92/92-1

PatentUS9910447B2
Patent
IT1428884PatentEP30

EN Description

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

The DYNfiSTY incorporates a small diaphragm type DPCV in order to keep a constant differential pressure across the orifice of the regulating valve and to provide a constant flow rate whilst the differential pressure is kept within the operating limits of the valve. Beyond these working pressures, the valve acts as a fixed orifice. Thanks to the new diaphragm technology, the valve can also work with very dirty water. For more information about that, see the "Dirt-resistant feature" section.

Making this orifice adjustable allows the valve to be pre-set and deliver a range of flow rates (unlike automatic balancing valves). The presetting gear can be easily adjusted and works by varying the stroke of the control valve. The DYNfiSTY valve also includes a 2-port valve in order to control temperature by means of an oblique pattern globe valve. The plug of the globe valve is machined to give a near-linear 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 DYNfiSTY valve controls the flow rate, irrespective of differential pressure branch and submains, 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.

The 92-1 model does not have the pressure ports: these connections are closed by caps. If desired, PT ports can be added later. For more information about that, see the "Accessories" section.

EN Valve Features

The 92 series PICV valve offers the following functions:

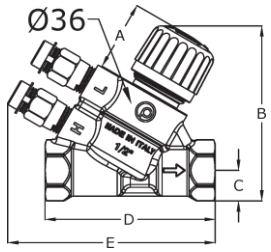
- Good valve authority to maintain temperature control and power output from the terminal unit.
- Maximum design flow limitation: once set, the DYNfiSTY valve maintains design flow regardless of pressure changes in the system.
- It can be easily set once installed, using the setting ring (with no actuator on).
- Measurement by means of a specific meter of the differential pressure across the valve: in this way, users can verify if the start-up pressure has been reached and surpassed.
- DPCV dirt-resistant: the valve worked during and after a Contaminated Water Test (proprietary test) with a high concentration of iron oxide.
- Fast and easy maintenance: internal elements (control valve and DPCV) can be easily removed, replaced, or cleaned.

ΔPmax.	Temperature	Max. workingpressure	Stroke(max)			Rangeability	Leakage	Accuracy (0÷1bar)*
			DN15-20	DN25-32	DN40-50			
600kPa/6bar	-10÷ 120°C	2500kPa/25bar	3mm	6mm	7,5mm	50÷100 IEC60534-2-3	Class IVIEC60534-4	±5%

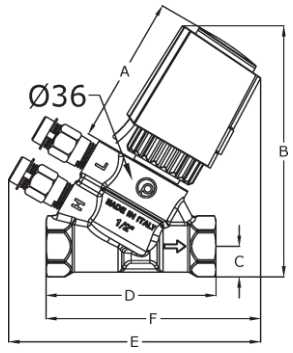
	92VL½"	92L½"	92H½"	92L¾"	92H¾"	92L1"	92H1"	92H1¼"	92H1½"	92H2"
	92VL1½"	92L1½"	92H1½"	92L1¾"	92H1¾"	92L11"	92H11"	92H11¼"	92H11½"	92H1 2"
Flowratemax.	150l/h 0,042l/s	450l/h 0,125l/s	850l/h 0,236l/s	1000l/h 0,277l/s	1850 l/h 0,514l/s	2500l/h 0,694l/s	3300l/h 0,917l/s	5200l/h 1,44l/s	9000l/h 2,5l/s	14000l/h 3,88l/s
Start-upmax.	25kPa 0,25bar	35kPa 0,35bar	30kPa 0,30bar	30kPa 0,30bar	35kPa 0,35bar	30kPa 0,30bar	30kPa 0,30bar	35kPa 0,35bar	40kPa 0,40bar	40kPa 0,40bar
Connections**	Rp ½" FEN10226-1	Rp ½" FEN10226-1	Rp ½" FEN10226-1	Rp ¾" FEN10226-1	Rp ¾" FEN10226-1	Rp1"UnionFEN 10226-1	Rp1"UnionFEN 10226-1	Rc1¼"UnionFEN10226-1	Rp 1 ½" FEN10226-1	Rp2"F EN10226-1
Close offpressure ***	600kPa 6bar	600kPa 6bar	600kPa 6bar	600kPa 6bar	600kPa^ 6bar^	600kPa 6bar	600kPa 6bar	600kPa 6bar	600kPa 6bar	600kPa 6bar

* Atpos.9.FordifferentpresettingsandΔP,pleaserefertothegraphinthe"Flowsettingaccuracy"section.**AlsoavailablewithNPTconnectionsaccordingtoANSIB1.20.1.***Closedbyelectromotiveactuator.^300kPa/3barwiththermo-electricactuatorsseriesA5.

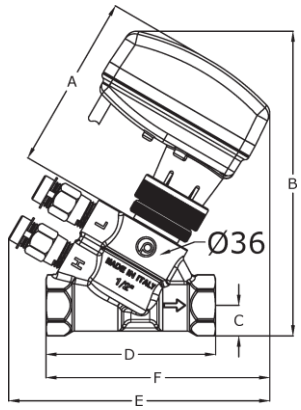
EN Dimensional data



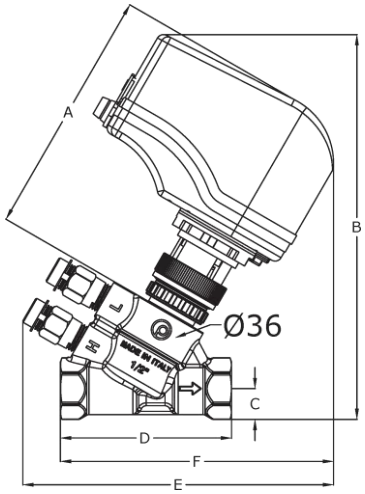
Manual valve						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92VL ½"	150	33	83	14,5	80,5	98
92L½"	450	33	83	14,5	80,5	98
92VL1½"	150	33	83	14,5	80,5	-
92L1½"	450	33	83	14,5	80,5	-



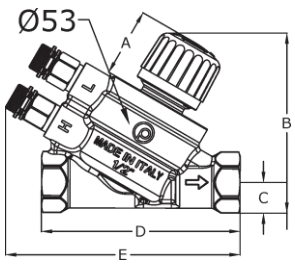
Valve with thermo-electricactuator							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92VL ½"	150	70	119	14,5	80,5	119	-
92L½"	450	70	119	14,5	80,5	119	-
92VL1½"	150	70	119	14,5	80,5	-	101,5
92L1½"	450	70	119	14,5	80,5	-	101,5



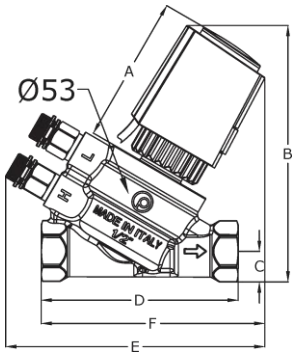
Valve with electromotiveactuator							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92VL ½"	150	83	144,5	14,5	80,5	124	-
92L½"	450	83	144,5	14,5	80,5	124	-
92VL1½"	150	83	144,5	14,5	80,5	-	106
92L1½"	450	83	144,5	14,5	80,5	-	106



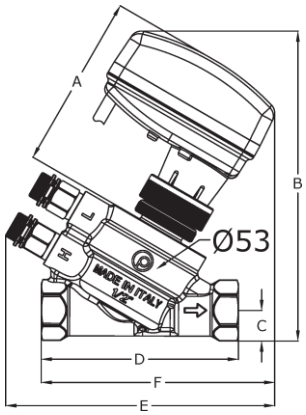
Valve with VM060							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92VL ½"	150	116,5	181	14,5	80,5	146	-
92L½"	450	116,5	181	14,5	80,5	146	-
92VL1½"	150	116,5	181	14,5	80,5	-	128
92L1½"	450	116,5	181	14,5	80,5	-	128



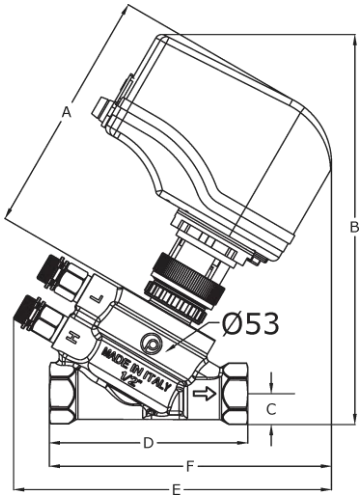
Manual valve						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92H½"	850	33	84,5	14,5	93,5	110,5
92H1½"	850	33	84,5	14,5	93,5	-



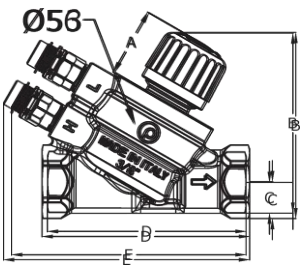
Valve with thermo-electricactuator							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92H½"	850	70	121	14,5	93,5	123	-
92H1½"	850	70	121	14,5	93,5	-	106



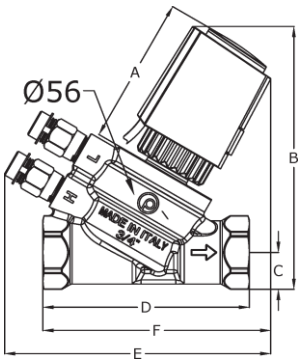
Valve with electromotiveactuator							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92H½"	850	83	147	14,5	93,5	127	-
92H1½"	850	83	147	14,5	93,5	-	110,5



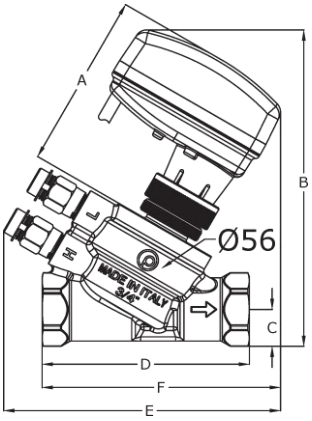
Valve with VM060							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92H½"	850	116,5	184	14,5	93,5	150	-
92H1½"	850	116,5	184	14,5	93,5	-	133,5



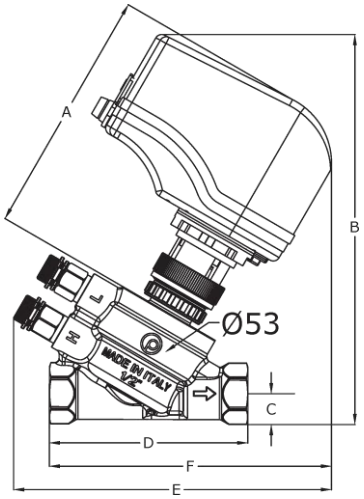
Manualvalve						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92L¾"	1000	33	88	17,5	98	116
92H¾"	1850	33	88	17,5	98	116
92L1¾"	1000	33	88	17,5	98	-
92H1¾"	1850	33	88	17,5	98	-



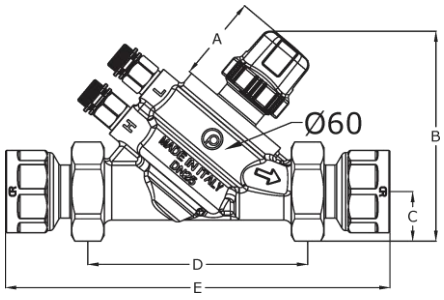
Valve with thermo-electricactuator							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92L¾"	1000	70	125	17,5	98	126	-
92H¾"	1850	70	125	17,5	98	116	-
92L1¾"	1000	70	125	17,5	98	-	108
92H1¾"	1850	70	125	17,5	98	-	108



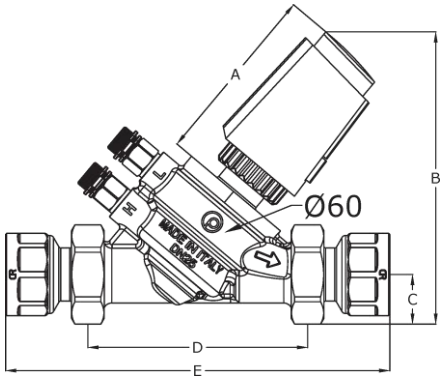
Valve with electromotiveactuator							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92L¾"	1000	83	150	17,5	98	131	-
92H¾"	1850	83	150	17,5	98	131	-
92L1¾"	1000	83	150	17,5	98	-	112,5
92H1¾"	1850	83	150	17,5	98	-	112,5



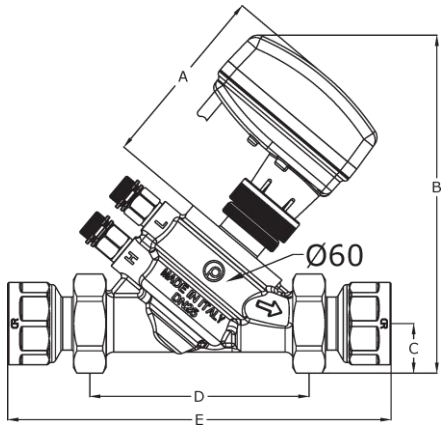
ValvewithVM060							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92L¾"	1000	116,5	187	17,5	98	153	-
92H¾"	1850	116,5	187	17,5	98	153	-
92L1¾"	1000	116,5	187	17,5	98	-	135
92H1¾"	1850	116,5	187	17,5	98	-	135



