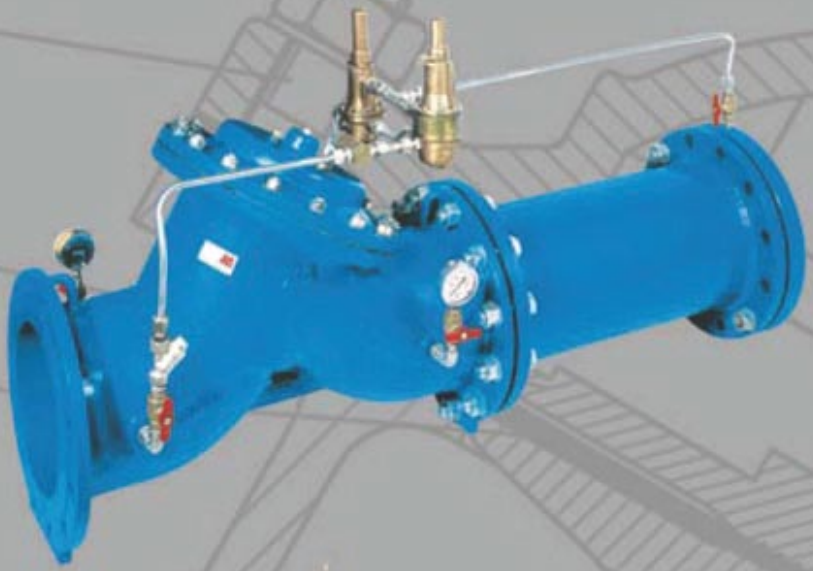
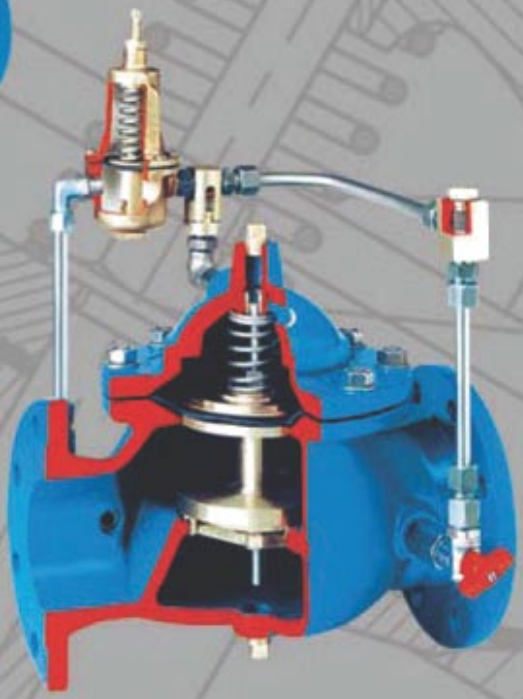
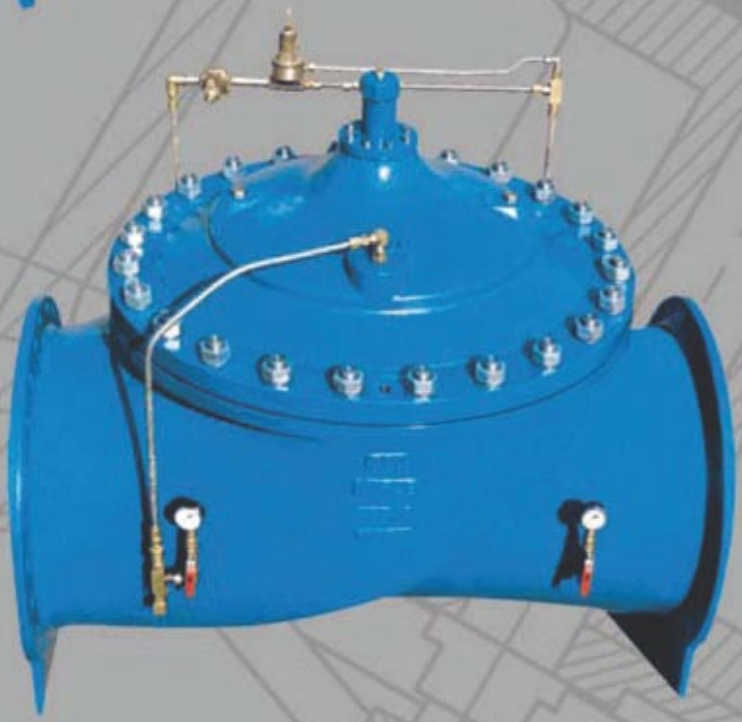
PARS ETHYLENE KISH

Manufacturer of Polyethylene Pipe,Fittings
and Relevant Valves and Equipments

Automatic Control Valves
(RVA)







شیر فشار شکن

www.parsethylene.com
www.parsethylene-kish.com

(98-21) 88 20 20 60 (50 Lines)
Info@parsethylene-kish.com

Automatic Control Valves (RVA)

Size: DN 50 – 800 mm
Pressure: PN 10 – 40 bar

Face to face: DIN EN 588-1 series 1(DIN 3202-F1)
Flanges: DIN EN1092-2(DIN 2501)

Product Features:
AB Control Valves are used as regulating and Control valves. The body is designed in either horizontal or diagonal shape, with the internal configuration suitable for fluid flow. The valves are controlled automatically by a pilot valve and water flow. The body interior and exterior is coated with epoxy powder.

Application:
Automatic control valves are used to control pressure, flow rate, fluid level, pump operation and … automatically. they can use in water supplies and water storages, pipe line and water networks, pump stations, etc. these valve can be used for fluids such as water and raw water with temperature up to 70°C.

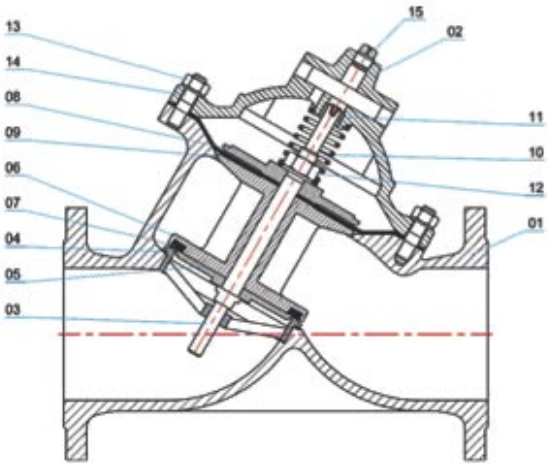
Corrosion protection:
All casting parts are coated with epoxy powder RAL 5015 or 5005 by electrostatic method.

