

# PICV-85 and 94FA

## Technical Manual



# PICV 85



The pressure independent control valve (PICV) combines the functions of a differential pressure controller, regulation valve and 2 port control valve into a single body.

The PICV incorporates a small diaphragm type DPCV in order to keep a constant differential pressure across an orifice and to provide a constant flow rate whilst the differential pressure is within the operating limits of the valve. Beyond these working pressures the valve acts as a fixed orifice.

Making this orifice adjustable allows the valve to be pre-set to deliver a range of flow rates. In the case of the PICV valve this adjustment can be made in situ without removing any covers or actuators if the accessory 081PR1 is on; this device is already mounted on the valves. The adjustment wheel is lockable.

The PICV valve also includes 2 port temperature control by means of a special pattern ball valve. The hole of the ball valve is machined to give a near equal-percentage flow control characteristic. Due to the fact that the differential pressure across the valve seat is constant it can be said that the authority of this control valve is very close to 1.

Due to the way the PICV valve controls the flow rate, irrespective of differential pressure branch and sub mains, balancing valves are not required. The flow rate is maintained at the terminal unit regardless of system conditions making the valve ideal for systems with inverter driven pumps.

By turning 180° the ball valve becomes a fullport valve and the pressure regulator gets blocked. So the flashing of the valve is possible.

## Valve Features

The **85 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 85 valve maintains design flow regardless of pressure changes in the system.
- It can easily be set up once installed, using the actuator or by means of the device 081PR1.
- Measure by means of a specific meter of the differential pressure across the valve: in this way user can verify if the start-up pressure has been reached and overpassed.

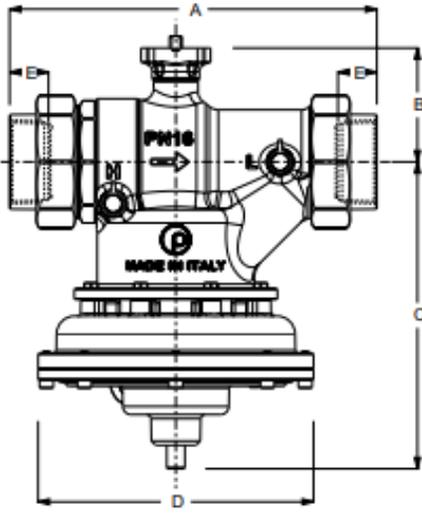
Δ P max.	Temperature	Working pressure max.	Stroke (max)	Rangeability	Leakage	Accuracy 0 - 1 bar *
87 PSI	-14 to 248 °	232 PSI	90 °	>100	Class IV	+/- 5%



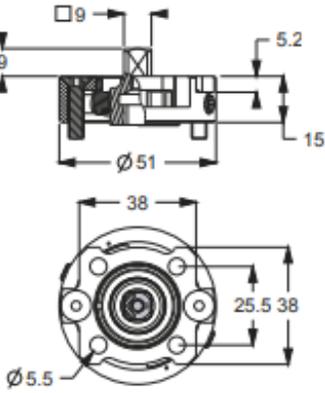
	85 1-1/4"	85 1-1/2"	85 2"	85 2"
Flow rate max.	26.4 GPM	39.6 GPM	52.8 GPM	79.2 GPM
Start-up max.	4.35 psi	5.07 psi	5.07 psi	5.07 psi
Connections	1-1/4" FNPT	1-1/2" FNPT	2" FNPT	2" FNPT

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

# Dimensional Data

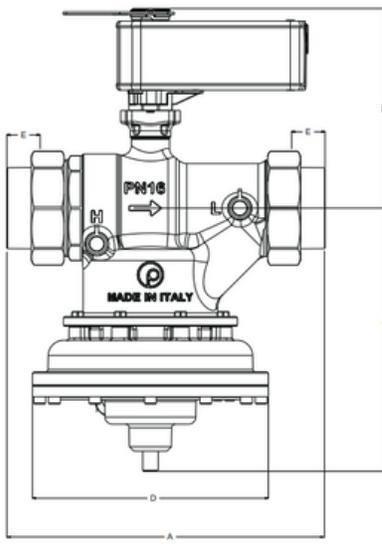


Part Number	Flow Rate	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
85 1-1/4"	26.4	233	89	176	158	23.6
85 1-1/2"	39.6	231	89	176	158	23.6
85 2"	52.8	267	97	221	198	28
85 2"	79.2	267	97	221	198	28



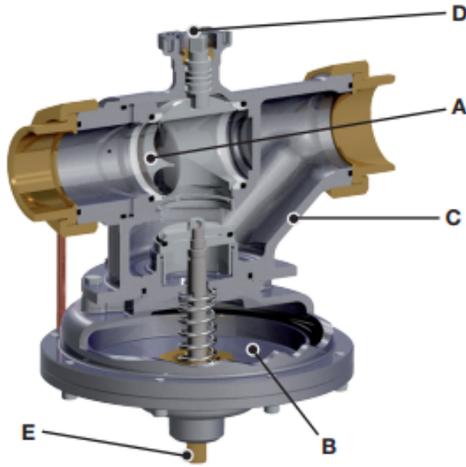
mounting pad

Rotary actuator series VA9208 with presetting mounted



Part Number	Flow Rate	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
85 1-1/4"	26.4	232	174	176	158	23.6
85 1-1/2"	39.6	231	174	176	158	23.6
85 2"	52.8	267	221	198	198	28
85 2"	79.2	267	221	198	198	28

# Materials and Weight



## Material List

Regulating valve (A)	Brass CW617N PTFE
Diaphragm (B)	Brass CW614N-EPDM-X Stainless Steel AISI 303
Presetting (D)	Brass CW617N
Body (C)	Ductile Iron
Gaskets	EPDM-X
Additional manual shut-off device (E)	Brass CW614N

Part Number	Weight (lb)
85 26.4 GPM	18.65
85 39.6 GPM	18.65

Part Number	Weight (lb)
85 52.8 GPM	34.52
85 79.2 GPM	34.52

## Installation and maintenance PICV 85

### 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:



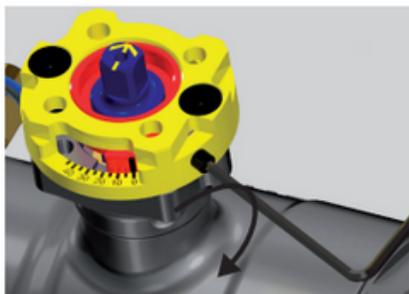
	1-1/4" 26.4 GPM	1-1/2" 39.6 GPM	2" 52.8 GPM	2" 79.2 GPM	Media
$\Delta P$ Start-up	87 PSI	4.35 PSI	232 PSI	90 PSI	Water/ Water + glyco 30%

## Flow preset

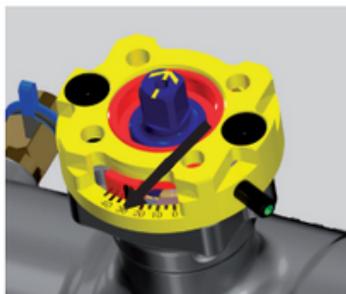
The presetting device limits the ball stroke. To set the selected flow, follow these steps:



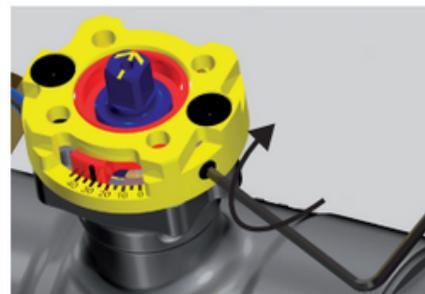
Close the valve



Release locking device



Set maximum flow rate



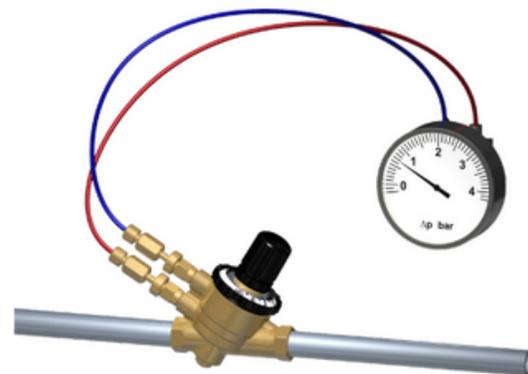
Lock again and re-open the valve. Don't overtighten. Could seriously damage the device. Torque 2÷3 Nm

## 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.

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 PICV catalogue).



## Maintenance and cleaning

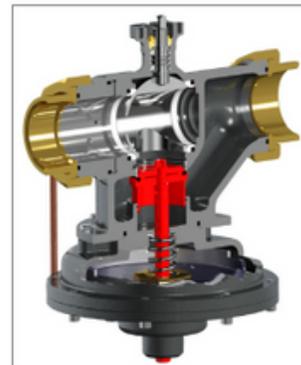
During valve cleaning operations, use a damp cloth. DO NOT use any detergent or chemical product that may seriously damage or compromise the proper functioning and the reliability of the valve.

