

# 94F



## EN Description

The 94F series PICV valve offers the following functions:

- Good valve authority to maintain temperature control and power output from the terminal unit using the complete stroke of the valve.
- Maximum design flow limitation: once set, the 94F maintains design flow regardless of pressure changes in the system.
- It can easily be set up once installed, using the M94F2 actuator provided.
- Fail safe option through M94FC (optional) and 2 x 18650 rechargeable batteries 2600 mAh (not included).
- Easy fitting system to assembly actuator.

## EN Valve features

- Modulating temperature control valve
- The design flow can be set on the actuator and then the valve maintains that flow during commissioning
- No requirement for differential pressure control and balancing valves
- Large diaphragm to ensure good performance
- No valve sizing calculation is required as it maintains constant differential pressure (then flow rate) across itself
- Conform to European Directive 2014/68/EU PED (ex 97/23/CE): DN50 art 4.3, from DN65 to DN200 cat. I, DN250 art 4.3

Temperature <sup>1</sup>	Working pressure max.	Stroke	Rangeability	Leakage	Accuracy 0 ÷ 1 bar <sup>2</sup>
-10 ÷ 120 °C	1600 kPa / 16 bar	15÷22 mm	>100 IEC 60534-2-3	Class IV IEC 60534-4	± 5%

	94FH 2"	94FL 2 1/2"	94FH 2 1/2"	94FL 3"	94FL 4"	94FL 5"	94FH 5"
<b>Flow rate max.</b>	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	90000 l/h 25,00 l/s	120000 l/h 33,33 l/s
<b>Start-up max.</b>	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	35 kPa 0,35 bar
<b>Connections</b>	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)	Flanged 5" EN 1092-2 EN 558 (face to face)	Flanged 5" EN 1092-2 EN 558 (face to face)
<b>ΔP max.<sup>3</sup> &amp; close off pressure<sup>4</sup></b>	600 kPa / 6 bar	600 kPa / 6 bar	600 kPa / 6 bar	600 kPa / 6 bar	600 kPa / 6 bar	600 kPa / 6 bar	600 kPa / 6 bar

	94FL 6"	94FH 6"	94FL 8"	94FH 8"	94FL 10" <sup>1,5</sup>	94FH 10" <sup>1</sup>
<b>Flow rate max.</b>	90000 l/h 25,00 l/s	150000 l/h 41,667 l/s	200000 l/h 55,56 l/s	300000 l/h 83,33 l/s	300000 l/h 83,33 l/s	500000 l/h 138,8 l/s
<b>Start-up max.</b>	35 kPa 0,35 bar	50 kPa 0,50 bar	40 kPa 0,40 bar	60 kPa 0,60 bar	40 kPa 0,40 bar	65 kPa 0,65 bar
<b>Connections</b>	Flanged 6" EN 1092-2 EN 558 (face to face)	Flanged 6" EN 1092-2 EN 558 (face to face)	Flanged 8" EN 1092-2 EN 558 (face to face)	Flanged 8" EN 1092-2 EN 558 (face to face)	Flanged 10" EN 1092-2 EN 558 (face to face)	Flanged 10" EN 1092-2 EN 558 (face to face)
<b>ΔP max.<sup>3</sup> &amp; close off pressure<sup>4</sup></b>	600 kPa / 6 bar	600 kPa / 6 bar	400 kPa / 4 bar	400 kPa / 4 bar	400 kPa / 4 bar	400 kPa / 4 bar

1. max operating temperature of DN250 is reduced to 110°C on all EU countries. 94FHE 10" must be ordered on all EU countries.

2. at 100%. For other presetting and differential pressure, refer to "Flow setting accuracy" on the PICV manual.

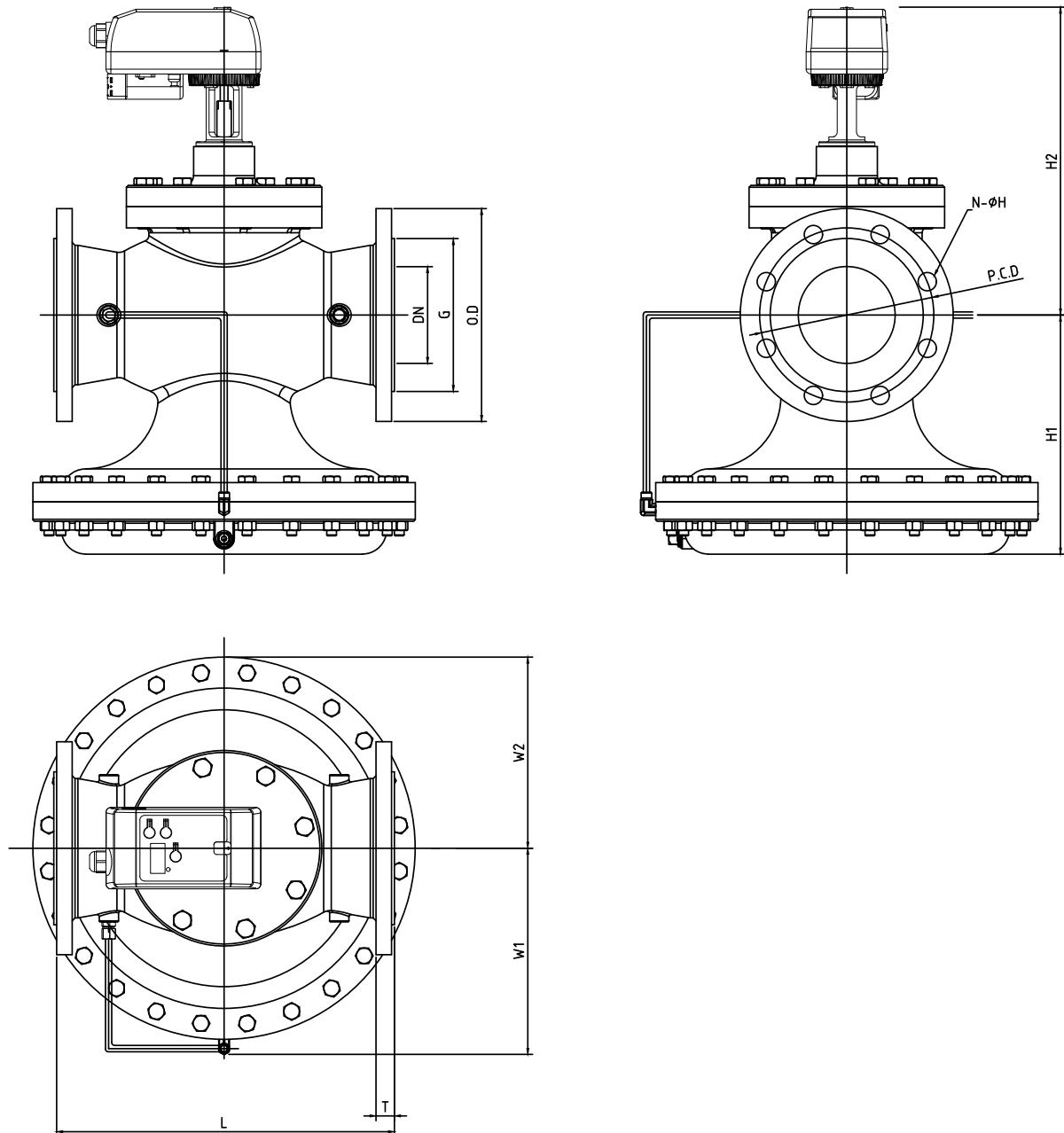
3. see product instructions for further information.

4. closing the valve by means of the actuator. Not suitable to be used for end of line service.

5. 94FL 10" available upon request.



