



Pressure & Temperature Control

Pressure Reducing Valves

Armstrong pressure reducing valves (PRVs) and temperature regulators help you manage steam, air and liquid systems safely and efficiently. And assure uninterrupted productivity—by maintaining constant pressure or temperature for process control. In short, Armstrong products make using resources safe and productive...as well as environmentally sound.

For decades, Armstrong has devoted itself to learning—and sharing—all it can about energy conservation as it relates to steam equipment. As part of our product/service network, PRVs and temperature regulators represent expanded options for a reliable Armstrong solution.

PRV Types

Steam, liquids and gases usually flow at high pressures to the points of final use. At these points, a pressure reducing valve lowers the pressure for safety and efficiency and to match the requirements of the application. There are three types of pressure reducing valves.

Direct Acting. The simplest of PRVs, the direct acting type operates with either a flat diaphragm or convoluted bellows. Since it is self-contained, it does not need an external sensing line downstream to operate. It is the smallest and most economical of the three types and designed for low to moderate flows. Accuracy of direct acting PRVs is typically +/-10% of the downstream set point.

Internally Piloted Piston-Operated. This type of PRV incorporates two valves—a pilot and main valve—in one unit. The pilot valve has a design similar to the direct acting valve. The discharge from the pilot valve acts on top of a piston, which opens the main valve. This design makes use of inlet pressure in opening a larger main valve than could otherwise be opened directly. As a result, there is a greater capacity per line size and greater accuracy (+/-5%) than with the direct acting valve. As with direct acting valves the pressure is sensed internally, eliminating the need for an external sensing line.

Externally Piloted. In this type, double diaphragms replace the piston operator of the internally piloted design. This increased diaphragm area can open a larger main valve, allowing a greater capacity per line size than the internally piloted valve. In addition, the diaphragms are more sensitive to pressure changes, and that means accuracy of +/-1%. This greater accuracy is due to the location, external of the valve, of the sensing line where there is less turbulence. This valve also offers the flexibility to use different types of pilot valves (i.e., pressure, temperature, air loaded, solenoid or combinations).



Selector Guide

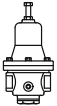

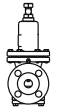
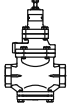
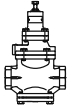
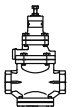
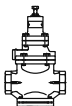
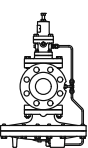
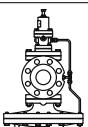
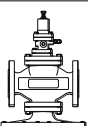
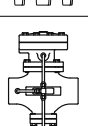
Pressure Reducing Valve Selection								
If Fluid Is	If Inlet Pressure Is		If Outlet Pressure Is		If Maximum Capacity Is Less Than		Look for Model	Find on Page
	psig	bar	psig	bar	lb/hr	kg/hr		
Steam	15 to 150	1 to 10	3 to 60	.21 to 4	425	193	GD-6N	276
	5 to 15	.3 to 1	2 to 12	.14 to .8	5,643	2,565	GP-2000L	291
	15 to 250	1 to 17	5 to 200	.34 to 13.8	18,024	8,175	GP-1000	285
	15 to 300	1 to 20	1.5 to 200	.10 to 14	134,534	61,024	GP-2000 Series	290
	15 to 300	1 to 20	3 to 140	.21 to 9.6	1,038	471	GD-30S/GD-45	272/274
	15 to 250	1 to 17	3 to 140	.21 to 9.6	3,471	1,575	GD-30	272
	15 to 425	1 to 30	1.5 to 248	.10 to 17	25,706	11,660	GP-2000CS	292
15 to 150	1 to 10	5 to 125	.34 to 8.6	4,505	2,048	GP-1000 SS/AS	285	
If Fluid Is	If Inlet Pressure Is		If Outlet Pressure Is		If Maximum Capacity Is Less Than		Look for Model	Find on Page
	psig	bar	psig	bar	gpm	l/min		
Water and Non-corrosive Liquids	20 to 230	1.4 to 16	7 to 80	.48 to 5.5	141	534	GD-24	279
	15 to 150	1 to 10	3 to 60	.21 to 4.1	18	68	GD-6	276
	15 to 150	1 to 10	7 to 100	.48 to 6.9	1,323	5,007	GD-200	280
	15 to 300	1 to 20	7 to 130	.48 to 9.0	1,323	5,007	GD-200H	280
If Fluid Is	If Inlet Pressure Is		If Outlet Pressure Is		If Maximum Capacity Is Less Than		Look for Model	Find on Page
	psig	bar	psig	bar	scfm	m3/min		
Air and Non-Corrosive Gases	15 to 150	1 to 10	5 to 125	.34 to 8.6	413	702	GD-10F	277
	15 to 300	1 to 20	5 to 125	.34 to 8.6	8,329	14,153	GD-10	277
	15 to 150	1 to 10	3 to 60	.21 to 4.1	153	260	GD-6	276
	15 to 150	1 to 10	5 to 125	.34 to 8.6	6,488	11,024	GP-1000A	285
	15 to 150	1 to 10	7 to 100	.48 to 6.9	20,614	35,028	GD-200	280
	15 to 300	1 to 20	7 to 130	.48 to 9.0	20,614	35,028	GD-200H	280
	15 to 300	1 to 20	3 to 140	.21 to 9.6	374	764	GD-45	274
	15 to 250	1 to 17	3 to 150	.21 to 9.6	1,249	2,122	GD-30	272

NOTE: GD models are direct acting; GP models are pilot controlled.

Pressure and Temperature Control ID Charts

Illustration	Type	Fluid	Conn. Type	Max. Allow. Press. psig	TMA °F	Body Material	Model	Max. Oper. Press. psig	Connection Size	Located on Page
	GD-30 Direct Acting Valves	Steam, Air, Non-Corrosive Gases	NPT	250	410	Cast Bronze ASTM B584	GD-30	250	1/2", 3/4", 1", 1-1/2", 2"	272
				300	430	Stainless Steel AISI 316	GD-30S	300	1/2", 3/4", 1"	
	GD-45 Direct Acting Valves	Steam, Air, Non-Corrosive Gases	NPT	300	450	Ductile Iron ASTM A536	GD-45	300	1/2", 3/4", 1"	274
	GD-6 Direct Acting Valves	Steam	NPT	150	450	Cast Iron ASTM A278	GD-6N	150	3/8", 1/2", 3/4", 1"	276
		Liquid, Gas			175		GD-6			
	GD-10 Direct Acting Valves	Air, Non-Corrosive Gases	NPT	300	175	Zinc and Aluminum	GD-10	300	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	277
				250			GD-10F	250	1/4", 3/8", 1/2", 3/4"	
				250			AF-10	250	1/4", 3/8", 1/2", 3/4", 1"	

Pressure and Temperature Control ID Charts

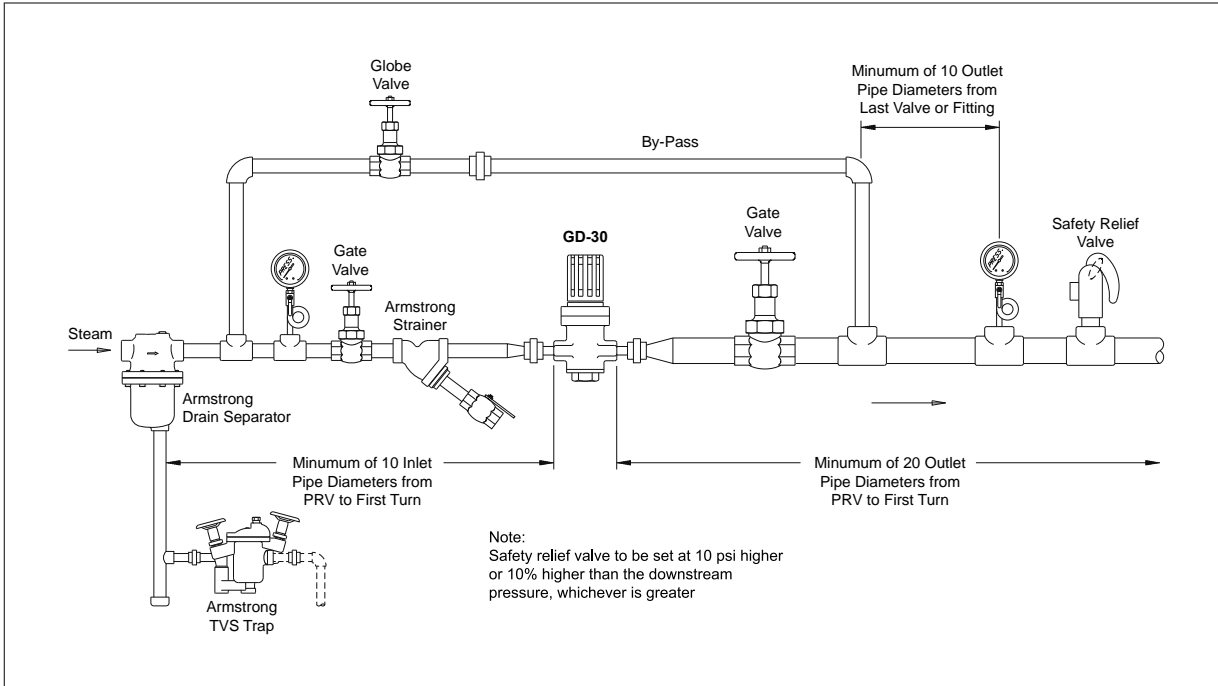
Illustration	Type	Fluid	Conn. Type	Max. Allow. Press. psig	TMA °F	Body Material	Model	Max. Oper. Press. psig	Connection Size	Located on Page
	GD-24 Direct Acting Valves	Water	NPT	230	175 210 (Viton)	Cast Bronze ASTM B584	GD-24	230	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	279
	GD-200 Direct Acting Valves	Air, Water, Non-Corrosive and Non-Viscous Liquids	Flanged ANSI 150#	150	175 210 (Viton)	Ductile Iron ASTM A536	GD-200	150	2", 2-1/2", 3", 4", 5", 6"	280
			Flanged ANSI 300#	300			GD-200H	300		
	GD-20R Direct Acting Valves	Water, Non-Corrosive Gases	Flanged ANSI 150#	150	175	Ductile Iron ASTM A536	GD-20R	150	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 5", 6"	282
	GP-1000 Internal Pilot Piston Operated	Steam	NPT	250	450	Ductile Iron ASTM A536	GP-1000	250	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	285
			Flanged ANSI 150#	150				150	2", 2-1/2", 3", 4"	
	GP-1000 A Internal Pilot Piston Operated	Air, Non-Corrosive Gases	NPT	150	175	Ductile Iron ASTM A536	GP-1000A	150	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	285
			Flanged ANSI 150#						2", 2-1/2", 3", 4"	
	GP-1000 SS Internal Pilot Piston Operated	Steam	NPT	150	450	Stainless Steel AISI 304	GP-1000SS	150	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	285
	GP-1000 AS Internal Pilot Piston Operated	Steam	NPT	150	450	Stainless Steel AISI 304	GP-1000AS	150	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	285
	GP-2000 External Pilot Diaphragm Operated	Steam	NPT	300	450	Ductile Iron ASTM A536	GP-2000 Integral or Remote Pilot	300	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	290
			Flanged ANSI 150	185				185	2", 2-1/2", 3", 4", 6"	
			Flanged ANSI 300	300				300		
	GP-2000 L External Pilot Diaphragm Operated (low pressure)	Steam	NPT	150	450	Ductile Iron ASTM A536	GP-2000 L	15	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	291
			Flanged ANSI 150#					2", 2-1/2", 3", 4", 6"		
	GP-2000CS External Pilot Diaphragm Operated	Steam	NPT	450	600	Carbon Steel Grade WCB	GP-2000CS	450	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4"	292
			Flanged ANSI 150	140				140		
			Flanged ANSI 300	450				450		
	GP-2000K-1, GP-2000K-3, GP-2000K-6 External Pilot Diaphragm Operated	Steam	NPT	300	450	Ductile Iron ASTM A536	GP- 2000K-1 GP- 2000K-3 GP- 2000K-6	300	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	293
			Flanged ANSI 150#	185				185	2", 2-1/2", 3", 4", 6"	
			NPT	300				300		

Pressure and Temperature Control ID Charts

Illustration	Type	Fluid	Conn. Type	Max. Allow. Press. psig	TMA °F	Body Material	Model	Max. Oper. Press. psig	Connection Size	Located on Page
	GD-2000K Direct Acting Diaphragm Operated	Steam	NPT	300	450	Ductile Iron ASTM A536	GD-2000K	300	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	294
			Flanged ANSI 150	185				2", 2-1/2", 3", 4"		
			Flanged ANSI 300	300						
	OBK-2000 Pneumatic Temperature Pilot	Air	NPT	250 (Process) 25 (Air)	400	Brass	OBK-2000	250 (Process) 25 (Air)	1/2" Process 1/8" Air	297
	GP-2000R External Pilot Diaphragm Operated	Steam	NPT	200	450	Ductile Iron ASTM A536	GP-2000R	200	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	298
			Flanged ANSI 150	185				2", 2-1/2", 3", 4", 6"		
			Flanged ANSI 300	200						
	GP-2000 On/Off External Pilot Solenoid Operated Valve	Steam	NPT	150	366	Ductile Iron ASTM A536	GP-2000	150	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	301
			Flanged ANSI 150						2", 2-1/2", 3", 4", 6"	
			Flanged ANSI 300							
	OB-30/31 Direct Acting Temperature Regulators	Water, Steam and Non-Corrosive Liquids	NPT	150	366	Bronze ASTM B584	OB-30 (Heating)	150	1/2", 3/4", 1"	304
				250			OB-31 (Cooling)	250		
	OB-2000 Piloted Diaphragm Operated Temperature Regulator	Steam	NPT	300	450	Pilot Bronze ASTM B584 Valve Ductile Iron A536	OB-2000	300	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	306
			Flanged ANSI 150	185				2", 2-1/2", 3", 4", 6"		
			Flanged ANSI 300	300						
	OB-2000 L Piloted Diaphragm Operated Temperature Regulator (low pressure)	Steam	NPT	150	450	Pilot Bronze ASTM B584 Valve Ductile Iron A536	OB-2000 L	15	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	308
			Flanged ANSI 150						2", 2-1/2", 3", 4"	
	OB-2000PT Pressure/Temperature Piloted Diaphragm Operated Temperature Regulator	Steam	NPT	300	450	Temp. Pilot Bronze ASTM B584 Valve and Pressure Pilot Ductile Iron A536	OB-2000PT	300	1/2", 3/4", 1", 1-1/4", 1-1/2", 2"	310
			Flanged ANSI 150	185				2", 2-1/2", 3", 4", 6"		
			Flanged ANSI 300	300						
	Control Valve Pneumatic Actuated Control Valve	Steam, Liquid	NPT	300	450	Carbon Steel A216 Gr. WCB	1100	300	1/2", 3/4", 1", 1-1/2", 2"	314
			Flanged ANSI 150	185				1/2", 3/4", 1", 1-1/2", 2", 2-1/2", 3, 4, 6, 8		
			Flanged ANSI 300	300						

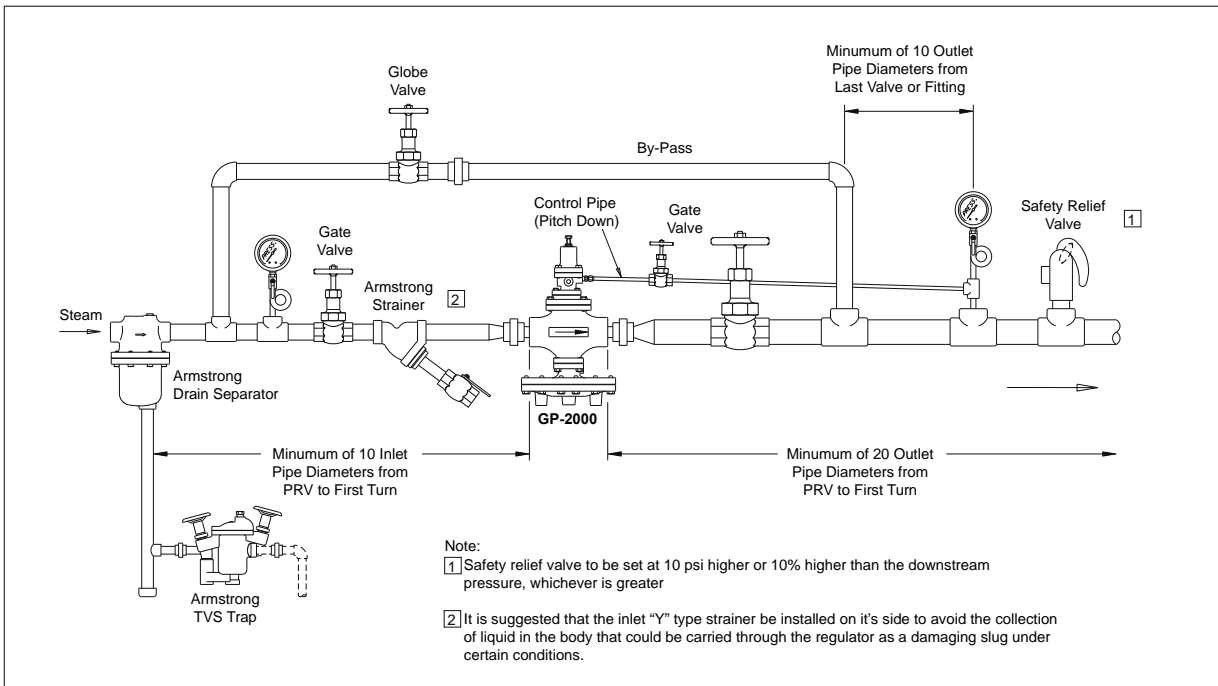
Application Data—Pressure Reducing Valves

Direct Acting Single Stage Reduction



Typical Direct Acting PRV Installation

External Pressure Pilot Single Stage Reduction

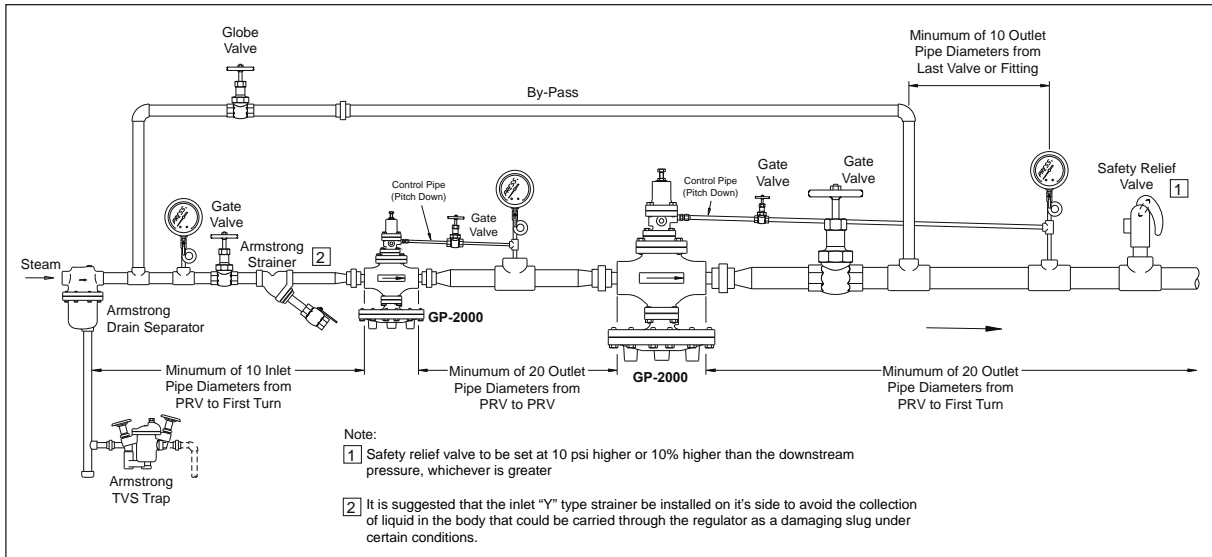


Typical External Pressure Pilot PRV Installation

Application Data—Pressure Reducing Valves

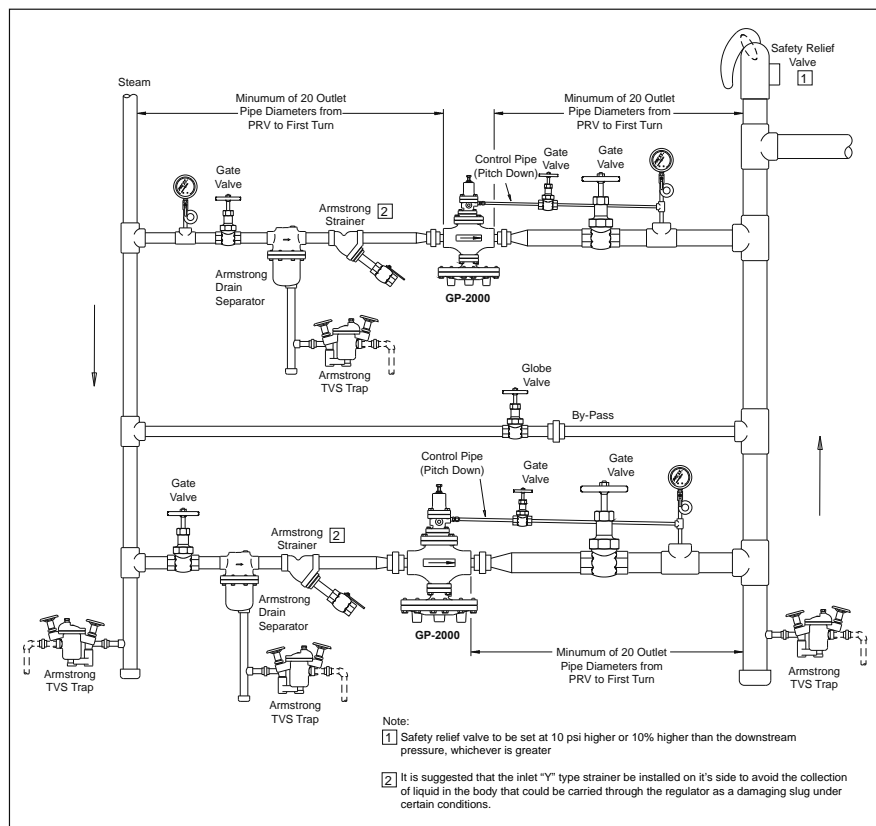
External Pressure Pilot Two Stage Reduction

This piping application is used when the pressure turndown ratio is greater than that of a single valve. Pressure reduction is accomplished by using two valves in series to reduce the pressure in stages. Depending on the volume of fluid required and pressure reduction, the second stage valve typically will be larger in size than the first stage valve. Unless a specific intermediate pressure of the fluid is required, this intermediate pressure is typically selected so as to keep the pressure turndown ratios of both valves as similar as possible. This will help equalize and maximize the service life of both valves.



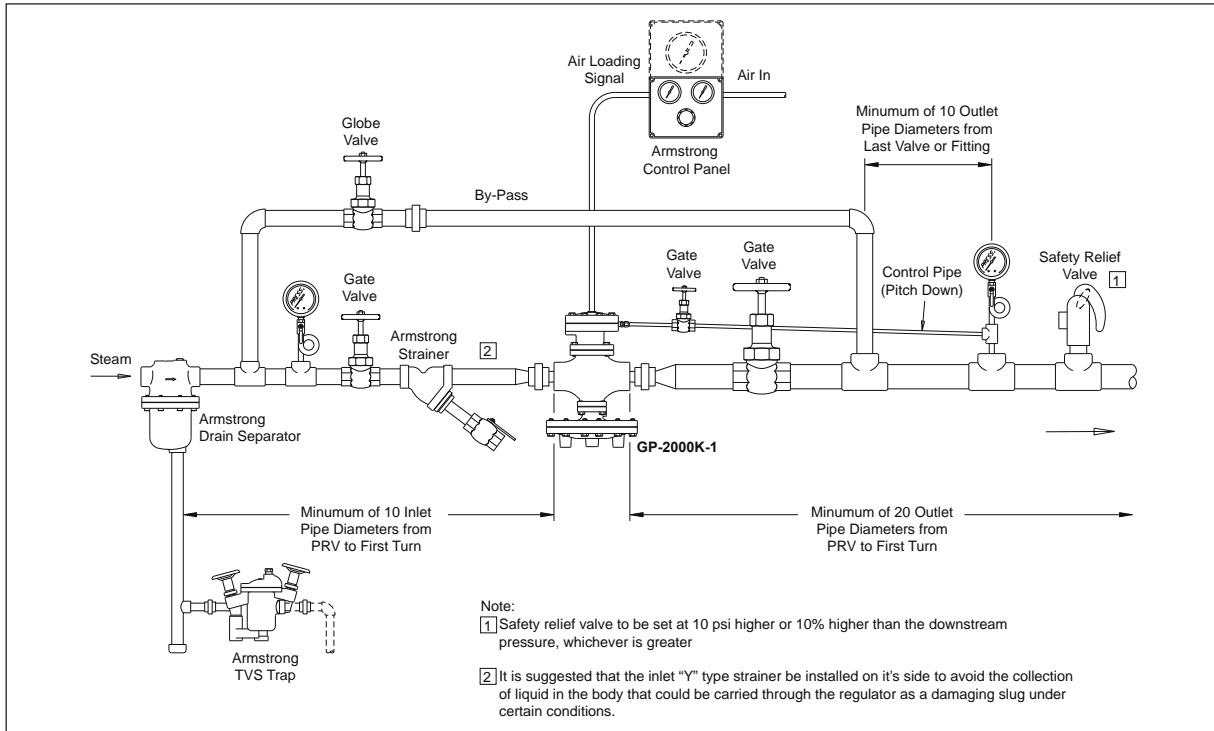
External Pressure Pilot One-Third to Two-Thirds Reduction Station

This piping application is used when the flow rangeability is greater than that of a single valve. Better control is achieved by piping two valves in parallel and sizing one to handle 1/3 the maximum load and the other 2/3 the maximum load. These two valves are staged by offsetting their pressure set points by 2-3 psig. The smaller valve is usually the lead valve and would have a pressure set point at the desired pressure. The larger valve is usually the lag valve and would have a pressure set point of 2-3 psig below the lead valve. This offset of set points will stage the valves so that the lag valve will remain closed until the lead valve can no longer pass the required flow and is wide open. This lack of flow will cause the set pressure to drop slightly until the lag valve opens and regulates at the higher demands of flow.



