GLOBE 2 WAY ANGLE VALVE - SERIES 170

Performance

- High flow capacity.
- Tight shut-off: correlated with ANSI B16.104 1976.
- High Range ability- well in excess of usual control system requirement.
- Cast spilt angle type body with streamline inlet and outlet flow passage. Body proportioned to withstand high pipe stresses without distortion.

Design Flexibility

- Split body design permits ready access to valve internals, and eases on its replacement of worn components. Removal of bonnet also enables parts to be inspected without removing valve from the line.
- Wide range of interchangeable trim styles and sizes available.
- adaptability to specialist duties i e. venturi outlet low noise etc.

High duty parts

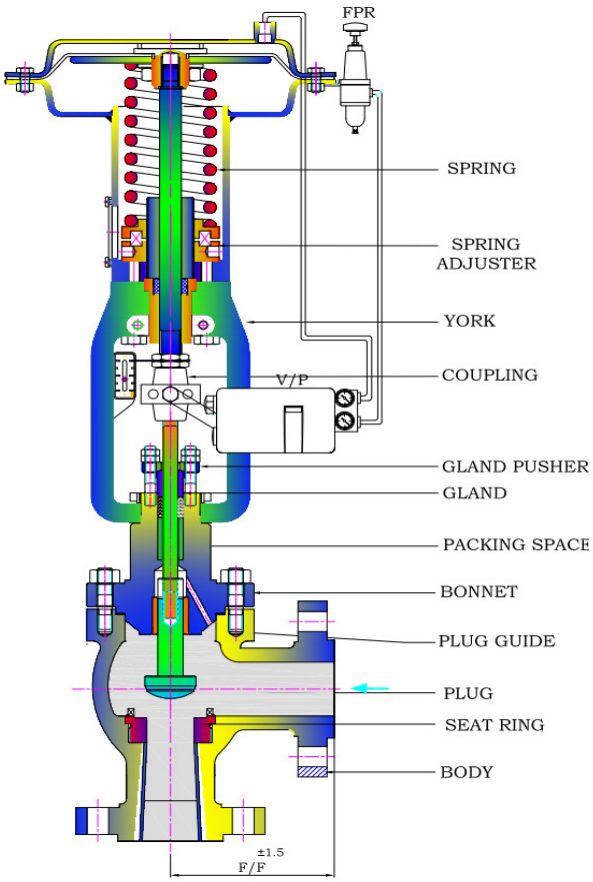
- Heavy duty top guiding- no bottom guide permanently obstructing seat bore and trapping debris.
- Clamped in seat consistent with high pressure drop and sonic velocities associated with this valve type.
- Deep all purpose packing box accommodating a variety of proprietary packing.
- Large diameter stems.

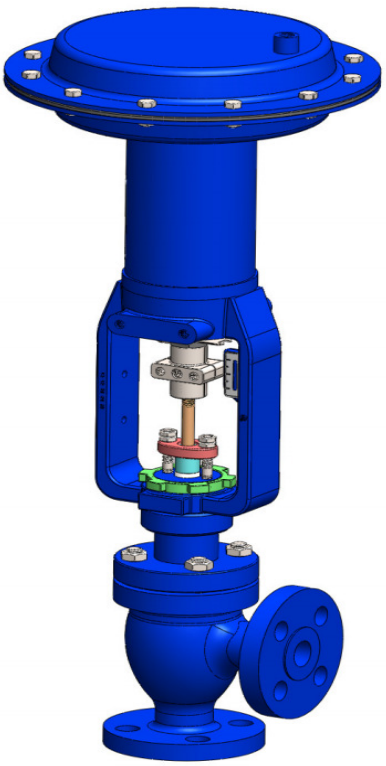
Quality Manufacturing

- Heavy duty ground and polished stem.
- Full range of body and trim material available.
- Comprehensively tested to ensure specified performance on site.
- maintenance of material and inspection records throughout manufacture.

General

The Series 170 valve developed by Pneucon valves will in its basic from satisfy the large pressure drops, critical flow regimes and sonic velocities normally associated with high pressure steam and gas service. The construction of this range of valves is of a simple from but it has a design which in itself allows many standard variation to be incorporated thus extending the range into that of specialized application.

