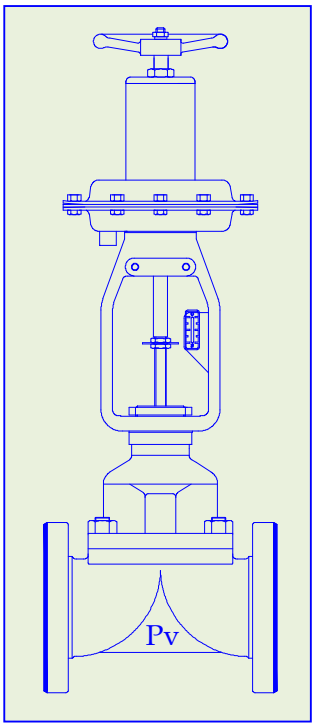
DIAPHRAGM CONTROL VALVE

INTRODUCTION

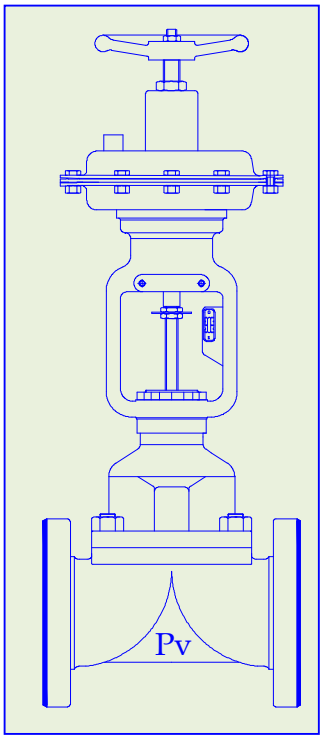
The Diaphragm Valve is essentially a simple pinch clamp, closed by pressing a flexible diaphragm against transverse weir, when fully closed, the diaphragm seats against the weir providing a leak tight closure.
The diaphragm valves are recommended for handling sticky and viscous fluids, slurries and highly corrosive and hazardous substances and other hard to handle mediums or where tight closure is prime factor. It is the most ideal valve to handle fluids that require high purity and should remain free from contamination.
The Diaphragm Valve is a simple pinch type valve and of low pressure type because of large area of diaphragm and is extensively used for both On/Off and throttling services and finds its application in Waste & Water Treatment Plants, Filtration Plants, Chlorination Plants etc



DIAPHRAGM VALVE WITH REVERSE ACTUATOR

SPECIFICATIONS

DESIGN	:	Confirm to BS - 5156
BODY TYPE	:	Weir (Rubber Lined - Series 410) (Unlined - Series 430) (PFA Lined - Series 440)
VALVE SIZE	:	15mm to 300mm (1/ 2" to 12")
END CONNECTION	:	ANSI B 16.1Class 150
BODY MATERIAL	:	Cast Iron (IS 210 grade FG 200) Cast Steel, Other alloys on request.
LINING MATERIAL	:	Ebonite, PVDF, PFA, PP, EPDM,Glass etc.
LINING HARDNESS	:	Ebonite-95° ± 5 Shore A Natural/Neo Rubber-55° ± 5 Shore A Teflon-Rockwell/Shore R100 D78 or D62 Glasslining & FRP-Parcol Parcol 40 Respectively.
LINING THICKNESS	:	15 to 65 mm Valve - 3.0 mm 80 to 100 mm Valve - 3.5 mm 125 to 150 mm Valve - 4.0 mm 200 to 300 mm Valve - 5.0 mm Teflon Coating Thickness – 800 micron, Glass Lining – 1.5mm.
BODY DIAPHRAGM	:	Neoprene, Teflon Backed with Neoprene Butyl, Viton, Hyplon, Nitrile, EPDM.
LEAKAGE RATE	:	As per ANSI B 16.104 Class VI (100% Leak tight.)
TEMPERATURE	:	- 30°C to 80°C
FLOW CHARACTERISTICS.	:	On/Off, Throttling.
TESTING STANDARD	:	BS 6755 Part - I
ACTUATOR TYPE	:	Diaphragm or Motorised or Cylinder
ACTUATOR ACTION	:	Direct Acting - Normally Open (Air to Close) Reverse Acting - Normally Close (Air to Open)
SPRING RANGE	:	3 – 15 PSIG (0.2 – 1.0 Kg/cm²)
	:	8 – 20 PSIG (0.4 – 2.0 Kg/cm²)
		18 – 30 PSIG (1.2 – 2.0 Kg/cm²)
AIR SUPPLY	:	20-50 PSIG (1.4-3.5 Kg/cm²)
AIR CONNECTION	:	1/ 4" or 1/ 2" NPT
ACCESSORIES	:	Top or Side Mounted Handwheel, Limit Switches
OPTIONAL		Airset, Valve Positioner etc.