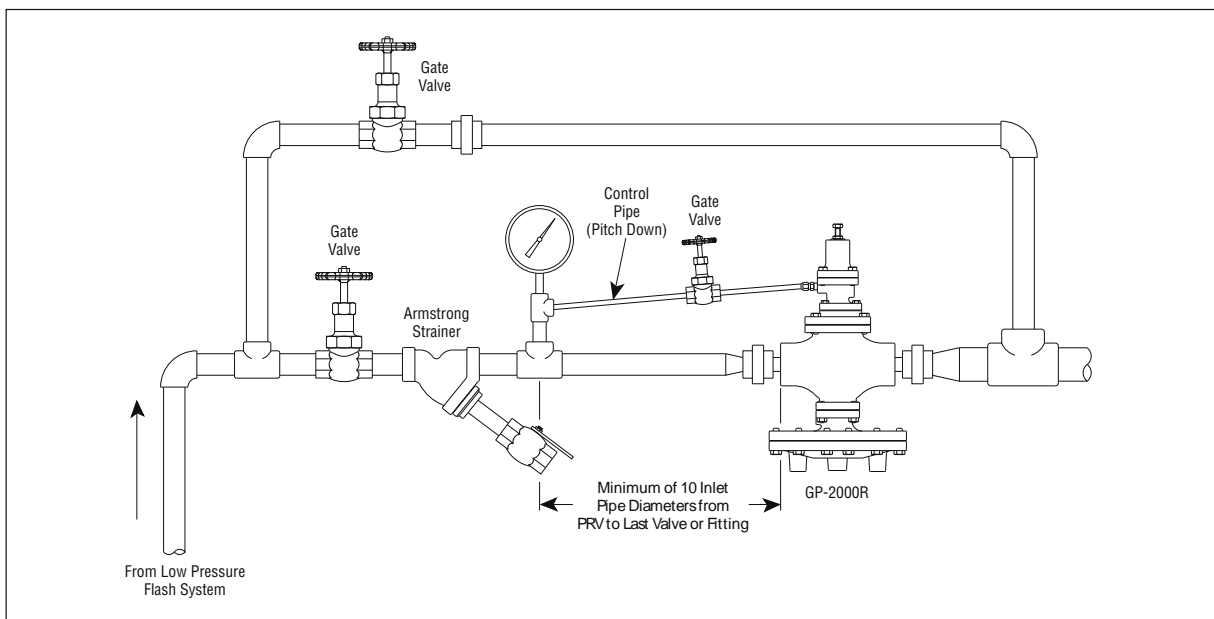
Application Data—Pressure Reducing Valves

Air Loaded External Pilot Single Stage Reduction



Typical Air Loaded External Pilot Reduction Station. Complete with remote located air loading control panel.

External Back Pressure Pilot Installation



Typical External Pilot Back Pressure Installation. Used to maintain a constant upstream pressure in the piping system.

Sizing Data

Selection Formulas

C_v Value and Calculations

1. For Steam:

$$\text{When } P_2 > \frac{P_1}{2} \quad C_v = \frac{W}{2.1 \sqrt{\Delta P} (P_1 + P_2)}$$

$$\text{*When } P_2 \leq \frac{P_1}{2} \quad C_v = \frac{W}{1.71 (P_1)}$$

2. For Gas:

$$\text{When } P_2 > \frac{P_1}{2} \quad C_v = \frac{Q \sqrt{G} (T+460)}{963 \sqrt{\Delta P} (P_1 + P_2)}$$

$$\text{When } P_2 \leq \frac{P_1}{2} \quad C_v = \frac{Q}{36.39 (P_1)}$$

3. For Liquid:

$$C_v = \frac{(\text{GPM}) \sqrt{G}}{\sqrt{\Delta P}}$$

Formula Key

W = Maximum flow capacity of steam, lbs/hr

P_1 = Inlet pressure, psia (psig + 14.7)

P_2 = Outlet pressure, psia (psig + 14.7)

ΔP = Pressure drop ($P_1 - P_2$) psi

Q = Maximum flow capacity of gas SCFH

G = Specific gravity

T = Fluid temperature °F

GPM = Maximum flow capacity of liquid GPM

C_v = Valve flow coefficient

* Formula applies only to piloted valves. With direct acting valves, at critical flow or sonic flow, capacities diminish with greater differential pressure.

Ordering Information

Model	Connection Size																									
	in		mm		in		mm		in		mm		in		mm		in		mm							
	1/4	8	3/8	10	1/2	15	3/4	20	1	25	1-1/4	32	1-1/2	40	2	50	2-1/2	65	3	80	4	100	5	125	6	150
GD-10	1.4		1.4		1.4		2.6		5.8		5.8		5.8		43		—		—		—		—		—	
GD-10F	1.4		1.4		1.4		2.6		5.8		—		—		—		—		—		—		—		—	
GD-6/6N	—		.35		.5		1.0		1.5		—		—		—		—		—		—		—		—	
GD-200/200H	—		—		—		—		—		—		—		16		28		36		68		75		108	
GD-20R	—		—		1.5		2.7		4		8		11		14		23		32		48		75		108	
GD-24	—		—		1.5		1.9		3		4		7		10		—		—		—		—		—	
GD-30/GD-45	—		—		1.3		1.5		2.5		—		5.6*		8.5*		—		—		—		—		—	
GP-2000 Series	—		—		5		7.2		10.9		14.3		18.8		32		60		78		120		—		250	
GP-1000	—		—		1		2.3		4		6.5		9		16		25		36		64		—		—	
OB-30/OB-31	—		—		3.7		4.6		5.8		—		—		—		—		—		—		—		—	
OB-2000/OB-2000PT	—		—		5		7.2		10.9		14.3		18.8		32		60		78		120		—		—	

NOTE: 50% reduced ports are available for all 2000 Series valves. Capacities and C_v are reduced by 1/2. GD-6/6N and GD-30/45 capacities cannot be determined with a formula—consult capacity tables. Reference note under formula key above.

*GD-30 only.

When ordering please specify:

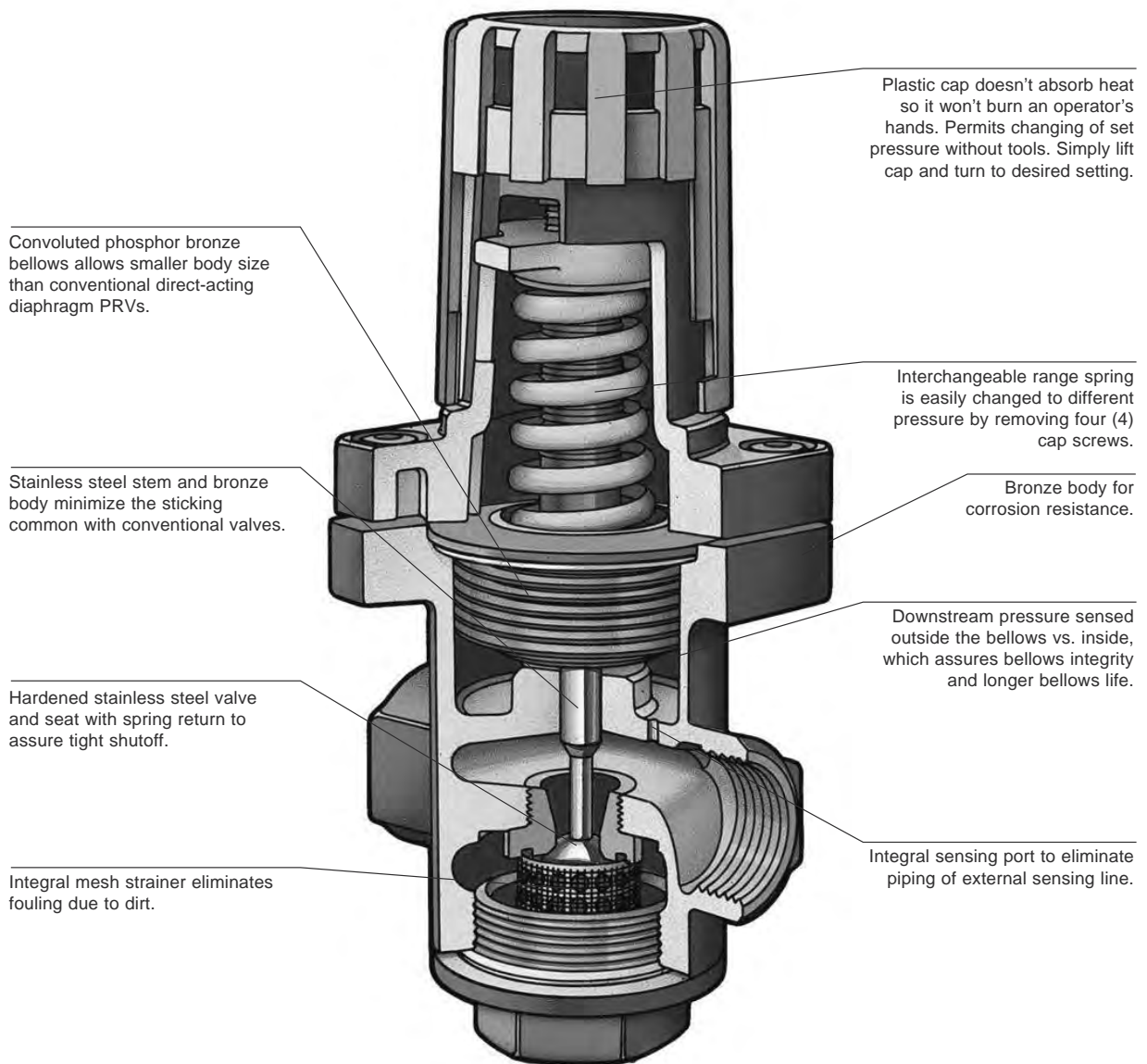
1. Model number
2. Connection size and type
3. Quantity
4. Service fluid
5. Specific gravity (if other than steam, air, water)
6. Fluid temperature
7. Maximum inlet pressure
8. Desired delivered pressure (reduced pressure)
9. Flow rate
10. Special conditions (if any)

Direct Acting

For Steam, Air and Non-Corrosive Gas Service

The simplest of pressure reducing valves, the direct acting type operates with either a flat diaphragm or convoluted bellows. Since it is self-contained, it does not need an external sensing line downstream to operate. It is the

smallest and most economical of the three types and is designed for low to moderate flows. Accuracy of direct acting PRVs is typically +/-10%.



GD-30/30S

For Steam, Air and Non-Corrosive Gases

The GD-30 is a compact, high performance direct acting valve. Economical to buy and use, it's ideal for those low to moderate flow applications where accuracy of +/-10% is acceptable. The GD-30 is well suited for laundry and dry cleaning equipment, hospital equipment, tire molds, humidifiers, small heaters and applications in food processing. It provides tight shutoff for dead-end service on steam. Turndown ratio is 10:1 and ANSI Class IV Shutoff.

For a fully detailed certified drawing, refer to:

GD-30 (bronze only) CDY #1038

GD-30S (stainless steel) CDY #1089

GD-30/30S Specifications

Model Number	Inlet Pressure psig (bar)	Reduced Pressure psig (bar)	Spring Color	Minimum Differential psig (bar)	Application	Maximum Temp. °F (°C)	Materials		
							Body	Valve/Seat	Bellows
GD-30	15 - 250 (1 - 17)	3 - 15 (.21 - 1.0) 7 - 80 (.48 - 5.5)	Yellow Blue Green	7 (.48)	Steam, Air, Non-Corrosive Gases	410 (210)	Cast Bronze ASTM B584	Stainless Steel AISI 440/304	Phosphor Bronze ASTM B103*
GD-30S	15 - 300 (1 - 20)	50 - 140 (3.4 - 9.6)			Steam	430 (220)	Stainless Steel AISI 316		Stainless Steel AISI 316L

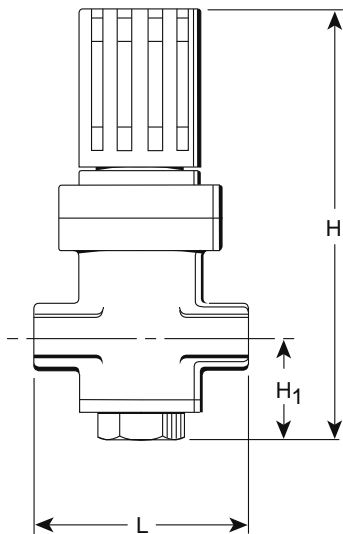
*Stainless steel optional

GD-30/30S Dimensions and Weights

Symbol	Connection Size									
	in	mm	in	mm	in	mm	in	mm	in	mm
L	3-1/8	80	3-3/8	85	3-3/4	95	5-1/2	140	5-7/8	150
H ₁	2	47	2	47	2	47	3	77	3	77
H	7-1/2	191	7-1/2	191	7-1/2	191	12-1/8	307	12-1/8	307
Weight lb (kg)	4-1/4 (1.9)		4-1/4 (1.9)		4-1/2 (2.0)		21-3/8 (9.7)		22 (10)	
C _v	1.3		1.5		2.5		5.6		8.5	

NOTE: GD-30 capacities cannot be determined with a formula—consult capacity tables. Reference note under formula key on page 269.

*GD-30S available in 1/2", 3/4", and 1" only.



GD-30/30S

GD-30 Capacities—Steam							GD-30S Only						
		lb/hr							kg/hr				
Inlet	Outlet	Connection Size					Inlet	Outlet	Connection Size				
		in							mm				
psig		1/2	3/4	1	1-1/2	2	bar		15	20	25	40	50
C _v Factor		1.3	1.5	2.5	5.6	8.5	C _v Factor		1.3	1.5	2.5	5.6	8.5
15	7	49	56	92	198	297	1.0	.5	22	25	42	90	135
20	13	53	61	105	216	331	1.4	.9	24	28	48	98	150
	7	42	55	63	180	264		.5	19	25	35	82	120
30	23	62	71	112	242	408	2.0	1.6	28	32	51	110	185
	15	53	60	101	209	309		1.0	24	27	46	95	140
	3	33	40	60	139	216		.2	15	18	27	63	98
40	32	99	121	187	407	617	2.8	2.2	45	55	85	185	280
	20	79	97	159	330	517		1.4	36	44	72	150	235
	4	40	55	77	159	264		.3	18	25	35	72	120
50	40	130	143	242	539	837	3.4	2.8	59	65	110	245	380
	20	99	115	187	407	628		1.4	45	52	85	185	285
	5	48	62	88	193	297		.3	22	28	40	88	135
60	48	137	154	265	584	899	4.0	3.3	62	70	120	265	408
	40	150	165	289	617	969		2.8	68	75	131	280	440
	18	90	104	170	374	584		1.2	41	47	77	170	265
	6	55	73	99	220	331		.4	25	33	45	100	150
80	64	176	205	342	738	1,168	5.5	4.4	80	93	155	335	530
	54	187	225	353	782	1,201		3.7	85	102	160	355	545
	23	121	137	220	489	749		1.6	55	62	100	222	340
	8	60	77	108	231	363		.5	27	35	49	105	165
100	80	203	242	397	863	1,355	6.9	5.5	92	110	180	392	615
	66	225	262	437	958	1,465		4.5	102	119	198	435	665
	40	198	231	375	837	1,278		2.8	90	105	170	380	580
	10	68	79	132	297	473		.7	31	36	60	135	215
120	96	231	276	452	991	1,520	8.3	6.6	105	125	205	450	690
	70	276	311	518	1,168	1,818		4.8	125	141	235	530	825
	45	240	267	450	980	1,509		3.1	109	121	204	445	685
	12	110	121	198	462	705		.8	50	55	90	210	320
150	120	287	333	551	1,212	1,862	10.3	8.3	130	151	250	550	845
	85	364	421	705	1,531	2,369		5.9	165	191	320	695	1,075
	55	298	353	595	1,278	2,005		3.8	135	160	270	580	910
	15	132	165	254	562	848		1.0	60	75	115	255	385
180	140	408	485	794	1,719	2,677	12.4	9.7	185	220	360	780	1,215
	115	430	507	860	1,829	2,832		8.0	195	230	390	830	1,285
	70	386	430	739	1,619	2,501		4.8	175	195	335	735	1,135
	18	165	187	309	683	1,035		1.2	75	85	140	310	470
200	140	461	518	871	1,983	3,063	13.8	9.7	209	235	395	900	1,390
	115	474	540	904	2,005	3,085		8.0	215	245	410	910	1,400
	80	430	496	827	1,818	2,810		5.5	195	225	375	825	1,275
	20	209	242	386	848	1,300		1.4	95	110	175	385	590
225	140	485	573	948	2,060	3,195	15.5	9.7	220	260	430	935	1,450
	115	496	584	961	2,071	3,207		8.0	225	265	436	940	1,455
	85	463	540	904	1,983	3,063		5.9	210	245	410	900	1,390
	23	254	298	496	1,079	1,675		1.6	115	135	225	490	760
250	140	525	606	1,014	2,226	3,438	17.2	9.7	238	275	460	1,010	1,560
	120	551	584	1,038	2,248	3,471		8.3	250	265	471	1,020	1,575
	70	463	529	893	1,939	2,997		4.8	210	240	405	880	1,360
	25	276	320	529	1,146	1,796		1.7	125	145	240	520	815
275	140	529	613	1,023	—	—	18.9	9.7	240	278	464	—	—
	120	529	613	1,023	—	—		8.3	240	278	464	—	—
	70	470	542	902	—	—		4.8	213	246	409	—	—
	28	295	344	562	—	—		1.9	134	156	255	—	—
300	140	529	613	1,023	—	—	20.0	9.7	240	278	464	—	—
	100	529	613	1,023	—	—		6.9	240	278	464	—	—
	70	478	551	926	—	—		4.8	217	250	420	—	—
	30	309	359	595	—	—		2.7	140	163	270	—	—

NOTE: For air capacities scfm, multiply steam capacities (lb/hr) by 0.36. For air capacities m3/hr, multiply steam capacities (kg/hr) by 1.35. Maximum pressure reduction ratio 10:1.

Externally Piloted

For Steam Service

This type is similar to the internally piloted piston-operated valve in that a pilot and main valve are utilized. However, double diaphragms replace the piston. This increased diaphragm area can open a larger main valve, allowing a greater capacity per line size than the internally piloted piston-operated valve. In addition, the diaphragms are more

sensitive to pressure changes, which results in accuracy of $\pm 1\%$. This greater accuracy is due to the positioning of the sensing line downstream, where there is less turbulence. This valve also offers the flexibility to use different types of pilot valves (i.e., pressure, temperature, air loaded, solenoid or combination).

Interchangeable springs—regardless of valve size—means more flexibility in applications.

Enclosed spring chamber eliminates dirt fouling.

Dual stainless steel diaphragms provide corrosion resistance.

All cast mating parts are male and female to reduce the chance of leaks at gasket surfaces and assure proper alignment.

Ductile iron body provides a wider range of applications than cast iron and offers a less costly option to cast steel.

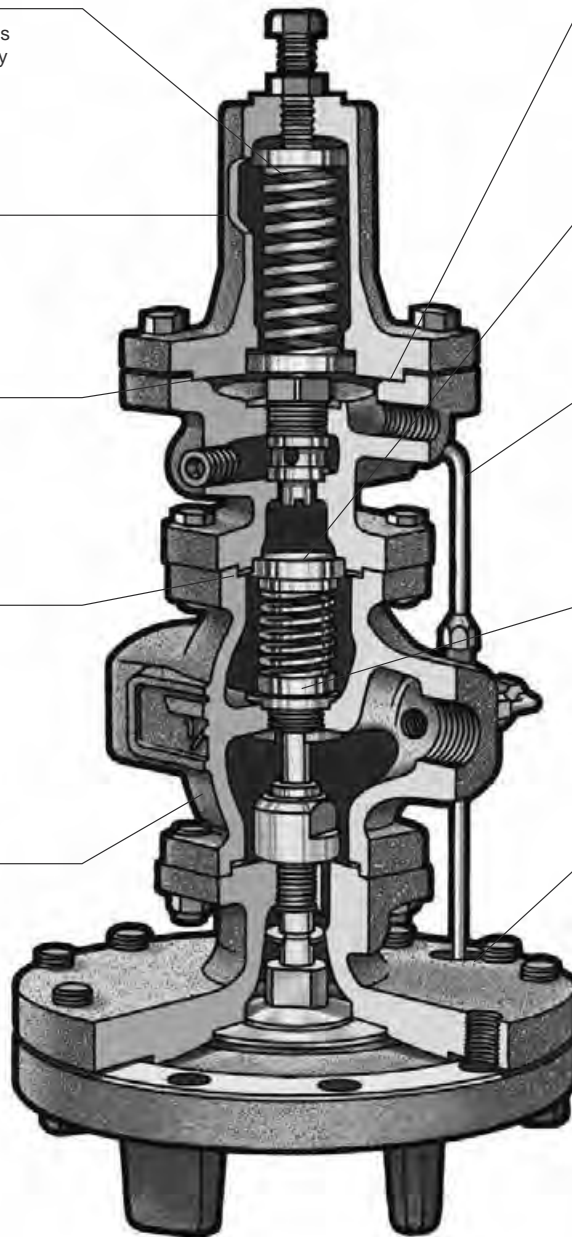
Available in both integral and remote mounted pilot.

Integral strainer protects the pilot valve from failure due to dirt.

Easily removable copper tubing permits troubleshooting while valve is in-line.

Easy access to main valve for quick inspection or maintenance by removing main valve spring and screen and lifting valve from stem. No special tools needed.

Design eliminates copper tubing from passing around the bottom diaphragm housing, minimizing chance of damage during shipping or installation.



GP-2000

For Steam Service

The GP-2000 is a high performance, externally piloted reducing valve for large capacity requirements. Typical use is on intermittent service, including applications such as heat exchangers, steam coils, rotating dryers, process equipment and heating systems. With a 20:1 rangeability and high C_v , the GP-2000 is reliable and accurate (+/-1% of pressure set point from 5% to 100% of flow) over a long, trouble-free service life. Hardened stainless steel working parts

are renewable in-line. Single seated for dead-end service. Available with both NPT (1/2" - 2") and flanged connections in 1/2" - 6" sizes. ANSI Class IV Shutoff.

For a fully detailed certified drawing, refer to:

GP-2000 CDY #1008
 GP-2000 Flanged CDY #1007

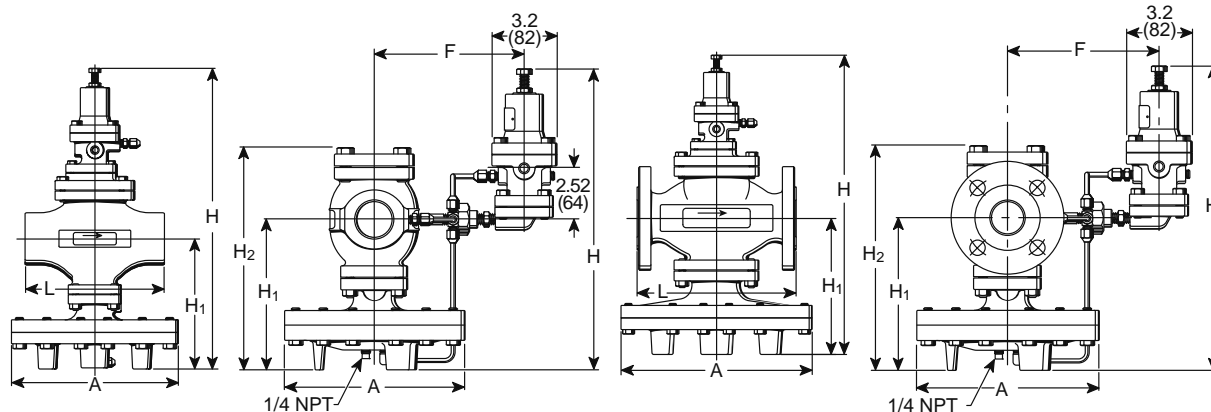
GP-2000 Specifications										
Application	Inlet Pressure psig (bar)	Reduced Pressure psig (bar)	Spring Color	Maximum Temperature °F (°C)	Minimum Differential psig (bar)	Materials				
						Body	Main Valve/Seat	Pilot Valve/Seat	Diaphragm	Color
Steam	NPT 15 - 300 (1 - 20)	*1.5 - 3 (.10 - .21) 3 - 21 (.21 - 1.4) 15 - 200 (1 - 13.8)	Yellow Yellow Green	450 (232)	7 (.48)	Ductile Iron ASTM A536	Stainless Steel AISI 420	Stainless Steel AISI 301	Dark Gray	
	15 - 185 (1 - 13) 150 lb. Flanged									
	15 - 300 (1 - 20) 300 lb. Flanged									

*NOTE: When using this spring range, remove one (1) pilot diaphragm. Capacities are reduced by 1/2 of capacity chart when this spring is being used.

GP-2000 Dimensions and Weights																										
Size	Face-to-Face "L"						A	F	H Integral	H Remote	H ₁	H ₂	Weight						C _v *							
	NPT		150#		300#								NPT		150#		300#									
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg	lb	kg	lb	kg			
1/2	15	5-15/16	150	5-9/16	141	5-3/4	147	7-15/16	200	6-7/8	176	15-3/4	398	14-1/4	362	6-3/4	170	9-5/8	244	34	14	36	15	42	19	5.0
3/4	20	5-15/16	150	5-1/2	140	5-3/4	147	7-15/16	200	6-7/8	176	15-3/4	398	14-1/4	362	6-3/4	170	9-5/8	244	34	14	36	15	42	19	7.2
1	25	6-5/16	160	5-3/4	147	6-1/4	159	8-15/16	226	7-1/16	179	15-15/16	404	14-7/16	367	6-15/16	175	10	254	44	19	48	20	54	23	10.9
1-1/4	32	7-1/8	180	6-1/2	166	7-1/16	179	8-15/16	226	7-7/16	188	17-1/8	434	15-1/8	384	7-5/8	192	11-1/8	283	51	22	53	22	59	25	14.3
1-1/2	40	7-1/8	180	7-7/16	189	7-15/16	202	8-15/16	226	7-7/16	188	17-1/8	434	15-1/8	384	7-5/8	192	11-1/8	283	51	22	55	23	61	26	18.8
2	50	9-1/8	230	8-9/16	217	9-1/8	232	10-15/16	276	7-11/16	195	19-5/8	498	16	406	8-1/2	216	12-5/8	321	75	33	81	36	84	36	32
2-1/2	65	-	-	10-15/16	278	11-1/2	292	13-13/16	352	8-5/16	211	21-3/4	552	17-5/16	440	9-13/16	251	14-3/4	375	-	-	142	65	150	65	60
3	80	-	-	11-3/4	298	12-7/16	315	13-13/16	352	8-3/4	222	22-5/8	575	17-15/16	456	10-7/16	264	15-3/4	400	-	-	155	69	166	72	78
4	100	-	-	13-1/2	343	14-1/8	359	15-13/16	401	9-7/16	239	25-15/16	658	20-1/8	511	12-5/8	321	19-1/4	489	-	-	247	112	264	119	120
6	150	-	-	18-1/8	460	19	483	19-3/4	502	-	-	31-3/4	806	-	-	16-1/4	414	26-1/2	673	-	-	507	230	553	252	250

*50% reduced port available for sizes 1/2" - 4". The C_v value should be divided by 2 to get reduced port C_v.