## 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 occur.

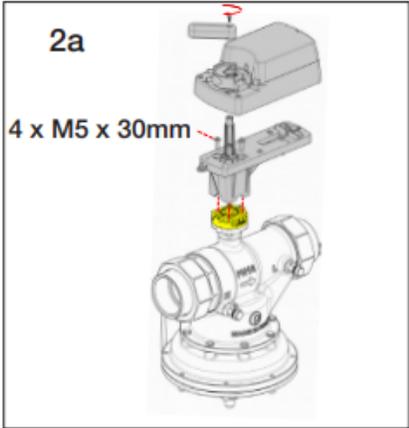
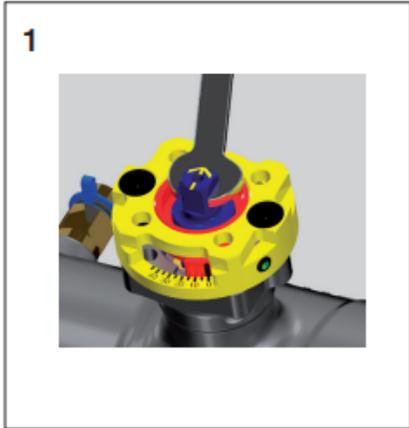
Remember to restore the valve in its working position after flushing.



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.

The valve can be equipped with electro-mechanical actuators, according to the requirements of the system. The mounting pad is made according to ISO 9210 F04 which accommodates selectable actuators.

For proper installation, always close the valve. The actuator must be in closed position too before assembling.

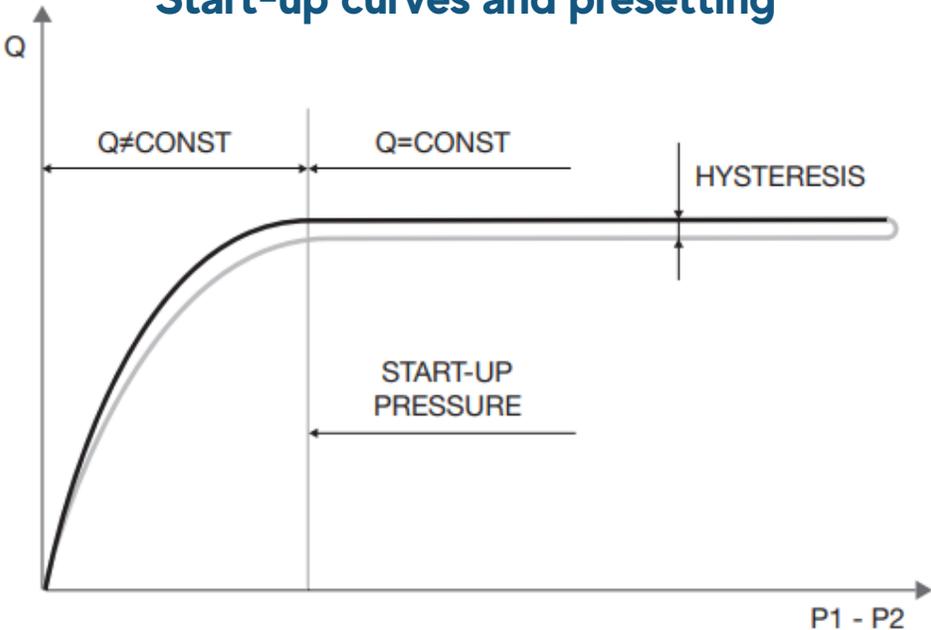


Close the valve and do the presetting. Do not open up the valve after the presetting. To close the valve, rotate the stem 90° clockwise (the arrow on the stem must be pointed towards the PT ports).

- SN08 series assembling:
- put the stem adaptor, aligning the arrows;
  - put and fix the support through the screws
  - place and hold the actuator on the front (stem) and on the rear.

- VA9208 series assembling:
- place the actuator on the valve
  - tighten the screw on the top of the actuator connection.

## Start-up curves and presetting

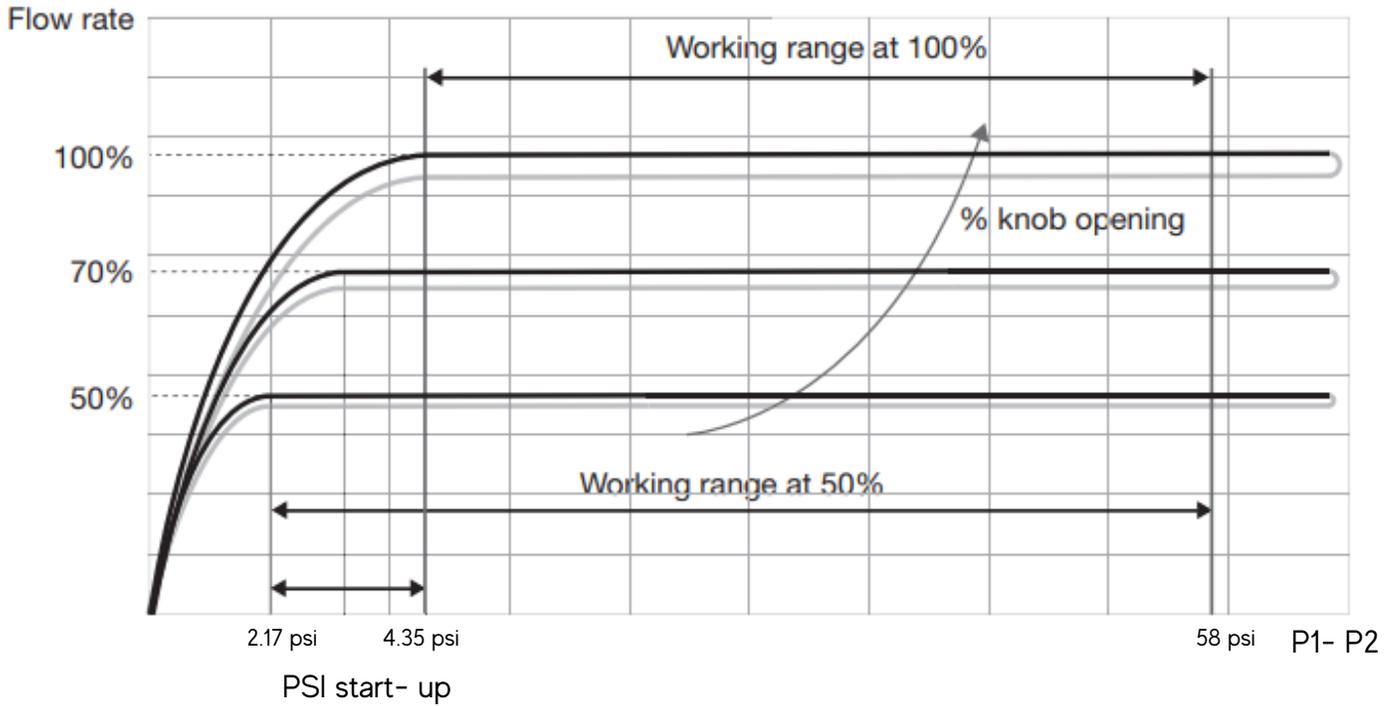


The example above shows a characteristic curve where start-up pressure, hysteresis and accuracy can be evaluated.

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.

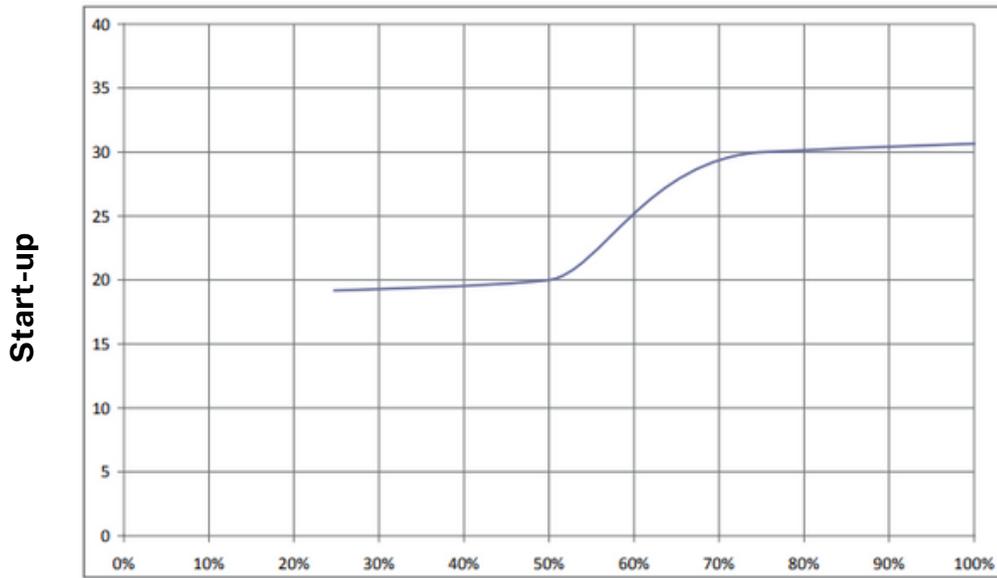
Start-up value varies with flow setting of the valve, as shown by the example below:



When the valve is set at 100% of nominal (maximum) flow, the curve begins to remain constant at 4.35 psi, therefore the working range of the valve is 4.35 ÷ 58 psi;

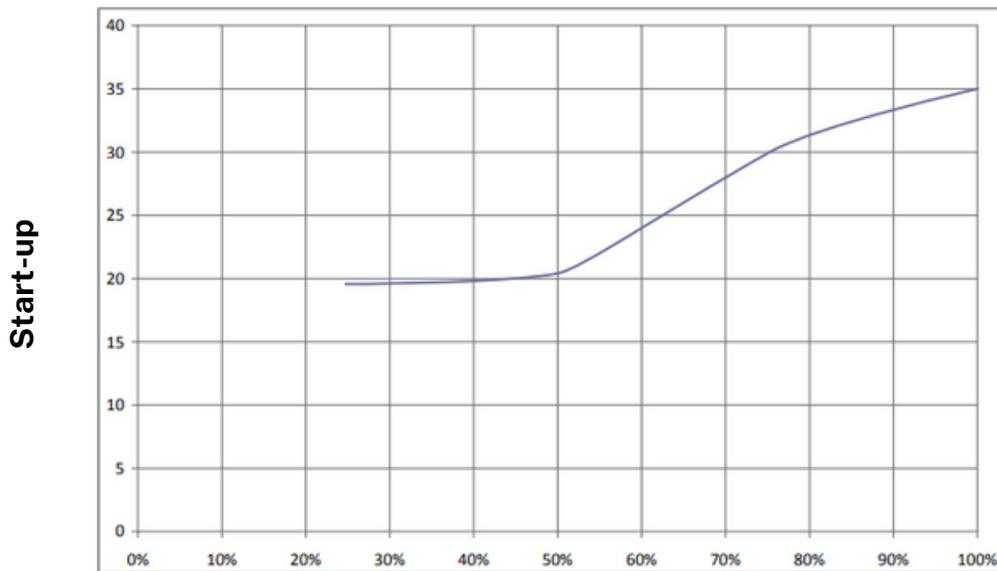
When the valve is set at 50% of nominal flow, the curve begins to remain constant at 2.17 psi, therefore the working range of the valve is 2.17 ÷ 58 psi.

The following diagrams show the start-up pressure at different presetting



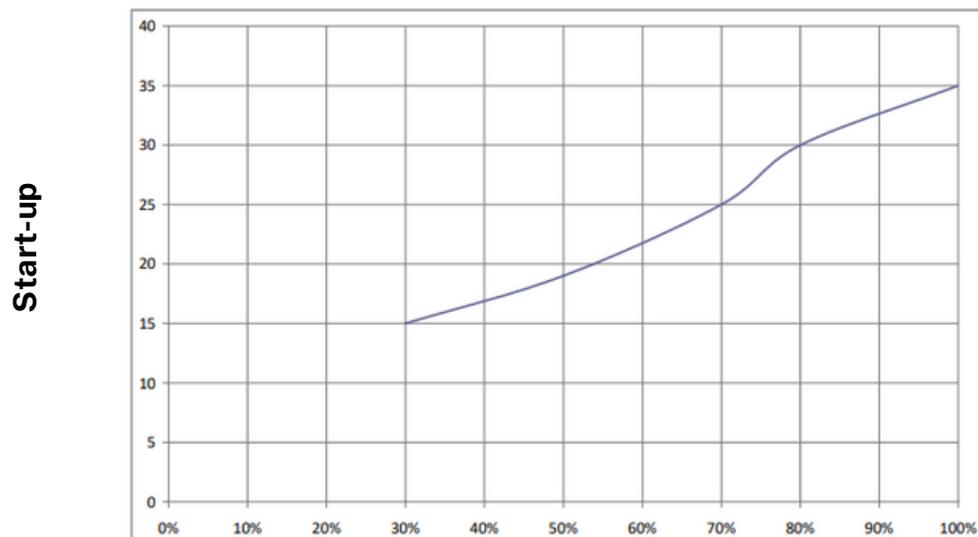
Part Number
85 1-1/2" 26.4 GPM
85 1-1/4" 39.6 GPM

Manual flow setting [Position]



Part Number
85 2" - 52.8 GPM

Manual flow setting [Position]



Part Number
85 2" - 79.2 GPM

Manual flow setting [Position]

**Flow pre-setting**

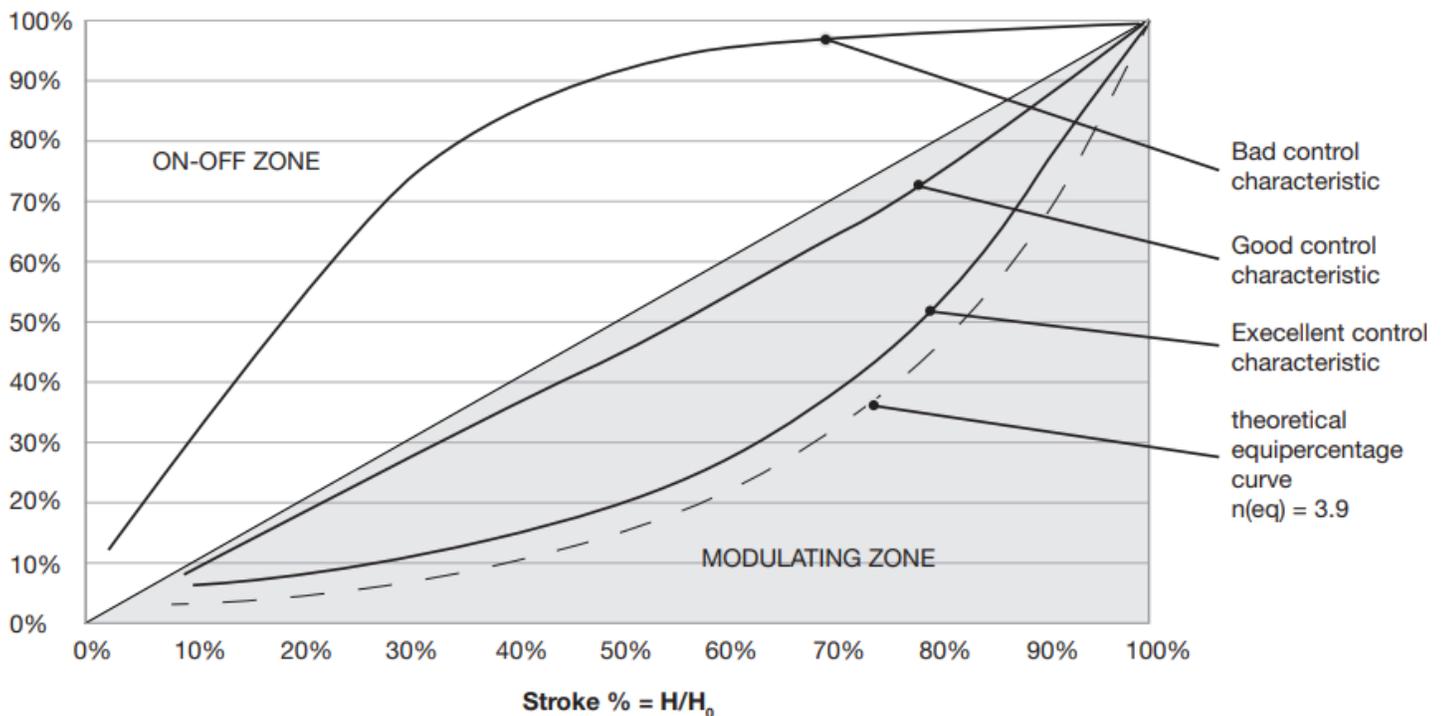
Presetting %	1-1/4"	1 1/2"	2"	2"
	Flow Rate	Flow Rate	Flow Rate	Flow Rate
	GPM	GPM	GPM	GPM
100	26.4	39.6	52.8	79.2
90	23.8	35.6	47.5	71.3
80	21.1	31.7	42.3	63.4
70	18.5	27.7	37.0	55.5
60	15.9	23.8	31.7	47.6
50	13.2	19.8	26.4	39.6
40	10.6	15.8	21.3	31.7
30	7.9	11.88	15.6	23.8
20	-	-	-	-
10	-	-	-	-