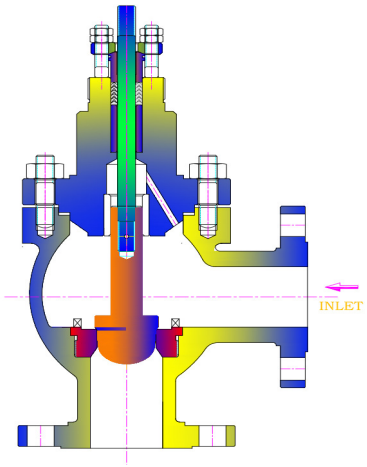




Standard trims for in Barstock and Cast iron valve in size up to 1.1/2" (40mm) diameter

Contoured (Metal to Metal)

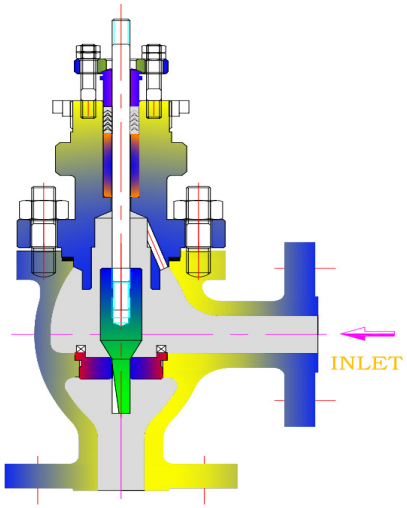
- **Duties:**
  Modulating or On/Off
- **Characteristic available:**
  Linear, Equal Percentage or Quick Opening.
- **Direction of flow:**
  Valves can be flowed in either of direction, whichever is more suited to the individual application.
- **Degree of shut off:**
  Metal to Metal (Standard) 0.002%.
  Metal to Metal (Special lapped) 0.0002%.
- **Application:**
  The design of trim presents a symmetrical, smooth profile to the fluid stream and is extremely well suited to the majority of low/medium pressure application.



Contoured Trim (Metal to Metal)

Microspline

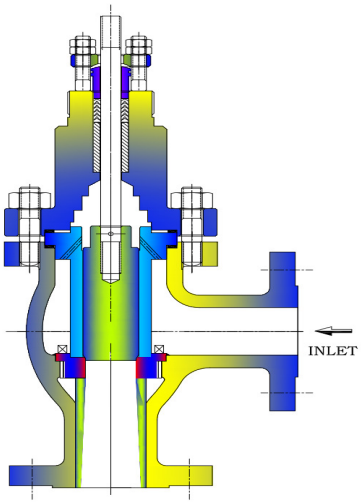
- **Duties:**
  Modulating only.
- **Characteristic available:**
  Modified Equal Percentage.
- **Direction of flow:**
  Over the head.
- **Degree of shut off:**
  Metal to Metal (Standard) 0.002%.
  Metal to Metal (Special lapped) 0.0002%.
- **Application:**
  The design of trim is seat guide construction having a very high rangeability and has been designed for the accurate control of minute flow rates.