For capacities see page 299.



GP-2000L

For Steam Service

The GP-2000L is a high performance, externally piloted reducing valve for large capacity and low inlet pressure requirements. The GP-2000L is reliable and accurate (+/-1% of pressure set point from 5% to 100% of flow) over a long, trouble-free service life. Hardened stainless steel working

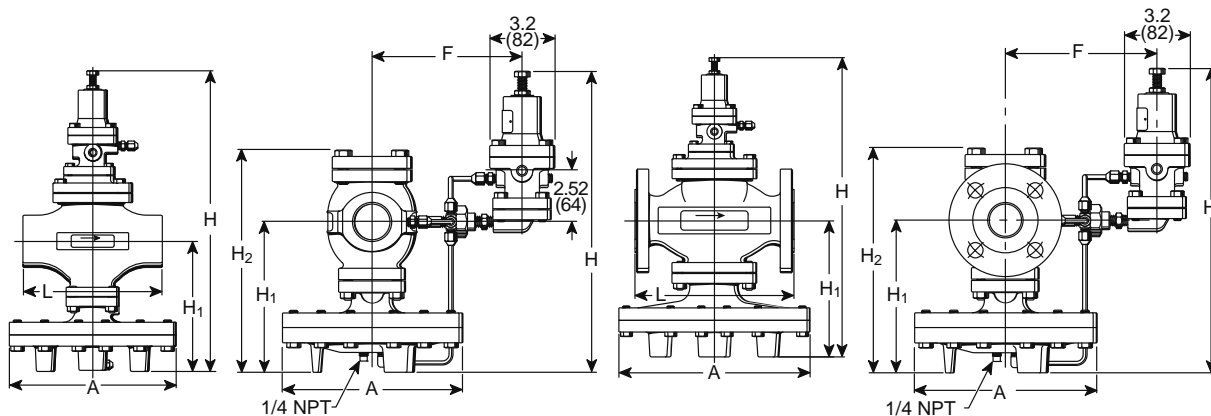
parts are renewable in-line. Single seated for dead-end service. Available with both NPT (1/2" - 2") and flanged connections in 1/2" - 4" sizes. ANSI Class IV Shutoff.

GP-2000L Specifications						Materials				
Application	Inlet Pressure psig (bar)	Reduced Pressure psig (bar)	Spring Color	Maximum Temperature °F (C)	Minimum Differential psig (bar)	Body	Main Valve/Seat	Pilot Valve/Seat	Diaphragm	Color
Steam	5 - 15 (.3 - 1)	2 - 12 (.13 - .8)	Yellow	450 (232)	3 (.21)	Ductile Iron ASTM A536	Stainless Steel AISI 420		Stainless Steel AISI 301	Dark Gray

GP-2000L Dimensions and Weights																										
Size		Face-to-Face "L"						A		F		H Integral		H Remote		H ₁		H ₂		Weight						C _v *
		NPT		150#		300#														NPT		150#		300#		
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg	lb	kg	lb	kg	
1/2	15	5-15/16	150	5-9/16	141	5-3/4	147	7-15/16	200	6-7/8	176	15-3/4	398	14-1/4	362	6-3/4	170	9-5/8	244	34	14	36	15	42	19	7.2
3/4	20	5-15/16	150	5-1/2	140	5-3/4	147	7-15/16	200	6-7/8	176	15-3/4	398	14-1/4	362	6-3/4	170	9-5/8	244	34	14	36	15	42	19	7.2
1	25	6-5/16	160	5-3/4	147	6-1/4	159	8-15/16	226	7-1/16	179	15-15/16	404	14-7/16	367	6-15/16	175	10	254	44	19	48	20	54	23	10.9
1-1/4	32	7-1/8	180	6-1/2	166	7-1/16	179	8-15/16	226	7-7/16	188	17-1/8	434	15-1/8	384	7-5/8	192	11-1/8	283	51	22	53	22	59	25	14.3
1-1/2	40	7-1/8	180	7-7/16	189	7-15/16	202	8-15/16	226	7-7/16	188	17-1/8	434	15-1/8	384	7-5/8	192	11-1/8	283	51	22	55	23	61	26	18.8
2	50	9-1/8	230	8-9/16	217	9-1/8	232	10-15/16	276	7-11/16	195	19-5/8	498	16	406	8-1/2	216	12-5/8	321	75	33	81	36	84	36	32
2-1/2	65	-	-	10-15/16	278	11-1/2	292	13-13/16	352	8-5/16	211	21-3/4	552	17-5/16	440	9-13/16	251	14-3/4	375	-	-	142	65	150	65	60
3	80	-	-	11-3/4	298	12-7/16	315	13-13/16	352	8-3/4	222	22-5/8	575	17-15/16	456	10-7/16	264	15-3/4	400	-	-	155	69	166	72	78
4	100	-	-	13-1/2	343	14-1/8	359	15-13/16	401	9-7/16	239	25-15/16	658	20-1/8	511	12-5/8	321	19-1/4	489	-	-	247	112	264	119	120

*50% reduced port available for sizes 1/2" - 4". The C_v value should be divided by 2 to get reduced port C_v.

For capacities see page 309.



GP-2000CS Carbon Steel Body

For Steam Service

The GP-2000CS is a high performance, externally piloted reducing valve for large capacity requirements. Typical use is on intermittent service, including applications such as heat exchangers, steam coils, rotating dryers, process equipment and heating systems. With a 20:1 rangeability and high C_v , the GP-2000CS is reliable and accurate (+/-1% of pressure set point from 5% to 100% of flow) over a long, trouble-free service life. Stellite stainless steel working

parts are renewable in-line. Single seated for dead-end service. Available with both NPT (1/2" - 2") and flanged connections in 2" - 4" sizes.

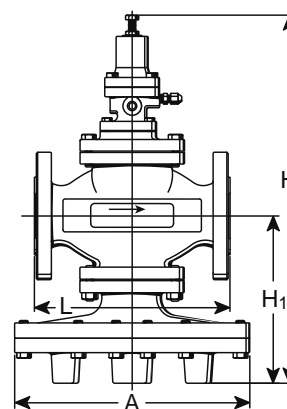
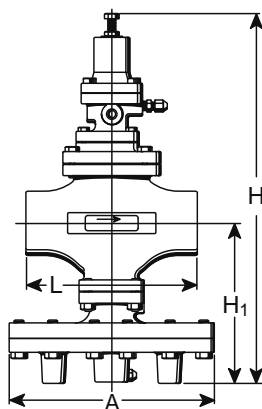
For a fully detailed certified drawing, refer to:

GP-2000 CDY #1008
 GP-2000 Flanged CDY #1007

GP-2000GP-2000CS Specifications										
Application	Inlet Pressure psig (bar)	Reduced Pressure psig (bar)	Spring Color	Maximum Temperature °F (°C)	Minimum Differential psig (bar)	Materials				
						Body	Main Valve/Seat	Pilot Valve/Seat	Diaphragm	Color
Steam	NPT 15 - 450 (1 - 31)	3 - 21 (.21 - 1.4)	Yellow	600°F (315°C)	7 (.48)	Carbon Steel WCB ASTM216 A216M-08	Stainless Steel 304 Stainless Steel Stellite	420 Stainless Steel	Stainless Steel AISI 301	Silver
	150 lb Flanged 15 - 140 (1 - 9.6)	15 - 200 (1 - 13.6)	Green							
	300 lb Flanged 15 - 450 (1 - 31)	190 - 300 (13.1 - 20.6)	Brown							

GP-2000CS Dimensions and Weights																								
Size		L						A		F		H Integral		H ₁		H ₂		Weight						C _v
		NPT		150#		300#												NPT	150#	300#	lb	kg	lb	
1/2	15	5-15/16	150	-	-	-	-	7-15/16	200	6-7/8	176	15-3/4	398	6-3/4	170	9-5/8	244	35	16	-	-	-	-	5.0
3/4	20	5-15/16	150	-	-	-	-	7-15/16	200	6-7/8	176	15-3/4	398	6-3/4	170	9-5/8	244	35	16	-	-	-	-	7.2
1	25	6-5/16	160	-	-	-	-	8-15/16	226	7-1/16	179	15-15/16	404	6-15/16	175	10	254	49	22	-	-	-	-	10.9
1-1/4	32	7-1/8	180	-	-	-	-	8-15/16	226	7-7/16	188	17-1/8	434	7-5/8	192	11-1/8	283	53	24	-	-	-	-	14.3
1-1/2	40	7-1/8	180	-	-	-	-	8-15/16	226	7-7/16	188	17-1/8	434	7-5/8	192	11-1/8	283	53	24	-	-	-	-	18.8
2	50	9-1/8	230	8-9/16	217	9-1/8	232	10-15/16	276	7-11/16	195	19-5/8	498	8-1/2	216	12-5/8	321	62	37	88	40	92	42	32
2-1/2	65	-	-	10-15/16	278	11-1/2	292	13-13/16	352	8-5/16	211	21-3/4	552	9-13/16	251	14-3/4	375	-	-	159	72	168	76	60
3	80	-	-	11-3/4	298	12-7/16	315	13-13/16	352	8-3/4	222	22-5/8	575	10-7/16	264	15-3/4	400	-	-	174	79	185	84	78
4	100	-	-	13-1/2	343	14-1/8	359	15-13/16	401	9-7/16	239	25-15/16	658	12-5/8	321	19-1/4	489	-	-	276	125	293	133	120

For capacities see page 299.



GP-2000, 2000K-1, 3 & 6, GD-2000K, GP-2000R, GP- 11S

Capacities for Steam

GP-2000, GP-2000K-1, GP-2000K-3, GP-2000K-6, GD-2000K, GP-2000R Capacities—Steam lb/hr											
Inlet	Outlet	lb/hr									
		Connection Size									
psig		1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6
C _v Factor		5	7.2	10.9	14.3	18.8	32	60	78	120	250
15	8	201	290	438	575	756	1,287	2,413	3,137	4,826	10,055
	3	250	361	546	716	942	1,603	3,005	3,907	6,010	12,521
20	13	219	316	478	628	825	1,404	2,633	3,423	5,267	10,972
	3	313	451	683	896	1,178	2,006	3,761	4,889	7,521	15,669
25	18	236	340	515	676	889	1,513	2,837	3,688	5,673	11,819
	3 - 5	339	489	740	971	1,276	2,172	4,073	5,295	8,146	16,972
30	23	252	363	550	721	948	1,614	3,026	3,934	6,052	12,609
	3 - 7	382	550	833	1,093	1,437	2,446	4,586	5,962	9,172	19,109
40	33	281	405	613	804	1,057	1,799	3,373	4,385	6,747	14,056
	25	395	569	861	1,130	1,486	2,529	4,741	6,164	9,483	19,756
50	3 - 12	468	673	1,020	1,338	1,758	2,993	5,612	7,296	11,224	23,384
	42	327	471	713	936	1,230	2,094	3,927	5,105	7,853	16,361
60	30	491	707	1,071	1,405	1,847	3,143	5,894	7,662	11,788	24,557
	3 - 17	553	797	1,206	1,582	2,080	3,540	6,638	8,630	13,276	27,659
75	51	373	537	814	1,067	1,403	2,389	4,479	5,823	8,958	18,662
	45	471	679	1,028	1,348	1,773	3,017	5,657	7,355	11,315	23,572
100	35	586	843	1,277	1,675	2,202	3,748	7,027	9,135	14,053	29,278
	3 - 22	639	920	1,392	1,827	2,401	4,088	7,664	9,963	15,328	31,934
125	63	471	678	1,026	1,346	1,769	3,012	5,647	7,341	11,295	23,530
	55	593	854	1,292	1,696	2,229	3,794	7,114	9,249	14,229	29,643
150	45	703	1,012	1,532	2,010	2,643	4,499	8,435	10,966	16,871	35,148
	4 - 30	767	1,104	1,672	2,193	2,884	4,908	9,203	11,964	18,406	38,347
200	85	595	857	1,298	1,703	2,239	3,811	7,145	9,289	14,291	29,773
	75	751	1,081	1,636	2,147	2,822	4,804	9,007	11,709	18,014	37,529
250	60	914	1,316	1,992	2,614	3,436	5,849	10,967	14,257	21,934	45,696
	5 - 42	981	1,412	2,138	2,805	3,687	6,276	11,768	15,299	23,536	49,034
300	106	739	1,064	1,610	2,112	2,777	4,727	8,863	11,522	17,725	36,928
	100	837	1,206	1,825	2,395	3,149	5,359	10,048	13,063	20,097	41,869
350	75	1,125	1,619	2,451	3,216	4,228	7,197	13,494	17,543	26,989	56,226
	7 - 55	1,194	1,720	2,604	3,416	4,491	7,644	14,333	18,633	28,666	59,722
400	127	881	1,269	1,922	2,521	3,314	5,641	10,577	13,751	21,155	44,072
	100	1,241	1,787	2,705	3,549	4,666	7,943	14,893	19,360	29,785	62,052
450	8 - 67	1,408	2,028	3,070	4,027	5,295	9,012	16,898	21,968	33,796	70,409
	148	1,024	1,475	2,233	2,929	3,851	6,555	12,291	15,978	24,581	51,211
500	125	1,348	1,940	2,938	3,854	5,067	8,624	16,170	21,021	32,341	67,376
	100	1,587	2,285	3,459	4,537	5,965	10,154	19,038	24,750	38,076	79,325
600	9 - 80	1,622	2,336	3,536	4,639	6,098	10,380	19,463	25,302	38,926	81,097
	170	1,149	1,655	2,506	3,287	4,322	7,356	13,792	17,930	27,585	57,468
700	150	1,446	2,083	3,153	4,136	5,438	9,256	17,354	22,560	34,708	72,309
	125	1,712	2,465	3,732	4,896	6,437	10,956	20,542	26,705	41,085	85,593
800	10 - 92	1,836	2,643	4,002	5,250	6,902	11,748	22,028	28,637	44,056	91,784
	191	1,292	1,861	2,817	3,695	4,858	8,270	15,505	20,157	31,011	64,606
900	175	1,539	2,215	3,354	4,400	5,785	9,847	18,462	24,001	36,925	76,926
	150	1,829	2,633	3,986	5,230	6,876	11,703	21,944	28,527	43,887	91,431
1000	12 - 105	2,049	2,951	4,468	5,861	7,706	13,116	24,593	31,971	49,186	102,472
	200	1,626	2,341	3,544	4,649	6,112	10,404	19,508	25,360	39,015	81,282
1100	175	1,938	2,791	4,226	5,544	7,288	12,406	23,261	30,239	46,521	96,919
	150	2,176	3,133	4,743	6,223	8,181	13,925	26,110	33,943	52,219	108,790
1200	13 - 117	2,263	3,259	4,934	6,473	8,510	14,484	27,158	35,306	54,316	113,159
	200	2,042	2,941	4,452	5,841	7,679	13,070	24,507	31,859	49,014	102,112
1300	175	2,299	3,311	5,012	6,575	8,644	14,714	27,588	35,864	55,176	114,950
	14 - 130	2,477	3,567	5,400	7,084	9,313	15,852	29,723	38,640	59,446	123,847
1400	200	2,416	3,479	5,267	6,910	9,084	15,462	28,991	37,688	57,982	120,796
	175	2,637	3,797	5,748	7,540	9,913	16,874	31,638	41,130	63,277	131,826
1500	15 - 142	2,691	3,875	5,866	7,695	10,117	17,220	32,288	41,975	64,576	134,534
	248	2,656	3,825	5,791	7,597	9,987	17,000	31,864	41,423	63,728	—
1600	225	2,886	4,156	6,292	8,254	10,852	18,471	34,629	45,017	69,258	—
	200	3,095	4,457	6,748	8,853	11,639	19,811	37,135	48,276	74,270	—
1700	18 - 160	3,118	4,490	6,798	8,918	11,724	19,956	39,890	51,856	79,779	—
	248	3,702	5,331	8,071	10,588	13,921	23,695	44,415	57,740	88,830	—
1800	225	3,870	5,574	8,438	11,070	14,553	24,771	46,439	60,370	92,877	—
	22 - 195	4,000	5,578	8,719	11,439	15,038	25,595	48,096	62,525	96,192	—

NOTE: Maximum pressure reduction 20:1, except for GD-2000K 10:1. Minimum pressure reduction is 85% of inlet pressure.
 For 50% reduced port capacities, divide the capacity by 2.
 50% reduced port available for sizes 1/2" - 4".

GP-2000, 2000K-1, 3 & 6, GD-2000K, GP-2000R

Capacities for Steam *continued*

GP-2000, GP-2000K-1, GP-2000K-3, GP-2000K-6, GD-2000K, GP-2000R Capacities—Steam (kg/hr)											
Inlet	Outlet	kg/hr									
		Connection Size									
		mm									
bar		15	20	25	32	40	50	65	80	100	150
C _v Factor		5	7.2	10.9	14.3	18.8	32	60	78	120	250
1.03	0.55	91	131	199	261	343	584	1,095	1,423	2,189	4,561
	0.21	114	164	248	325	427	727	1,363	1,772	2,726	5,679
1.38	0.90	100	143	217	285	374	637	1,194	1,553	2,389	4,977
	0.21	142	205	310	407	534	910	1,706	2,218	3,412	7,108
1.72	1.24	107	154	234	307	403	686	1,287	1,673	2,573	5,361
	.21 - .34	154	222	336	440	579	985	1,848	2,402	3,695	7,698
2.07	1.59	114	165	249	327	430	732	1,373	1,784	2,745	5,719
	.21 - .48	173	250	378	496	652	1,109	2,080	2,704	4,161	8,668
2.76	2.28	128	184	278	365	479	816	1,530	1,989	3,060	6,376
	1.72	114	165	249	327	430	732	1,373	1,784	2,745	5,719
3.45	.21 - .83	173	250	378	496	652	1,109	2,080	2,704	4,161	8,668
	2.90	128	184	278	365	479	816	1,530	1,989	3,060	6,376
4.14	2.07	179	258	391	513	674	1,147	2,151	2,796	4,301	8,961
	.21 - 1.17	212	305	462	607	798	1,358	2,546	3,309	5,091	10,607
5.17	3.52	148	214	324	425	558	950	1,781	2,315	3,562	7,421
	3.10	148	214	324	425	558	950	1,781	2,315	3,562	7,421
6.89	2.41	223	321	486	637	838	1,426	2,673	3,475	5,347	11,139
	.21 - 1.5	251	361	547	718	943	1,606	3,011	3,914	6,022	12,546
8.62	4.34	213	307	465	611	803	1,366	2,562	3,330	5,123	10,673
	3.79	269	387	586	769	1,011	1,721	3,227	4,195	6,454	13,446
10.34	3.10	319	459	695	912	1,199	2,041	3,826	4,974	7,653	15,943
	.27 - 2.1	348	501	758	995	1,308	2,226	4,175	5,427	8,349	17,394
12.07	5.86	270	389	589	772	1,016	1,729	3,241	4,213	6,482	13,505
	5.17	340	490	742	974	1,280	2,179	4,086	5,311	8,171	17,023
13.79	4.14	415	597	904	1,186	1,559	2,653	4,975	6,467	9,949	20,728
	.34 - 2.9	445	641	970	1,272	1,673	2,847	5,338	6,939	10,676	22,242
15.51	7.31	335	482	730	958	1,260	2,144	4,020	5,226	8,040	16,750
	6.89	380	547	828	1,086	1,428	2,431	4,558	5,925	9,116	18,991
17.24	5.17	510	735	1,112	1,459	1,918	3,265	6,121	7,957	12,242	25,504
	.48 - 3.7	542	780	1,181	1,550	2,037	3,467	6,502	8,452	13,003	27,090
18.96	8.76	400	576	872	1,143	1,503	2,559	4,798	6,237	9,596	19,991
	6.89	563	811	1,227	1,610	2,117	3,603	6,755	8,782	13,510	28,147
20.00	.55 - 4.6	639	920	1,392	1,827	2,402	4,088	7,665	9,964	15,330	31,937
	10.20	465	669	1,013	1,329	1,747	2,973	5,575	7,247	11,150	23,229
24.13	8.62	611	880	1,332	1,748	2,298	3,912	7,335	9,535	14,670	30,562
	6.89	720	1,036	1,569	2,058	2,706	4,606	8,636	11,226	17,271	35,982
29.30	.62 - 5.5	736	1,059	1,604	2,104	2,766	4,709	8,828	11,477	17,657	36,785
	11.72	521	751	1,137	1,491	1,960	3,337	6,256	8,133	12,512	26,067
34.13	10.34	656	945	1,430	1,876	2,466	4,198	7,872	10,233	15,744	32,799
	8.62	776	1,118	1,693	2,221	2,920	4,970	9,318	12,113	18,636	38,825
39.30	.68 - 6.3	833	1,199	1,815	2,381	3,131	5,329	9,992	12,990	19,984	41,633
	13.17	586	844	1,278	1,676	2,204	3,751	7,033	9,143	14,066	29,305
44.13	12.07	698	1,005	1,521	1,996	2,624	4,466	8,374	10,887	16,749	34,894
	10.34	829	1,194	1,808	2,372	3,119	5,309	9,954	12,940	19,907	41,473
49.13	.82 - 7.24	930	1,339	2,027	2,659	3,495	5,950	11,155	14,502	22,311	46,481
	13.79	737	1,062	1,607	2,109	2,773	4,719	8,849	11,503	17,697	36,869
54.13	12.07	879	1,266	1,917	2,515	3,306	5,627	10,551	13,716	21,102	43,962
	10.34	987	1,421	2,152	2,823	3,711	6,316	11,843	15,396	23,687	49,347
59.13	.89 - 8.06	1,027	1,478	2,238	2,936	3,860	6,570	12,319	16,015	24,638	51,329
	13.79	926	1,334	2,019	2,649	3,483	5,929	11,116	14,451	22,233	46,318
64.13	12.07	1,043	1,502	2,273	2,982	3,921	6,674	12,514	16,268	25,028	52,141
	.96 - 8.96	1,124	1,618	2,449	3,213	4,224	7,191	13,482	17,527	26,965	56,177
69.13	13.79	1,096	1,578	2,389	3,134	4,120	7,013	13,150	17,095	26,300	54,793
	12.07	1,196	1,722	2,607	3,420	4,497	7,654	14,351	18,656	28,702	59,796
74.13	1.03 - 9.79	1,220	1,758	2,661	3,491	4,589	7,811	14,646	19,040	29,292	61,024
	17.10	1,205	1,735	2,627	3,446	4,530	7,711	14,453	18,789	28,907	—
79.13	15.51	1,309	1,885	2,854	3,744	4,922	8,379	14,668	20,419	31,415	—
	13.79	1,404	2,022	3,061	4,016	5,279	8,986	16,844	21,898	33,689	—
84.13	1.24 - 11.02	1,414	2,037	3,083	4,045	5,318	9,052	18,094	23,521	36,187	—
	17.10	1,679	2,418	3,661	4,803	6,314	10,748	20,146	26,190	40,293	—
89.13	15.51	1,756	2,528	3,827	5,021	6,601	11,236	21,064	27,383	42,129	—
	1.52 - 13.4	1,814	2,530	3,955	5,189	6,821	11,610	21,816	28,361	43,632	—

NOTE: Maximum pressure reduction 20:1, except for GD-2000K 10:1. Minimum pressure reduction is 85% of inlet pressure.
 For 50% reduced port capacities, divide the capacity by 2.
 50% reduced port available for sizes 15 - 100 mm.

Temperature Regulators

For Steam, Water and Non-Corrosive Liquid Service

Armstrong self-actuated temperature regulators are compact, high performance units that are simple in design and operation—and suitable for a wide variety of applications.

Features including flexible mounting positions of the sensor, interchangeable capillaries and varied temperature ranges make installation, adjustment and maintenance quick and easy.

Color coded handles (red for heating and blue for cooling) make for easy identification in the field.

Easy no-tools temperature adjustment with a simple turn of the handle.

Cast bronze body permits liquid service to 250 psi and steam service to 150 psi.

Main valve seat materials are stainless steel and Teflon® for high durability and positive sealing.

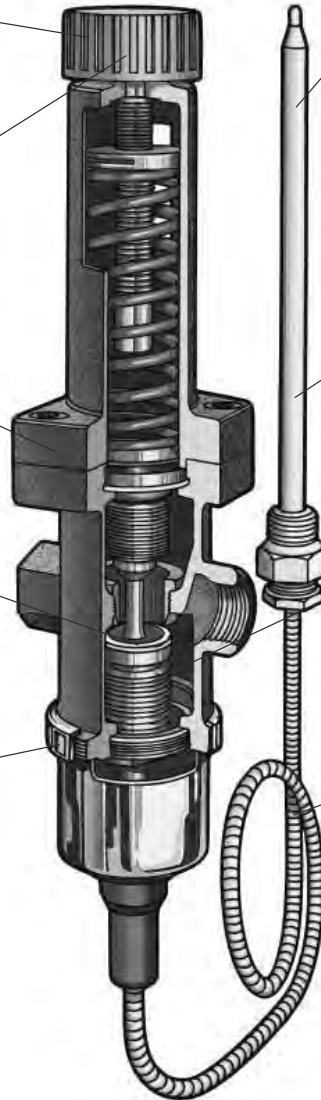
Quick installation and removal of sensor from main body means easy temperature range changes.

Sensor temperature endurance—+72°F of the maximum value of the temperature regulation range. Gas-charged capillary eliminates chance of capillary charge mixing with process in case of breakage. Sensor can be mounted in any position.

Sensors are standard for both heating and cooling for all sizes (1/2" - 1"). Standard capillary units for heating or cooling are accurate to within ±7°F.

A single valve with bellows and balancing mechanism ensures stable regulation. Not affected by pressure fluctuation.

Braided stainless steel capillary protects against crimping.



