Rangeability	Leakage
600 kPa / 6 bar	600 kPa / 6 bar	-10 ÷ 120 °C	2500 kPa / 25 bar	3 mm	50÷100 IEC 60534-2-3	Class IV IEC 60534-4

	91XVL/2 1/2"	91XL/2 1/2"	91XL/2 3/4"	91XH/2 3/4"
Flow rate max.	150 l/h 0,042 l/s	600 l/h 0,167 l/s	600 l/h 0,167 l/s	900 l/h 0,250 l/s
Start-up max.	20 kPa 0,20 bar	25 kPa 0,25 bar	25 kPa 0,25 bar	30 kPa 0,30 bar
Connections	G 1/2"M (flat face) EN 10226-1	G 1/2"M (flat face) EN 10226-1	G 3/4"M (flat face) EN 10226-1	G 3/4"M (flat face) EN 10226-1

* see product instructions for further information.

91X/3 EvoPICV


	Material list
Regulating valve	Brass CW614N Stainless steel 18/8
Cartridge	High resistance polymer - EPDM Stainless steel AISI 303
Presetting	High resistance polymer Brass CW614N
Body	Brass CW617N
Gaskets	EPDM-x

ΔP max. *	Close off pressure	Temperature	Working pressure max.	Stroke	Rangeability	Leakage
600 kPa / 6 bar	600 kPa / 6 bar	-10 ÷ 120 °C	2500 kPa / 25 bar	3 mm	50÷100 IEC 60534-2-3	Class IV IEC 60534-4

	91XVL/3 1/2" x 1/2"	91XL/3 1/2" x 1/2"	91XH/3 1/2" x 1/2"
Flow rate max.	150 l/h 0,042 l/s	600 l/h 0,167 l/s	900 l/h 0,250 l/s
Start-up max.	20 kPa 0,20 bar	25 kPa 0,25 bar	30 kPa 0,30 bar
Connections	1/2" F x 1/2" union M EN 10226-1	1/2" F x 1/2" union M EN 10226-1	1/2" F x 1/2" union M EN 10226-1

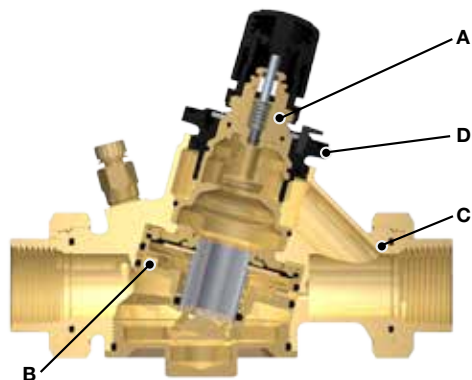
91X3S EvoPICV


	Material list
Regulating valve	Brass CW614N Stainless steel 18/8
Cartridge	High resistance polymer - EPDM Stainless steel AISI 303
Presetting	High resistance polymer Brass CW614N
Body	Brass CW617N
Gaskets	EPDM-x

ΔP max. *	Close off pressure	Temperature	Working pressure max.	Stroke	Rangeability	Leakage
600 kPa / 6 bar	600 kPa / 6 bar	-10 ÷ 120 °C	2500 kPa / 25 bar	3 mm	50÷100 IEC 60534-2-3	Class IV IEC 60534-4

	91XVL3S 1/2" F x 3/4" M	91XL3S 1/2" F x 3/4" M	91XH3S 1/2" F x 3/4" M
Flow rate max.	150 l/h 0,042 l/s	600 l/h 0,167 l/s	900 l/h 0,250 l/s
Start-up max.	20 kPa 0,20 bar	25 kPa 0,25 bar	30 kPa 0,30 bar
Connections	1/2" F x 3/4" M BS5200 60° EN 10226-1	1/2" F x 3/4" M BS5200 60° EN 10226-1	1/2" F x 3/4" M BS5200 60° EN 10226-1

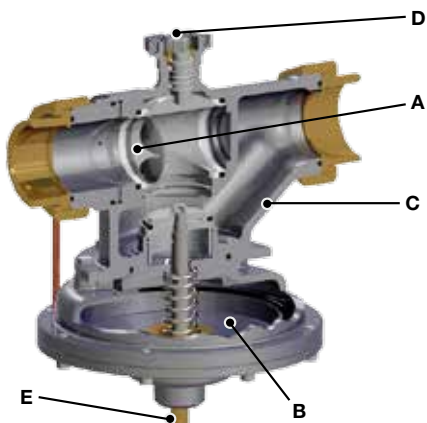
* see product instructions for further information.

93 EvoPICV


	Material list
Regulating valve (A)	Brass CW614N Stainless steel 18/8
Cartridge (B)	Brass CW614N - EPDM Stainless steel AISI 303
Presetting (D)	High resistance polymer Brass CW614N
Body (C)	Brass CW602N
Gaskets	EPDM-x

ΔP max. *	Close off pressure	Temperature	Working pressure max.	Stroke	Rangeability	Leakage
600 kPa / 6 bar	600 kPa / 6 bar	-10 ÷ 120 °C	2500 kPa / 25 bar	6 mm	100÷150 IEC 60534-2-3	Class IV IEC 60534-4

	93L 3/4"	93H 3/4"	93L 1"	93H 1"	93L 1 1/4"	93H 1 1/4"
Flow rate max.	2200 l/h 0,611 l/s	2700 l/h 0,750 l/s	2200 l/h 0,611 l/s	2700 l/h 0,750 l/s	2700 l/h 0,750 l/s	3000 l/h 0,833 l/s
Start-up max.	25 kPa 0,25 bar	30 kPa 0,30 bar	25 kPa 0,25 bar	30 kPa 0,30 bar	30 kPa 0,30 bar	35 kPa 0,35 bar
Connections	Rc 3/4" union F EN 10226-1	Rc 3/4" union F EN 10226-1	Rc 1" union F EN 10226-1	Rc 1" union F EN 10226-1	Rc 1 1/4" union F EN 10226-1	Rc 1 1/4" union F EN 10226-1

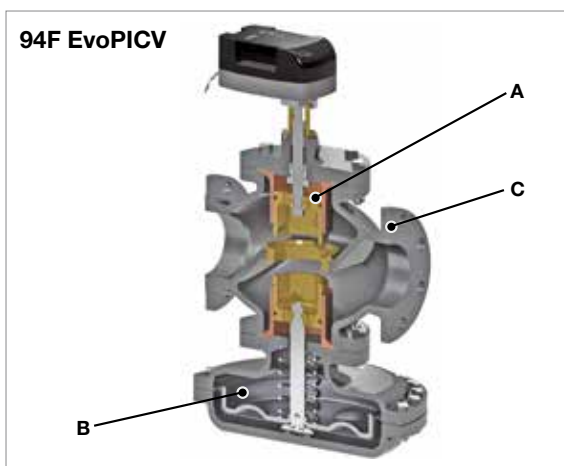
83 EvoPICV


	Material list
Regulating valve (A)	Brass CW617N PTFE
Cartridge (B)	Brass CW614N - EPDM-X Stainless steel AISI 303
Presetting (D) [PR1 series]	Brass CW617N
Body (C)	Ductile Iron
Gaskets	EPDM-x
Additional manual shut-off device (E)	Brass CW614N

ΔP max. *	Close off pressure	Temperature	Working pressure max.	Stroke	Rangeability	Leakage
600 kPa / 6 bar	600 kPa / 6 bar	-10 ÷ 120 °C	1600 kPa / 16 bar	90°	>100 IEC 60534-2-3	Class IV IEC 60534-4

	83HJP 1 1/4"	83LJP 1 1/2"	83HJP 1 1/2"	83VLJP 2"	83LJP 2"	83HJP 2"
	83HPR1 1 1/4"	83LPR1 1 1/2"	83HPR1 1 1/2"	83VLPR1 2"	83LPR1 2"	83HPR1 2"
Flow rate max.	6000 l/h 1,67 l/s	6000 l/h 1,67 l/s	9000 l/h 2,5 l/s	11000 l/h 3,06 l/s	12000 l/h 3,33 l/s	18000 l/h 5,00 l/s
Start-up max.	30 kPa 0,30 bar	30 kPa 0,30 bar	35 kPa 0,35 bar	40 kPa 0,40 bar	35 kPa 0,35 bar	35 kPa 0,35 bar
Connections	Rc 1 1/4" union F EN 10226-1	Rc 1 1/2" union F EN 10226-1	Rc 1 1/2" union F EN 10226-1	Rc 2" union F EN 10226-1	Rc 2" union F EN 10226-1	Rc 2" union F EN 10226-1

* see product instructions for further information.



	Material list
Regulating valve (A)	Brass CW602N Stainless steel 18/8
Cartridge (B)	Brass CW602N - EPDM Stainless steel AISI 303
Body (C)	Ductile iron
Gaskets	EPDM-x

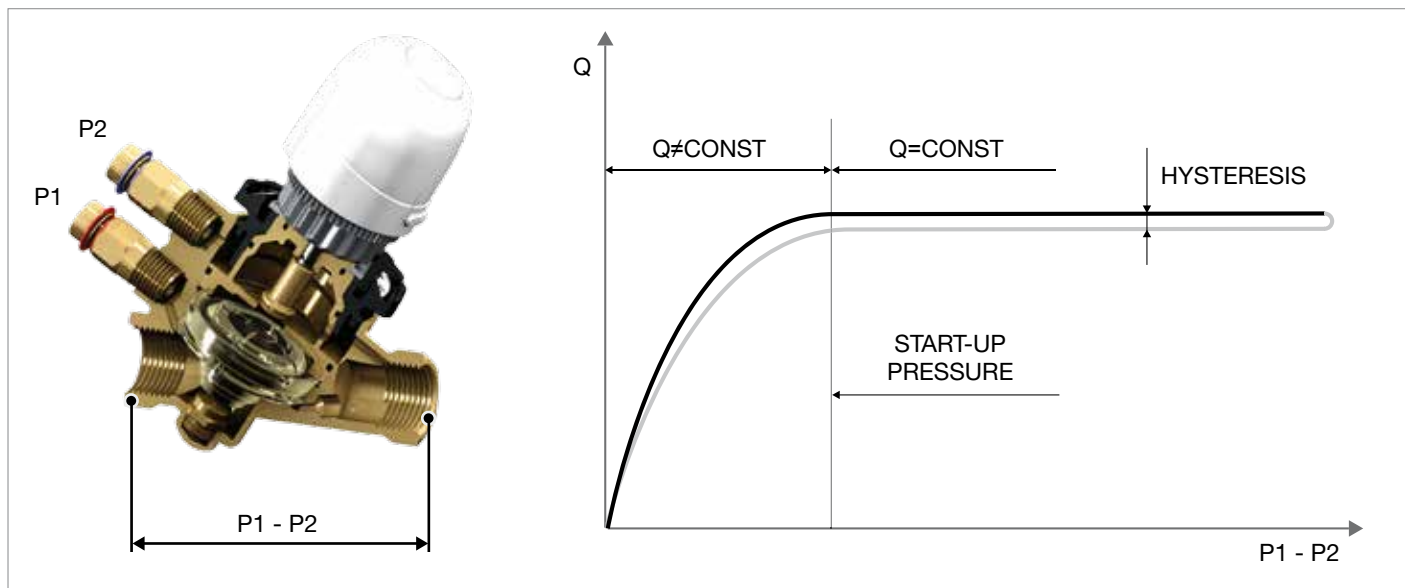
ΔP max. *	Close off pressure	Temperature	Working pressure max.	Stroke	Rangeability	Leakage
600 kPa / 6 bar	600 kPa / 6 bar	-10 ÷ 120 °C	1600 kPa / 16 bar	15÷22 mm	>100 IEC 60534-2-3	Class IV IEC 60534-4

	94FH 2"	94FL 2 1/2"	94FH 2 1/2"	94FL 3"	94FL 4"
Flow rate max.	20000 l/h 5,56 l/s	20000 l/h 5,56 l/s	30000 l/h 8,30 l/s	30000 l/h 8,30 l/s	55000 l/h 15,28 l/s
Start-up max.	40 kPa 0,40 bar	40 kPa 0,40 bar	30 kPa 0,30 bar	30 kPa 0,30 bar	30 kPa 0,30 bar
Connections	Flanged 2" EN 1092-2 EN 558 (face to face)	Flanged 2 1/2" EN 1092-2 EN 558 (face to face)	Flanged 2 1/2" EN 1092-2 EN 558 (face to face)	Flanged 3" EN 1092-2 EN 558 (face to face)	Flanged 4" EN 1092-2 EN 558 (face to face)

	94FL 5"	94FH 5"	94FL 6"	94FH 6"
Flow rate max.	90000 l/h 25,00 l/s	120000 l/h 33,33 l/s	90000 l/h 25,00 l/s	150000 l/h 41,667 l/s
Start-up max.	35 kPa 0,35 bar	35 kPa 0,35 bar	35 kPa 0,35 bar	50 kPa 0,50 bar
Connections	Flanged 5" EN 1092-2 EN 558 (face to face)	Flanged 5" EN 1092-2 EN 558 (face to face)	Flanged 6" EN 1092-2 EN 558 (face to face)	Flanged 6" EN 1092-2 EN 558 (face to face)

* see product instructions for further information.

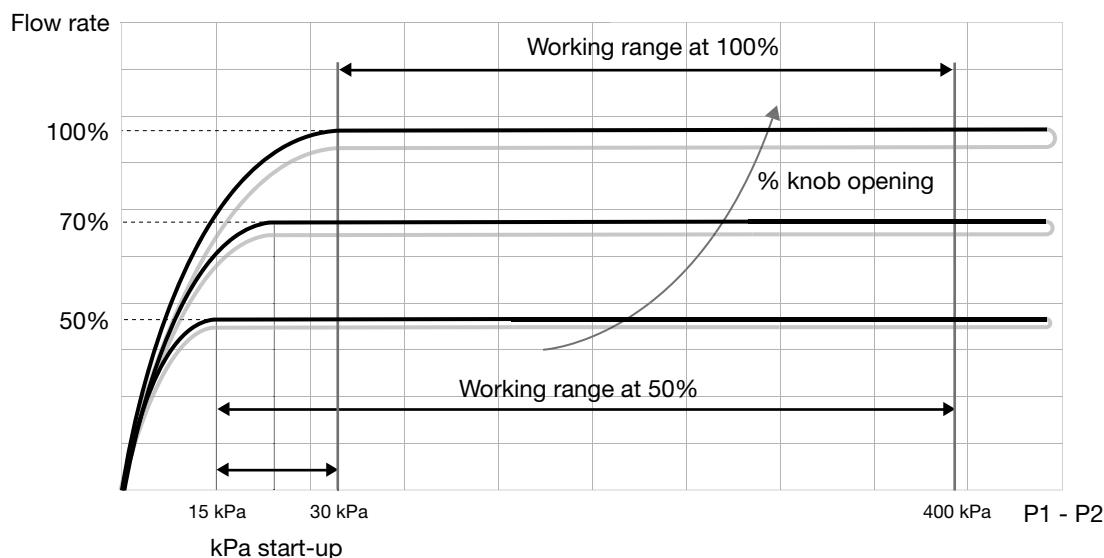
Dynamic characteristic curves



Using a differential pressure gauge to measure the pressure drop the valve absorbs, allows to check 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.

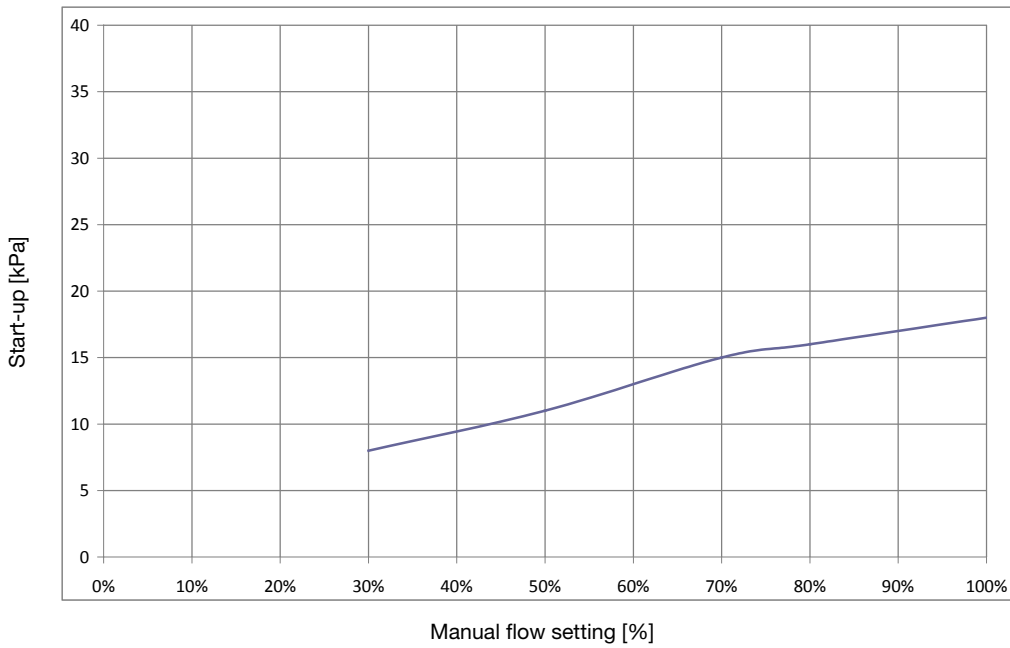
Start-up value varies with flow setting of the valve, as shown by the example below:



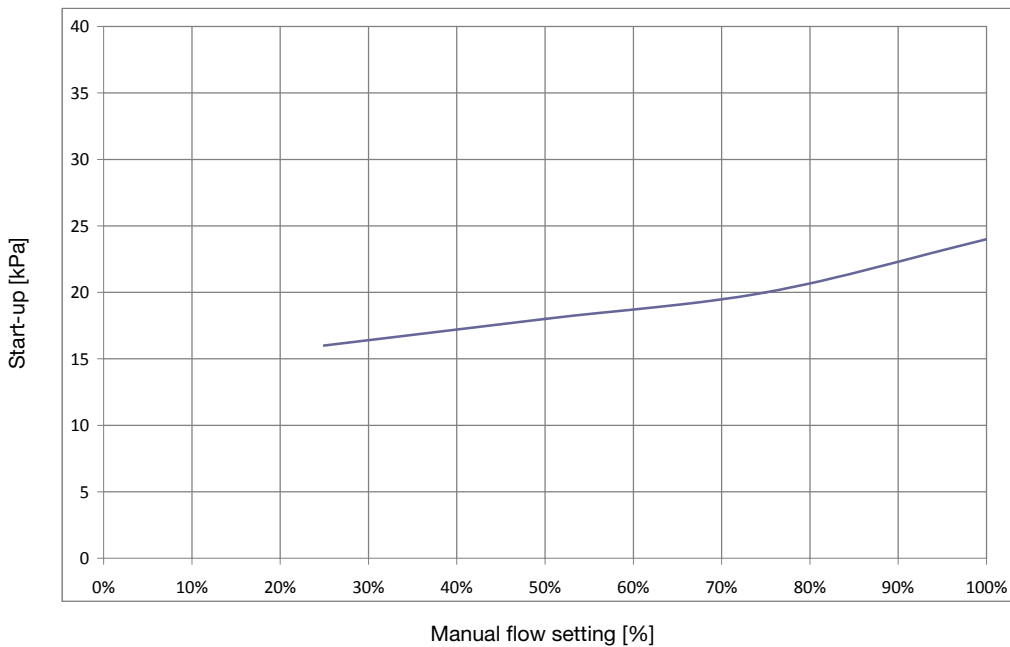
When the valve is set at 100% of nominal (maximum) flow, the curve begins to remain constant at 30 kPa, therefore the working range of the valve is $30 \div 400$ kPa;

When the valve is set at 50% of nominal flow, the curve begins to remain constant at 15 kPa, therefore the working range of the valve is $15 \div 400$ kPa.

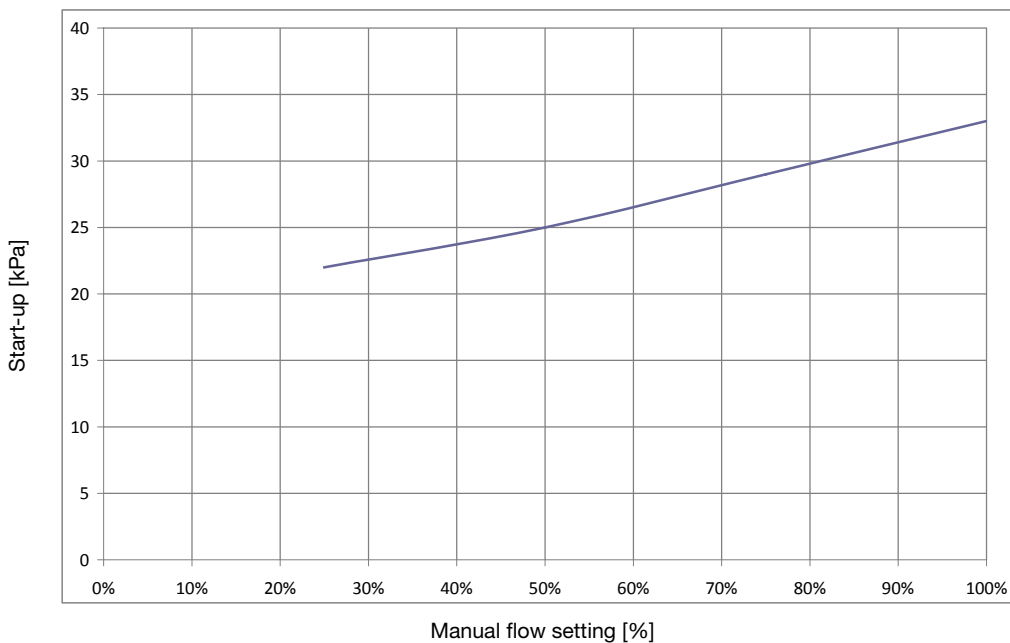
The following charts show how *start-up pressure* changes for each models



Valve model
91VL 1/2" - 150 l/h
91VL1 1/2" - 150 l/h
91XVL 1/2" - 150 l/h
91XVL/3 1/2" - 150 l/h
91XVL3S 1/2" - 150 l/h
91XVL/2 1/2" - 150 l/h

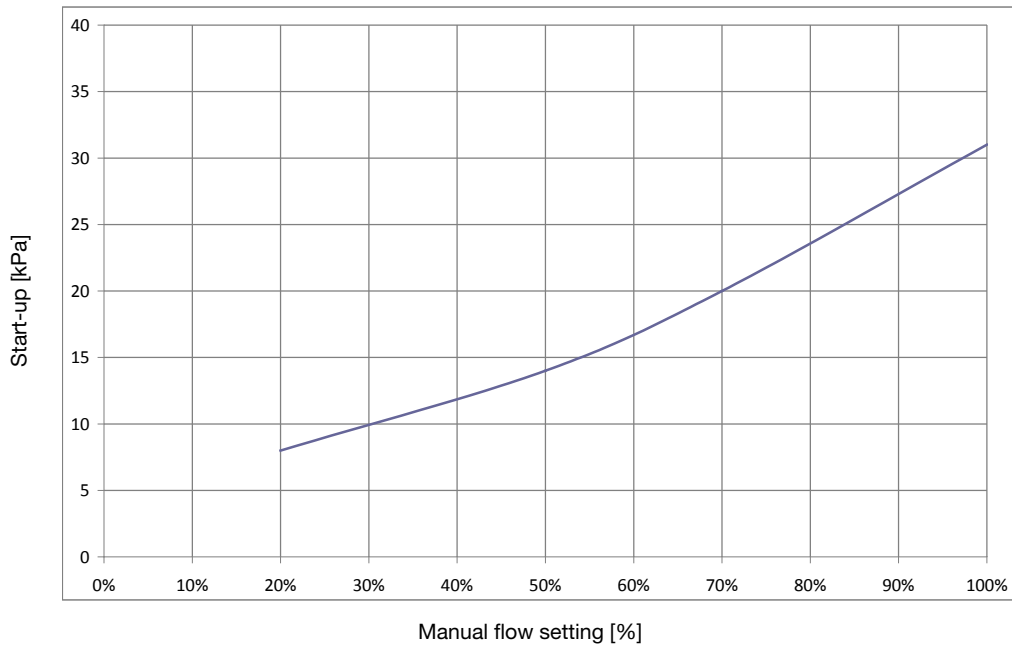


Valve model
91L 1/2" - 600 l/h
91L1 1/2" - 600 l/h
91XL 1/2" - 600 l/h
91XL/2 1/2" - 600 l/h
91XL/3 1/2" - 600 l/h
91XL3S 1/2" - 600 l/h
91XL/2 1/2" - 600 l/h