DIAPHRAGM VALVE WITH DIRECT ACTUATOR

DESIGN AND PERFORMANCE FEATURES

>> It is a full bore straight through, give high flow performance with minimum turbulence, while giving 100% leak tight closure.

>> Perfect sealing and longer diaphragm life due to weir design.

>> Valve is self cleaning with no pockets, recesses, corners, grooves or sharp edges in the direction of flow.

VALVE SIZING CO-EFFICIENT Cv RATINGS

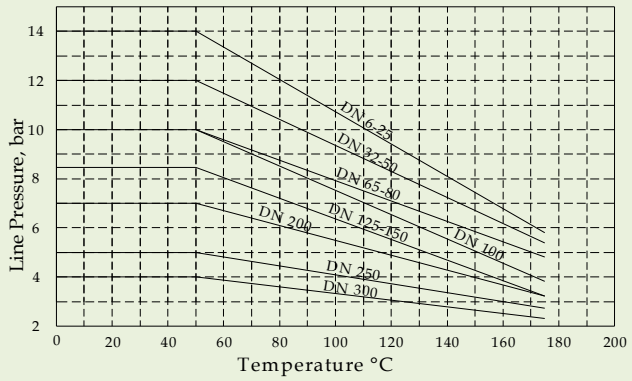
VALVE SIZE (in)	TRAVEL(in)		RUBBER LINED		UNLINED OR GLASS LINED	
	RUBBER DIAPHRAGM	TEFLON DIAPHRAGM	RUBBER DIAPHRAGM	TEFLON DIAPHRAGM	RUBBER DIAPHRAGM	TEFLON DIAPHRAGM
1/ 2”	1/ 4”	1/ 4”	6	4	6	4
3/ 4”	3/8”	3/8”	12	6	9	6
1”	3/8”	9/16”	15	12	12	10
1.1/2”	3/4”	3 / 4”	40	25	30	20
2”	1.1/8”	3 / 4”	55	35	50	30
2.1/2”	1.1/4”	15/16”	85	55	75	50
3”	1.1/2”	1.1/4”	120	75	95	70
4”	1.3/4”	1.1/2”	210	180	200	160
6”	2.3/4”	--	375	275	350	270
8”	3”	--	650	475	625	450
10”	3.1/2”	--	870	1045	845	1020
12”	4”	--	1328	1503	1303	1478