Hydrostatic test Pressure (bar) according to DIN EN 12266-1		
Nominal Pressure PN (bar)	Test Pressure, with water, (bar)	
	Body	Seat
10	17	11
16	25	17.6
25	37.5	27.5

Type of pilots manufactured by AB:

1- Pressure reducing pilot
2- Pressure relief pilot
3- 2-way on/off float level control
4- Differential pressure control
5- 3-way excess differential pressure control with locked trip

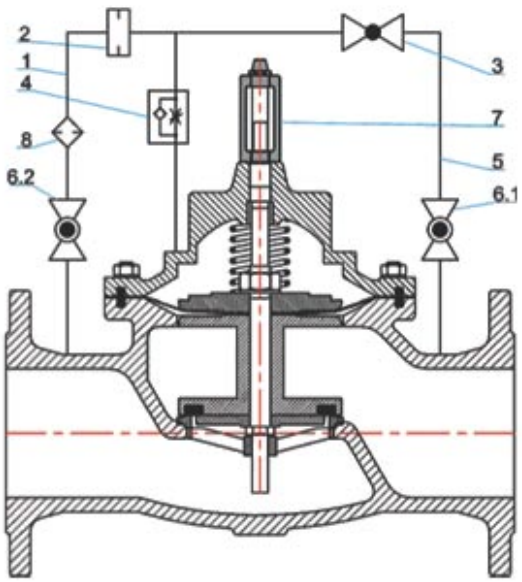
Automatic operated control valve Part list:



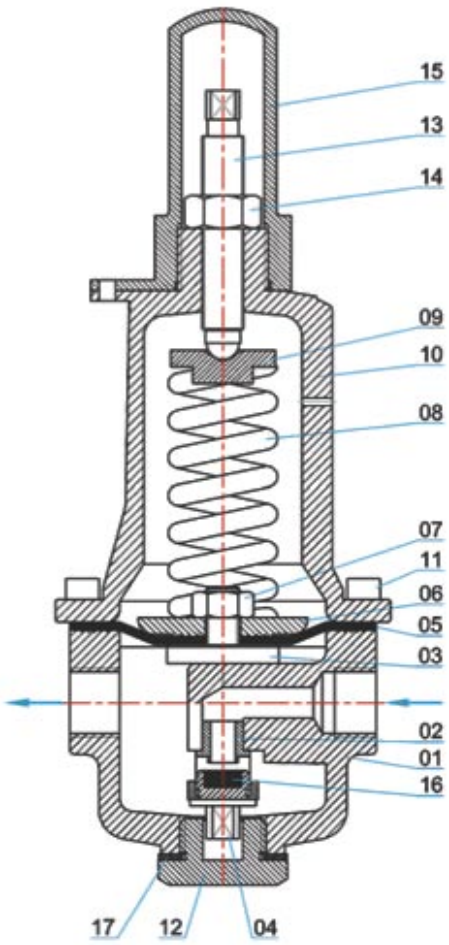
Pos.	Description	Material	Spare Part
1	Body	EN - GJS - 400 - 15	
2	Cover	EN - GJS - 400 - 15	
3	Axle	1.4301	
4	Seat ring	1.4308	
5	Guide Disc	Al- Bz/S.S 304	
6	Retainer	GJS-400-15	
7	Sealing ring	NBR	●
8	Diaphragm washer	Al.Bz.	
9	Diaphragm	NBR	●
10	Spring	1.4310	●
11	Bush	MS 58	
12	Nut	A2	
13	Nut	A2	
14	Stud	A2	
15	Plug	A2	●

Components of Pressure reducing valve:

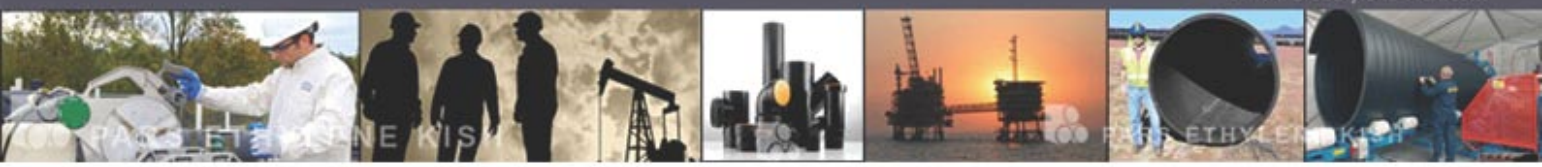
1- Inlet pipe (pressurized)
2- Orifice
3- Pilot
4- Flow control valve
5- Outlet pipe (pressurized)
6- Ball valve
7- Valve disc position indicator
8- Strainer (filter)



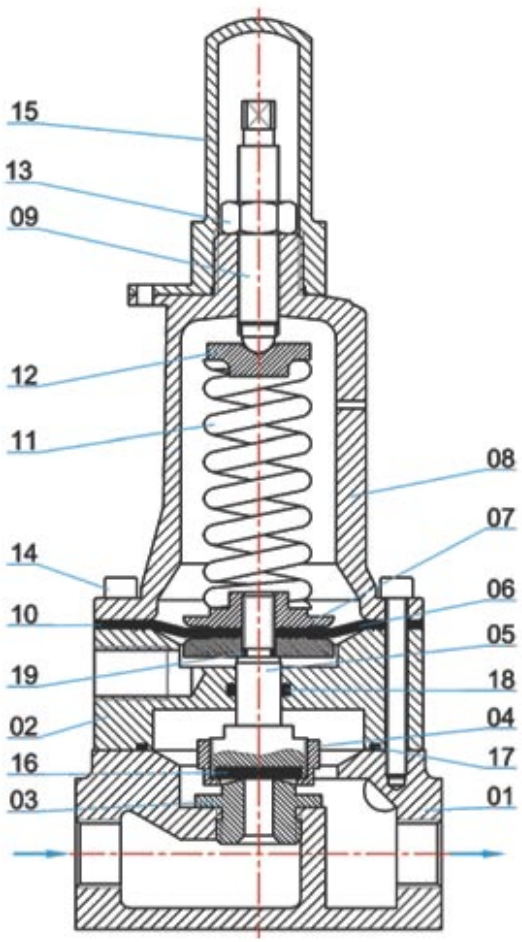
Pressure Reducing Pilot



Pos.	Description	Material	Spare Part
1	Body	CuSn5Pb5Zn5	
2	Seat	1.4401	●
3	Yoke	Al.Bz.	
4	Disc retainer assembly	1.4401	
5	Diaphragm	NBR	●
6	Diaphragm washer	Brass	
7	Lock nut	Brass	
8	Spring	1.4310	●
9	Spring guide	Brass	
10	Cover	Brass	
11	Socket screw	A2	
12	Plug	Al.Bz.	
13	Adjusting screw	Brass	●
14	Lock nut	Brass	●
15	Cap	CuZn 40/ABS	
16	Rubber	NBR	●
17	Gasket	Paper	●



Pressure Relief Pilot

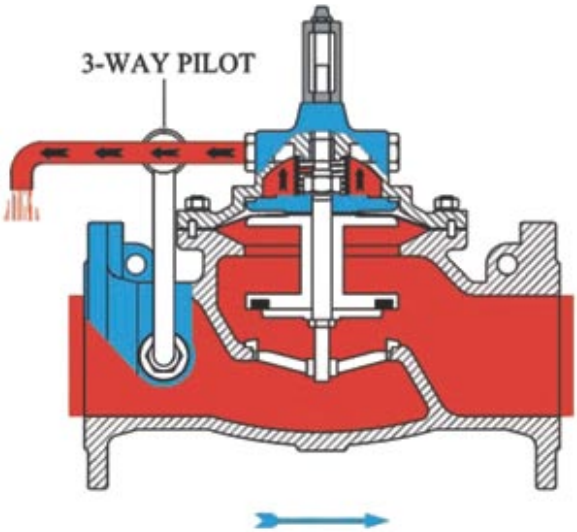


Pos.	Description	Material	Spare Part
1	Body	CuSn5Pb5Zn5	
2	Powerunit body	CuZn 40	
3	Seat	1.4401	●
4	Nut	Brass	
5	Stem	1.4401	
6	Lower diaphragm washer	Brass	
7	Upper diaphragm washer	Brass	
8	Cover	Brass	
9	Adjusting screw	Brass	●
10	Diaphragm	NBR	●
11	Spring	1.4310	●
12	Spring guide	Brass	
13	Lock nut	Brass	●
14	Socket screw	A2	
15	Cap	CuZn 40/ABS	
16	Rubber	NBR	●
17.18.19	O-Ring	NBR	