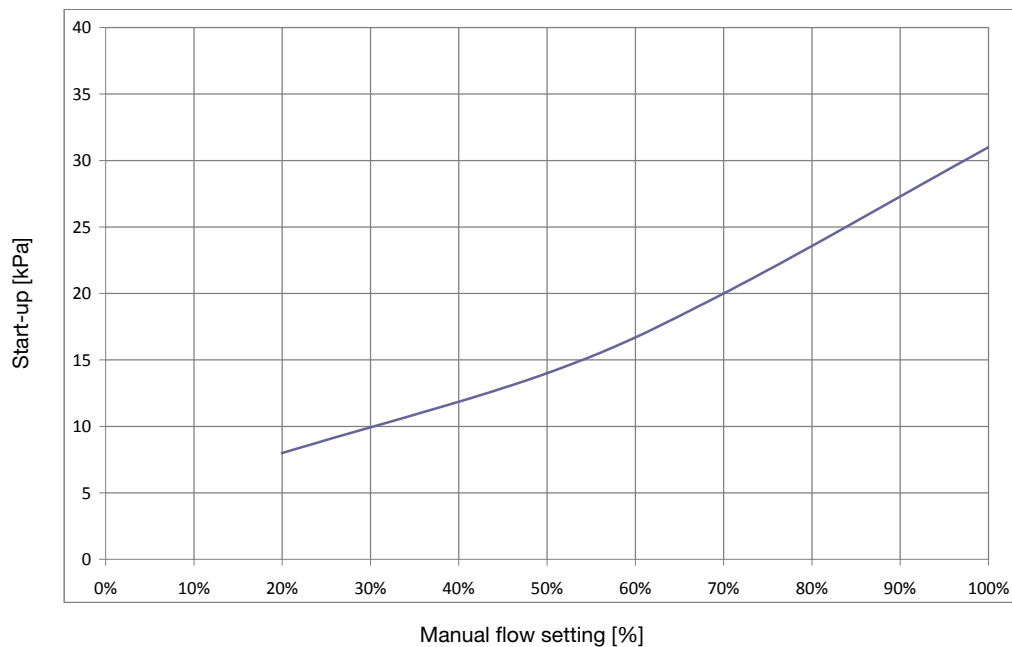


Valve model
91H 1/2" - 780 l/h
91H1 1/2" - 780 l/h

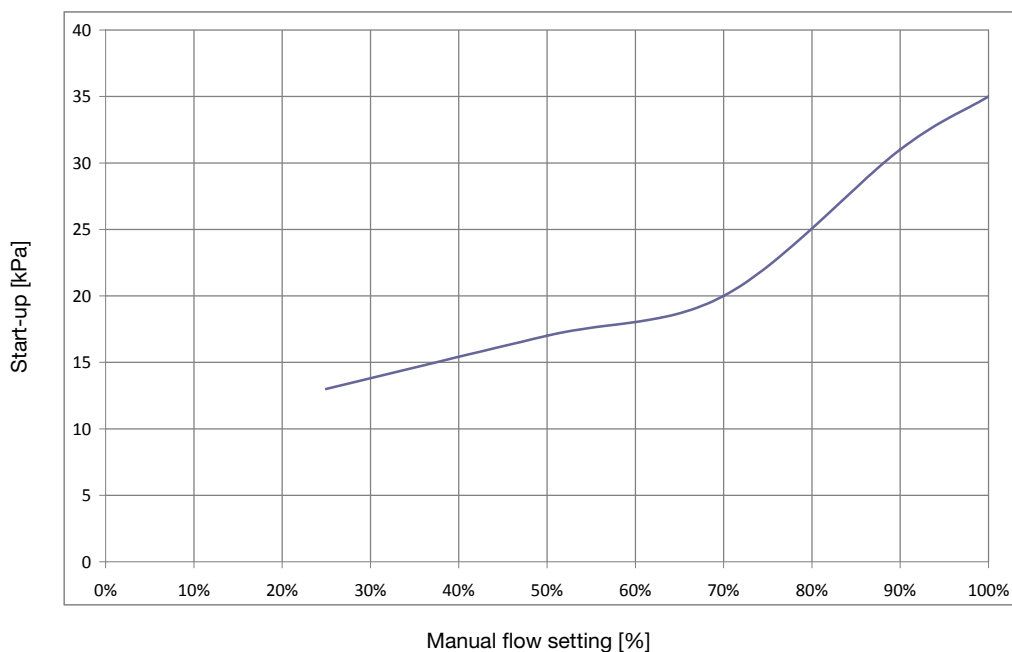




Valve model
91XH 1/2" - 900 l/h
91XH/2 3/4" - 900 l/h
91XH/3 1/2" - 900 l/h
91XH3S 1/2" - 900 l/h

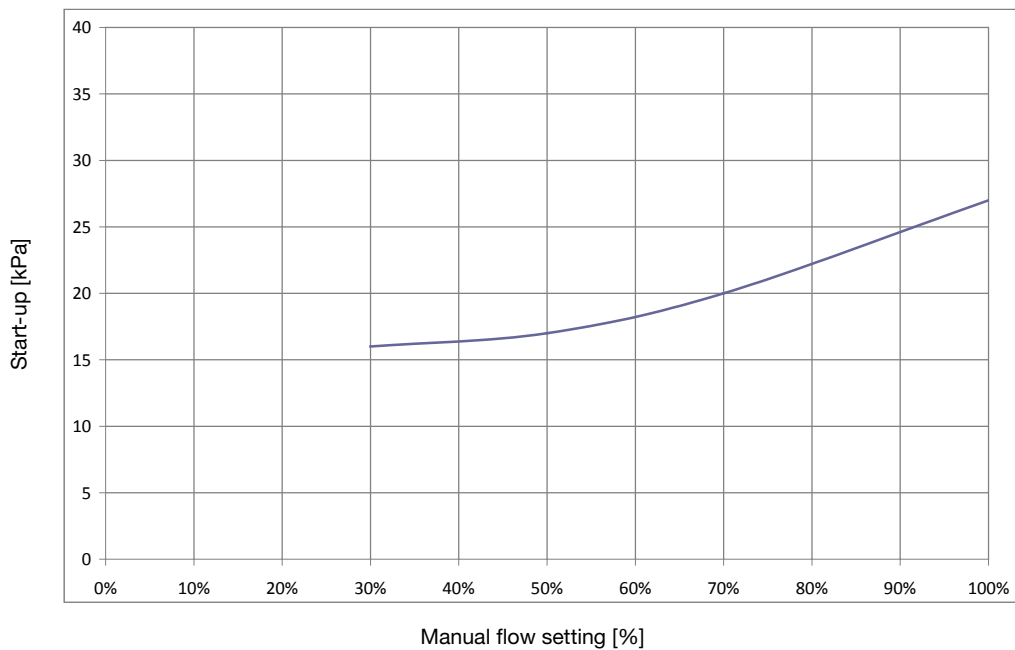


Valve model
91L 3/4" - 1000 l/h
91L1 3/4" - 1000 l/h

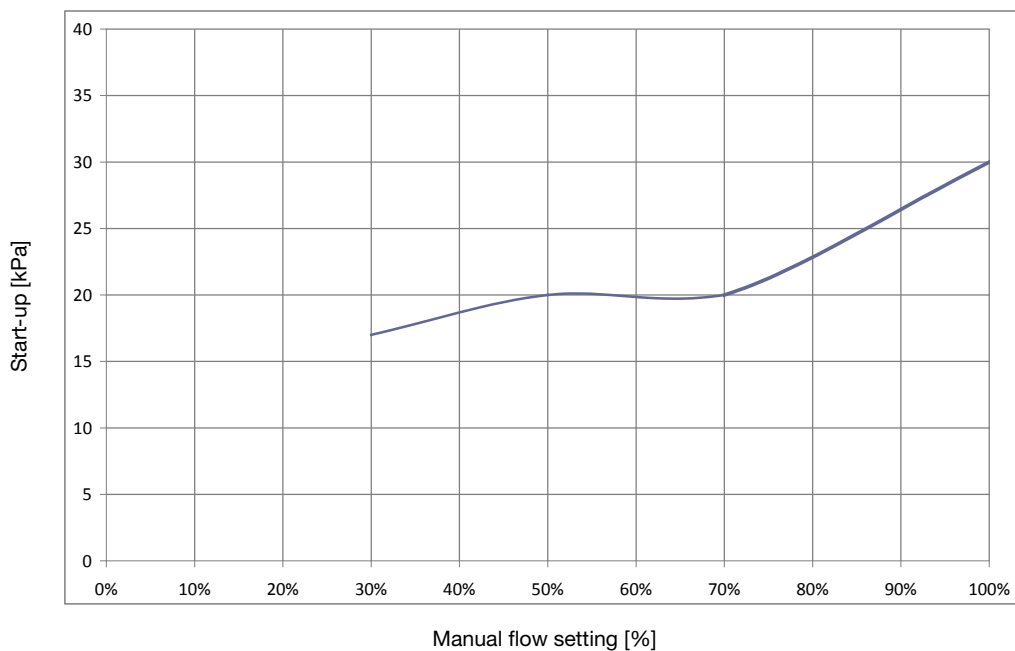


Valve model
91H 3/4" - 1500 l/h
91H1 3/4" - 1500 l/h
91H 1" - 1500 l/h
91H1 1" - 1500 l/h

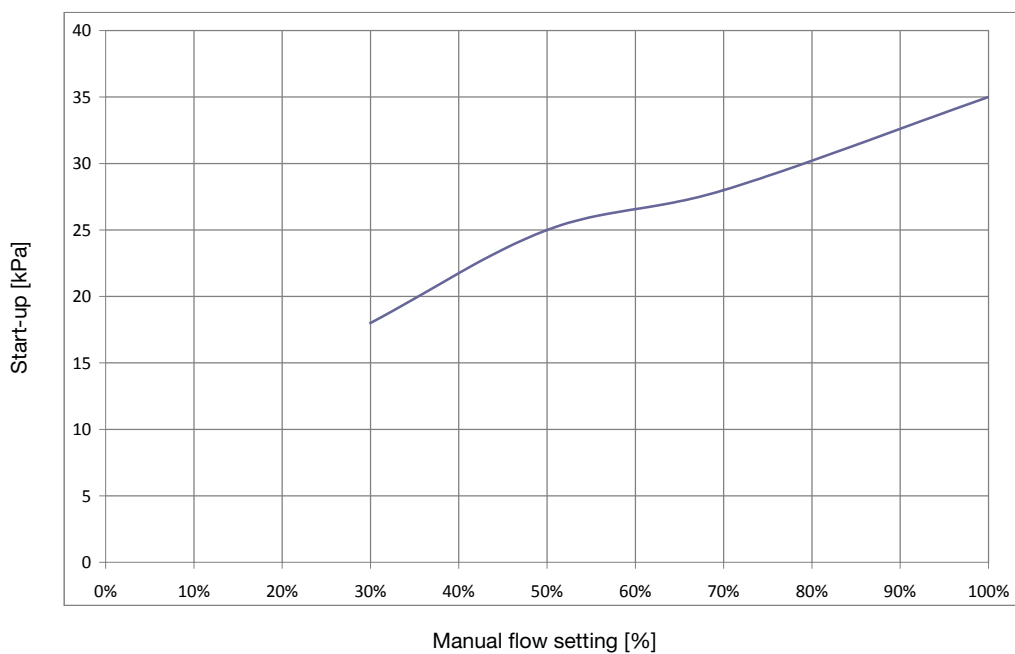




Valve model
93L 3/4" - 2200 l/h
93L 1" - 2200 l/h

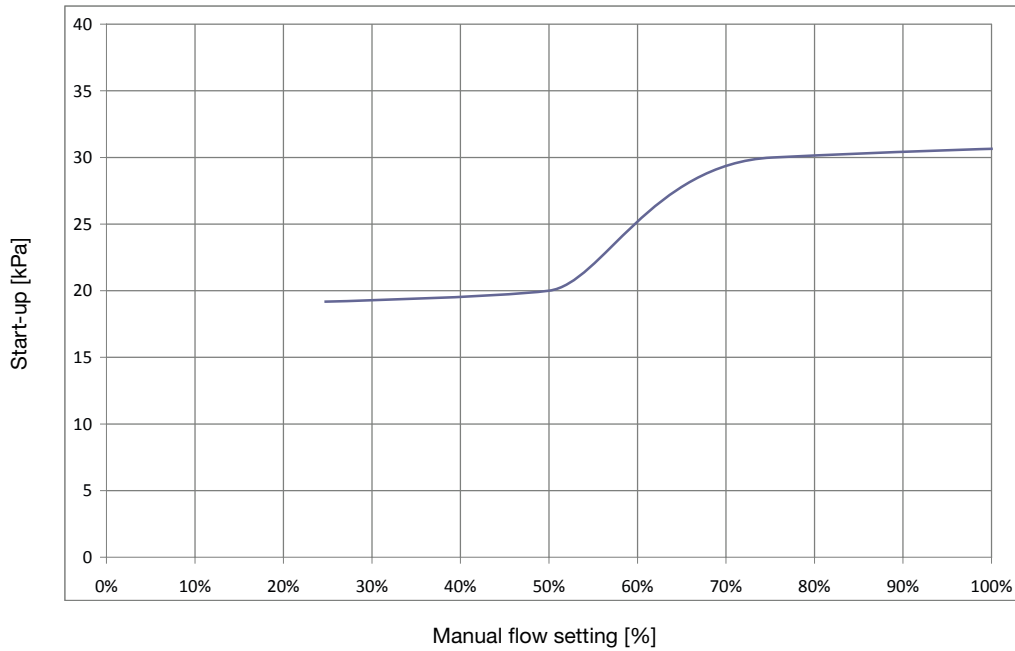


Valve model
93H 3/4" - 2700 l/h
93H 1" - 2700 l/h
93L 1 1/4" - 2700 l/h

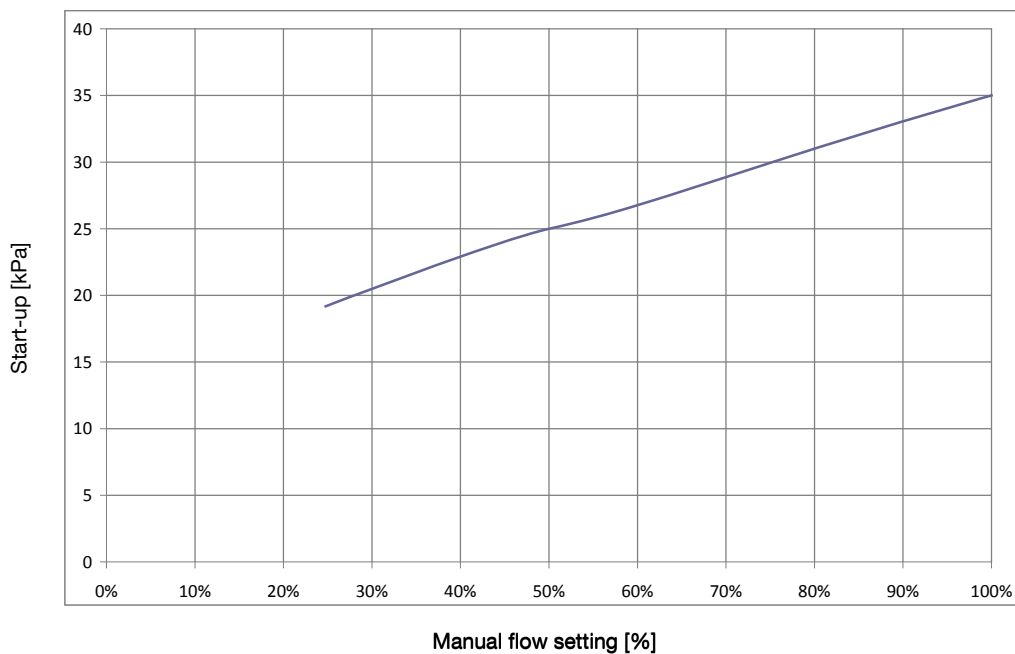


Valve model
93H 1 1/4" - 3000 l/h

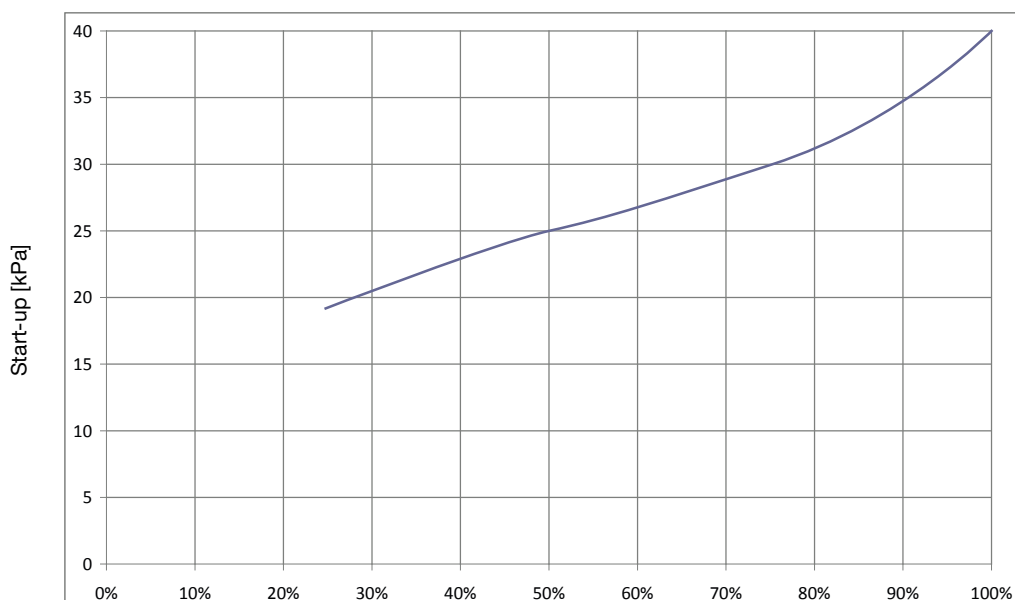




Valve model
83HJP 1 1/4" - 6000 l/h
83HPR1 1 1/4" - 6000 l/h
83LJP 1 1/2" - 6000 l/h
83LPR1 1 1/2" - 6000 l/h