Temperature Regulator Valve Selection

If the Service Is	If Inlet Pressure is psig (bar)	Type of Control	Temperature Ratings °F (°C)	Temperature Accuracy °F (°C)	If Maximum Capacity Is Less Than	Look for Model	Find on Page
Heating	5 to 150 (.34 to 10)	Self Contained Direct Acting	From 32 to 302 (0 to 150) 5 Ranges	±7 (±3) From set point	1,745 (792)	OB-30	304
	5 to 15 (.34 to 1)	Self Contained Pilot Operated	From 18 to 361 (-7 to 183) 6 Ranges	±2 (±1) From set point	5,643 (2,565)	OB-2000L	308
	10 to 300 (.69 to 20)				58,032 (26,323)	OB-2000 OB-2000PT	306 310
Cooling	5 to 250 (.34 to 17)	Self Contained Reverse Acting	From 32 to 302 (0 to 150) 5 Ranges	±7 (±3) From set point	70 gpm (308 m3/hr)	OB-31	304

OB-30/31

For Steam, Air and Non-Corrosive Liquids

The Armstrong OB-30/31 is a direct acting temperature regulator that requires no external source for operation. Simple and compact, the unit is suitable for a wide variety of heating/cooling applications. Installing, adjusting or maintaining the OB-30/31 is quick and easy because interchangeable capillaries mount in any position and disconnect by simply loosening the union nut. No stem

packing so there's no leakage. Single composition seat for tight shutoff. The OB-30/31 comes in 1/2", 3/4" or 1" sizes and is available with a choice of five temperature ranges and three capillary lengths.

For a fully detailed certified drawing, refer to CDY #1036.

OB-30/31 Specifications								
Model	Application	Service	Max. Inlet Pressure psig (bar)	Maximum Diff. psig (bar)	Temperature Ranges °F (°C)	Max. Temp. °F (°C)	Temperature Accuracy °F (°C)	Capillary Lengths feet (meters)
OB-30	Heating	Steam, Water	Steam 150 (10)	140 (9.6)	32 - 95 (0 - 35)	366 (185)	±7 (±3) From Set Point	*6-1/2 (2) 9-1/2 (3) 16-1/2 (5)
OB-31	Cooling	Water, Non-Corrosive Liquids	Liquid 250 (17)		77 - 158 (25 - 70) 104 - 212 (40 - 100) 140 - 266 (60 - 130) 158 - 302 (70 - 150)			

*Standard length.

NOTES: Capillary can withstand a maximum of 72°F (40°C) above rated range. If desired set temperature is in temperature range overlap, select lower range.

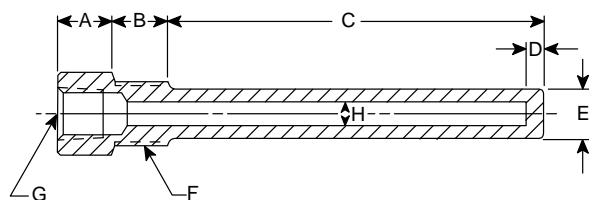
OB-30/31 Materials					
Body Material	Seat Type & Material	Valve Material	Capillary Material	Bulb Material	Thermal Well Material
Bronze ASTM B584	Single Seat 304 Stainless Steel	Teflon	304 Stainless Steel Armor Shielded Capillary	Copper-Nickel Plated	*304 Stainless Steel or Brass

*Other materials available upon request.

OB-30/31 Dimensions and Weights																
Size		L		H ₁		H		T		K		R		Weight		C _v
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg	
1/2	15	3	80	5-1/8	130	12-1/2	315	3/8	10	8	200	1/2	15	6	2.8	3.7
3/4	20	3-1/8	85	5-1/8	130	12-1/2	315	3/8	10	8	200	1/2	15	6	2.8	4.6
1	25	3-1/2	95	5-1/8	130	12-1/2	315	3/8	10	8	200	1/2	15	6-1/2	3.0	5.8

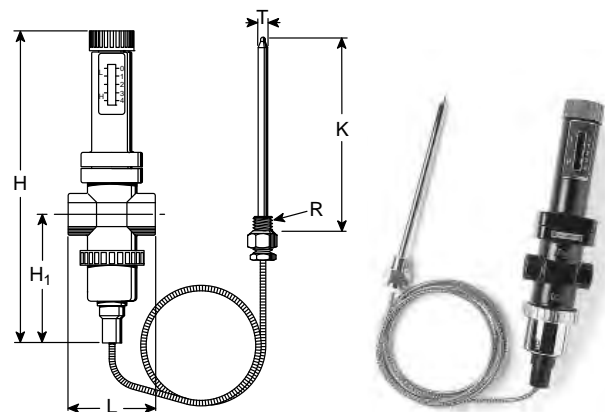
Thermal Well Dimensions																
Model	A		B		C		D		E		F		G		H	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
OB-30/31	3/4	20	1	25	7-1/2	204	1/4	7	.765	20	3/4	20	1/2	15	.380	10
OB-2000/2000PT	1	25	3/4	20	7-3/4	197	1/4	7	.89	23	1	25	3/4	20	.630	16
OBK-2000	1	25	3/4	20	12-1/2	318	1/4	7	.765	20	3/4	20	1/2	15	.515	13

OB-30/31, OBK-2000 and OB-2000/2000PT Thermal Well



Standard Material: 304 stainless steel or brass. Other materials available upon request.

NOTE: When inserting sensor into thermal well, for best results, it is recommended that heat transfer medium be applied to sensor before installation.



OB-30/31

OB-30 Capacities—Steam					OB-31 Capacities—Steam				
Inlet	Outlet	lb/hr			Inlet	Outlet	kg/hr		
		Connection Size in					Connection Size mm		
psig		1/2	3/4	1	bar		15	20	25
C _v Factors		3.7	4.6	5.8	C _v Factors		3.7	4.6	5.8
5	3	67	83	105	.35	.20	30	38	48
	2	81	100	127		.14	37	45	58
	0	101	126	159		0	46	57	72
10	8	75	94	118	.7	.55	34	43	54
	6	104	130	164		.41	47	59	75
	4	125	155	196		.28	57	70	89
	0	154	191	241		0	70	87	110
15	12	101	125	158	1.0	.83	46	57	72
	9	139	172	218		.62	63	78	99
	6	165	205	259		.41	75	93	118
	0-5	200	249	314		0-.35	91	113	143
	15	139	173	218		1.0	63	79	99
20	10	181	235	296	1.38	.7	82	107	135
	5	221	275	347		.35	100	125	158
	0-2	234	290	367		0-.14	106	132	167
	20	149	186	234		1.38	68	85	106
25	15	204	254	320	1.72	1.0	93	115	145
	10	241	300	378		.7	110	136	172
	0-5	268	333	420		0-.35	122	151	191
30	25	159	198	250	2.0	1.72	72	90	114
	15	258	322	406		1.0	117	146	185
	0-7	302	375	473		0-.48	137	170	215
40	30	244	304	384	2.76	2.0	111	138	175
	20	328	408	515		1.38	149	185	234
	0-12	369	459	579		0-.83	168	209	263
50	40	268	333	420	3.45	2.76	122	151	191
	30	383	451	569		2.0	174	205	259
	0-17	437	543	685		0-1.2	199	247	311
60	50	290	360	454	4.0	3.45	132	164	206
	40	395	491	619		2.76	180	223	281
	0-22	504	627	791		0-1.5	229	285	360
70	60	310	385	486	4.83	4.0	141	175	221
	50	328	424	665		3.45	149	193	302
	40	502	624	787		2.76	228	284	358
	0-27	572	711	897		0-1.9	260	323	408
80	70	329	409	616	5.52	4.83	150	186	280
	60	452	562	708		4.0	205	255	322
	50	537	668	842		3.45	244	304	383
90	0-32	640	795	1,003	6.0	0-2.2	291	361	456
	80	346	431	543		5.52	157	196	247
	70	478	694	749		4.83	217	315	340
	60	570	708	893		4.0	259	322	406
	50	639	795	1,002		3.45	290	361	455
100	0-37	707	879	1,109	6.9	0-2.6	321	400	504
	90	363	452	570		6.0	165	205	259
	80	502	625	788		5.52	228	284	358
	70	600	747	942		4.83	273	340	428
	60	676	840	1,060		4.0	307	382	482
125	0-42	776	963	1,215	8.62	0-2.9	353	438	552
	110	489	608	767		7.59	222	276	349
	100	619	770	971		6.9	281	350	441
	80	798	992	1,250		5.52	363	451	568
	70	863	1,073	1,353		4.83	392	488	615
150	0-55	944	1,174	1,480	10.0	0-3.8	429	534	673
	130	611	759	958		8.97	278	345	435
	120	736	915	1,154		8.28	335	416	525
	100	918	1,141	1,439		6.9	417	519	654
0-63	1,113	1,384	1,745	0-4.3	506	629	793		

NOTE: Where it is not possible to calculate pressure drop, 35% - 40% of gauge supply pressure can be used as a reasonable approximation.

Temperature Regulator Selection Example

Parameters:

Fluid Steam
 Maximum inlet pressure 100 psi
 Outlet pressure 90 psi
 Maximum flow rate 500 lbs/hr
 Temperature required 150°F
 Distance from regulator to sensing point 5'

To Locate Proper Model:

Enter inlet column at 100 psi
 Move to outlet pressure of 90 psi
 Locate capacity of 570 lbs/hr under
 connection size 1"
 Find capillary temperature range 77-158°F
 Select capillary length 6-1/2'

Application Will Require:

**OB-30, 1" with 77-158°F Temp. Range,
 Capillary Length 6-1/2'**

OB-30/31 Capacities—Water							
Δ P	gpm			l/min			
	Connection Size			Δ P	Connection Size		
	1/2	3/4	1		bar	15	20
psig				bar			
5	8.1	10.1	12.3	.35	30	38	47
10	11.9	14.3	18.5	.70	45	55	70
15	14.3	17.6	22.0	1.00	55	67	83
20	16.7	20.7	26.4	1.40	63	78	100
25	18.5	22.0	28.2	1.80	70	83	107
30	20.3	25.6	31.7	2.00	77	97	120
50	26.4	33.5	41.4	3.50	100	127	157
75	32.6	39.6	49.3	5.20	123	150	187
100	37.9	46.2	57.2	7.00	143	175	217
125	42.2	52.0	65.6	8.70	160	197	248
150	46.3	57.25	70.5	10.00	175	217	267

Capillary Temperature Ranges

Temperature Ranges °F (°C)
32 - 95 (0 - 35)
77 - 158 (25 - 70)
104 - 212 (40 - 100)
140 - 266 (60 - 130)
158 - 302 (70 - 150)

NOTE: If desired set temperature is in temperature range overlap, select lower range.

OB-2000

For Steam

Armstrong's OB-2000 is a high performance externally piloted temperature regulator for large capacity applications such as heat exchangers, steam coils, steam dryers, plating tanks and parts washers. It is self-actuated and requires no external energy source. Capillary units mount in any position and can be easily disconnected and interchanged,

offering easy installation and maximum application flexibility. Available in sizes 1/2" through 6" with six temperature ranges and three capillary lengths.

For a fully detailed certified drawing, refer to CDY #1013.

OB-2000L Specifications

Application	Inlet Pressure psig (bar)	Reduced Pressure psig (bar)	Temperature Ranges °F (°C)	Temperature Accuracy °F (°C)	Capillary Lengths feet (meters)
Steam	NPT 10 - 300 (.69 - 20) 150 lb Flanged 10 - 185 (.69 - 13) 300 lb Flanged 10 - 300 (.69 - 20)	7 (.48)	18 - 59 (-8 - 15) 50 - 97 (10 - 36) 86 - 144 (30 - 62) 131 - 201 (55 - 94) 176 - 260 (80 - 127) 239 - 361 (115 - 183)	±2 (±1) From Set Point	*6-1/2 (2) 9-1/2 (3) 16-1/2 (5)

*Standard length.

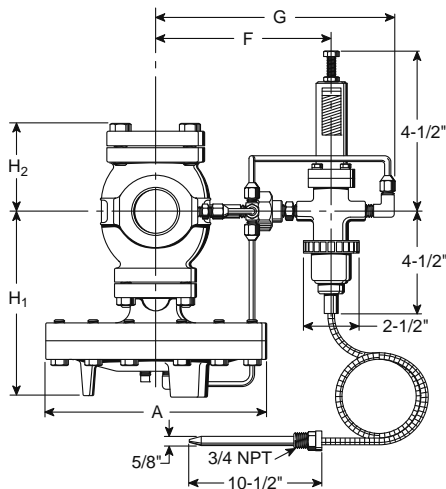
Note: If desired set temperature is in temperature range overlap, select lower range.

OB-2000 Dimensions and Weights

Size	Face-to-Face								H ₁	H ₂	A	F	G	Weight						C _v				
	NPT		150#		300#		NPT	150#						300#										
	in	mm	in	mm	in	mm		in						mm	in	mm	in	mm	lb		kg	lb	kg	lb
1/2	15	5-15/16	150	5-9/16	141	5-3/4	147	6-3/4	170	2-15/16	74	7-15/16	200	6-5/8	169	8-3/4	222	31	15	33	15	39	18	5.0
3/4	20	5-15/16	150	5-1/2	140	5-3/4	147	6-3/4	170	2-15/16	74	7-15/16	200	6-5/8	169	8-3/4	222	31	15	33	15	39	18	7.2
1	25	6-15/16	160	5-3/4	147	6-1/4	159	6-15/16	175	3-1/16	76	8-15/16	226	6-7/8	174	8-7/8	226	39	19	41	20	47	21	10.9
1-1/4	32	7-1/8	180	6-1/2	166	7-1/16	179	7-5/8	192	3-9/16	90	8-5/16	226	7-1/8	182	9-1/4	235	47	22	49	23	54	24	14.3
1-1/2	40	7-1/8	180	7-7/16	189	7-15/16	202	7-5/8	192	3-9/16	90	8-15/16	226	7-1/8	182	9-1/4	235	47	22	49	23	54	24	18.8
2	50	9-1/8	230	8-9/16	217	9-1/8	232	8-1/2	216	4-1/16	103	10-15/16	276	7-7/16	189	9-1/2	242	71	33	77	36	78	36	32
2-1/2	65	-	-	10-15/16	278	11-1/2	292	9-13/16	251	4-7/8	122	13-13/16	352	8-1/8	206	10-1/8	259	-	-	138	63	140	64	60
3	80	-	-	11-3/4	298	12-7/16	315	10-7/16	264	5-3/8	135	13-13/16	352	8-9/16	217	10-5/8	270	-	-	149	69	155	71	78
4	100	-	-	13-1/2	343	14-1/8	359	12-5/8	321	6-9/16	167	15-13/16	401	9-1/4	234	11-1/4	287	-	-	234	107	243	110	120

NOTE: For 6" (150 mm) consult factory.

*50% reduced port available for sizes 1/2" - 4". The C_v value should be divided by 2 to get reduced port C_v.



OB-2000

For Steam

OB-2000 Sensor and Accessory Specifications					
Capillary Material	Capillary Temperature Ranges °F (°C)	Bulb Material	Bulb Connection	Thermal Well Material	Thermal Well Connection
Copper Capillary Tube With 304 Stainless Steel Armor Shield	18 - 59 (-8 - 15) 50 - 97 (10 - 36) 86 - 144 (30 - 62) 131 - 201 (55 - 94) 176 - 260 (80 - 127) 239 - 361 (115 - 183)	Nickel Plated Copper Bulb	3/4" (20 mm) NPT	Brass* 304 Stainless Steel*	1" (25 mm) NPT

*Standard. Other material available upon request. See page 304 for dimensions of well.

NOTE: Capillary can withstand a maximum of 36°F (20°C) above rated range.

NOTE: If desired set temperature is in temperature range overlap, select lower range.

OB-2000 Materials					
OB-2000	Body Material	Seat Type & Material	Valve Material	Connection	Maximum Temperature °F (°C)
Main Valve	Ductile Iron ASTM A536	Single Seat Stainless Steel AISI 420	Stainless Steel AISI 420	NPT	450 (232)
Temperature Pilot Valve	Bronze ASTM B584			150 lb Flanged 300 lb Flanged	
				1/4" (6 mm) NPT	

Valve Sizing

Proper valve selection requires the following information
• Steam capacity required for application
• Supply pressure of steam
• Allowable pressure drop across valve*

*Where it is not possible to calculate pressure drop, 35% - 40% of gauge supply pressure can be used as a reasonable approximation.

Temperature Regulator Selection Example

Parameters:

Fluid Steam
 Maximum inlet pressure 100 psi
 Outlet pressure 75 psi
 Maximum flow rate 1,500 lbs/hr
 Temperature required 180°F
 Distance from regulator to sensing point 5'

To Locate Proper Model (refer to chart on page 311):

Enter inlet column at 100 psi
 Move to outlet pressure of 75 psi
 Locate capacity of
 1,500 lbs/hr under 1" connection size
 Find capillary temp. range 131-201°F
 Select capillary length 6-1/2'

Application Will Require:

**OB-2000, 1" with 131-201°F Temp. Range,
 Capillary Length 6-1/2'**

OB-2000L

For Steam

Armstrong's OB-2000L is a high performance externally piloted temperature regulator for large capacity and low pressure applications. It is self-actuated and requires no external energy source. Capillary units mount in any position and can be easily disconnected and interchanged, offering easy installation and maximum application flexibility.

Available in sizes 1/2" through 4" with six temperature ranges and three capillary lengths.

For a fully detailed certified drawing, refer to CDY #2232.

OB-2000L Specifications					
Application	Inlet Pressure psig (bar)	Reduced Pressure psig (bar)	Temperature Ranges °F (°C)	Temperature Accuracy °F (°C)	Capillary Lengths feet (meters)
Steam	5 - 15 (.3 - 1)	3 (.21)	18 - 59 (-8 - 15) 50 - 97 (10 - 36) 86 - 144 (30 - 62) 131 - 201 (55 - 94) 176 - 260 (80 - 127) 239 - 361 (115 - 183)	±2 (±1) From Set Point	*6-1/2 (2) 9-1/2 (3) 16-1/2 (5)

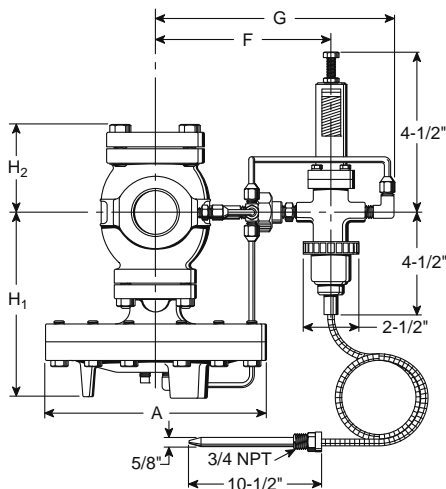
*Standard length.

Note: If desired set temperature is in temperature range overlap, select lower range.

OB-2000L Dimensions and Weights																					
Size		Face-to-Face "L"				H ₁		H ₂		A		F		G		Weight				C _v	
		NPT		150#												NPT		150#			
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg	lb	kg		
1/2	15	5-15/16	150	5-9/16	141	6-3/4	170	2-15/16	74	7-15/16	200	6-5/8	169	8-3/4	222	31	15	33	15	6.5	
3/4	20	5-15/16	150	5-1/2	140	6-3/4	170	2-15/16	74	7-15/16	200	6-5/8	169	8-3/4	222	31	15	33	15	9	
1	25	6-5/16	160	5-3/4	147	6-15/16	175	3-1/16	76	8-15/16	226	6-7/8	174	8-7/8	226	39	19	41	20	12	
1-1/4	32	7-1/8	180	6-1/2	166	7-5/8	192	3-9/16	90	8-15/16	226	7-1/8	182	9-1/4	235	47	22	49	23	19	
1-1/2	40	7-1/8	180	7-7/16	189	7-5/8	192	3-9/16	90	8-15/16	226	7-1/8	182	9-1/4	235	47	22	49	23	22	
2	50	9-1/8	230	8-9/16	217	8-1/2	216	4-1/16	103	10-15/16	276	7-7/16	189	9-1/2	242	71	33	77	36	38	
2-1/2	65	—	—	10-15/16	278	9-13/16	251	4-7/8	122	13-13/16	352	8-1/8	206	10-1/8	259	—	—	138	63	66	
3	80	—	—	11-3/4	298	10-7/16	264	5-3/8	135	13-13/16	352	8-9/16	217	10-5/8	270	—	—	149	69	78	
4	100	—	—	13-1/2	343	12-5/8	321	6-9/16	167	15-13/16	401	9-1/4	234	11-1/4	287	—	—	234	107	116	

*50% reduced port available for sizes 1/2" - 4". The C_v value should be divided by 2 to get reduced port C_v.

For capacities see page 48.



Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit www.armstronginternational.com for up-to-date information.

OB-2000L

For Steam

OB-2000L Sensor and Accessory Specifications					
Capillary Material	Capillary Temperature Ranges °F (°C)	Bulb Material	Bulb Connection	Thermal Well Material	Thermal Well Connection
Copper Capillary Tube With 304 Stainless Steel Armor Shield	18 - 59 (-8 - 15) 50 - 97 (10 - 36) 86 - 144 (30 - 62) 131 - 201 (55 - 94) 176 - 260 (80 - 127) 239 - 361 (115 - 183)	Nickel Plated Copper Bulb	3/4" (20 mm) NPT	Brass* 304 Stainless Steel*	1" (25 mm) NPT

*Standard. Other material available upon request. See page 304 for dimensions of well.

NOTE: Capillary can withstand a maximum of 36°F (20°C) above rated range.

NOTE: If desired set temperature is in temperature range overlap, select lower range.

OB-2000L Materials					
OB-2000	Body Material	Seat Type & Material	Valve Material	Connection	Maximum Temperature °F (°C)
Main Valve	Ductile Iron ASTM A536	Single Seat Stainless Steel AISI 420	Stainless Steel AISI 420	NPT 150 lb Flanged 300 lb Flanged	450 (232)
Temperature Pilot Valve	Bronze ASTM B584			1/4" (6 mm) NPT	

GP-2000L, OB-2000L

Capacities for Steam Service

GP-2000L and OB-2000L Steam Capacities																					
		lb/hr								kg/hr											
Inlet	Outlet	Connection Size										Inlet	Outlet	Connection Size							
		in												mm							
psig		1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	bar	15	20	25	32	40	50	65	80	100	
5	2	218	277	316	495	594	1,100	1,782	1,881	3,135	0.34	0.14	99	126	143	225	269	499	808	853	1,422
10	7	161	223	297	471	545	942	1,635	1,933	2,874	0.69	0.48	73	101	135	214	247	427	742	877	1,304
	3	356	435	475	812	920	1,518	2,574	2,772	4,598		0.21	161	197	215	368	417	689	1,168	1,257	2,086
15	12	178	246	328	519	601	1,038	1,803	2,131	3,169	1.03	0.83	81	112	149	235	273	471	818	966	1,437
	8	261	362	483	764	885	1,528	2,654	3,137	4,665		0.55	119	164	219	347	401	693	1,204	1,423	2,116
	3	416	482	594	970	1,168	1,694	3,069	3,366	5,643		0.21	189	219	269	440	530	768	1,392	1,527	2,560

Note: For reduced port capacity, please divide capacity by 2.

OB-2000PT

For Steam Service

The OB-2000PT is a diaphragm-operated externally piloted pressure/temperature combination regulator. It is used in applications where maximum pressure should be limited and the temperature of the heated medium is controlled using a single seated main valve. Temperature pilot and capillary unit disconnect, making repairs or temperature range

changes quick and easy. Available in sizes 1/2" through 6" and with a choice of four spring ranges, six temperature ranges and three capillary lengths.

For a fully detailed certified drawing, refer to CDY #1006.

OB-2000PT Specifications						
Application	Inlet Pressure psig (bar)	Minimum Differ. Pressure psig (bar)	Reduced Pressure & Spring Color psig (bar)	Temperature Ranges °F (°C)	Temperature Accuracy °F (°C)	Capillary Lengths feet (meters)
Steam	NPT 15 - 300 (1 - 20)	7 (.48)	1.5 - 3 (.10 - .21) Yellow 3 - 21 (.21 - 1.4) Yellow 15 - 200 (1.0 - 13.8) Green	18 - 59 (-8 - 15) 50 - 97 (10 - 36) 86 - 144 (30 - 62) 131 - 201 (55 - 94) 176 - 260 (80 - 127) 239 - 361 (115 - 183)	±2 (±1) From Set Point	6-1/2 (2)* 9-1/2 (3) 16-1/2 (5)
	150 lb Flanged 15 - 185 (1 - 13)					
	300 lb Flanged 15 - 300 (1 - 20)					

*Standard length.

OB-2000PT Sensor and Accessory Specifications					
Capillary Material	Capillary Temperature Ranges °F (°C)	Bulb Material	Bulb Connection	Thermal Well Material	Thermal Well Connection
Copper Capillary Tube With 304 Stainless Steel Armor Shield	18 - 59 (-8 - 15) 50 - 97 (10 - 36) 86 - 144 (30 - 62) 131 - 201 (55 - 94) 176 - 260 (80 - 127) 239 - 361 (115 - 183)	Nickel Plated Copper Bulb	3/4" (20 mm) NPT	Brass* 304 Stainless Steel*	1" (25 mm) NPT

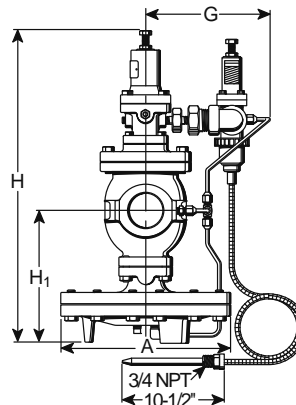
*Standard. Other material available upon request. See page 304 for dimensions of well.

NOTES: Capillary can withstand a maximum of 36°F (20°C) above rated range. If desired set temperature is in temperature range overlap, select lower range.

OB-2000PT Dimensions and Weights																							
Size		Face-to-Face						H	H ₁	A	G	Weights						C _v					
		NPT		150#		300#						NPT		150#		300#							
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg	lb	kg	lb	kg		
1/2	15	5-15/16	150	5-9/16	141	5-3/4	147	15-3/4	398	6-3/4	170	7-15/16	200	6-1/2	166	47	22	49	23	55	25	5.0	
3/4	20	5-15/16	150	5-1/2	140	5-3/4	147	15-3/4	398	6-3/4	170	7-15/16	200	6-1/2	166	47	22	49	23	55	25	7.2	
1	25	6-15/16	160	5-3/4	147	6-1/4	159	15-15/16	404	6-15/16	175	8-15/16	226	7	178	57	26	59	28	64	29	10.9	
1-1/4	32	7-1/8	180	6-1/2	166	7-1/16	179	17-1/8	434	7-5/8	192	8-15/16	226	7-1/4	185	67	31	69	31	74	34	14.3	
1-1/2	40	7-1/8	180	7-7/16	189	7-15/16	202	17-1/8	434	7-5/8	192	8-15/16	226	7-1/4	185	67	31	69	31	75	34	18.8	
2	50	9-1/8	230	8-9/16	217	9-1/8	232	19-5/8	498	8-1/2	216	10-15/16	276	6-1/2	166	89	41	94	43	100	46	32	
2-1/2	65	-	-	10-15/16	278	11-1/2	292	21-3/4	552	9-13/16	251	13-13/16	352	6-1/2	166	-	-	158	72	167	76	60	
3	80	-	-	11-3/4	298	12-7/16	315	22-5/8	575	10-7/16	264	13-13/16	352	6-1/2	166	-	-	171	78	183	83	78	
4	100	-	-	13-1/2	343	14-1/8	359	25-15/16	658	12-5/8	321	15-13/16	401	6-1/2	166	-	-	263	120	281	128	120	

Note: For 6" (150 mm) consult factory.