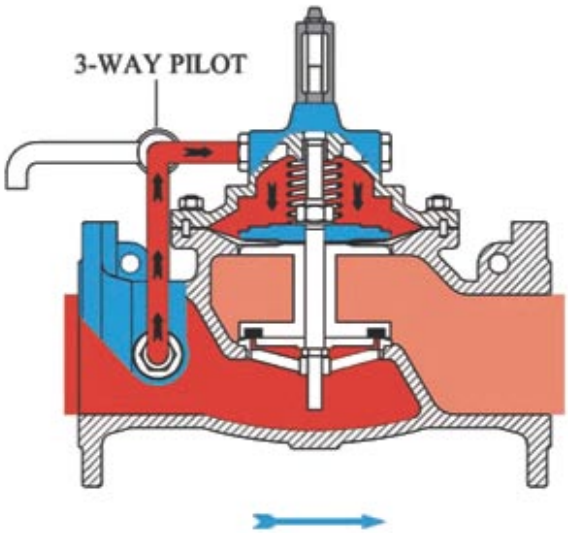
Operation of Automatic Control Valves

- **On/Off position**

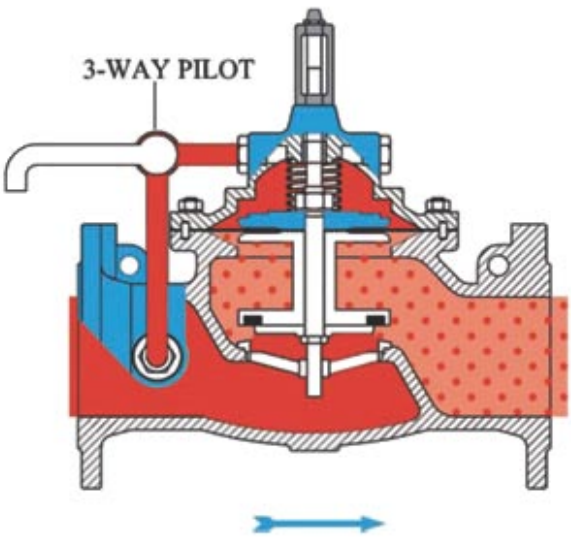
3-Way pilot drains the fluid from the control chamber **and the main valve opens completely.**



3-Way pilot runs the fluid into the control chamber and **the main valve closes.**

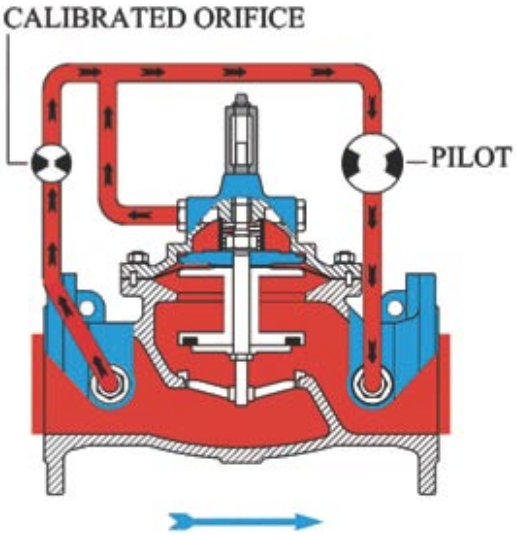


3-Way pilot retains a portion of the fluid in the control chamber **and the main valve stays in half open position.**

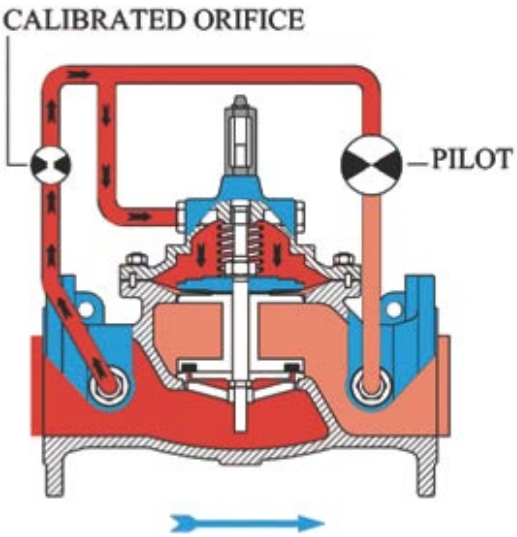


• Modulating version

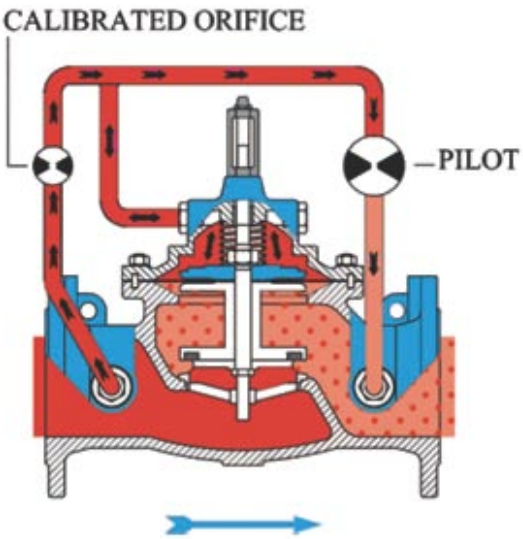
By opening the pilot, flow rate through the calibrated orifice increases **and the valve opens.**



By closing the pilot, flow rate through the calibrated orifice decreases **an causes the main valve to close gradually.**



When the flow rate through the pilot and the orifice is balanced **the main valve would be in a balanced half open Position.**



Dimensions and weight of automatic control valves:

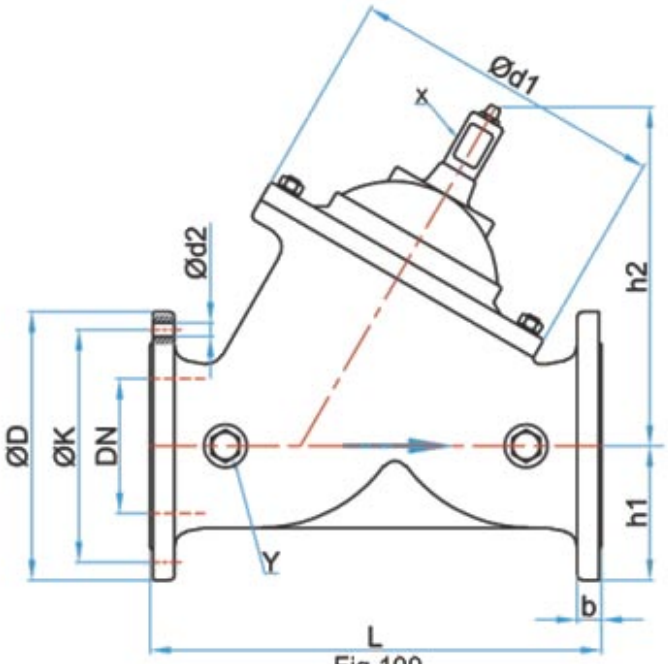


Fig.100

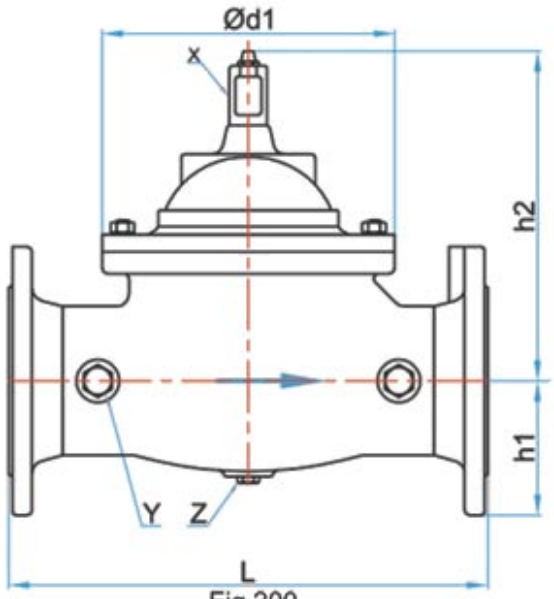


Fig.200

Flanges: DIN EN 1092-2 (DIN 2501)
Face to face: DIN EN 558-1 Series1 (DIN 3202-F1)

DN mm	PN bar	L mm	D mm	K mm	d2 mm	n mm	b mm	h1 mm	h2 mm	d1 mm	FIG.	X mm	Y mm	Z mm	Weight kg
50	10,16	230	165	125	19	4	19	83	125	143	200	G 3/8"	G 3/8"	G 1/4"	18.5
65	10,16	290	185	145	19	4	19	93	166	200	200	G 3/8"	G 3/8"	G 3/8"	23
80	10,16	310	200	160	19	8	19	100	185	200	200	G 3/8"	G 1/2"	G 3/8"	34
100	10,16	350	220	180	19	8	19	110	230	245	100,200	G 1/2"	G 1/2"	G 1/2"	46
125	10,16	400	250	210	19	8	19	125	240	245	200	G 1/2"	G 1/2"	G 3/8"	50
150	10,16	480	285	240	23	8	19	143	324	335	100	G 1/2"	G 1/2"	—	88
200	10	600	340	295	23	8	20	178	370	430	100	G 1/2"	G 1/2"	—	138
	16		340	295	23	12	20								
250	10	730	395	350	23	12	22	200	390	430	100	G 1/2"	G 1/2"	G 1/2"	160
	16		405	350	28		22								
300	10	850	445	400	23	12	24.5	208	488	560	100	G 1"	G 3/4"	G 3/4"	307
	16		460	410	28		24.5								
350	10	980	505	460	22	16	26	253	650	712	200	G1 1/4"	G 3/4"	—	580
	16		520	470	26		30								
400	10	1100	565	515	26	16	26	283	650	712	200	G1 1/4"	G 3/4"	—	600
	16		580	525	30		32								
500	10	1250	670	620	26	20	28	345	781	900	200	G 1"	G 3/4"	—	950
	16		715	650	33		34								
600	10	1450	780	725	30	20	28	400	777	900	200	G 3/4"	G 3/4"	—	1300
	16		840	770	36		36								
700	10	1650	895	840	30	24	30	458	1068	1226	200	G 3/4"	G 1"	—	2550
	16		910	840	36		36								
800	10	1850	1015	950	33	24	32	593	1068	1226	200	G 3/4"	G 1"	—	2800
	16		1025	950	39		38								

PN 25 bar and higher as per request.

Different types of Automatic valves

Pressure reducing valve (RVAP115)	The Automatic valve type 115 maintains the reduced downstream pressure at a constant value irrespective of the changes in upstream pressure and flow rate.
Pressure reducing & Sustaining valve (RVAP115-2)	Automatic valve type 115-2 performs the two following functions automatically: 1- keeping outlet pressure constant irrespective of variation in the inlet pressure. 2- Adjust and maintain inlet pressure at constant value.
Pressure relief or Sustaining valve (RVAR116)	Automatic valve type 116 is capable of adjusting the inlet pressure, control the network pressure and if necessary bypass the excessive pressure through the adjacent pipe.
Pressure regulating solenoid valve (RVAP116E)	Automatic valve type 116E/D performs two duties: 1- Acting as a relief valve when the inlet pressure exceeds the adjusted value. 2- Acting as a shut-off valve by signal from the solenoid valve.
Surge anticipator valve (RVAP116-6)	In electricity failure situations, the automatic valve type 116-6 opens to release excessive pressure and then closes slowly before creation of surge effect.
Check valve with controllable opening & closing speed (RVAF118-2R)	Automatic valve type 118-2R closes on pressure return wave and opens with adjustable speed when the inlet pressure returns to the initial valve.
Pump control valve (RVAC118)	Automatic valve type 118-2R-EL is responsible for protection of the pump's electric motor by preventing water hammer effect when pump is turned off.
Rate of flow control valve (RVAF114)	Automatic valve type 114-E&D controls the outlet flow rate irrespective of pressure variation.
Solenoid control valve (RVAF113)	Automatic control valve type 113 equipped with solenoid valve, acts as a shut-off valve and can be used in the following status: 1- To close when power failure occurs. 2- To open when power failure occurs.
Float control valve (RVAM-RVAS)	Floater valves model 110-6 and 110-10 keep tank water at constant level or keep the water level between the adjusted maximum and minimum range.
Excess flow shut - off valve (RVAE85)	Automatic valve type 85-H&E is used as a safety valve down stream of water reservoirs to prevent the reservoir water from wasting and from downstream flood. When the pipe bursts, the valve closes quickly with adjustable closing time – Type 85-H for places without electricity. – Type 85-E for places with electricity.

In addition to the described automatic valves, it is possible to design a control valve that performs two or three duties at the same time by certain arrangements in the control circuit. AB control valves are manufactured with pressure rating up to PN 40 bar.

Float control valve (On/Off)

Pump control valve

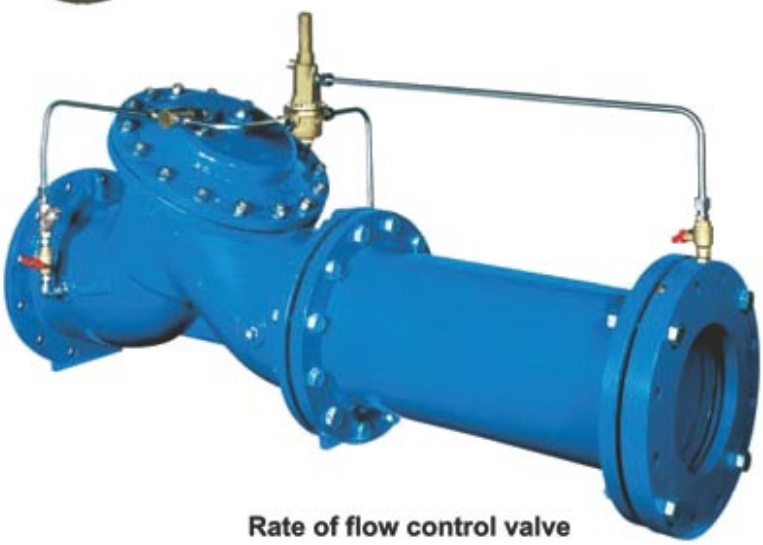
Rate of flow control &
Pressure reducing valve