ACTUATOR SELECTION GUIDE FOR RUBBER LINED DIAPHRAGM VALVE

Valve Charecterstics/Action			On/Off/ Control Duty Air to Open		On/Off Duty Air to Close			Control Duty Air to Close	
Air Supply to Actuator (Psig)			25	35	18	28	38	28	38
Spring Range (Psig)			8-20.	18-30	3-6			3-15.	
Valve Size	Max. Travel	Actuator Size	Shut Off Pressure Kg/ Cm²		Shut Off Pressure Kg/ Cm2			Shut Off Pressure Kg/ Cm²	
Upto 1"	9/16"	12	--	6.0	--	6.0	12.0	--	6.0
		30	10.0	22.0	7.0	22.0	38.0	7.0	22.0
1.1/2"	3/4"	30	--	8.0	--	8.0	15.0	--	8.0
		55	5.5	18.0	5.5	18.0	32.0	5.5	18.0
2"	1.1/8"	55	--	8.0	--	8.0	17.0	--	8.0
		95	5.0	18.0	5.0	18.0	33.0	5.0	18.0
2.1/2"	1.1/4"	55	--	7.5	--	7.5	14.0	--	7.5
		95	4.0	16.0	4.0	16.0	28.0	4.0	16.0
3"	1.1/2"	95	--	7.5	--	7.5	15.0	--	7.5
		140	3.5	13.5	3.5	13.5	24.0	3.5	13.5
4"	1.3/4"	95	--	4.0	--	4.0	8.0	--	4.0
		140	--	7.0	--	7.0	14.0	--	7.0
		300	7.0	20.0	7.0	20.0	35.0	7.0	20.0
5"	2"	140	--	7.0	--	7.0	14.0	--	7.0
		300	7.0	20.0	7.0	20.0	35.0	7.0	20.0
6"	2. 3/4"	140	--	2.0	--	2.0	5.0	--	2.0
		300	1.5	8.0	1.5	8.0	16.0	1.5	8.0
8"	3"	300	--	3.0	--	3.0	6.0	--	3.0
		600	2.5	9.0	2.5	9.0	16.0	2.5	9.0
10"	3. 1/2"	600	0.5	5.7	0.5	5.7	11.0	0.5	5.7
12"	4"	600	0.4	3.0	0.4	3.0	6.0	0.4	3.0

LINE PRESSURE AT ONE END ONLY

(FOR LINE PRESSURE AT BOTH END MULTIPLY ΔP VALUES BY 0.5)



PRESSURE – TEMPERATURE RATING

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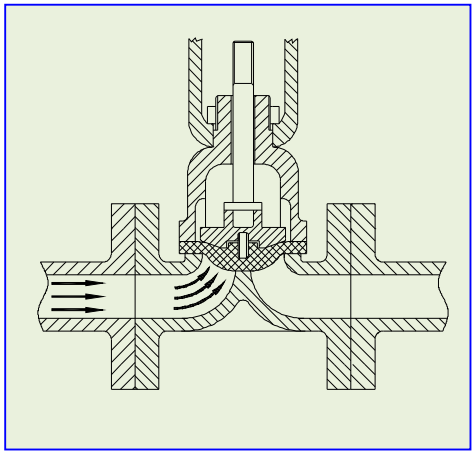
BUILT IN RELIABILITY

ACTUATOR SELECTION GUIDE FOR PTFELINED DIAPHRAGM VALVE

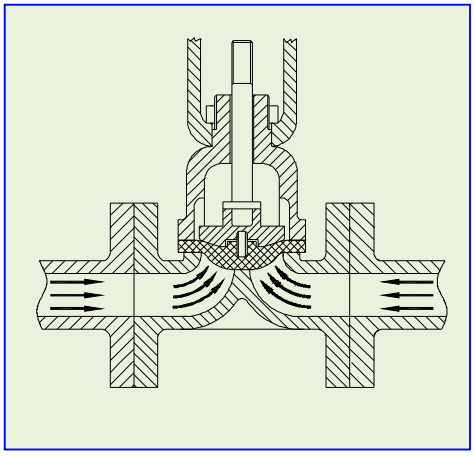
Valve Charecterstics/Action			On/Off/ Control Duty Air to Open		On/Off Duty Air to Close		**Control Duty Air to Close**	
Air Supply to Actuator (Psig)			25	35	20	35	30	40
Spring Range (Psig)			8-20.	18-30	3-6		3-15.	
Valve Size	Max. Travel	Actuator Size	Shut Off Pressure Kg/ Cm²		Shut Off Pressure Kg/ Cm2		Shut Off Pressure Kg/ Cm²	
1/2"	1/4"	30	6.0	12.0	9.5	15.5	9.5	15.5
		55	10.0	NA	15.5	NA	15.5	NA
3/4"	3/8"	30	7.0	12.0	9.5	15.5	9.5	15.5
		55	10.0	NA	15.5	NA	15.5	NA
1"	9/16"	30	3.5	7.5	2.5	11.5	2.5	11.5
		55	7.5	13.5	14.0	NA	14.0	NA
1.1/4"	9/16"	30	NA	4.0	2.5	7.5	2.5	7.5
		55	5.0	13.5	9.5	NA	9.5	NA
1.1/2"	3/4"	30	NA	3.5	1	4.5	1	4.5
		55	5.0	13.5	5.5	15.5	5.5	15.5
2"	3/4"	55	2.0	9.0	5.5	15.5	5.5	15.5
		95	4.5	13.5	7.5	NA	7.5	NA
		140	12.0	NA	NA	NA	NA	NA
2.1/2"	15/16"	55	1.0	6.0	2	15.5	2.0	15.5
		95	3.0	10.5	5.5	15.5	5.5	15.5
		140	9.0	NA	15.5	NA	15.5	NA
3"	11/4"	95	NA	4.0	1	6.5	1	6.5
		140	4.0	12.0	8	15.5	8	15.5
4"	11/2"	140	2.0	6.5	3.5	11.0	3.5	11.0
		300	4.5	13.5	8.5	NA	8.5	NA
6"	2"	300	2.0	7.0	4.5	11.0	4.5	11.0
8"	2.1/4"	300	NA	3.0	1	3.5	1	3.5