OB-2000PT Materials			
OB-2000PT	Body Material	Valve & Seat Material	Maximum Temperature °F (°C)
Main Valve	Ductile Iron ASTM A536	Stainless Steel AISI 420	450 (232)
Temperature Pilot Valve	Bronze ASTM B584		
Pressure Pilot	Ductile Iron ASTM A536		



OB-2000, OB-2000PT

Capacities for Steam Service

OB-2000, OB-2000PT Capacities—Steam											
		kg/hr									
Inlet	Outlet	Connection Size									
		mm									
bar		15	20	25	32	40	50	65	80	100	150
C _v Factor		5	7.2	10.9	14.3	18.8	32	60	78	120	250
0.69*	0 - .21	96	138	209	274	360	613	1,150	1,494	2,299	4,790
1.03	0.55	91	131	199	261	343	584	1,095	1,423	2,189	4,561
	0 - .21	114	164	248	325	427	727	1,363	1,772	2,726	5,679
1.38	0.90	100	143	217	285	374	637	1,194	1,553	2,389	4,977
	0 - .21	142	205	310	407	534	910	1,706	2,218	3,412	7,108
1.72	1.24	107	154	234	307	403	686	1,287	1,673	2,573	5,361
	0 - .34	154	222	336	440	579	985	1,848	2,402	3,695	7,698
2.07	1.59	114	165	249	327	430	732	1,373	1,784	2,745	5,719
	0 - .48	173	250	378	496	652	1,109	2,080	2,704	4,161	8,668
2.76	2.28	128	184	278	365	479	816	1,530	1,989	3,060	6,376
	1.72	114	165	249	327	430	732	1,373	1,784	2,745	5,719
3.45	0 - .83	173	250	378	496	652	1,109	2,080	2,704	4,161	8,668
	2.90	128	184	278	365	479	816	1,530	1,989	3,060	6,376
4.14	2.07	179	258	391	513	674	1,147	2,151	2,796	4,301	8,961
	0 - 1.17	212	305	462	607	798	1,358	2,546	3,309	5,091	10,607
5.17	3.52	148	214	324	425	558	950	1,781	2,315	3,562	7,421
	3.10	148	214	324	425	558	950	1,781	2,315	3,562	7,421
6.89	2.41	223	321	486	637	838	1,426	2,673	3,475	5,347	11,139
	0 - 1.5	251	361	547	718	943	1,606	3,011	3,914	6,022	12,546
8.62	4.34	213	307	465	611	803	1,366	2,562	3,330	5,123	10,673
	3.79	269	387	586	769	1,011	1,721	3,227	4,195	6,454	13,446
10.34	3.10	319	459	695	912	1,199	2,041	3,826	4,974	7,653	15,943
	0 - 2.1	348	501	758	995	1,308	2,226	4,175	5,427	8,349	17,394
12.07	5.86	270	389	589	772	1,016	1,729	3,241	4,213	6,482	13,505
	5.17	340	490	742	974	1,280	2,179	4,086	5,311	8,171	17,023
13.79	4.14	415	597	904	1,186	1,559	2,653	4,975	6,467	9,949	20,728
	0 - 2.9	445	641	970	1,272	1,673	2,847	5,338	6,939	10,676	22,242
15.51	7.31	335	482	730	958	1,260	2,144	4,020	5,226	8,040	16,750
	6.89	380	547	828	1,086	1,428	2,431	4,558	5,925	9,116	18,991
17.24	5.17	510	735	1,112	1,459	1,918	3,265	6,121	7,957	12,242	25,504
	0 - 3.7	542	780	1,181	1,550	2,037	3,467	6,502	8,452	13,003	27,090
18.96	8.76	400	576	872	1,143	1,503	2,559	4,798	6,237	9,596	19,991
	6.89	563	811	1,227	1,610	2,117	3,603	6,755	8,782	13,510	28,147
20.00	0 - 4.6	639	920	1,392	1,827	2,402	4,088	7,665	9,964	15,330	31,937
	10.20	465	669	1,013	1,329	1,747	2,973	5,575	7,247	11,150	23,229
21.00	8.62	611	880	1,332	1,748	2,298	3,912	7,335	9,535	14,670	30,562
	6.89	720	1,036	1,569	2,058	2,706	4,606	8,636	11,226	17,271	35,982
22.00	0 - 5.5	736	1,059	1,604	2,104	2,766	4,709	8,828	11,477	17,657	36,785
	11.72	521	751	1,137	1,491	1,960	3,337	6,256	8,133	12,512	26,067
23.00	10.34	656	945	1,430	1,876	2,466	4,198	7,872	10,233	15,744	32,799
	8.62	776	1,118	1,693	2,221	2,920	4,970	9,318	12,113	18,636	38,825
24.00	0 - 6.3	833	1,199	1,815	2,381	3,131	5,329	9,992	12,990	19,984	41,633
	13.17	586	844	1,278	1,676	2,204	3,751	7,033	9,143	14,066	29,305
25.00	12.07	698	1,005	1,521	1,996	2,624	4,466	8,374	10,887	16,749	34,894
	10.34	829	1,194	1,808	2,372	3,119	5,309	9,954	12,940	19,907	41,473
26.00	0 - 7.24	930	1,339	2,027	2,659	3,495	5,950	11,155	14,502	22,311	46,481
	13.79	737	1,062	1,607	2,109	2,773	4,719	8,849	11,503	17,697	36,869
27.00	12.07	879	1,266	1,917	2,515	3,306	5,627	10,551	13,716	21,102	43,962
	10.34	987	1,421	2,152	2,823	3,711	6,316	11,843	15,396	23,687	49,347
28.00	0 - 8.06	1,027	1,478	2,238	2,936	3,860	6,570	12,319	16,015	24,638	51,329
	13.79	926	1,334	2,019	2,649	3,483	5,929	11,116	14,451	22,233	46,318
29.00	12.07	1,043	1,502	2,273	2,982	3,921	6,674	12,514	16,268	25,028	52,141
	0 - 8.96	1,124	1,618	2,449	3,213	4,224	7,191	13,482	17,527	26,965	56,177
30.00	13.79	1,096	1,578	2,389	3,134	4,120	7,013	13,150	17,095	26,300	54,793
	12.07	1,196	1,722	2,607	3,420	4,497	7,654	14,351	18,656	28,702	59,796
31.00	0 - 9.79	1,220	1,758	2,661	3,491	4,589	7,811	14,646	19,040	29,292	61,024

*Minimum inlet pressure for OB-2000PT is 15 psi (1 bar) because of the pressure pilot.

OB-2000, OB-2000PT

Capacities for Steam Service

OB-2000, OB-2000PT Capacities—Steam											
		lb/hr									
Inlet	Outlet	Connection Size									
		in									
psig		1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6
C _v Factor		5	7.2	10.9	14.3	18.8	32	60	78	120	250
10*	0 - 3	211	304	460	604	794	1,352	2,534	3,294	5,068	10,559
15	8	201	290	438	575	756	1,287	2,413	3,137	4,826	10,055
	0 - 3	250	361	546	716	942	1,603	3,005	3,907	6,010	12,521
20	13	219	316	478	628	825	1,404	2,633	3,423	5,267	10,972
	0 - 3	313	451	683	896	1,178	2,006	3,761	4,889	7,521	15,669
25	18	236	340	515	676	889	1,513	2,837	3,688	5,673	11,819
	0 - 5	339	489	740	971	1,276	2,172	4,073	5,295	8,146	16,972
30	23	252	363	550	721	948	1,614	3,026	3,934	6,052	12,609
	0 - 7	382	550	833	1,093	1,437	2,446	4,586	5,962	9,172	19,109
40	33	281	405	613	804	1,057	1,799	3,373	4,385	6,747	14,056
	25	395	569	861	1,130	1,486	2,529	4,741	6,164	9,483	19,756
50	0 - 12	468	673	1,020	1,338	1,758	2,993	5,612	7,296	11,224	23,384
	42	327	471	713	936	1,230	2,094	3,927	5,105	7,853	16,361
60	30	491	707	1,071	1,405	1,847	3,143	5,894	7,662	11,788	24,557
	0 - 17	553	797	1,206	1,582	2,080	3,540	6,638	8,630	13,276	27,659
75	51	373	537	814	1,067	1,403	2,389	4,479	5,823	8,958	18,662
	45	471	679	1,028	1,348	1,773	3,017	5,657	7,355	11,315	23,572
100	35	586	843	1,277	1,675	2,202	3,748	7,027	9,135	14,053	29,278
	0 - 22	639	920	1,392	1,827	2,401	4,088	7,664	9,963	15,328	31,934
125	63	471	678	1,026	1,346	1,769	3,012	5,647	7,341	11,295	23,530
	55	593	854	1,292	1,696	2,229	3,794	7,114	9,249	14,229	29,643
150	45	703	1,012	1,532	2,010	2,643	4,499	8,435	10,966	16,871	35,148
	0 - 30	767	1,104	1,672	2,193	2,884	4,908	9,203	11,964	18,406	38,347
200	85	595	857	1,298	1,703	2,239	3,811	7,145	9,289	14,291	29,773
	75	751	1,081	1,636	2,147	2,822	4,804	9,007	11,709	18,014	37,529
250	60	914	1,316	1,992	2,614	3,436	5,849	10,967	14,257	21,934	45,696
	0 - 42	981	1,412	2,138	2,805	3,687	6,276	11,768	15,299	23,536	49,034
300	106	739	1,064	1,610	2,112	2,777	4,727	8,863	11,522	17,725	36,928
	100	837	1,206	1,825	2,395	3,149	5,359	10,048	13,063	20,097	41,869
350	75	1,125	1,619	2,451	3,216	4,228	7,197	13,494	17,543	26,989	56,226
	0 - 55	1,194	1,720	2,604	3,416	4,491	7,644	14,333	18,633	28,666	59,722
400	127	881	1,269	1,922	2,521	3,314	5,641	10,577	13,751	21,155	44,072
	100	1,241	1,787	2,705	3,549	4,666	7,943	14,893	19,360	29,785	62,052
450	0 - 67	1,408	2,028	3,070	4,027	5,295	9,012	16,898	21,968	33,796	70,409
	148	1,024	1,475	2,233	2,929	3,851	6,555	12,291	15,978	24,581	51,211
500	125	1,348	1,940	2,938	3,854	5,067	8,624	16,170	21,021	32,341	67,376
	100	1,587	2,285	3,459	4,537	5,965	10,154	19,038	24,750	38,076	79,325
550	0 - 80	1,622	2,336	3,536	4,639	6,098	10,380	19,463	25,302	38,926	81,097
	170	1,149	1,655	2,506	3,287	4,322	7,356	13,792	17,930	27,585	57,468
600	150	1,446	2,083	3,153	4,136	5,438	9,256	17,354	22,560	34,708	72,309
	125	1,712	2,465	3,732	4,896	6,437	10,956	20,542	26,705	41,085	85,593
650	0 - 92	1,836	2,643	4,002	5,250	6,902	11,748	22,028	28,637	44,056	91,784
	191	1,292	1,861	2,817	3,695	4,858	8,270	15,505	20,157	31,011	64,606
700	175	1,539	2,215	3,354	4,400	5,785	9,847	18,462	24,001	36,925	76,926
	150	1,829	2,633	3,986	5,230	6,876	11,703	21,944	28,527	43,887	91,431
750	0 - 105	2,049	2,951	4,468	5,861	7,706	13,116	24,593	31,971	49,186	102,472
	200	1,626	2,341	3,544	4,649	6,112	10,404	19,508	25,360	39,015	81,282
800	175	1,938	2,791	4,226	5,544	7,288	12,406	23,261	30,239	46,521	96,919
	150	2,176	3,133	4,743	6,223	8,181	13,925	26,110	33,943	52,219	108,790
850	0 - 117	2,263	3,259	4,934	6,473	8,510	14,484	27,158	35,306	54,316	113,159
	200	2,042	2,941	4,452	5,841	7,679	13,070	24,507	31,859	49,014	102,112
900	175	2,299	3,311	5,012	6,575	8,644	14,714	27,588	35,864	55,176	114,950
	0 - 130	2,477	3,567	5,400	7,084	9,313	15,852	29,723	38,640	59,446	123,847
950	200	2,416	3,479	5,267	6,910	9,084	15,462	28,991	37,688	57,982	120,796
	175	2,637	3,797	5,748	7,540	9,913	16,874	31,638	41,130	63,277	131,826
1000	0 - 142	2,691	3,875	5,866	7,695	10,117	17,220	32,288	41,975	64,576	134,534

*Minimum inlet pressure for OB-2000PT is 15 psi (1 bar) because of the pressure pilot.

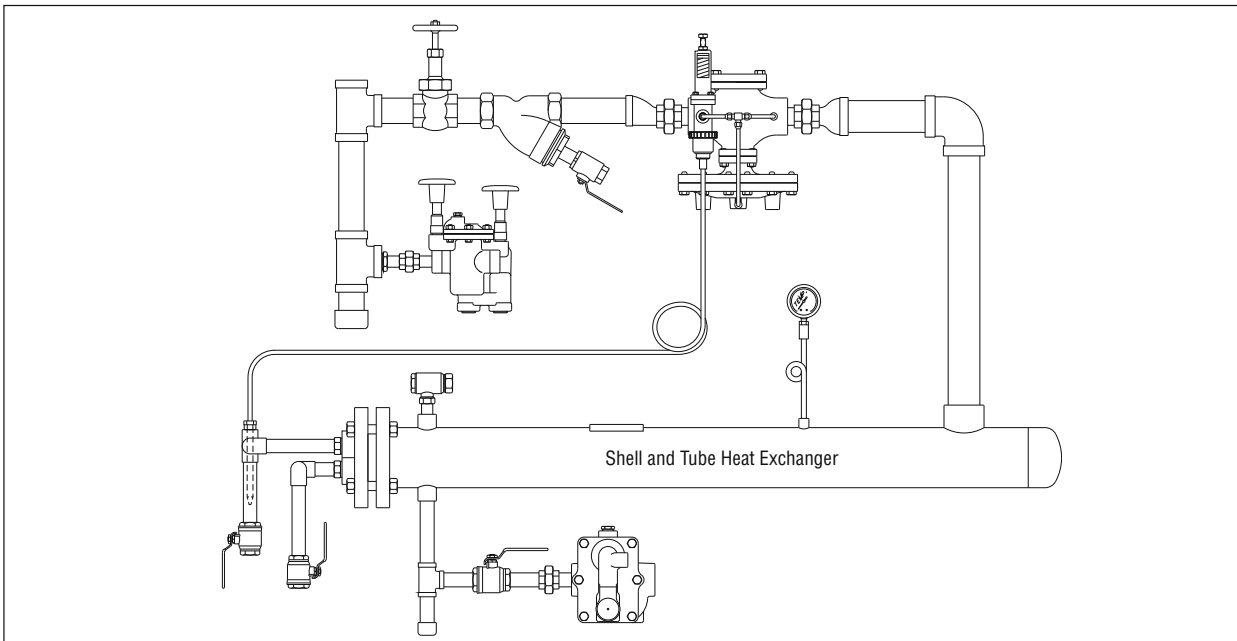
OB-30, OB-2000, OB-2000PT

For Steam Service

Points to Remember When Installing

- Drain condensate at inlet of pressure/temperature regulator with inverted bucket steam trap.
- Protect temperature regulating valve from dirt and scale by installing strainer with 100 mesh screen at inlet of valve.
- Install shutoff valves on either side of the regulating valve along with a by-pass line for maintenance purposes.
- Install vacuum breaker after the outlet of equipment and before the steam trap.
- Install sensor so it is fully immersed in the fluid being heated.
- If temperature well is used, apply heat transfer medium to sensor before insertion into well.
- Place thermometer into system in close proximity to temperature sensor for accurate valve adjustment.
- If possible, do not elevate condensate after steam trap.
- Determine pressure setting before temperature setting (OB-2000PT only).

Typical Installation—OB-30, OB-2000



Load Calculations

Heating oil with steam

$$\text{lb/hr steam} = \frac{\text{GPM} \times \Delta T \times 1.1}{4}$$

Heating water with steam

$$\text{lb/hr steam} = \frac{\text{GPM} \times \Delta T \times 1.1}{2}$$

Heating air with steam

$$\text{lb/hr steam} = \frac{\text{CFM} \times \Delta T \times 1.1}{900}$$

Jacketed kettles or tanks

$$\text{lb/hr steam} = \frac{\text{Gal} \times \text{SG} \times \text{Cp} \times \Delta T \times 8.3}{\text{Lat} \times T}$$

Where:

- GPM = Gallons per minute
- ΔT = Temperature rise ($^{\circ}\text{F}$)
- CFM = Cubic feet per minute
- Cp = Specific heat of liquids (Btu/lb- $^{\circ}\text{F}$)
- T = Time (hours)
- Lat = Latent heat of steam (Btu/lb)
- Gal = Gallons of liquid to be heated
- SG = Specific gravity
- 1.1 = Safety factor

PNEUMATIC CONTROL VALVES - PV16G

(V16G globe valves series with linear actuators PA series)

DESCRIPTION

The PV16G control valves are single seated, two-way body constructed with in-line straight connections. The PA pneumatic actuator is rubber diaphragm and multi-springs. Its action can be DA -direct action (air to close) or RA-reverse action (air to open). The PV16G valves have been designed to assure an accurate control in any process condition. Their wide application ranges allows the use of this valve with the most common process fluids such as water, superheated water, steam, air, gas and other non corrosive fluids.

MAIN FEATURES

Single seated, two ways, direct or reverse action valve. Valve top flange permanently attached to the body, removal is unnecessary for replacing the actuator. Soft sealing as standard.

OPTIONS: Balanced plug (sizes DN125-DN200)
 Position transmitter 4-20 mA
 Pneumatic pilot positioner
 Electropneumatic pilot positioner
 Air filter regulator
 Top-work manual handwheel
 Stainless steel construction.

USE: Saturated and superheated steam.
 Hot and superheated water.
 Air, gases and other noncorrosive fluids.

AVAILABLE MODELS: PV16G-single seat unbalanced.
 PV16G2-single seat,pressure balanced.

VALVE SIZES: DN15 to DN200

CONNECTIONS: Flanged EN 1092-2 PN16

ACTUATORS: PA-205; PA-280; PA-340; PA-435

ACTUATOR CONN: 1/4" NPT-F

CONTROL SIGNAL: 0,2 - 1 bar ; 0,4 - 1,2 bar ; 0,4 - 2 bar.

HOW TO SELECT: Never size the valve according to the pipe diameter in which it has to be fitted but according to the required actual flow of steam or water. Refer to valve calculation data sheet or consult the factory.



VALVE LIMITING CONDITIONS: Body design conditions: PN16
 16 bar at 120°C
 14,7 bar at 200°C
 Min.working temperature: -10°C

MAX. AIR SUPPLY PRESSURE: 3,5 bar

AMBIENT TEMPERATURE: -20°C ...+70°C

BONNET : From -5°C to +220°C (standard)

STEM SEALING: PTFE/GR V-Rings - up to 220°C (Standard bonnet)
 Graphite - up to 400°C (Standard on valves DN125-200)

PLUG CHARACT.: EQP - Equal percentage
 PT - On-off

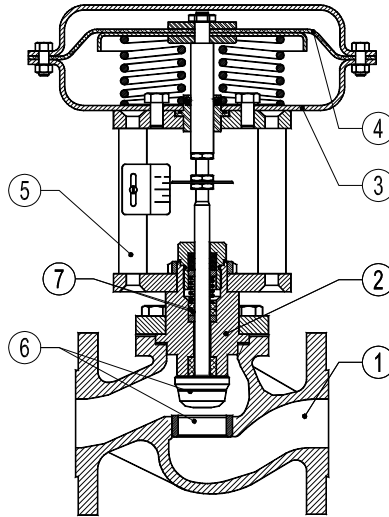
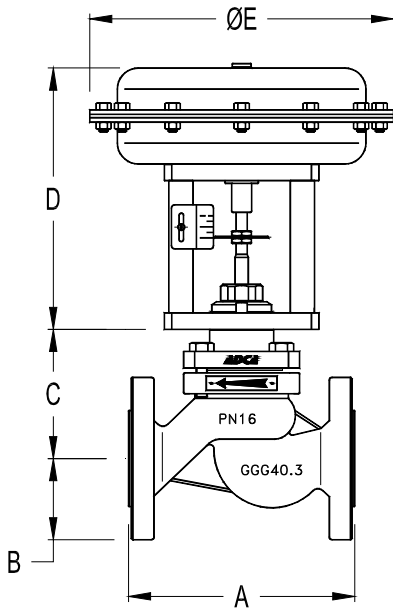
PLUG DESIGN: Contoured

PORT : Full port

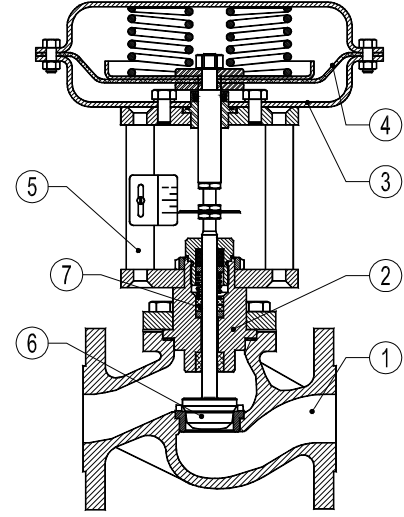
CE MARKING (PED - European Directive 97/23/EC)	
PN 16	Category
DN15 to DN50	SEP - art. 3, paragraph3
DN65 to DN200	1 (CE Marked)

PNEUMATIC CONTROL VALVES - PV16G

(V16G globe valves series with linear actuators PA series)



PV16 DA – Direct action



PV16 RA – Reverse action

DIMENSIONS - VALVE BODY				
DN	A (mm)	B (mm)	C (mm)	WEIGHT Kgs
15	130	48	80	3
20	150	53	80	3,7
25	160	58	85	4,4
32	180	70	90	6,8
40	200	75	105	9,5
50	230	83	105	11,7
65	290	93	165	18,5
80	310	100	175	20,3
100	350	110	190	30
125	400	125	240	-
150	480	142	290	-
200	600	170	315	-

PV16 DA - Direct action from DN15 to DN200
 PV16 RA - Reverse action from DN15 to DN100

MATERIALS		
POS.	DESIGNATION	MATERIAL
1	Valve Body	GJS-400-18-LT / 0.7043
2	Bonnet	CF8 / 1.4308
3	Actuator (Steel)	S235JRG2 / 1.0038
	Actuator (Stainless steel)	AISI304 / 1.4301
4	Diaphragm	NBR 70
5	Yoke (Steel)	C45E / 1.1191
	Yoke (Stainless steel)	AISI304 / 1.4301
6	Valve Seal	PTFE/GR
7	Standard packing	PTFE/GR

DIMENSIONS - ACTUATOR				
Type	ø E (mm)	D (mm)		WEIGHT Kgs
		DN15-100 DA/RA	DN125-200 DA	
PA-205	210	235	—	5,7
PA-280	275	240	—	8,8
PA-340	335	265	—	14,3
PA-435	430	295	—	24,5

FLOW RATE COEFFICIENTS												
	SIZES											
	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
Kvs	3,8	5,1	9,4	15,4	22,2	40,1	63,4	89,7	136,7	230,6	316,1	555,3

Kvs in m³/h , see data sheet IS PV10.00 E ; For conversion Kvs = Cv(US) x 0,855

ACTUATOR STROKE IN mm												
	SIZES											
	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
Stroke	20	20	20	20	20	20	30	30	30	40	40/50	50

PNEUMATIC CONTROL VALVES - PV16G

(V16G globe valves series with linear actuators PA series)

MAX. PERMISSIBLE PRESS.DROP IN bar - Normally closed valve (fluid to open) - Reverse action actuator (air signal to open)													
ACTUATOR	CONTROL SIGNAL	SIZES											
		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
PA-205	0,2 ÷ 1 bar	6	6	5	—	—	—	—	—	—	—	—	—
	0,4 ÷ 1,2 bar	10	10	7	—	—	—	—	—	—	—	—	—
	0,4 ÷ 2 bar	12	12	9	—	—	—	—	—	—	—	—	—
PA-280	0,2 ÷ 1 bar	28	26	16	8	6	3,5	—	—	—	—	—	—
	0,4 ÷ 1,2 bar	40	38	20	12	10	5	—	—	—	—	—	—
	0,4 ÷ 2 bar	50	45	25	16	12	6,5	—	—	—	—	—	—
PA-340A	0,2 ÷ 1 bar	60	60	50	20	12	10	—	—	—	—	—	—
	0,4 ÷ 1,2 bar	80	80	60	30	16	13	—	—	—	—	—	—
	0,4 ÷ 2 bar	100	100	80	40	20	18	—	—	—	—	—	—
PA-340B	0,2 ÷ 1 bar	—	—	—	—	—	—	4	2,5	1	—	—	—
	0,4 ÷ 1,2 bar	—	—	—	—	—	—	5	3,5	1,5	—	—	—
	0,4 ÷ 2 bar	—	—	—	—	—	—	6	4	2	—	—	—
PA435A	0,2 ÷ 1 bar	—	—	—	—	40	25	—	—	—	*	*	*
	0,4 ÷ 1,2 bar	—	—	—	—	48	30	—	—	—	*	*	*
	0,4 ÷ 2 bar	—	—	—	—	55	45	—	—	—	*	*	*
PA435B	0,2 ÷ 1 bar	—	—	—	—	—	—	6	5	3	*	*	*
	0,4 ÷ 1,2 bar	—	—	—	—	—	—	8	7	5	*	*	*
	0,4 ÷ 2 bar	—	—	—	—	—	—	10	8	6	*	*	*
	0,4 ÷ 2,5 bar	—	—	—	—	—	—	16	15	12	*	*	*

* For valve size DN125 and above please consult.

The pressure drop values are referred to closed valves. They have been verified by a control signal coming from an electro-pneumatic converter with an enduring minimum signal of 0,2 bar.

The actuator press. drops given with closed valve for the actuator signal 0,4 - 2 bar are also valid for ON-OFF service with air supply at 2,5 bar.

Special spring drops available on request.