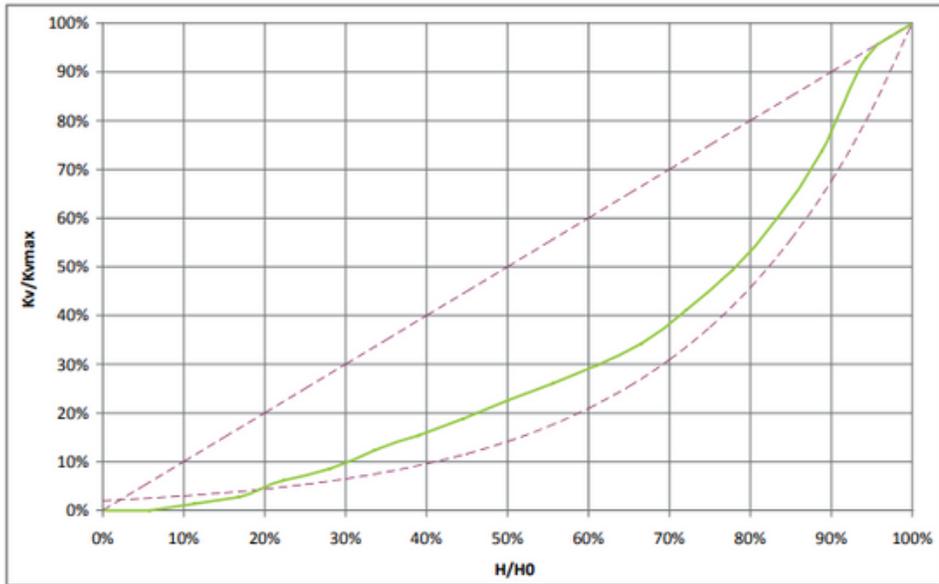
**Control curves**

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.\*

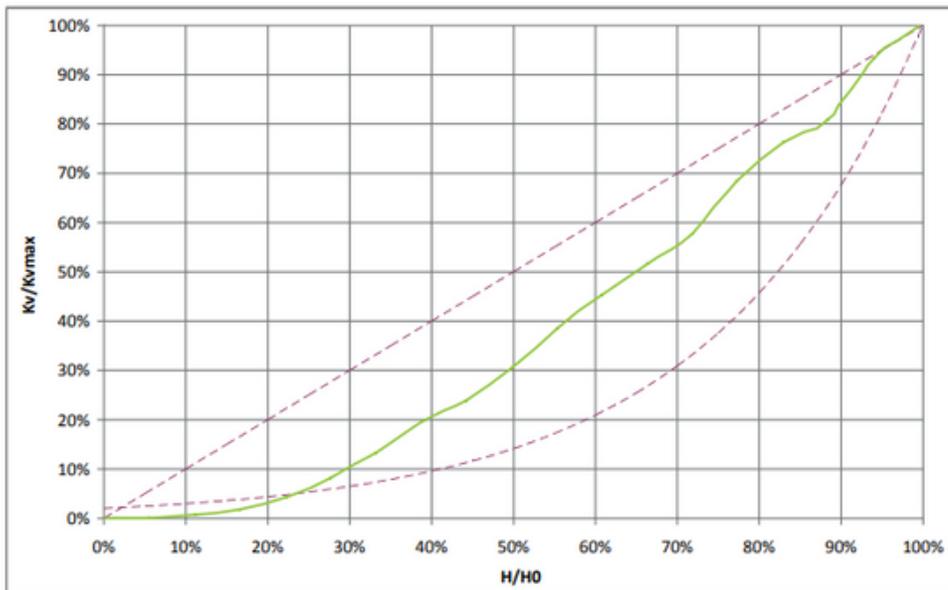
$$K_v \% = K_v / K_{vmax}$$



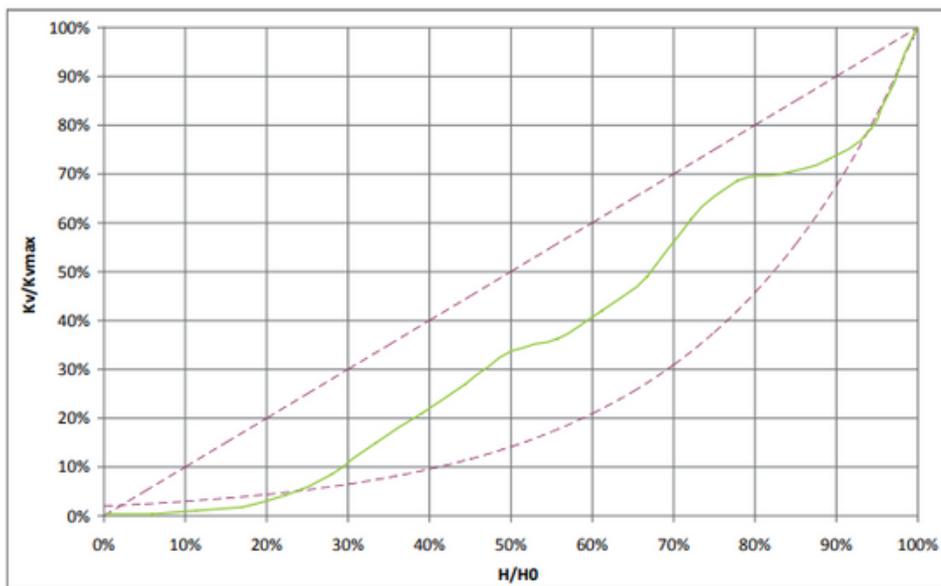


Part Number
1-1/2" - 26.4 GPM
Presetting Positions
 100% Open

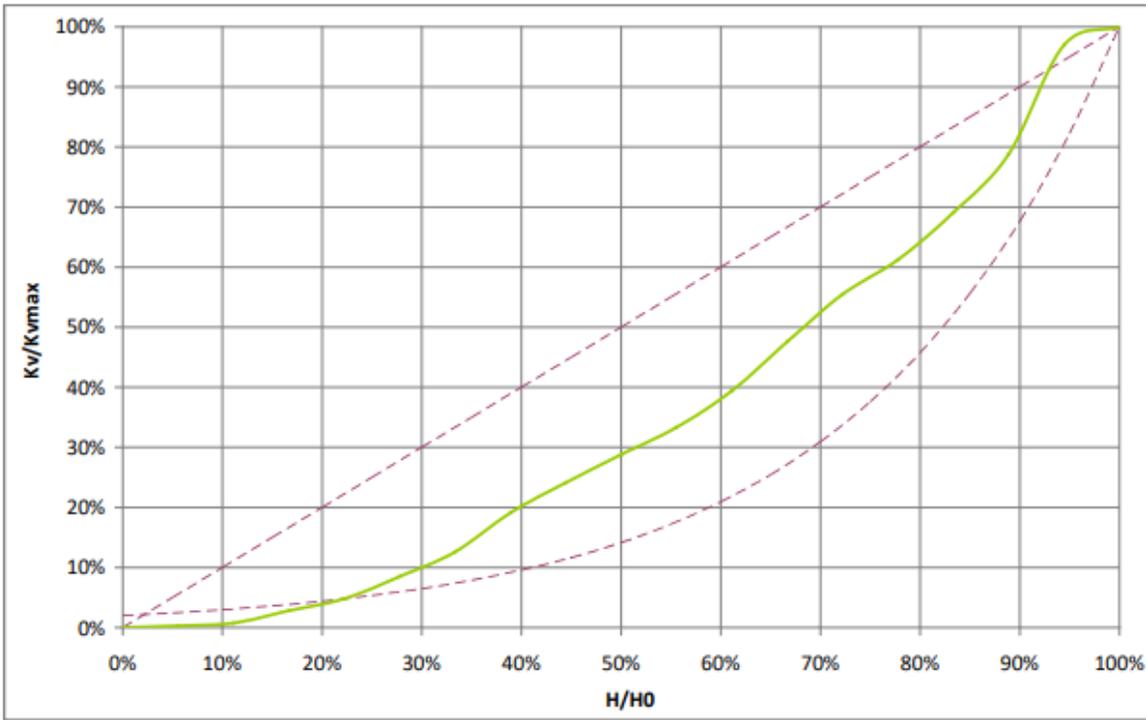
- H: current lift (opening) of the control valve; H varies from 0 to H0
- H0: maximum lift of the control valve;
- Kv: valve flow factor at lift = H
- Kvmax: valve flow factor at lift = H0



Part Number
1-1/4" - 39.6 GPM
Presetting Positions
 100% Open



Part Number
2" - 52.8 GPM
Presetting Positions
 100% Open



Part Number
2" - 79.2 GPM
Presetting Positions
100% Open

- H: current lift (opening) of the control valve; H varies from 0 to H0
- H0: maximum lift of the control valve;
- Kv: valve flow factor at lift = H
- Kvmax: valve flow factor at lift = H0

## Actuators

The table below shows actuator part numbers for different control types

Type	Standard	Stroke
24v, 0-10v Proportional spring return	2" - 79.2 GPM	max. 95 °

# PICV 94FA



# Description

- 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 95F 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.