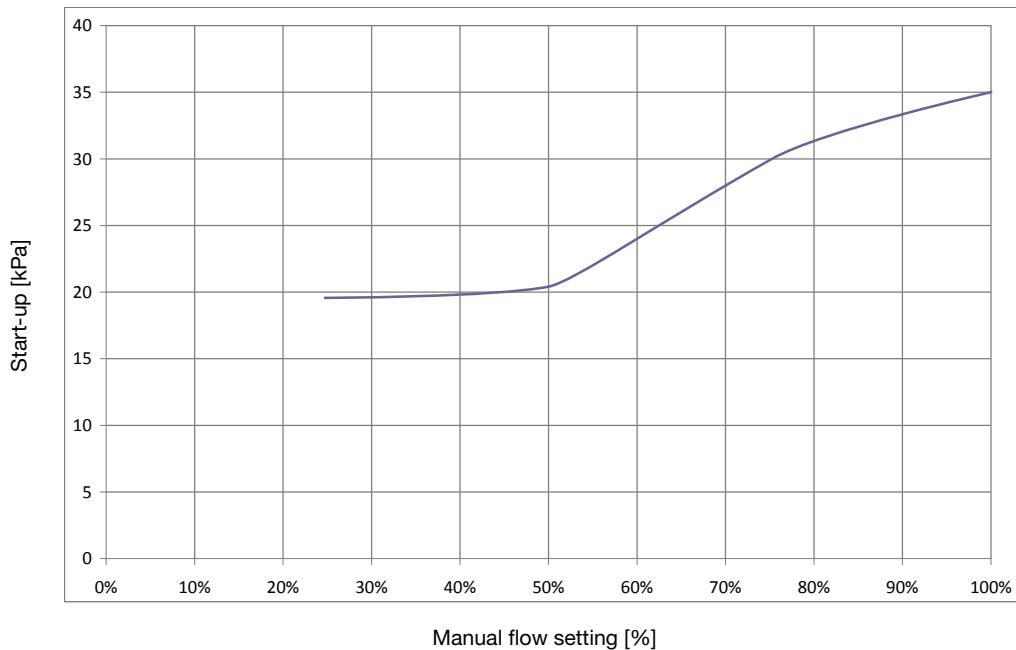


Valve model
83HJP 1 1/2" - 9000 l/h
83HPR1 1 1/2" - 9000 l/h

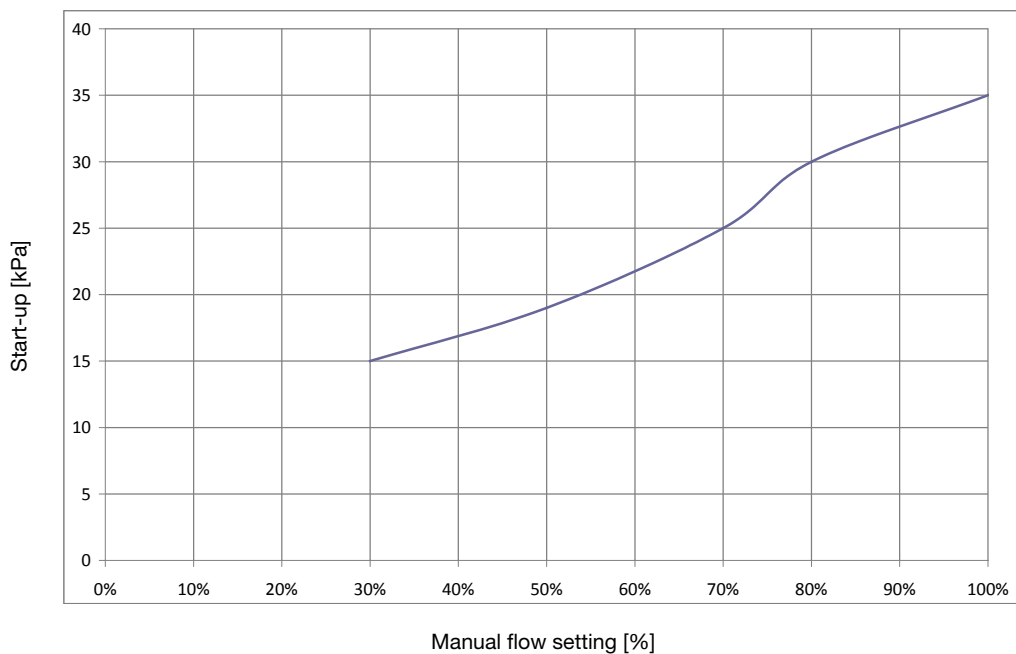


Valve model
83VLJP 2" - 11000 l/h
83VLPR1 2" - 11000 l/h

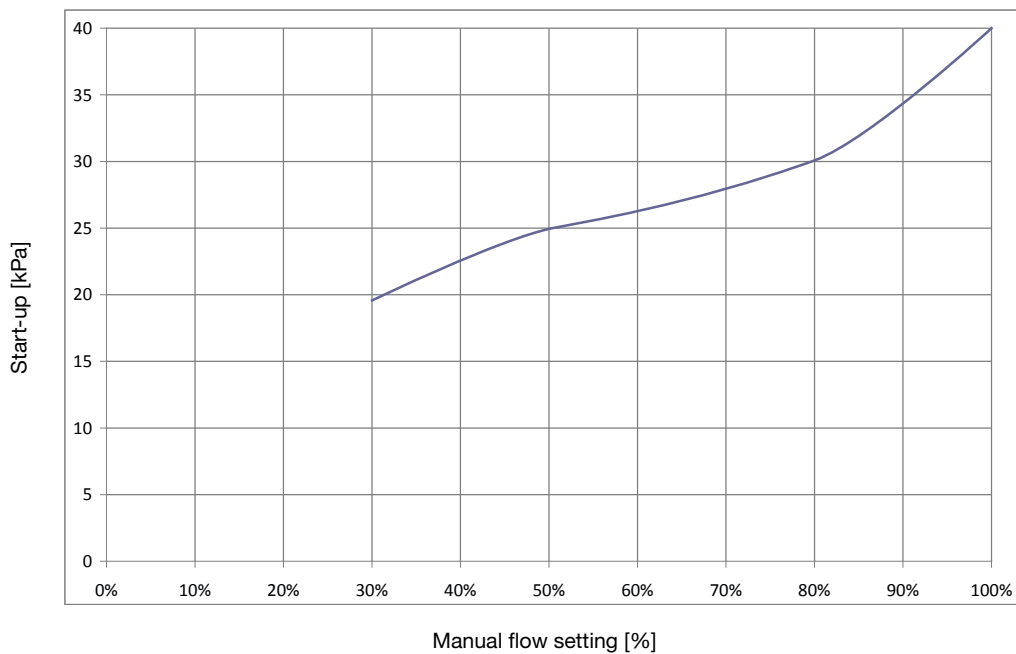




Valve model
83LJP 2" - 12000 l/h
83LPR1 2" - 12000 l/h

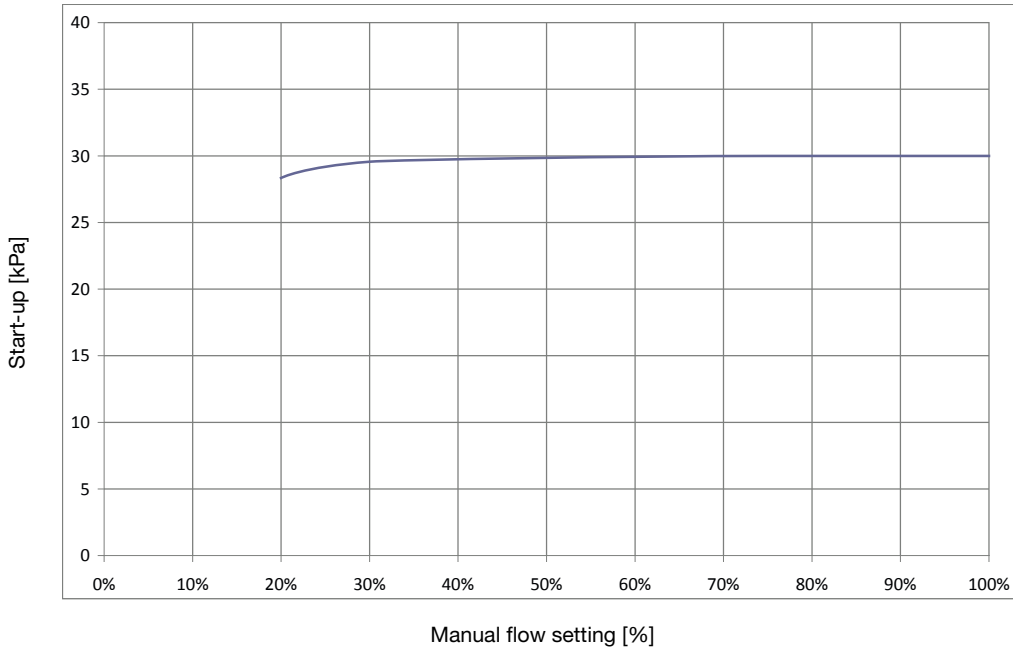


Valve model
83HJP 2" - 18000 l/h
83HPR1 2" - 18000 l/h

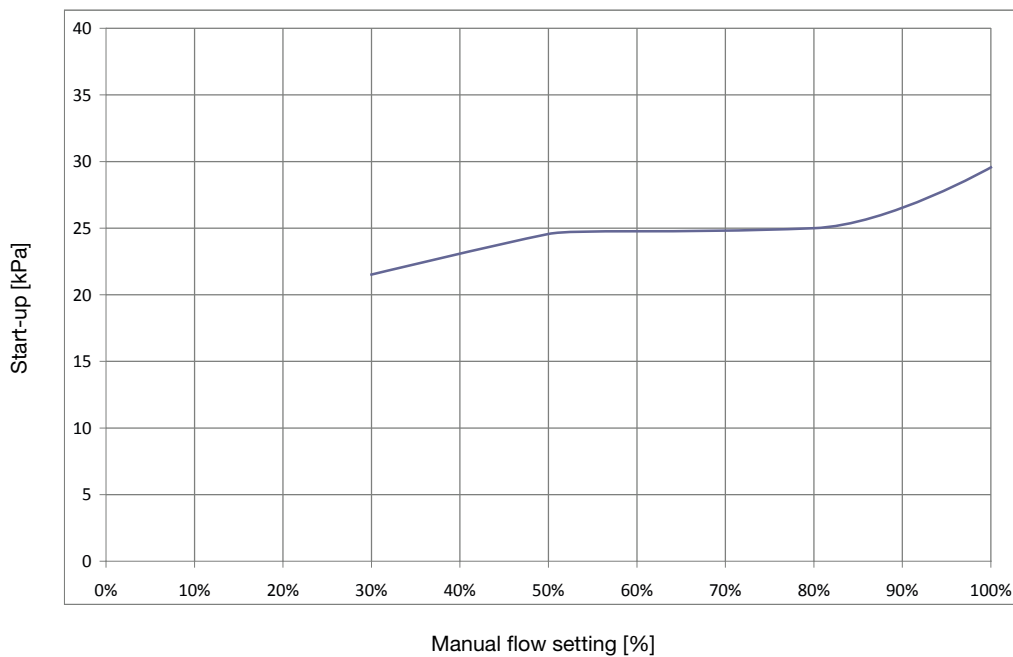


Valve model
94FH 2" - 20000 l/h
94FL 2 1/2" - 20000 l/h

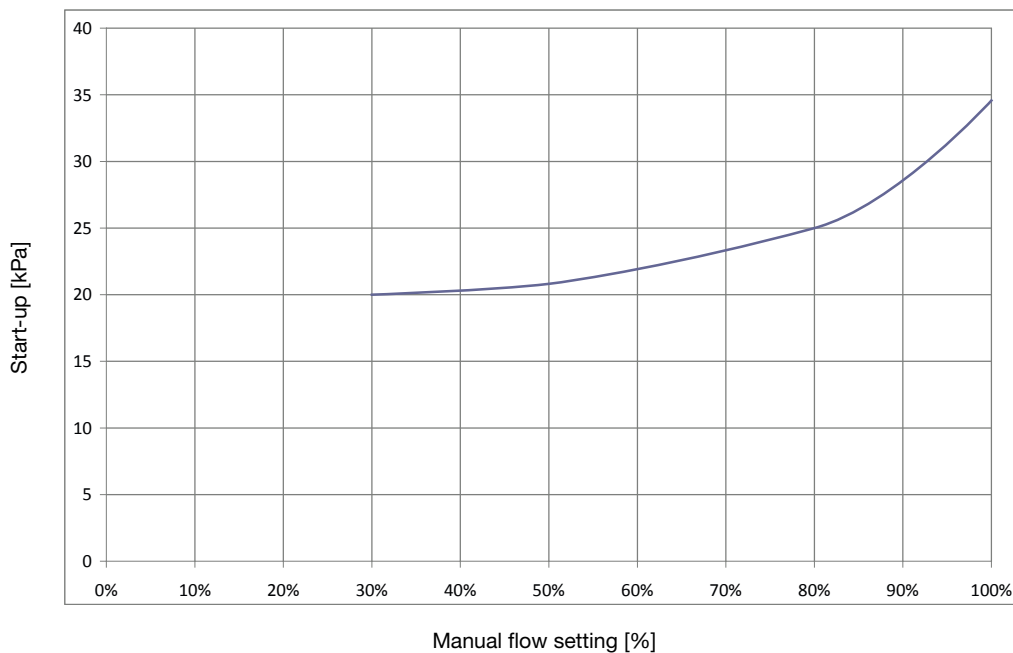




Valve model
 94FH 2 1/2" - 30000 l/h
 94FL 3" - 30000 l/h

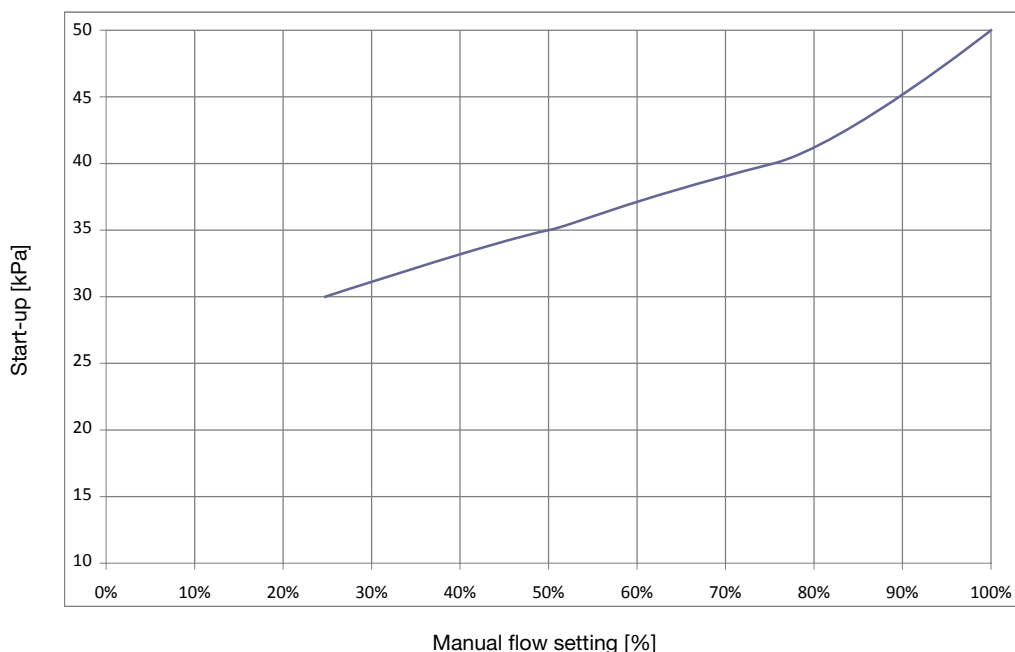
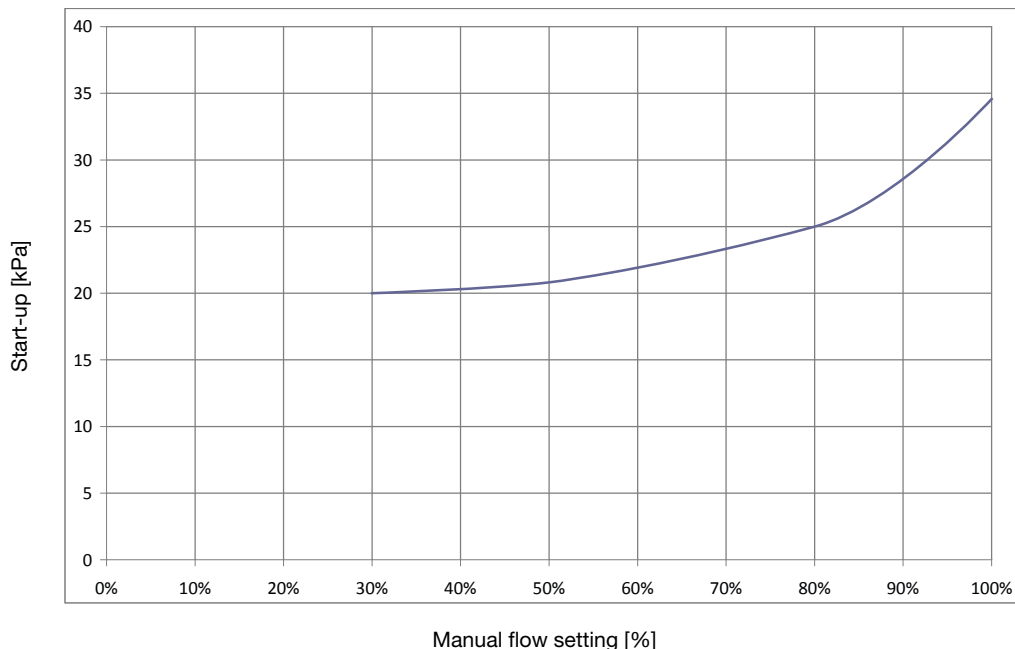


Valve model
 94FL 4" - 55000 l/h



Valve model
 94FL 5" - 90000 l/h
 94FL 6" - 90000 l/h





Flow pre-setting 91 - 91-1 EvoPICV

Presetting %	91VL-91VL1 1/2"		91L-91L1 1/2"		91H-91H1 1/2"		91L-91L1 3/4"		91H-91H1 3/4"		91H-91H1 1"	
	Flow rate		Flow rate		Flow rate		Flow rate		Flow rate		Flow rate	
	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s
100	150	0,042	600	0,167	780	0,217	1000	0,278	1500	0,417	1500	0,417
90	135	0,038	540	0,150	702	0,195	900	0,250	1350	0,375	1350	0,375
80	120	0,033	480	0,133	624	0,173	800	0,222	1200	0,333	1200	0,333
70	105	0,029	420	0,117	546	0,152	700	0,194	1050	0,292	1050	0,292
60	90	0,025	360	0,100	468	0,130	600	0,167	900	0,250	900	0,250
50	75	0,021	300	0,083	390	0,108	500	0,139	750	0,208	750	0,208
40	60	0,017	240	0,067	312	0,087	400	0,111	600	0,167	600	0,167
30	45	0,013	180	0,050	234	0,065	300	0,083	450	0,125	450	0,125
20	-	-	120	0,033	156	0,043	200	0,056	-	-	-	-
10	-	-	60	0,017	78	0,022	100	0,028	-	-	-	-



Flow pre-setting 91X - 91X/2 - 91X/3 - 91X3S EvoPICV

Presetting %	150 l/h		600 l/h		900 l/h	
	Flow rate		Flow rate		Flow rate	
	l/h	l/s	l/h	l/s	l/h	l/s
100	150	0,042	600	0,167	900	0,250
90	135	0,038	540	0,150	810	0,225
80	120	0,033	480	0,133	720	0,200
70	105	0,029	420	0,117	630	0,175
60	90	0,025	360	0,100	540	0,150
50	75	0,021	300	0,083	450	0,125
40	60	0,017	240	0,067	360	0,100
30	45	0,013	180	0,050	270	0,075
20	-	-	120	0,033	180	0,050
10	-	-	60	0,017	90	0,025

Flow pre-setting 93 EvoPICV

Presetting %	93L ¾"		93H ¾"		93L 1"		93H 1"		93L 1 1/4"		93H 1 1/4"	
	Flow rate		Flow rate		Flow rate		Flow rate		Flow rate		Flow rate	
	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s
100	2200	0,611	2700	0,750	2200	0,611	2700	0,750	2700	0,750	3000	0,833
90	1980	0,550	2430	0,675	1980	0,550	2430	0,675	2430	0,675	2700	0,750
80	1760	0,489	2160	0,600	1760	0,489	2160	0,600	2160	0,600	2400	0,667
70	1540	0,428	1890	0,525	1540	0,428	1890	0,525	1890	0,525	2100	0,583
60	1320	0,367	1620	0,450	1320	0,367	1620	0,450	1620	0,450	1800	0,500
50	1100	0,306	1350	0,375	1100	0,306	1350	0,375	1350	0,375	1500	0,417
40	880	0,244	1080	0,300	880	0,244	1080	0,300	1080	0,300	1200	0,333
30	660	0,183	810	0,225	660	0,183	810	0,225	810	0,225	900	0,250
20	440	0,122	540	0,150	440	0,122	540	0,150	540	0,150	600	0,167
10	220	0,061	270	0,075	220	0,061	270	0,075	270	0,075	300	0,083

Flow pre-setting 83 EvoPICV

Presetting %	83HJP 1 1/4"		83LJP 1 1/2"		83HJP 1 1/2"		83VLJP 2"		83LJP 2"		83HJP 2"	
	83HPR1 1 1/4"		83LPR1 1 1/2"		83HPR1 1 1/2"		83VLPR1 2"		83LPR1 2"		83HPR1 2"	
	Flow rate		Flow rate		Flow rate		Flow rate		Flow rate		Flow rate	
	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s
100	6000	1,667	6000	1,667	9000	2,500	11000	3,056	12000	3,333	18000	5,000
90	5400	1,500	5400	1,500	8100	2,250	9900	2,750	10800	3,000	16200	4,500
80	4800	1,333	4800	1,333	7200	2,000	8800	2,444	9600	2,667	14400	4,000
70	4200	1,167	4200	1,167	6300	1,750	7700	2,139	8400	2,333	12600	3,500
60	3600	1,000	3600	1,000	5400	1,500	6600	1,833	7200	2,000	10800	3,000
50	3000	0,833	3000	0,833	4500	1,250	5500	1,528	6000	1,667	9000	2,500
40	2400	0,667	2400	0,667	3600	1,000	4400	1,222	4800	1,333	7200	2,000
30	1800	0,500	1800	0,500	2700	0,750	3300	0,917	3600	1,000	5400	1,500
20	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-

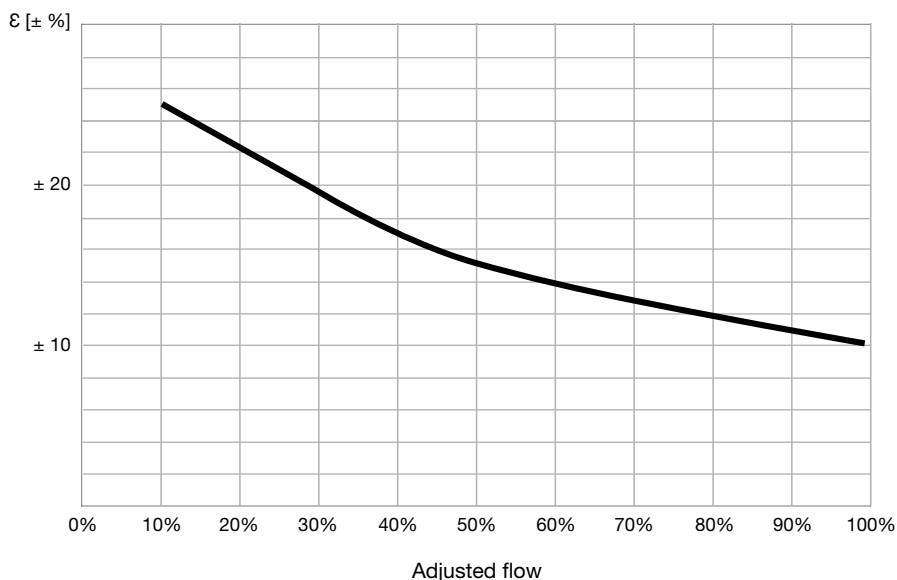
Flow pre-setting 94F EvoPICV

Presetting %	94FH 2"		94FL 2 1/2"		94FH 2 1/2"		94FL 3"		94FL 4"		94FL 5"	
	Flow rate		Flow rate		Flow rate		Flow rate		Flow rate		Flow rate	
	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s
100	20000	5,556	20000	5,556	30000	8,333	30000	8,333	55000	15,278	90000	25,000
90	18000	5,000	18000	5,000	27000	7,500	27000	7,500	49500	13,750	81000	22,500
80	16000	4,444	16000	4,444	24000	6,667	24000	6,667	44000	12,222	72000	20,000
70	14000	3,889	14000	3,889	21000	5,833	21000	5,833	38500	10,694	63000	17,500
60	12000	3,333	12000	3,333	18000	5,000	18000	5,000	33000	9,167	54000	15,000
50	10000	2,778	10000	2,778	15000	4,167	15000	4,167	27500	7,639	45000	12,500
40	8000	2,222	8000	2,222	12000	3,333	12000	3,333	22000	6,111	36000	10,000
30	6000	1,667	6000	1,667	9000	2,500	9000	2,500	16500	4,583	27000	7,500
20	4000	1,111	4000	1,111	6000	1,667	6000	1,667	11000	3,056	18000	5,000
10	2000	0,556	2000	0,556	3000	0,833	3000	0,833	5500	1,528	9000	2,500

Presetting %	94FH 5"		94FL 6"		94FH 6"	
	Flow rate		Flow rate		Flow rate	
	l/h	l/s	l/h	l/s	l/h	l/s
100	120000	33,333	90000	25,000	150000	41,667
90	108000	30,000	81000	22,500	135000	37,500
80	96000	26,667	72000	20,000	120000	33,333
70	84000	23,333	63000	17,500	105000	29,167
60	72000	20,000	54000	15,000	90000	25,000
50	60000	16,667	45000	12,500	75000	20,833
40	48000	13,333	36000	10,000	60000	16,667
30	36000	10,000	27000	7,500	45000	12,500
20	24000	6,667	18000	5,000	30000	8,333
10	12000	3,333	9000	2,500	15000	4,167

Flow setting accuracy

Max flow deviation at different settings



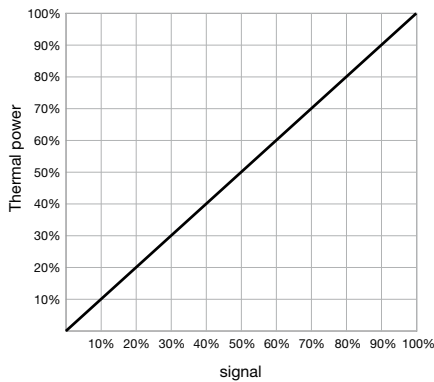
Flow control and characteristic curves

The type of characteristic of the control valve (ON/OFF, linear, equipercantage) should be chosen according to the heat exchanger and to the type of control to be performed on the system. For ON/OFF control, a valve with ON/OFF curve will be sufficient, while a modulating control requires a linear or equal percentage characteristic.

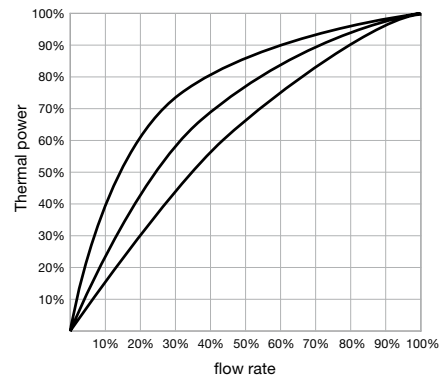
The following graphs show the optimal characteristic curve for the remote control of a heating / cooling system (A), the

typical curve of the heat exchangers normally used in thermo-hydraulic systems (B), the typical curves of the control valves of these systems (C) and, finally, the resulting curves (D), obtained joining the curve (B) with the different valve curves. As showed, the curve (D3), obtained combining an equal percentage valve with a heat exchanger, corresponds to the optimal control curve (A).

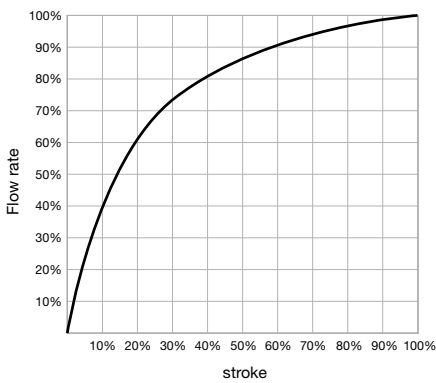
(A) Optimal control characteristic of any heating / cooling system



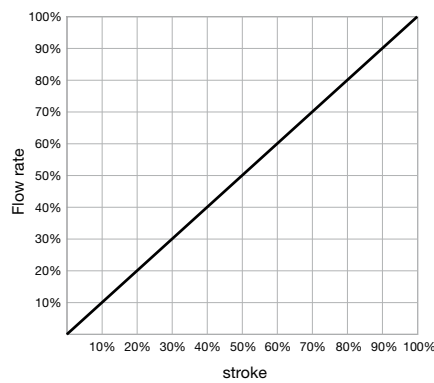
(B) Typical characteristic curve of a generic heat exchanger (thermal output / flow rate)



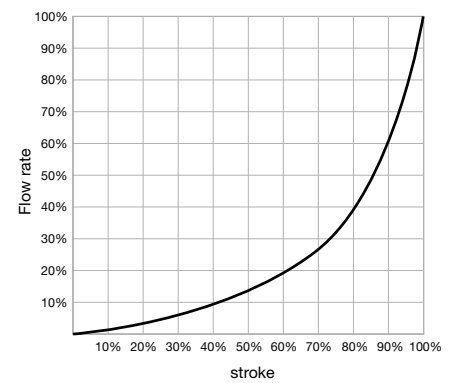
(C1) ON/OFF valve characteristic curve



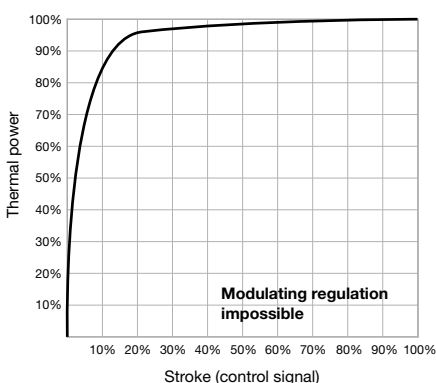
(C2) Linear valve characteristic curve



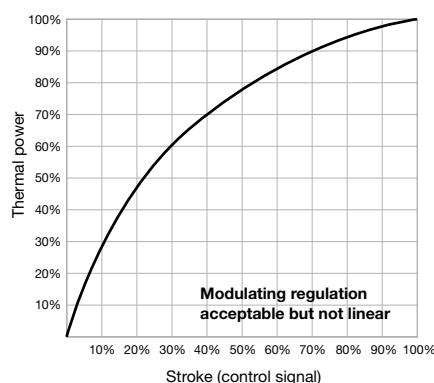
(C3) Equal percentage EvoPICV control valve characteristic curve



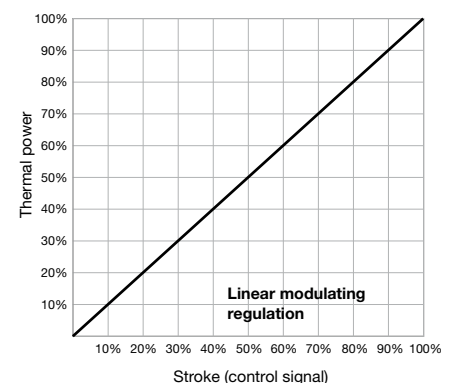
(D1) ON/OFF valve + heat exchanger system resulting graph



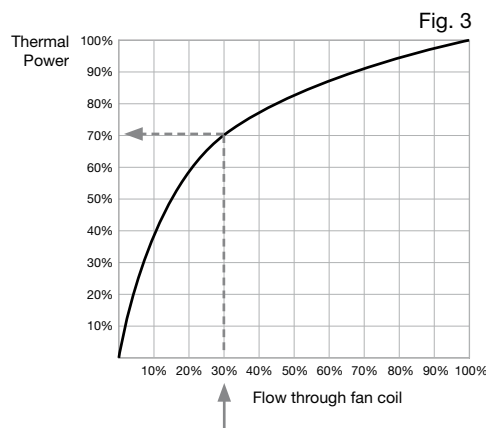
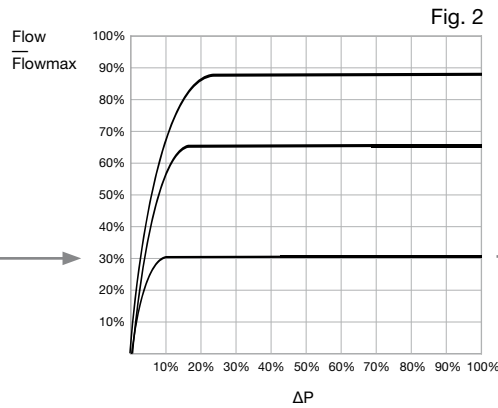
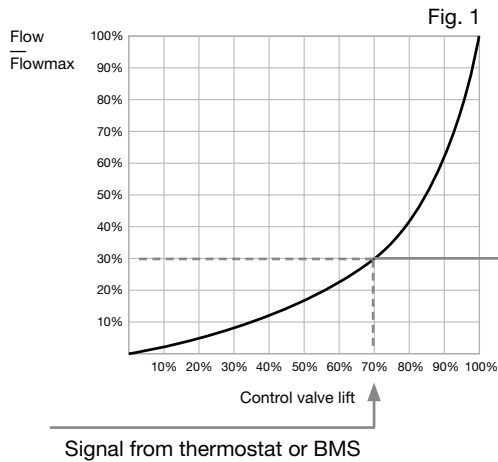
(D2) Linear valve + heat exchanger system resulting graph



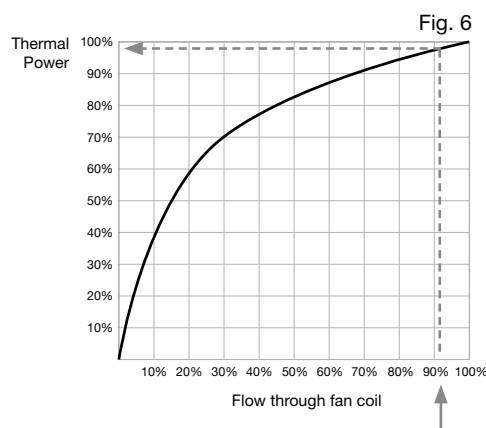
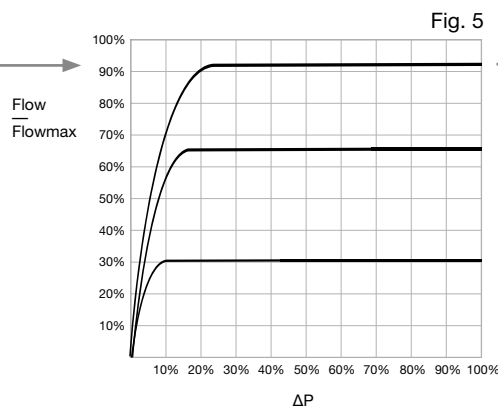
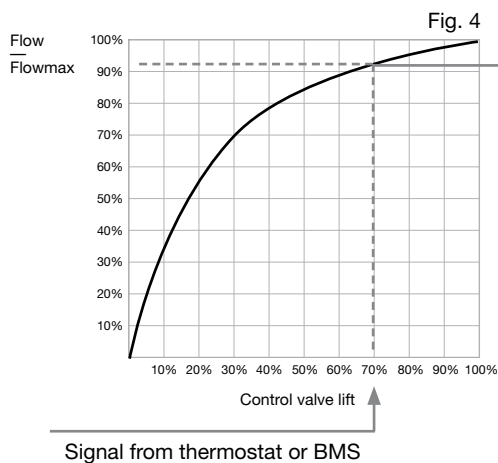
(D3) Equal percentage EvoPICV valve + heat exchanger system resulting graph



As an example, a control valve with equal percentage characteristic can be considered in figure 1. Should a reduction down to 70% of thermal power be required, control signal will simply drive the valve actuator to 70% of its stroke, thus reducing the valve flow rate down to 30%, see figure 2.