The pressure drop values must be used within the body rating limits.

For electric actuator selection please consult catalogue IS EL.20.00 E or our technical department.

MAX.PERMISSIBLE PRESS.DROP IN bar - Normally open valve (fluid to open) - Direct action actuator (air signal to close)													
ACTUATOR	CONTROL SIGNAL	SIZES											
		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
PA-205	0,2 ÷ 1 bar	16	16	12	5	—	—	—	—	—	—	—	—
	0,4 ÷ 2 bar	25	24	16	7,5	—	—	—	—	—	—	—	—
PA-280	0,2 ÷ 1 bar	—	—	19	10	8	4	—	—	—	—	—	—
	0,4 ÷ 2 bar	—	—	25	20	16	7	—	—	—	—	—	—
PA-340A	0,2 ÷ 1 bar	—	—	—	17	16	10	—	—	—	—	—	—
	0,4 ÷ 2 bar	—	—	—	28	26	25	—	—	—	—	—	—
PA-340B	0,2 ÷ 1 bar	—	—	—	—	—	—	5	3,5	1,5	—	—	—
	0,4 ÷ 2 bar	—	—	—	—	—	—	8	7	3	—	—	—
PA435B	0,2 ÷ 1 bar	—	—	—	—	—	—	8	5	3	*	*	*
	0,4 ÷ 2 bar	—	—	—	—	—	—	16	10	7,5	*	*	*

* For valve size DN125 and above please consult.

The actuator pressure drops given with closed valve, are obtained with the following air pressures supply :

Actuator signal 0,2 to 1 bar : air supply 1,2 bar

Actuator signal 0,4 to 2 bar : air supply 2,5 bar

The actuator press. drops given with closed valve for the actuator signal 0,4 - 2 bar are also valid for ON-OFF service with air supply at 2,5 bar.

Special spring drops available on request.

The pressure drop values must be used within the body rating limits.

For electric actuator selection please consult catalogue IS EL.20.00 E or our technical department.

PNEUMATIC CONTROL VALVES - PV16G

(V16G globe valves series with linear actuators PA series)

ORDERING CODES V16									
VALVE CODES									
Actuator Type (1)		V	.16	G					.X.
Pneumatic Actuator		P							
Electric Actuator		E							
Group Designation									
Globe valve, two way, straight body		V							
Valve Model									
Class PN16, GJS-400-18-LT body, stainless steel trim		.16	G						
Class PN16, CF8M body, stainless steel trim		.16	I						
Stem Sealing									
PTFE/GR-V-Rings / Standard bonnet								1	
Virgin PTFE V-Rings / Standard bonnet								2	
Graphite / Standard bonnet								3	
Valve Plug									
EQP (equal percentage) - Soft (PTFE/GR)									1
Pipe Connection									
Flanged EN1092-2 PN16									L
Size									
DN15									15
DN20									20
...									
Actuator									(1)
Extras (3)									E
ACTUATOR CODES (pneumatic)									
Group Designation		P.							
Multi-spring , pneumatic linear actuator		P.							
Actuator Size									
205								1	
280								3	
340 A - From DN15 to DN50								5	
340 B - From DN65 to DN100								6	
435 A - From DN15 to DN50								7	
435 B - From DN65 to DN100								8	
Actuator									
Direct Action									D
Reverse Action									R
Actuator Construction									
Steel construction (painted) - standard									(2)
Stainless steel construction									I
Control Signal									
0,2 - 1 bar (3/15 psi)									15
0,4 - 1,2 bar (6/18 psi)									18
0,4 - 2 bar (6/30 psi)									30

P. → To be introduced on ".X.", if supplied in combination with the valve.
 Example:
 V16G valve model EQP soft plug, PTFE/GR stem sealing DN50 complete with reverse action actuator signal 0,4-1,2bar, size340A steel.

 Code: PV.16G.11L50.5R18

REMARKS:
 (1)- Indicate actuator type.
 (2)- Omitted if the standard actuator is selected.
 (3)- To be used only when a non-standard combination valve is supplied.
 ADCATROL control valves are identified by a serial number on a nameplate, located on the actuator yoke.
 Always order spares by using that serial number. If the valve has non-standard extras the serial number has also an E (extras).

PNEUMATIC CONTROL VALVES - PV25 (ANSI)

V25S globe control valves with linear actuators PA series

DESCRIPTION

The PV25 control valves are single seated, two-way body constructed with in-line straight connections. The PA pneumatic actuator is rubber diaphragm and multi-springs. Its action can be DA -direct action (air to close) or RA-reverse action (air to open). The PV25 valves have been designed to assure an accurate control in any process condition. Their wide application ranges allows the use of this valve with the most common process fluids such as water, superheated water, steam, air, gas and other non corrosive fluids (group 1).

MAIN FEATURES

Single seated, two way, direct or reverse action valve. Valve top flange permanently attached to the body, removal is unnecessary for replacing the actuator. Metal to metal sealing as standard.

OPTIONS: Position transmitter 4-20 mA
Pneumatic pilot positioner
Electropneumatic pilot positioner
Air filter regulator
Top-work manual handwheel
Stainless steel construction.
Soft sealing and stellite seat and plug.

USE: Saturated and superheated steam.
Hot and superheated water.
Air, gases and other noncorrosive fluids.

AVAILABLE MODELS: PV25S Cast steel

VALVE SIZES: 1/2" to 6"

CONNECTIONS: Flanged ANSI B16.5 150# and 300#

ACTUATORS: PA-205; PA-280; PA-340; PA-435
ACTUATOR CONN: 1/4" NPT-F

CONTROL SIGNAL: 0,2 - 1 bar ; 0,4 - 1,2 bar ; 0,4 - 2 bar.

HOW TO SELECT: Never size the valve according to the pipe diameter in which it has to be fitted but according to the required actual flow of steam or water. Refer to valve calculation data sheet or consult the factory.

CE MARKING (PED - European Directive 97/23/EC)		
ANSI 150	ANSI 300	Category
1" - 2" (DN25-50)	1" (DN25)	SEP - art. 3, paragraph3
3"-6" (DN80-150)	1 1/2"-4" (DN40-100)	1 (CE Marked)
/	1 1/2"-6" (DN40-150)	2 (CE Marked)

Note: classification for gases - Group 2, for others see IMI



MAX. AIR SUPPLY PRESSURE: 3,5 bar

AMBIENT TEMPERATURE: -20°C ...+70°C

BONNET : From -5°C to +220°C (standard)
Finned for temperature >220°C

STEM SEALING: PTFE/GR V-Rings - up to 220°C (Standard bonnet)
Graphite - up to 400°C (Finned bonnet)
Stainless steel bellows

PLUG CHARACT.: EQP - Equal percentage
PL - Linear
PT - On-Off

PLUG DESIGN : Contoured
V-ported
Perforated (Low noise, anti-cavitation)
Microflow

PORT : Full port or reduced on request

COMPLEMENTARY INFORMATION : See IS PV10.00 E

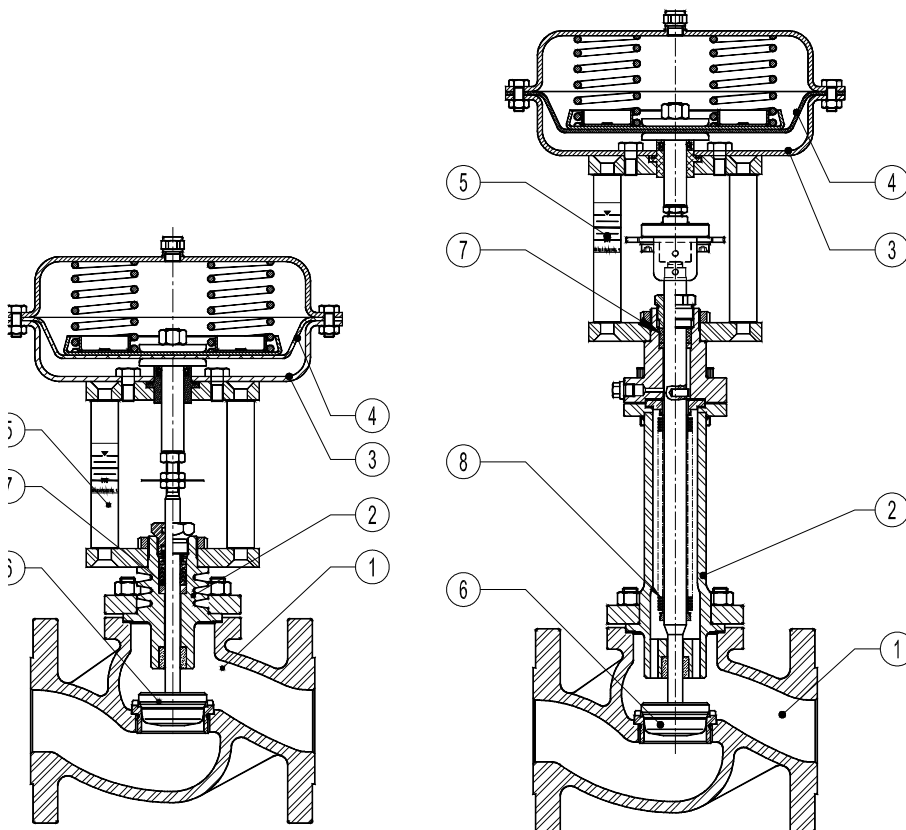
PNEUMATIC CONTROL VALVES - PV25 (ANSI)

V25S globe control valves with linear actuators PA series

VALVE BODY LIMITING CONDITIONS			
PV25S - ANSI 150		PV25S - ANSI 300	
ALLOWABLE PRESSURES	RELATED TEMP.	ALLOWABLE PRESSURES	RELATED TEMP.
19,3 bar	-10 /50° C	50 bar	-10 /50° C
15,8 bar	150 °C	43,9 bar	200 °C
12,1 bar	250 °C	36,9 bar	350 °C
8,4 bar	350 °C	34,6 bar	400 °C

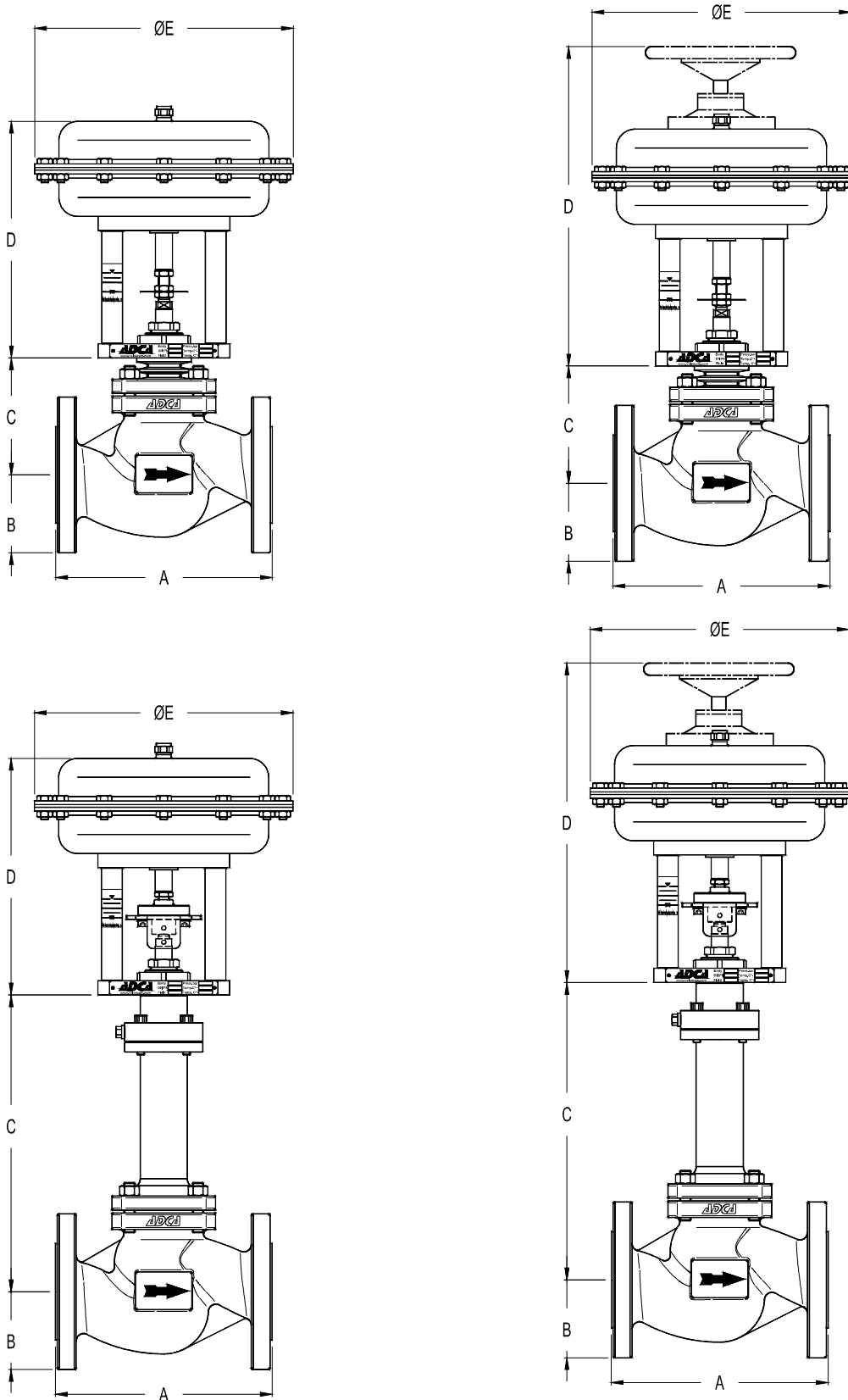
MATERIALS		
POS.	DESIGNATION	MATERIAL V25S
1	Valve Body	ASTM A216WCB / 1.0619 ; GP240GH / 1.0619
2	Bonnet	CF8 / 1.4308 **
3	Actuator (Steel)	S235JRG2 / 1.0038
	Actuator (Stainless steel)	AISI304 / 1.4301
4	*Diaphragm	NBR 70
5	Yoke (Steel)	C45E / 1.1191
	Yoke (Stainless steel)	AISI304 / 1.4301
6	*Valve plug	PTFE/GR ; St.Steel
7	*Standard packing	PTFE/GR
8	*Metal bellows	AISI316Ti / 1.4571

* Available spare parts **Except DN6", totally in cast steel.



PNEUMATIC CONTROL VALVES - PV25 (ANSI)

V25S globe control valves with linear actuators PA series



PNEUMATIC CONTROL VALVES - PV25 (ANSI)

V25S globe control valves with linear actuators PA series

DIMENSIONS (mm) - VALVE BODY							
SIZE	A * ANSI 300	B ANSI 150	B ANSI 300	C			
				BONNET			
				STANDARD	FINNED	EXTENDED	BELLOWS
1/2"	190	44,5	47,5	85	150	150	290
3/4"	194	49	58,5	85	150	150	290
1"	197	54	62	90	170	170	295
1 1/2"	235	63,5	78	115	195	195	285
2"	267	76	82,5	125	215	215	285
3"	317	95	105	175	275	275	392
4"	368	114,5	127	190	310	310	400
6"	470	140	159	210	390	390	480








* ANSI 150 is drilled with the same length

DIMENSIONS - ACTUATOR				
Type	ø E (mm)	D (mm)		WEIGHT Kgs
		DN1/2" - 4"	DA/RA	
PA-205	210	235		5,7
PA-280	275	240		8,8
PA-340	335	265		14,3
PA-435	430	295		24,5




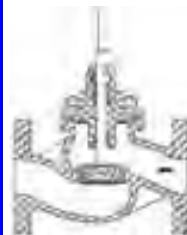
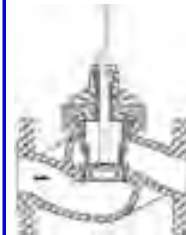
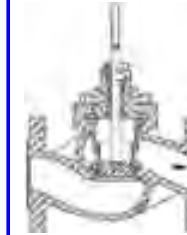
FLOW RATE COEFFICIENTS & VALVE STROKE										
	SIZES									
	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"
Kvs (m3/h)	3,8	5,1	9,4	-	22,2	40,1	-	89,7	136,7	316,1
Stroke (mm)	20	20	20	-	20	20	-	30	30	40

Kvs in m3/h , for conversion $Kvs = Cv(US) \times 0,855$

Perforated plugs has different flow rates, see data sheet IS PV10.00 E .

PLUG DESIGN						
Microflow Linear PL	Contoured Equal % or Linear EQP - PL	Equal EQP	V - Ported Equal percentage EQP	V - Ported Linear PL	Perforated Equal percentage EQP	Perforated Linear PL
						

V-Ported and perforated plugs are also available in balanced pressure version.

VALVE DESIGN - FLOW DIRECTION					
Microflow Linear PL	Contoured Equal % or Linear EQP - PL	V - Ported EQP - PL	V - Ported Perforated EQP - PL	V-Ported Balanced EQP - PL	Perforated Balanced EQP - PL
					

PNEUMATIC CONTROL VALVES - PV25 (ANSI)

V25S globe control valves with linear actuators PA series

MAX. PERM.PRESS.DROP IN bar - N.C.(fluid to open) -Reverse action actuator (air signal to open)								
ACTUATOR	CONTROL SIGNAL	SIZES						
		1/2"	3/4"	1"	1 1/2"	2"	3"	4"
PA-205	0,2 ÷ 1 bar	6	6	5	—	—	—	—
	0,4 ÷ 1,2 bar	10	10	7	—	—	—	—
	0,4 ÷ 2 bar	12	12	9	—	—	—	—
PA-280	0,2 ÷ 1 bar	28	26	16	6	3,5	—	—
	0,4 ÷ 1,2 bar	40	38	20	10	5	—	—
	0,4 ÷ 2 bar	50	45	25	12	6,5	—	—
PA-340A	0,2 ÷ 1 bar	60	60	50	12	10	—	—
	0,4 ÷ 1,2 bar	80	80	60	16	13	—	—
	0,4 ÷ 2 bar	100	100	80	20	18	—	—
PA-340B	0,2 ÷ 1 bar	—	—	—	—	—	2,5	1
	0,4 ÷ 1,2 bar	—	—	—	—	—	3,5	1,5
	0,4 ÷ 2 bar	—	—	—	—	—	4	2
PA435A	0,2 ÷ 1 bar	—	—	—	40	25	—	—
	0,4 ÷ 1,2 bar	—	—	—	48	30	—	—
	0,4 ÷ 2 bar	—	—	—	55	45	—	—
PA435B	0,2 ÷ 1 bar	—	—	—	—	—	5	3
	0,4 ÷ 1,2 bar	—	—	—	—	—	7	5
	0,4 ÷ 2 bar	—	—	—	—	—	8	6
	0,4 ÷ 2,5 bar	—	—	—	—	—	15	12

* For valve size DN 6" please consult .

The pressure drop values are referred to closed valves. They have been verified by a control signal coming from an electro-pneumatic converter with an enduring minimum signal of 0,2 bar.

The actuator press. drops given with closed valve for the actuator signal 0,4 - 2 bar are also valid for ON-OFF service with air supply at 2,5 bar. Special spring drops available on request.

The pressure drop values must be used within the body rating limits.

For electric actuator selection please consult catalogue IS EL.20.00 E or our technical department.

If higher differential pressures are required please consult PA45 pneumatic actuators catalogue.

MAX. PERM.PRESS.DROP IN bar - N.O.(fluid to open) -Direct action actuator (air signal to close)								
ACTUATOR	CONTROL SIGNAL	SIZES						
		1/2"	3/4"	1"	1 1/2"	2"	2"	4"
PA-205	0,2 ÷ 1 bar	16	16	12	—	—	—	—
	0,4 ÷ 2 bar	25	24	16	—	—	—	—
PA-280	0,2 ÷ 1 bar	—	—	19	8	4	—	—
	0,4 ÷ 2 bar	—	—	25	16	7	—	—
PA-340A	0,2 ÷ 1 bar	—	—	—	16	10	—	—
	0,4 ÷ 2 bar	—	—	—	26	25	—	—
PA-340B	0,2 ÷ 1 bar	—	—	—	—	—	3,5	1,5
	0,4 ÷ 2 bar	—	—	—	—	—	7	3
PA435B	0,2 ÷ 1 bar	—	—	—	—	—	5	3
	0,4 ÷ 2 bar	—	—	—	—	—	10	7,5

* For valve size DN 6" please consult.

The actuator pressure drops given with closed valve, are obtained with the following air pressures supply:

Actuator signal 0,2 to 1 bar :air supply 1,2 bar ; Actuator signal 0,4 to 2 bar : air supply 2,5 bar

The actuator press. drops given with closed valve for the actuator signal 0,4- 2 bar are also valid for ON-OFF service with air supply at 2,5 bar.

Special spring drops available on request.

The pressure drop values must be used within the body rating limits.

For electric actuator selection please consult catalogue IS EL.20.00 E or our technical department.

PNEUMATIC CONTROL VALVES - PV25 (ANSI)

V25S globe control valves with linear actuators PA series

ORDERING CODES V25									
VALVE CODES									
Actuator Type (1)		V	.25	S					.X.
Pneumatic Actuator		P							
Electric Actuator		E							
Group Designation									
Globe valve, two way, straight body		V							
Valve Model									
ASTM A216 WCB body, stainless steel trim			.25	S					
Stem Sealing									
PTFE/GR-V-Rings / Standard bonnet									1
Virgin PTFE V-Rings / Standard bonnet									2
Graphite / Standard bonnet									3
Graphite / Finned bonnet									4
Bellows									8
Valve Plug									
EQP (equal percentage) - Soft (PTFE-GR)									1
EQP (equal percentage) - Metal AISI316 / 1.4401									3
EQP (equal percentage) - Stellite									4
PL (linear) - Soft (PTFE/GR)									6
PL (linear) - Metal AISI316 / 1.4401									7
PT (on-off) - Soft (PTFE/GR)									9
PT (on-off) - Metal AISI316 / 1.4401									10
Pipe Connection									
Flanged ANSIB16.5 150#									U
Flanged ANSIB16.5 300#									V
Size									
1/2"									15
3/4"									20
...									
Actuator									(1)
Extras (3)									E
ACTUATOR CODES (pneumatic)									
Group Designation		P.							
Multi-spring , pneumatic linear actuator		P.							
Actuator Size									
205									1
280									3
340 A - From DN15 to DN50									5
340 B - From DN65 to DN100									6
435 A - From DN15 to DN50									7
435 B - From DN65 to DN100									8
Actuator									
Direct Action									D
Reverse Action									R
Actuator Construction									
Steel construction (painted) - standard									(2)
Stainless steel construction									I
Control Signal									
0,2 - 1 bar (3/15 psi)									15
0,4 - 1,2 bar (6/18 psi)									18
0,4 - 2 bar (6/30 psi)									30

To be introduced on ".X.", if supplied in combination with the valve.

Example:

V25G valve model EQP soft plug, PTFE/GR stem sealing DN 2" ANSI 150#complete with reverse action actuator signal 0,4-1,2bar, size340A steel.

Code: PV.25G.11U50.5R18

REMARKS:

- (1)- Indicate actuator type.
 - (2)- Omitted if the standard actuator is selected.
 - (3)- To be used only when a non-standard combination valve is supplied.
- ADCATROL control valves are identified by a serial number on a nameplate, located on the actuator yoke.
- Always order spares by using that serial number. If the valve has non-standard extras the serial number has also an E (extras).

PNEUMATIC CONTROL VALVES - PV40

(V40 globe valves series with linear actuators PA or EL series)

DESCRIPTION

The PV40 control valves are single seated, two-way body constructed with in-line straight connections. The PA pneumatic actuator is rubber diaphragm and multi-springs. Its action can be DA -direct action (air to close) or RA-reverse action (air to open). The PV40 valves have been designed to assure an accurate control in any process condition. Their wide application ranges allows the use of this valve with the most common process fluids such as water, superheated water, steam, air, gas and other non corrosive fluids.

MAIN FEATURES

Single seated, two way, direct or reverse action valve.
Valve top flange permanently attached to the body, removal is unnecessary for replacing the actuator.
Metal to metal sealing as standard.

OPTIONS:

Soft sealing
Position transmitter
Pneumatic pilot positioner
Air filter regulator
Top-work manual handwheel

USE:

Saturated and superheated steam
Hot and superheated water
Diathermic oil
Air, gases and other no corrosive fluids

AVAILABLE MODELS:

PV40S-EV40S – steel construction
PV40I-EV40I – stainless steel

VALVE SIZES:

DN15 to DN50

CONNECTION:

Flanged EN 1092-1 or ANSI
Threaded connections on request

PNEUMATIC ACTUATORS:

PA-205,PA-280,PA-340,PA-435

ACTUATOR CONN:

1/4" NPT-F

CONTROL SIGNAL:

0,2 – 1bar; 0,4 – 1,2 bar ; 0,4 – 2 bar

ELECTRIC ACT.:

Consult catalogue IS EL20.00 E

MAX.AIR SUPPLY:

3,5 bar

AMBIENT TEMPERATURE:

-20°C+70°C

STEM SEALING:

PTFE/GR V-Rings-220°C
(Standard bonnet)
Graphite – 300°C
(Extended bonnet)

PLUG CHARACTER.:

EQP – Equal percentage
PL – Linear
PT – On-off

PLUG DESIGN:

Contoured
Perforated
(Low noise, anti-cavitation)
Microflow

PORT:

Full or reduced on request



HOW TO SELECT: Never size the valve according to the pipe diameter in which it has to be fitted, but according to the required actual flow of steam or water. Refer to the valve calculation data sheet or consult the factory.

