

The **AIL METSEAL Butterfly Valve** is a high performance valve which is used for positive isolation in Power Generation, Petroleum Refining, Oil and Gas Production, Chemical, Petrochemical and Gas Processing industries. The valves are manufactured to the latest international designs, using advanced manufacturing techniques and stringent quality control checks.

AUDCO INDIA LIMITED (AIL) is a leading valve manufacturer, with a strong presence in India and overseas.

AIL has three manufacturing facilities located in Southern India. The main plant is located in Manapakkam, Chennai. The two other plants are at Maraimalai Nagar, 40 kilometres south and at Kancheepuram, 70 kilometres west of the main plant. These plants are equipped with modern manufacturing facilities with special-purpose machines, automatic welding equipment, heat treatment furnaces and testing equipment for total control of all manufacturing operations. In-house metallurgical and NDE and calibration facilities with modern equipment provide support to ensure the quality of products manufactured.

AIL manufactures a wide variety of industrial valves. The Quality Management System in all three plants is certified to ISO 9001:2000 System.



AIL METSEAL Manufacturing Programme

Body ends	ASME Class	Operation	mm inch	80	100	150	200	250	300	350	400	450	500	600
				3	4	6	8	10	12	14	16	18	20	24
Wafer	150	Lever operation		●	●									
		Gear operation		●	●	●	●	●	●	●	●	●	●	●
	300	Lever operation		●	●									
		Gear operation		●	●	●	●	●	●	●	●	●	●	●
Wafer-Lugged	150	Lever operation		●	●									
		Gear operation		●	●	●	●	●	●	●	●	●	●	
	300	Lever operation		●	●									
		Gear operation		●	●	●	●	●	●	●	●	●	●	
Flanged	150	Lever operation		●	●									
		Gear operation		●	●	●	●	●	●	●	●	●	●	
	300	Lever operation		●	●									
		Gear operation		●	●	●	●	●	●	●	●	●	●	

Manufacturing Plant at Kancheepuram

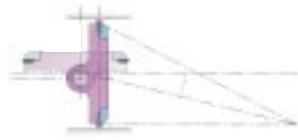


Salient Features

Triple Offset Geometry

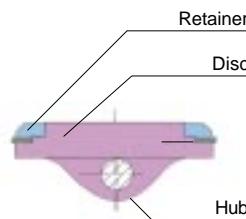
The triple offset geometry (see details on page 6) ensures a uniform compressive seal around the entire seat, and produces a wedging effect. The triple offset, combined with the resilient construction, ensures both zero leakage and bidirectionality.

The triple offset geometry also ensures contact between the body seat and disc seal only at the final shut-off position, thereby eliminating wear and enhancing life.



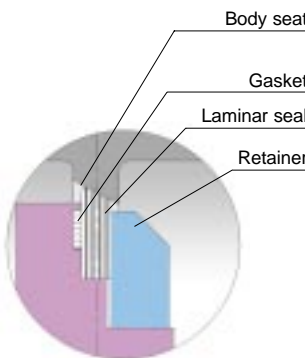
Special Disc Profile

The disc is designed for minimum obstruction to flow, and is made of high integrity casting with integrally cast hubs. The upper hub is attached to the shaft by means of a key for positive engagement. The disc seal is attached to the disc by means of a retainer ring.



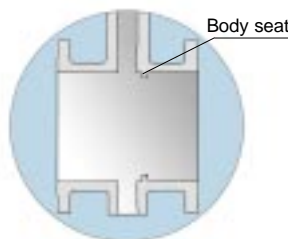
Laminar Resilient Disc Seal

The laminar seal is constructed with graphite layers sandwiched between metal layers bonded together. The seats are suitable to withstand temperatures up to 538°C (1000°F). The construction allows for resiliency of the seal material which flexes and energises according to the compressive forces generated. The resiliency of the seal allows the valve body and disc to contract or expand without the risk of jamming due to temperature changes. As a standard, the metal layers are of stainless steel. Alternate materials like monel and inconel are also available.



Raised conical Body Seat

The raised conical body seat prevents solid accumulation interfering with the seal. As a standard, the seat is hard faced to meet severe service conditions.