If a control signal of 70% resulted in a reduced flow of 30%, then the fan coil shown on figure 3 will still deliver 70% of maximum thermal power, which correspond to desired reduced output.

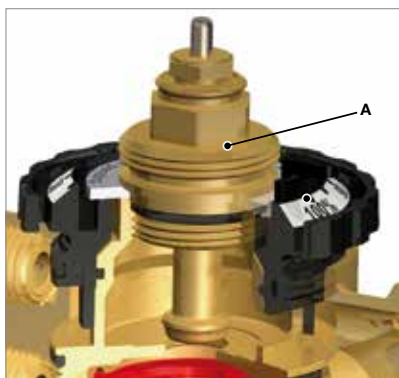


On the other hand, if we consider to use an ON/OFF valve, as shown in figure 4, when driving the actuator down to 70%, valve flow will be reduced down to 92%, as shown in figure 5; If the same fan coil is used, resulting thermal power can be immediately calculated, as shown in figure 6 and it equals to 98%, which correspond to almost no reduction of thermal power.

If a reduction down to 70% of thermal power must be achieved, then ON/OFF control valve of the example, should be driven down to less than 10% of its travelling.



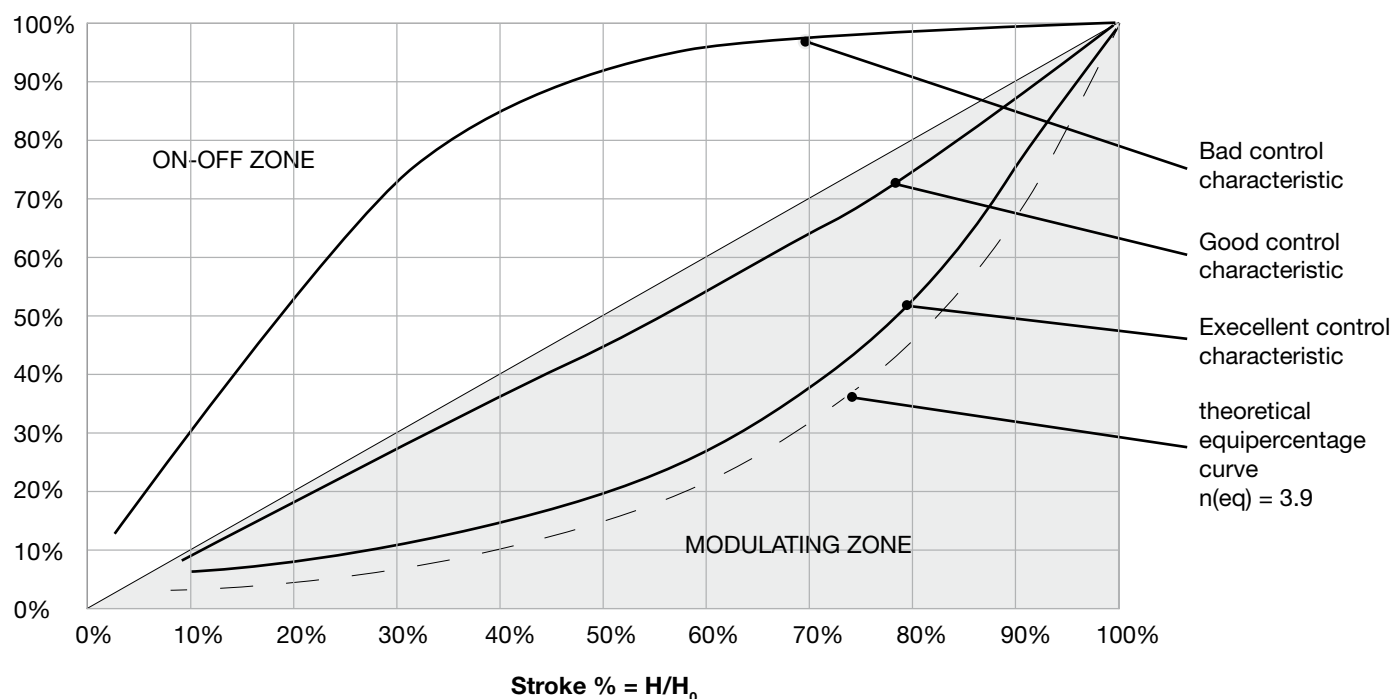
Control characteristic curve



Operating on the position of the regulating valve control stem A will modify the valve K_v , hence the flow rate. The relation between K_v and stroke is shown in the graph below.

Typical control valve characteristic curves

$$K_v \% = K_v / K_{vmax}$$



Combining the **EvoPICV** valve characteristic with heat exchanger results in a linear control system.

* Control curve characteristic may change according to valve version.

H = current lift of the control valve; H varies from 0 to H_0

H_0 = maximum lift of the control valve;

K_v = valve flow factor at lift = H

K_{vmax} = valve flow factor at lift = H_0

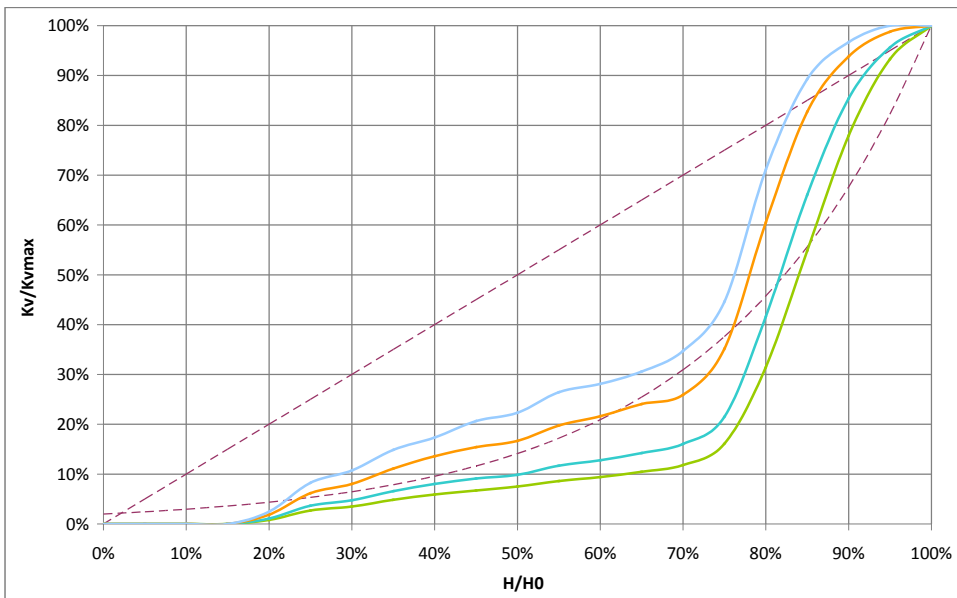
In the next pages, control curves for each valve model are shown.

All valves control characteristic have been tested and plotted according to VDI/VDE 2173 guidelines; valves were driven by following actuators:

- VA7482 0-10V actuator - Eq mode ON

- SM16CC 0-10V actuator

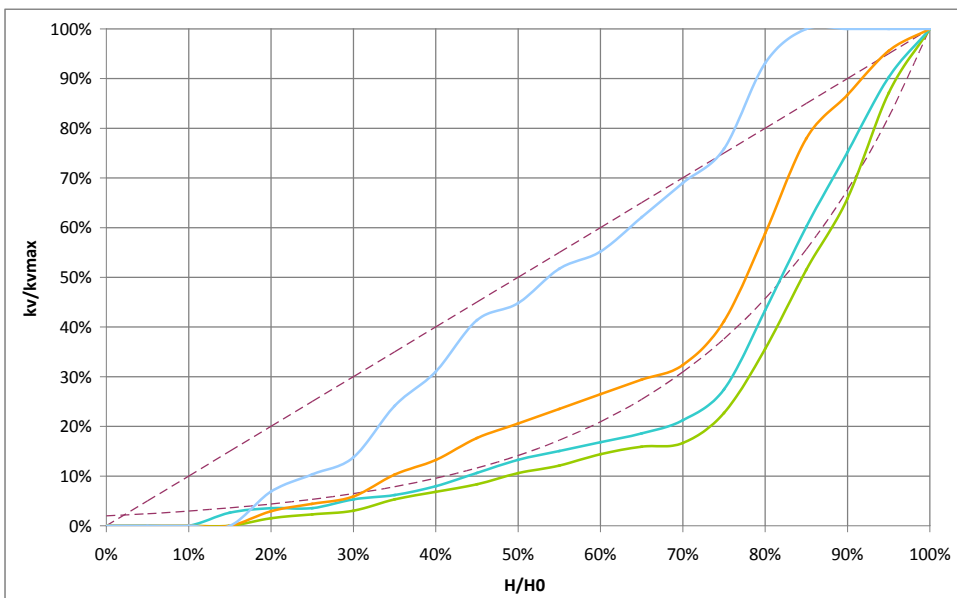
- A94F 0-10V actuator - Eq mode ON



Valve model
 91VL 1/2" - 150 l/h
 91VL1 1/2" - 150 l/h

Presetting positions

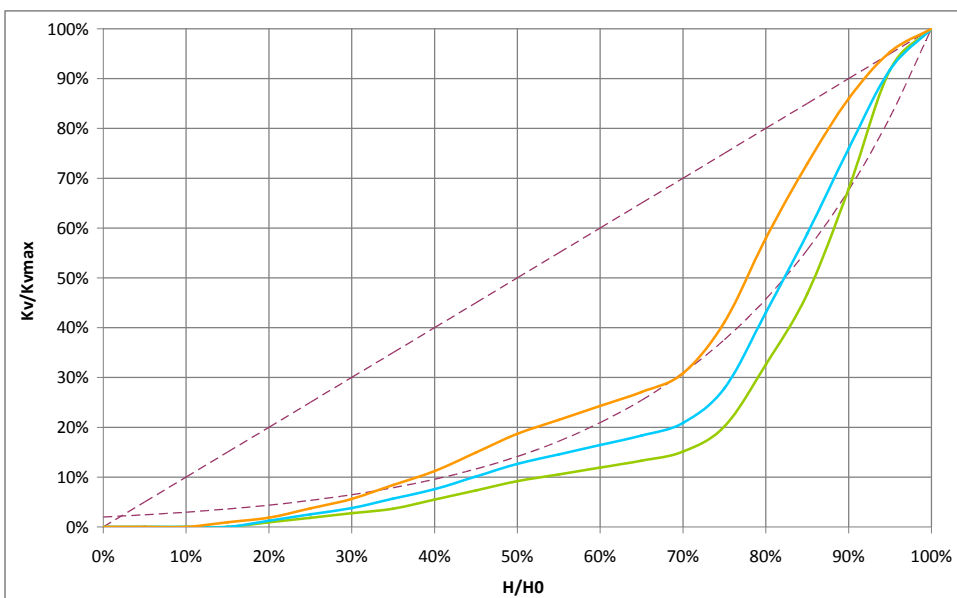
- 100% Open
- 75% Open
- 50% Open
- 25% Open



Valve model
 91L 1/2" - 600 l/h
 91L1 1/2" - 600 l/h

Presetting positions

- 100% Open
- 75% Open
- 50% Open
- 25% Open

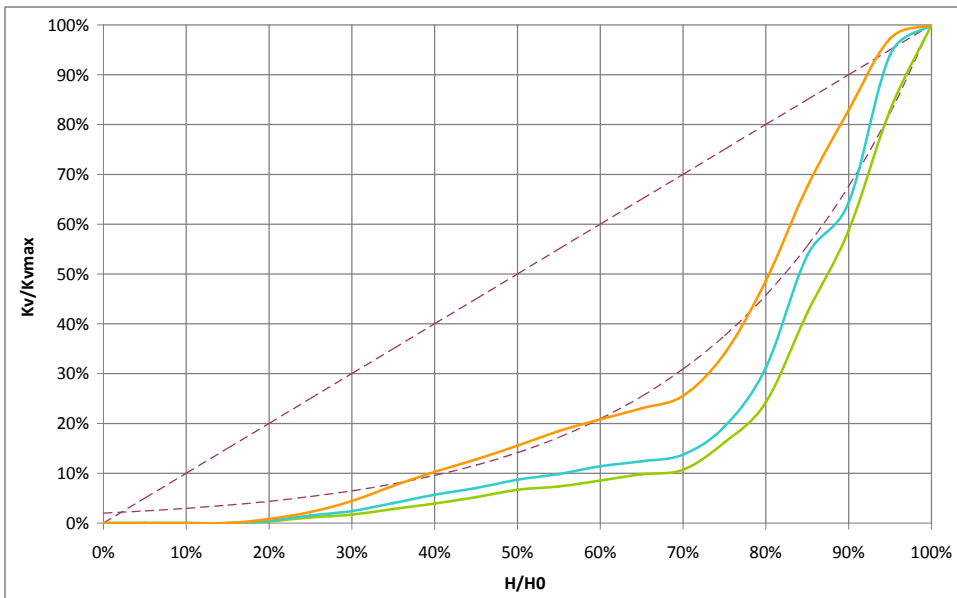


Valve model
 91H 1/2" - 780 l/h
 91H1 1/2" - 780 l/h

Presetting positions

- 100% Open
- 75% Open
- 50% Open

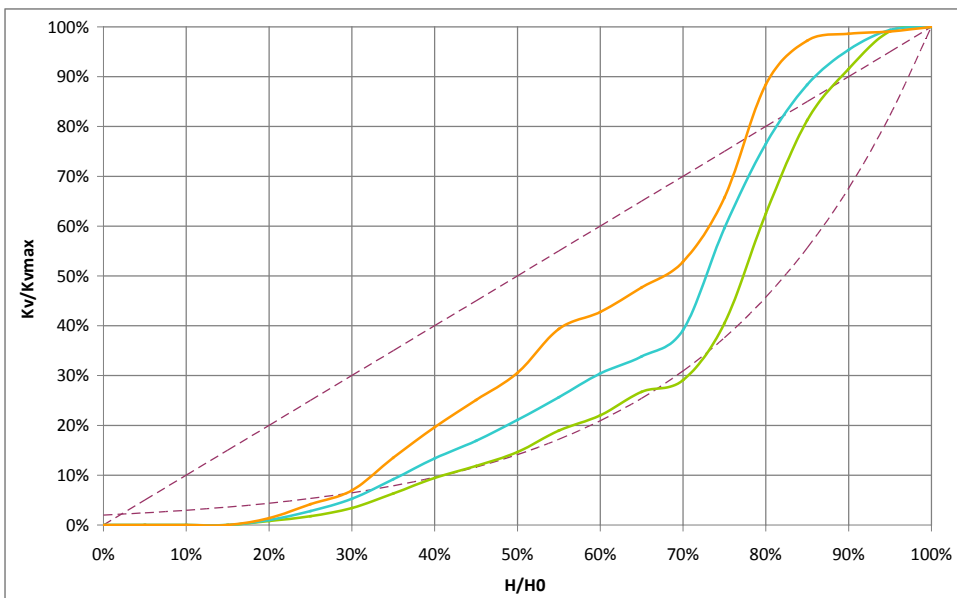




Valve model
 91L 3/4" - 1000 l/h
 91L1 3/4" - 1000 l/h

Presetting positions

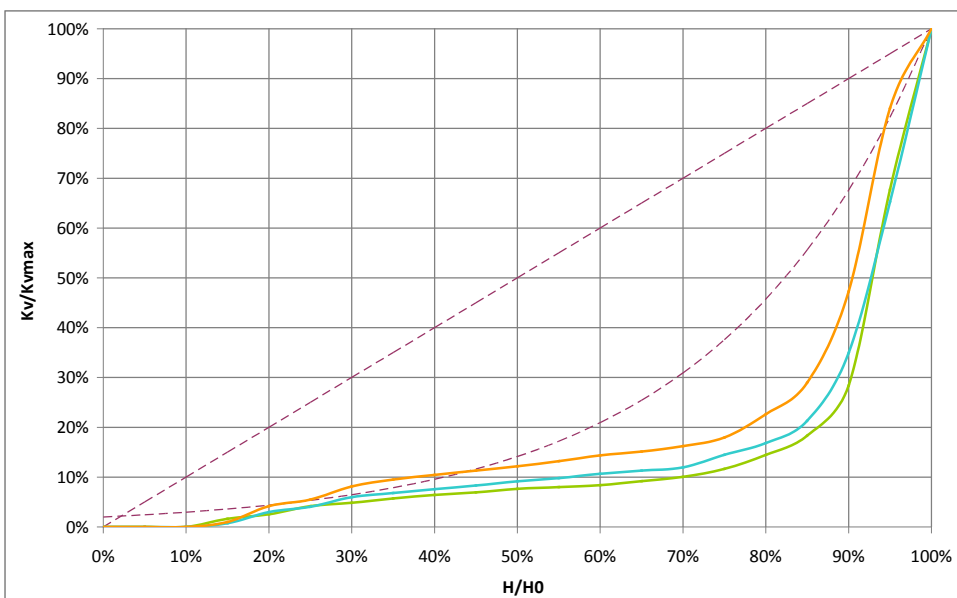
- 100% Open
- 75% Open
- 50% Open



Valve model
 91H 3/4" - 1500 l/h
 91H1 3/4" - 1500 l/h
 91H 1" - 1500 l/h
 91H1 1" - 1500 l/h

Presetting positions

- 100% Open
- 75% Open
- 50% Open

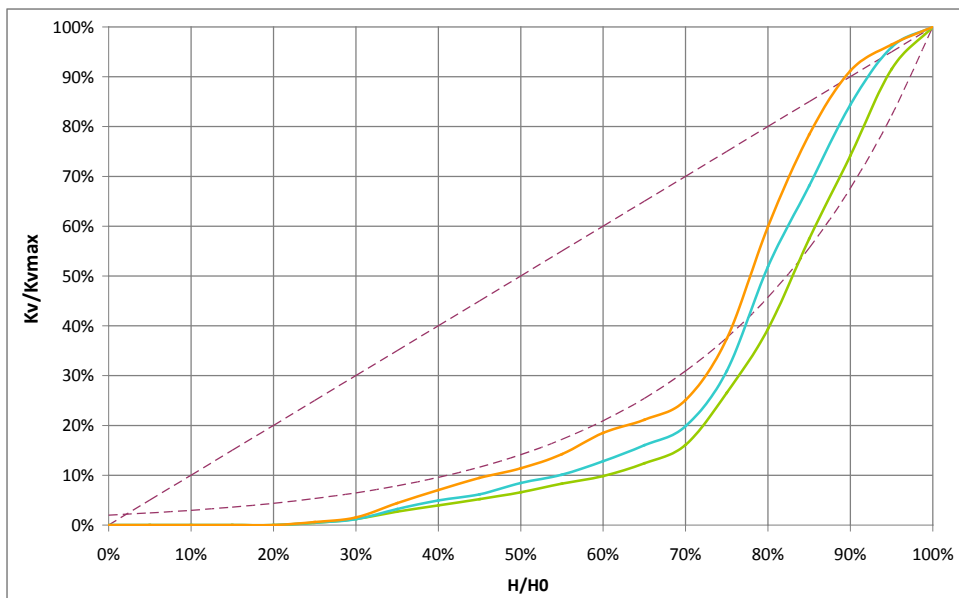


Valve model
 93L 3/4" - 2200 l/h
 93L 1" - 2200 l/h

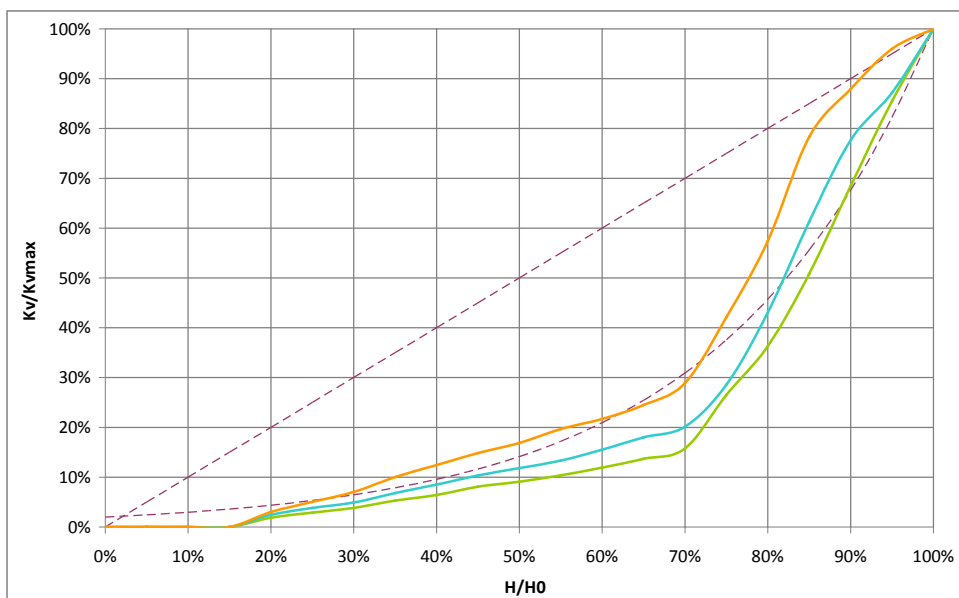
Presetting positions

- 100% Open
- 75% Open
- 50% Open

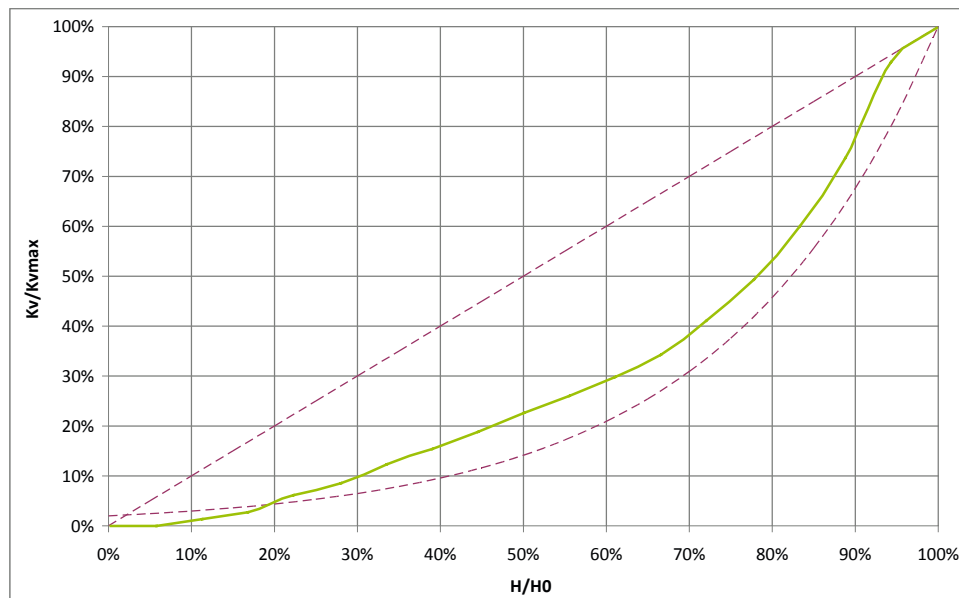




Valve model	
93H 3/4" - 2700 l/h	
93H 1" - 2700 l/h	
93L 1 1/4" - 2700 l/h	
Presetting positions	
— 100% Open	
— 75% Open	
— 50% Open	

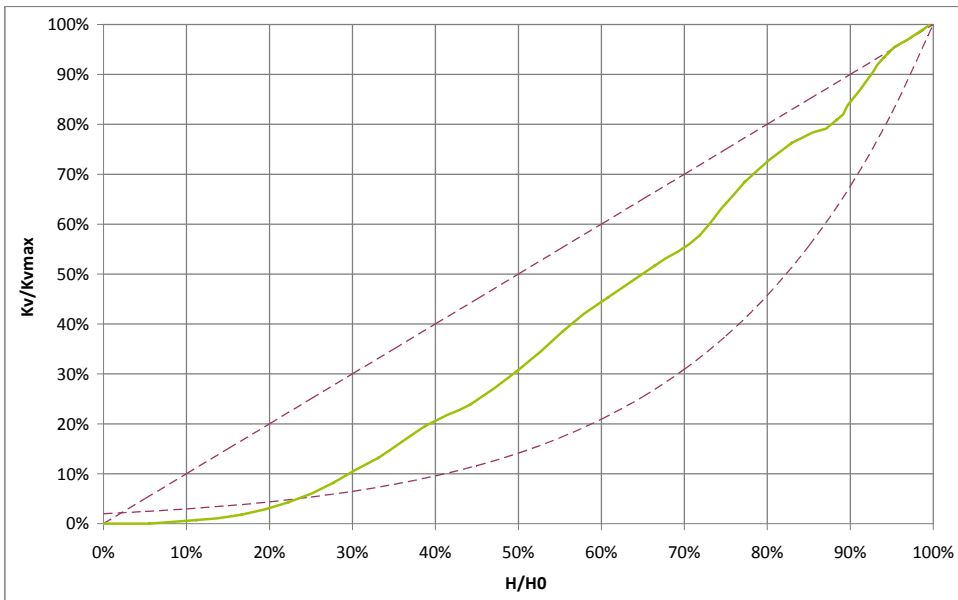


Valve model	
93H 1 1/4" - 3000 l/h	
Presetting positions	
— 100% Open	
— 75% Open	
— 50% Open	