# Valve Features

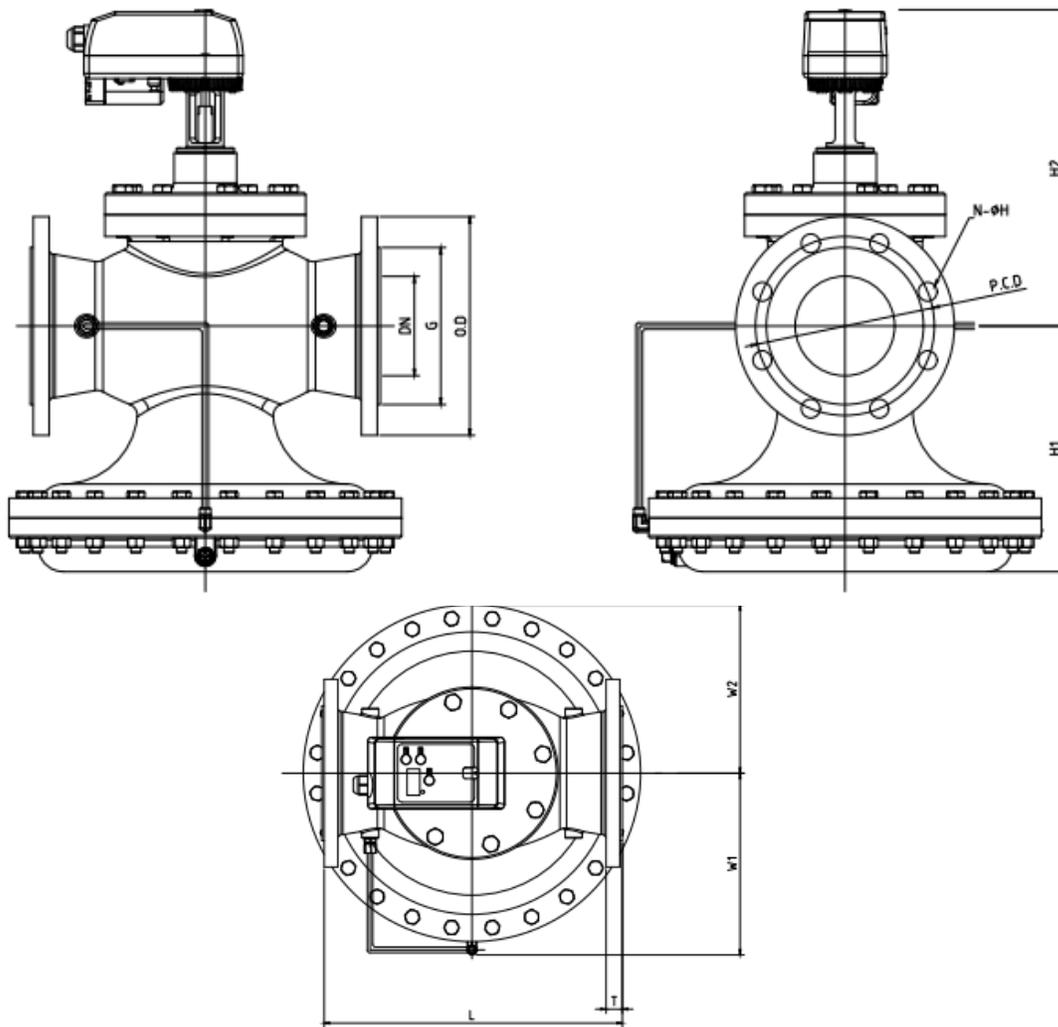
The **94FA series PICV** valve offers the following functions:

- 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

▲ P max.	Close off pressure	Temperature	Working pressure max.	Stroke (max)	Rangeability	Leakage	Accuracy 0 - 1 bar *
87 PSI	87 PSI	-14 to 248 °	232 PSI	90 °	>100	Class IV	+/- 5%

	94FA 2-1/2"	94FA 3"	94FA 4"	94FA 6"
Flow rate max.	132 GPM	132 GPM	242 GPM	660 GPM
Start-up max.	4.35 psi	4.35 psi	4.35 psi	7.25 PSI
Connections	2-1/2" Flanged	3" Flanged	4" Flanged	6" Flanged



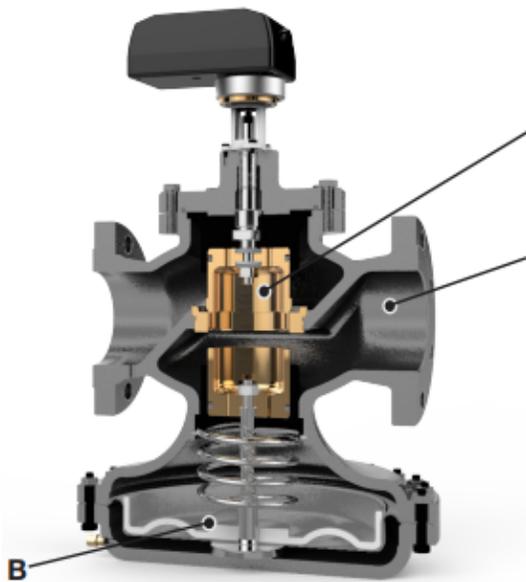


## Valve with actuator 24V

Part Number	Flow Rate	H1 (mm)	H2 (mm)	L (mm)	DN (mm)	W1 (mm)	W2 (mm)	O.D (mm)	P.C.D (mm)	G (mm)	T (mm)	N-0h (mm)
94FA 2-1/2"	132	183	300	272	65	155	139	178	139.5	105	22	4-19
94FA 3"	132	183	300	272	65	155	139	191	152.5	127	24	4-19
94FA 4"	242	247	318	352	100	213	198	229	190.5	157	24	8-19
94FA 6"	660	348	397	451	150	213	198	279	241.5	216	25.4	8-22

# Materials and Weight

Part Number	Weight (lb)
94FA 2-1/2"	88
94FA 3"	94
94FA 4"	163
94FA 6"	357



## Material List

Regulating valve (A)	Brass CW602N Stainless steel 18/8
Diaphragm (B)	Brass CW602N-EPDM Stainless Steel AISI 303
Body (C)	Ductile Iron
Gaskets	EPDM-X

### Actuator features

Each 94FA 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 (2x186550 batteries not included)
- easy fitting gear. Square of the stem:8mm
- Extended life: 50,000 cycles

## Installation and maintenance PICV 94FA

### 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:

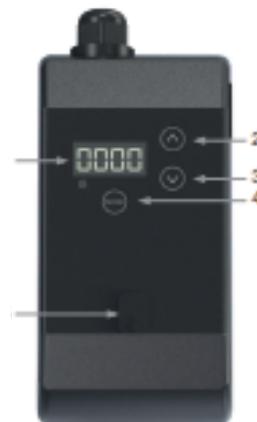
	2-1/2" 94FA	3" 94FA	4" 94FA	6" 94FA	Media
Δ P Start-up	4.35 PSI	4.35 PSI	4.35 PSI	7.25 PSI	Water/ Water + glyco 30%

### Flow preset

The 94FA is set up using the smart actuator; when first powered. 'GO o' is displayed on the LCD. Than wait for "o" to appear. Pressing the 'MODE' button for 2 seconds or longer turns to setting mode. You can than 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).

- SET 1- Selecting input indication in direct internal control mode
- SET 2- Selecting an input signal
- SET 3- Min. flow setting
- SET 4- Max. flow setting
- SET 5- Selecting parameters display mode during operation
- SET 6- Rotation angel compensation
- SET 7- Flow offset compensation
- SET 8- Power failure mode ( if fail safe option is fit)
- SET 9- Flow rate unit selection
- SET 10- Control curve selection (LIN- EQ)
- SET 11- Min voltage signal in PID control mode
- SET 12- Max voltage signal in PID control mode
- SET 13- Actuator rotation speed
- SET 14- Feedback signal selection
- SET 15- Rs485 ID number

- |   |                 |
|---|-----------------|
| 1 | Display         |
| 2 | Up button       |
| 3 | Mode button     |
| 4 | Down button     |
| 5 | Manual override |

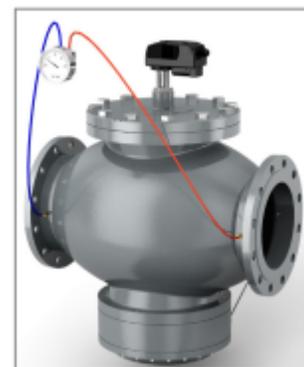


## Operation Control

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

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 PICV catalogue).



## Maintenance and cleaning

During the valve cleaning operations, use a damp cloth . DO NO

use any detergent or chemical product that may seriously damage or compromise the proper functioning and the reliability of the valve.