EN Dimensional data



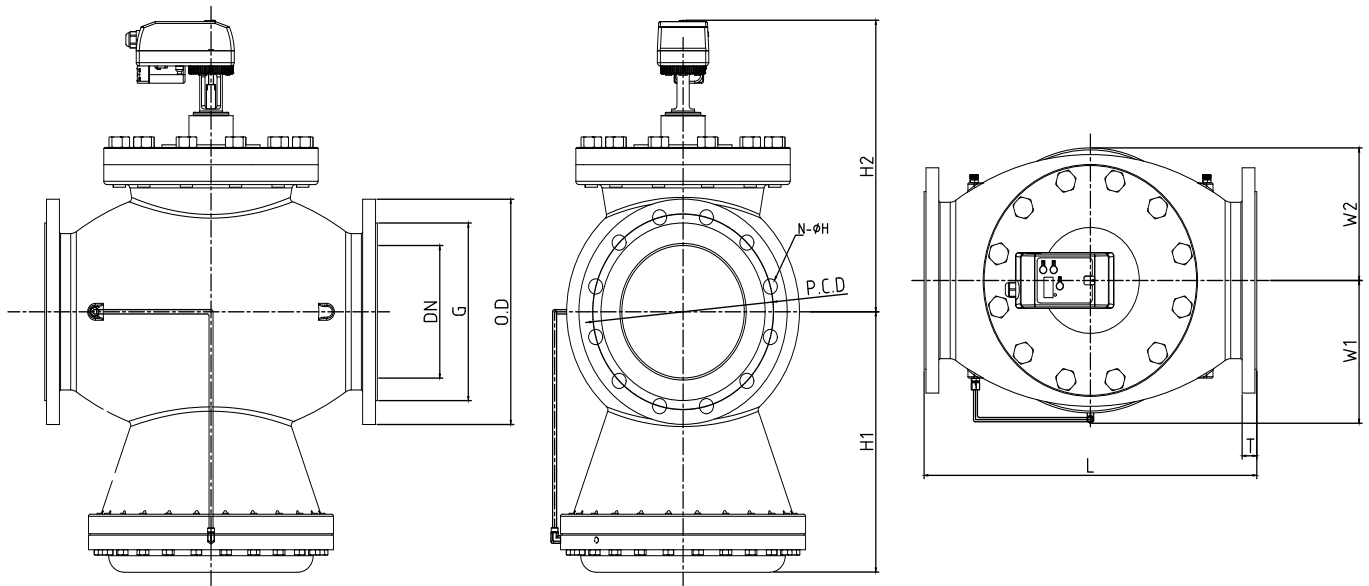
Valve with actuator 24V												
Art.	Flow rate [ l/h ]	H1 (mm)	H2 (mm)	L (mm)	DN (mm)	W1 (mm)	W2 (mm)	O.D (mm)	P.D.C (mm)	G (mm)	T (mm)	N-ØH (mm)
94FH 2"	20000	190	291	254*	50	155	139	165	125	102	16	4-18
94FL 2 1/2"	20000	190	291	254*	65	155	139	185	145	122	18	4-18
94FH 2 1/2"	30000	183	300	272	65	155	139	185	145	122	18	4-18
94FL 3"	30000	183	300	272	80	155	139	200	160	138	18	8-18
94FL 4"	55000	247	318	352*	100	213	198	220	180	158	18	8-18
94FL 5"	90000	264	347	400***	125	213	198	250	210	188	20	8-18
94FH 5"	120000	264	347	400***	125	213	198	250	210	188	20	8-18
94FL 6"	90000	264	346	400**	150	213	198	285	240	212	22	8-22
94FH 6"	150000	348	397	451*	150	213	198	285	240	212	22	8-22

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

\*\* EN558 ( DIN 3202 Part.1 - Series F6 )

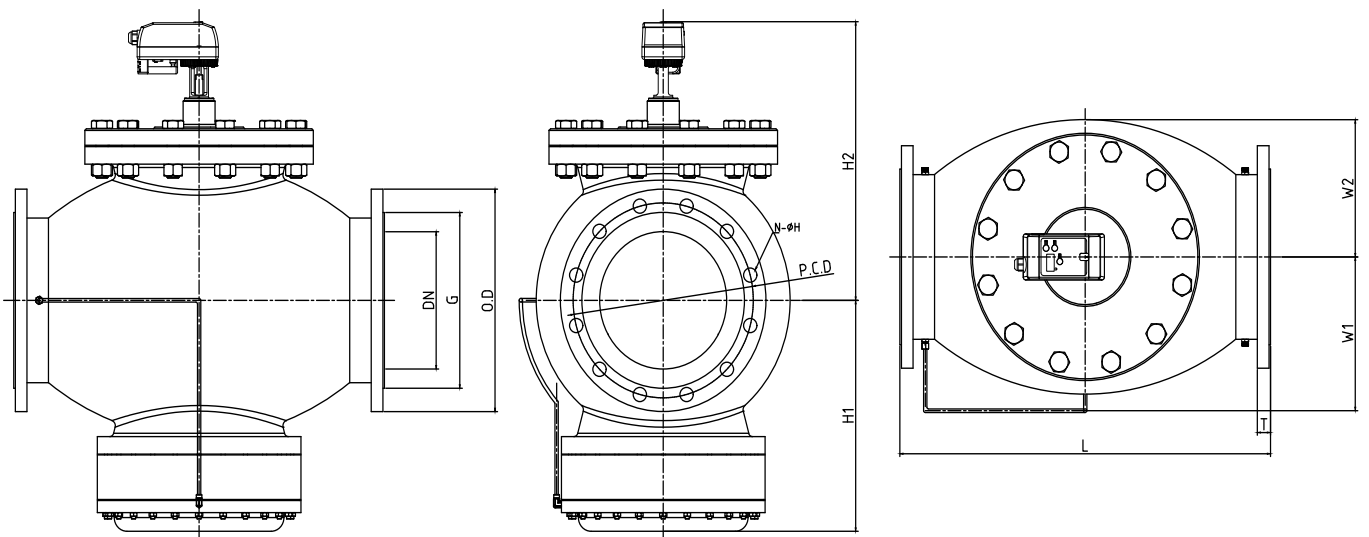
\*\*\* EN558 ( DIN 3202 Part.1 - Series F1 )





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)
94FL 8"	200000	393	440	543	200	216	200	340	295	268	22	12-22
94FH 8"	300000	393	440	543	200	216	200	340	295	268	22	12-22

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

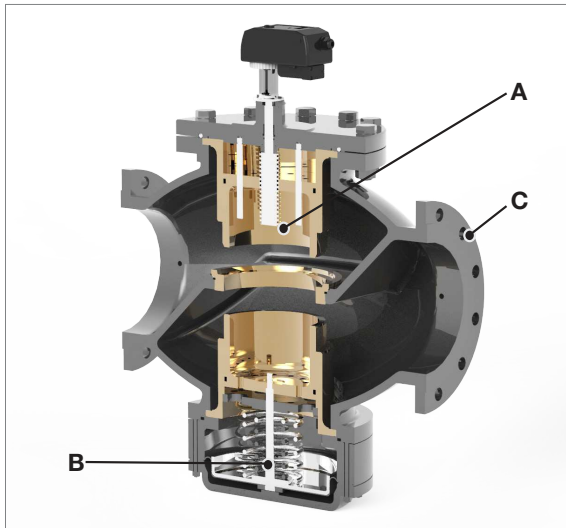


Valve with actuator 24V												
Art.	Flow rate [ l/h ]	H1 (mm)	H2 (mm)	L* (mm)	DN (mm)	W1 (mm)	W2 (mm)	O.D (mm)	P.D.C (mm)	G (mm)	T (mm)	N-ØH (mm)
94FL 10"	300000	421	508	730	250	283	250	405	355	320	24	12-26
94FH 10"	500000	421	508	730	250	283	250	405	355	320	24	12-26

\* EN558 ( DIN 3202 Part.1 - Series F1 )



EN Materials and weight



Material list	
<b>Regulating valve (A)</b>	Stainless steel AISI 304 Bronze BC6
<b>Diaphragm (B)</b>	Stainless steel AISI 303 Bronze BC6 - EPDM
<b>Body (C)</b>	Ductile iron
<b>Gaskets</b>	EPDM-x

Art.	Weight (Kg)
<b>94FH 2"</b>	33
<b>94FL 2 1/2"</b>	40
<b>94FH 2 1/2"</b>	40
<b>94FL 3"</b>	43
<b>94FL 4"</b>	74
<b>94FL 5"</b>	93
<b>94FH 5"</b>	93

Art.	Weight (Kg)
<b>94FL 6"</b>	98
<b>94FH 6"</b>	162
<b>94FL 8"</b>	280
<b>94FH 8"</b>	280
<b>94FL 10"</b>	385
<b>94FH 10"</b>	385

EN Actuator features M94F2

Each 94F comes with a M94F2 proportional actuator (for complete technical information, please refer to M94F2 technical specification):

- Proportional, ON-OFF and floating control
- Position detecting
- 4 Digit Display
- 3 buttons to set parameter
- Position control method to set actuator
- Fail safe option through M94FC (2x18650 batteries not included)
- Easy fitting gear. Square of the stem: 8mm
- Extended life: over 50.000 cycles

Control signal	0(2)-10V - 0(4)-20mA ON/OFF - 3 point floating - PWM - Remote Control through RS485
Supply voltage	24V AC/DC ±15% - 50/60 Hz
Current consumption	80 mA; Load max 380 mA
Power consumption	5 W; 2.5 W stand-by
Feedback	0(4) - 20 mA and 0(2) - 10 V
Manual Override	Through release button and 6mm Allen key

Torque	10 Nm Max, self-limited at 7 Nm
Running speed	Selectable: 1 RPM or 1.5 RPM
Ambient temperature	-20° / + 60°C (@)
Storage temperature	-20° / + 80°C (@)
Class/Degree of protection	II / IP54
Connecting cable	18 AWG
Motor	Brushless DC motor

EN Installation instructions

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

	94FL 8"	94FH 8"	94FL 10"	94FH 10"
<b>Start-up ΔP</b>	40 kPa 0,40 bar	60 kPa 0,60 bar	40 kPa 0,40 bar	65 kPa 0,65 bar