Microspline Trim

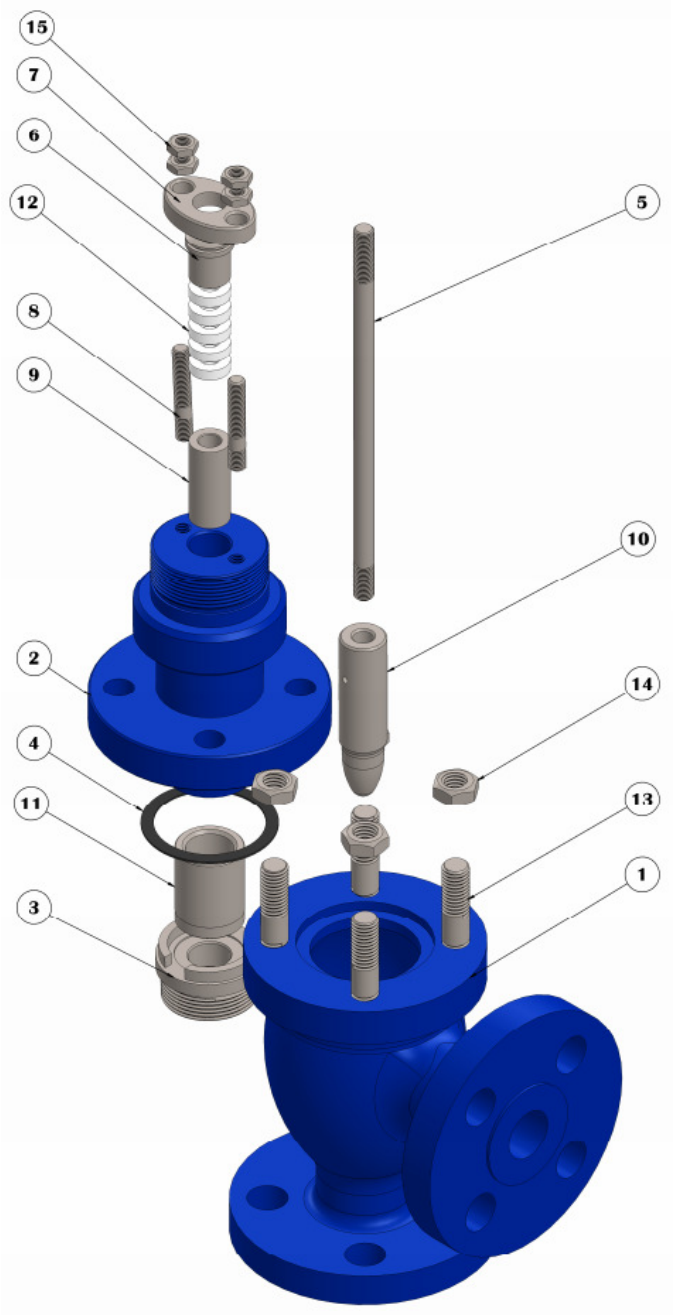
Low Noise

- **Duties:**
  Modulating .
- **Characteristic available:**
  Linear and Equal Percentage.
- **Direction of flow:**
  Valves can be flowed in either direction.
- **Degree of shut off:**
  Metal to Metal (Standard) 0.002%.
  Metal to Metal (Special lapped) 0.0002%.
- **Application:**
  The design of trim has been developed for medium/high pressure drop application in smaller trim sizes.

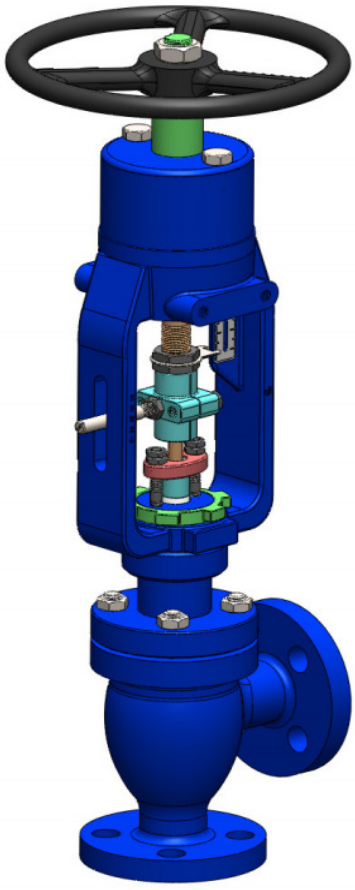


Low Noise Trim

Exploded view



Sr No	Parts
1	Body Flanged
2	Bonnet STD LN
3	Seat Ring
4	Gasket Body Joint
5	Plug Stem
6	Gland
7	Gland Pusher
8	Gland Stud
9	Packing Spacer
10	Plug LN-Contoured
11	Plug Guide Bush
12	Gland Packing
13	Body Stud
14	Body Stud Nut
15	Gland Stud Nut



Manual Angle Valve

Guide to valve selection

Flow coefficient (C_v)

All the C_v values given in the following tables are stated in US units For definition see technical sheet. Full procedure for calculating C_v values is given in engineering report EN12.

Inherent Rangeability

The inherent rangeability of a control valve is the ratio between maximum and minimum flow within the working characteristic at constant pressure drop. The renewability of Pneucon standard plug is given in the following table.

If C_v max = maximum C_v of valve.
and C_v min = minimum Controllable C_v of valve.
Q max = maximum flow through valve at pressure drop P_1.
Q min = minimum flow through valve at pressure drop P_2.
R = Valve Rangeability

$$\frac{Q_{max}}{Q_{min}} = \frac{C_{Vmax}\sqrt{\Delta P_1}}{C_{Vmin}\sqrt{\Delta P_2}} = R\frac{\sqrt{\Delta P_1}}{\sqrt{\Delta P_2}}$$

Inherent Flow Characteristics

The inherent flow characteristic of control valve is the relationship between the flow and the lift of the plug (or degree of opening) at constant pressure drop. The characteristic normally available are defined as follows:

Linear: Flow is directly proportional to lift.

Equal Percentage: Flow changes by constant percentage of its instantaneous valve for each unit change in lift.

Quick Percentage: Flow increases rapidly in a linear relationship with plug lift reaching a maximum value at a low lift.

Standard characteristic curves are shown below. Different body and trim combination may produce slight deviation from these standards. Actual flow test curves are available should precise flow characteristics be required.