VALVE LIM. CONDITIONS V40S		VALVE LIM. CONDITIONS V40I	
PRESSURE/TEMPERATURE *		PRESSURE/TEMPERATURE *	
40 bar	-10/50°C	40 bar	-10/100°C
33,3 bar	200 °C	33,7 bar	200 °C
30,4 bar	250 °C	31,8 bar	250 °C
27,6 bar	300 °C	29,7 bar	300 °C

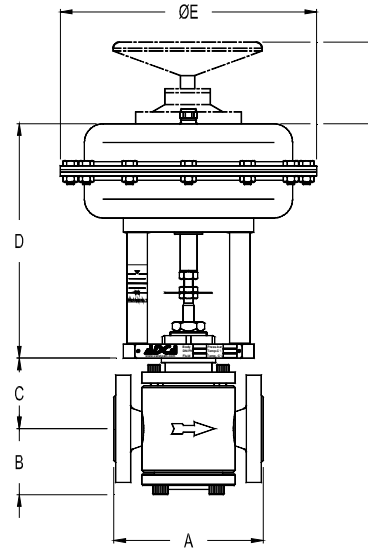
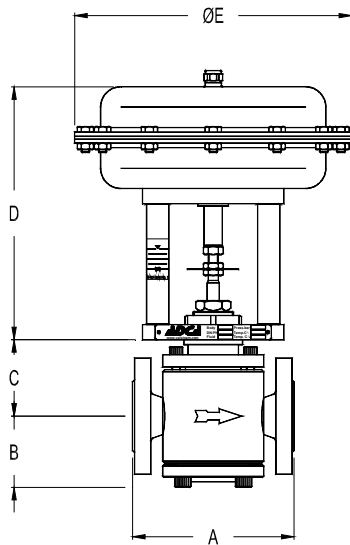
Maximum temperature limited to the valve packing selected
Valves with soft seat , maximum allowable temperature: 200°C

* **PN63 and PN100 design on request**

CE MARKING (PED - European Directive 97/23/EC)	
PN 40	Category
DN15 to DN32	SEP - art. 3, paragraph3
DN40 to DN50	1 (CE Marked)

PNEUMATIC CONTROL VALVES - PV40

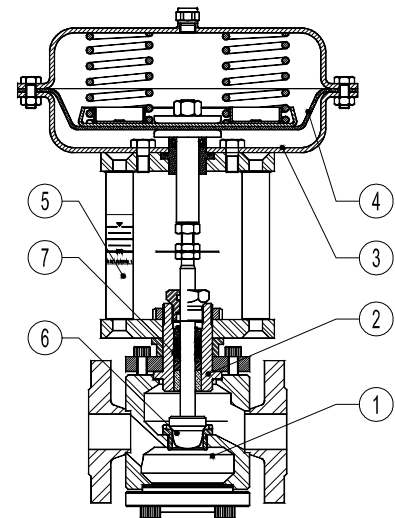
(V40 globe valves series with linear actuators PA or EL series)



DIMENSIONS - VALVE BODY

DN	EN FLANGES A (mm)	ANSI 150 FLANGES A (mm)	ANSI 300 FLANGES A (mm)	B (mm)	C (mm) BONNET		
					STAND.	FINNED	EXTEND.
15 - 1/2"	150	184	190	71	75	140	140
20 - 3/4"	150	184	194	71	75	140	140
25 - 1"	160	184	197	71	75	140	140
32	180	-	-	75	83	163	163
40 - 1 1/2"	200	222	235	82	96	163	163
50 - 2"	230	254	267	97	100	182	182

Note: welded-on flanges EN 1092-1 PN40 or ANSI B16.5 Cl.150 and 300 lbs. RF



DIMENSIONS - ACTUATOR

Type	ø E (mm)	D (mm)	WEIGHT Kgs
		DN15-50 DA/RA	
PA-205	210	235	5,7
PA-280	275	240	8,8
PA-340	335	265	14,3
PA-435	430	295	24,5

MATERIALS

POS.	DESIGNATION	PV40S - EV40S	PV40I - EV40I
1	Valve Body	S355 J2 G3 / 1.0570	AISI 316 / 1.4401
2	Bonnet	CF8 / 1.4308	CF8 / 1.4308
3	* Actuator (Steel)	S235JRG2 / 1.0038	S235JRG2 / 1.0038
	* Actuator (St. steel)	AISI304 / 1.4301	AISI304 / 1.4301
4	Diaphragm	NBR70	NBR70
5	Yoke (steel)	C45E / 1.1191	C45E / 1.1191
	Yoke (st. steel)	AISI304 / 1.4301	AISI304 / 1.4301
6	Valve plug	St.Steel - PTFE/GR	St.Steel - PTFE/GR
7	Standard packing	PTFE/GR	PTFE/GR

* Electric actuator : see IS EL20.00 E

PNEUMATIC CONTROL VALVES - PV40

(V40 globe valves series with linear actuators PA or EL series)

FLOW RATE COEFFICIENTS						
	SIZES					
	DN15	DN20	DN25	DN32	DN40	DN50
Kvs	3,8	5,1	9,4	15,4	22,2	40,1

Kvs in m³/h , see data sheet IS PV10.00 E ;
For conversion Kvs = Cv(US) x 0,855

ACTUATOR STROKE IN mm						
	SIZES					
	DN15	DN20	DN25	DN32	DN40	DN50
Stroke	20	20	20	20	20	20

MAX. PERM.PRESS.DROP IN bar - N.C.(fluid to open) -Reverse action actuator (air signal to open)										
ACTUATOR	CONTROL SIGNAL	SIZES								
		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100
PA-205	0,2 ÷ 1 bar	6	6	5	—	—	—	—	—	—
	0,4 ÷ 1,2 bar	10	10	7	—	—	—	—	—	—
	0,4 ÷ 2 bar	12	12	9	—	—	—	—	—	—
PA-280	0,2 ÷ 1 bar	28	26	16	8	6	3,5	—	—	—
	0,4 ÷ 1,2 bar	40	38	20	12	10	5	—	—	—
	0,4 ÷ 2 bar	50	45	25	16	12	6,5	—	—	—
PA-340A	0,2 ÷ 1 bar	60	60	50	20	12	10	—	—	—
	0,4 ÷ 1,2 bar	80	80	60	30	16	13	—	—	—
	0,4 ÷ 2 bar	100	100	80	40	20	18	—	—	—
PA435A	0,2 ÷ 1 bar	—	—	—	—	40	25	—	—	—
	0,4 ÷ 1,2 bar	—	—	—	—	48	30	—	—	—
	0,4 ÷ 2 bar	—	—	—	—	55	45	—	—	—

The pressure drop values are referred to closed valves. They have been verified by a control signal coming from an electro-pneumatic converter with an enduring minimum signal of 0,2 bar.

The actuator press. drops given with closed valve for the actuator signal 0,4 - 2 bar are also valid for ON-OFF service with air supply at 2,5 bar.

Special spring drops available on request.

The pressure drop values must be used within the body rating limits.

For electric actuator selection please consult catalogue IS EL.20.00 E or our technical department.

MAX. PERM.PRESS.DROP IN bar - N.O.(fluid to open) -Direct action actuator (air signal to close)										
ACTUATOR	CONTROL SIGNAL	SIZES								
		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100
PA-205	0,2 ÷ 1 bar	16	16	12	5	—	—	—	—	—
	0,4 ÷ 2 bar	25	24	16	7,5	—	—	—	—	—
PA-280	0,2 ÷ 1 bar	—	—	19	10	8	4	—	—	—
	0,4 ÷ 2 bar	—	—	25	20	16	7	—	—	—
PA-340A	0,2 ÷ 1 bar	—	—	—	17	16	10	—	—	—
	0,4 ÷ 2 bar	—	—	—	28	26	25	—	—	—

The actuator pressure drops given with closed valve, are obtained with the following air pressures supply:

Actuator signal 0,2 to 1 bar : air supply 1,2 bar

Actuator signal 0,4 to 2 bar : air supply 2,5 bar

The actuator press. drops given with closed valve for the actuator signal 0,4- 2 bar are also valid for ON-OFF service with air supply at 2,5 bar.

Special spring drops available on request.

The pressure drop values must be used within the body rating limits.

For electric actuator selection please consult catalogue IS EL.20.00 E or our technical department.

PNEUMATIC CONTROL VALVES - PV40

(V40 globe valves series with linear actuators PA or EL series)

ORDERING CODES V40										
VALVE CODES										
Actuator Type (1)										
Pneumatic Actuator	P									
Electric Actuator	E									
Group Designation										
Globe valve, two way, straight body	V									
Valve Model										
PN40 steel body		.40	S							
PN40 stainlesssteel body		.40	I							
Stem Sealing										
PTFE/GR-V-Rings / Standard bonnet										1
Virgin PTFE V-Rings / Standard bonnet										2
Graphite / Standard bonnet										3
Graphite / Finned bonnet										4
Valve Plug										
EQP (equal percentage) - Soft (PTFE-GR)										1
EQP (equal percentage) - Metal AISI316 / 1.4401										3
EQP (equal percentage) - Stellite										4
PL (linear) - Soft (PTFE/GR)										6
PL (linear) - Metal AISI316 / 1.4401										7
PT (on-off) - Soft (PTFE/GR)										9
PT (on-off) - Metal AISI316 / 1.4401										10
Pipe Connection										
Threaded BSP ISO 7/1 Rp										A
Flanged EN1092-1 PN40										N
Flanged ANSI B16.5 300#										V
Size										
DN15										15
DN20										20
...										
Actuator										
Extras (3)										
ACTUATOR CODES (pneumatic)										
Group Designation										
Multi-spring , pneumatic linear actuator	P.									
Actuator Size										
205										1
280										3
340 A - From DN15 to DN50										5
435 A - From DN15 to DN50										7
Actuator										
Direct Action										D
Reverse Action										R
Actuator Construction										
Steel construction (painted) - standard										(2)
Stainless steel construction										I
Control Signal										
0,2 - 1 bar (3/15 psi)										15
0,4 - 1,2 bar (6/18 psi)										18
0,4 - 2 bar (6/30 psi)										30

To be introduced on ".X.", if supplied in combination with the valve.

Example:

V40S valve model EQP soft plug, PTFE/GR stem sealing DN50 complete with reverse action actuator signal 0,4-1,2bar, size340A steel.

Code: PV.40S.11N50.5R18

REMARKS:

- (1)- Indicate actuator type.
 - (2)- Omitted if the standard actuator is selected.
 - (3)- To be used only when a non-standard combination valve is supplied.
- ADCATROL control valves are identified by a serial number on a nameplate, located on the actuator yoke.
- Always order spares by using that serial number. If the valve has non-standard extras the serial number has also an E (extras).

LINEAR PNEUMATIC ACTUATORS

PA205 – PA435

DESCRIPTION

Pneumatic multi-spring linear actuators PA series for modulating and open-close duty of a control and process technology to operate control valves.

MAIN FEATURES

Direct and reverse action actuators for maximum 45mm valve stroke.
Operation with compressed air, nitrogen or clean water.

OPTIONS: Limit switches
 Manual operating device
 Different kind of positioners
 Stainless steel construction

USE: Actuating of V series Adcatrol control valves or others on request.

AIR SUPPLY: Max. 3,5 bar

CONNECTION: DN 1/4"

AVAILABLE MODELS: PA205, PA280, PA340, PA435

MAX.AMBIENT TEMPERATURE: -20 °C to 80 °C

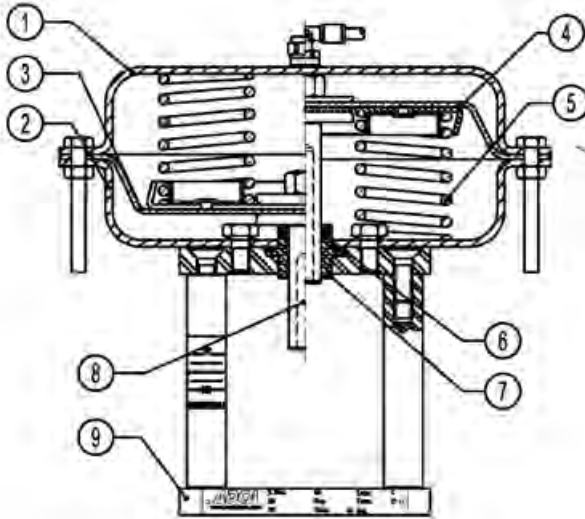


LINEAR PNEUMATIC ACTUATORS

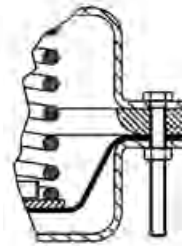
PA205 – PA435

PA205 – PA435

RA- Reverse action DA – Direct action

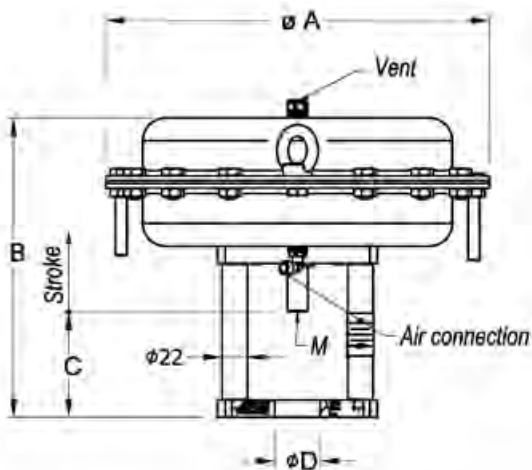
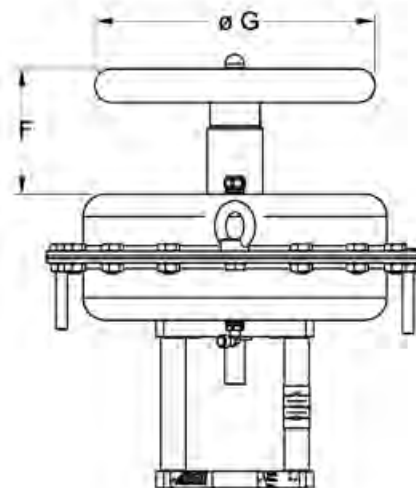


PA 435B



MATERIALS		
POS.	DESIGNATION	MATERIAL
1	Body (Steel)	S235JRG2 / 1.0038
	Body (Stainless steel)	AISI 304 / 1.4301
2	Body (Steel)	S235JRG2 / 1.0038
	Body (Stainless steel)	AISI 304 / 1.4301
3	*Diaphragm	NBR 70
4	Diaphragm plate	S235JRG2 / 1.0038
5	Spring	Spring steel
6	*Seal ring	NBR
7	Guide	Nylon
8	Rod	AISI316 / 1.4401
9	Yoke (Steel)	C45E / 1.1191
	Yoke (Stainless steel)	AISI 304 / 1.4301

* Available spare parts



DIMENSIONS	DIMENSIONS (mm)					
	ACTUATOR MODEL					
	PA205	PA280	PA340A	PA340B	PA435A	PA435B
Ø A	210	275	335	335	430	430
B	235	245	265	265	295	315
C	92	92	82	92	72	82
Ø D	40	40	40	45	40	45
M	M10	M10	M10	M10	M10	M10
Ø G	250	250	350	350	350	350
F	100	100	110	110	120	140
STROKE (mm)	20	20	20	30	40	45
WEIGHT (Kgs)	6	10	15	15	25	27

LINEAR ELECTRIC ACTUATORS - Type EL

EL12, EL20, EL45, EL80, EL120, EL250

DESCRIPTION

Electric linear actuators EL series for modulating and open-close duty of control and process technology to operate control valves.

The self-locking stem/stem nut is driven by an electric motor via a gearing. Load and limit switches define the stops for the end positions.

MAIN FEATURES

- Valve protection against excessive force due to load-dependent seating.
- Comfortable manual operation when disengaging the actuator motor.
- Mounting to valve made via yoke or mounting flange DIN 3358. The design enables easy connection to all types of valves. Standard version is suitable for Adcatrol valves.
- Generating a defined closing force in the end position leads to constantly tight shut-off of the valve.
- A robust metal cover protects efficiently against external contamination and manipulation.
- The actuators are in enclosure protection IP 65 (EL12 IP43) and are designed for rugged industrial use.
- Stall proof synchronous motors (or brake motors for higher positioning forces) ensure highest positioning accuracy.
- Mechanical stroke indication via anti-rotation bar.
- Exact, backlash-free measurement of actual valve stroke by direct coupling to the valve stem.
- Universally usable actuators due to control via 3-point-step controllers, analogue input signals (0...10 V, 0 (4)...20 mA), or fieldbus systems.
- Easy supplement to actuator with optional devices due to modular design.
- Limit switches, easily adjustable, for stroke limitation (not necessary for Adcatrol valves) or as signal for intermediate positions.
- Integrated, adjustable stroke setting to nominal stroke over the complete stroke range (without exchanging pinions, ...).



LINEAR ELECTRIC ACTUATORS - Type EL

EL12, EL20, EL45, EL80, EL120, EL250

TECHNICAL DATA						
Type	EL12	EL20	EL45	EL45.1	EL45.2	
Positioning force kN	1,2	2,0	4,5			
Positioning speed ¹⁾ mm/min (mm/s)	8 (0,14)	15 (0,25)	17 (0,28)	25 (0,4)	50 (0,8)	
Power consumption (230 V) A	4	6,6	28	28	32	
Nominal current (230 V) A	0,017	0,029	0,135	0,135	0,160	
Type of motor ³⁾	syn	syn	syn	syn	syn	
Motor protection ⁴⁾	B	B	B	B	B	
Max. stroke mm	35 mm	75 (standard 55mm)				
Supply voltages ²⁾	24 V / 115 V / 230 V / 400 V 50/60 Hz, 24 V DC					
Type of duty acc. to IEC 34-1	S1 – 100%			S4 – 30% c.d.f. 600 c/h		
Cable entry	3 x M16 x 1,5		2 x M16x1.5 and 1 dummy plug M16x1.5			
Electrical connection	Inside terminal board, terminal configuration according to electrical connection wiring diagram					
Switch off in end position	2 load-dependent switches, max. 250 V AC, rating for resistive load, max. 5 A, for inductive load, max. 3 A					
Mounting position	as desired, however downward position not possible					
Ambient temperature	–20 °C to +60 °C					
Lubricant for gearing	Klüber Mickrolube GL 261 grease					
Position indicator	by anti-rotation bar					
Manual adjustment	crank handle	by means of lateral hand wheel				
Enclosure protection acc. to EN 60529	IP 43			IP 65		
Trapezoidal thread	Tr 8 x 1,5		Tr 14 x 3			
Connection type	EN ISO 5210 F05 (also refer to options)					
Weight kg	2,1		8,0			

TECHNICAL DATA						
Type	EL80	EL80.1	EL80.2	EL120	EL120.1	EL120.2
Positioning force kN	8,0					
Positioning speed ¹⁾ mm/min (mm/s)	13,5 (0,2)	25 (0,4)	50 (0,8)	13,5 (0,2)	25 (0,4)	50 (0,8)
Power consumption (230 V) A	25	34	152	25	34	152
Nominal current (230 V) A	0,11	0,15	0,78	0,11	0,15	0,78
Type of motor ³⁾	syn	syn	asyn	syn	syn	asyn
Motor protection ⁴⁾	B	B	T	B	B	T
Max. stroke mm	80					
Supply voltages ²⁾	24 V / 115 V / 230 V / 400 V 50/60 Hz, 24 V DC					
Type of duty acc. to IEC 34-1	S4 – 30% c.d.f. 600 c/h					
Cable entry	2 x M16x1.5 and 1 dummy plug M16x1.5					
Electrical connection	Inside terminal board, terminal configuration according to electrical connection wiring diagram					
Switch off in end position	2 load-dependent switches, max. 250 V AC, rating for resistive load, max. 5 A, for inductive load, max. 3 A					
Mounting position	as desired, however downward position not possible					
Ambient temperature	–20 °C to +60 °C					
Lubricant for gearing	Klüber Microlube GL 261 grease					
Position indicator	by anti-rotation bar					
Manual adjustment	by means of lateral hand wheel					
Enclosure protection according to EN 60529	IP 65					
Trapezoidal thread	Tr 20 x 4					
Connection type	DIN 3210 G0 (also refer to options)					
Weight kg	13,0					

LINEAR ELECTRIC ACTUATORS - Type EL

EL12, EL20, EL45, EL80, EL120, EL250

TECHNICAL DATA						
Type	-	-	-	-	EL250.1	EL250.2
Positioning force	kN	-			25	
Positioning speed ¹⁾	mm/min (mm/s)	-	-	-	25 (0,4)	50 (0,8)
Power consumption (230 V)	A	-	-	-	157	218
Nominal current (230 V)	A	-	-	-	0.73	1.0
Type of motor ³⁾		-	-	-	asyn	asyn
Motor protection ⁴⁾		-	-	-	T	T
Max. stroke mm		100				
Supply voltages ²⁾		115 V / 230 V 50/60 Hz, 24 V DC				
Type of duty acc. to IEC 34-1		S4 – 30% c.d.f. 600 c/h				
Cable entry		2 x M20x1.5 and 1 dummy plug M20x1.5				
Electrical connection		Inside terminal board, terminal configuration according to electrical connection wiring diagram				
Switch off in end position		2 load-dependent switches, max. 250 V AC, rating for resistive load, max. 5 A, for inductive load, max. 3 A				
Mounting position		as desired, however downward position not possible				
Ambient temperature		–20 °C to +60 °C				
Lubricant for gearing		Klüber Microlube GL 261 grease				
Position indicator		by anti-rotation bar				
Manual adjustment		by means of lateral hand wheel				
60529		IP 65				
Trapezoidal thread		Tr 26 x 5				
Connection type		DIN 3210 G0 (also refer to options)				
Weight	kg	19,0				

1) at 60 Hz, the positioning speeds and input power increase by 20%

2) other supply voltages on request

3) syn synchronous motor
asyn asynchronous motor

4) B stallproof motor
T thermoswitch for temperature monitoring

ACCESSORIES AND OPTIONS

Accessories for actuators		
	Yoke for adaptation to valves refer to dimension sheet.	STALA/ FLA
	Mounting flange with central attachment Mxx refer to dimension sheet (thrust rod must be secured against revolving).	ZFLA
	Compact plug 10/24 poles with additional housing at actuator Voltages ≤ 500 V.	KS
	Special finish coating for use in the tropics "tropics coating".	LA-TR
	Version with bellows at thrust rod (for EL20, EL45, EL80, EL120).	A-FAB

Options for actuators		
	Additional limit switches for signalling end positions or intermediate positions, freely adjustable, max. 250 V AC, rating for resistive load max. 5 A, for inductive load max. 3 A, max. 2 switches for EL20 and EL45, max. 4 switches for EL80 and EL120.	WE
	Additional limit switches for signalling end positions or intermediate positions, freely adjustable, with gold-plated contacts for low voltage, max. 30 V AC, rating for resistive load max. 0.1 A, max. 2 switches for EL20 and EL45, max. 4 switches for EL80 and EL120.	WE-G
	Potentiometer 100/130/200/500/1000/5000 Ohms or 10 kOhms Linearity error ≤ 0.5 %, max. 1.5 W, contact current 30 mA max. 2 pieces	POT
	Electronic position feedback 2-/3-/4-wire system Inductive travel measuring, output 0 (4)...20 mA Connection 24 V DC	ESR
	Positioning electronics for actuator control Input 0...10 V, 0 (4)...20 mA, output 0...10 V, 0 (4)...20 mA Supply voltage 24, 115, 230 V 50/60 Hz	PEL
	Heating resistor with thermoswitch against moisture with automatic temperature regulation, max. 15 Watts Supply voltage 24, 115, 230 V 50/60 Hz	HZ/WP

LINEAR ELECTRIC ACTUATORS - Type EL
EL12, EL20, EL45, EL80, EL120, EL250

ELECTRICAL CONNECTION

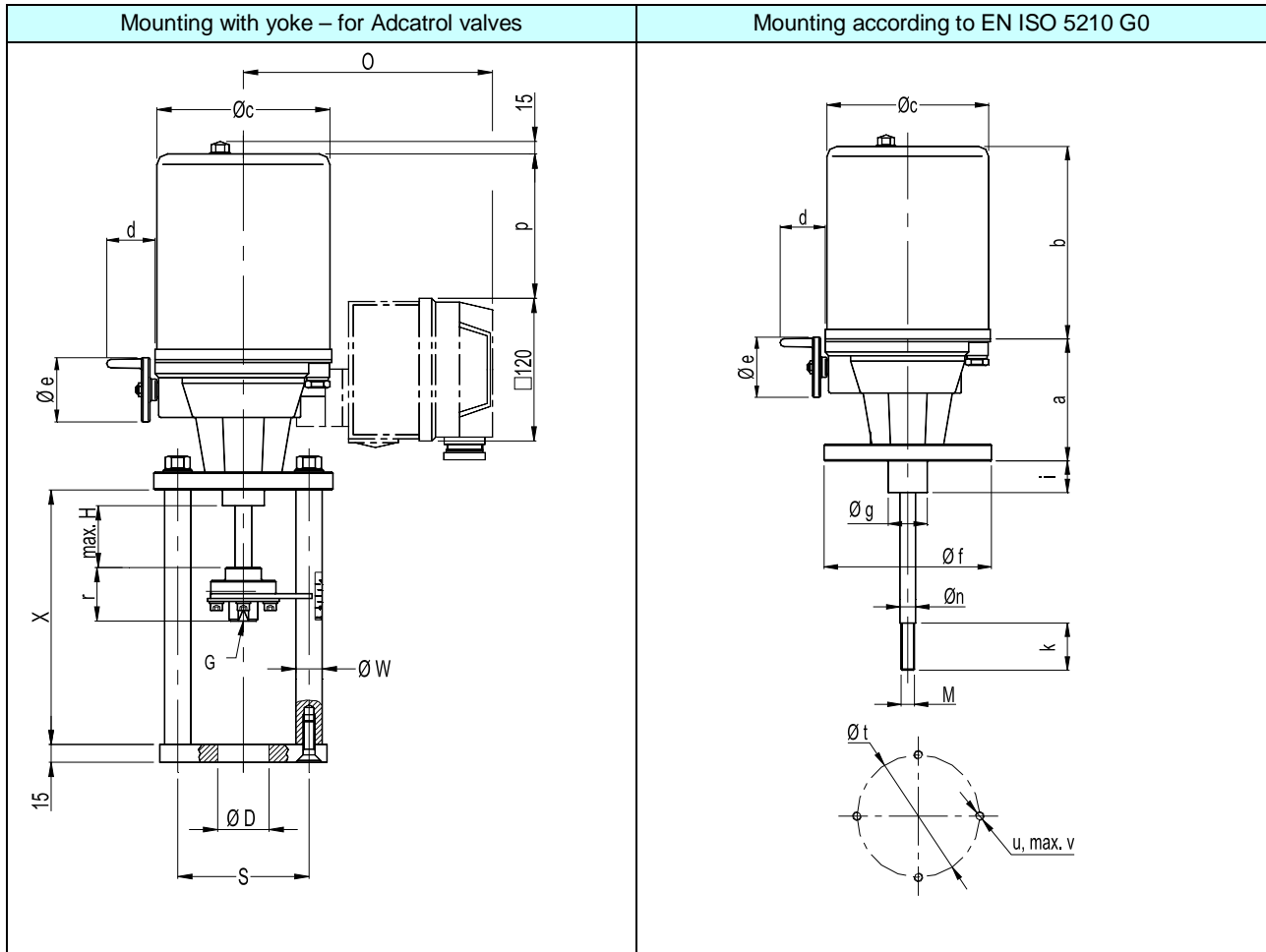
3 ~ asynchronous motor with brake and thermoswitch	1 ~ asynchronous motor with brake and thermoswitch	Synchronous motor with thermoswitch	synchronous motor	Basic wiring diagram including options
				<p>Switch off in end position via two load-dependant switches to control e.g. three-way mixing valves.</p>
				<p>Switch off in end position via a load-dependent switch and a limit switch to control e.g. full-way valves without upper stop. Monitoring blocking in OPEN direction.</p>
				<p>Control of three-phase actuators with thermoswitch. Switch off in end position via two load-dependant switches to control e.g. three-way mixing valves. For motors without thermoswitch, the wiring to terminal 4 and 5 is not applicable.</p>
				<p>Control of three-phase actuators with thermoswitch. Switch off in end position via a load-dependent switch and a limit switch to control e.g. full-way valves without upper stop. Monitoring blocking in OPEN direction. For motors without thermoswitch, the wiring to terminal 4 and 5 is not applicable.</p>