Medium
Water / Water+glycol 30%

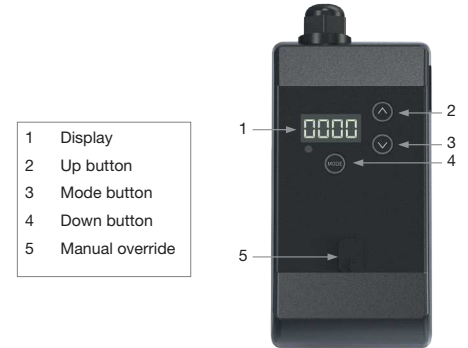
(@) no condensation



**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 15).

- SET1 - Selecting input indication in direct internal control mode
- SET2 - Selecting an input signal
- SET3 - Min. flow setting
- SET4 - Max. flow setting
- SET5 - Selecting parameters display mode during operation
- SET6 - Rotation angle compensation
- SET7 - Flow offset compensation
- SET8 - Power failure mode (if fail safe option is fit)
- SET9 - Flow rate units selection
- SET10 - Control curve selection (LIN - EQ)
- SET11 - Min voltage signal in PID control mode
- SET12 - Max voltage signal in PID control mode
- SET13 - Actuator rotation speed
- SET14 - Feedback signal selection
- SET15 - RS485 ID number

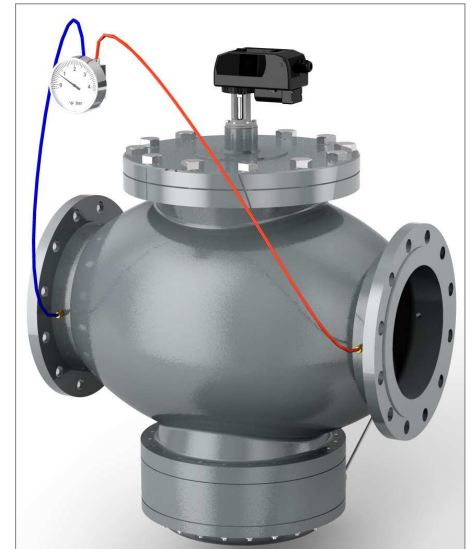


**3. Operating control**

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.

Pettinaroli **MDPS2** is the device which allows to do it: along with a smartphone and the dedicated app, it can directly give the user the differential pressure compared to the start-up differential pressure of the valve (proper valve has to be selected among all the Pettinaroli EvoPICV catalogue).



**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.

**EN Actuator wiring and programming**

**Valve wiring**

Black	1	Common
Red	2	24VAC/DC
White	3	Control Signal 1
Green	4	Control Signal 2
Blue	5	Feedback Signal
Yellow	6	Remote control +
Brown	7	Remote control +

Wiring guide

Input	Number	1	2	3	4	5	Remarks
	Color	Black	Red	White	Green	Blue	
Internal control	Common	24VAC/ DC				Feedback (0)2-10 V (0)4-20 mA	Power: cable 1 - 2
Voltage signal	Common	24VAC/ DC	0 ~10VDC 2 ~10VDC			Feedback (0)2-10 V (0)4-20 mA	Power: cable 1 - 2 Voltage signal: cable 1 - 3
Current signal	Common	24VAC/ DC	0 ~ 20mA 4 ~ 20mA			Feedback (0)2-10 V (0)4-20 mA	Power: cable 1 - 2 Current signal: cable 1 - 3
ON / OFF signal	Common	24VAC/ DC	24DCV (open) 0V(close)			Feedback (0)2-10 V (0)4-20 mA	Power: cable 1 - 2 ON/OFF signal: cable 1 - 3
3 Points floating	Common	24VAC/ DC	Opening 24V AC/DC	Closing 24V AC/DC		Feedback (0)2-10 V (0)4-20 mA	Power: cable 1 - 2 Floating 3 points: cable 3 - 4
PWM control	Common	24VAC/ DC	PWM signal			Feedback (0)2-10 V (0)4-20 mA	Power: cable 1 - 2 PWM control: cable 1 - 3

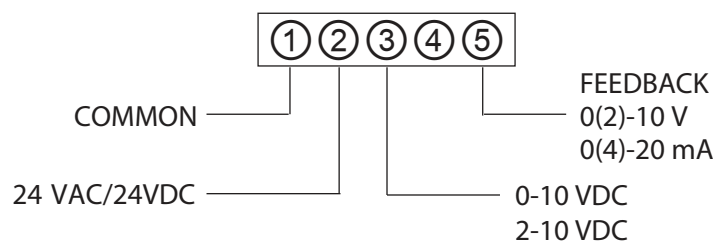
Cables 1 & 2: power

Cables 3 & 4: control signal; please refer to the table above

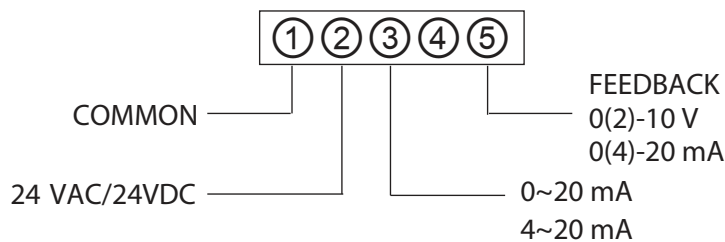
Cable 5: only used for feedback

Control method

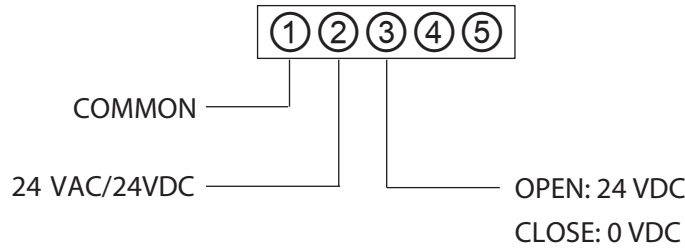
1. Analog voltage signal



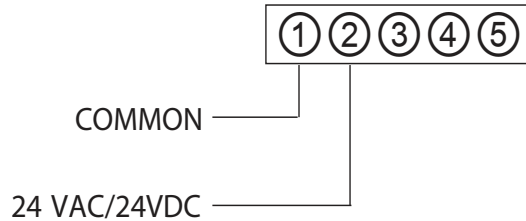
2. Analog current signal



3. ON/OFF control

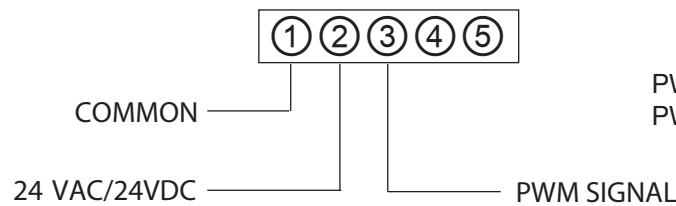


4. Internal control\*



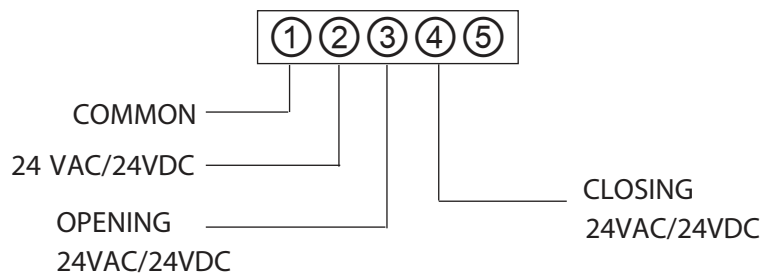
\* flow rate can be set through buttons on the actuator and it can be read on the 4 digits display

5. PWM signal



PWM Type1: 0.1 - 5 s / Step 20 ms  
 PWM Type2: 0.1 - 25 s / Step 100 ms

6. 3 points floating



The digital method is sensitive to electric noise occurring from electronic equipment; therefore connection of a 1k Ohm resistor between wire n. 3 and wire n. 1 and a 0.5 W resistor between wire n. 4 and wire n. 1 is recommended. This will prevent any electric noise.

If PWM control (No 5) or memote control is used, please check with Fratelli Pettinaroli technical staff.

For Remote Control, set SET2 on RT and select ID number on SET15.

**Settings**

When power is on, display indicates 'Go-0' and the actuator automatically looks for the valve zero point. Do not press any buttons as this might cause incorrect flow control.

A safety function is built in the actuator: in case the zero point is not detected the actuator can be activated by pressing the DOWN button. By means of DOWN button it is possible to force the zero position setting.

Pressing the MODE button, the actuator shows the setting menu. Use the UP and DOWN buttons to browse through the menu. Settings indications are specified in the following.