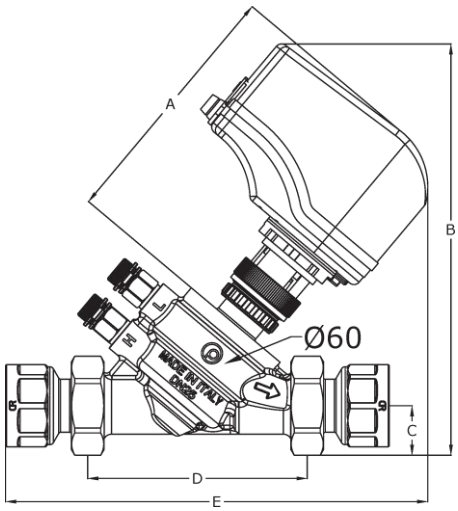
Manualvalve						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92L1"	2500	41	99	23,5	108	182
92H1"	3300	41	99	23,5	108	182
92L11"	2500	41	99	23,5	108	182
92H11"	3300	41	99	23,5	108	182



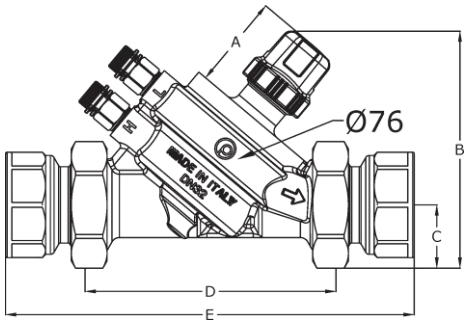
Valve with thermo-electricactuator						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92L1"	2500	86	138	23,5	108	182
92H1"	3300	86	138	23,5	108	182
92L11"	2500	86	138	23,5	108	182
92H11"	3300	86	138	23,5	108	182



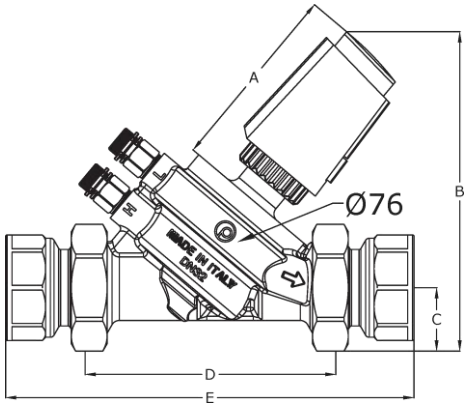
Valve with electromotiveactuator						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92L1"	2500	87,5	160	23,5	108	182
92H1"	3300	87,5	160	23,5	108	182
92L11"	2500	87,5	160	23,5	108	182
92H11"	3300	87,5	160	23,5	108	182



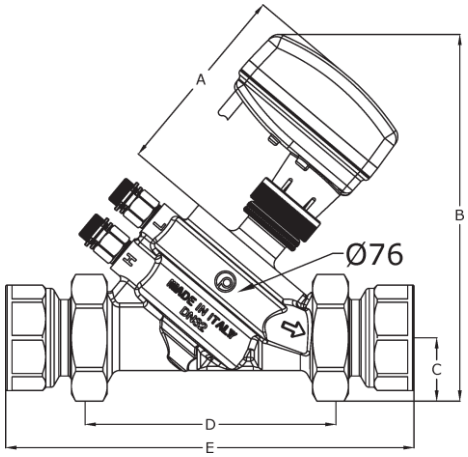
ValvewithVM060						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92L1"	2500	121	195	23,5	108	200
92H1"	3300	121	195	23,5	108	200
92L11"	2500	121	195	23,5	108	200
92H11"	3300	121	195	23,5	108	200



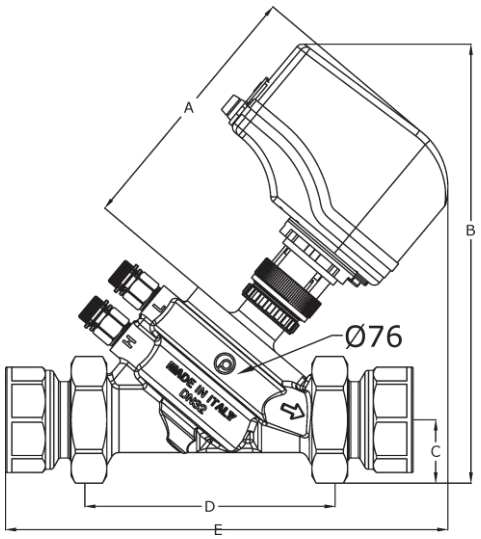
Manualvalve						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92H1¼"	5200	44,5	107,5	30	119	194
92H11¼"	5200	44,5	107,5	30	119	194



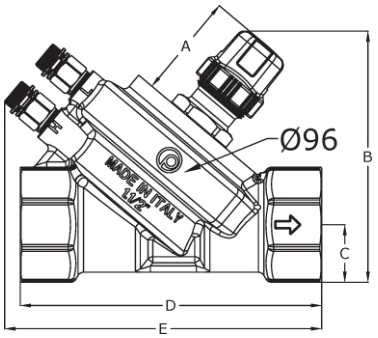
Valve with thermo-electricactuator						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92H1¼"	5200	90	151	30	119	194
92H11¼"	5200	90	151	30	119	194



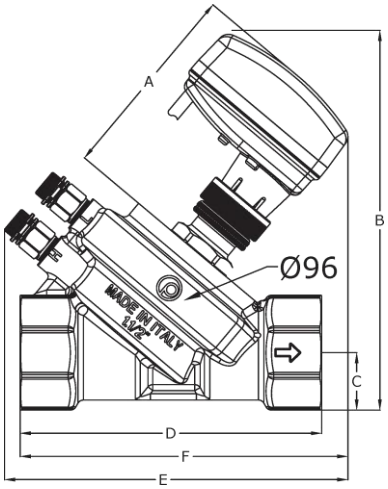
Valve with electromotiveactuator						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92H1¼"	5200	89	168,5	30	119	194
92H11¼"	5200	89	168,5	30	119	194



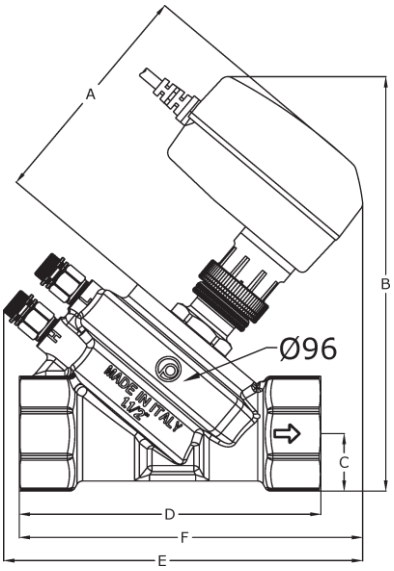
ValvewithVM060						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92H1¼"	5200	124,5	208	30	119	210
92H11¼"	5200	124,5	208	30	119	210



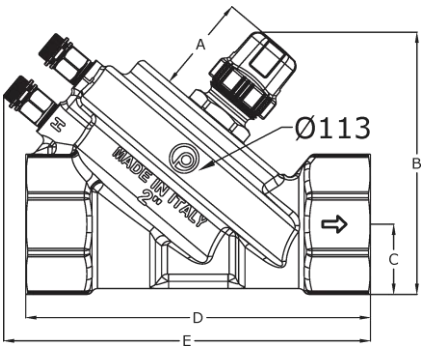
Manualvalve						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92H1½"	9000	49,5	119	27	143	150,5
92H11½"	9000	49,5	119	27	143	-



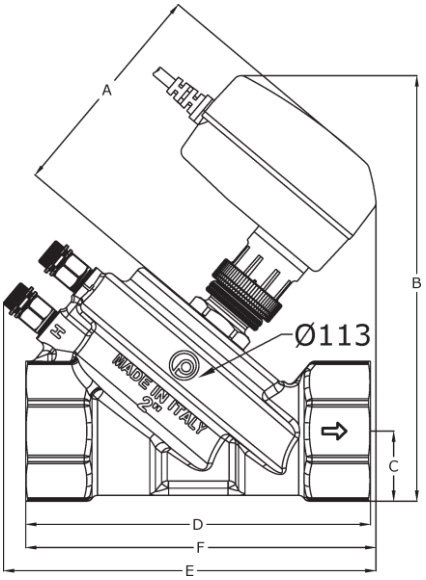
ValvewithelectromotiveactuatorVA7493							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92H1½"	9000	98,5	181	27	143	165	-
92H11½"	9000	98,5	181	27	143	-	158



Valve with electromotiveactuatorRVAZ2							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92H1½"	9000	109,5	196,5	27	143	170	-
92H11½"	9000	109,5	196,5	27	143	-	163



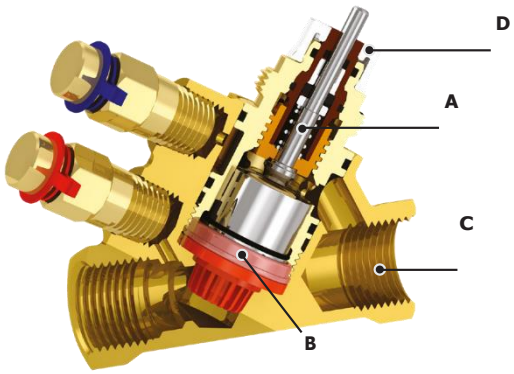
Manualvalve						
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**
92H2"	14000	46	124	33	163,5	174
92H1 2"	14000	46	124	33	163,5	-



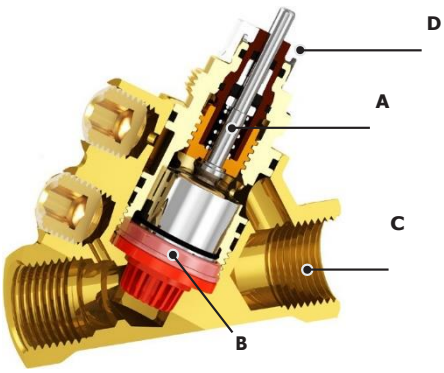
ValvewithelectromotiveactuatorRVAZ2							
Figura	**Flowrate [l/h]**	**A [mm]**	**B [mm]**	**C [mm]**	**D [mm]**	**E [mm]**	**F [mm]**
92H2"	14000	105,5	202	33	163,5	176,5	-
92H1 2"	14000	105,5	202	33	163,5	-	166

EN Materials and weight

DYNfiSTY**92**



DYNfiSTY**92-1**



	Material list
Regulating valve(A)	High resistance polymer, Stainless steel 18/8
Diaphragm(B)	High resistance polymer, EPDM-X, WMQ, Silicone, Stainless steel AISI 303, HNBR
Presetting (D)	ABS,PC
Body(C)	Corrosion-resistant brass CW602N
Gaskets	EPDM-X

Art.	Weight(kg)	Art.	Weight(kg)	Art.	Weight(kg)	Art.	Weight(kg)
92VL ½"	0,46	**92L1"**	1,17	**92VL1½"**	0,43	**92L11"**	1,15
92L½"	0,46	**92H1"**	1,17	**92L1½"**	0,43	**92H11"**	1,15
92H½"	0,65	**92H1¼"**	1,80	**92H1½"**	0,63	**92H11¼"**	1,78
92L¾"	0,69	**92H1½"**	2,06	**92L1¾"**	0,67	**92H11½"**	2,04
92H¾"	0,69	**92H2"**	3,05	**92H1¾"**	0,67	**92H1 2"**	3,03

EN Installation and Maintenance DYNfiSTY92

1. **Use Conditions**

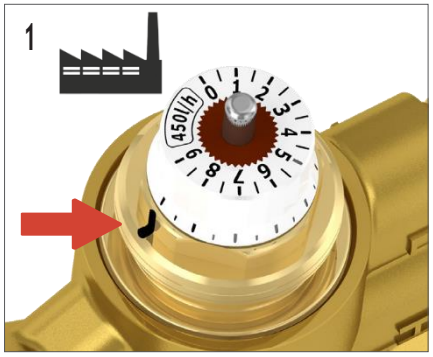
The valve has to be mounted with the arrow in the direction of the flow. Mounting it in the wrong direction may damage the system and the valve itself.
If flow reversal is possible, a non-return valve should be mounted.
Minimum differential pressure above which the valve begins to exercise its regulating effect is listed in the table below.To achieve max nominal flow rate on DN40 and DN50 valves (1½" and 2"), remove the protective cap.