LINE PRESSURE AT ONE END ONLY

(FOR LINE PRESSURE FROM BOTH SIDES MULTIPLY ΔP VALUES BY 0.5)



PRESSURE AT ONE END 100% ΔP



PRESSURE AT BOTH END 0% ΔP

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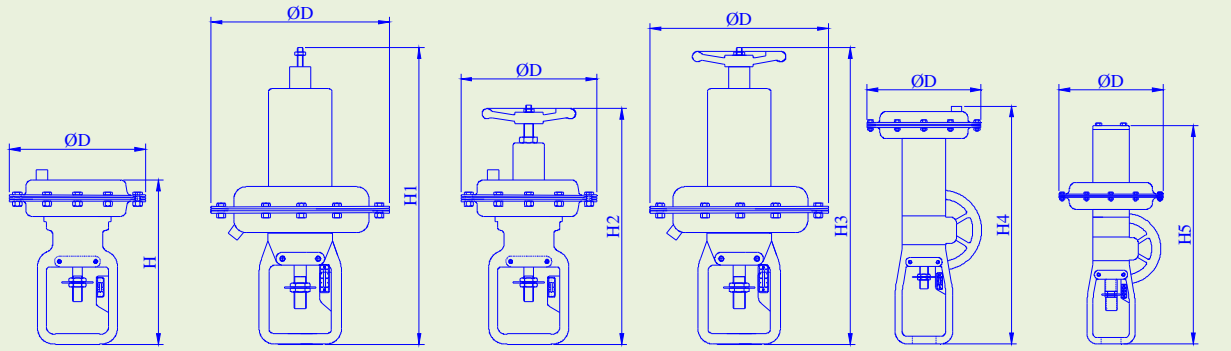
ACTUATOR DIMENSIONS



DIAPHRAGM ACTUATOR DIRECT - ACTING.

DIAPHRAGM ACTUATOR REVERSE - ACTING.

DIAPHRAGM ACTUATOR WITH TOP MOUNTED HANDWHEEL. DIRECT- ACTING.

DIAPHRAGM ACTUATOR WITH TOP MOUNTED HANDWHEEL. REVERSE - ACTING.

DIAPHRAGM ACTUATOR WITH SIDE MOUNTED HANDWHEEL. DIRECT- ACTING.

DIAPHRAGM ACTUATOR WITH SIDE MOUNTED HANDWHEEL. REVERSE ACTING.