Trim size	Rangeability			
	Contoured	'LR' Trim	Multi Stage	Micro Spline
1/4" - 3/4"	40:1	35:1	-	100:1
1" - 3"	50:1	45:1	40:1	80:1
4" - 6"	60:1	55:1	50:1	-

Table 1 : Rangeability of Series 170

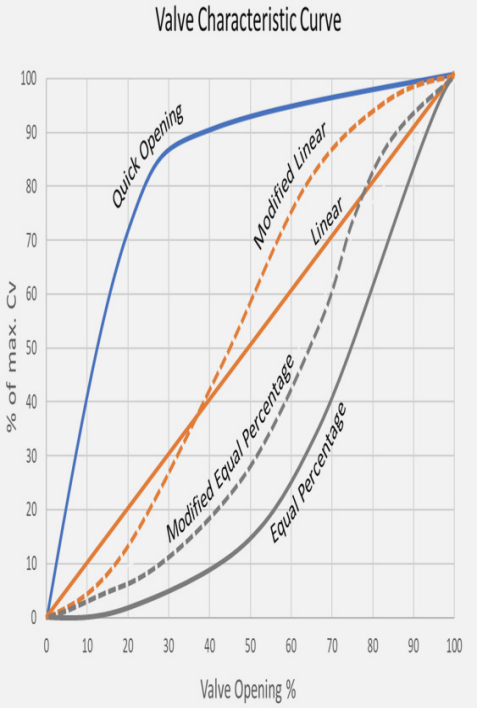


Figure 1 : Characteristic Curves

C_V Values - Microspline			
Valve Size		Trim	Mod
in	mm	Size	Equal
		No 1	0.75
		No 2	0.45
		No 3	0.30
		No 4	0.20
		No 5	0.13
1/2	15	No 6	0.075
3/4	20	No 7	0.045
1	25	No 8	0.030
		No 9	0.020
		No 10	0.013
		No 11	0.0075
		No 12	0.0045
		No 13	0.0030
		No 14	0.0020
		No 15	0.0013

Table 2 : Cv Values - Microspline

Cv Values - Valves Size		Contoured				Low Noise (Liquid)			Low Noise (Gas)			Micro spline	
in	mm	Trim size in	Equal %	Linear	Quick Opening	150 to 600	900 to 1500	2500	150 to 600	900 to 1500	2500	Equal	Linear
1/2	15	1/2	5	5	5	5	5	5	5	5	5	5	5
		3/8	3.2	3.2	-	-	-	-	-	-	-	3.2	3.2
		1/4	2	2	-	-	-	-	-	-	-	2	2
		3/16	1.2	1.2	-	-	-	-	-	-	-	1.2	1.2
		1/8	0.63	0.63	-	-	-	-	-	-	-	0.63	0.63
		1/16	0.40	0.40	-	-	-	-	-	-	-	0.4	0.4
3/4	20	3/4	8	8	8.	8	8	8	8	8	8	8	8
		1/2	5	5	5.0	5	5	5	5	5	5	5	5
		3/8	3.2	3.2	-	-	-	-	-	-	-	3.2	3.2
		1/4	2	2	-	-	-	-	-	-	-	2	2
		3/16	1.2	1.2	-	-	-	-	-	-	-	1.2	1.2
		1/8	0.63	0.63	-	-	-	-	-	-	-	0.63	0.63
		1/16	0.40	0.40	-	-	-	-	-	-	-	0.4	0.4
1	25	1	13.5	13.5	13.5	-	-	-	-	-	-	13	13
		3/4	8	8	8	8	8	8	8	8	8	8	8
		1/2	5	5	5	5	5	5	5	5	5	5	5
		3/8	3.2	3.2	-	-	-	-	-	-	-	3.2	3.2
		1/4	2	2	-	-	-	-	-	-	-	2	2
		3/16	1.2	1.2	-	-	-	-	-	-	-	1.2	1.2
		1/8	0.63	0.63	-	-	-	-	-	-	-	0.63	0.63
		1/16	0.40	0.40	-	-	-	-	-	-	-	0.4	0.4
1.1/2	40	1.1/2	32	32	37	28	26	-	28	26	-	30	30
		1.1/4	21	21	23	20	18	18	20	18	18	21	21
		1	13.5	13.5	13.5	-	-	-	-	-	-	13	13
		3/4	9	9	8	8	8	8	8	8	8	8	8
		1/2	5	5	5	5	5	5	5	5	5	5	5
2	50	2	50	50	55	42	40	-	42	40	-	50	50
		1.1/2	32	32	37	28	26	26	28	26	26	30	30
		1.1/4	21	21	23	20	18	18	20	18	18	20	20
		1	13.5	13.5	13.5	-	-	-	-	-	-	13	13
		3/4	9	9	8	8	8	8	8	8	8	8	8
3	80	3	118	118	125	88	83	-	88	83	-	118	118
		2.1/2	90	90	95	65	58	58	65	58	58	90	90
		2	50	50	55	42	40	40	42	40	40	50	50
		1.1/2	32	32	37	28	26	26	28	26	26	30	30
		1.1/4	21	21	23	20	18	18	20	18	18	20	20
		1	13.5	13.5	13.5	15	13	13	15	13	13	13	13
4	100	4	220	220	225	140	132	-	140	132	-	220	220
		3	118	118	125	100	95	70	100	95	70	118	118
		2.1/2	90	90	95	65	58	58	65	65	58	90	90
		2	50	50	55	42	40	40	42	42	40	50	50
		1.1/2	32	32	37	28	26	26	28	28	26	30	30
		1.1/4	21	21	23	20	18	18	20	20	18	20	20
6	150	6	450	450	470	310	290	-	310	290	-	450	450
		5	320	320	335	240	230	210	240	230	210	320	320
		4	220	220	225	170	170	170	170	170	170	220	220
		3	118	118	125	125	125	125	125	125	80	118	118
		2.1/2	90	90	95	100	100	90	100	100	90	90	90
		2	50	50	55	70	65	39	50	70	65	50	50