Pressure sustaining &
Pressure reducing valve

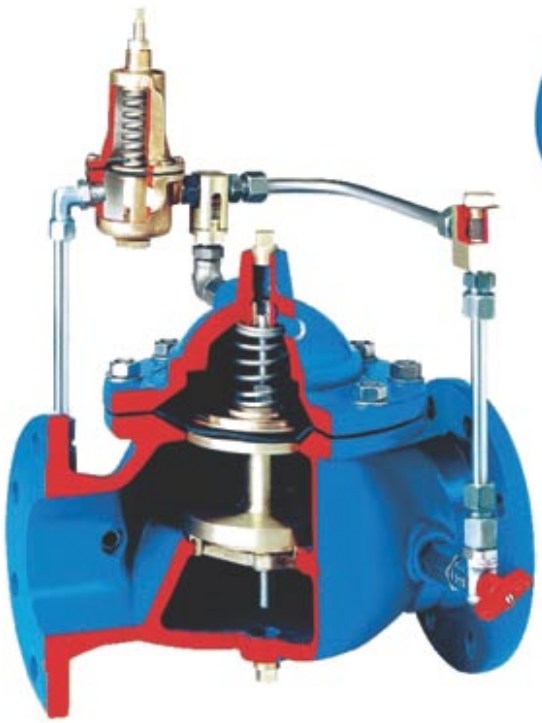
No.18 , Mina blv, Africa St., Tehran/IRAN
Tel.: (+98 21) 88 20 20 60 - 50 lines
Fax: (+98 21) 88 20 20 81
www.parsethylene-kish.com

Excess flow shut- off valve

Float control valve



Rate of flow control valve



Pressure reducing valve

No.18 , Mina blv, Africa St., Tehran/IRAN
Tel.: (+98 21) 88 20 20 60 - 50 lines
Fax: (+98 21) 88 20 20 81
www.parsethylene-kish.com

Significant points in choosing control valves

The maximum and minimum rate of flow is the major element in the choice of control valves, pressure reducing valves in particular, where as pipe diameter is not a significant factor. The following table shows the minimum, normal and maximum flow rate for different valves. These values are very important for the correct performance of the valves.

DN	50	65	80	100	125	150	200	250	300	350	400	500	600	700	800
l/S min.	1.6	2.7	4	6	10	14	25	39	56	77	100	157	226	307	402
l/S norm.	6	10	15	24	37	53	94	147	212	289	377	589	848	1154	1508
l/S max.	10	17	25	40	61	88	157	245	353	481	628	982	1414	1924	2513

Note: For valves under continuous operation the maximum flow rate should be considered 20% less than the valves mentioned in the above table.

Determination of pressure loss (P) in Automatic control valves

a) By calculation: Take Kv value from the table

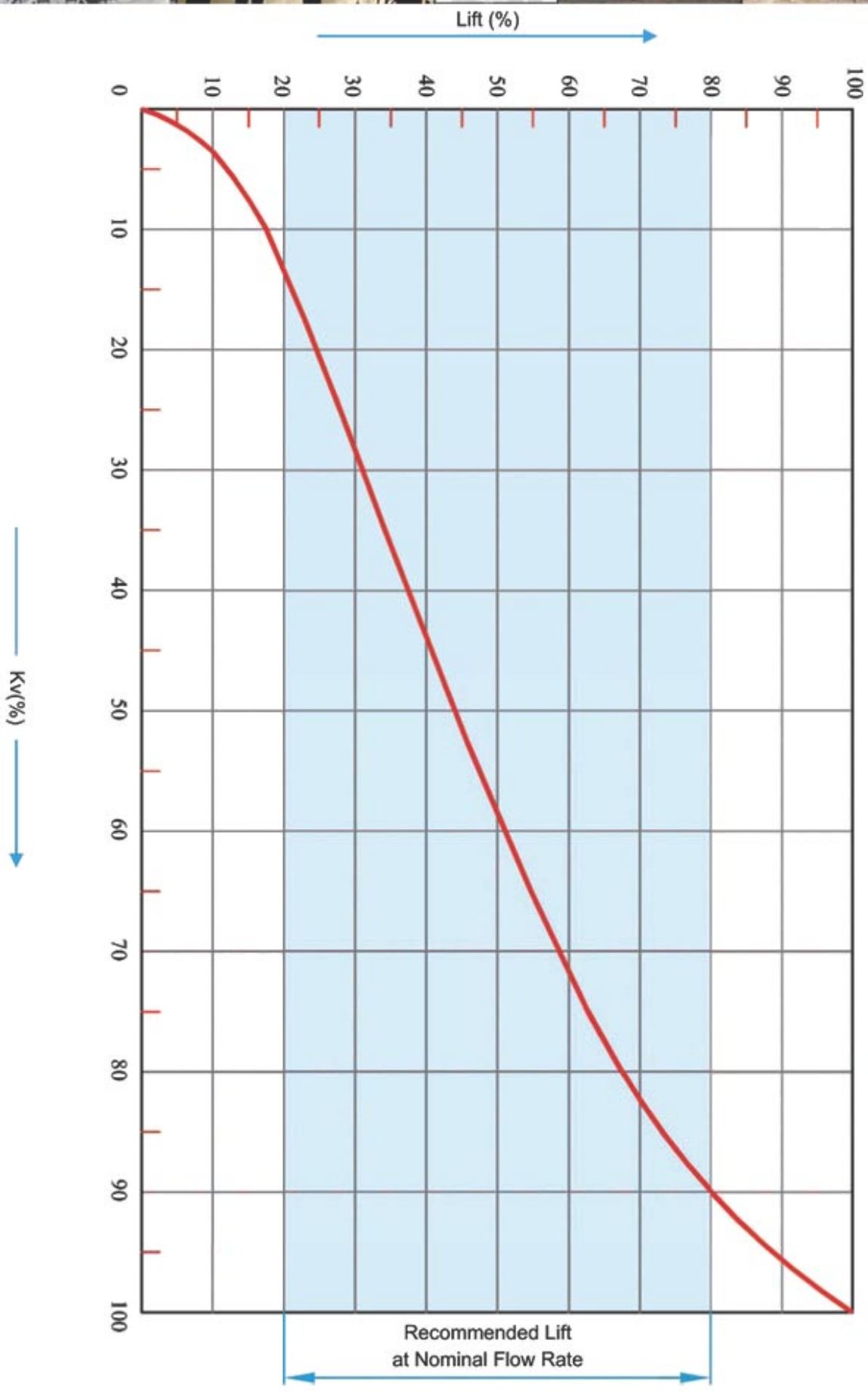
P = Pressure loss (bar)
Kv = Flow coefficient
Q = Flow rate

$$Q = Kv\sqrt{P} \qquad P = \left(\frac{Q}{Kv}\right)^2$$

DN (mm)	Lift (mm)	Chamber Volume (lit)	Kv (m^3/h)
50	15	0/121	50
65	25	0.3	72
80	25	0.3	102
100	30	0.64	195
125	30	0.64	264
150	45	2	570
200	58	4.7	960
250	58	4.7	1440
300	70	9.5	1950
350	82	16.8	2250
400	82	16.8	2700
500	110	41	3150
600	110	41	3420
700	150	108	6000
800	150	108	7800