	92VL ½" / **92VL1½"**	**92L½"** / **92L1½"**	**92H½"** / **92H1½"**	**92L¾"** / **92L1¾"**	**92H¾"** / **92H1¾"**	**92L1"** / **92L11"**	**92H1"** / **92H11"**	**92H1¼"** / **92H11¼"**	**92H1½"** / **92H11½"**	**92H2"** / **92H1 2"**
ΔPStart-up	25kPa 0,25bar	35kPa 0,35bar	30kPa 0,30bar	30kPa 0,30bar	35kPa 0,35bar	30kPa 0,30bar	30kPa 0,30bar	35kPa 0,35bar	40kPa 0,40bar	40kPa 0,40bar

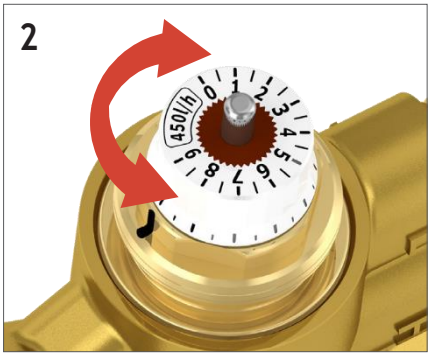
Medium
Water/Water+glycol30%

Flowpreset

On the top of the valve, there's a black mark which indicates the current position of the presetting. By setting the position of the white selector, it is possible to set the desired flow rate. To do that, please follow these steps:



Remove the handwheel or the actuator. Default setting: pos. 9.

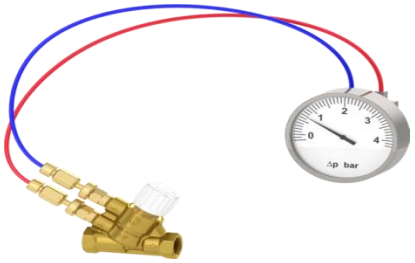


Turn the selector to the target position to set the flow rate.

Re-assemble the handwheel or the actuator.

1. Operating Control (not for 92-1 model)

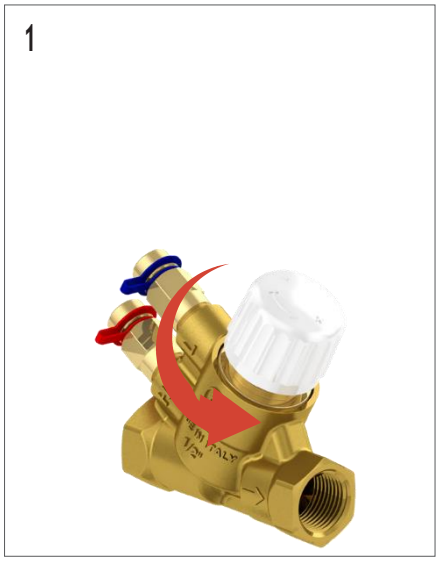
It is necessary to be sure that the valve is actually working in the operating range. In order to verify it, just measure the differential pressure across the valve, as shown in the picture.If the measured differential pressure is higher than the start-up pressure, the valve is actually keeping the flow constant at the set value.Pettinaroli MDPS2 is the device which allows doing this: 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 catalogue).



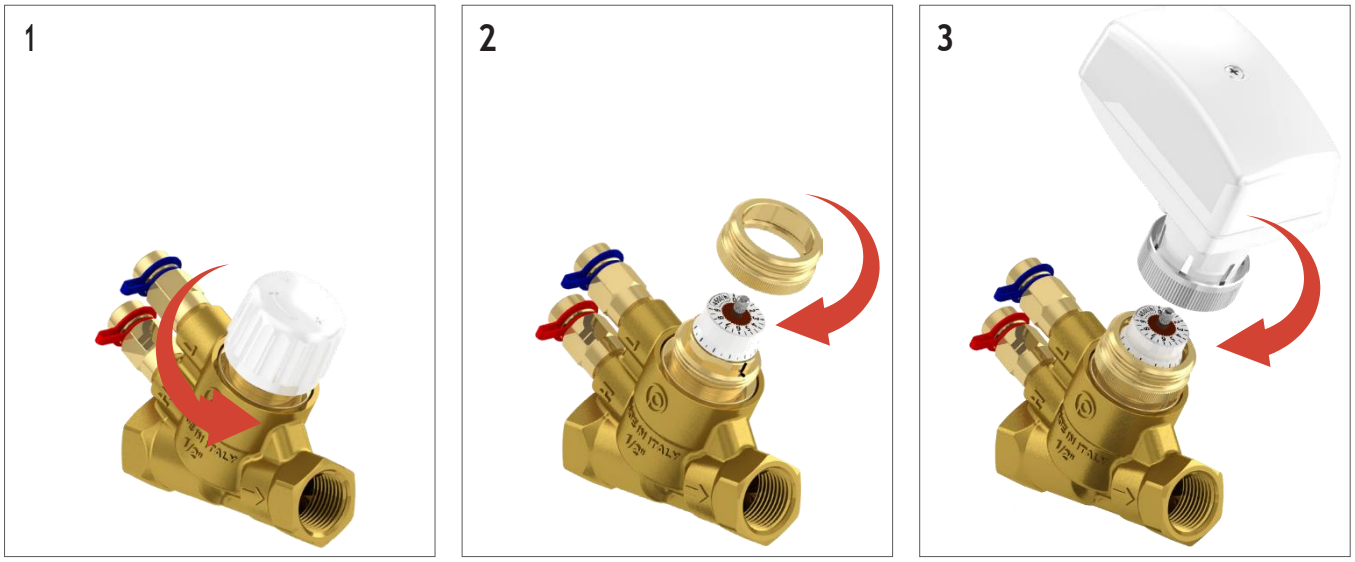
1. **Actuator assembly**

The valve can be equipped with a series of thermo-electric or electromotiveactuators,according to the requirements of the system. Actuators come along with an adapter for proper mounting on the valve and for proper functioningofthewholedevice.

Thermo-electricactuator:not suitable for DN40andDN50valves(1½"and2")



Electromotiveactuator

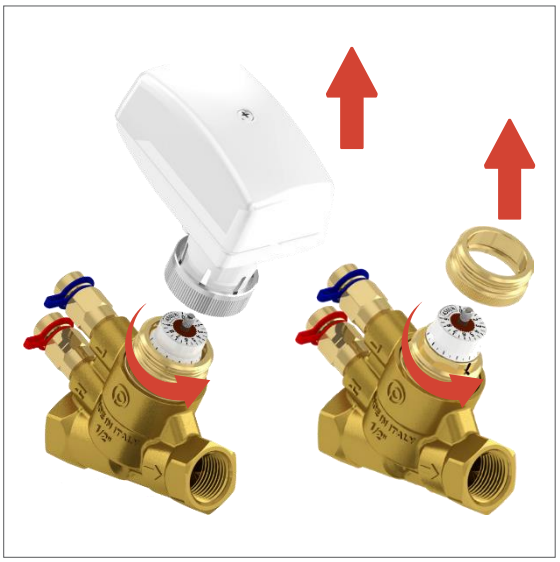


2. Maintenance,cleaning and replacement of the diaphragm of DYNfiSTY92valve

During val ve cleaning operations, use a damp cloth. **Do not use any detergent or chemical product** that mayseriously damage or compromise the proper functioning and the reliability of the valve. Maintenance and cleaningofthedifferentialpressureregulatorandthecontrolvalvemustbecarriedoutasperfollowinginstructions:

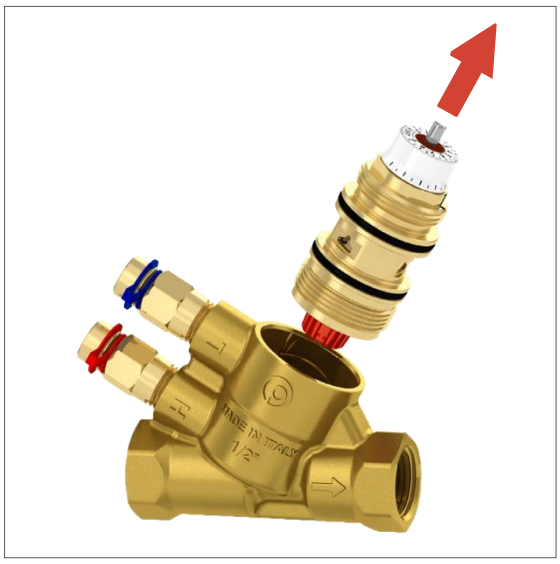
Step1a:completely remove the knob.

Step1b:remove the actuator and its adapter.



Step2Using a 21mm (DN15 to DN25) or a 30mm (DN32 to DN50) spanner, unscrew the head work..

Step3:remove the headwork.

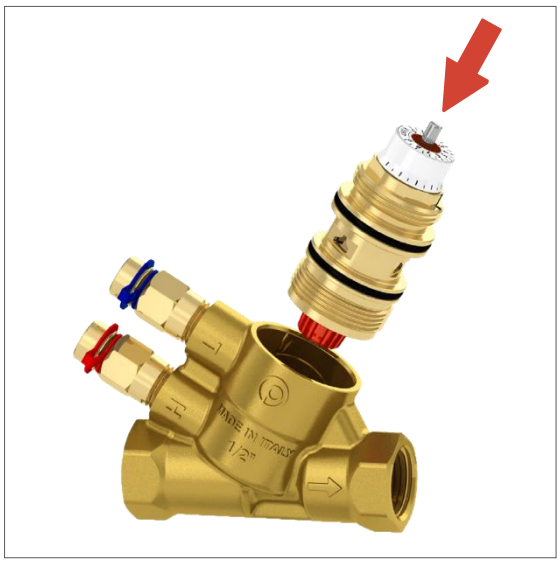


Step4: Push down the control valve's stem and pull the diaphragm out.

Step5: Clean the diaphragm with water and a cloth. Do not use chemical products.

Step6:put back the diaphragm in the headwork.Push it in its seat.

Step7:replace the headwork.

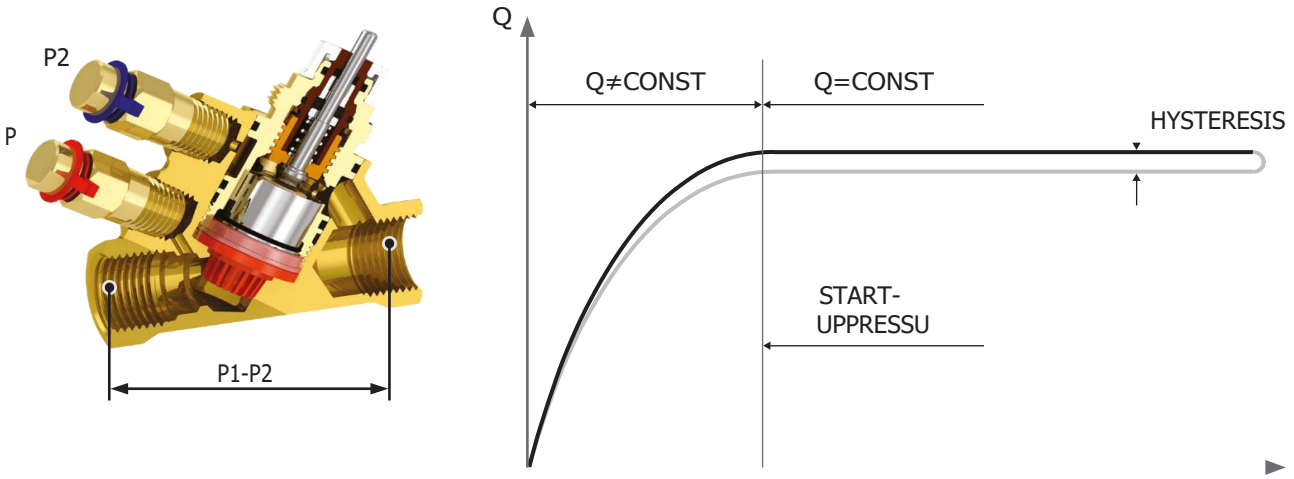


Step8:screw the headworkwith 20Nmt or que(refer to step2 fordimensions of the tool).

Step 9: place the actuator with its adapter or theknob.

To replace the element control valve (DPCV), follow the instructions above except for steps 4, 5, and 6.
In step 7, put a new headwork (092DC).

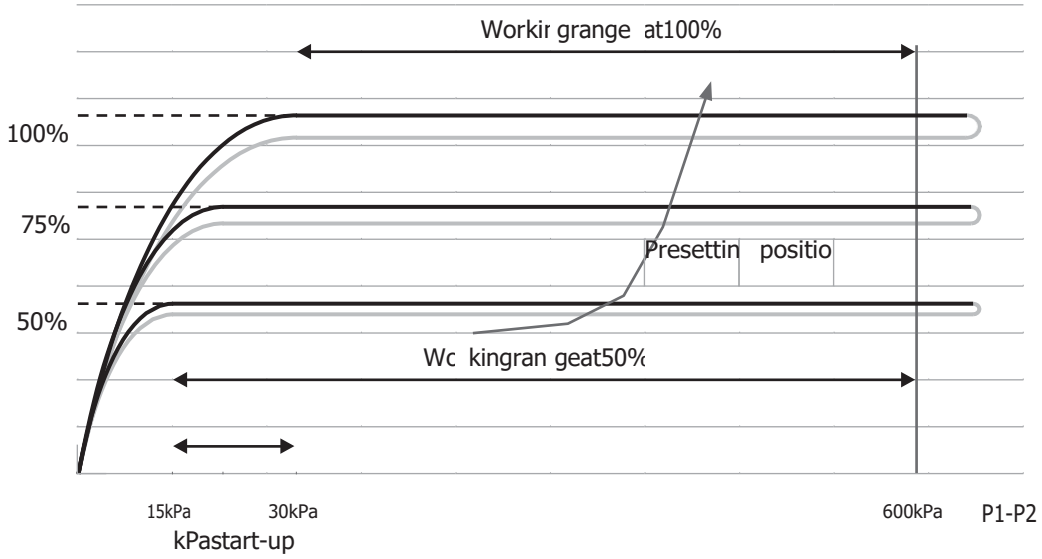
EN Start-up curves andpresetting



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 you 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−P2P_1 - P_2P1 −P2 is higher than the start-up value for the presetting position selected. This feature is not available on the DYNfiSTY92-1 model, but it can be implemented by adding two pressure ports. For more information about that, see the "Accessories" section.If the ΔP measured value is lower than the start-up value, then the valve works as a fixed orifice valve, so it doesn't keep the flow rate constant.