Table 3 : Cv Values of Contoured, LN (Liquid & Gas), Microspline

Guide to Bonnet Selection

Two types of bonnet are available. The type selected depend upon the temperature of the working fluid. For application outside the common service condition, the normalizing bonnet is used in table below.

For the selection of the valve bonnet and the packing please refer to the chart below.
The standard form of connection for all ANSI Class 300 and 600lb valves and up to including 8"(200mm) in the 2500lb class is the bolted bonnet arrangement.
For valves which are outside the above range a more acceptable bonnet connection arrangement would be that of the pressure sealed form.

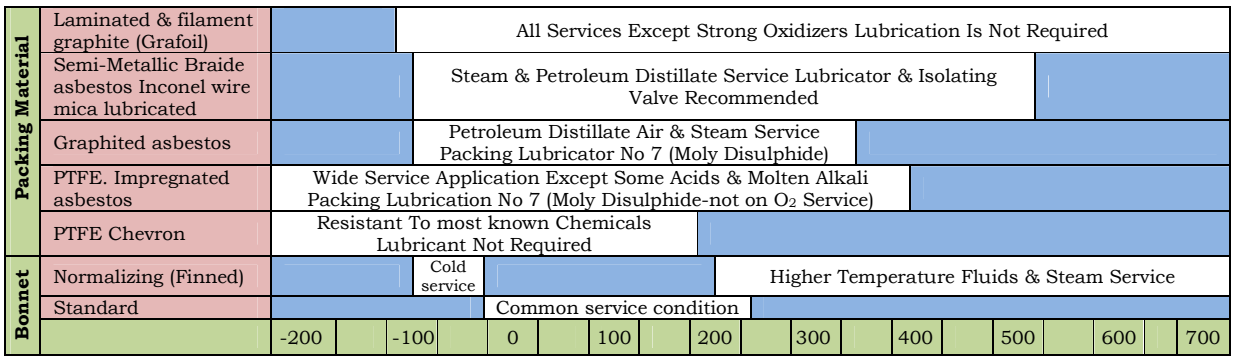


Figure 2 : Guide to Bonnet and Gland Packing Selection

Leakage Standard ANSI B16.104-1976

Ansi B16.104-1976	Maximum leakage		Test medium	Pressure & temperature
CLASS I	-		-	-
CLASS II	0.5% valve capacity at full travel		Water	3.-4 bar (45-60 psig) or max, Operating differential, whichever is lower, at 50° or 125°F (10° to 52°C)
CLASS III	0.1% valve capacity at full travel		Water	As above
CLASS IV	0.01% valve capacity at full travel		Water	As above
CLASS V	5 X 10^{-4} mL/min/psid/inch port dia		Water	Max service pressure drop, across valve plug , not to exceed ANSI body Rating,