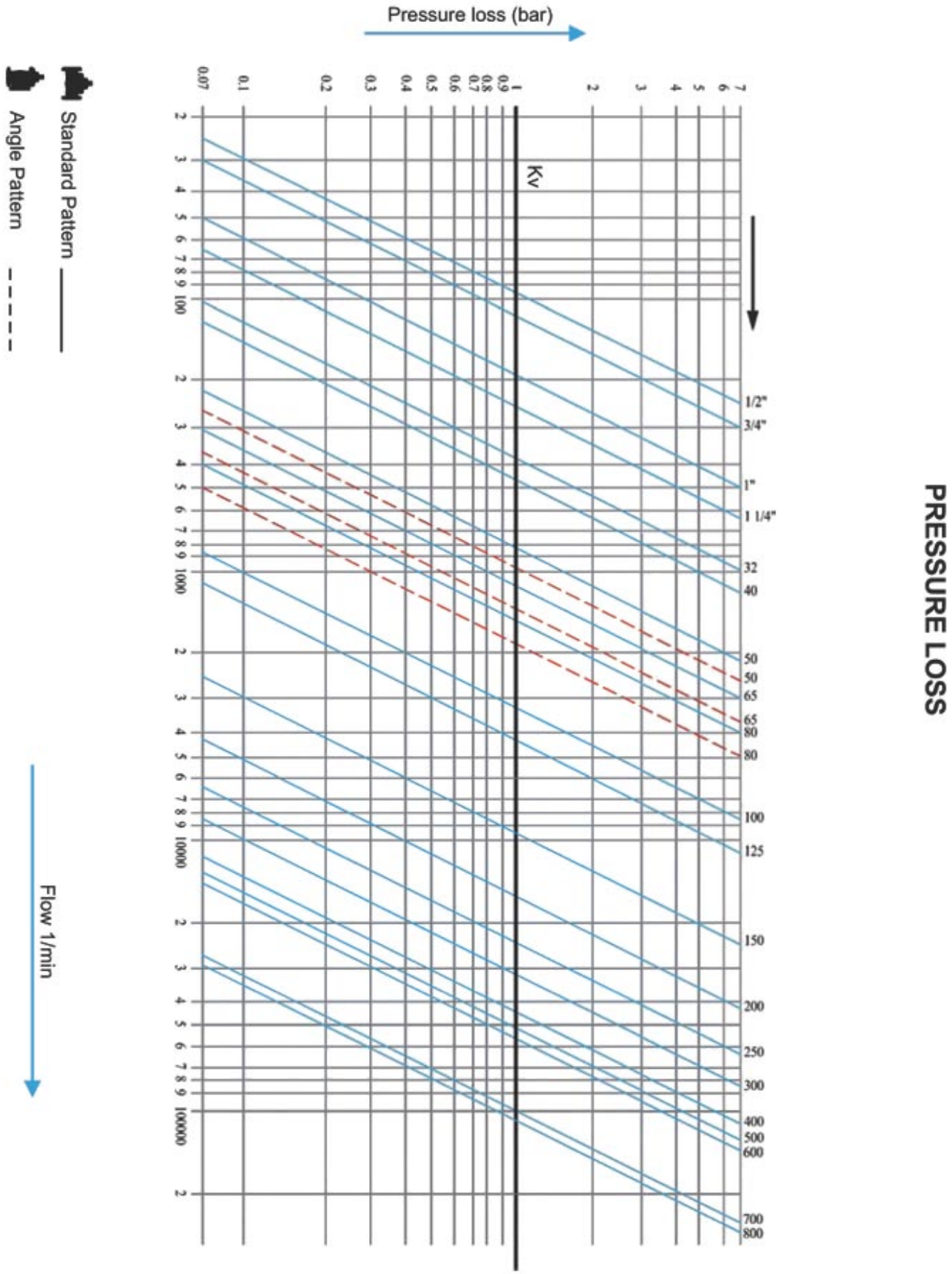
Definition of Kv:
The amount of flow in m^3 that passes through the valve in one hour in ambient temperature of 20°C, causing a pressure loss of 1 bar when the valve is fully open.

Lift / Kv Diagram



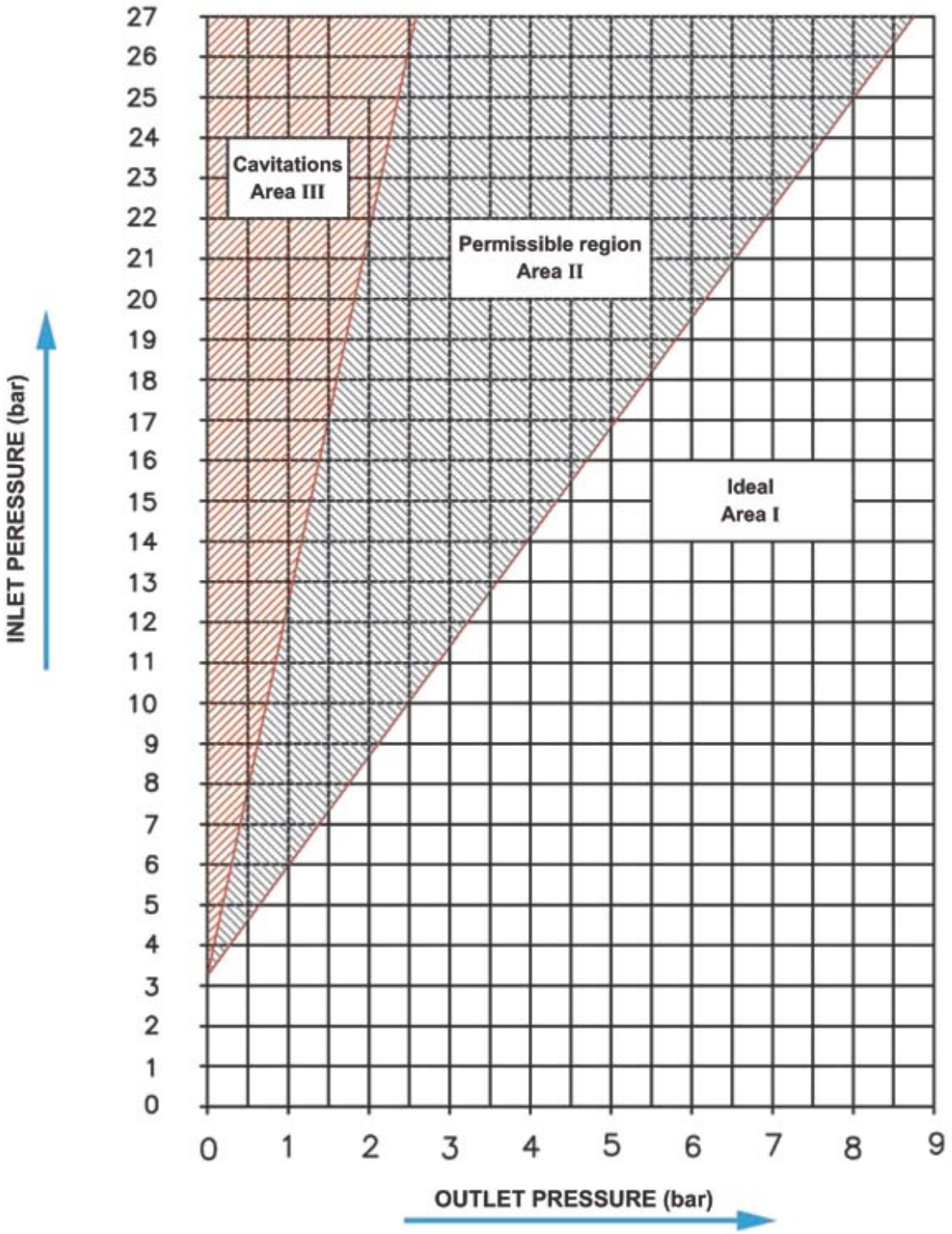
No.18 , Mina blv, Africa St., Tehran/IRAN
Tel.: (+98 21) 88 20 20 60 - 50 lines
Fax: (+98 21) 88 20 20 81
www.parsethylene-kish.com