- WE Limit switch
- HZ Heater with thermoswitch
- POT Potentiometer
- ESR Electronic position feedback
- PEL Positioning electronics
- WSE External reversing contactor unit
- REG Process controller

LINEAR ELECTRIC ACTUATORS - Type EL EL12, EL20, EL45, EL80, EL120, EL250

DIMENSIONS

EL20 - EL45- EL80 – EL120

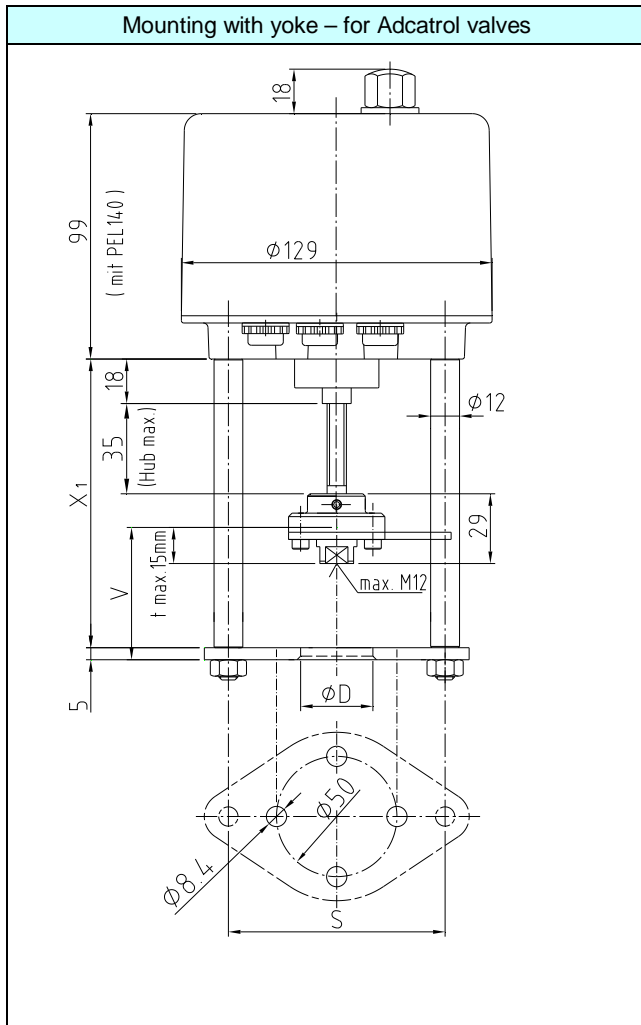


DIMENSIONS							
Type	EL20- EL45	EL80 - EL120	EL250	Type	EL20 - EL45	EL80 - EL120	EL250
a	94.5	130	190	o	210	220	240
b	173	197	226	p	115	179	164
Ø c	145	188	216	r	45	45	51
d	42	69	70	Ø w	22	22	22
Ø e	54	100	100	M		M16x1,5	M20x1,5
Ø f	74	130	130	max. G	M20	M20	M20
Ø g	35 f8	60	60	Ø D	Ø 40, Ø 45	Ø 40, Ø 45	Ø 45, 65
i	3	26	3	G	M10	M10	M16
k		16	22	S	110 (100)	110 (100)	125
n	14	20	26	X	190 - 228		235
Ø t	50	102	102				
u	M6	M10	M10				
v							
H	Stroke actuators (see technical data)						

LINEAR ELECTRIC ACTUATORS - Type EL
EL12, EL20, EL45, EL80, EL120, EL250

DIMENSIONS

EL12



Type	EL 12
ϕD	40
S	100
X1	160
X2	55

LINEAR ELECTRIC ACTUATORS - Type EL

EL12, EL20, EL45, EL80, EL120, EL250

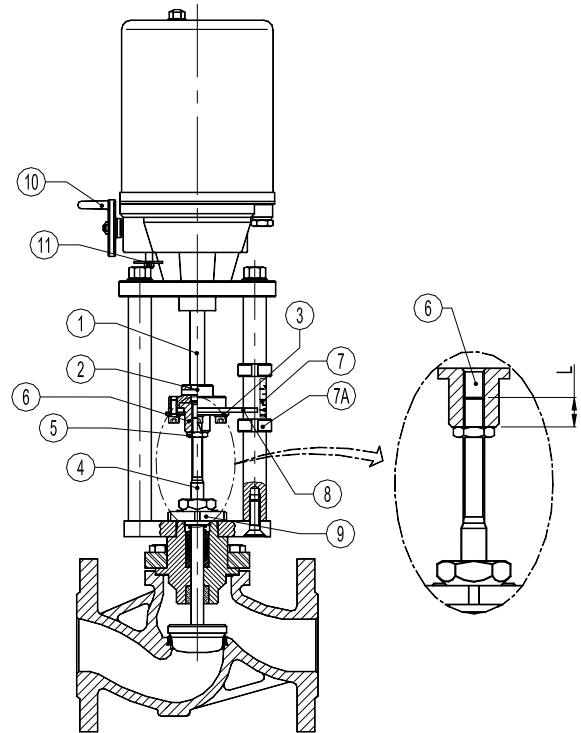
COMBINATION WITH A CONTROL VALVE (short instruction)

On delivery the driving rod (1) is driven out to the bottom end limit (anti-rotation flange at bottom mark).

Further procedure:

- Insert valve stem (4) into the valve all the way to limit stop -
- Move the driving rod (1) up by rotating the hand wheel anti-clockwise by about 20 mm (see manual operation).
- Lift the actuator and yoke over the valve stem, place onto the top of the valve and secure using the mounting nut (9) -
- Unscrew the locking plate (3) and the anti-rotation flange (8) in succession from the coupling flange (2) and allow it to fall over the stem.
- Remove the threaded socket (6) from the coupling flange and screw it onto the stem according to dimension L from table 1.
- Drive out the rod by rotating the hand wheel clockwise until the threaded socket (6) stops in the coupling flange (2).
- Screw the anti-rotation flange (8) and the locking plate (3) onto the coupling flange
- Tighten the stem with the nut (5) against the threaded socket.
- When mounting pay attention that the valve plug is not pressed onto the seat and is not turned.

For electrical connections please report to IMI EL20.00



MANUAL OPERATION

The manual adjustment must not be disengaged or engaged while the motors is running.

Execute the manual adjustment only with motor being at standstill, hereto:

- With the left hand press the disengaging rod (11) with plate in direction of the outgoing driving rod toward the bottom
- Simultaneously turn the handwheel (10) with the right hand until the coupling-in has sensible been executed
- To actuate the linear actuator now turn the handwheel, hold the disengaging rod with the plate in engaged position

Turning crank handle to the right (clockwise), the driving rod moves out of the actuator

Turning crank handle to the left (anti-clockwise), the driving rod moves into the actuator

(The linear actuator is automatically switched back to motoric operation, as soon as the disengaging rod will be released).

(L) Dimensions in mm

Valve Type	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
EV16G	18	18	18	13	12	14	25	25	19	-	-	-
EV40S	18	18	18	13	12	14	25	25	19	-	-	-

Table1

Actuator selection for two way valves type EV16G, EV25G and EV40S

Actuator Type	Differential pressure (bar)											
	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
EL12	38	20	12	6,5	3,5	1,8	-	-	-	-	-	-
EL20	40	40	28	16	9,9	5,8	3	1,7	0,6	-	-	-
EL45	40	40	40	40	29,8	18,5	10,5	6,6	3,8	-	-	-
EL80	40	40	40	40	40	36,4	21	13,6	8,2	-	-	-
EL120	-	-	-	-	40	40	33,1	21,6	13,3	8,3	5,6	3
EL250	-	-	-	-	-	-	40	40	30,2	19,1	12,1	5,5

Remarks: V-rings stem packing.

Actuator selection for three way valves type EV253G and EV403S

Actuator Type	Differential pressure (bar)											
	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
EL12	25	22	13,2	7,1	3,8	1,9	-	-	-	-	-	-
EL20	25	25	25	17,3	10,8	6,6	3,4	2	1,1	-	-	-
EL45	-	-	-	25	25	19,8	11,6	7,3	3,8	2,4	1,5	-
EL80	-	-	-	-	25	25	23,1	14,8	8,9	5,5	3,6	-
EL120	-	-	-	-	25	25	25	23,1	14,5	9,1	6,1	-
EL250	-	-	-	-	-	-	-	-	-	-	-	-

PI991 Intelligent Positioner with HART, PROFIBUS PA, FOUNDATION Fieldbus H1 or FoxCom for EEx ia Intrinsically Safe Applications

DESCRIPTION

The microprocessor controlled positioner PI991 is designed to control pneumatic valve actuators and can be operated locally or by means of control systems. The advanced diagnostic can be partially shown on the local LCD of the positioner or fully on a PC or a DCS workstation with a DTM based software (VALcare or Valve Monitor). The positioner is available with different communication protocols. This includes versions with analog setpoint (4 to 20 mA) and superimposed HART- or FoxCom signal; digital with FoxCom protocol, or fieldbus communication according to PROFIBUS-PA and FOUNDATION fieldbus H1 according to IEC 1158-2 based on FISCO. The PI991 also has the capability to control a Partial Stroke Test (PST) that offers operators a tool to identify the trouble-proof function of ESD (Emergency Shut Down) valves.



Version “Intelligent”

- Autostart with self calibration
- Self diagnostic, status and diagnostic messages

Version “Intelligent with Communication”

- Communication HART, FOUNDATION Fieldbus H1, PROFIBUS-PA or FoxCom
- Configuration by means of local keys, Hand Held Terminal, PC or I/A Series system or with an infrared interface by means of IRCOM

Version “Intelligent without Communication”

- Input signal 4-20 mA

For all Versions

- Stroke range 8 to 260 mm (0.3 to 10.2 in)
- Angle range up to 95°
- Supply air pressure up to 6 bar (90 psig), with “Spool Valve” up to 7 bar (105 psig)
- Single or double acting
- Mounting on linear actuators according to NAMUR:
 - IEC 534 Part 6
 - VDI/VDE 3847
- Direct mounting on actuators FlowPak and FlowTop
- Mounting on rotary actuators acc. to VDI/VDE 3845
- Protection class IP 65, NEMA 4X
- Explosion protection:
 - II 2 G EEx i / II 2 G EEx n (intrinsic safety) according to ATEX
 - Intrinsic safety according to FM and CSA
- Ambient temperature -40 to 80°C (-40 to 176°F)
- Display and Local User Interface:
 - Multilingual Full-Text Graphic LCD or LEDs
 - Status- and Diagnostic-Messages displayed on LCD
 - Easy configuration by means of 3 pushbuttons

PI991 Intelligent Positioner with HART, PROFIBUS PA, FOUNDATION Fieldbus H1 or FoxCom for EEx ia Intrinsically Safe Applications

- Mechanical travel indicator
- Suitable for safety applications up to SIL 3
- Partial Stroke Test (PST) for Emergency Shut Down applications
- Infrared Interface for wireless communication
- Stainless Steel housing for Offshore or Food and Beverage applications
- Additional Inputs/outputs (optional):
 - 2 binary outputs (limits)
 - Position feedback 4 to 20 mA, 1 Alarm output
 - 2 binary inputs
 - Built-in independent inductive limit switches (2- 3-wire) or micro switches
 - Sensors for supply air pressure and output pressure
 - Binary Inputs/Outputs dedicated to SIS logic solvers
- Accessories
 - Booster relay to minimize stroke time
 - Gauge Manifold

Input

All “intelligent” versions are with micro controller

With HART communication

Two-wire system

Reverse polarity protection . . . built-in standard feature

Signal range 4 to 20 mA

Operating range 3.6 to 21 mA

Voltage DC 12 to 36 V (unloaded circuit)

Max. load. 420 Ohms (8.4 V at 20 mA)

Communication signal HART, 1200 Baud, FSK modulated on 4 to 20 mA

With Fieldbus communication (acc. to FISCO)

Input signal digital fieldbus

Supply voltage DC 9 to 32 V

Operating current 10.5 mA \pm 0.5 mA (base current)

Current amplitude. \pm 8 mA

Fault current base current +0 mA

(+4 mA by means of independent FDE-safety circuit)

PROFIBUS-PA

Data transfer acc. to PROFIBUS- PA

profileclass B based on EN

50170 and DIN 19245 part 4

FOUNDATION Fieldbus H1

Data transfer FF Specification Rev. 1.4, Link-Master (LAS)

Function blocks AO, PID, Transducer, Resource, 2xDI, DO

With FoxCom communication

Operating mode digital

Input signal digital

Supply voltage DC 13 to 36 V

Supply current \sim 9 mA at 24 V

Communication signal FoxCom digital, 4800 Baud, FSK modulated on supply Voltage

PI991 Intelligent Positioner with HART, PROFIBUS PA, FOUNDATION Fieldbus H1 or FoxCom for EEx ia Intrinsically Safe Applications

Without communication 4 to 20 mA

Two-wire system
 Reverse polarity protection . . . built-in standard feature
 Signal range 4 to 20 mA
 Operating range 3.8 to 21.5 mA
 Voltage DC 8 to 36 V (unloaded circuit)
 Max. load 300 Ohms (6 V at 20 mA)

Common data for all versions

Supply

Supply air pressure 1.4 to 6 bar (29 to 90 psig)
 with spool valve 1.4 to 7 bar (20 to 105 psig)
 Supply air quality according to ISO 8573-1
 Max. particle size and density . . . Class 2
 Max. oil contents. Class 3

Response characteristics

Min. Sensitivity. <0.1% of travel span
 Non-linearity
 terminal based adjustment. <0.4% of travel span
 Hysteresis <0.3% of travel span
 Supply air dependence. <0.1%/1 bar (15 psi)
 Temperature effect <0.3%/10 K
 Mechanical effect
 10 to 60 Hz up to 0.14 mm,
 60 to 500 Hz up to 2 g . . . <0.25 of travel span

Pneumatic connection

NAMUR mounting 3x female threads 1/4-18 NPT or G1/4 for pipe diameter 6 to 12 mm (0.24 to 0.47 in)
 Direct mounting Instead of output y1 an air connection on the backside with O-ring is used (closed at NAMUR mounting).

Electrical connection

Line entry 1 or 2 cable glands M20 x1.5
 or 1/2-14 NPT (with Adapter) (for additional Adapter see AD-...)
 Cable diameter 6 to 12 mm (0.24 to 0.47 in)
 Screw terminals 2 terminals for input,
 4 terminals for additional inputs/outputs
 Wire cross section 0.3 to 2.5 mm² (AWG 22-14)
 Test Sockets for connection of communicator

Technical Data for Stainless Steel Housing

Material Stainless Steel 1.4404/316, 1.25 mm
 Protection Class IP 66 acc. to EN 60529
 Impact Resistance 7 Joule acc. to EN 50014
 Seals. VMQ (Silicone)
 Weight (Complete Positioner) 3.5 kg
 Pneumatic Connection 1/4–18 NPT on manifold, prepared for gauges (option)
 Electrical Connection M20 x 1.5 (others with Adapter AD...)

AIR FILTER REGULATOR - P 10

DESCRIPTION

The P10 air filter regulators are used to remove both solid and liquid impurities from the air and to regulate the output pressure to the required value for general purpose pneumatic systems. The filter bowl which is transparent allows easy monitoring of the condensate level.

MAIN FEATURES

Self relieving.
Compact combined filter/regulator.
5 micron large surface area element.
Manual and automatic condensate exhaust easier when there is no pressure.
Pressure gauge D.42 x 1/8"
Mounting bracket

USE: Pneumatic systems

AVAILABLE

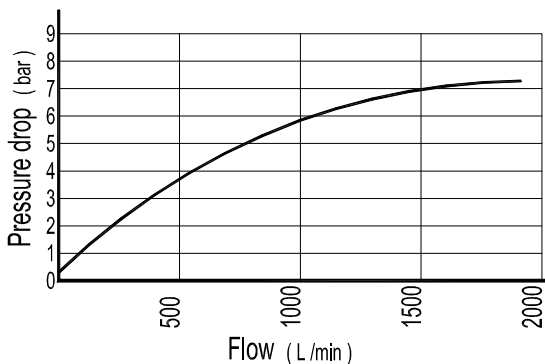
MODELS: P 10

VALVE SIZES: DN 1/4"

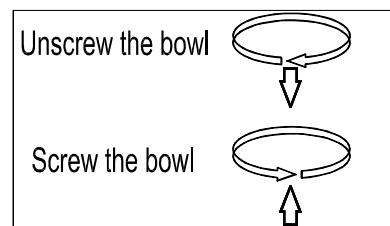
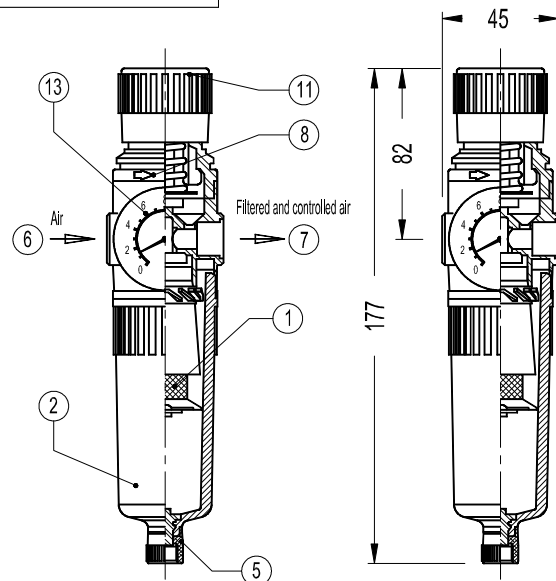
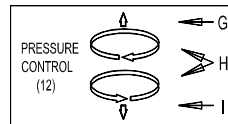
CONNECTIONS: BSP (BS21-Rp)



LIMITING CONDITIONS	
Valve model	P10
Max.upstream pressure	12 bar
Max.downstream pressure	10 bar
Min.downstream pressure	0,5 bar
Max.design temperature	60 °C
Min.Operating temperature	-10 °C



POS.Nr.	DESIGNATION
1	Filtering element
2	Bowl I (including bowl I guard)
5	Exhaust ring
6	Air inlet connection
7	Low pressure air outlet
8	Flow indicator arrow
11	Pressure regulating knob
13	Pressure gauge



MATERIALS	
Body	Aluminium die cast
Bowl I	Polycarbonate

PNEUMATIC ANGLE TYPE INTERCEPTION VALVE - Type PAV 21

DESCRIPTION

The PAV series angle seat interception valves are designed for steam, gas and other fluids used on the process industry and they are the effective response to fluid interception when flexibility and cost is requested. Connections are female screwed.

MAIN FEATURES

Stainless steel body with high coefficient of flow.
Resistance to corrosion
Low air consumption
Nylon rotational servo control
Self-centring plug with soft sealing
Live loading packing gland

OPTIONS: Pilot solenoid valves
Electromechanical switches

USE: Saturated steam, water and other fluids compatible with the construction.

AIR SUPPLY: 5 bar / 8 bar

ACTUATOR

CONNECTIONS: PPI-63 G1/8" NPT
PPI-90 G1/4" NPT

AVAILABLE

MODELS: PAV 21 - Pneumatic angle valve

SIZES: DN 1/2" – DN 2"

CONNECTIONS: Threaded ISO

VALVE LIMITING

CONDITIONS: Body design conditions:
PN16
Max. Working temperature: 190 °C
Min. Working temperature: -10 °C
Ambient temp. : -10 °C ...+ 80 °C



FLOW RATE COEFFICIENTS

	SIZES					
	DN15	DN20	DN25	DN32	DN40	DN50
Kvs	4,8	9,5	18	23,2	32,7	52,6

MAX. PERMISSIBLE PRESS.DROP IN bar Normally closed valve (fluid to open) Reverse action actuator (air signal to open)

ACT. Type	AIR PRESSURE	SIZES					
		DN15	DN20	DN25	DN32	DN40	DN50
PPI-63	5 - 8 bar	16	16	16	-	-	-
PPI-90	5 - 8 bar	-	-	-	16	16	10

Note: Waterhammer free design.

Kvs in m3/h , see data sheet IS PV10.00 E ;
For conversion Kvs = Cv(US) x 0,855

CE MARKING (PED - European Directive 97/23/EC)

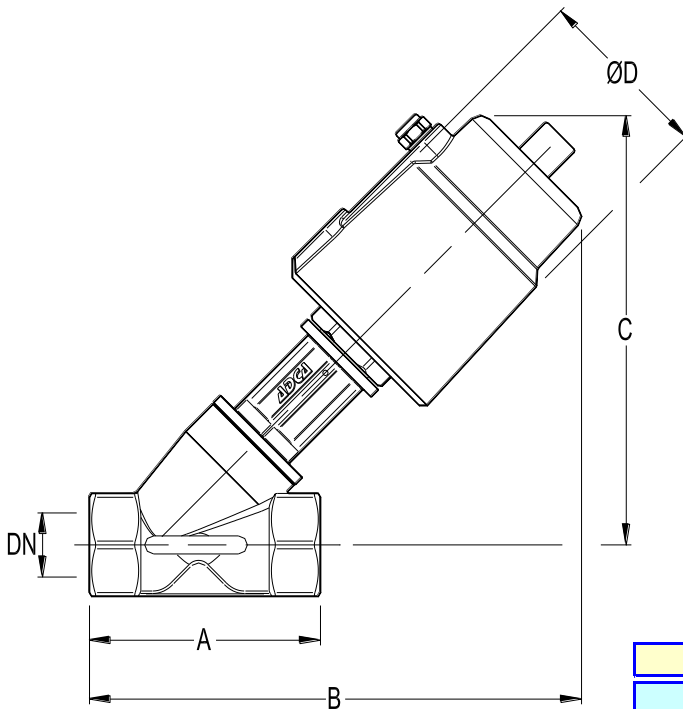
PN 16	Category
DN15 to DN50	SEP - art. 3, paragraph3

MAX. PERMISSIBLE PRESS.DROP IN bar Normally closed valve (fluid to close) Reverse action actuator (air signal to open)

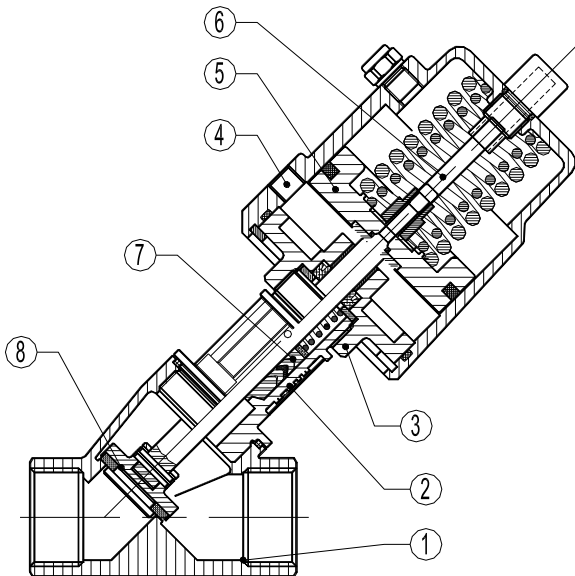
ACT. Type	AIR PRESSURE	SIZES					
		DN15	DN20	DN25	DN32	DN40	DN50
PPI-63	5 - 8 bar	16	16	16	-	-	-
PPI-63	6 - 8 bar	16	16	16	-	-	-
PPI-63	7 - 8 bar	16	16	16	-	-	-
PPI-90	5 - 8 bar	-	-	-	16	-	-
PPI-90	6 - 8 bar	-	-	-	16	16	-
PPI-90	7 - 8 bar	-	-	-	16	16	16

Note: not recommended when controlling liquids at high speed doing to waterhammer occurrence.

PNEUMATIC ANGLE TYPE INTERCEPTION VALVE - Type PAV 21



DIMENSIONS (mm)								
DN	A	B	C	Ø D	C	Ø D	WHT. Kgs w/PPI63	WHT. Kgs w/PPI90
			Actuator PPI-63		Actuator PPI-90			
15	68	174	155	75	155	110	1,35	2,4
20	75	182	158	75	158	110	1,45	2,5
25	90	190	166	75	166	110	1,65	2,7
32	116	261	227	75	227	110	2,3	3,3
40	116	265	229	75	229	110	2,55	3,5
50	138	282	238	75	238	110	3,6	4,7



MATERIALS		
POS.	DESIGNATION	MATERIAL
1	Valve Body	CF8M / 1.4408
2	Bonnet	CF8 / 1.4308
3	Actuator Flange	CF8 / 1.4308
4	Actuator Cover	CF8 / 1.4308
5	Piston	Aluminium
6	Indication Stem	Plastic
7	* Packing	PTFE / GR
8	* Valve Plug	1.4401 / PTFE-GR

* Available spare parts

PNEUMATIC ANGLE TYPE INTERCEPTION VALVE - Type PAV 21

ORDERING CODES PAV21										
VALVE CODES				PAV					.X.	
Group Designation										
Pneumatic on-off angle valve				PAV						
Valve Model										
Two way straight design, stainless steel construction				.21						
Valve Plug										
Soft (PTFE/GR) PT Type				1						
Pipe Connection										
Threaded BSP ISO 7/1 Rp					A					
Size										
DN 15								15		
DN 20								20		
...										
Fluid Direction										
Normally closed valve, fluid enter above the seat									A	
Normally closed valve, fluid enter below the seat									B	
Actuator									(1)	
Extras (3)										E
ACTUATOR CODES (pneumatic)				PI.						
Group Designation										
Piston linear actuator				PI.						
Actuator Size										
Piston pneumatic actuator PPI 63				.63						
Piston pneumatic actuator PPI 90				.90						
Actuator Type										
Direct action (air to close)									.D	
Reverse action (air to open)									.R	
Actuator Construction										
Stainless steel									(2)	

→ To be introduced on ".X.", if supplied in combination with the valve.

(1)- Indicate actuator type.
 (2)- Omitted if the standard actuator is selected.
 (3)- To be used only when a non-standard combination valve is supplied