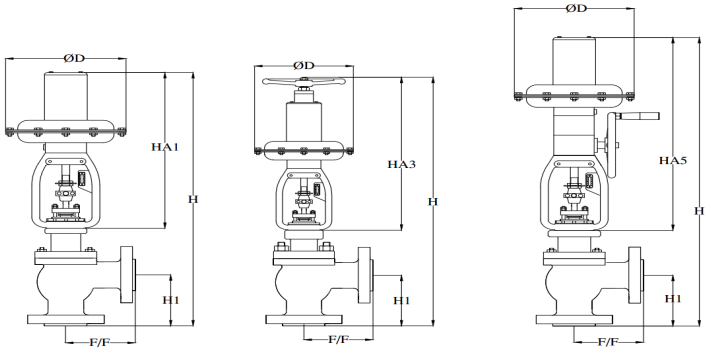
CLASS VI	Nominal port diameter		Bubbles /min	mL/min		
	In	mm			Test medium	Pressure & temperature
	1	25	1	0.15		
	1-1/2	38	2	0.30		
	2	51	3	0.45	Air or nitrogen at 10° to 52°C	Service ΔP or 50 psig (3.4 bar differntial), whichever is lower , at 50° or 125°F (10° to 52°C)
	2-1/2	64	4	0.60		
	3	76	6	0.90		
	4	102	11	1.70		
	6	152	27	4.00		
	8	203	45	6.75		

Table 4

Trim style	Valve Size		Velocity for Liquid Flows			Velocity for Gas/Vapours Flows		MAXIMUM OUTLET MACH No. For Predicted Noise Level		
			Valve Body Material			Max	Max			
			Carbon Steel	Alloy Steel	Aluminium bronze	Inlet Velocity	Outlet Velocity			
	Ins	mm	m /s	m /s	m / s	m/s	m/s	> 95 dba	< 95 dba	< 85 dba
Contoured	1/2 to 2	15 to 50	12.5	14.0	8.0	105	253	0.65	0.5	0.3
	3 to 4	80 to 100	10.5	11.0	6.5	90	253	0.65	0.5	0.3
	6	150	10.5	11.0	85	85	253	0.65	0.5	0.3
Cage Guided	1 to 6	25 to 150	13.1	15.8	8.0	68	253	0.65	0.5	0.3

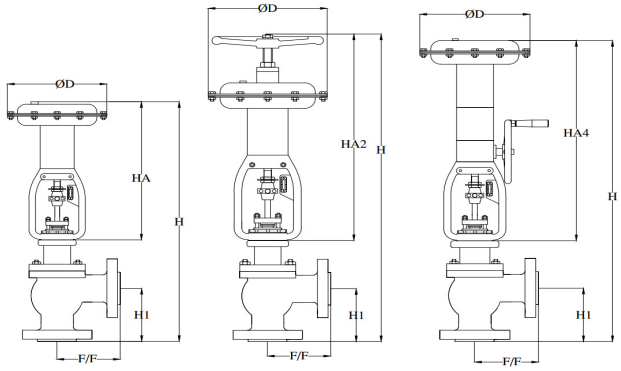
Table 5

* Standard exit configuration are suitable for velocities up to sonic. For other Application Consult Factory .
Velocity limits given in Table 5 are governed by consideration of mechanical vibration. They do not take into account noise levels which should be considered.