b) Kv value from table



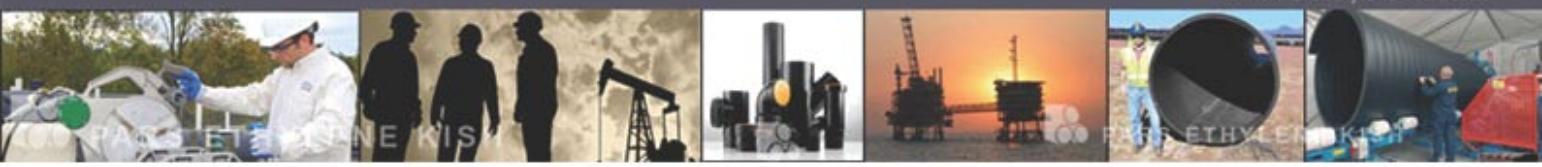
PRESSURE LOSS

Cavitations chart for sizes up to 200 mm

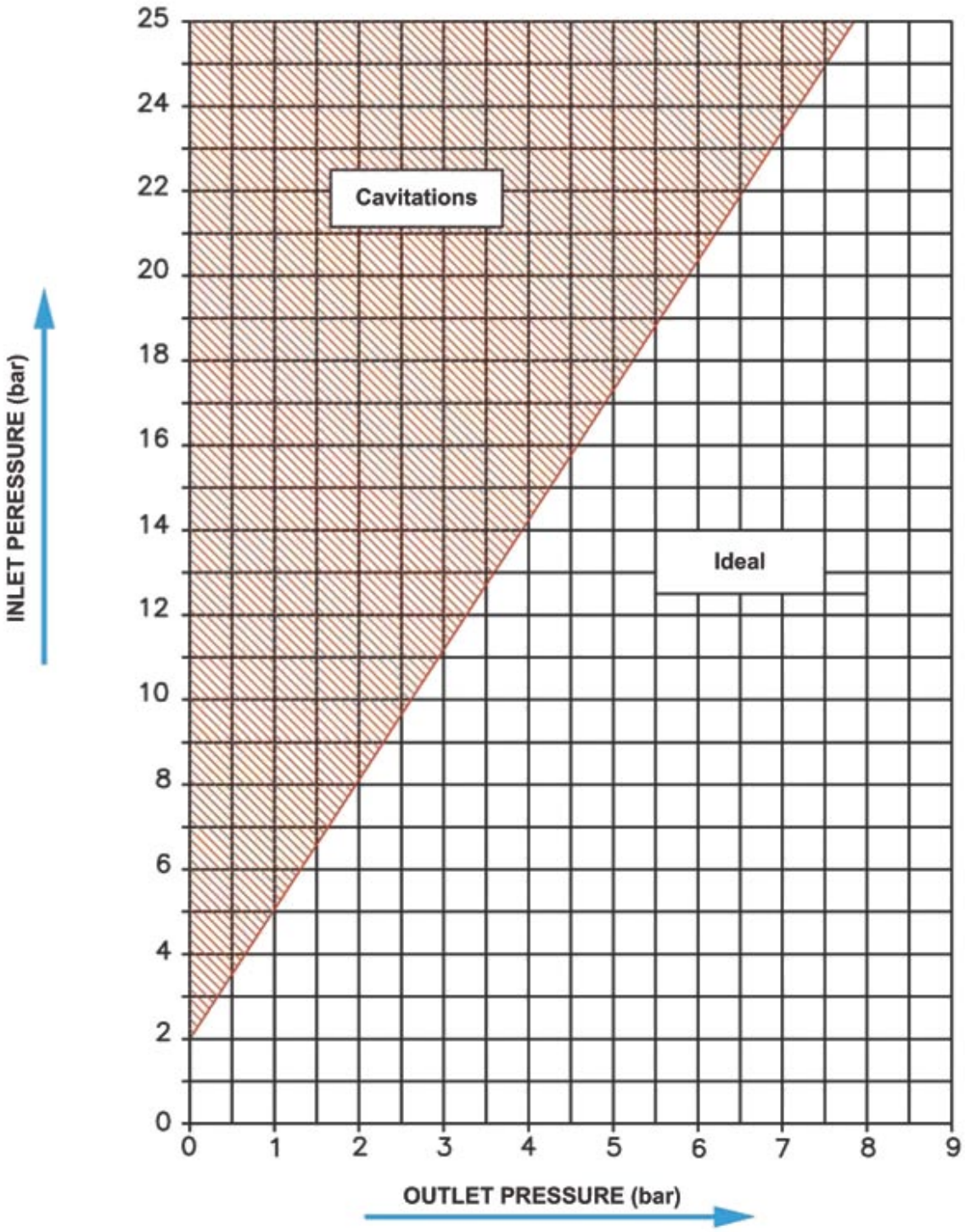


One other major element in choosing automatic control valve is that they should not get into cavitations situation. The ration of inlet pressure to out let pressure is a significant element. If the valves operate in the cavitations conduction, it would cause extensive wear of the parts which would shorten the service life of the valves.

Area 1: ideal valve performance.
Area 2: acceptable valve performance.
Area 3: valves are not allowed to operate in this situation.