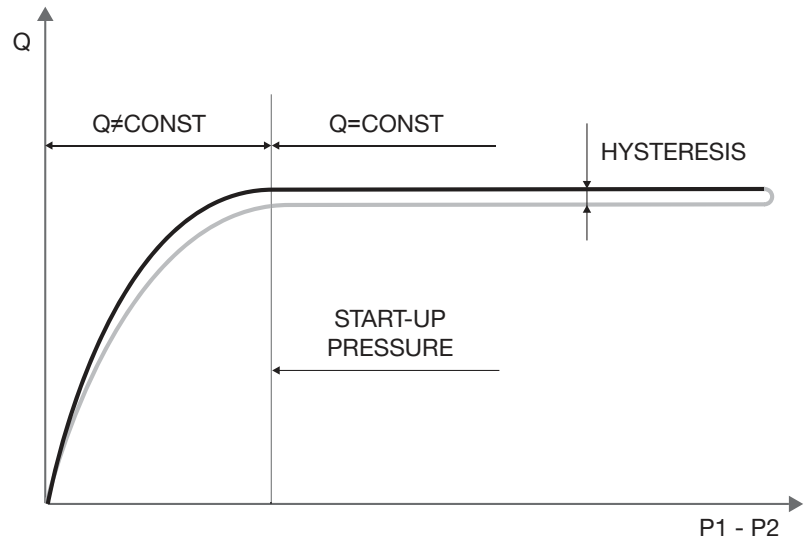
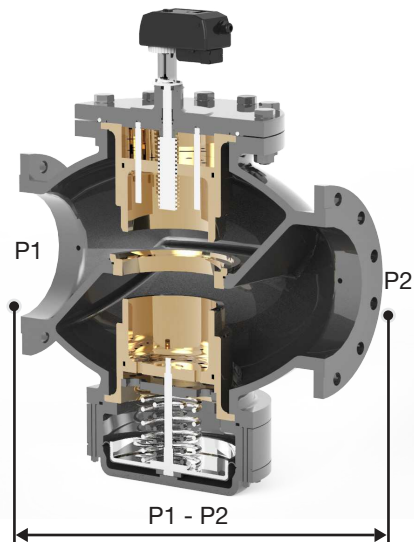
	Display indication	Meaning	Operating
SET 1	<i>PErc</i>	Input internal control in %	Selection with UP/DOWN buttons and confirmation with MODE button
	<i>FLo</i> (default)	Input internal control in flow rate	
SET 2	<i>0-10</i> (default)	Voltage control signal	Control with voltage signal
	<i>2-10</i>	Voltage control signal	Control with voltage signal
	<i>0-20</i>	Current control signal	Control with current signal
	<i>4-20</i>	Current control signal	Control with current signal
	<i>on-F</i>	ON/OFF	24 V: open; 0 V: close;
	<i>3-FL</i>	3 points floating	opening giving white wire 24 V closing giving green wire 24 V
	<i>rT</i>	Remote control	RS485 communication
	<i>P-05</i>	PWM 5 s	PWM (0.1 – 5 s)
	<i>P-25</i>	PWM 25 s	PWM (0.1 – 25 s)
	<i>Int</i>	Internal input	Flow rate set by on board display and buttons. Push MODE, wait until “Set” is replaced by flow rate indication (or flow rate %, depending on SET 1), set the flow rate with UP/DOWN buttons and confirm with MODE.
SET 3	Flow rate on display	Min flow rate selection (default: 0)	Selection with UP/DOWN buttons and confirmation with MODE button
SET 4	Flow rate on display	Max flow rate selection (default: depending on model)	Selection with UP/DOWN buttons and confirmation with MODE button
SET 5	<i>St-P</i>	Set flow rate in “%”	Selection with UP/DOWN buttons and confirmation with MODE button Display option during operation: St allows to see the flow rate value required by the controller; Fd allows to see the current flow rate value given by the valve (the progressive change of flow rate values is displayed during valve stem motion)
	<i>St-F</i>	Set flow rate in “flow rate”	
	<i>Fd-P</i>	Current flow rate in “%”	
	<i>Fd-F</i> (default)	Current flow rate in “flow rate”	
SET 6*	Value on display	Rotation angle compensation	Selection with UP/DOWN buttons and confirmation with MODE button
SET 7	Value on display	% flow rate offset (default: 0)	Selezione con tasti SU/GIÙ e conferma con tasto MODE.
SET 8	<i>oPEN</i>	Valve open at power failure	Selection Fail-CLOSE or Fail-OPEN option. Additional battery needed. <b>Available with M94FC+batteries.</b>
	<i>CLoS</i> (default)	Valve close at power failure	
SET 9	<i>LIt</i> (default)	Unit SI (m3/h)	Selection with UP/DOWN buttons and confirmation with MODE button
	<i>GAL</i>	Unit GPM (gal/min)	
SET 10	<i>LIn</i> (default)	Linear control curve	Selection with UP/DOWN buttons and confirmation with MODE button
	<i>EPEr</i>	Equal percentage control curve	
SET 11*	Value on display	Min voltage control signal	Selection min voltage control value with UP/DOWN buttons and confirmation with MODE button
SET 12*	Value on display	Max voltage control signal	Selection max voltage control value with UP/DOWN buttons and confirmation with MODE button
SET 13	<i>PE15</i> (default)	Actuator rotation speed 1.5 RPM	Selection of actuator rotation speed with UP/DOWN buttons and confirmation with MODE button
	<i>PE01</i>	Actuator rotation speed 1 RPM	
	<i>Ruto</i>	Actuator rotation speed automatic	
SET 14	<i>0-10</i> (default)	Voltage feedback signal	Selection of feedback signal type with UP/DOWN buttons and confirmation with MODE button
	<i>2-10</i>	Voltage feedback signal	
	<i>0-20</i>	Current feedback signal	
	<i>4-20</i>	Current feedback signal	
SET 15	<i>1 to 254</i> (default 247)	RS485 ID number	ID selection with UP/DOWN and confirmation with MODE

\* Contact the supplier to modify.





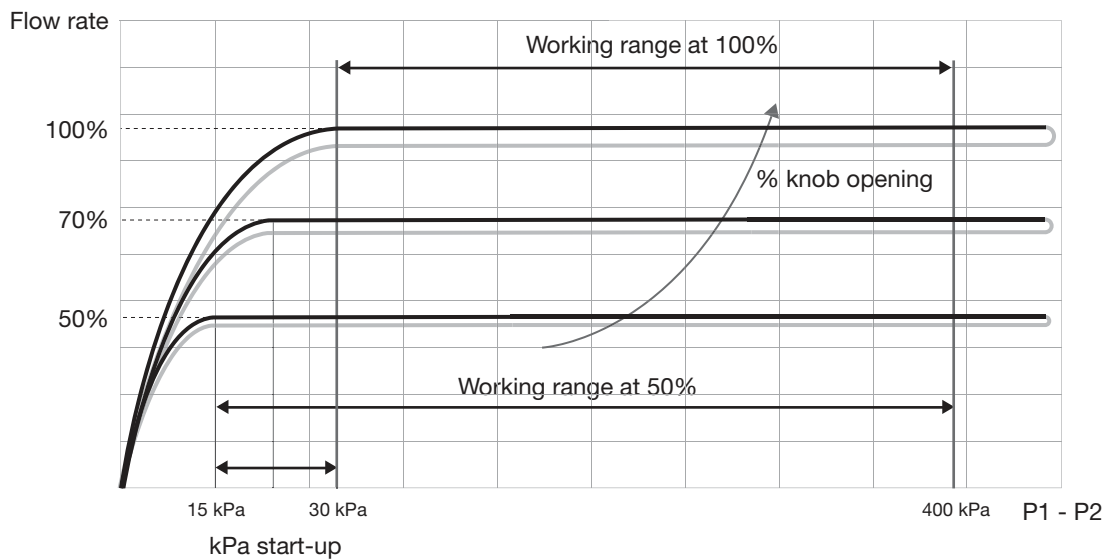
## EN Start-up curves and presetting



The example above shows a characteristic curve where start-up pressure, hysteresis and accuracy can be evaluated.