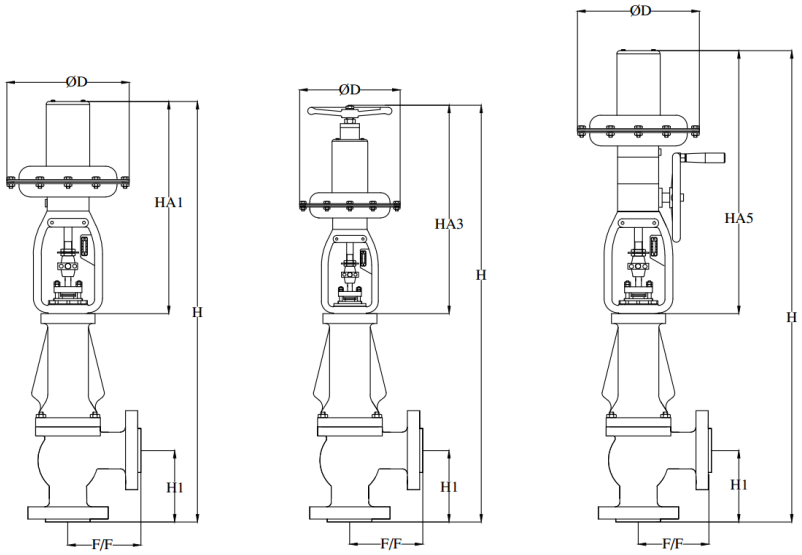
ANGLE VALVE WITH PDC ACTUATOR

Description			Mounting Dimensions													
Valve Size	Actuator Model	Travel in mm	F/F		H1		ØD	H 150#			H 300#			HA1	HA3	HA5
			150 #	300#	150#	300#		STD	TMH	SMH	STD	TMH	SMH			
1/2"	PDC - 30	28	105	105	105	105	220	665	723	822	665	723	822	424	482	581
	PDC - 55						288	729	812	932	729	812	932	488	571	691
1"	PDC - 30	28	105	105	105	105	220	665	723	822	665	723	822	424	485	581
	PDC - 55						228	729	812	932	729	812	932	488	571	691
1.1/2"	PDC - 30	28	112	117	112	126	220	689	747	846	702	760	859	424	485	581
	PDC - 55						288	753	836	956	766	849	969	488	571	691
2"	PDC - 30	28	127	-	127	-	220	712	772	871	718	776	875	424	482	581
	PDC - 55						288	776	861	981	782	865	985	488	571	691
3"	PDC - 30	38	149.5	159	149.5	159	288	887	966	1089	896	975	1098	537	616	739
	PDC - 95						371	921	1003	1123	930	1012	1132	571	653	773
4"	PDC - 95	38	176	178	176	178	288	952	1034	1154	954	4036	1156	571	653	773
	PDC - 140						371	981	1080	1223	983	1032	1225	600	699	842
6"	PDC -140	57	226	237	226	237	443	1232	1335	1478	1243	1346	1489	731	834	977



ANGLE VALVE WITH PDO ACTUATOR

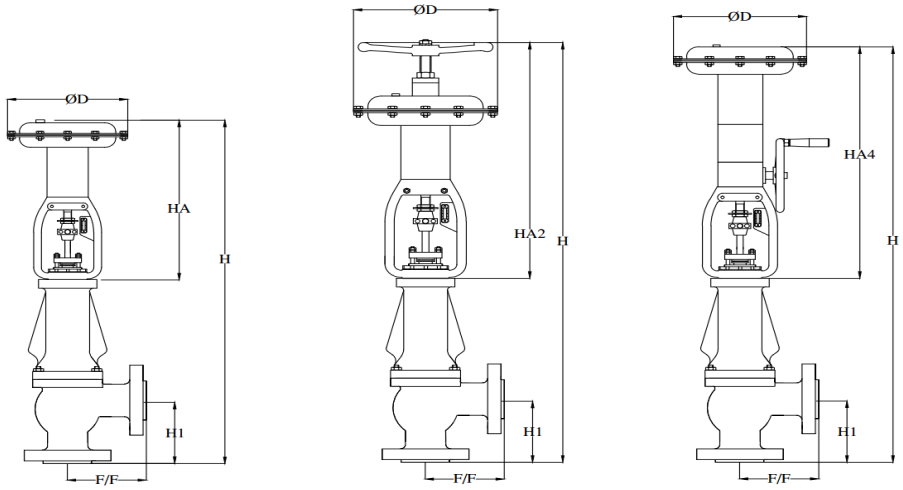
Description			Mounting Dimensions													
Valve Size	Actuator Model	Travel in mm	F/F		H1		ØD	H 150#			H 300#			HA1	HA3	HA5
			150 #	300#	150#	300#		STD	TMH	SMH	STD	TMH	SMH			
1/2"	PDO - 30	28	105	105	105	105	220	648	759	806	648	759	806	407	518	565
	PDO - 55						288	712	919	914	712	919	914	471	678	673
1"	PDO - 30	28	105	105	105	105	220	648	759	806	648	759	806	407	518	565
	PDO - 55						228	712	919	914	712	919	914	471	678	673
1.1/2"	PDO - 30	28	112	117	112	126	220	672	783	830	686	797	844	407	518	565
	PDO - 55						288	736	943	938	750	957	952	471	678	673
2"	PDO - 30	28	127	134	127	134	220	697	808	855	701	812	859	407	518	565
	PDO - 55						288	761	968	963	765	972	967	471	678	673
3"	PDO - 30	38	149.5	159	149.5	159	288	869	1077	1072	878	1086	1081	519	727	722
	PDO - 95						371	901	1108	1103	910	1117	1112	552	759	754
4"	PDO - 95	38	176	178	176	178	288	933	1140	1135	935	1142	1137	552	759	754
	PDO- 140						371	953	1239	1201	955	1241	1203	572	858	820
6"	PDO- 140	57	226	237	226	237	443	1208	1495	1456	1219	1506	1467	707	994	955