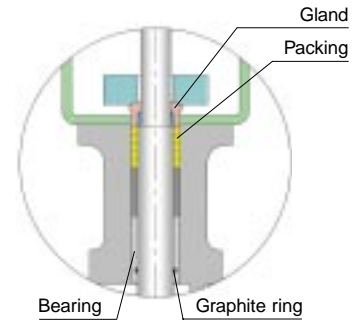
Fire-safe design

The valves being metal seated are intrinsically fire safe and are suitable for use in most critical applications. The valves are fire safe to API 6FA and BS 6755 Part II.

High integrity Shaft Sealing

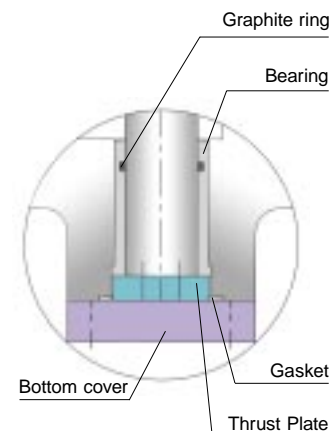
The shaft is of single-piece design which provides greater rigidity to the disc and imparts better resistance to bending. The shaft is keyed to the upper hub of the disc, which allows for differential expansion due to variation in temperature.

The main shaft seal is located at the top housing area in the form of a stuffing box arrangement which consists of graphite packings, gland and gland flange. The entire gland arrangement is asbestos-free in line with international norms. The shaft sealing at the bottom housing uses a gasket between the bottom cover and the bottom housing. Braided graphite rings are provided both at the top and bottom housing to prevent ingress of solid particles. Special packings can be provided to achieve low level of fugitive emission.



One-piece blowout-proof Shaft

The shaft bottom face is attached to the thrust plate, which is located between the bearing and the bottom cover plate. In addition, a step in the upper shaft area is held in place by the gland. These features provide full anti-blowout protection.

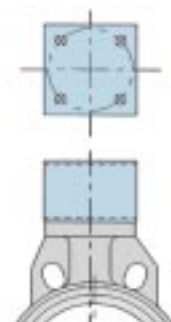


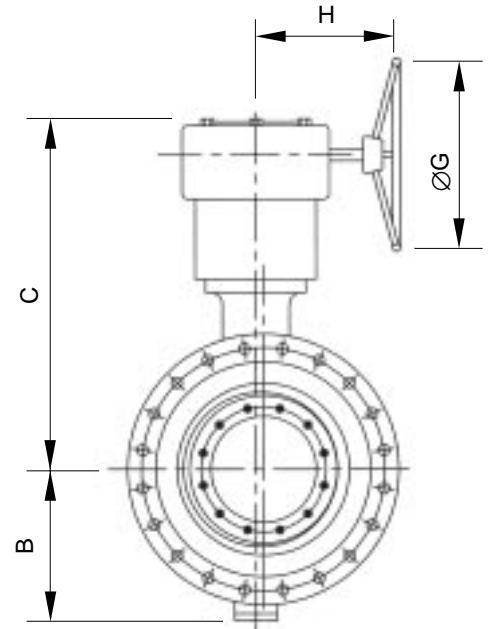
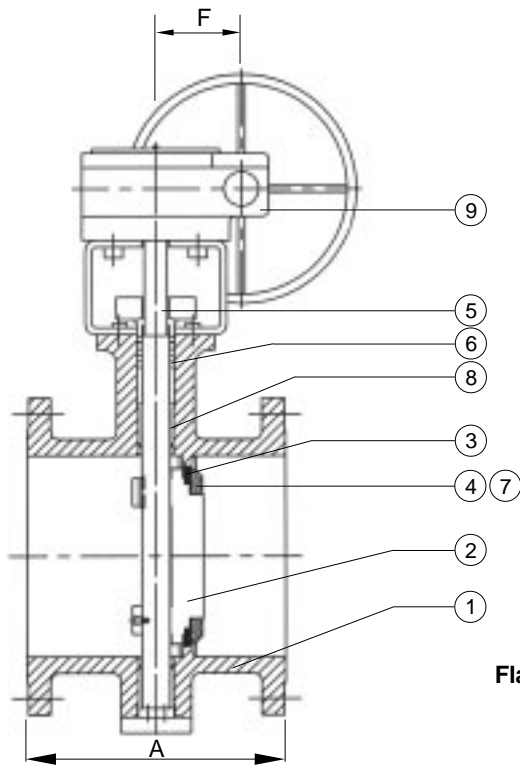
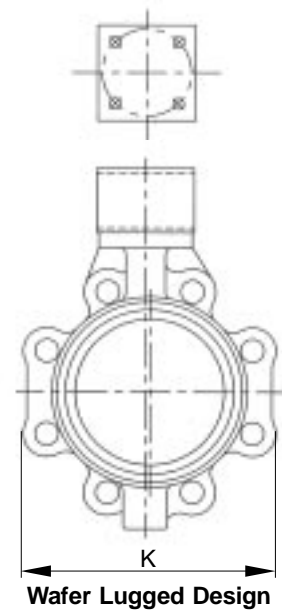
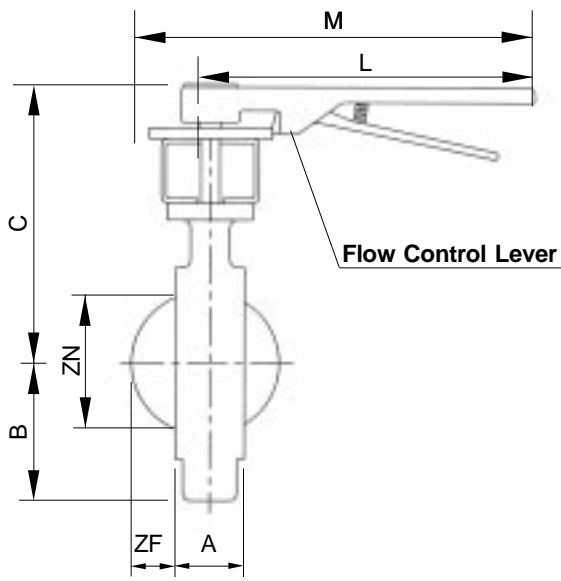
Shaft Bearings