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  $\Delta P$  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:

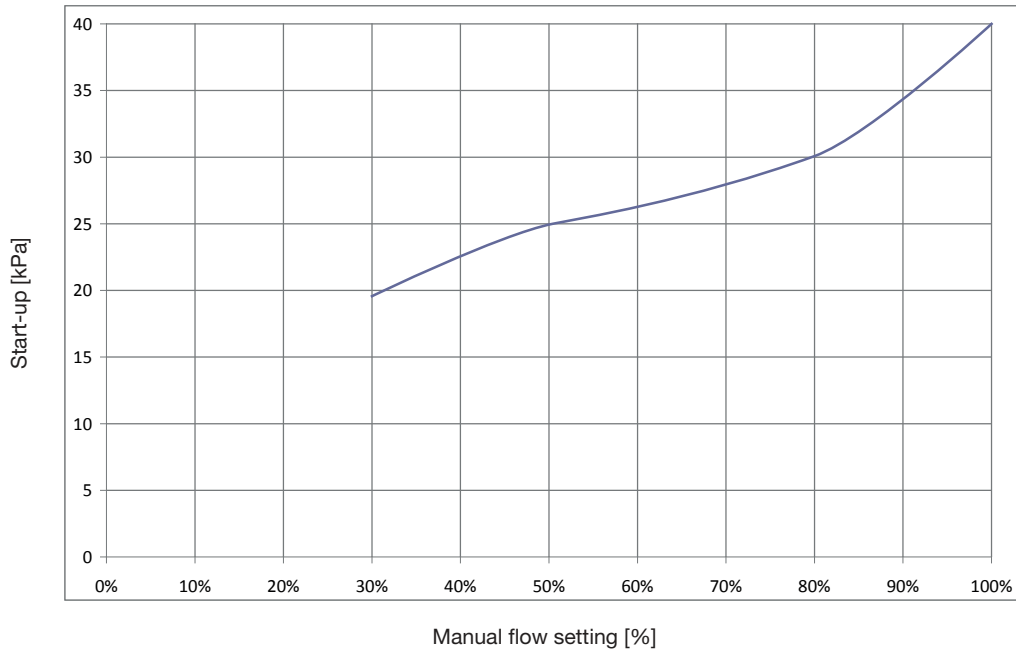


When the valve is set at 100% of nominal (maximum) flow, the curve begins to remain constant at 30 kPa, therefore the working range of the valve is  $30 \div 400$  kPa;

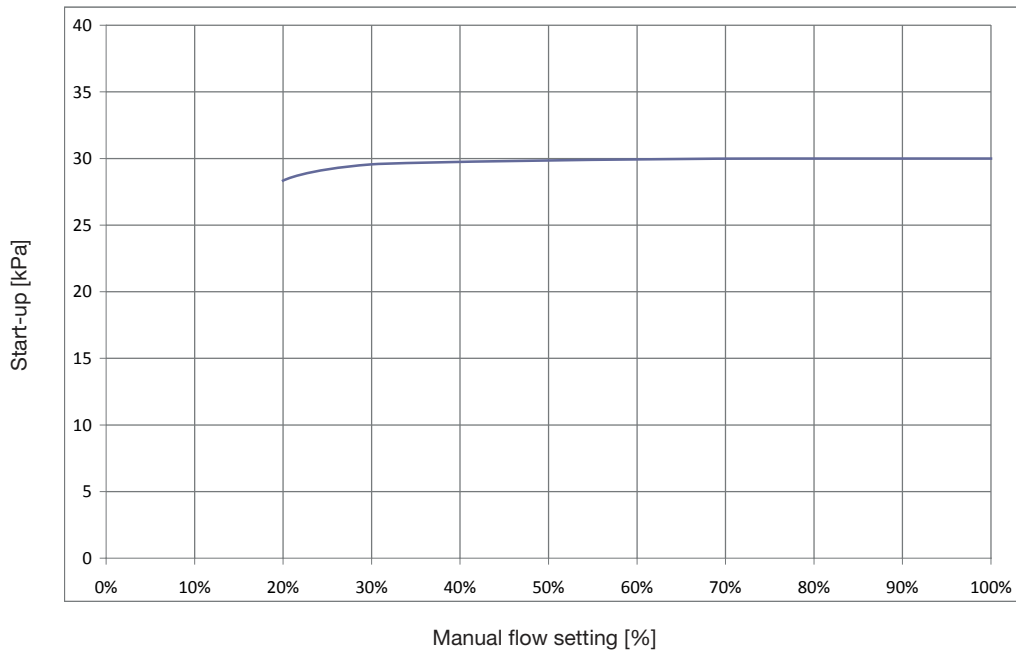
When the valve is set at 50% of nominal flow, the curve begins to remain constant at 15 kPa, therefore the working range of the valve is  $15 \div 400$  kPa.

Over 400 kPa the fluid velocity through the valve is extremely high and cavitation may happen due to extreme turbulence of the flow.

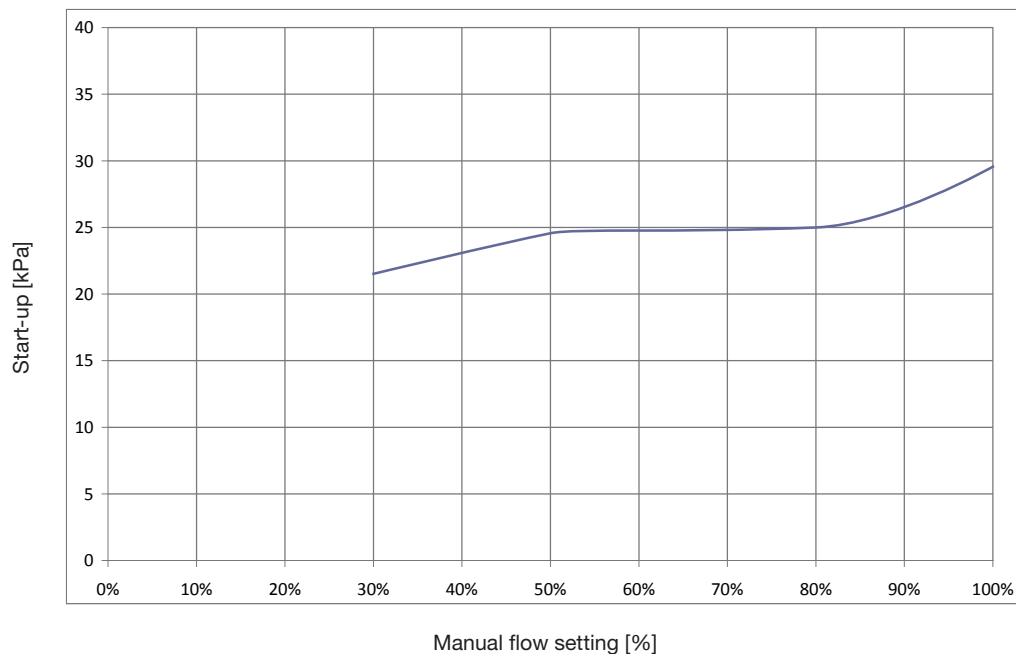
Because of these phenomena the valve can get damaged. For energy saving reasons, we suggest to continuously work the valve under 400 kPa.