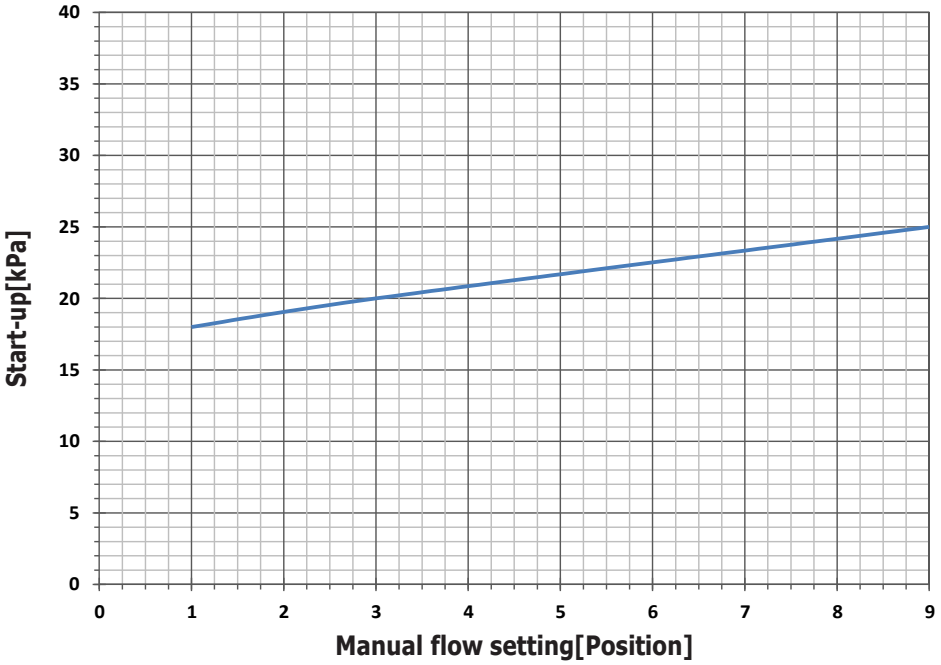
The start-up value varies with the flow setting of the valve, as shown by the example below:

Flowrate

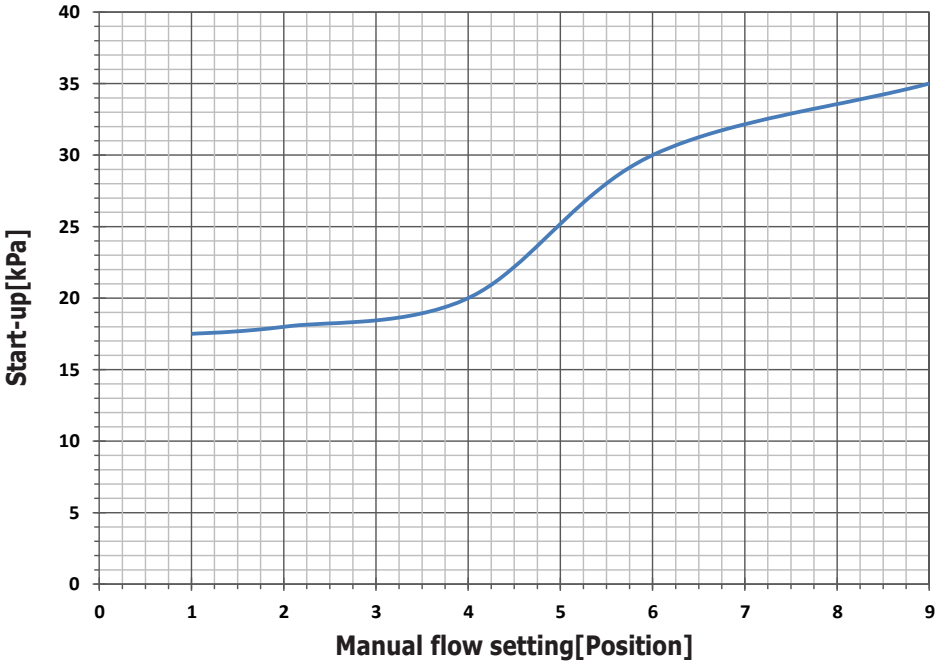


When the valve is set at 100% of nominal (maximum) flow, the curve begins to remain constant at 30 kPa. Therefore, the suggested working range of the valve is 30 ÷ 600 kPa.When the valve is set at 50% of nominal flow, the curve begins to remain constant at 15 kPa. Therefore, the working range of the valve is 15 ÷ 600 kPa.Over 600 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 600 kPa.

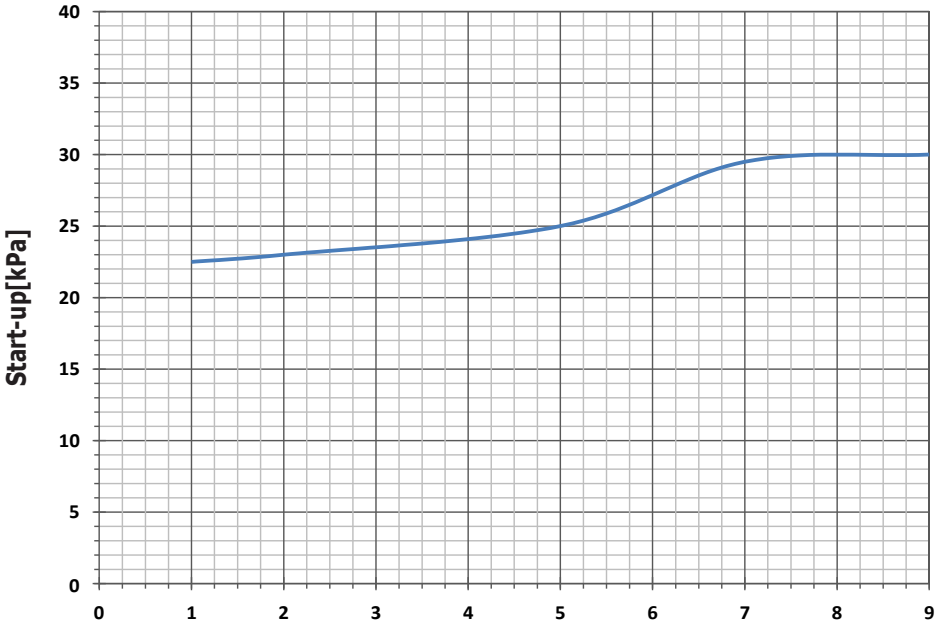
The following diagrams show the start-up pressure at different presettings.



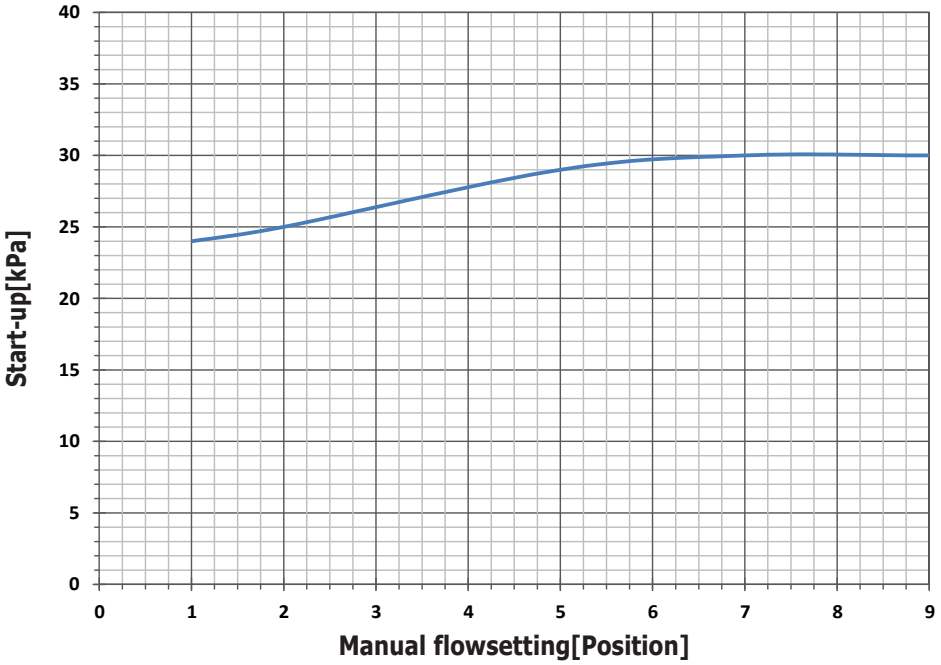
Valve			
92VL½"-150l/h			
92VL1½"-150l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	18	5.5	22,1
1.5	18,5	6	22,5
2	19,05	6.5	22,95
2.5	19,55	7	23,35
3	20	7.5	23,75
3.5	20,45	8	24,6
4	20,85	8.5	24,6
4.5	21,3	9	25
5	21,7		



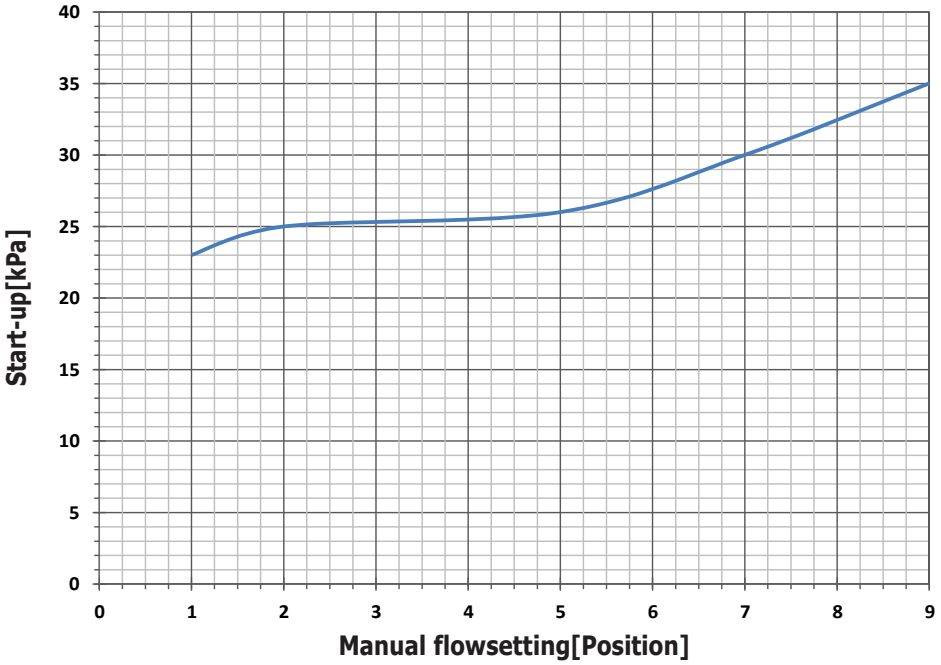
Valve			
92L½"-450l/h			
92L1½"-450l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	17,5	5.5	28
1.5	17,7	6	30
2	18	6.5	31,25
2.5	18,3	7	32,15
3	18,55	7.5	32,9
3.5	19,05	8	33,55
4	20	8.5	34,25
4.5	22,15	9	35
5	25,2		