## Actuator wiring and programing

### 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)			Feedback (0)2-10 V (0)4-20 mA	Power: cable 1 - 2
			0V(close)				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

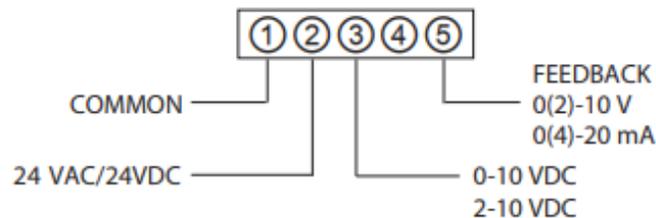
Cables 1 & 2: power

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

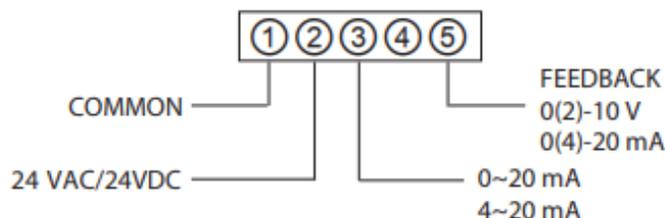
Cable 5: only used for feedback

Control method

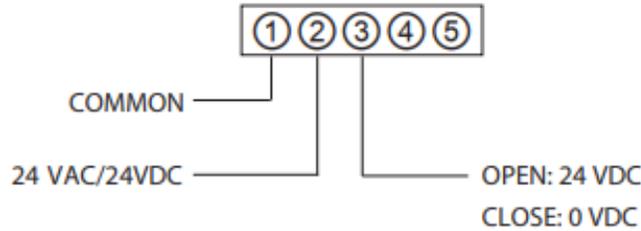
1. Analog voltage signal



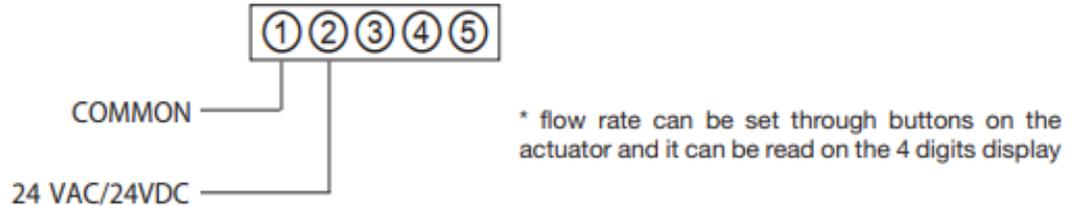
2. Analog current signal



3. ON/OFF control



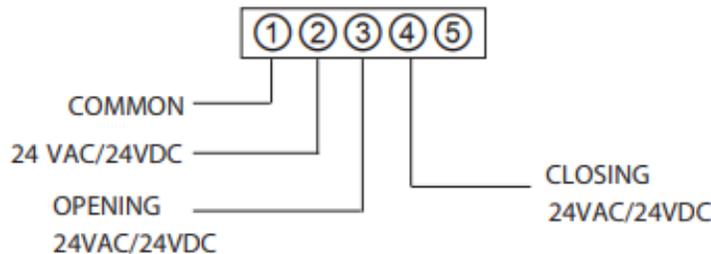
4. Internal control\*



5. PWM signal



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 remote control is used, please check with Fratelli Pettinaroli technical staff.

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

**Settings**

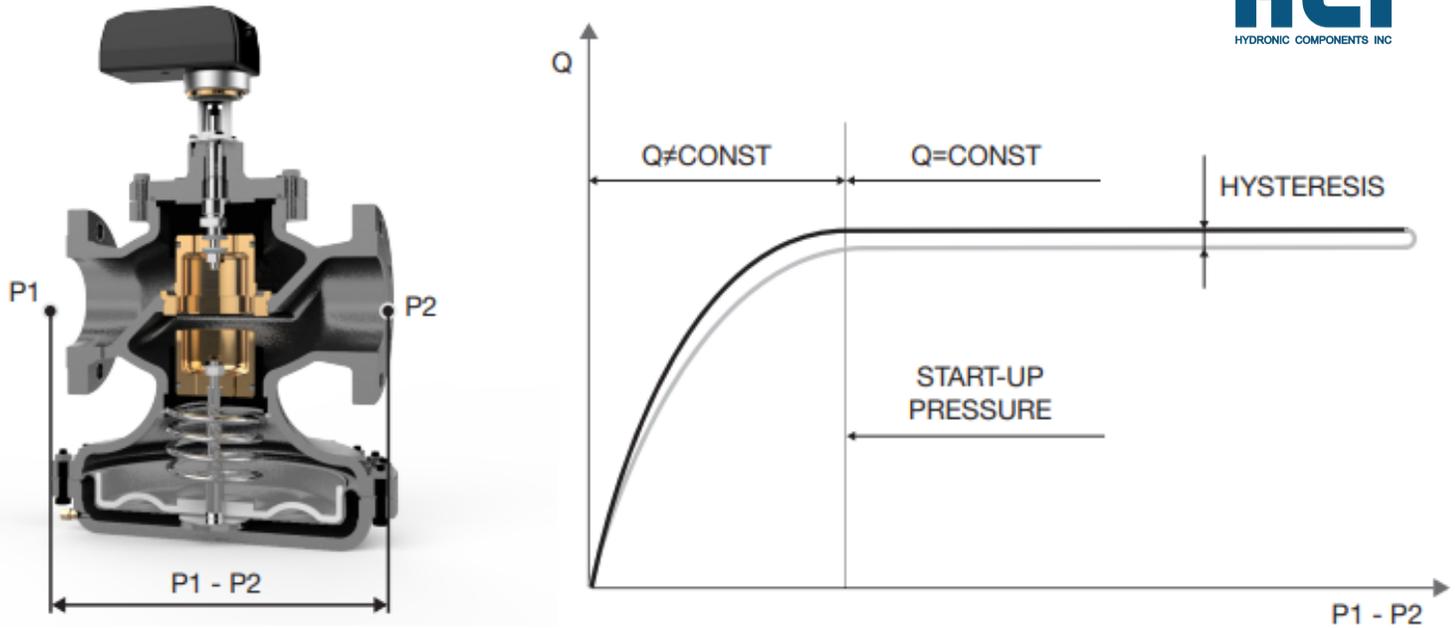
When power is on, display indicates 'Go-0' and the actuator automatically looks for the valve zero point. Do not press any buttons as this might cause incorrect flow control.

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>LIl</i> (default)	Unit SI (m3/h)	Selection with UP/DOWN buttons and confirmation with MODE button
	<i>GRL</i>	Unit GPM (gal/min)	
SET 10	<i>LIIn</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>RuLo</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

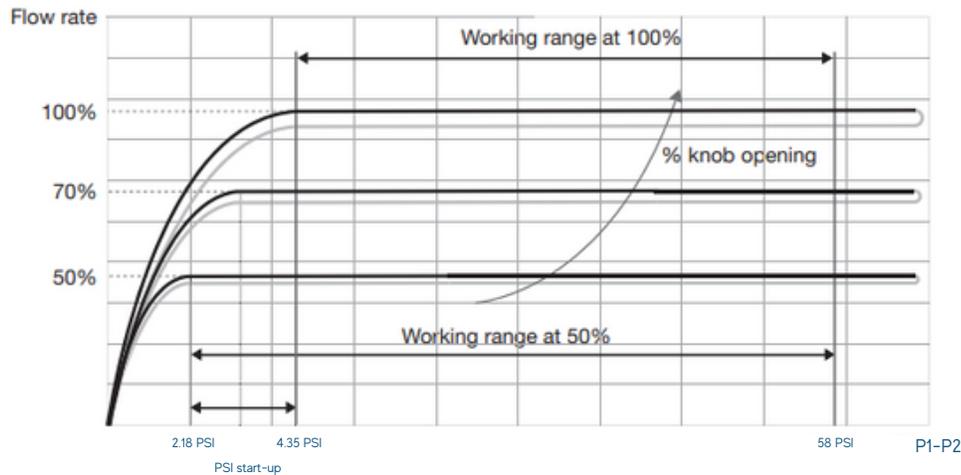
\* Contact the supplier to modify.



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.