ACTUATOR MODEL	EFFECTIVE Inch²	BONNET MOUNT DIA.	TRAVEL	ΦD	H	H1	H2	H3	H4	H5
PDC – 012	12	32	14.3	150	--	370	--	365	--	--
PDO - 012	12	32	14.3	150	235	--	335	--	--	--
PDC - 030	30	32	19	218	--	440	--	400	--	--
PDO - 030	30	32	19	218	295	--	390	--	--	--
PDC - 030	30	54	32	218	--	510	--	520	--	--
PDO - 030	30	54	32	218	325	--	475	--	--	--
PDC - 055	55	54	28	286	--	550	--	570	--	640
PDO - 055	55	54	28	286	410	--	540	--	640	--
PDC - 055	55	54	38	286	--	570	--	590	--	690
PDO - 055	55	54	38	286	325	--	510	--	690	--
PDC - 095	95	54	32	371	--	680	--	700	--	670
PDO - 095	95	54	32	371	430	--	770	--	670	--
PDC - 095	95	54	45	371	--	700	--	720	--	725
PDO - 095	95	54	45	371	590	--	550	--	725	--
PDC - 140	140	54	38	443	--	840	--	640	--	860
PDO - 140	140	54	38	443	750	--	1000	--	860	--
PDC - 140	140	90.5	70	443	--	870	--	890	--	1000
PDO - 140	140	90.5	70	443	750	--	1000	--	1000	--
PDC - 300	300	90.5	45	599	--	980	--	--	--	1230
PDO - 300	300	90.5	45	599	950	--	--	--	1230	--
PDC - 300	300	90.5	70/76	599	--	1070	--	--	--	1275
PDO - 300	300	90.5	70/76	599	950	--	--	--	1275	--

- PDO - Direct Acting Actuator (used on supply failure Valve – Opens)
- PDC – Reverse Acting Actuator (used on supply failure Valve – Closes)
- All dimensions in mm.
- The company reserves the right to confirm these dimensions on certified Drawings.

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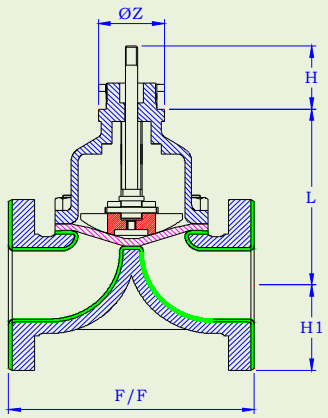
BODY DIMENSIONS

SIZE 15 TO 300mm

SIZE		F/F		H1	L	H	ØZ	Approx Weights, In Kgs.
Inch.	mm	LINED	UN LINED					
½”	15	114	108	45	75	117	31.7	2.50
¾”	20	123	117	50	85	117	31.7	2.75
1”	25	133	127	55	97	117	31.7	3.50
1.1/4”	32	152	146	60	90	117	31.7	5.50
1.1/2”	40	165	159	70	110	117	31.7	6.75
2”	50	196	190	75	135	117	53.9	11
2.1/2”	65	222	216	90	155	143	53.9	16.65
3”	80	261	254	95	175	143	53.9	22.9
4”	100	312	305	115	200	143	53.9	34.8
5”	125	364	350	125	230	143	53.9	46.5
6”	150	414	406	140	360	197	69.8	75
8”	200	531	521	175	370	197	69.8	156
10”	250	645	635	204	559	229	69.8	230
12”	300	759	749	242	651	229	69.8	399



INSTALLATION

The valve should be installed preferably in a straight run of the pipe, a few diameters away from the bends. The preferred position is with actuator vertically above or below the valve body. It may also be installed in a horizontal or angled position provided the diaphragm actuator is supported. Necessary clearance should be provided above the actuator to permit removal for servicing or for inspection of the valve internals. The supply pressure to the actuator be either 20 psig or 35 psig or as per rating indicated on the name plate. For control applications, positioner mounted are piped and adjusted at the factory.

FINAL CHECK

After the valve has been installed, check the operations for full stroke travel as indicated on the name plate. Check for air leaks in air line connection. Open and close the valve two or three times to ensure proper operation. Before commissioning the process flow, it would be advisable to use conical filter or other temporary devices to avoid damage to the rubber lining or body diaphragm as the fluid is likely to carry foreign solid material during testing or commissioning of the plant. This care is particularly important with neoprene or other soft elastomer lining. Special care has to be exercised with glass lining construction. It is generally not desirable to use excessive air pressure to the actuator than specified as it would reduce the life of the body diaphragm and also cause undue forces on the actuator diaphragm. Valves having manual hand wheels should be preferably operated with air pressure, particularly during the start of the plant when any foreign material is likely to damage the internals.

The Company’s policy is one of continuous product improvement and the right is reserved to modify the specifications contained herein without notice.

BUREAU VERITAS Certification

UKAS QUALITY MANAGEMENT

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BUILT IN RELIABILITY

Designed By : Rajesh