Cavitations chart for sizes 300 mm and higher

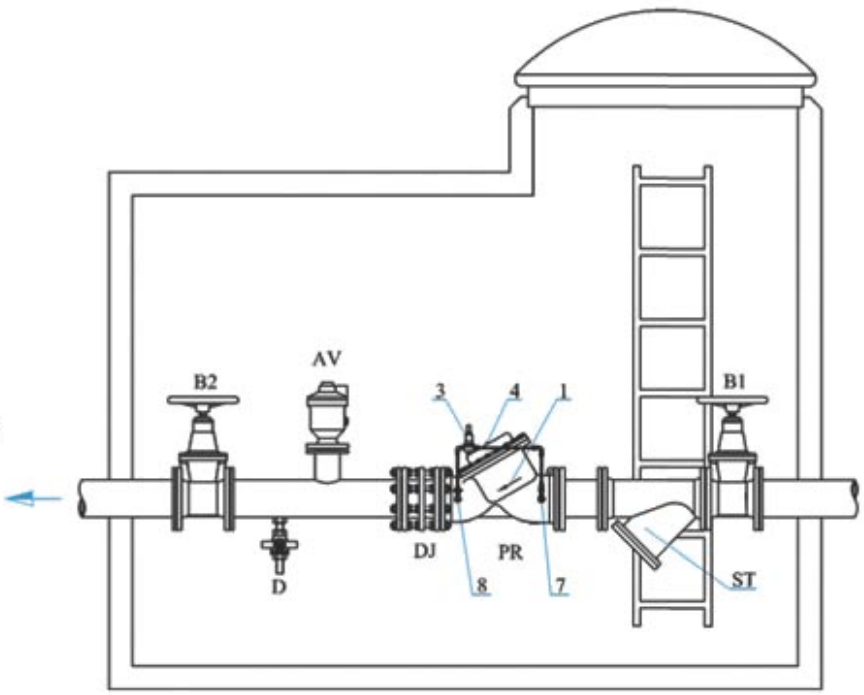


The ratio of inlet pressure to the outlet pressure is a significant element. If the valves operate in the cavitations condiction it would cause extensive wear to the parts which would shorten the service life of the valves.

Installation and operation of AB pressure reducing valve

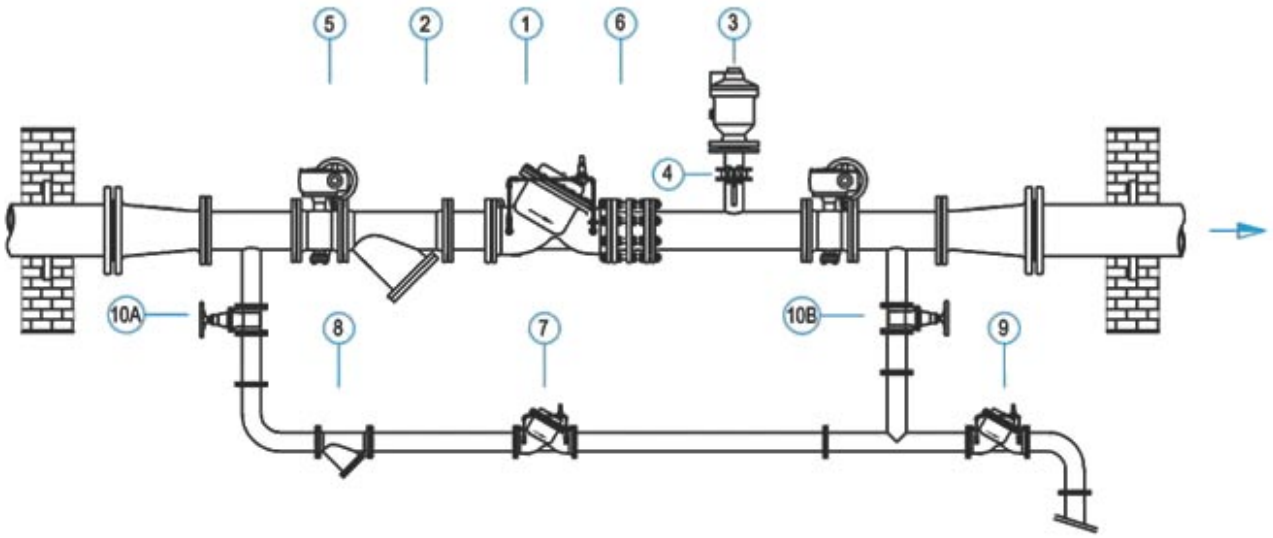
1 - Make sure that the pipe is clean and check that there are no objects like pieces of wood, stone, etc., in the pipe before installation.
2 - Start installation of AB pressure reducing valve according to the installation drawing. Make sure that the directional arrow on the valve body points to the direction of the flow line.
3 - Open ball valve no. 7 fixed before the pilot and close ball valve no. 8 fixed after the pilot.
4 - Fully open the air bleeding bolt (4) on top of the control chamber, and loosen by one turn the pipe fitting at the highest point in the control circuit.
5 - Loosen the lock nut on the pilot adjusting screw and turn the adjusting screw anti clock wise until you can feel tension on the spring.
6 - Fill in the control chamber with water through the bolt (4) and fasten the bolt, but not tightly.
7 - Open the inlet shut-off valve B1 slowly until water starts flowing in the valve.
8 - When the air is completely exhausted from the control chamber, fasten the bolt on the control chamber and all the fittings tightly on the control circuit and make sure there is no leakage of water in the control system.
9 - To make sure that all above mentioned operation carried out correctly, open shut-off valve B2 slightly, the pressure reducing valve should be in closed position or should close in a few moments. If the valve did not close repeat the procedure all over again and make sure there is no air in the control parts. After complete air bleeding, the shut-off valve B2 must be completely closed.
10 - To adjust the downstream pressure, slowly open the ball valve no. 8. The pressure reducing valve should start opening and fill the pipe between valve and B2 with water. In this situation the down stream pressure would reach to about 0.4 bars and the pressure reducing valve would close automatically.
11 - Open the shut-off valve B2 slowly, the main valve would close again when the pipe is full of water. When the shut-off valve B2 is fully opened slowly open the valve B1 until fully opened.
12 - If there is a fire hydrant valve at down stream, open the fire hydrant valve to allow adjustment of the down stream pressure with pilot adjusting screw while the water is running. (pressure increases by turning the pilot adjusting screw clock wise). Close fire hydrant valve when adjustment is completed.
13 - Wait a little after each turn of pilot's adjusting screw for the down stream pressure to remain unchanged Down stream pressure can be seen on pressure gauge.
14 - Tighten the lock nut on the pilot adjusting screw when the down stream pressure is adjusted to the desired valve.

PR – AB Pressure Reducing valve
ST – Filter
AV – Air valve
B – Shut-Off valve (B1, B2)
DJ – Dismantling Joints
D – Ball valve (for emergency use)



Installation of Pressure reducing valve using bypass system.

For a better operation of larger size pressure reducing valves, a bypass system is recommended.



1 - Pressure Reducing valve
2 - Filter
3 - Air valve
4 - Butterfly valve wafer type
5 - Butterfly valves flanged type
6 - Dismantling joints
7 - Pressure reducing valve
8 - Filter
9 - Relief valve
10 - Gate valve

Type of bypass	Parts
A - Manual bypass	10A
B - Manual bypass with relief valve	9 - 10A - 10B
C - Automatic bypass	7 - 8 - 10A - 10B
D - Automatic bypass with relief valve	7 - 8 - 9 - 10A - 10B
E - Relief valve (without bypass)	9 - 10B

Maintenance:

Due to the experience of AB in manufacturing and choice of Material, AB Pressure reducing valves are basically maintenance free, and can be used for a long time without a problem. However for more efficient performance we recommend the followings:

A) For operation in normal condition
- Every 6 months: check and clean the strainer in the valve control circuit
- Annually: check the valve for correct functioning
- Every 4 years: All moving components must be dismantled and cleaned from sediment deposited on them and faulty parts must be replaced.

B) In conditions such as floating substances in the water, high pressure differential between inlet and outlet, low flow rate, operations mentioned in section A must be carried out more frequently.

Spare parts:

For 4 years operation; spare parts are required for components that are subject to wear like components of the Main body, Pilot and control circuit. Spare parts are shown on pages 3, 4 and 5.