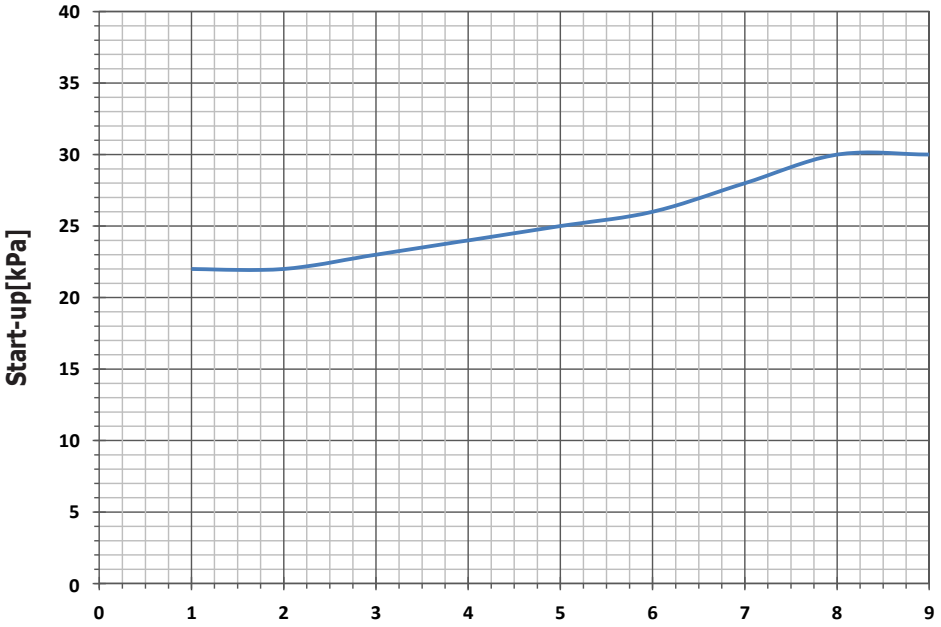
Valve			
92H½"-850l/h			
92H1½"-850l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	22,5	5.5	25,9
1.5	22,7	6	27,15
2	23	6.5	28,55
2.5	23,3	7	29,5
3	23,5	7.5	29,9
3.5	23,8	8	30
4	24,1	8.5	30
4.5	24,5	9	30
5	25		



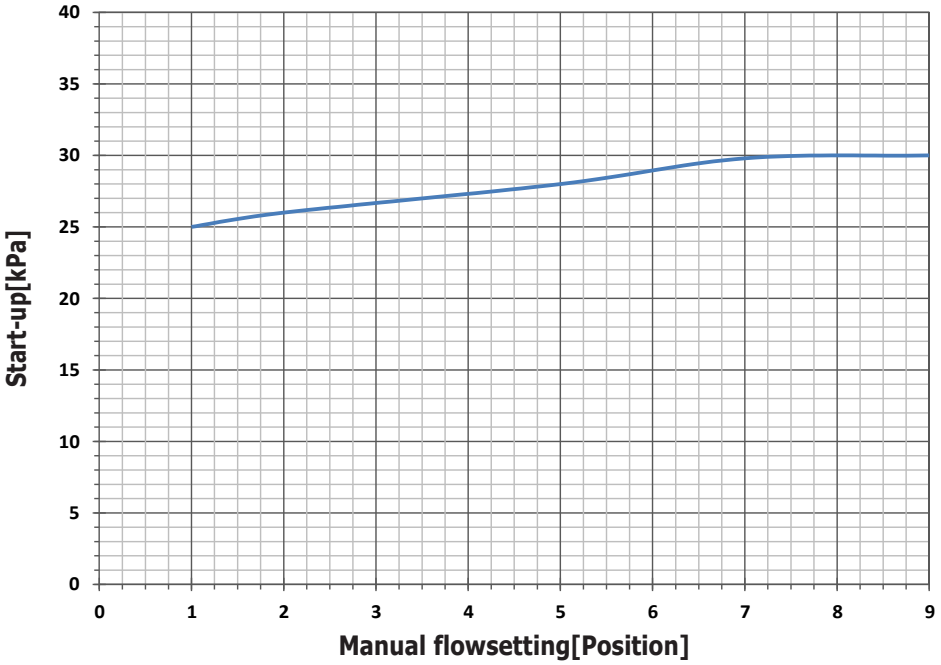
Valve			
92L¾"-1000l/h			
92L1¾"-1000l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	24	5.5	29,45
1.5	24,45	6	29,7
2	25	6.5	29,9
2.5	25,7	7	30
3	26,4	7.5	30
3.5	27,1	8	30
4	27,8	8.5	30
4.5	28,4	9	30
5	29		



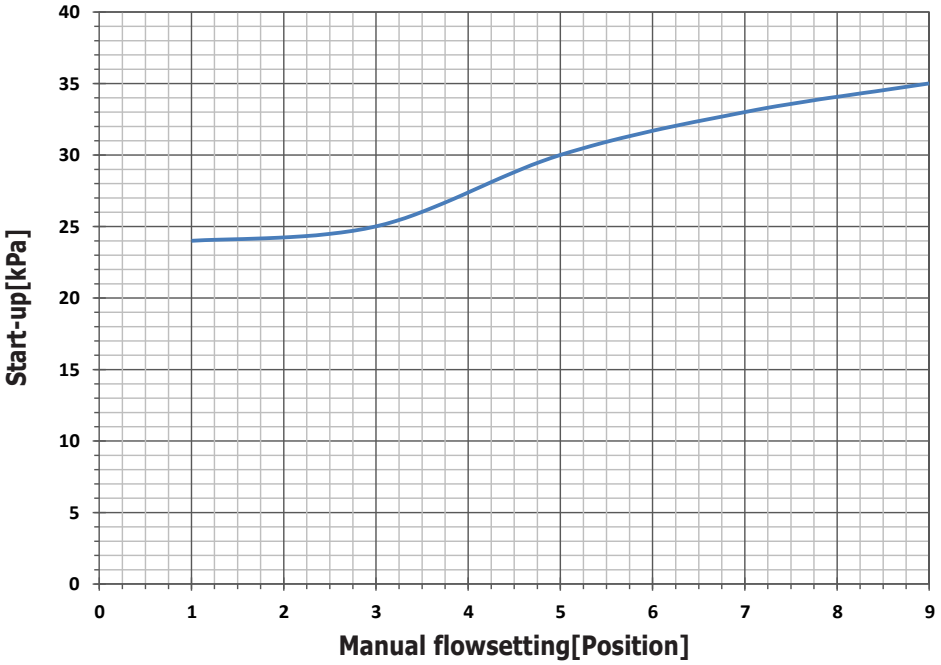
Valve			
92H¾"-1850l/h			
92H1¾"-1850l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	23	5.5	26,7
1.5	24,4	6	27,6
2	25	6.5	28,8
2.5	25,2	7	30
3	25,3	7.5	31,2
3.5	25,4	8	32,4
4	25,5	8.5	33,7
4.5	25,65	9	35
5	26		



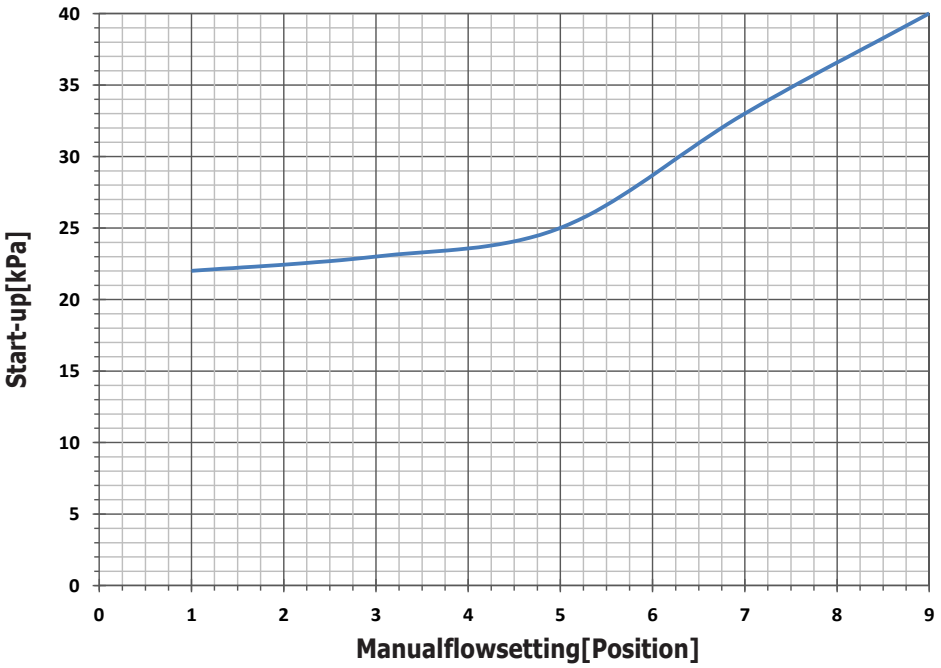
Valve			
92L1"-2500l/h			
92L11"-2500l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	22	5.5	25,5
1.5	22	6	26
2	22	6.5	26,95
2.5	22,45	7	28
3	23	7.5	29,1
3.5	23,5	8	30
4	24	8.5	30
4.5	24,5	9	30
5	25		



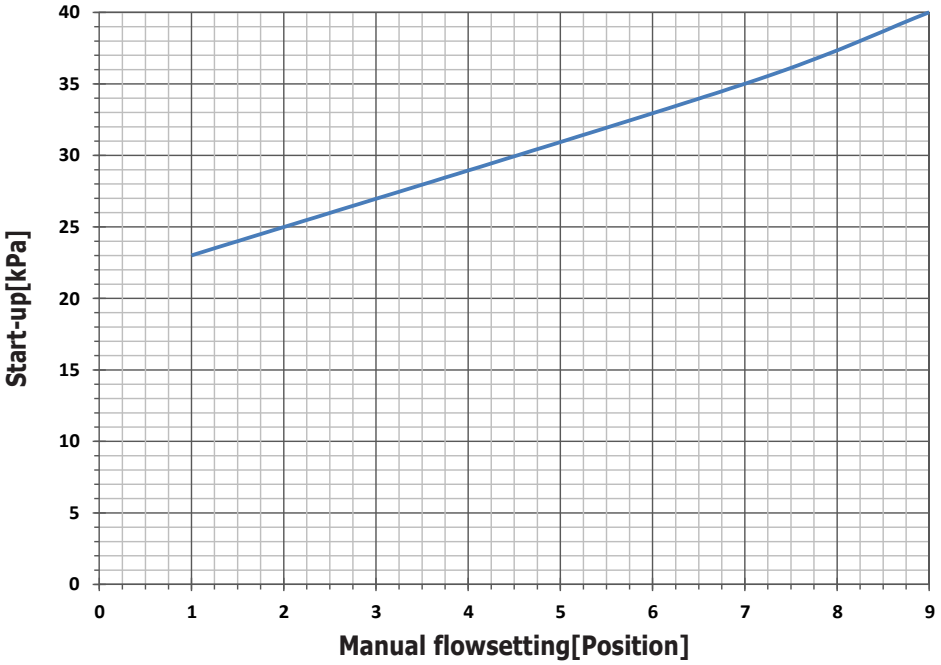
Valve			
92H1”-3300l/h			
92H11”-3300l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	25	5.5	28,4
1.5	25,55	6	28,95
2	26	6.5	29,45
2.5	26,35	7	29,8
3	26,65	7.5	29,95
3.5	27	8	30
4	27,3	8.5	30
4.5	27,65	9	30
5	28		



Valve			
92H1¼”-5200l/h			
92H11¼”-5200l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	24	5.5	30,9
1.5	24,1	6	31,7
2	24,2	6.5	32,35
2.5	24,5	7	33
3	25	7.5	33,55
3.5	26	8	34,05
4	27,4	8.5	34,5
4.5	28,8	9	35
5	30		



Valve			
92H1½”-9000l/h			
92H11½”-9000l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	22	5.5	26,6
1.5	22,2	6	28,7
2	22,45	6.5	30,9
2.5	22,7	7	33
3	23	7.5	34,8
3.5	23,3	8	36,55
4	23,6	8.5	38,25
4.5	24,1	9	40
5	25		



Valve			
92H2”-14000l/h			
92H12”-14000l/h			
Presetting [Position]	Start-up[kPa]	Presetting [Position]	Start-up[kPa]
1	23	5.5	31,9
1.5	24	6	32,9
2	24,95	6.5	33,95
2.5	25,95	7	35
3	26,9	7.5	36,1
3.5	27,95	8	37,35
4	28,9	8.5	38,65
4.5	30	9	40
5	30,9		

EN Flow presetting for DYNfiSTY92

The following tables collect the flow rate values corresponding to the different presetting that can be set on the valve:

Presetting [Position]	92VL ½" / 92VL1½"		92L½" / 92L1½"		92H½" / 92H1½"		92L¾" / 92L1¾"		92H¾" / 92H1¾"	
	Flowrate		Flowrate		Flowrate		Flowrate		Flowrate	
	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s
9	150	0,043	450	0,125	850	0,236	1000	0,277	1850	0,514
8	133,2	0,037	387	0,108	774	0,215	911	0,253	1734	0,484
7	114	0,032	328,8	0,091	689	0,191	804	0,223	1548	0,430
6	99,6	0,028	261	0,073	606	0,168	722	0,201	1320	0,367
5	85,2	0,024	207	0,058	496	0,138	573	0,159	1080	0,300
4	70,8	0,020	165	0,046	393	0,109	451	0,125	846	0,235
3	55,2	0,015	121,2	0,034	331	0,092	376	0,104	624	0,173
2	39,6	0,011	81,6	0,023	265	0,074	291	0,081	492	0,137
1	19,2	0,005	42	0,012	157	0,044	169	0,047	276	0,077
0	0	0	0	0	0	0	0	0	0	0