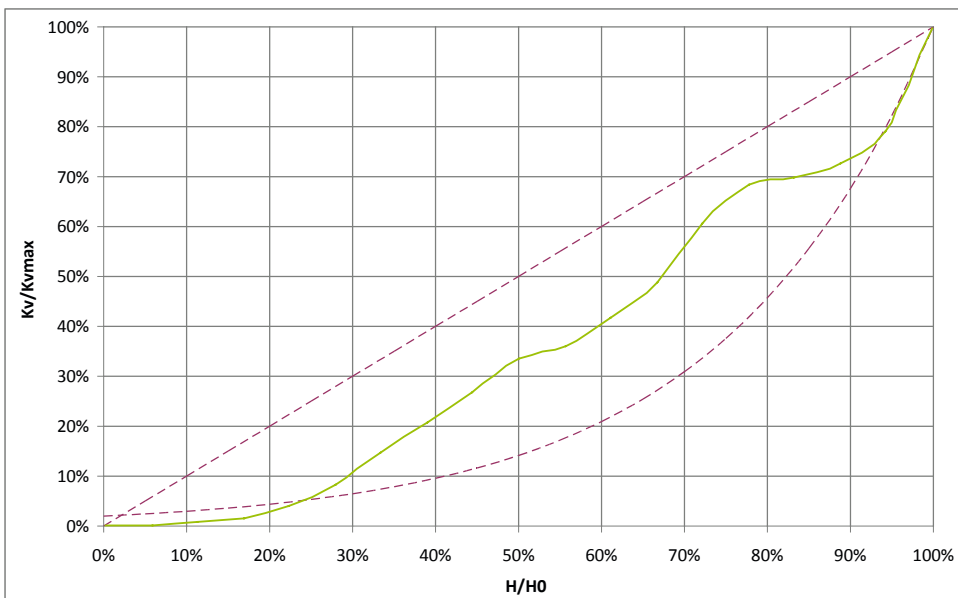


Valve model	
83HJP 1 1/4" - 6000 l/h	
83LJP 1 1/2" - 6000 l/h	
Presetting positions	
— 100% Open	

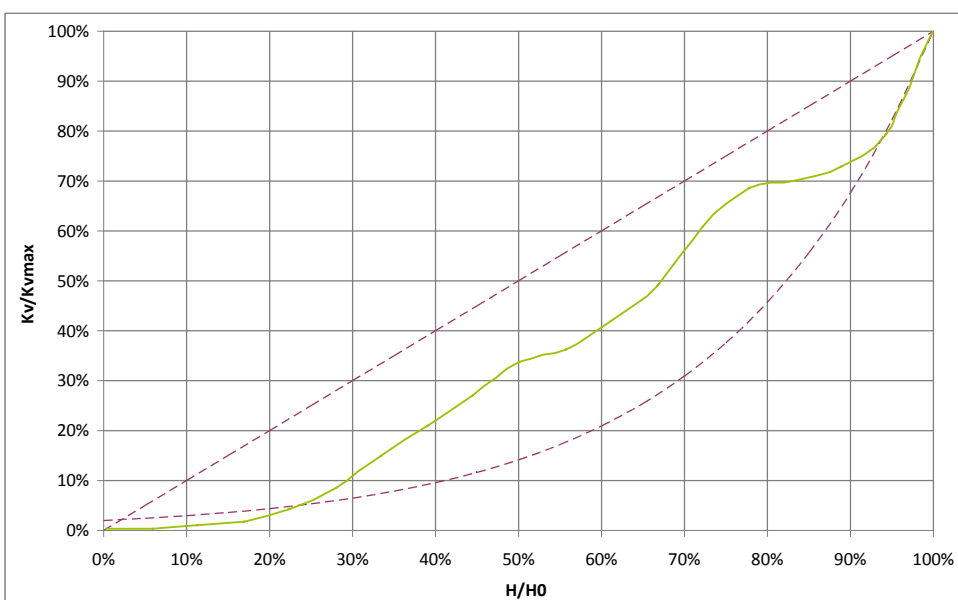




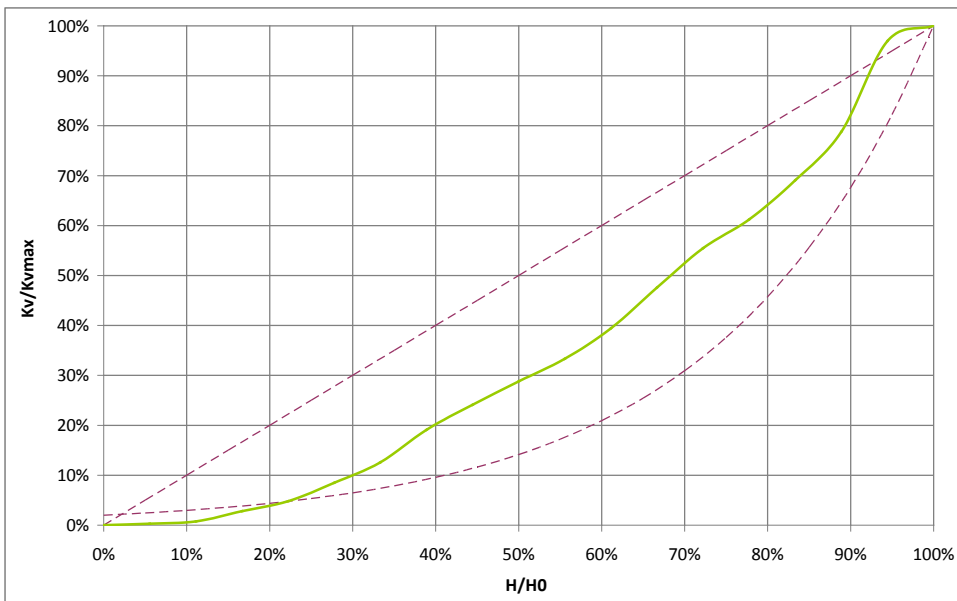
Valve model
83HJP 1 1/2" - 9000 l/h
83HPR1 1 1/2" - 9000 l/h
Presetting positions
— 100% Open



Valve model
83VLJP 2" - 11000 l/h
83VLPR1 2" - 11000 l/h
Presetting positions
— 100% Open

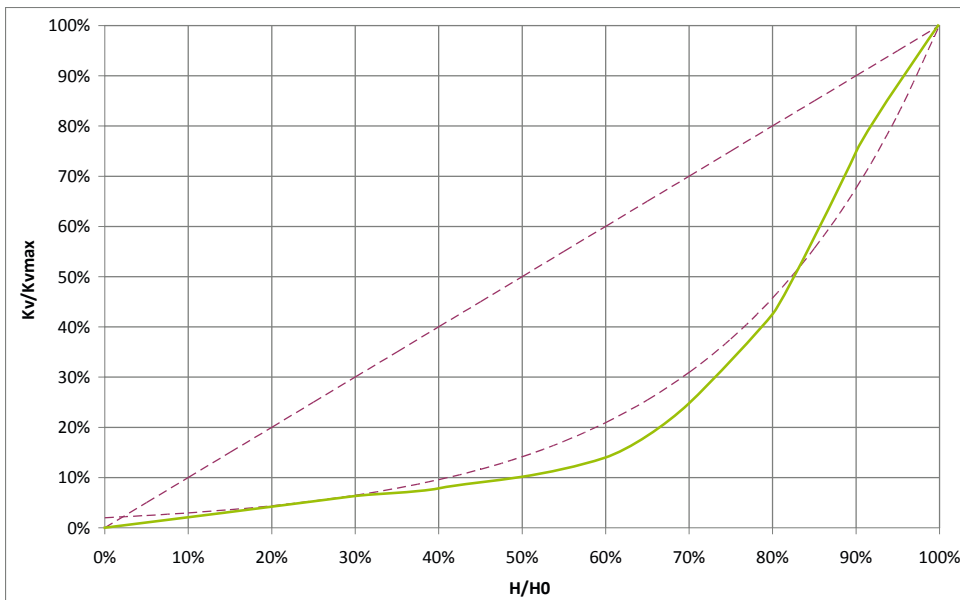


Valve model
83LJP 2" - 12000 l/h
83LPR1 2" - 12000 l/h
Presetting positions
— 100% Open



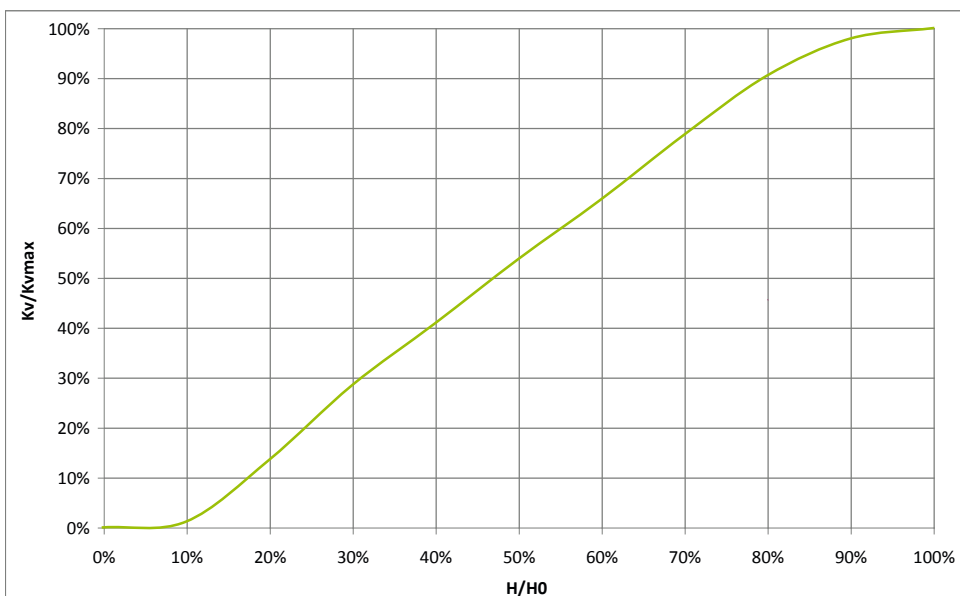
Valve model	
83HJP 2" - 18000 l/h	
83HPR1 2" - 18000 l/h	
Presetting positions	
—	100% Open

Equal percentage mode



Valve model	
94FH 2" - 20000 l/h	
94FL 2 1/2" - 20000 l/h	
94FH 2 1/2" - 30000 l/h	
94FL 3" - 30000 l/h	
94FL 4" - 55000 l/h	
94FL 5" - 90000 l/h	
94FH 5" - 120000 l/h	
94FL 6" - 90000 l/h	
94FH 6" - 150000 l/h	
Presetting positions	
	Any

Linear mode



Installation and maintenance

Before filling the terminal unit system with water, make sure main pipeline has been flushed and most of 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, Pettinaroli does not accept any liability for improper or wrong use of this product.

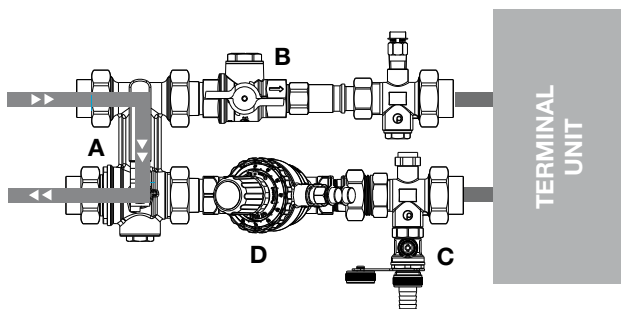
Always protect the pressure regulator by using strainers upstream of the valve and, in any case, make sure water quality complies with UNI 8065 standards ($Fe < 0.5 \text{ mg/kg}$ and $Cu < 0.1 \text{ mg/Kg}$).

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

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

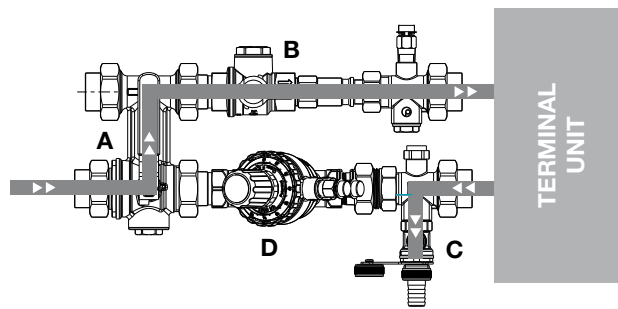
Here is an example, explaining the safest installation arrangement and filling/flushing methods:

Flushing of maine pipe line



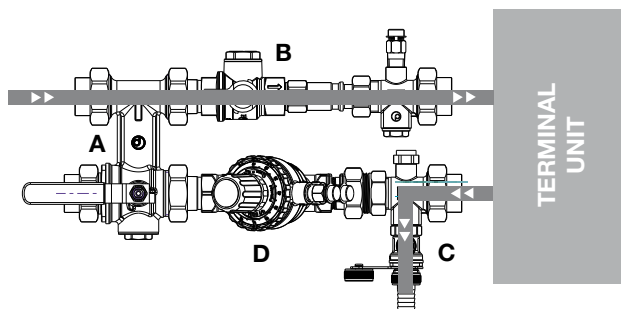
A: Bypass mode B: Closed C: Closed D: Open

Reverse back flushing



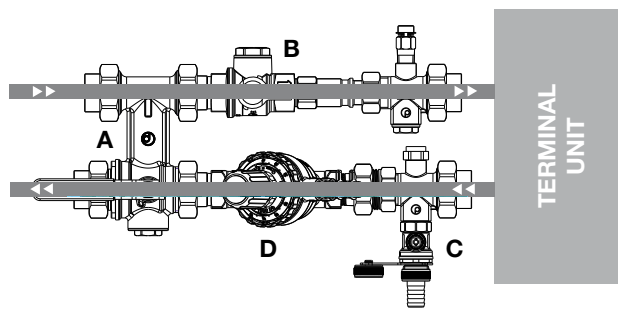
A: Bypass mode B: Open C: Open D: Closed

Direct back flushing



A: Normal mode B: Open C: Open D: Closed

Ready for commissioning



A: Normal mode B: Open C: Closed D: Open

Installation and maintenance - 91 / 91X / 91-1 EvoPICV

1. Use conditions

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.

Minimum differential pressure above which the valve begins to exercise its regulating effect:

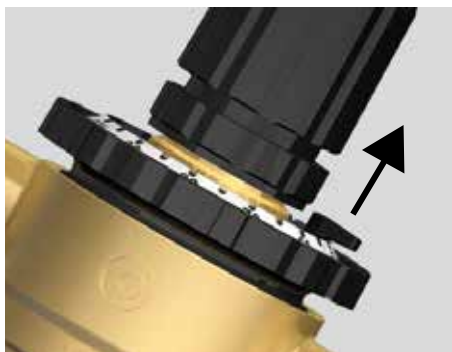
	91VL 1/2"	91L 1/2"	91H 1/2"	91L 3/4"	91H 3/4"	91H 1"
Start-up ΔP	20 kPa 0,20 bar	25 kPa 0,25 bar	35 kPa 0,35 bar	30 kPa 0,30 bar	35 kPa 0,35 bar	35 kPa 0,35 bar

Rounded values. At 100% preset. See also pages 9-10

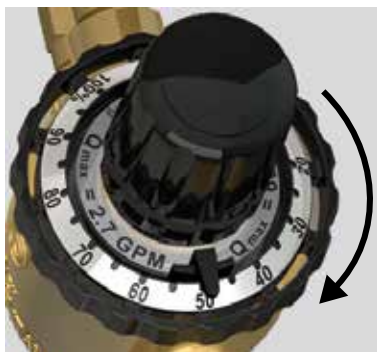


2. Flow preset

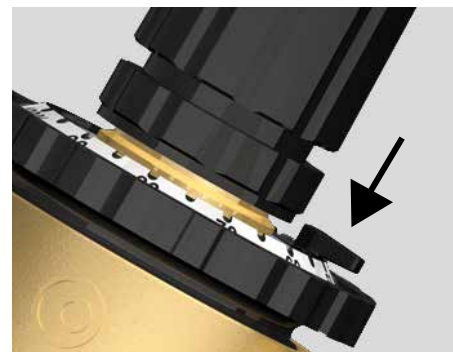
To set the selected flow, follow these steps:



Lift the lock pin to unlock the selector



Turn the selector to the target position



Press the lock pin to lock the selector in the final position

3. Operating control

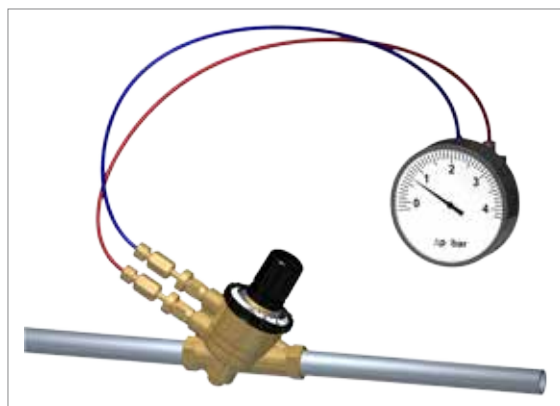
It is necessary to be sure that the valve is actually working in the operating range. In order to verify it, just measure the differential pressure across the valve, as shown in the picture.

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

This paragraph does not apply to 91X series.

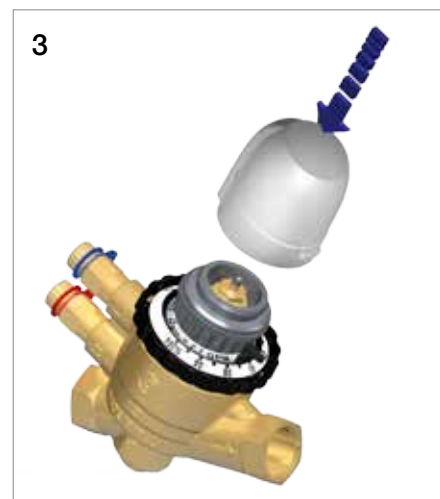
4. Maintenance and cleaning

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.



5. Actuator assembly

The valve can be equipped with a series of thermal-electric or electro-mechanical actuators, according to the requirements of the system. Actuators come along with an adaptor for proper mounting on the valve and for proper functioning of the whole device.



Installation and maintenance - 93 EvoPICV

1. Use conditions

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.

Minimum differential pressure above which the valve begins to exercise its regulating effect:

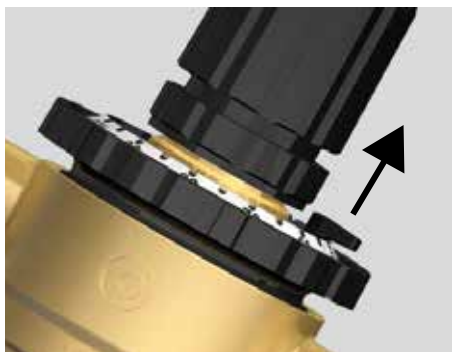
	93L 3/4"	93H 3/4"	93L 1"	93H 1"	93L 1 1/4"	93H 1 1/4"
Start-up ΔP	25 kPa 0,25 bar	30 kPa 0,30 bar	25 kPa 0,25 bar	30 kPa 0,30 bar	30 kPa 0,30 bar	35 kPa 0,35 bar

Rounded values. At 100% preset. See also pages 10-11



2. Flow preset

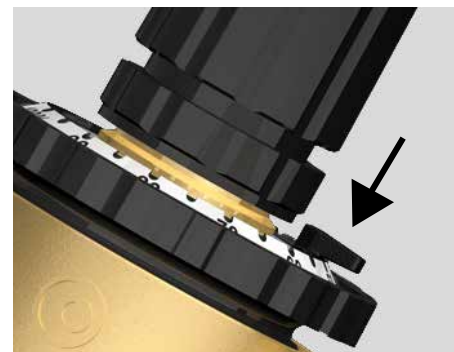
To set the selected flow, follow these steps:



Lift the lock pin to unlock the selector



Turn the selector to the target position



Press the lock pin to lock the selector in the final position

3. Operating control

It is necessary to be sure that the valve is actually working in the operating range. In order to verify it, 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 actually keeping the flow constant at the set value.



4. 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.

5. Cartridge replacement and flushing

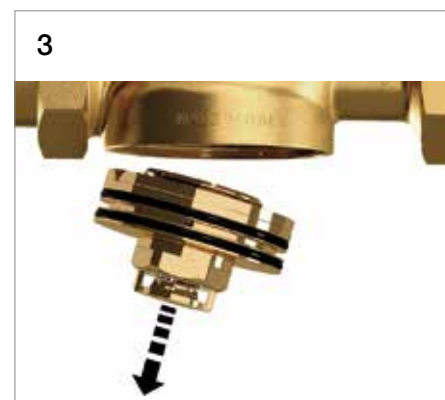
If the cartridge (ΔP regulator) needs to be replaced or when flushing the pipework during pre-commissioning, follow instructions below.



1 Unscrew bottom cap



2 Unscrew the cartridge using an hexagonal socket wrench



3 Manually pull out the cartridge. Wear gloves.

Installation and maintenance - 83 EvoPICV

1. Use conditions

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. Minimum differential pressure above which the valve begins to exercise its regulating effect:

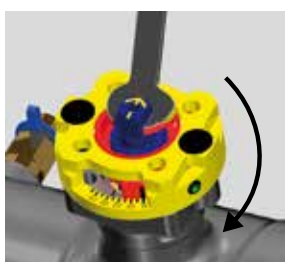


	83HJP 1 1/4"	83LJP 1 1/2"	83HJP 1 1/2"	83VLJP 2"	83LJP 2"	83HJP 2"
	83HPR1 1 1/4"	83LPR1 1 1/2"	83HPR1 1 1/2"	83VLPR1 2"	83LPR1 2"	83HPR1 2"
Start-up ΔP	30 kPa 0,30 bar	30 kPa 0,30 bar	35 kPa 0,35 bar	40 kPa 0,40 bar	35 kPa 0,35 bar	35 kPa 0,35 bar

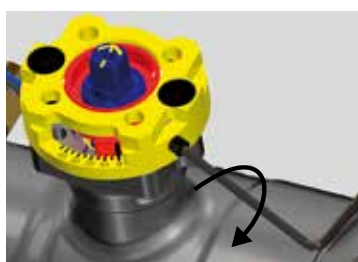
Rounded values. At 100% preset. See also pages 11-13

2. Flow preset (only for PR1 series or with optional art. 081PR1)

To set the selected flow, follow these steps:



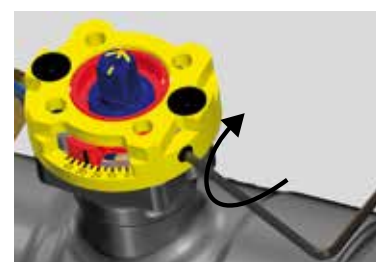
Close the valve



Release locking device



Set maximum flow rate



Lock again and re-open the valve. Don't overtighten. Could seriously damage the device. Torque 2÷3 Nm

3. Operating control

It is necessary to be sure that the valve is actually working in the operating range. In order to verify it, 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 actually keeping the flow constant at the set value.



4. 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.

5. Flushing and shut off

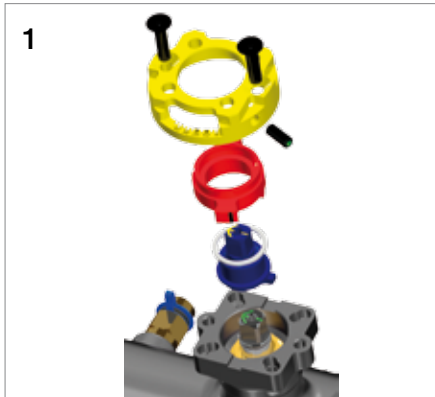


Flushing can be made through the valve by turning the valve 180°. The differential pressure reducer is now inhibited and no flow limitation occurs. Remember to restore the valve in its working position after flushing.

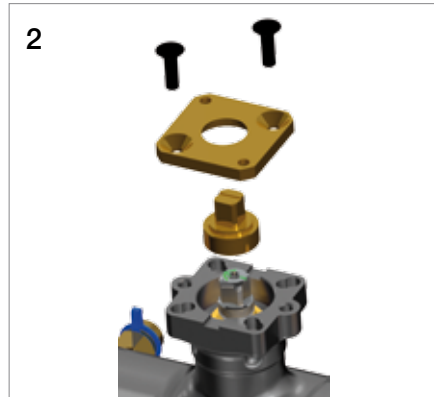
The valve can be closed through the cartridge, should there be the need to do so, by using a 6 mm allen key. In normal working conditions this shut off device must be fully open.

6. Actuator assembly

The valve can be equipped with electro-mechanical actuators, according to the requirements of the system. Actuators come along with an adaptor for proper mounting on the valve and for proper functioning of the whole device. The mounting pad is made according to ISO 9210 F04, however the valve comes with options to accommodate different actuators.



1 Flow presetting device (optional)

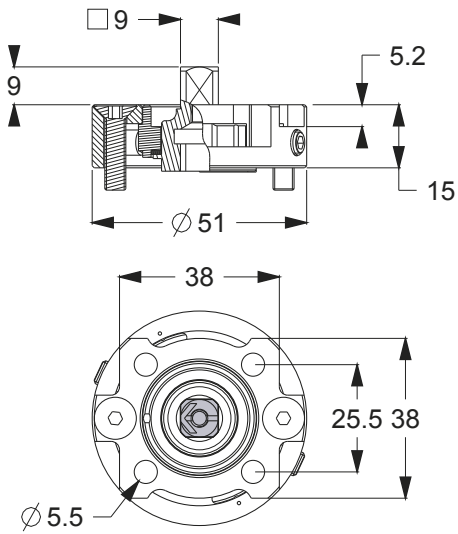


2 Actuator adaptor (optional)



3 Final assembly

Presetting device 081PR1



Installation and maintenance - 94F EvoPICV

1. Use conditions

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.

Minimum differential pressure above which the valve begins to exercise its regulating effect:

	94FH 2"	94FL 2 1/2"	94FH 2 1/2"	94FL 3"	94FL 4"	94FL 5"
Start-up ΔP	40 kPa 0,40 bar	40 kPa 0,40 bar	30 kPa 0,30 bar	30 kPa 0,30 bar	30 kPa 0,30 bar	35 kPa 0,35 bar

	94FH 5"	94FL 6"	94FH 6"
Start-up ΔP	35 kPa 0,35 bar	35 kPa 0,35 bar	50 kPa 0,50 bar

Rounded values. At 100% preset. See also pages 13-15

2. Flow preset

The 94F is set up using the Smart Actuator:

When first powered 'GO 0' is displayed on the LCD. Then wait for '0' to appear. Pressing the 'MODE' button for 2 seconds or longer turns to setting mode. You can then choose the detail indication that's suitable for your on-site installations. When in 'set' mode, press the mode button again and you can choose another set mode (set 1 - set 10).