ANGLE VALVE WITH PDC ACTUATOR

Description			Mounting Dimensions											
Valve Size	Actuator Model	Travel in mm	F/F				H1				ØD	HA1	HA3	HA5
			600 #	900 #	1500 #	2500 #	600 #	900 #	1500 #	2500#				
1"	PDC - 30	28	105	146	146	159	105	146	146	159	220	424	485	581
	PDC - 55										228	488	571	691
1.1/2"	PDC - 30	28	126	167	167	191	126	167	167	191	220	424	485	581
	PDC - 55										288	488	571	691
2"	PDC - 30	28	143	188	188	200	143	188	188	200	220	424	482	581
	PDC - 55										288	488	571	691
3"	PDC - 30	38	169	221	221	330	169	221	221	330	288	537	616	739
	PDC - 95										371	571	653	773
4"	PDC - 95	38	197	256	276	369	197	256	276	369	288	571	653	773
	PDC - 140										371	600	699	842
6"	PDC -140	57	254	357	353	432	254	357	353	432	443	731	834	977

Description			Mounting Dimensions									
Valve Size	Actuator Model	Travel in mm	H 600#			H 900#			H 1500#			H 2500#		
			STD	THM	SMH	STD	THM	SMH	STD	THM	SMH	STD	THM	SMH
1"	PDC - 30	28	717	775	874	797	885	954	792	850	949	855	913	1012
	PDC - 55		781	864	984	861	944	1064	856	939	1059	919	1002	1122
1.1/2"	PDC - 30	28	792	850	949	885	943	1042	885	943	1042	923	991	1080
	PDC - 55		856	939	1059	949	1032	1152	949	1032	1152	987	1070	1190
2"	PDC - 30	28	805	863	962	-	-	-	859	971	1016	1002	1060	1159
	PDC - 55		869	952	1072	-	-	-	923	1006	1126	1066	1149	1269
3"	PDC - 30	38	1014	1093	1216	1127	1206	1329	1122	1201	1324	1264	1343	1466
	PDC - 95		1048	1130	1250	116	1243	1363	1156	1238	1358	1298	1380	1500
4"	PDC - 95	38	1095	1177	1297	1214	1296	1416	1224	1306	1426	1365	1447	1567
	PDC - 140		1124	1223	1366	1243	1342	1485	1253	1352	1495	1394	1493	1636
6"	PDC -140	57	1375	1478	1651	1558	1661	1804	1554	1657	1800	-	-	-



ANGLE VALVE WITH PDC ACTUATOR

Description			Mounting Dimensions											
Valve Size	Actuator Model	Travel in mm	F/F				H1				ØD	HA1	HA3	HA5
			600 #	900 #	1500 #	2500 #	600 #	900 #	1500 #	2500#				
1"	PDO - 30	28	105	146	146	159	105	146	146	159	220	407	518	565
	PDO - 55										228	471	678	673
1.1/2"	PDO - 30	28	126	167	167	191	126	167	167	191	220	407	518	565
	PDO - 55										288	471	678	673
2"	PDO - 30	28	143	188	188	200	143	188	188	200	220	407	518	565
	PDO - 55										288	471	678	673
3"	PDO - 30	38	169	221	221	330	169	221	221	330	288	519	727	722
	PDO - 95										371	552	759	754
4"	PDO - 95	38	197	256	276	369	197	256	276	369	288	552	759	754
	PDO - 140										371	572	858	820
6"	PDO -140	57	254	357	353	432	254	357	353	432	443	707	994	955

Description			Mounting Dimensions											
Valve Size	Actuator Model	Travel in mm	H 600#			H 900#			H 1500#			H 2500#		
			STD	THM	SMH	STD	THM	SMH	STD	THM	SMH	STD	THM	SMH
1"	PDO - 30	28	700	811	858	780	891	938	775	886	933	838	949	996
	PDO - 55		764	971	966	844	1051	1046	839	1046	1041	902	1109	1104
1.1/2"	PDO - 30	28	775	886	933	867	978	1025	867	978	1025	906	1017	1064
	PDO - 55		839	1046	1041	931	1138	1133	931	1138	1133	970	1177	1172
2"	PDO - 30	28	788	899	9646	-	-	-	842	953	1000	1042	1153	1200
	PDO - 55		852	1059	1054	-	-	-	906	1113	1108	1106	1313	1308
3"	PDO - 30	38	996	1204	1231	1109	1317	1312	1104	1312	1307	1246	1454	1449
	PDO - 95		1029	1236	1231	1142	1349	1344	1137	1344	1339	1279	1486	1481
4"	PDO - 95	38	1076	1283	1278	1195	1402	1397	1205	1412	1407	1346	1553	1548
	PDO - 140		1096	1382	1344	1215	1501	1463	1225	1511	1473	1366	1652	1614
6"	PDO -140	57	1351	1638	1599	1534	1821	1782	1530	1817	1778	-	-	-

PNEUCON VALVES PVT LTD

UNIT-I

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