Presetting [Position]	92L1" / 92L11"		92H1" / 92H11"		92H1¼" / 92H11¼"		92H1½" / 92H11½"		92H2" / 92H1 2"	
	Flowrate		Flowrate		Flowrate		Flowrate		Flowrate	
	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s	l/h	l/s
9	2500	0,694	3300	0,917	5200	1,444	9000	2,500	14000	3,88
8	2202	0,612	3046	0,846	4680	1,300	8040	2,233	12780	3,550
7	1875	0,521	2682	0,745	4164	1,157	7200	2,000	11040	3,067
6	1577	0,438	2265	0,629	3582	0,995	6240	1,733	9240	2,567
5	1304	0,362	1849	0,514	2880	0,800	5070	1,408	7620	2,117
4	1048	0,291	1387	0,385	2220	0,617	3954	1,098	5760	1,600
3	798	0,222	884	0,246	1578	0,438	2814	0,782	4260	1,183
2	560	0,155	543	0,151	1026	0,285	2064	0,573	2790	0,775
1	339	0,094	173	0,048	540	0,150	1110	0,308	1560	0,433
0	0	0	0	0	0	0	0	0	0	0

In order to find the presetting position for a general flow rate value which isn't in the tables above, it is possible to use the linear interpolation formula.Once the desired flow rate XXX has been designed, in order to find the corresponding presetting position YYY, it is needed to identify the extremity flow rate values, X1X_1X1 and X2X_2X2 (respectively the upper and lower ones), and their relative presetting positions Y1Y_1Y1 and Y2Y_2Y2.Since the difference Y1−Y2Y_1 - Y_2Y1−Y2 is always equal to 1, the desired presetting position can be easily calculated as:

$$Y=Y_2+\frac{(Y_1-Y_2)\times(XXX-XXX_2)}{(XXX_1-XXX_2)}=Y_2+\frac{(XXX-XXX_2)}{(XXX_1-XXX_2)}$$

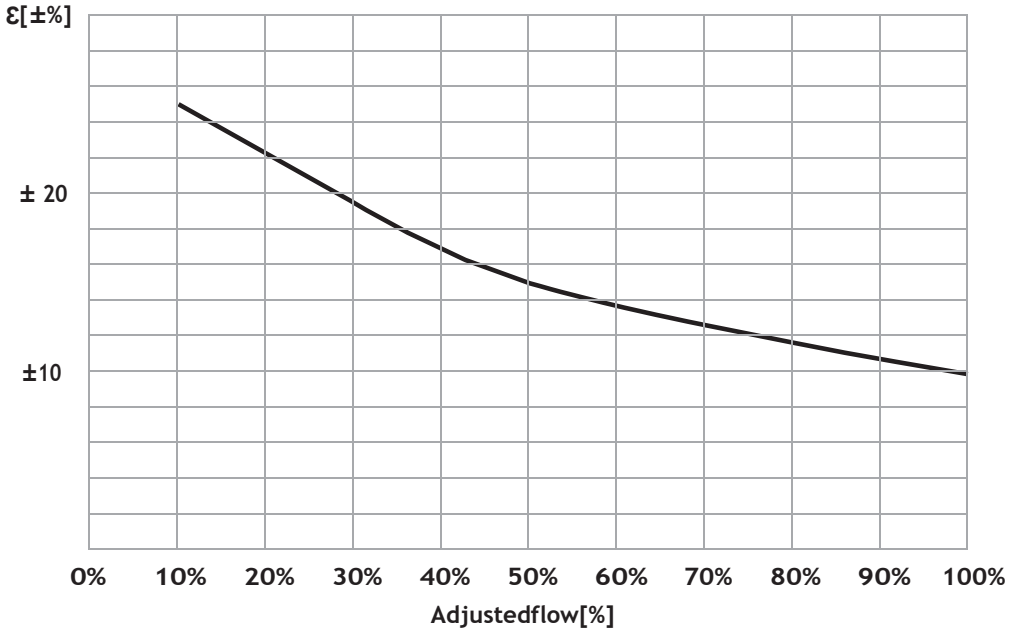
CALCULATIONEXAMPLE

We want to obtain the postion at which a92H1¼"valve must be presetted inorder to have a flowrate of 3200l/h.From the tables above the extremity flowrate values are 3582l/he 2880l/h which correspond to presetting 6 and 5.The presetting position that must be selected on the valve is:

$$Y=5+\frac{(6-5)\times(3200-2880)}{(3582-2880)}=5+\frac{(3200-2880)}{(3582-2880)}=5.46=5.5$$

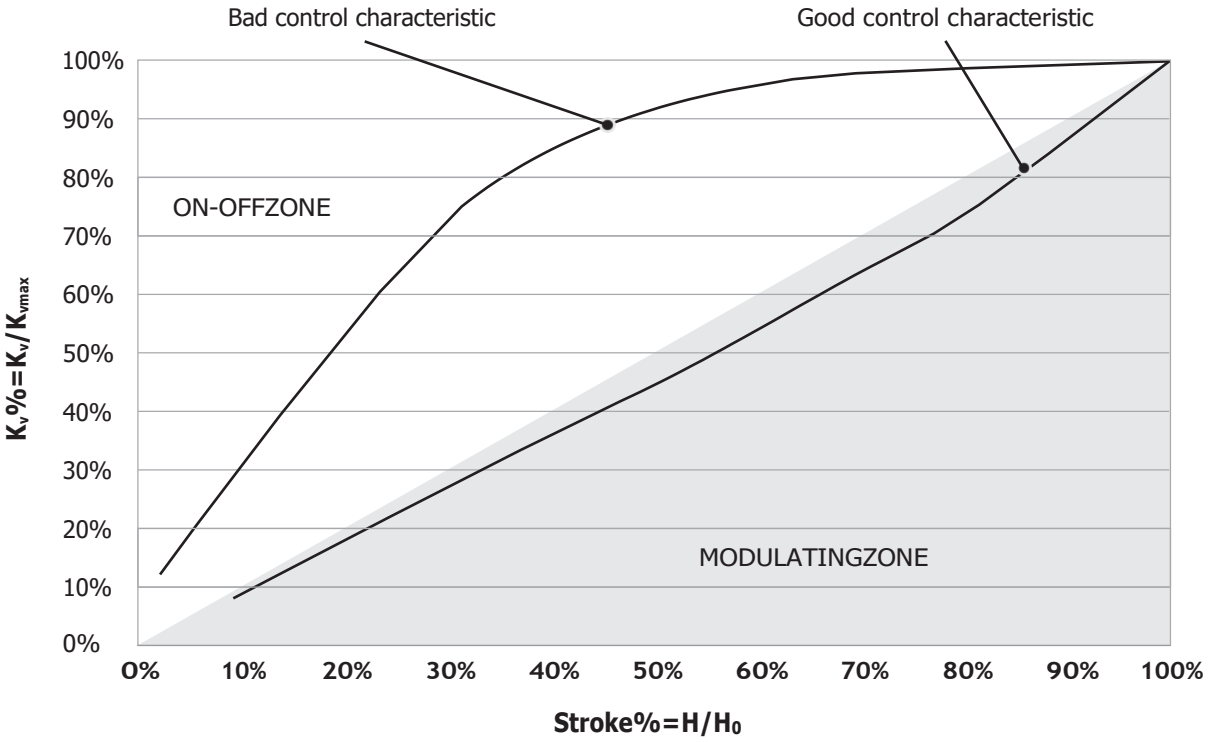
EN Flowsetting accuracy

The following graph shows the maxflow deviation for differential pressure over 1bar and presetting below pos.9.For presetting 9 and ΔP lower than 1 bar the maxflow deviation is reducedto±5%.Please contact technical department for further informations.



EN Control curves

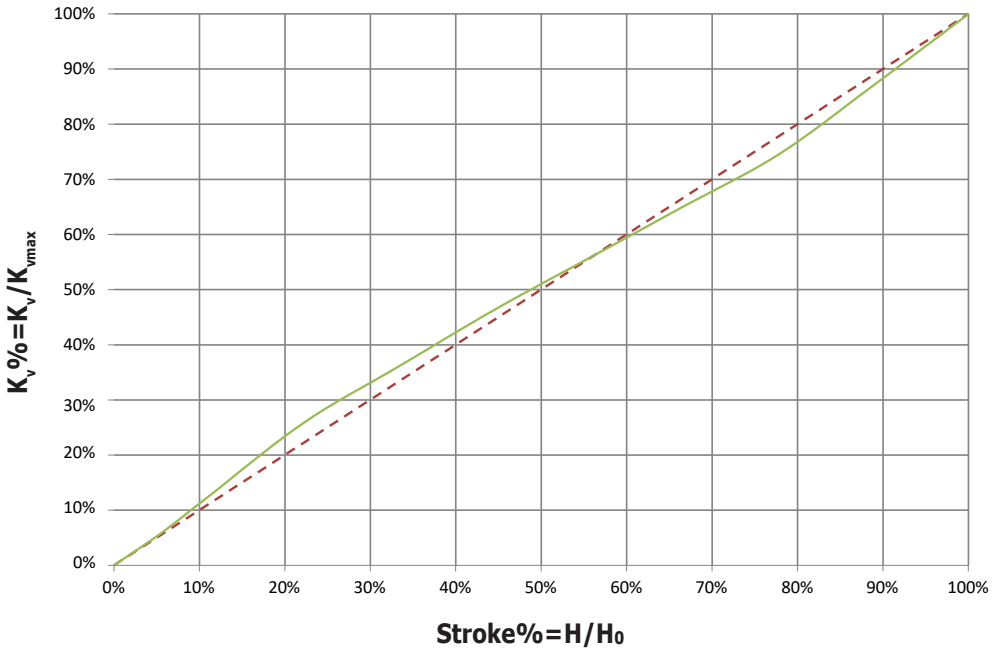
Operating on the position of the regulating valve control stem A will modify the valve K_v,hence the flowrate.Typical relations between$K_v$and stroke for a control valve are shown below:



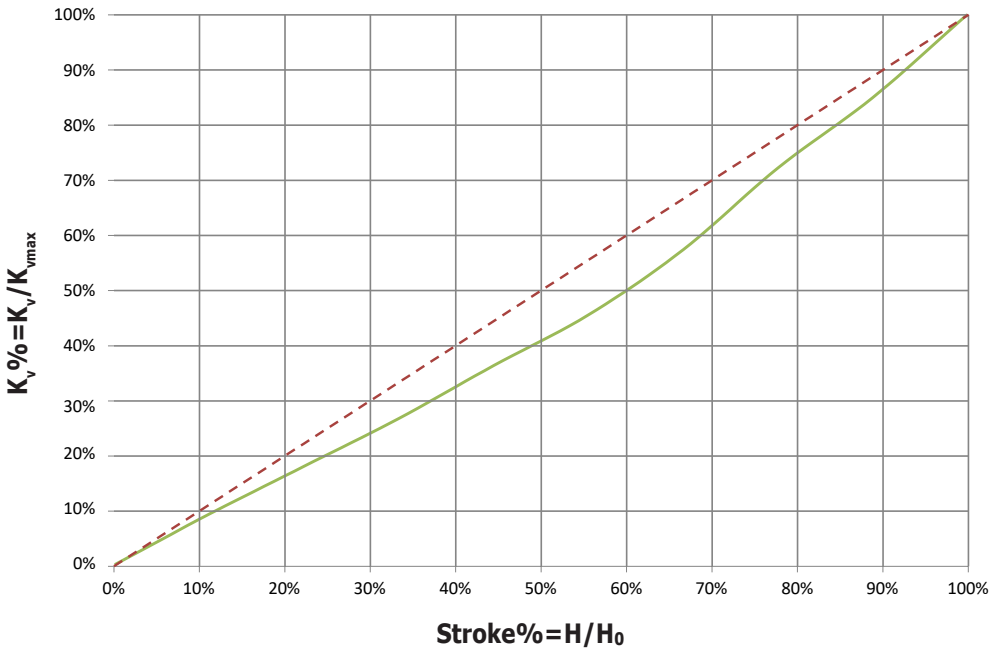
Where:

- H_0 is the maximum lift of thecontrol valve
- K_{vmax} is the valve flow factor when the valve is fully open so at lift equal to H_0
- H is thecurrent lift(opening) of the control valve.It will vary from 0toH_0
- K_v is the valve flow factor related to lift H