- SET1 - Selecting Input / Indication Type
- SET2 - Selecting an input tool
- SET3 - Min. flow setting
- SET4 - Max. flow setting
- SET5 - Checking the settings / current values
- SET6 - Rotation angle compensation
- SET7 - Flow offset compensation
- SET8 - Power failure mode
- SET9 - Flow rate units selection
- SET10 - Control curve selection (LIN - EQ)

3. Operating control

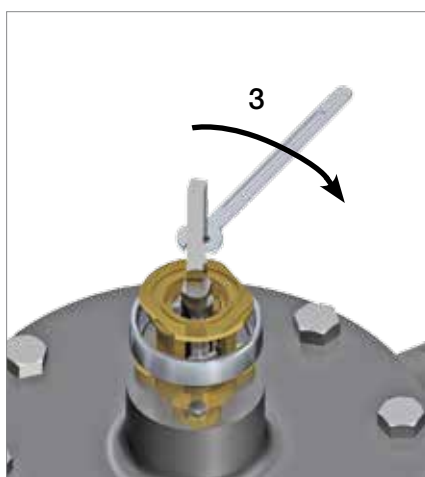
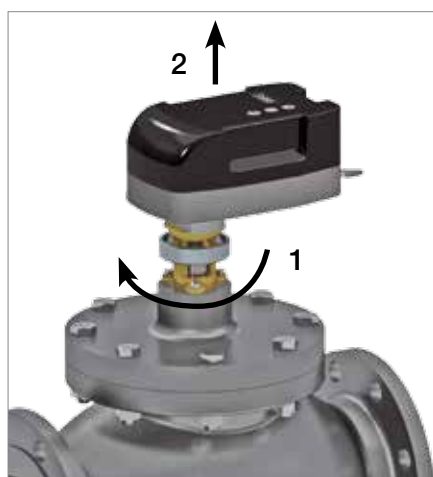
It is necessary to be sure that the valve is actually working in the operating range. In order to verify it, just measure the differential pressure across the valve, as shown in the picture.

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

4. Maintenance and cleaning

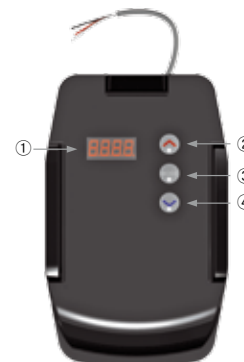
During valve cleaning operations, use a damp cloth. DO NOT use any detergent or chemical product that may seriously damage or compromise the proper functioning and the reliability of the valve.

5. Manual override



Actuator A94F

- 1 Display
- 2 Up button
- 3 Mode button
- 4 Down button



1. Untighten the actuator nut
2. Remove the actuator from the valve
3. Close the valve with a 8 mm wrench

Thermo-electric actuators for 91 series

1. Art. A544O2

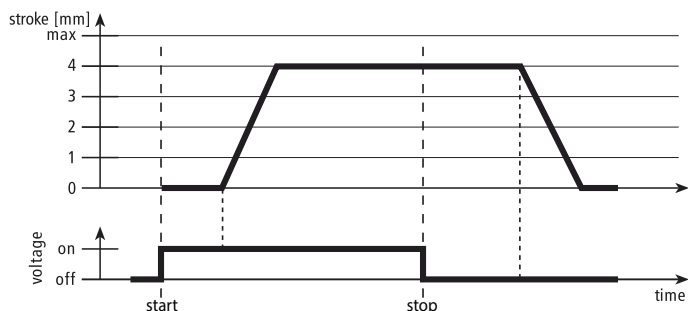
24V DC ON-OFF

Technical features	
Supply voltage	24 AC / DC, +20% ÷ -10%
Absorbed power	1 W
Max current	<300 mA max. 2 min.
Max fluid temperature	0 - 100 °C
Max ambient temperature	0 - 60 °C
Degree of protection	IP 54 (EN 60529)
Class of protection	II (IEC 60730) (with cable connector only)
Actuating force	100 N ± 5 %
Stroke	4 mm

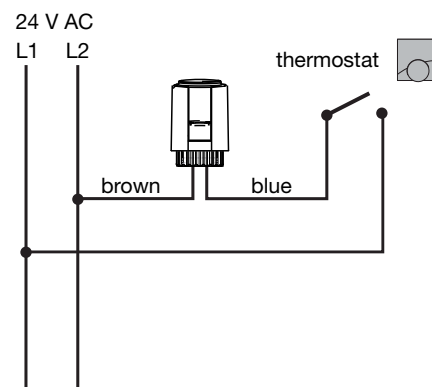


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

Characteristic curves

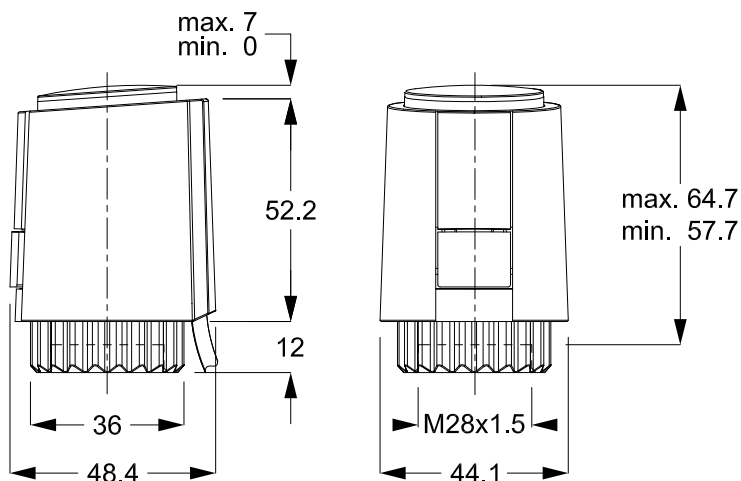


Wiring diagrams



Overall dimensions

Dimensions (mm)



2. Art. A544O4

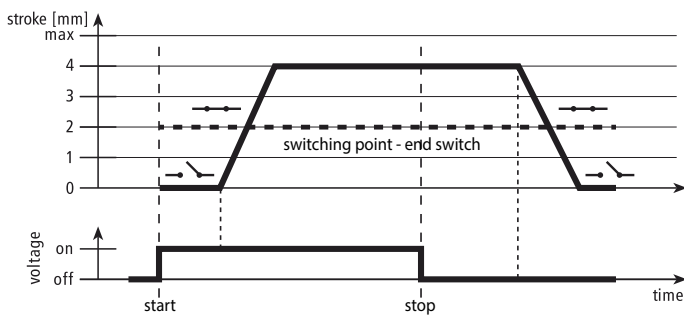
24V DC ON-OFF with integrated micro switch

Technical features	
Supply voltage	24 AC / DC, +20% ÷ -10%
Absorbed power	1 W
Max current	<300 mA max. 2 min.
Max fluid temperature	0 - 100 °C
Max ambient temperature	0 - 60 °C
Degree of protection	IP 54 (EN 60529)
Class of protection	III (IEC 60730) (with cable connector only)
Actuating force	100 N ± 5 %
Stroke	4 mm

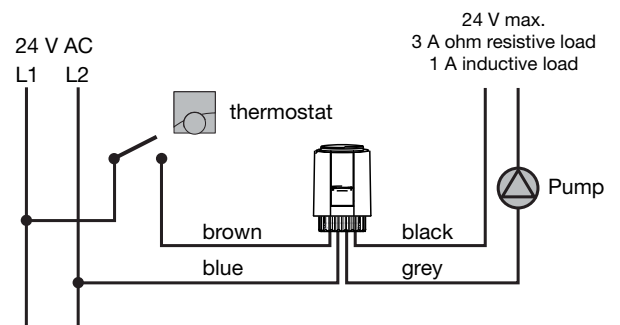


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

Characteristic curves

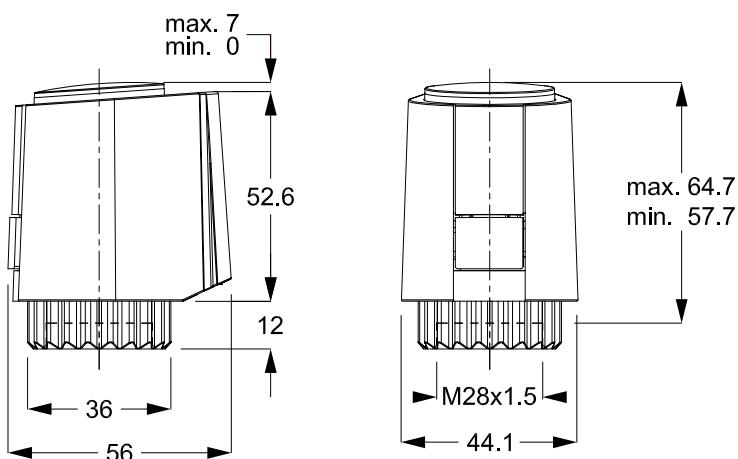


Wiring diagrams



Overall dimensions

Dimensions (mm)



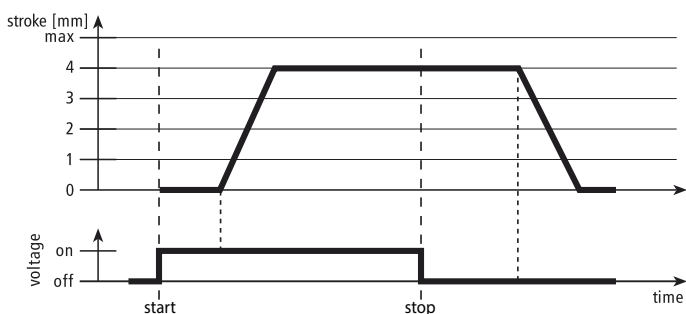
3. Art. A542O2
230V AC ON-OFF

Technical features	
Supply voltage	230 Vac ±10%, 50Hz
Absorbed power	1 W
Max current	<550 mA max. 100ms
Max fluid temperature	0 - 100 °C
Max ambient temperature	0 - 60 °C
Degree of protection	IP 54 (EN 60529)
Class of protection	II (IEC 60730) (with cable connector only)
Actuating force	100 N ± 5 %
Stroke	4 mm

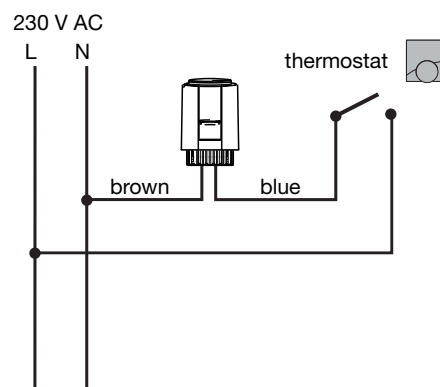


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

Characteristic curves

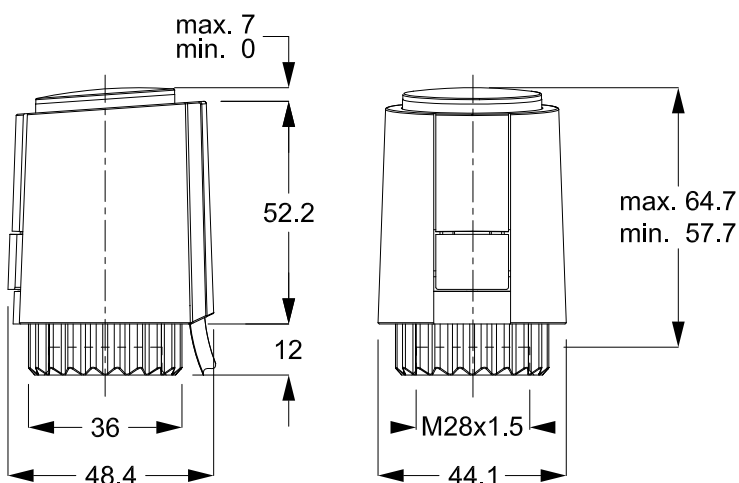


Wiring diagrams



Overall dimensions

Dimensions (mm)



4. Art. A542O4

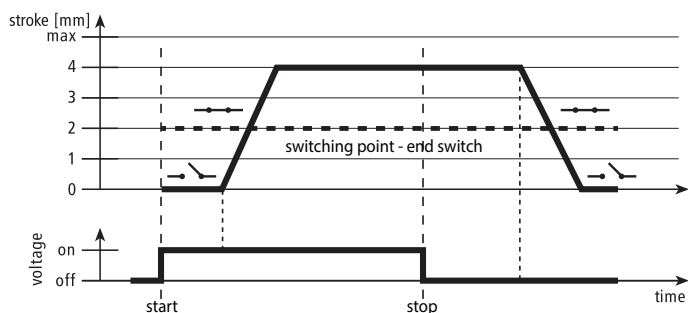
230V AC ON-OFF with integrated micro switch

Technical features	
Supply voltage	230 Vac ±10%, 50Hz
Absorbed power	1 W
Max current	<550 mA max. 100ms
Max fluid temperature	0 - 100 °C
Max ambient temperature	0 - 60 °C
Degree of protection	IP 54 (EN 60529)
Class of protection	II (IEC 60730) (with cable connector only)
Actuating force	100 N ± 5 %
Stroke	4 mm

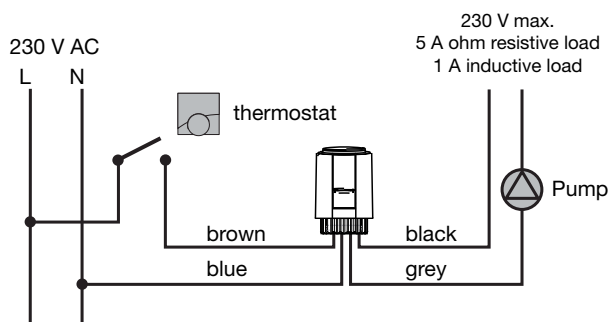


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

Characteristic curves

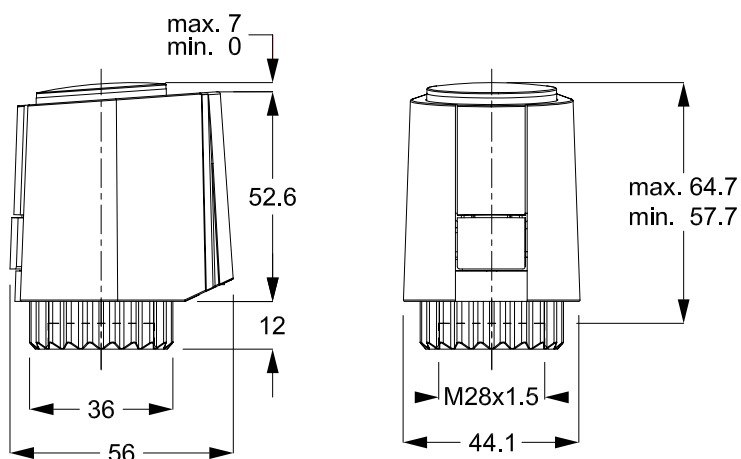


Wiring diagrams



Overall dimensions

Dimensions (mm)



5. Art. A544P3

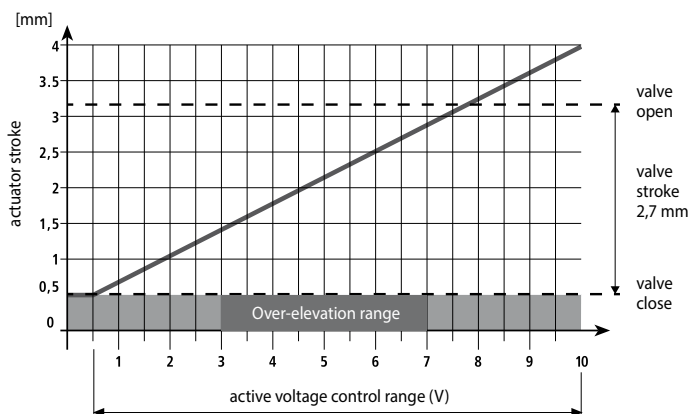
24V AC proportional 0-10V

Technical features	
Supply voltage	24V AC/DC -10% ÷ +20%
Absorbed power	1 W
Max current	< 320 mA max. 2 min.
Operating voltage	0 – 10 V DC 100 kΩ
Max fluid temperature	0 - 100 °C
Max ambient temperature	0 - 60 °C
Degree of protection	IP 54 (EN 60529)
Class of protection	III (IEC 60730)
Actuating force	100 N ± 5 %
Stroke	4 mm
Travelling time	30 s/mm

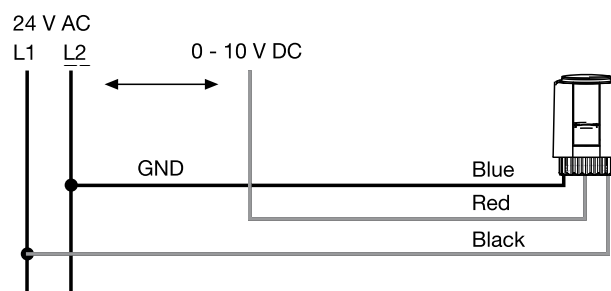


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

Characteristic curves

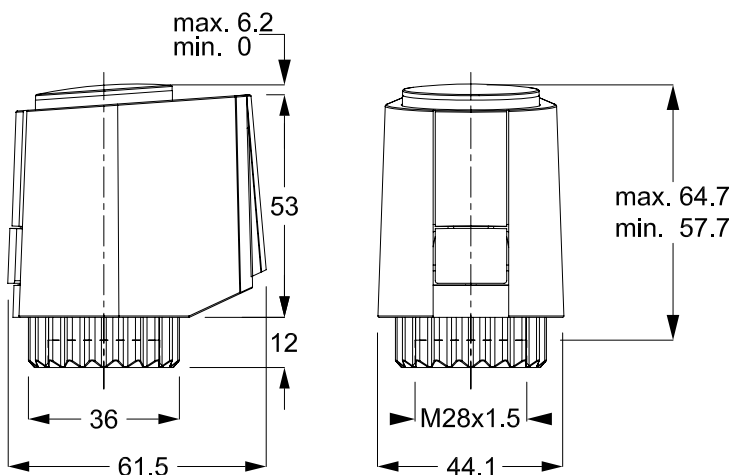


Wiring diagrams



Overall dimensions

Dimensions (mm)



Thermo-electric actuators for 93 series

1. Art. A564O2

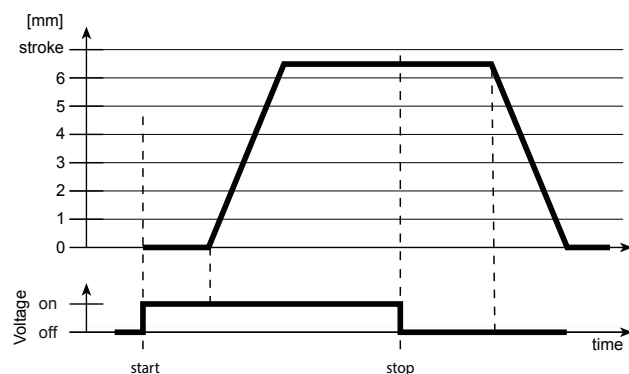
24V DC ON-OFF

Technical features	
Supply voltage	24 AC / DC, +20% ÷ -10%
Absorbed power	1,2 W
Max current	<300 mA max. 2 min.
Max fluid temperature	0 - 100 °C
Max ambient temperature	0 - 60 °C
Degree of protection	IP 54 (EN 60529)
Class of protection	III (IEC 60730) (with cable connector only)
Actuating force	100 N ± 5 %
Stroke	6,5 mm

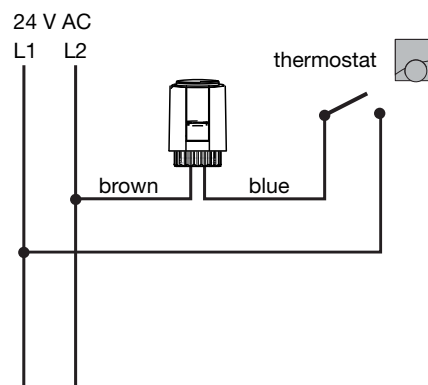


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

Characteristic curves

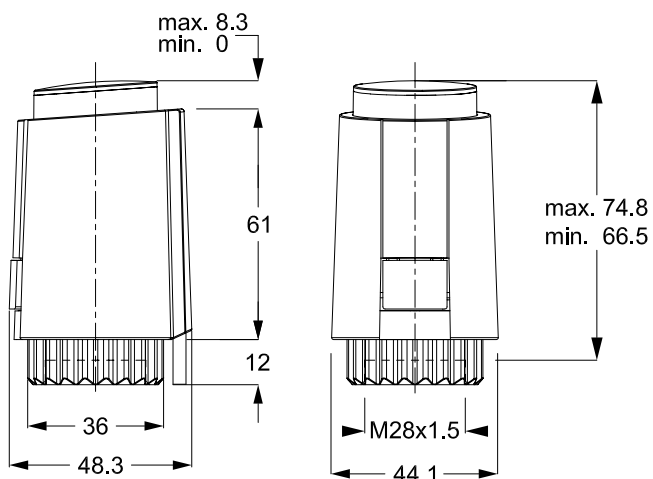


Wiring diagrams



Overall dimensions

Dimensions (mm)



2. Art. A562O2
230V AC ON-OFF

Technical features	
Supply voltage	230 Vac ±10%, 50Hz
Absorbed power	1,2 W
Max current	<550 mA max. 2 min.
Max fluid temperature	0 - 100 °C
Max ambient temperature	0 - 60 °C
Degree of protection	IP 54 (EN 60529)
Class of protection	II (IEC 60730) (with cable connector only)
Actuating force	100 N ± 5 %
Stroke	6,5 mm

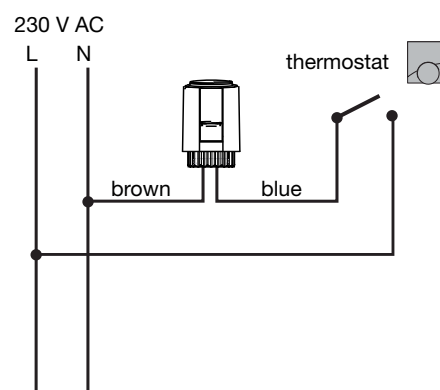


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

Characteristic curves

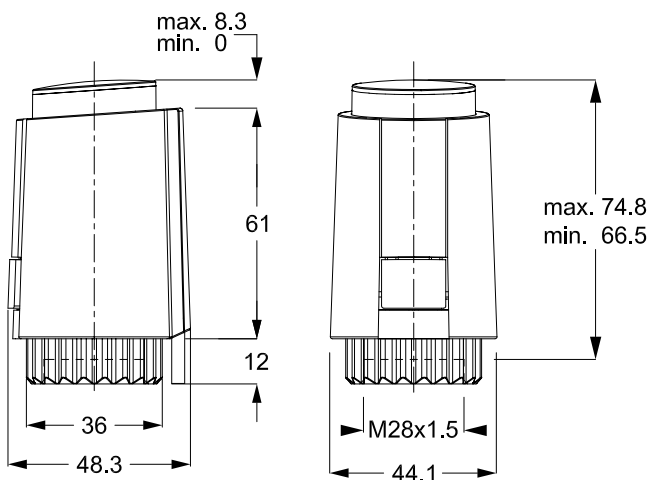


Wiring diagrams



Overall dimensions

Dimensions (mm)



3. Art. A564P3

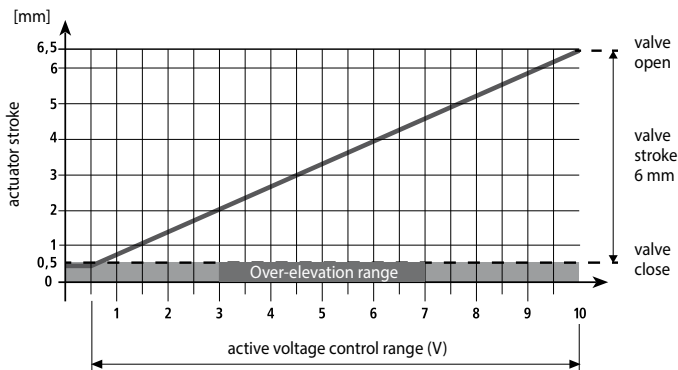
24V AC proportional 0-10V

Technical features	
Supply voltage	24V AC/DC -10% ÷ +20%
Absorbed power	1,2 W
Max current	< 320 mA max. 2 min.
Operating voltage	0 – 10 V DC 100 kΩ
Max fluid temperature	0 - 100 °C
Max ambient temperature	0 - 60 °C
Degree of protection	IP 54 (EN 60529)
Class of protection	III (IEC 60730)
Actuating force	100 N ± 5 %
Stroke	6,5 mm
Travelling time	30 s/mm

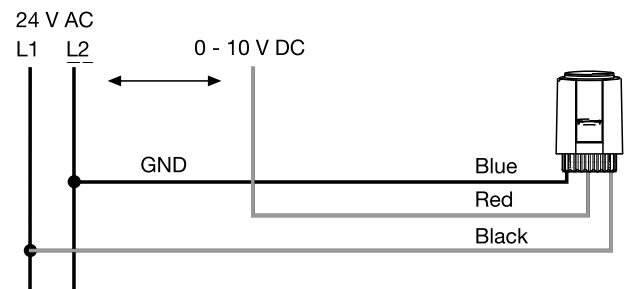


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

Characteristic curves

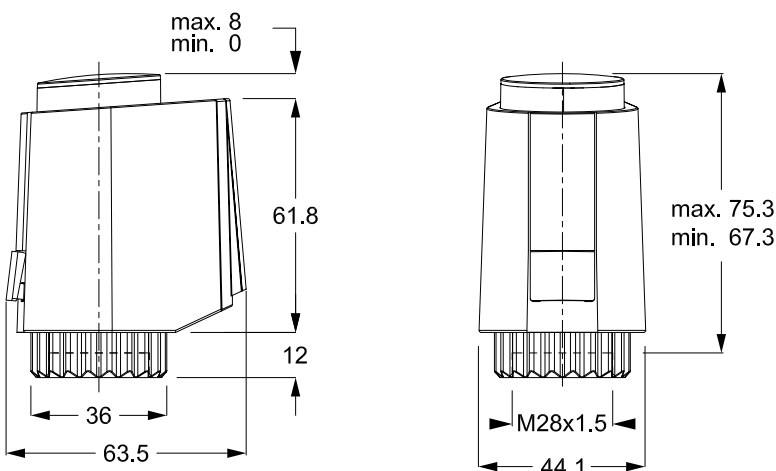


Wiring diagrams



Overall dimensions

Dimensions (mm)