The two bearings provided assure concentric stem rotation, allowing stem packing to provide maximum sealing effectiveness. As a standard, the bearings are made from nitrided stainless steel.

Actuator mounting Bracket

All valves are provided with brackets for easy on-site mounting of actuator. These brackets have actuator mounting holes conforming to ISO 5211.





Materials of Construction

Item No	Description	Carbon Steel	Stainless Steel
1	Body	ASTM A216 Gr. WCB*, Seat hard faced with 13% Cr.	ASTM A351 Gr. CF8M, Seat hard faced with stellite
2	Disc	ASTM A216 Gr. WCB	ASTM A351 Gr. CF8M
3	Seal	Laminated SS 304 + Graphite	Laminated SS 316 + Graphite
4	Retainer	ASTM A516 Gr. 70	ASTM A240 Type 316
5	Shaft	ASTM A479 Type 410	ASTM A479 Type 316
6	Packing	Graphite	Graphite
7	Fasteners	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
8	Bearing	SS 316 Nitrided	SS 316 Nitrided
9	Gear Unit	Worm type	Worm type

For other materials of construction, please refer Ordering Information.

* For service temperatures up to 427°C (800°F).

Dimensional Details

Wafer / Wafer Lugged - Class 150 (in mm)

Valve Size	A	B	C	F	G	H	J	K	L	M	ZN	ZF
80 (3")	48	95	237	67	300	218	127	191	508	619	62	17
100 (4")	54	112	257	67	300	218	157	229	508	619	92	29
150 (6")	57	146	317	67	300	218	216	279	NA	NA	141	52
200 (8")	64	180	362	67	400	218	270	343	NA	NA	178	67
250 (10")	71	227	431	148	400	290	324	406	NA	NA	237	92
300 (12")	81	252	553	148	400	290	381	483	NA	NA	289	114
350 (14")	92	276	595	148	400	290	413	533	NA	NA	323	127
400 (16")	102	310	790	215	400	290	470	597	NA	NA	373	147
450 (18")	114	342	848	215	400	415	533	635	NA	NA	420	162
500 (20")	127	385	929	215	400	415	584	699	NA	NA	469	180
600 (24")	154	455	1019	215	400	415	692	813	NA	NA	561	211

Wafer / Wafer Lugged - Class 300 (in mm)