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

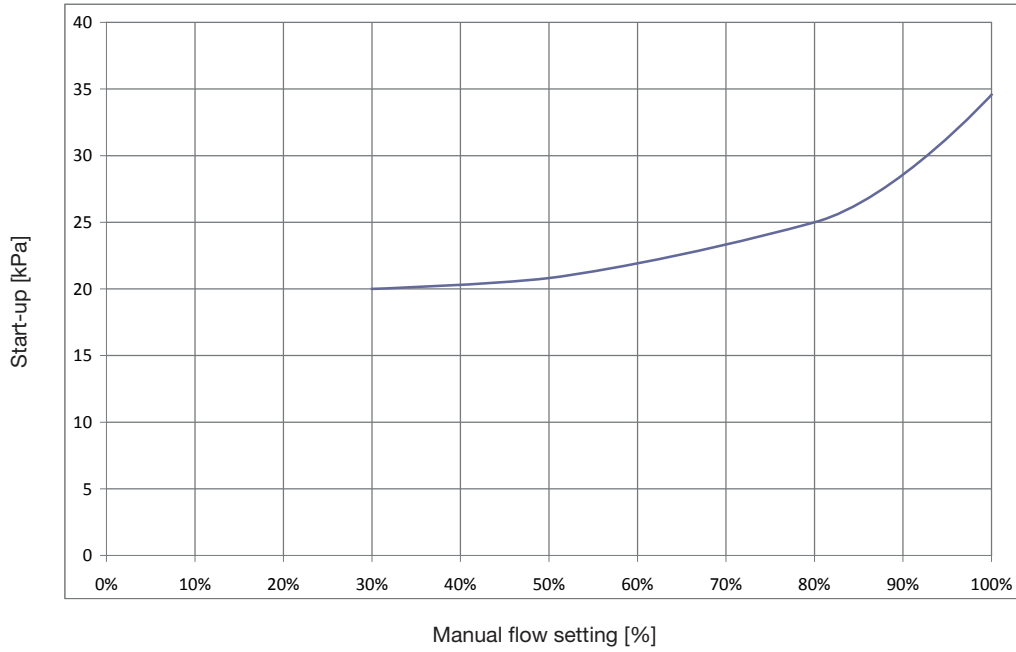


Valve model
94FH 2 1/2" - 30000 l/h
94FL 3" - 30000 l/h

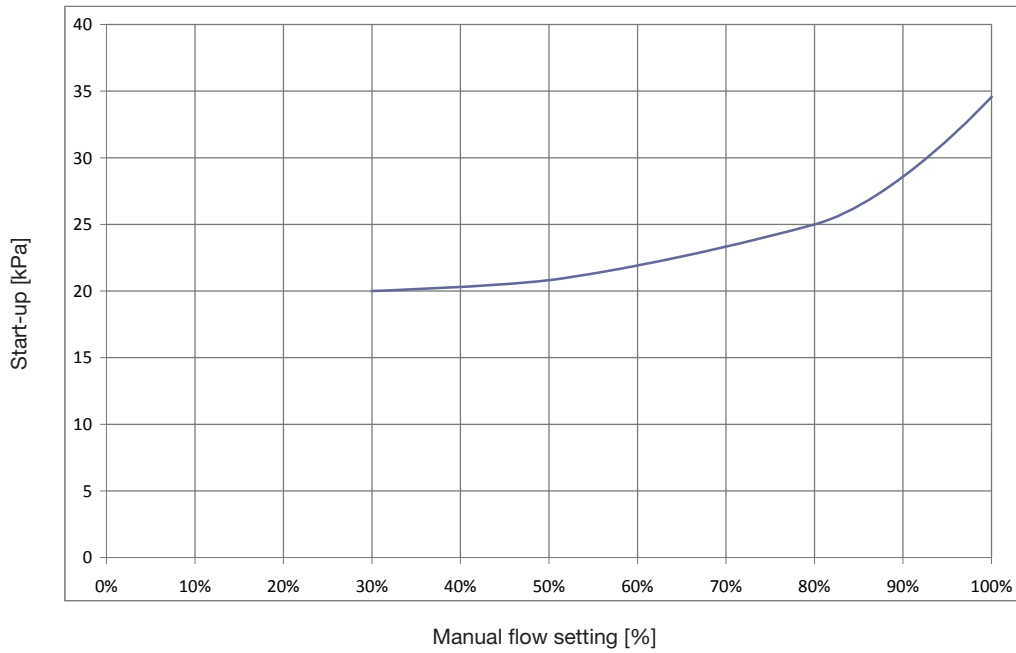


Valve model
94FL 4" - 55000 l/h

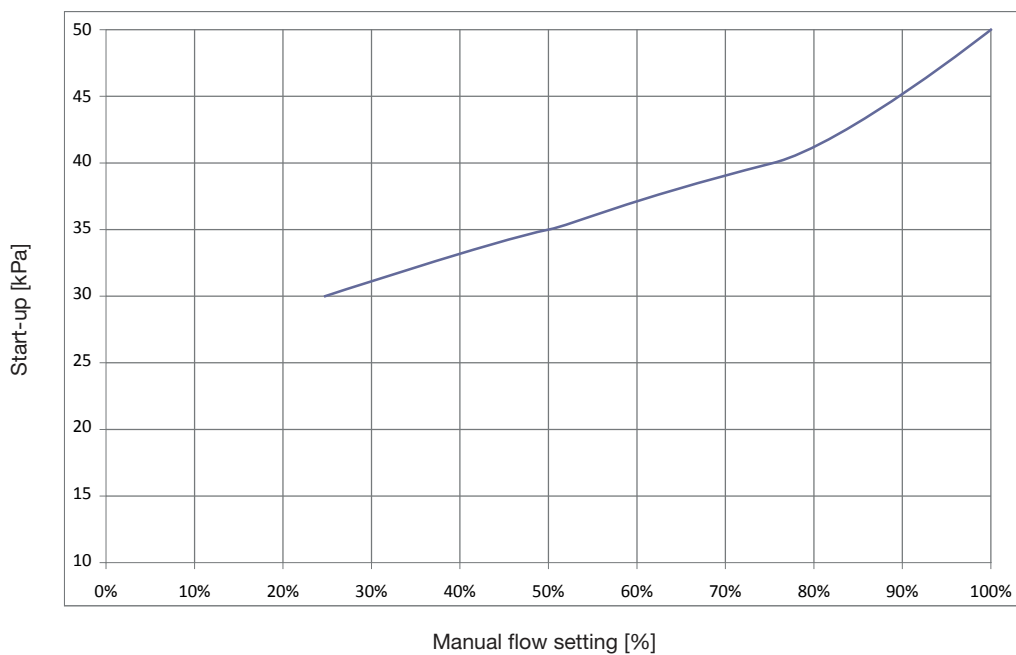




Valve model
94FL 5" - 90000 l/h
94FL 6" - 90000 l/h

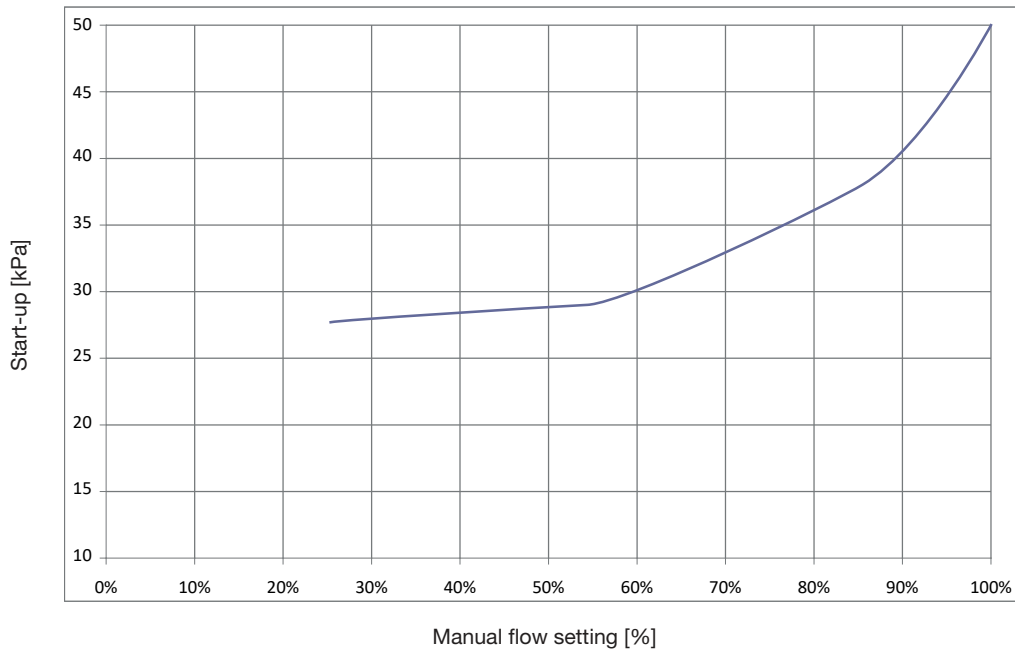


Valve model
94FH 5" - 120000 l/h

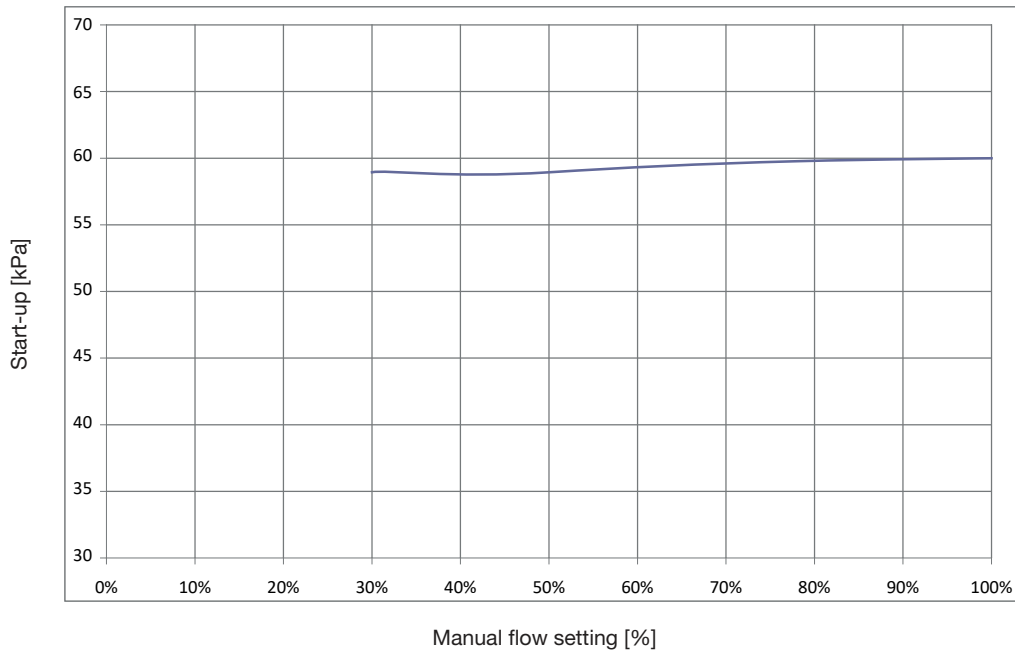


Valve model
94FH 6" - 150000 l/h

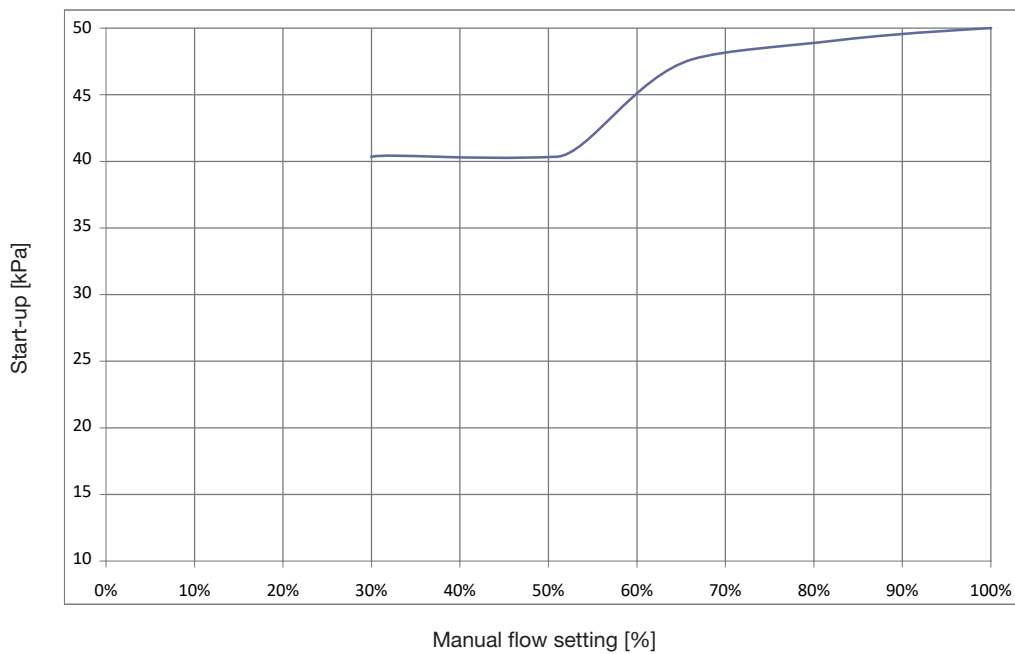




Valve model  
94FL 8" - 200000 l/h

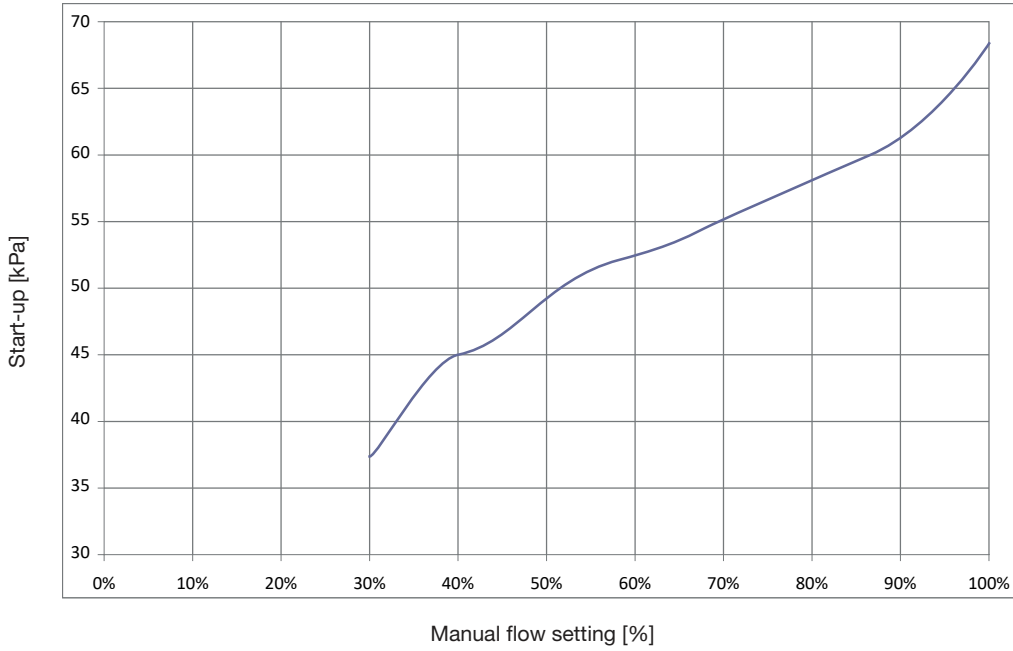


Valve model  
94FH 8" - 300000 l/h



Valve model  
94FL 10" - 300000 l/h





Valve model  
94FH 10" - 500000 l/h

Flow pre-setting 94F EvoPICV

Presetting %	94FH 2" / 94FL 2 1/2"		94FH 2 1/2" / 94FL 3"		94FL 4"		94FL 5" / 94FL 6"		94FH 5"		94FH 6"	
	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	30000	8,333	55000	15,278	90000	25,000	120000	33,333	150000	41,667
90	18000	5,000	27000	7,500	49500	13,750	81000	22,500	108000	30,000	135000	37,500
80	16000	4,444	24000	6,667	44000	12,222	72000	20,000	96000	26,667	120000	33,333