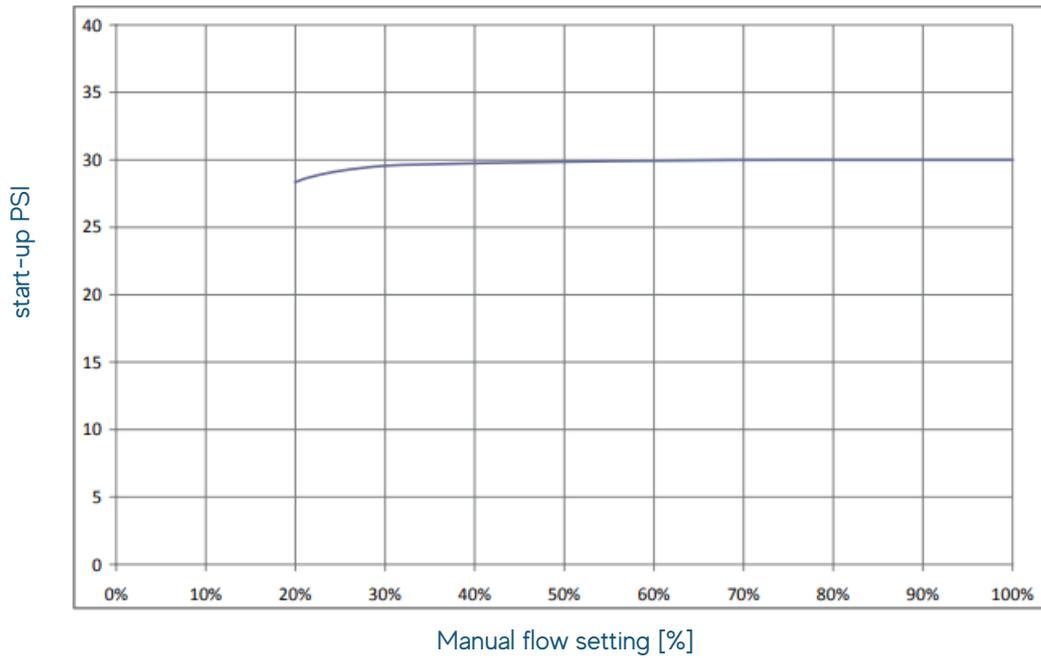
If the  $\Delta P$  measured value is lower than the start-up value, then the valve works as a fixed orifice valve. Start-up value varies with flow setting of the valve, as shown by the example below:



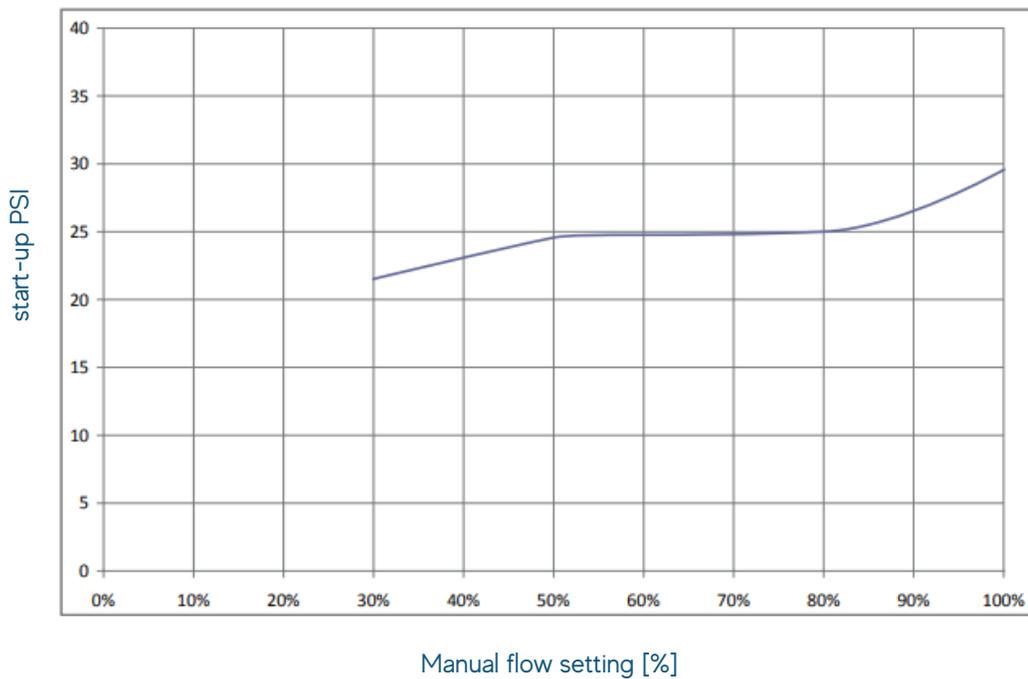
When the valve is set at 100% of nominal (maximum) flow, the curve begins to remain constant at 4.35 PSI, therefore the working range of the valve is 4.35 ÷ 58 PSI;

When the valve is set at 50% of nominal flow, the curve begins to remain constant at 2.17 PSI therefore the working range of the valve is 2.17 ÷ 58 PSI.

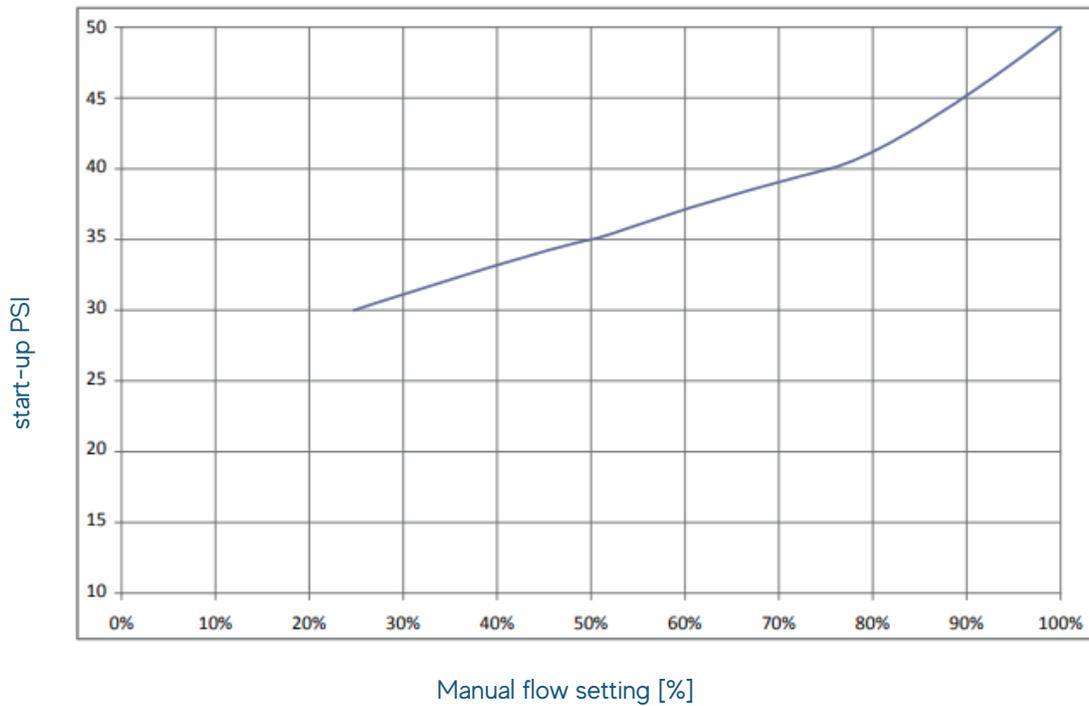
Over 58 PSI the fluid velocity through the valve is extremely high and cavitation may happen due to extreme turbulence of the flow. Because of these phenomena the valve can get damaged. For energy saving reasons, we suggest to continuously work the valve under 58 PSI.



Part Number
94 2-1/2" - 132 GPM
94 3" - 132 GPM



Part Number
94 4" - 242 GPM

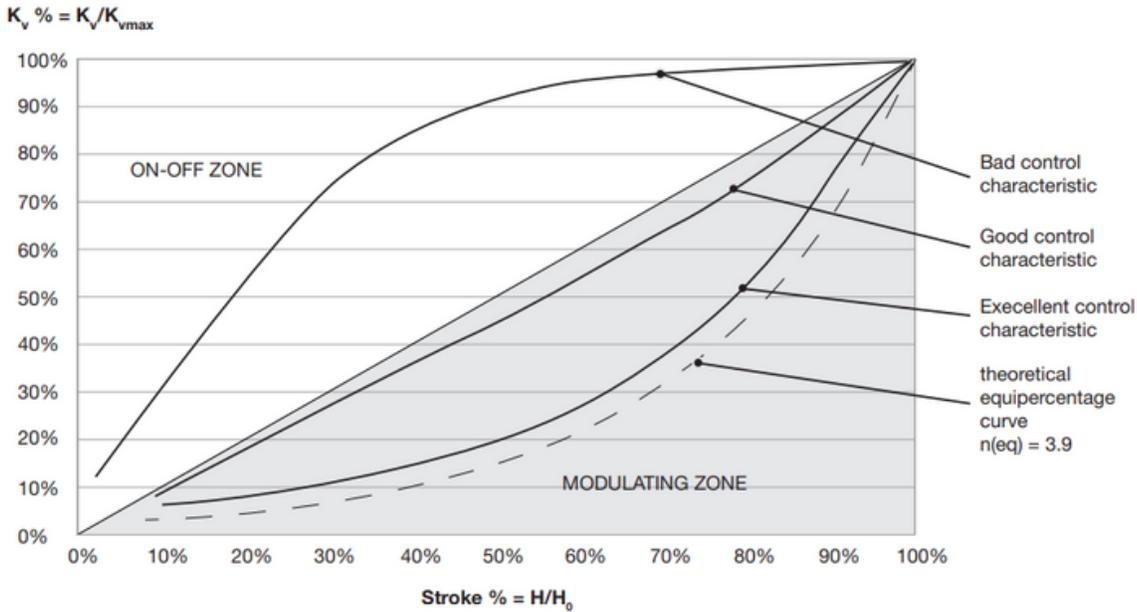


Part Number  
94 6"- 660 GPM

Presetting %	2-1/2"	3"	4"	6"
	Flow Rate GPM	Flow Rate GPM	Flow Rate GPM	Flow Rate GPM
100	132	132	242	660
90	118	118	217	356
80	105	105	193	317
70	92	92	169	277
60	79	79	145	237
50	66	66	121	198
40	52	52	96	158
30	39	39	72	118
20	26	26	48	79
10	13	13	24	39