Valve Size	A	B	C	F	G	H	J	K	L	M	ZN	ZF
80 (3")	48	97	245	67	300	218	127	206	508	619	62	17
100 (4")	54	112	265	67	300	218	157	238	508	619	92	29
150 (6")	59	149	325	67	300	218	216	308	NA	NA	141	52
200 (8")	73	182	387	67	400	218	270	375	NA	NA	178	67
250 (10")	83	216	456	148	400	290	324	438	NA	NA	237	92
300 (12")	92	254	578	148	400	290	381	514	NA	NA	273	114
350 (14")	117	486	657	148	400	290	448	584	NA	NA	310	105
400 (16")	133	527	852	215	400	290	505	648	NA	NA	358	122
450 (18")	149	599	910	215	400	415	568	711	NA	NA	402	136
500 (20")	159	679	1015	215	400	415	686	762	NA	NA	438	159
600 (24")	181	759	1105	215	400	415	720	889	NA	NA	498	184

Flanged - Class 150 (in mm)

Valve Size	A	B	C	F	G	H
80 (3")	203	95	237	67	300	218
100 (4")	229	112	257	67	300	218
150 (6")	267	146	317	67	300	218
200 (8")	292	180	362	67	400	218
250 (10")	330	227	431	148	400	290
300 (12")	356	252	553	148	400	290
350 (14")	381	276	595	148	400	290
400 (16")	406	310	790	215	400	290
450 (18")	432	342	848	215	400	415
500 (20")	457	385	929	215	400	415
600 (24")	508	455	1019	215	400	415

Flanged - Class 300 (in mm)

Valve Size	A	B	C	F	G	H
80 (3")	282	97	245	67	300	218
100 (4")	305	112	265	67	300	218
150 (6")	403	149	325	67	300	218
200 (8")	419	182	387	67	400	218
250 (10")	457	216	456	148	400	290
300 (12")	502	254	578	148	400	290
350 (14")	762	486	657	148	400	290
400 (16")	838	527	852	215	400	290
450 (18")	914	599	910	215	400	415
500 (20")	991	679	1015	215	400	415
600 (24")	1143	759	1105	215	400	415

Triple Offset Geometry

First Offset

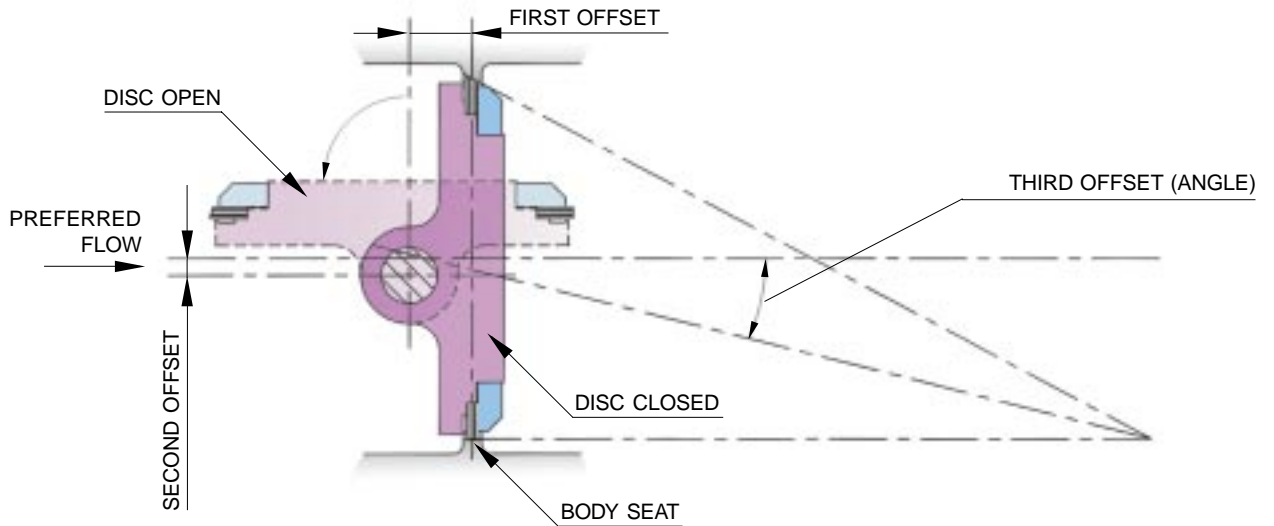
The centre of rotation of the disc is moved away from the seat. This allows complete sealing contact around the entire seal.