70	14000	3,889	21000	5,833	38500	10,694	63000	17,500	84000	23,333	105000	29,167
60	12000	3,333	18000	5,000	33000	9,167	54000	15,000	72000	20,000	90000	25,000
50	10000	2,778	15000	4,167	27500	7,639	45000	12,500	60000	16,667	75000	20,833
40	8000	2,222	12000	3,333	22000	6,111	36000	10,000	48000	13,333	60000	16,667
30	6000	1,667	9000	2,500	16500	4,583	27000	7,500	36000	10,000	45000	12,500
20	4000	1,111	6000	1,667	-	-	18000	5,000	24000	6,667	30000	8,333
10	-	-	-	-	-	-	-	-	12000	3,333	15000	4,167

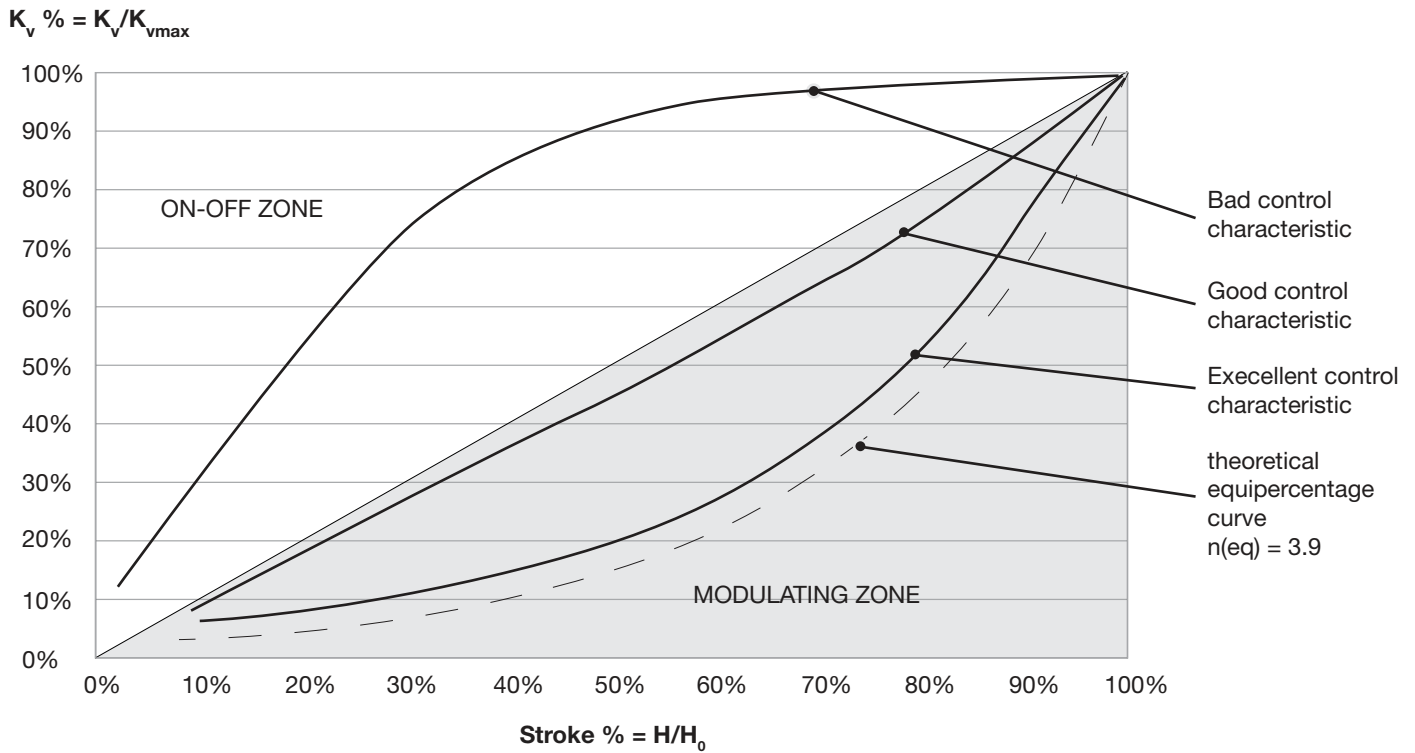
Presetting %	94FL 8"		94FH 8"		94FL 10"		94FH 10"	
	Flow rate		Flow rate		Flow rate		Flow rate	
	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s
100	200000	55,56	300000	83,33	300000	83,33	500000	138,8
90	180000	50,00	270000	75,00	270000	75,00	450000	124,9
80	160000	44,44	240000	66,67	240000	66,67	400000	111
70	140000	38,89	210000	58,33	210000	58,33	350000	97,1
60	120000	33,33	180000	50,00	180000	50,00	300000	83,2
50	100000	27,78	150000	41,67	150000	41,67	250000	69,3
40	80000	22,22	120000	33,33	120000	33,33	200000	55,4
30	60000	16,67	90000	25,00	90000	25,00	150000	41,5
20	-	-	-	-	60000	16,67	-	-
10	-	-	-	-	-	-	-	-