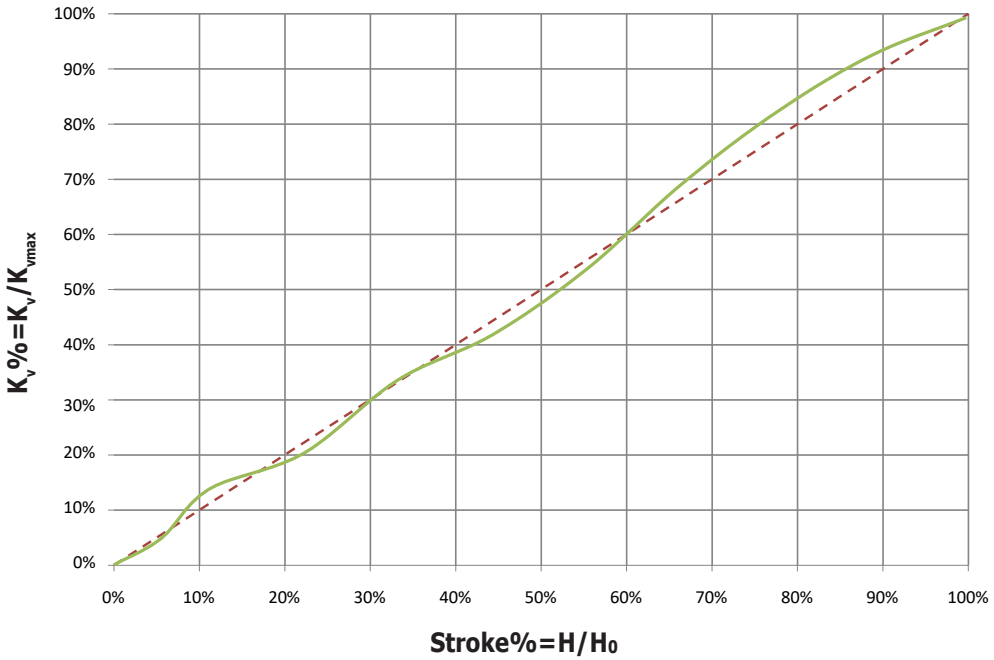
The DYNfiSTY**92** valve has an inherent linear characteristic.
Control curves for 92valves are shown below(control curve characteristic may change according to valve version):



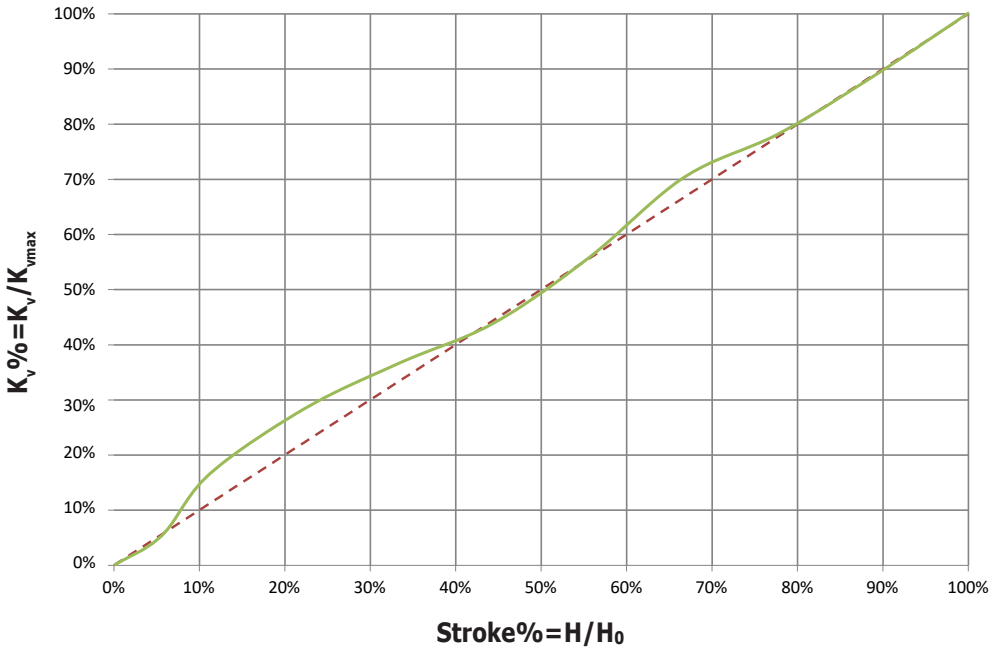
Valve
92VL½"-150l/h
92VL1½"-150l/h
Selectedpresetting
Position9



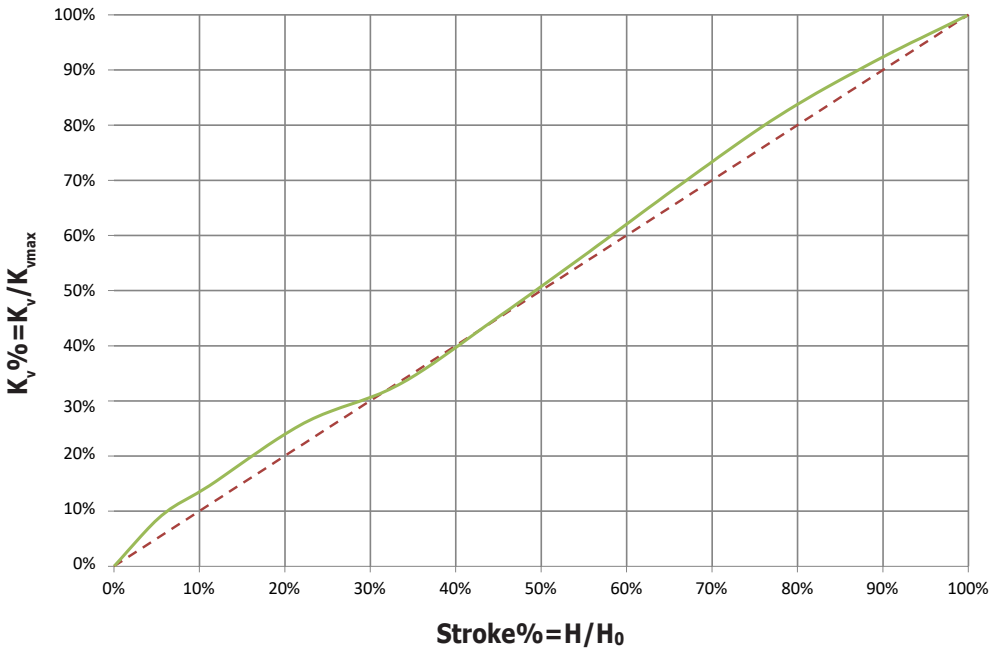
Valve
92L½"-450l/h
92L1½"-450l/h
Selectedpresetting
Position9



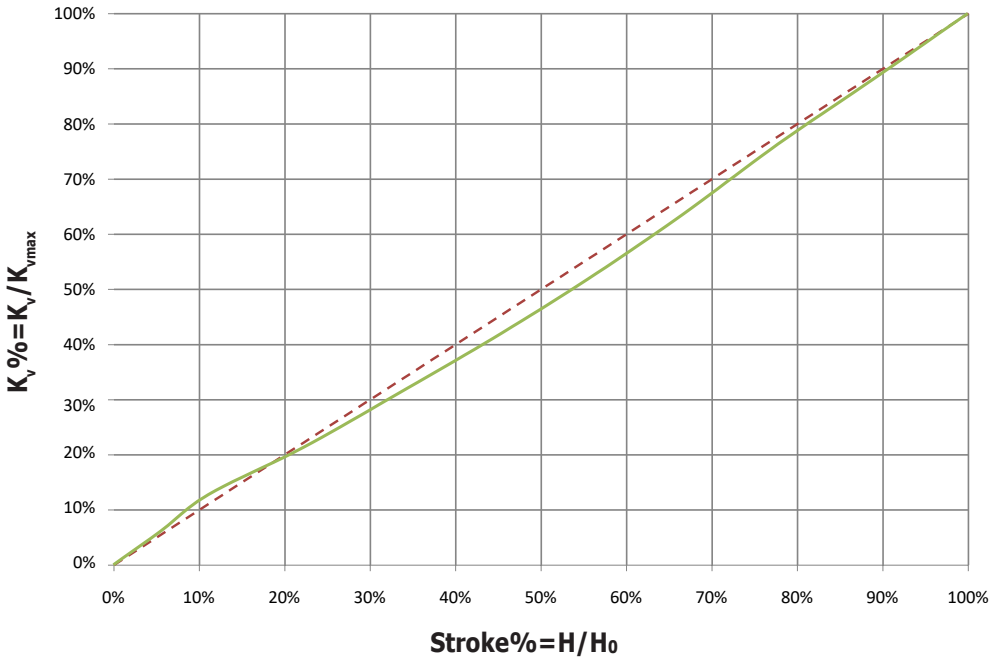
Valve
92H½"-850l/h
92H1½"-850l/h
Selectedpresetting
Position9



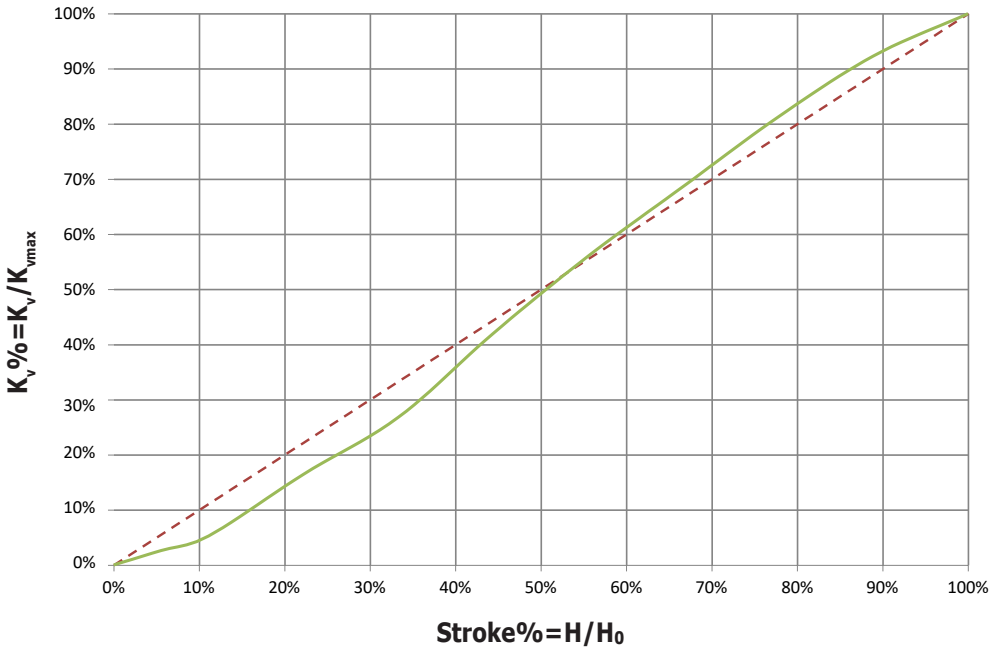
Valve
92L¾"-1000l/h
92L1¾"-1000l/h
Selectedpresetting
Position9



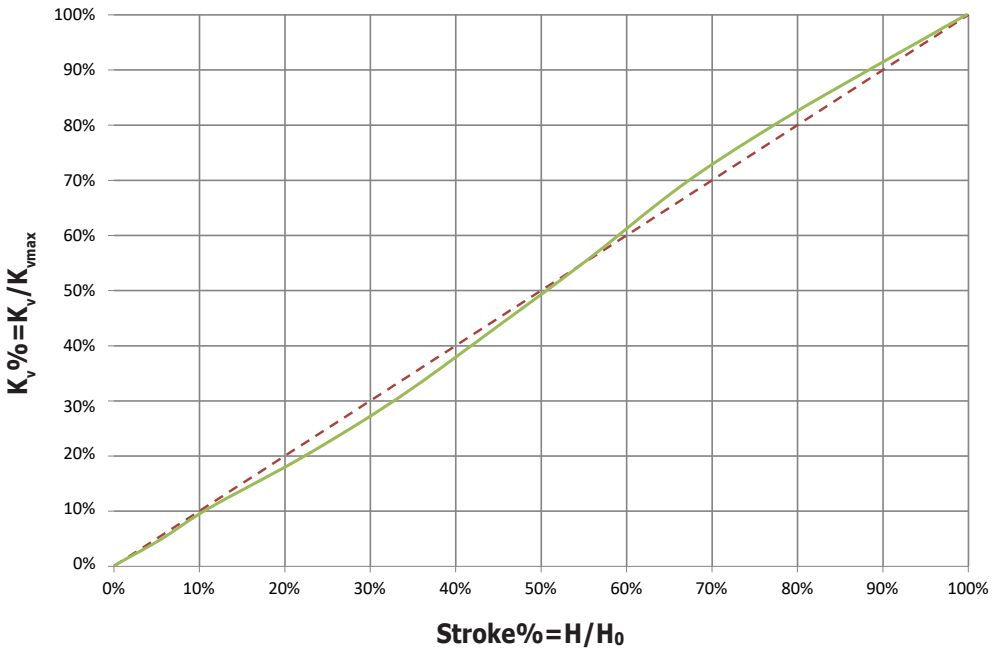
Valve
92H¾"-1850l/h
92H1¾"-1850l/h
Selectedpresetting
Position9