Second Offset

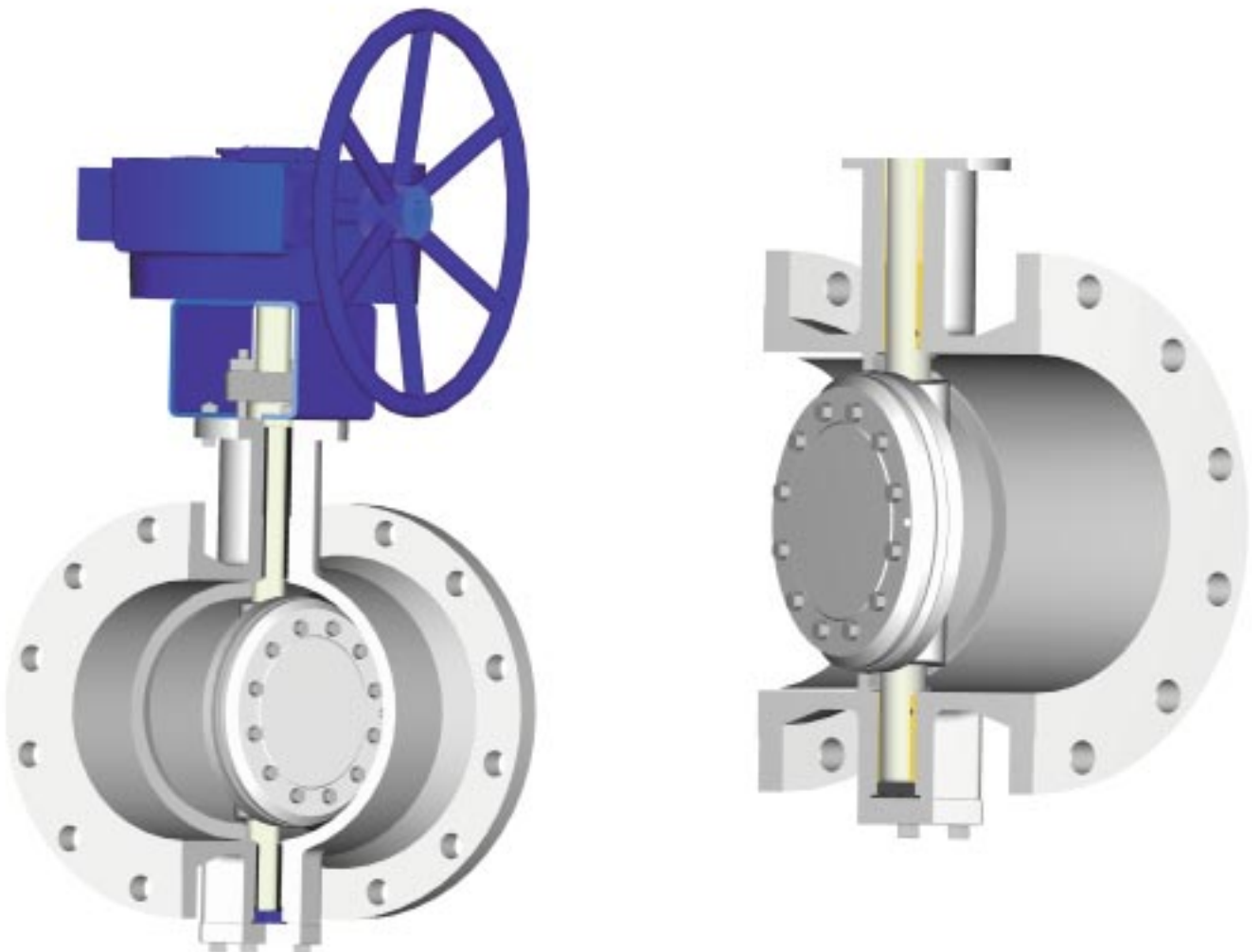
The centre of rotation of the disc is shifted from the valve body centre line. The extent of interference is reduced resulting in greater seal life.

Third Offset

The centre line of the sealing cone is tilted away from the bore centre line resulting in an ellipsoidal profile. The result is a **frictionless seal with uniform compressive sealing** around the entire seat.



The triple offset geometry is best suited for metal seated valves to provide bubble-tight shut-off on high temperature, high pressure and fire safe applications.