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.\*

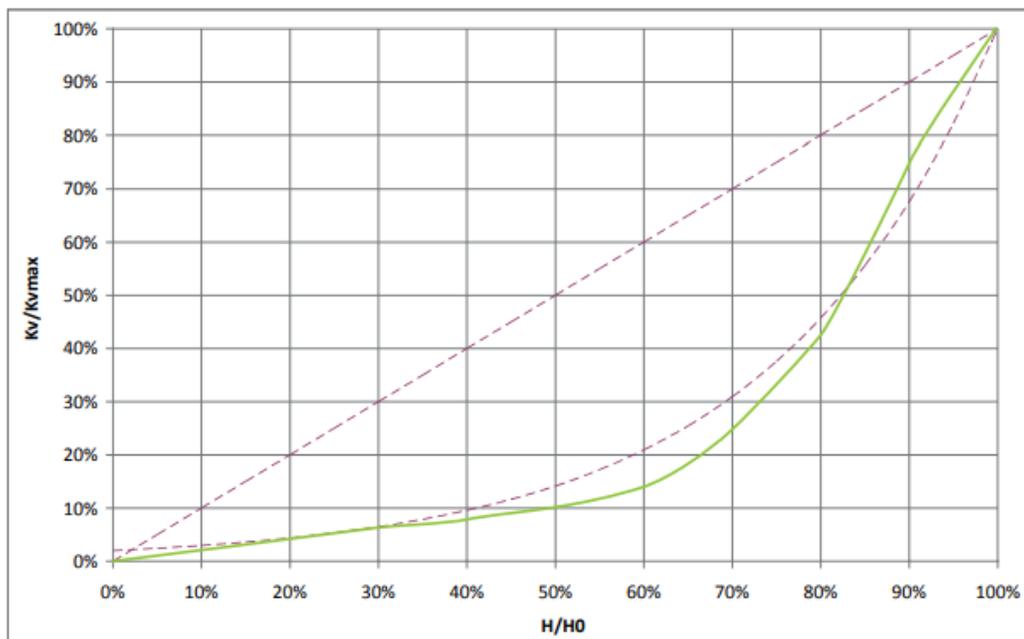


Combining the PICV valve characteristic with heat exchanger results in a linear control system.

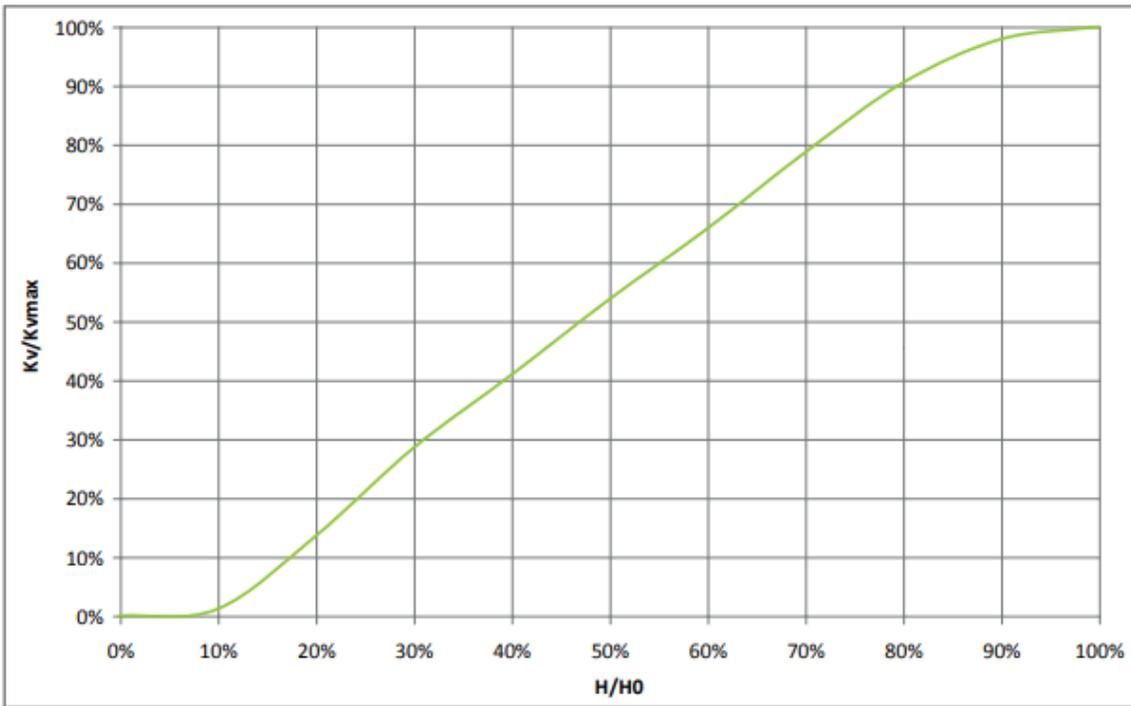
In the next page control curves of 94FA are shown.

\* 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 H0
- H0: maximum lift of the control valve;
- Kv: valve flow factor at lift = H
- Kvmax: valve flow factor at lift = H0

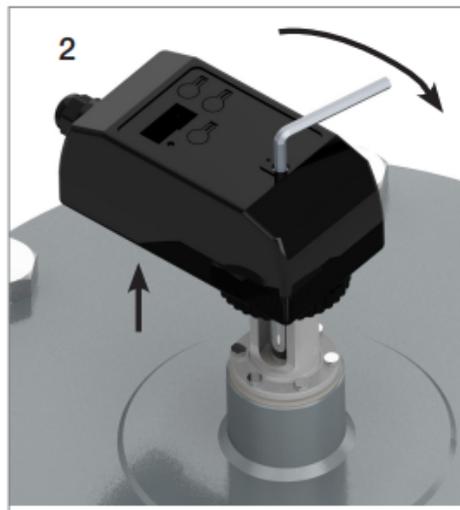
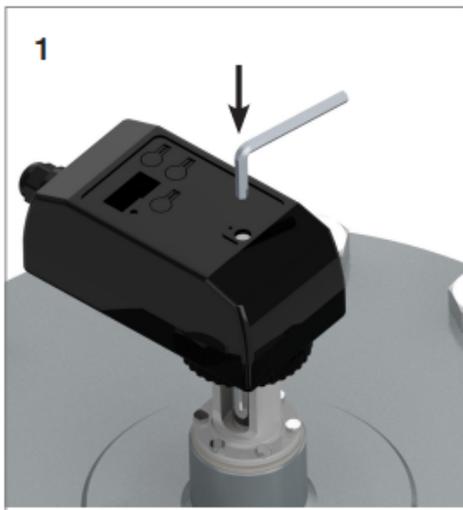


Part Number
94 2-1/2" - 132 GPM
94 3" - 132 GPM
94 4" - 242 GPM
94 6" - 660 GPM
Presetting positions
Any

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

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.

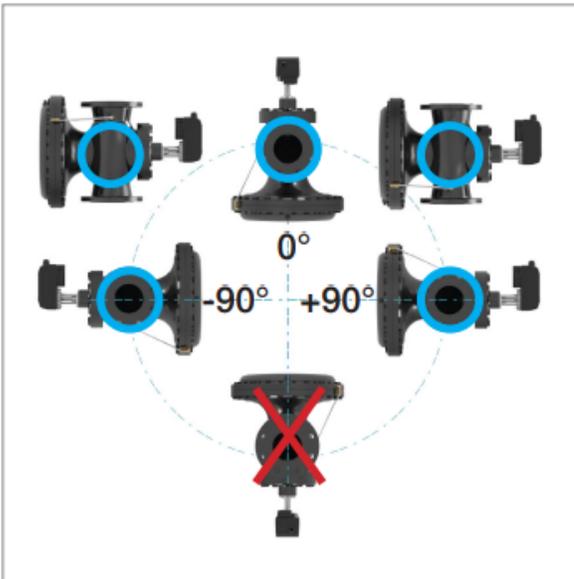


To assembly the actuator, follow the next procedure:

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.

## 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.

## Generals

HCi 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. HCi 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.

# HCI

HYDRONIC COMPONENTS INC

## World Headquarters



## Corporate Headquartes

📍 [www.hcivalve.com](http://www.hcivalve.com) 📞 P: (586) 268-1640

📍 32853 Edward Ave • Madison Heights, MI 48071