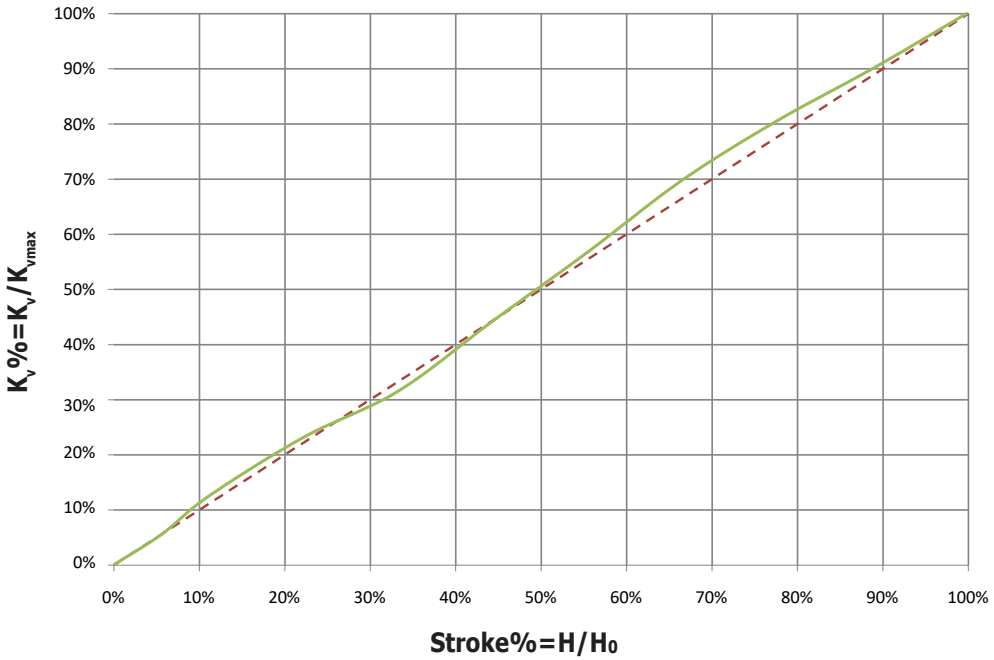
Valve
92L1"-2500l/h
92L11"-2500l/h
Selectedpresetting
Position9



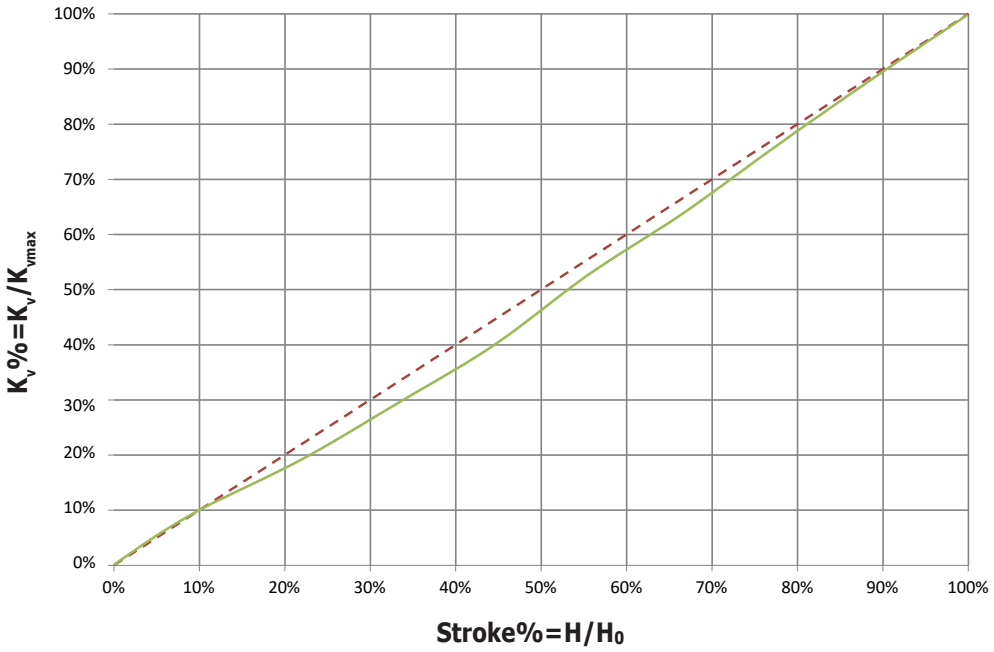
Valve
92H1”-3300l/h
92H11”-3300l/h
Selectedpresetting
Position9



Valve
92H1¼”-5200l/h
92H11¼”-5200l/h
Selectedpresetting
Position9



Valve
92H1½”-9000l/h
92H11½”-9000l/h
Selectedpresetting
Position9

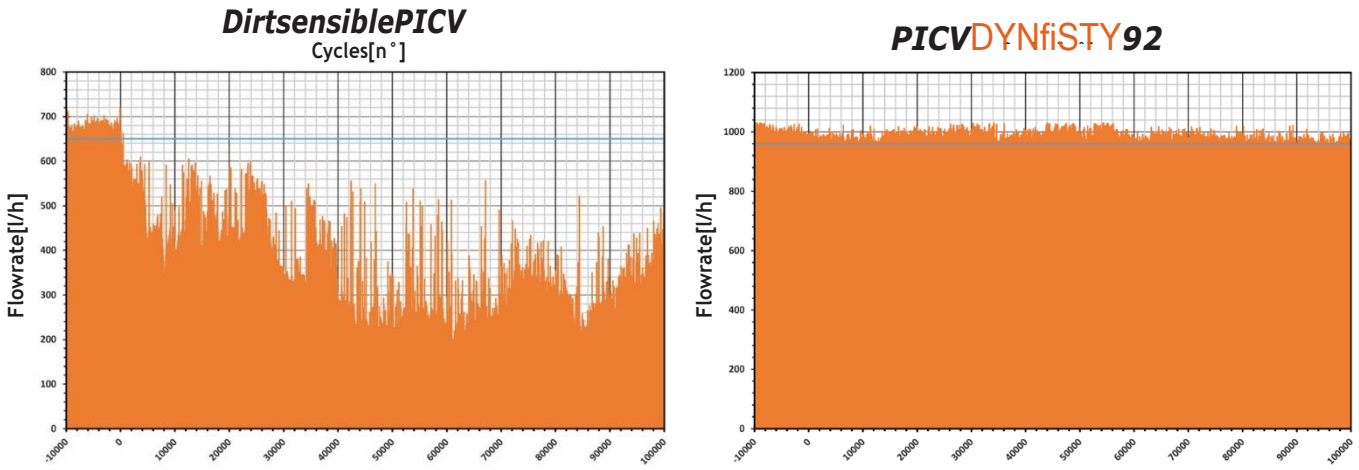


Valve
92H2”-14000l/h
92H12”-14000l/h
Selectedpresetting
Position9

END Dirt-resistant feature

In general, low water quality negatively affects the operation of a PICV. The installation of strainers helps to reduce the problem but nevertheless does not completely cancel it: very small impurities, in fact, manage to bypass the filtering meshes. Their accumulation inside the system can thus lead to the formation of deposits on moving parts, for example, the differential pressure regulator of the PICV, consequently causing blockage.One of the key features of the DYNfiSTY92 range is its ability to work even in dirty water conditions. The inspectable and washable differential pressure regulator has been specifically designed to prevent the valve from blocking even if the heat transfer fluid has micro-particles suspended inside.The conformation of the differential pressure regulator, combined with the special design of all the components, ensures the minimum friction between the moving and fixed parts: this way, the risk of blockage due to excessive friction is reduced.In order to evaluate its efficiency, the valve has been tried out with an appropriate internal wear test. The purpose of this test is to simulate very demanding working conditions to get an experimental confirmation with a proper safety factor. The test has been done on a dedicated circuit using water contaminated by ferric oxide (Fe_2O_3) at a concentration of 900 ppm. In order to obtain a valid response on the time scale, over 100,000 opening and closing cycles of the valve have been done in these demanding conditions.As an example, consider the following graph obtained for a DYNfiSTY 92H ¾" preset in position 4.5 (960 l/h). It represents the trend of the flow processed by the valve throughout the test, which can be divided into two ranges:

- **Cycles 0 → 10,000**: In this range, the valve has been tested in clean water conditions.
- **Cycles 10,000 → 100,000**: In this range, the valve has been tested in contaminated water conditions.



As it can be seen from the graph, differences are relevant. The PICV DYNfiSTY92 worked perfectly: there are no flow steps or jumps, unlike a common dirt-sensitive PICV. The flow rate has been kept constant even after the addition of iron oxide (cycle 0).As previously mentioned, these tests have been done in very demanding conditions with the aim to obtain an appropriate safety factor for the user.The manufacturer does not accept any liability for improper or wrong use of this product. The PICV DYNfiSTY series can work as per the specification with a maximum iron oxide concentration of up to 900 ppm, according to the results of the proprietary test carried out in Fratelli Pettinaroli's premises.Fratelli Pettinaroli suggests following the VDI 2035 standard to ensure suitable operation of all equipment in HVAC systems.

EN Valve Nomenclature

The nomenclature of the valve depends on the selected model and the desired thread. As an example, consider the following table:

With Rp thread		With NPT thread	
With pressure ports	Without pressure ports	With pressure ports	Without pressure ports
92H½"	**92H1½"**	**92HN½"**	**92H1N½"**

ENActuators

Thetablebelowshowsactuatorspartnumbersfordifferentcontroltypes:

Type-Electromotive	Partnumber	Stroke	Suitablesize	Adapter	
24V,0-10VProportional,Feedback	VA7483	6,3mm^	DN15toDN32	0A7010*	0A748X*
				DN15-20	DN25-32
24V,0-10V Prop, Feedback, Fail safe	VA7484	6,3mm^	DN15toDN32	0A7010*	0A748X*
				DN15-20	DN25-32
24V,3PointFloating	VA7481	6,3mm	DN15toDN32	0A7010*	0A748X*
				DN15-20	DN25-32
230V,3PointFloating	VA7481	6,3mm	DN15toDN32	0A7010*	0A748X*
				DN15-20	DN25-32
24V,0-10VProportional,Feedback	VA7493	8,7mm^	DN40	0A7493**	
24V,0-10VProportional,Feedback	RVAZ2C	8,5mm^	DN40,DN50	0A748X*	
24V,3PointFloating	RVAZ2	8,5mm^	DN40,DN50	0A748X*	
120/230V,3PointFloating	RVAZ2	8,5mm^	DN40,DN50	0A748X*	
24V,0-10VProportional,FailSafe	VM060	6.5mm^	DN15toDN32	76TE**	

Type-Thermo-electric	Partnumber	Stroke	Suitablesize	Adapter
24V,0-10VProportional	A544P3	4mm	DN15,DN20	VA64**
24V,0-10VProportional	A564P3	6.5mm	DN25,DN32	VA64**
24V, ON-OFF,2wires	A544O2	4mm	DN15,DN20	VA64**
24V,ON-OFF,4wires	A544O4	4mm	DN15,DN20	VA64**
230V,ON-OFF,2wires	A542O2	4mm	DN15,DN20	VA64**
230V,ON-OFF,4wires	A542O4	4mm	DN15,DN20	VA64**
230V,ON-OFF,2wires	V542O2	4mm	DN15,DN20	VA64**
120V,ON-OFF,2wires	A551O2	5mm	DN15,DN20	VA64**
24V, ON-OFF,2wires	A564O2	6.5mm	DN25,DN32	VA64**
120V,ON-OFF,2wires	A561O2	6.5mm	DN25,DN32	VA64**
230V,ON-OFF,2wires	A562O2	6.5mm	DN25,DN32	VA64**

*AdapterNOTincluded. **Adapterincluded. ^Equippedwithstrokedetectionsystem.

FratelliPettinaroliis not liable for unauthorized use of actuators not shown in the table above.

ENAccessories

T90RB

Pressure ports for temperature and pressure measurement. They can be added at the92-1model.

MDPS2

Digital differential manometer Bluetooth® for start-up test of PICV valves and flowrate measurement of Terminator balancing valves and Venturi devices.To be used with specific app installed on a smartphone.

MDP
Digital differential manometer for differential pressure measurement.

EN Insulating cases

UL94 fire rated insulating case for PICV.Available for heating and cooling installations with the following partnumbers:

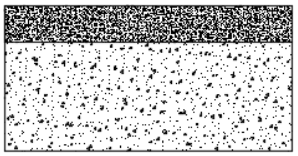
- **092IHV**:case for heating,closure by Velcro®.Size has to bespecified.
- **092ICV**:case forcooling,closure by Velcro®.Size has to be specified.

Cases for heating let the headwork and the actuator uncover wheras those for cooling cover the actuator too(all those in ther range).The case is made by 2sheel connected with Velcro®and realized with as and wichstructure:

- **External layer**: made by high density polyetylene cross linked foam (80 kg/m³) to give rigidity at the sheel.
- **Internal layer**: made by low density polyetylene cross linked foam (29 kg/m³) to increase the insulation performances of the sheel.

Total thickness: 20 mm. For more informations about insulating cases please see their dedicated technical specification"Insulatingcases".

Feature	Insulatingcase	
Density[kg/m³]	29	80
Operatingtemperaturerange[°C]	-60/+90	-60/+90
Thermalconductivity[W/mK]	0.040	0.049
Thickness[mm]	18	2



Crosssectioninsulatingsheel

EN General conditions

To ensure the main pipework is cleaned appropriately, flushing by-passes should be used: for effective flushing (suitable water velocity), any flushing through the pressure regulator of the PICV is not suggested, according to BSRIA GuidelineBG29.

FRATELLI PETTINAROLI S.p.A. CLIMATE SYSTEMS TECHNOLOGY

FratelliPettinaroliSpa
Via Pianelli, 38 - 28017 San Maurizio d'Opaglio (NO) -
ItalyTel.+39032296217-+39032296545-Fax+39032296546
info@pettinaroli.com-www.pettinaroli.com