Standards of Conformance

Parameter	Compliance
Valve Design	API 609 (Category B) and MSS SP-68
Face-to-Face	Wafer/Wafer lugged Valves - API 609, ASME B16.10 and MSS SP-68 Flanged Valves - API 609 Long Pattern
End Flanges	ASME B16.5
Pressure Test	API 598
Fire-safe Design	API 6FA and BS 6755 Part II

Pressure Testing

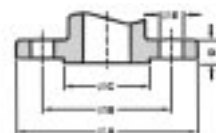
Valve Rating	Maximum CWP in kg/cm ²	Shell (Hydro) in kg/cm ²	Seat (hydro) in kg/cm ²	Seat (air) optional in kg/cm ²
Class 150	20 (285 psi)	32 (450 psi)	22 (315 psi)	5.6 (80 psi)
Class 300	52 (740 psi)	79 (1125 psi)	58 (815 psi)	5.6 (80 psi)

Pressure-Temperature Ratings ASME B16.34, 1996

Temp. in °F	Working Pressure in psig							
	WCB		LCB		CF8		CF8M	
	Cl. 150	Cl. 300	Cl. 150	Cl. 300	Cl. 150	Cl. 300	Cl. 150	Cl. 300
-20 to 100	285	740	265	695	275	720	275	720
200	260	675	250	655	230	600	235	620
300	230	655	230	640	205	540	215	560
400	200	635	200	620	180	495	195	515
500	170	600	170	585	170	465	170	480
600	140	550	140	535	140	435	140	450
650	125	535	125	525	125	430	125	445
700	110	535	110	520	110	425	110	430
750	95	505	95	475	95	415	95	425
800	80	410	80	390	80	405	80	420
850	65	270	65	270	65	395	65	420
900	50	170	50	170	50	390	50	415
950	35	105	35	105	35	380	35	385
1000	20	50	20	50	20	320	20	350

End Flange Dimensions - ASME B16.5, 1996

Valve Size	Class 150 Raised Face (in mm)						Class 300 Raised Face (in mm)							
	ØA	ØB	ØC	D	ØE	Bolt		ØA	ØB	ØC	D	ØE	Bolt	
						No.	Dia						No.	Dia
80 (3")	190	152	127	23.9 (0.94)	19	4	5/8"	210	168	127	28.6	22	8	3/4"
100 (4")	229	190	157	23.9	19	8	5/8"	254	200	157	31.8	22	8	3/4"
150 (6")	279	241	216	25.4	22	8	3/4"	318	270	216	36.6	22	12	3/4"
200 (8")	343	298	270	28.6	22	8	3/4"	381	330	270	41.3	25	12	7/8"
250 (10")	406	362	324	30.2	25	12	7/8"	444	387	324	47.7	29	16	1"
300 (12")	483	432	381	31.8	25	12	7/8"	521	451	381	50.8	32	16	1 1/8"
350 (14")	533	476	413	35.0	29	12	1"	584	514	413	54.0	32	20	1 1/8"
400 (16")	597	539	470	36.6	29	16	1"	648	571	470	57.2	35	20	1 1/4"
450 (18")	635	578	533	39.7	32	16	1 1/8"	711	628	533	60.4	35	24	1 1/4"
500 (20")	698	635	584	42.9	32	20	1 1/8"	775	686	584	63.5	35	24	1 1/4"
600 (24")	813	749	692	47.7	35	20	1 1/4"	914	813	692	69.9	41	24	1 1/2"



Height of raised face is 1.6mm (0.06").

Ordering Information

Valve Size	Valve Type	Operator	Class Rating	Ends	Body	Disc	Disc Seat	Shaft
80mm (3")	M - Metal-seated Butterfly Valve	G - Gear Unit	2 - Class 150	B - Wafer Flangeless	1 - WCB	1 - WCB	A - AISI 304 + Graphite B - AISI 316 + Graphite	A - AISI 410 B - AISI 316
100mm (4")		L - Lever						
150mm (6")		N - Bare Shaft	E - Electrical Actuator	3 - CF3	3 - CF3			
200mm (8")		H - Pneumatic Actuator - Spring Return				4 - CF3M		
250mm (10")			P - Pneumatic Actuator - Double Acting	5 - CF8	5 - CF8			
300mm (12")		6 - CF8M				6 - CF8M		
350mm (14")								
400mm (16")								
450mm (18")								
500mm (20")								
600mm (24")								

Other sizes available on request.



Administrative Office and Manufacturing Plant at Manapakkam



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* The name METSEAL is under registration

PB No. : C1101-0/01.03

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