Electromotive actuators

1. Art. VA7481

24V Vac floating model

Technical features	
Supply voltage	24 Vac ± 15%, 50...60 Hz
Absorbed power	1,5 W / 2,5VA
Max fluid temperature	95 °C
Max ambient temperature	0 - 50 °C
Degree of protection	IP 43
Actuating force	120 N +30% -20%
Max mechanical stroke	6,3 mm
Travelling time	8 sec/mm

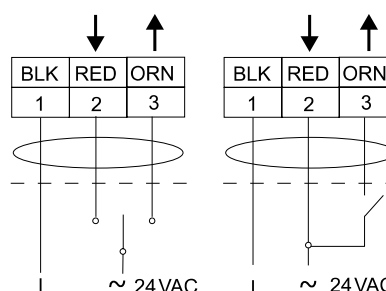


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

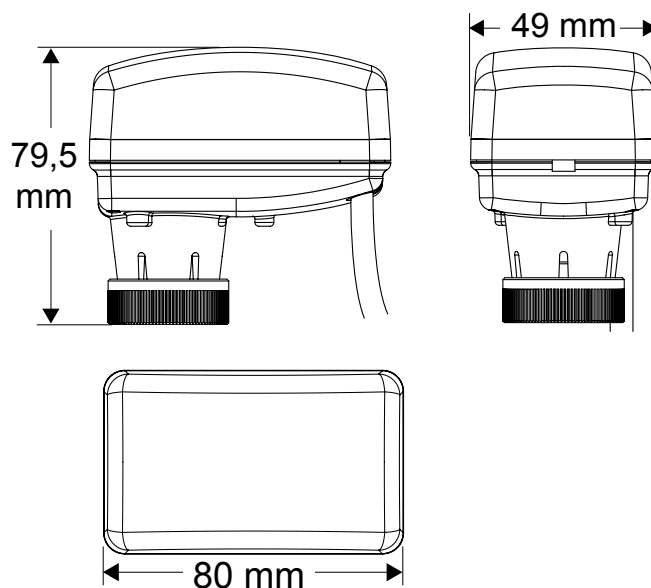
Operating status indication

OFF		No power supply
GREEN BLINKING		Moving to position
GREEN BLINKING		End stroke confirmation
GREEN STEADY ON		End Stroke reached

Connections



Overall dimensions



2. Art. VA7481

230V Vac floating model

Technical features	
Supply voltage	230 Vac \pm 10%, 50...60 Hz
Absorbed power	2,2 W / 6,5VA
Max fluid temperature	95 °C
Max ambient temperature	0 - 50 °C
Degree of protection	IP 43
Actuating force	120 N +30% -20%
Max mechanical stroke	6,3 mm
Travelling time	8 sec/mm

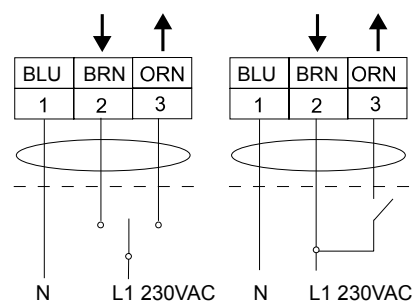


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

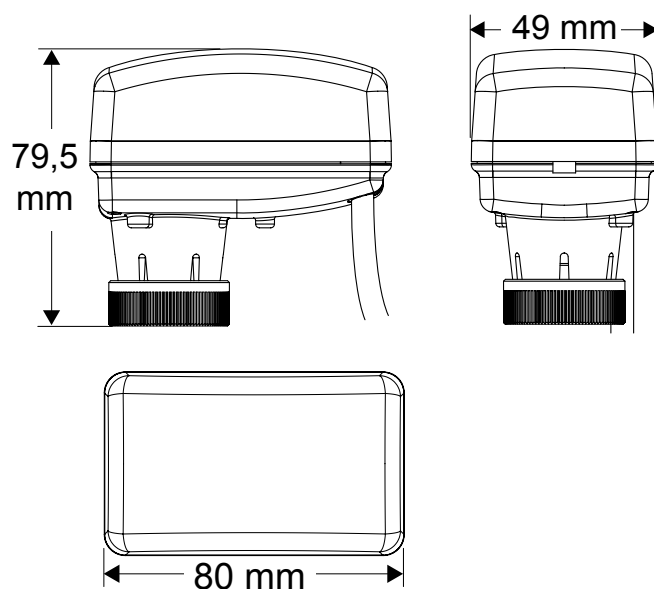
Operating status indication

OFF		No power supply
GREEN BLINKING		Moving to position
GREEN BLINKING		End stroke confirmation
GREEN STEADY ON		End Stroke reached

Connections



Overall dimensions



3. Art. VA7482

24 Vac/Vdc proportional model

Technical features	
Supply voltage	24 Vac/Vdc ± 15%, 50...60 Hz
Absorbed power	1,5 W / 2,5 VA
Input Impedance	Voltage > 100 kΩ - Current 500 Ω
Max fluid temperature	95 °C
Max ambient temperature	0 - 50 °C
Degree of protection	IP 43
Actuating force	120 N +30% -20%
Max mechanical stroke	6,3 mm / 3,2 mm
Travelling time	8 sec/mm

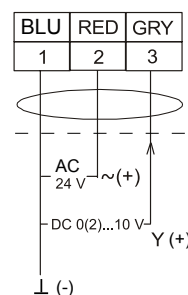


Mounting positions: any positions between vertical and horizontal. Upside down mounting (actuator underneath the valve) should be avoided.

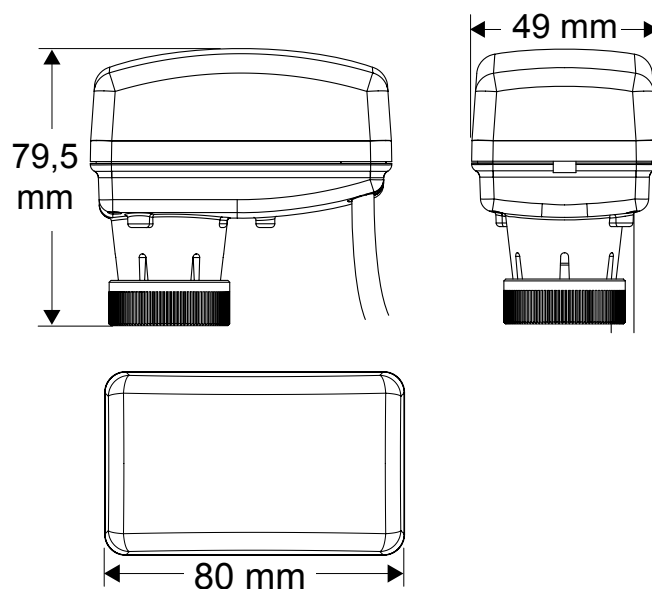
Operating status indication

OFF		No power supply
GREEN BLINKING		Moving to position
GREEN BLINKING		End stroke confirmation
GREEN STEADY ON		Position reached
RED BLINKING		Cycle
RED STEADY ON		4/20 mA or 2/10 Vdc signal lost

Connections

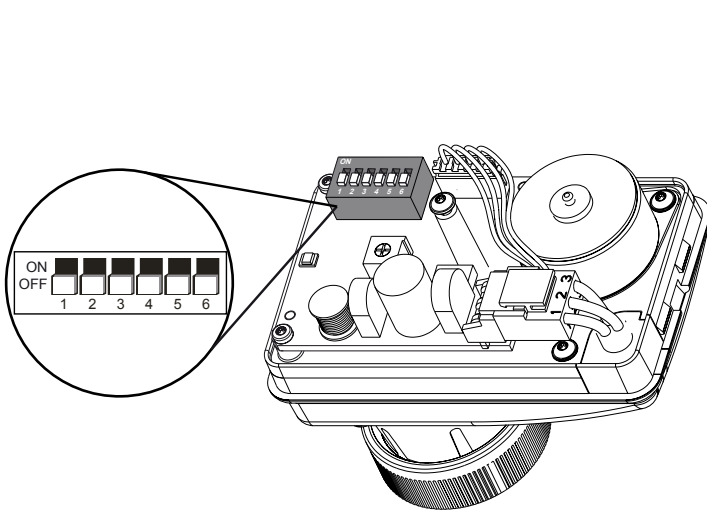


Overall dimensions



Dip switch settings for Proportional model only (VA7482)

All the proportional models have 6 dip switches which allow the user to field configure the actuator.
The actuator is factory released with all the dip switches in OFF position.



1	<input type="checkbox"/> OFF	<input type="checkbox"/> ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

0...10VDC	0...20mA	0...5VDC	5...10VDC	2...10VDC	4...20mA
DA	RA	LIN	Eq%	VDC	mA

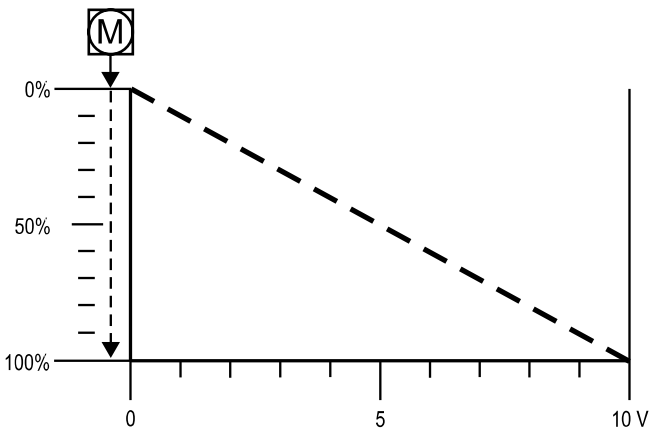
1: CONTROL SIGNAL	4: ACTION
2: RANGE	5: CURVE
3:	6: SIGNAL TYPE

Dip Switch 1 – 2 – 3 – 6

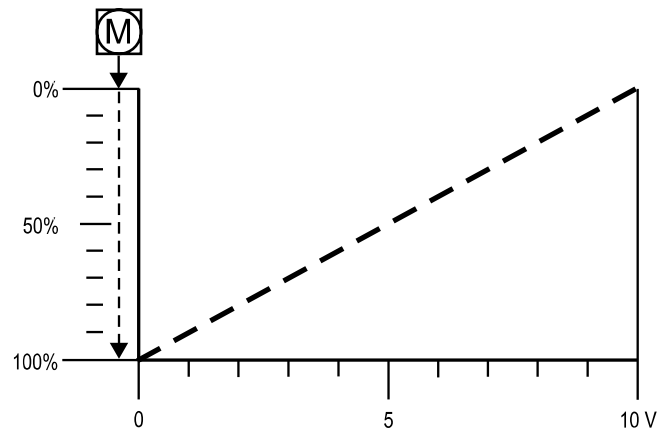
The dip switch 1-2-3 allows the user to change the analogue input ranges. To switch from voltage analog input to current analog input the dip switch 6 has to be set accordingly.

Dip Switch 4

The dip switch 4 allows the user to change the action of the actuator in relation of the analog input.



The dip switch 4 OFF (Direct Acting – DA)
When the signal increases the actuator stem extends.



The dip switch 4 ON (Reversing Acting – RA)
When the signal increases the actuator stem retracts.

Dip Switch 5

The dip switch 5 allows the user to change the control characteristic of the actuator in order to obtain a combination of valve and actuator linear or almost equal percentage.

The dip switch 5 OFF (Linear)

The dip switch 5 ON (almost EqualPercentage)



Rotary actuators for 83 series

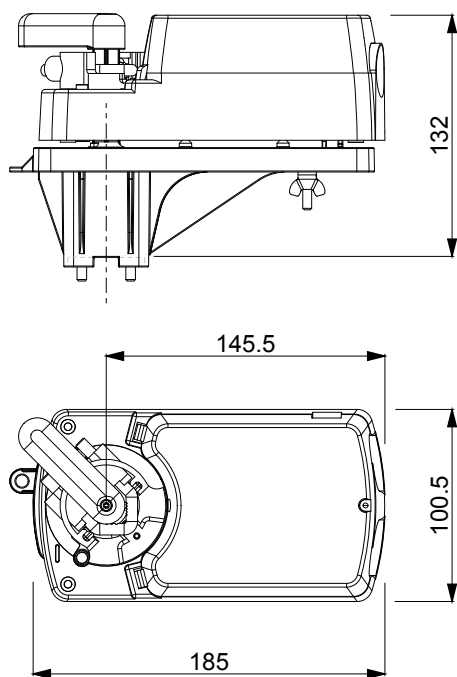
1. SN08 24V

3 point floating control signal

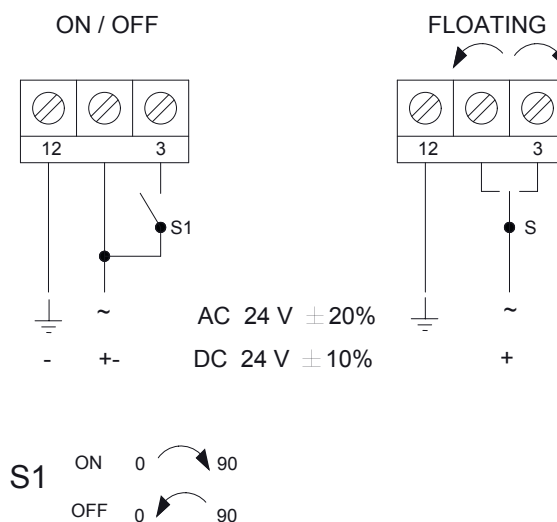
Technical features	
Operating torque	8 Nm Min.
Running time	30 s - 90°
Supply Voltage	AC 24 / DC 24 - 50/60Hz
Consumption	3.9 W - Stand-by 0.4 W - 6.5 VA
Control Signal	2 point and 3 point
Total rotation	0~90°
Angle limitation	5~85° (5° increment)
Life cycle	60,000 cycle
Protection Class	II
IP protection class	IP54
Temperature range	-20~+50°C
Humidity range	5~95% RH
Stock temperature	-40~+70°C
Certificate	CE



Overall dimensions



Connections



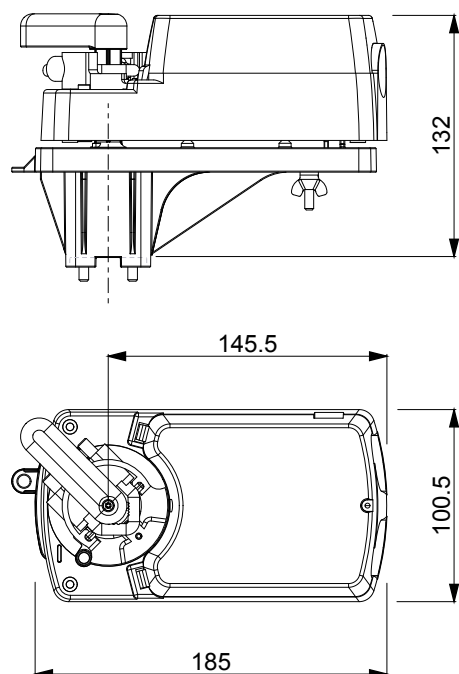
2. SN08 230V

3 point floating control signal

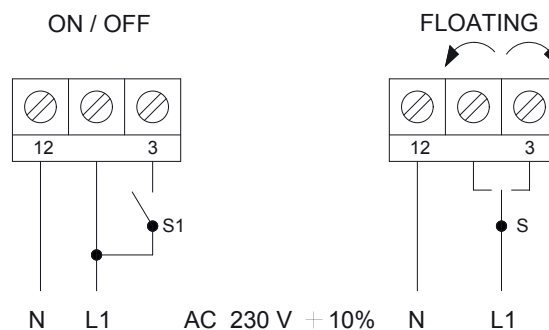
Technical features	
Operating torque	8 Nm Min.
Running time	30 s - 90°
Supply Voltage	AC 220/230 - 50/60Hz
Consumption	4.8 W - Stand-by 1.2 W - 6.5 VA
Control Signal	2 point and 3 point
Total rotation	0~90°
Angle limitation	5~85° (5° increment)
Life cycle	60,000 cycle
Protection Class	II
IP protection class	IP54
Temperature range	-20~+50°C
Humidity range	5~95% RH
Stock temperature	-40~+70°C
Certificate	CE



Overall dimensions



Connections



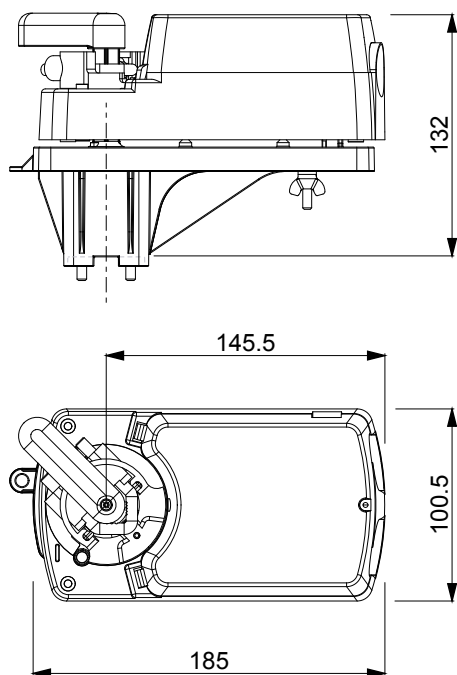
3. SN08CC 24V

Proportional control signal

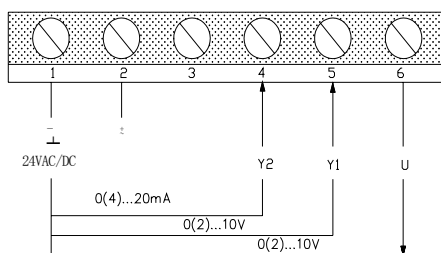
Technical features	
Operating torque	8 Nm Min.
Running time	30 s - 90°
Supply Voltage	AC/DC 24V - 50/60Hz
Consumption	4.8 W - Stand-by 1.2 W - 6.5 VA
Control Signal	0(2)-10 VDC 0(4)-20 mA
Total rotation	0~90°
Angle limitation	5~85° (5° increment)
Life cycle	60,000 cycle
Protection Class	II
IP protection class	IP54
Temperature range	-20~+50°C
Humidity range	5~95% RH
Stock temperature	-40~+70°C
Certificate	CE



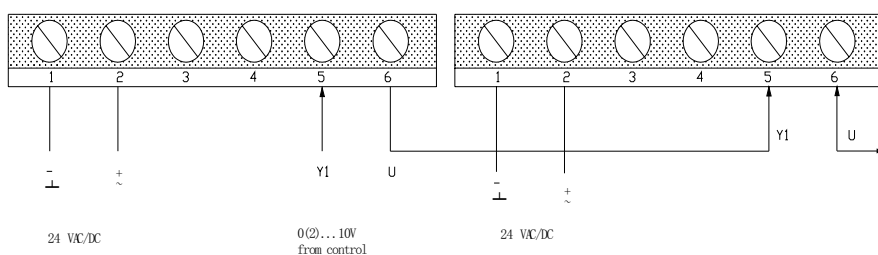
Overall dimensions



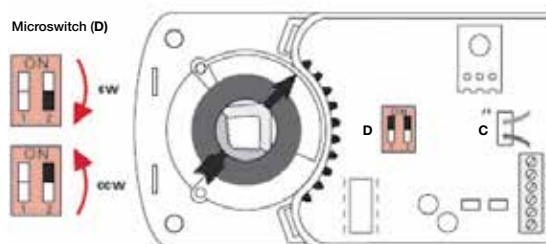
Connections



Master/sub-control



Selection of rotating direction



Plug (C) must never be reversed otherwise the motor will not function correctly.

094F - SMART actuators for 94F series



Flow rate can be easily set from the on-board user interface.
Compatible with most used control signals:

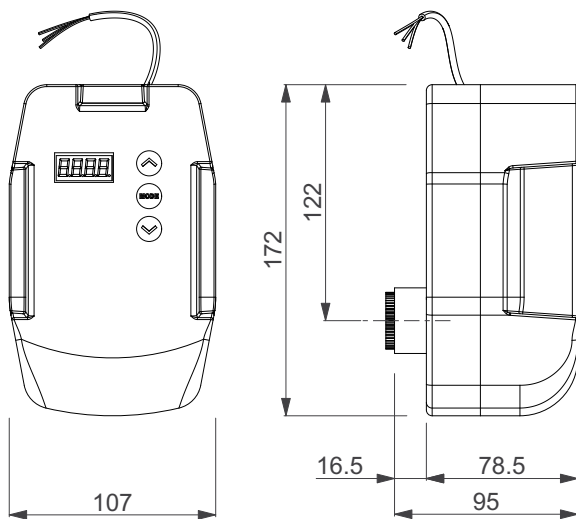
- Analogue (current or voltage control)
- PWM
- ON/OFF

4 – 20 mA position feedback signal as default option, for a total remote management.
Manual override available.
Electrical safe return available on request. (094FS)

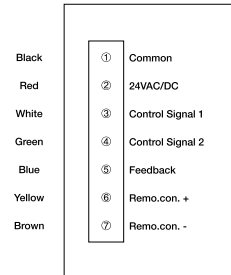


Technical features	
Operating duration	170 sec. (Full Open <-> Full Closed)
Emergency operation	Easy removable nut
Control input	PID Control (2-10VDC : installed on external cable of 500Ω resistor) 4 – 20mA (installed on external cable of 500Ω resistor) ON/OFF Control mode (e.g. Thermostat) PWM Control (0.1 ~ 5 sec/20ms or 25 sec/100ms depending on switch setting) Common switch – NPN transistor, SCR, triac or dry contact (max. current 50mA)
Torque	5 Nm
Position feedback	4-20mA or 2-10VDC (installed on external cable of 500Ω resistor)
Ambient temp.	-20°C ~ 65°C
Wire	18AWG
Cover material	Aluminium + Plastic
Protection class	II - IP54

Overall dimensions



Valve wiring



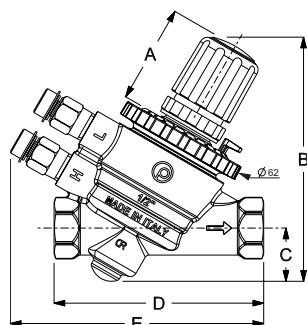
Function	NO.	COLOR							Remarks
		1 Black	2 Red	3 White	4 Green	5 Blue	6 Yellow	7 Brown	
Internal control		Common	24VAC/DC						Power cable : ①②
Voltage control		Common	24VAC/DC	2 – 10VDC					Power cable : ①② Voltage control cable : ①③
Current control		Common	24VAC/DC	2 – 20mA					Power cable : ①② Current control cable : ①③
ON / OFF control		Common	24VAC/DC	24DCV (open) 0V(close)		FEED BACK 4 – 20mA			Power cable : ①② ON/OFF control cable : ①③
External Remote control		Common	24VAC/DC				REMO. CON.	REMO. CON.	Power cable : ①② REMO.CON cable : ⑥⑦
3 POINT FLOATING control		Common	24VAC/DC	drive cw(open) 24VAC/DC	drive ccw(close) 24VAC/DC				Power cable : ①② 3 POINT control cable : ③④
PWM control		Common	24VAC/DC	pwm control signal					Power cable : ①② PWM control cable : ①③

Table selection for actuators

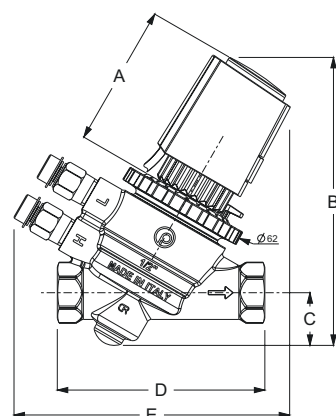
TYPE OF CONTROL SIGNAL																	
ON/OFF CONTROL						FLOATING CONTROL						PROPORTIONAL CONTROL (0-10 V)					
230V			24V			230V			24V			230V			24V		
Thermo-electric	Electromotive	Thermo-electric	Electromotive	Thermo-electric	Electromotive	Thermo-electric	Electromotive	Thermo-electric	Electromotive	Thermo-electric	Electromotive	Thermo-electric	Electromotive	Thermo-electric	Electromotive		
91 Series	A542O2	VA7481 + 0A7010	A544O2	VA7481 + 0A7010	---	VA7481 + 0A7010	---	VA7481 + 0A7010	---	VA7481 + 0A7010	---	VA7481 + 0A7010	---	A544P3	VA7482 3,2 mm + 0A7010		
91X Series	A542O2	VA7481 + 0A7010	A544O2	VA7481 + 0A7010	---	VA7481 + 0A7010	---	VA7481 + 0A7010	---	VA7481 + 0A7010	---	VA7481 + 0A7010	---	A544P3	VA7482 3,2 mm + 0A7010		
93 Series	A562O2	VA7481 + 0A748X	A564O2	VA7481 + 0A748X	---	VA7481 + 0A748X	---	VA7481 + 0A748X	---	VA7481 + 0A748X	---	VA7481 + 0A748X	---	A564P3	VA7482 6,3 mm + 0A748X		
83 Series	---	SN08 230V	---	SN08 24V	---	SN08 230V	---	SN08 24V	---	SN08 230V	---	SN08 24V	---	---	SN08CC 24V		
94F Series	---	---	---	SMART ACTUATOR	---	---	---	SMART ACTUATOR	---	---	---	SMART ACTUATOR	---	---	SMART ACTUATOR		



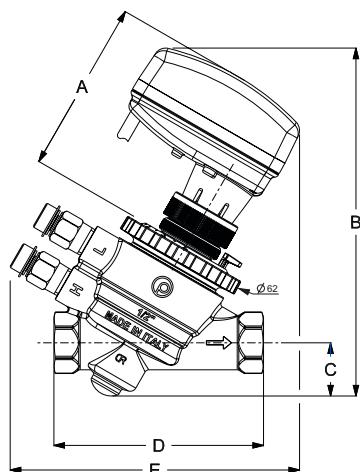
91 EvoPICV dimensional data



Manual valve						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91VL 1/2"	150	47	115	25	99	120
91L 1/2"	600	47	115	25	99	120
91H 1/2"	780	47	115	25	99	120
91L 3/4"	1000	47	115	25	108	127
91H 3/4"	1500	47	115	25	108	127
91H 1"	1500	47	115	25	130	134