### EN Control curves

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

Typical control valve characteristic curves.\*

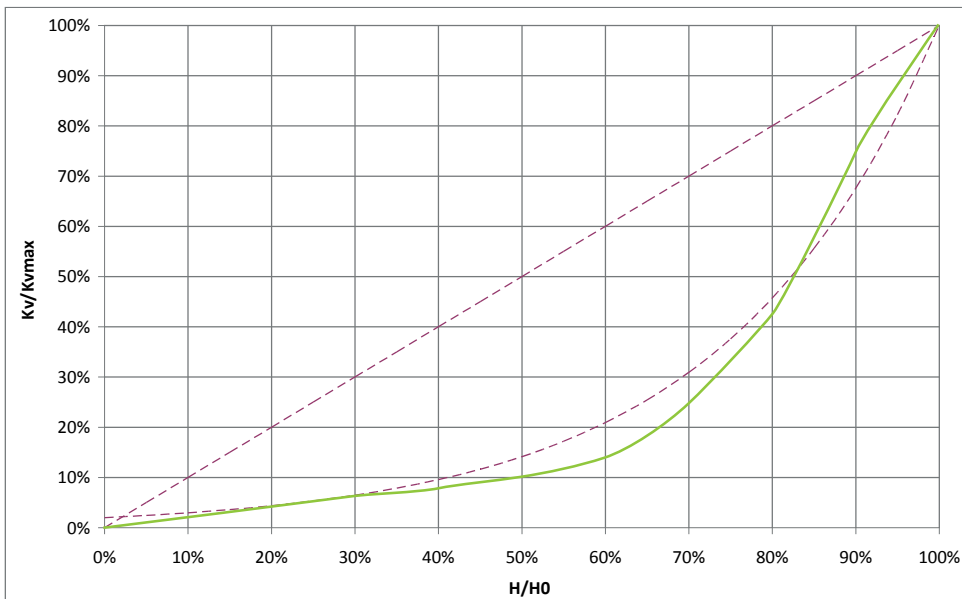


Combining the **EvoPICV** valve characteristic with heat exchanger results in a linear control system.

In the next page control curves of 94F are shown.

\* Control curve characteristic may change according to valve version.

Equal percentage mode

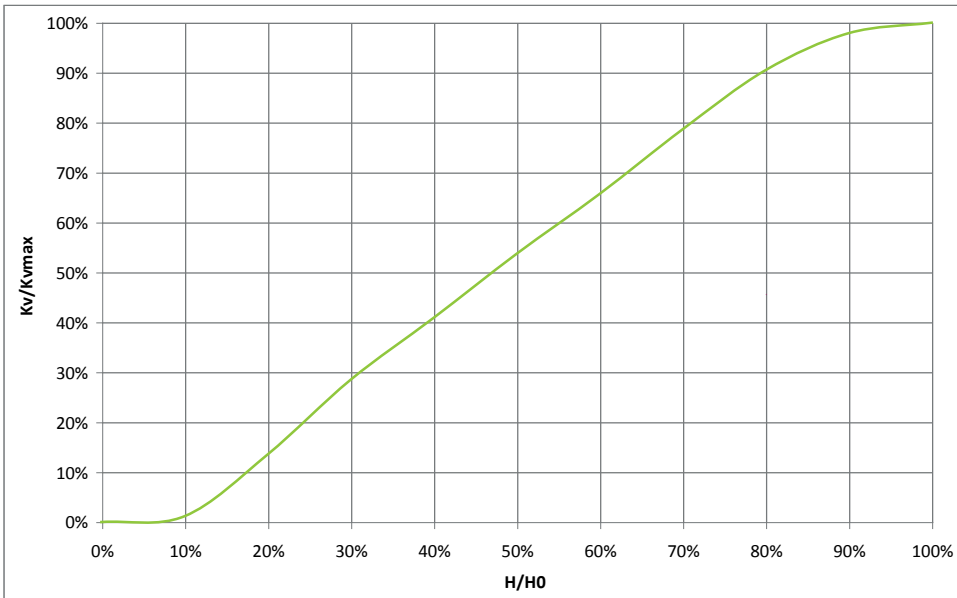


- H: current lift (opening) of the control valve; H varies from 0 to  $H_0$
- $H_0$ : maximum lift of the control valve;
- $K_v$ : valve flow factor at lift = H
- $K_{vmax}$ : valve flow factor at lift =  $H_0$

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
94FL 8" - 200000 l/h
94FH 8" - 300000 l/h
94FL 10" - 300000 l/h
94FH 10" - 500000 l/h
Presetting positions
Any



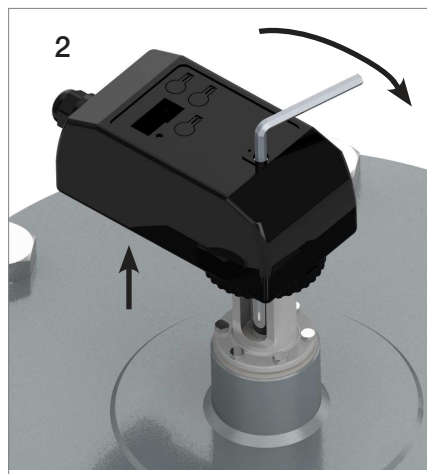
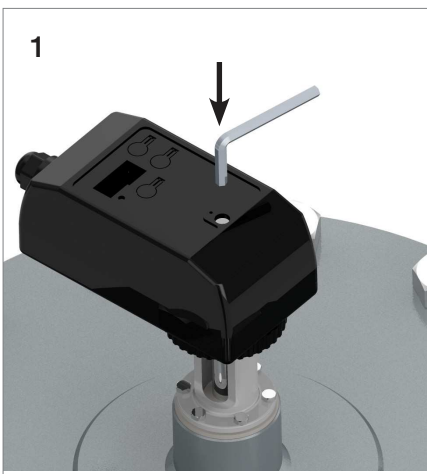
Linear mode



EN Ratio between flow rate and opening position (according to characteristic curve)

Position of valve lift [%]	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Linear curve [%]	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Equal percentage curve [%]	0	2	3	4	4	5	6	8	10	12	14	17	21	25	31	38	46	56	68	82	100

EN Manual override



1. Open the rubber cover on the actuator and insert the 6mm Allen key.
2. Turn the key keeping the released button pushed under the actuator.

## EN Actuator fitting

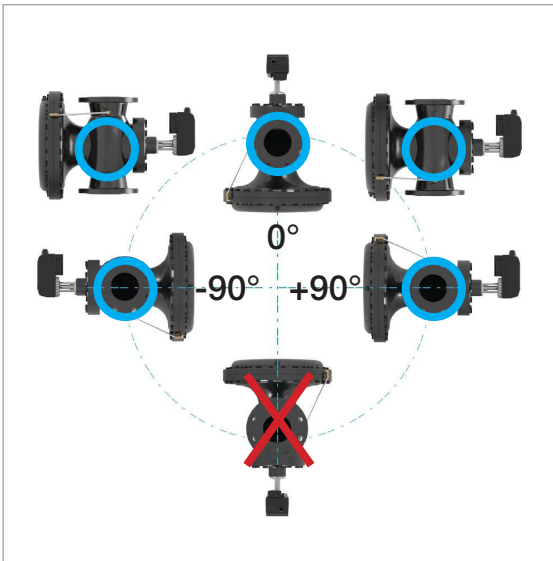


To assembly the actuator, follow the next procedure:

1. Completely open the valve with an 8 mm spanner (max torque 7 Nm)
2. Install the actuator in the same position of that has been previously removed
3. Insert the three pins in specific buttonholes on the fixing plate
4. Turn the fixing ring
5. Close the valve by means of the actuator which has to be electrically connected; the actuator performs a new Zero Detection cycle

Please note that care must be taken to actuator installation: little angular deviations can compromise the correct actuator operation.

## EN Valve and actuator installation



Valve must be installed among the allowed positions, marked by a blue circle.

Do not install the valve upside-down or below  $-90^{\circ}/+90^{\circ}$ . Actuator must be always installed at upward position as shown by the picture beside.

## EN Generals

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 standard. Fratelli Pettinaroli suggests to follow recommendations of VDI 2035/1 too. Maximum suggested content (total) content of Iron and Copper should be: Fe < 0.5 mg/kg and Cu < 0.1 mg/kg.

Furthermore, maximum iron oxide in the water passing through control valve (PICV) must 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 dirt that might clog the valve.

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