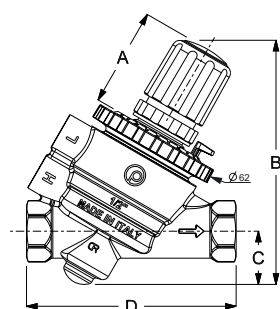


Valve with thermo-electric actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91VL 1/2"	150	68	137,5	25	99	127
91L 1/2"	600	68	137,5	25	99	127
91H 1/2"	780	68	137,5	25	99	127
91L 3/4"	1000	68	137,5	25	108	127
91H 3/4"	1500	68	137,5	25	108	127
91H 1"	1500	68	137,5	25	130	134

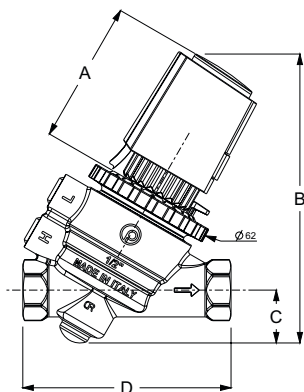


Valve with electromotive actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91VL 1/2"	150	82	164	25	99	137
91L 1/2"	600	82	164	25	99	137
91H 1/2"	780	82	164	25	99	137
91L 3/4"	1000	82	164	25	108	137
91H 3/4"	1500	82	164	25	108	137
91H 1"	1500	82	164	25	130	138

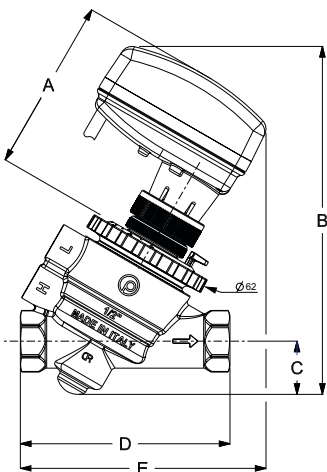
91-1 EvoPICV dimensional data



Manual valve					
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)
91VL1 1/2"	150	68	137,5	25	99
91L1 1/2"	600	68	137,5	25	99
91H1 1/2"	780	68	137,5	25	99
91L1 3/4"	1000	68	137,5	25	108
91H1 3/4"	1500	68	137,5	25	108
91H1 1"	1500	68	137,5	25	130

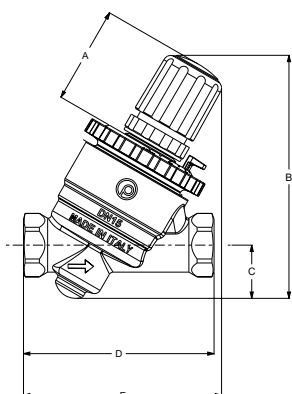


Valve with thermo-electric actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91VL1 1/2"	150	68	137,5	25	99	-
91L1 1/2"	600	68	137,5	25	99	-
91H1 1/2"	780	68	137,5	25	99	-
91L1 3/4"	1000	68	137,5	25	108	-
91H1 3/4"	1500	68	137,5	25	108	-
91H1 1"	1500	68	137,5	25	130	-

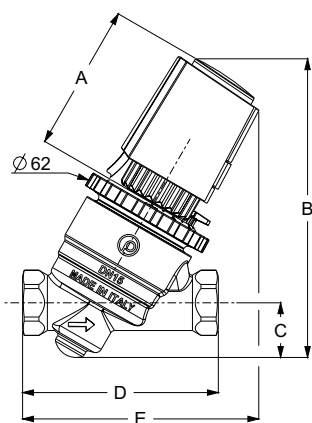


Valve with electromotive actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91VL1 1/2"	150	82	164	25	99	116
91L1 1/2"	600	82	164	25	99	116
91H1 1/2"	780	82	164	25	99	116
91L1 3/4"	1000	82	164	25	108	116
91H1 3/4"	1500	82	164	25	108	116
91H1 1"	1500	82	164	25	130	134

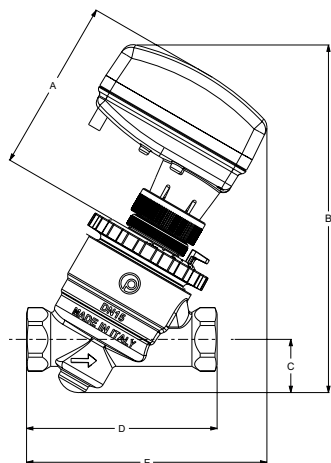
91X EvoPICV dimensional data



Manual valve						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91XVL 1/2"	150	47	115	25	90	93.5
91XL 1/2"	600	47	115	25	90	93.5
91XH 1/2"	900	47	115	25	90	93.5

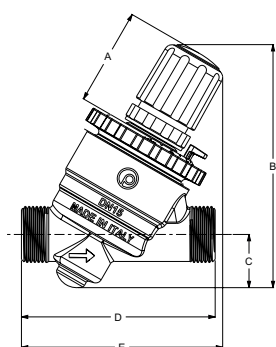


Valve with thermo-electric actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91XVL 1/2"	150	68	137,5	25	90	109
91XL 1/2"	600	68	137,5	25	90	109
91XH 1/2"	900	68	137,5	25	90	109

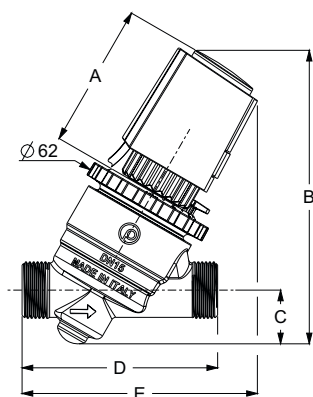


Valve with electromotive actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91XVL 1/2"	150	82	164	25	90	114
91XL 1/2"	600	82	164	25	90	114
91XH 1/2"	900	82	164	25	90	114

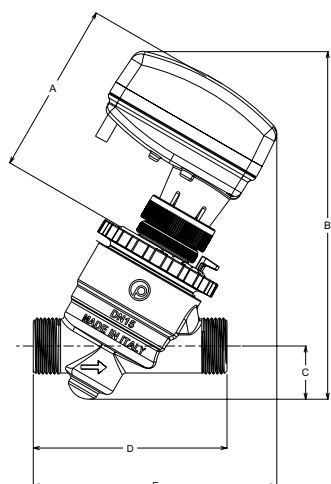
91X/2 EvoPICV dimensional data



Manual valve						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91XVL/2 1/2"	150	47	115	25	91.5	95
91XL/2 1/2"	600	47	115	25	91.5	95
91XL/2 3/4"	600	47	115	25	91.5	95
91XH/2 3/4"	900	47	115	25	91.5	95

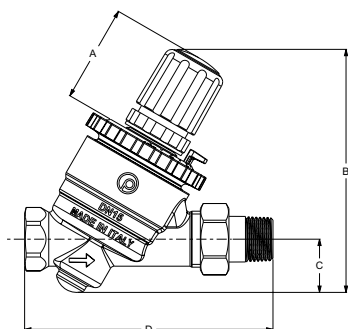


Valve with thermo-electric actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91XVL/2 1/2"	150	68	137,5	25	91.5	110
91XL/2 1/2"	600	68	137,5	25	91.5	110
91XL/2 3/4"	600	68	137,5	25	91.5	110
91XH/2 3/4"	900	68	137,5	25	91.5	110

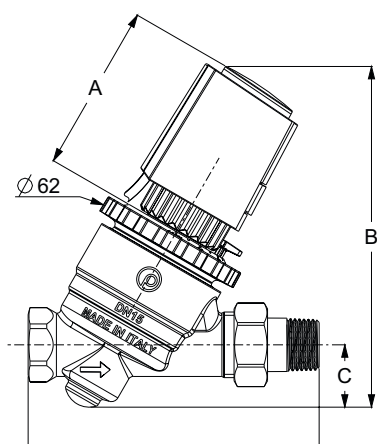


Valve with electromotive actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91XVL/2 1/2"	150	82	164	25	91.5	115
91XL/2 1/2"	600	82	164	25	91.5	115
91XL/2 3/4"	600	82	164	25	91.5	115
91XH/2 3/4"	900	82	164	25	91.5	115

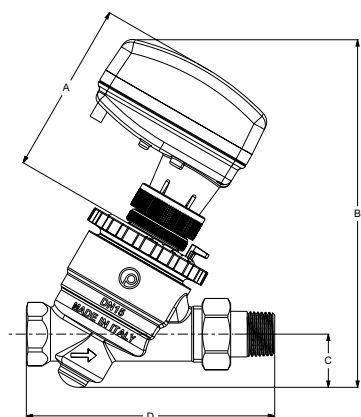
91X/3 EvoPICV dimensional data



Manual valve					
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)
91XVL/3 1/2"	150	46	115	25	117
91XL/3 1/2"	600	46	115	25	117
91XH/3 1/2"	900	46	115	25	117

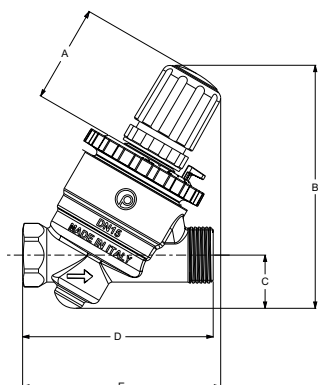


Valve with thermo-electric actuator					
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)
91XVL/3 1/2"	150	68	137,5	25	117
91XL/3 1/2"	600	68	137,5	25	117
91XH/3 1/2"	900	68	137,5	25	117

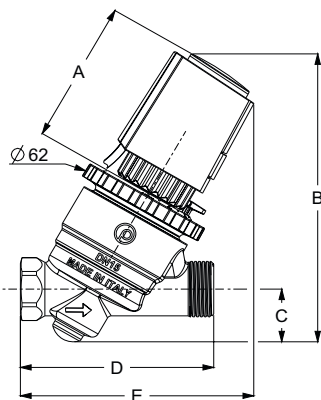


Valve with electromotive actuator					
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)
91XVL/3 1/2"	150	82	164	25	117
91XL/3 1/2"	600	82	164	25	117
91XH/3 1/2"	900	82	164	25	117

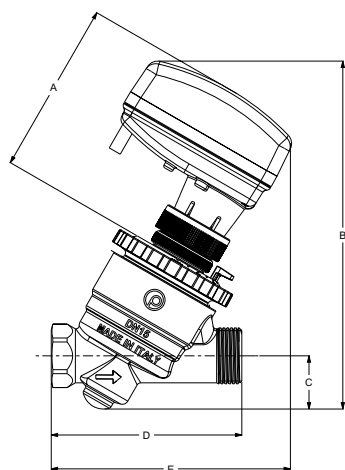
91X3S EvoPICV dimensional data



Manual valve						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91XVL3S 1/2"	150	47	115	25	90	93.5
91XL3S 1/2"	600	47	115	25	90	93.5
91XH3S 1/2"	900	47	115	25	90	93.5

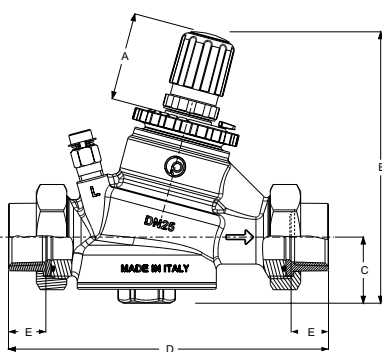


Valve with thermo-electric actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91XVL3S 1/2"	150	68	137,5	25	90	109
91XL3S 1/2"	600	68	137,5	25	90	109
91XH3S 1/2"	900	68	137,5	25	90	109

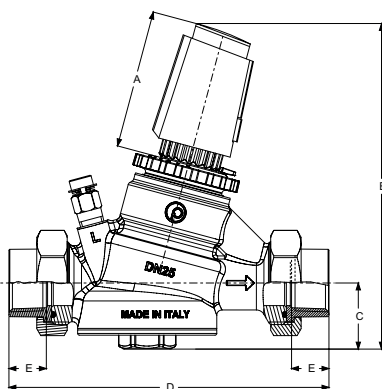


Valve with electromotive actuator						
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
91XVL3S 1/2"	150	82	164	25	90	114
91XL3S 1/2"	600	82	164	25	90	114
91XH3S 1/2"	900	82	164	25	90	114

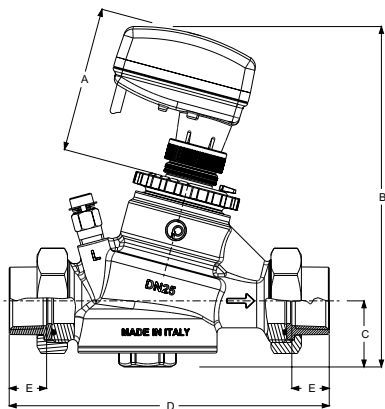
93 EvoPICV dimensional data



Manual valve					
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)
93L 3/4"	2200	47	152	38	134
93H 3/4"	2700	47	152	38	134
93L 1"	2200	47	152	38	134
93H 1"	2700	47	152	38	134
93L 1 1/4"	2700	47	152	38	134
93H 1 1/4"	3000	47	152	38	134

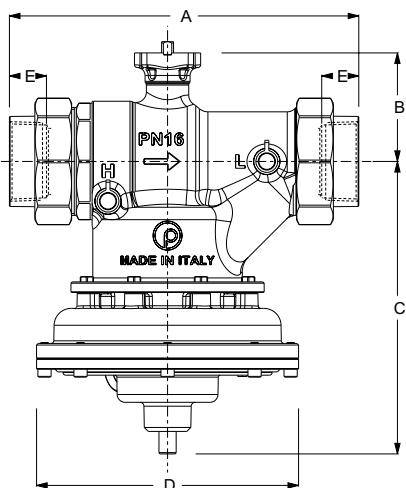


Valve with thermo-electric actuator					
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)
93L 3/4"	2200	79,5	187	38	134
93H 3/4"	2700	79,5	187	38	134
93L 1"	2200	79,5	187	38	134
93H 1"	2700	79,5	187	38	134
93L 1 1/4"	2700	79,5	187	38	134
93H 1 1/4"	3000	79,5	187	38	134



Valve with electromotive actuator					
Art.	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)
93L 3/4"	2200	70	183	38	134
93H 3/4"	2700	70	183	38	134
93L 1"	2200	70	183	38	134
93H 1"	2700	70	183	38	134
93L 1 1/4"	2700	70	183	38	134
93H 1 1/4"	3000	70	183	38	134

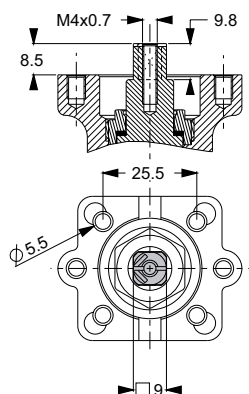
83 EvoPICV dimensional data



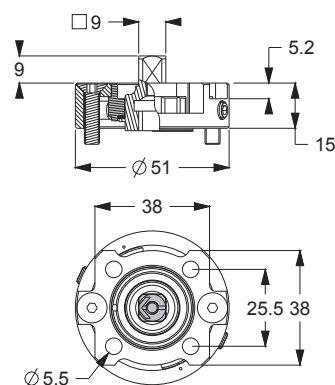
Manual valve							
Art.	DN	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
83HJP 1 1/4"	40	6000	232	74	176	158	23,6
83LJP 1 1/2"	40	6000	231	74	176	158	23,6
83HJP 1 1/2"	40	9000	231	74	176	158	23,6
83VLJP 2"	40	11000	278	74	176	158	23,6
83LJP 2"	50	12000	267	82	221	198	28
83HJP 2"	50	18000	267	82	221	198	28

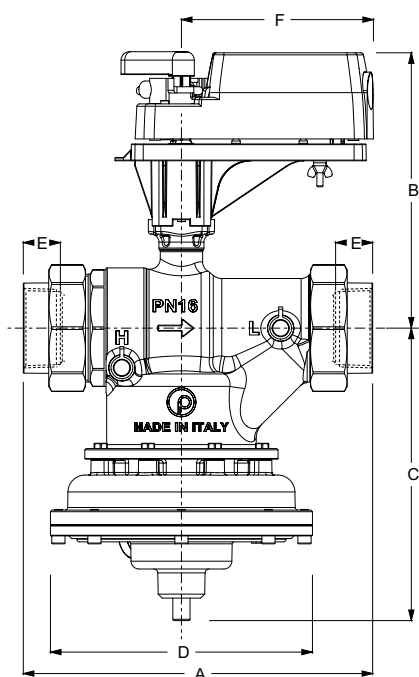
Manual valve with presetting 081PR1 mounted							
Art.	DN	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
83HPR1 1 1/4"	40	6000	232	89	176	158	23,6
83LPR1 1 1/2"	40	6000	231	89	176	158	23,6
83HPR1 1 1/2"	40	9000	231	89	176	158	23,6
83VLPR1 2"	40	11000	278	89	176	158	23,6
83LPR1 2"	50	12000	267	97	221	198	28
83HPR1 2"	50	18000	267	97	221	198	28

mounting pad 83 JP series



mounting pad 83 PR1 series

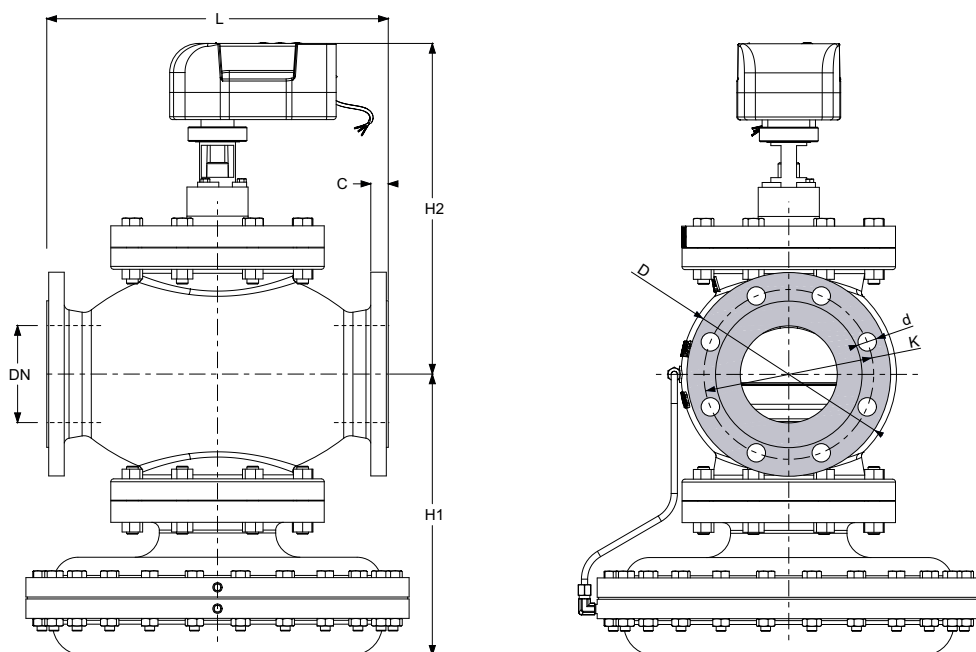




Rotary actuator serie SN08							
Art.	DN	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
83HJP 1 1/4"	40	6000	232	206	176	158	23,6
83LJP 1 1/2"	40	6000	231	206	176	158	23,6
83HJP 1 1/2"	40	9000	231	206	176	158	23,6
83VLJP 2"	40	11000	278	206	176	158	23,6
83LJP 2"	50	12000	267	214	221	198	28
83HJP 2"	50	18000	267	214	221	198	28

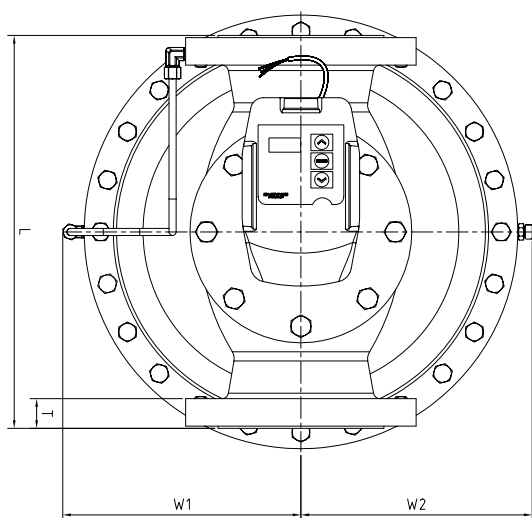
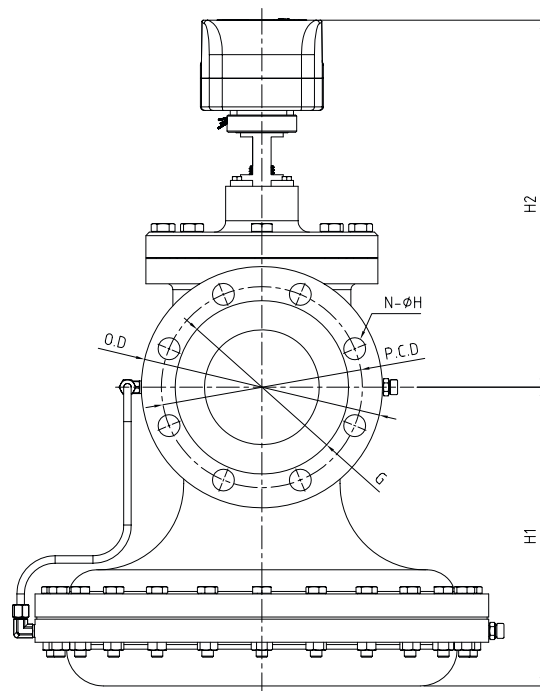
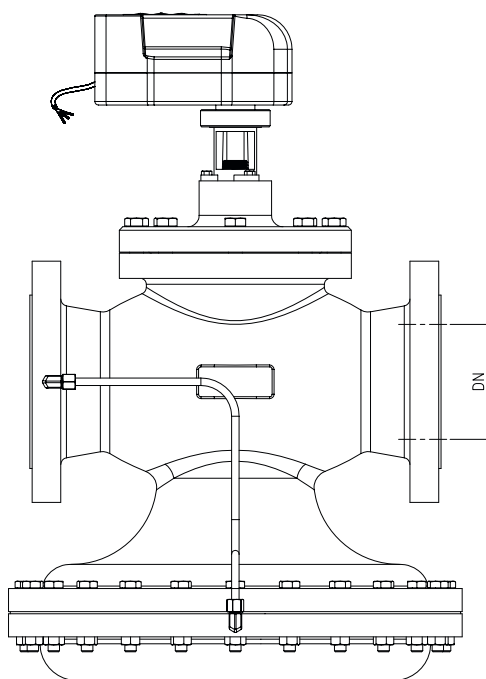
Rotary actuator serie SN08 with presetting 081PR1 mounted							
Art.	DN	Flow rate [l/h]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
83HPR1 1 1/4"	40	6000	232	221	176	158	23,6
83LPR1 1 1/2"	40	6000	231	221	176	158	23,6
83HPR1 1 1/2"	40	9000	231	221	176	158	23,6
83VLPR1 2"	40	11000	278	221	176	158	23,6
83LPR1 2"	50	12000	267	229	221	198	28
83HPR1 2"	50	18000	267	229	221	198	28

94F EvoPICV dimensional data



Valve with actuator 24V									
Art.	Flow rate [l/h]	H1 (mm)	H2 (mm)	L* (mm)	DN (mm)	D (mm)	K (mm)	d (mm)	C (mm)
94FH 6"	150000	350	379	451	150	285	240	23	19

* EN558 (IEC 60534-3-2 Table 1)



Valve with actuator 24V

Art.	Flow rate [l/h]	H1 (mm)	H2 (mm)	L (mm)	DN (mm)	W1 (mm)	W2 (mm)	O.D (mm)	P.D.C (mm)	G (mm)	T (mm)	N-ØH (mm)
94FH 2"	20000	191	291	254	50	161	154	165	125	102	18	4-18
94FL 2 1/2"	20000	191	291	254	50	161	154	185	145	122	18	4-18
94FH 2 1/2"	30000	185	300	272	65	161	154	185	145	122	18	4-18
94FL 3"	30000	185	300	272	65	161	154	200	160	138	20	8-18
94FL 4"	55000	260	320	352	100	227	221	220	180	153	20	8-18
94FL 5"	90000	266	346	400	125	219	212	250	210	188	22	8-18
94FH 5"	120000	266	346	400	125	219	212	250	210	188	22	8-18
94FL 6"	90000	266	346	400	125	219	212	285	240	212	22	8-18

EvoPICV shipping weight information

Art.	Weight (Kg)
91VL 1/2"	0,88
91L 1/2"	0,88
91H 1/2"	0,88
91L 3/4"	0,95
91H 3/4"	0,95
91VL1 1/2"	0,84
91L1 1/2"	0,84
91H1 1/2"	0,84
91L1 3/4"	0,91
91H1 3/4"	0,91
91H 1"	1,05
91H1 1"	1,01

Art.	Weight (Kg)
91XVL 1/2"	0,77
91XL 1/2"	0,77
91XH 1/2"	0,77
91XVL/2 1/2"	0,76
91XL/2 1/2"	0,76
91XL/2 3/4"	0,76
91XH/2 3/4"	0,76
91XVL/3 1/2"	0,84
91XL/3 1/2"	0,84
91XH/3 1/2"	0,84
91XVL3S 1/2"	0,77
91XL3S 1/2"	0,77
91XH3S 1/2"	0,77

Art.	Weight (Kg)
83HJP 1 1/4"	8,30
83LJP 1 1/2"	8,30
83HJP 1 1/2"	8,30
83VLJP 2"	9,00
83LJP 2"	15,50
83HJP 2"	15,50
83HPR1 1 1/4"	8,46
83LPR1 1 1/2"	8,46
83HPR1 1 1/2"	8,46
83VLPR1 2"	9,16
83LPR1 2"	15,66
83HPR1 2"	15,66

Art.	Weight (Kg)
93L 3/4"	2,30
93H 3/4"	2,30
93L 1"	2,40
93H 1"	2,40
93L 1 1/4"	2,60
93H 1 1/4"	2,60

Art.	Weight (Kg)
94FH 2"	33,00
94FL 2 1/2"	40,00
94FH 2 1/2"	40,00
94FL 3"	43,00
94FL 4"	74,00
94FL 5"	93,00
94FH 5"	93,00
94FL 6"	98,00
94FH 6"	162,00

Art.	Weight (Kg)
A544O2	0,137
A544O4	0,137
A542O2	0,137
A542O4	0,137
A544P3	0,137
A564O2	0,137
A562O2	0,137
A564P3	0,137
VA7481	0,266
VA7482	0,266
SN08	1,55
SN08CC	1,55

