Engineering Specification

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

Series 88

Ductile Iron Full Lug Butterfly Valves

Sizes: 2" – 48"

Typical Service

These concentric, soft seated butterfly valves are engineered for broad use across water, air, oil, and compatible gas systems. Typical applications include chilled and condenser water loops, irrigation networks, and process cooling circuits. The valves perform reliably in throttling and isolation service because the centered disc and resilient seat provide stable control and repeatable tight shutoff. Lug style valves are designed for dead-end service to the full pressure rating of the valve. Series 88 butterfly valves are especially well suited for higher velocity service and vacuum service. All valves are 100% factory tested to guarantee bi-directional, bubble tight shutoff at fully rated pressure.

Series 88 butterfly valves can be used both indoors and outdoors, with gear operators rated to IP67 to ensure a watertight seal and long service life.

Features

- Phenolic backed seat (2" – 14"), aluminum backed seat (16" – 48")
- Non-collapsible, resilient elastomer seat. Available in EPDM or Viton.
- ISO 5211 mount is standard. Double D shaft is standard 2" – 10" while keyway design is supplied 12" – 48"
- Stem is a one-piece design for 2" - 24" and two piece design for 26" - 48" for maximum strength and is retained in valve body for blowout proof operation. 316SS is standard for (2" – 12") and 431SS is standard for (14" – 48")
- Stem bushings provide shaft support for proper stem alignment and minimize stem deflection. Duralon bushings are standard material in 2" – 12" sizes. Bronze bushings are standard in 14" – 48" sizes.
- The stem seal prevents external contamination of stem area and provide backup for the primary shaft seal formed by the disc/seat interface.
- ASTM A536 ductile iron body available in full lug (Series 88) designed for use between ANSI 125 and 150 flanges. Face-to-face dimensions comply with API 609 and MSS-SP 67 Type I.
- 10 position locking handle is standard for sizes 2" – 6", IP67 rated gear operator is standard for sizes 8" – 48", and available for 2" – 6" as an option.

Approvals

The Valves are MSS-SP-67 Type I – Valves for tight shut-off (tested per section 10.2.1). As specified in MSS-SP-67, we conduct 100% shell testing at 1.5 times rated pressure and seat leakage testing a 1.1 times rated pressure



Series 88 (Full Lug)

Call customer service if you need assistance with technical details.

PRESSURE/TEMPERATURE - NON-SHOCK			
MODEL	SIZE	MATERIAL	RATING
88	2" – 12"	Ductile Iron	200 psi
88	14" – 48"	Ductile Iron	150 psi

Max. temp. can be limited by seat material. Consult Factory. Not Recommended for Steam Service. 54" & 60" available upon request.

Materials

MODEL 88	
Body	Ductile Iron Epoxy Electrostatic Sprayed (RAL9005-NSF)
Stem	316SS (2" – 12"), 431SS (14" – 48")
Disc	316SS
Seat	EPDM -5ºF to 250ºF (-15ºC to +121ºC)

ACTUATOR OPTIONS
Electric Actuator
Service: On-Off & Modulating
Torque Range (in.-lb): 347 to 20,000
Enclosure: Weatherproof (IP67, Type 4, 4X) or (ATEX/IECEx Ex d IIB T4)
Power Supply 110/220V AC 1PH, 50/60Hz, ± 10%, 24V AC/DC
Motor: Class F Reversible Motor
Limit Switches: (2) Operational & (2) Auxillary, Open / Close, 6A 125/250VAC
Mounting: ISO 5211

Performance Guidelines

Guidelines for throttling service:

Liquids – Line velocity should not exceed 20 ft/sec

Gases – Line velocity should not exceed 15,000 ft/min

NOTICE

Do not use EPDM when hydrocarbons are present.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

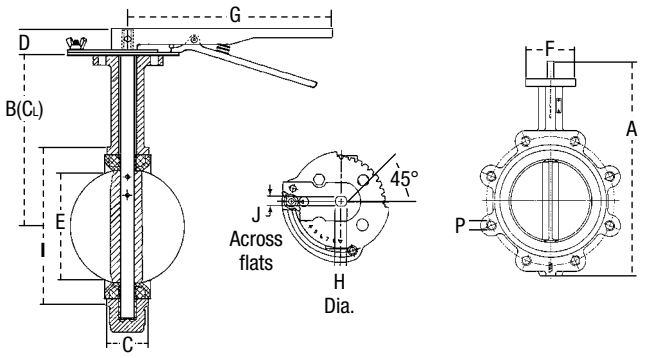
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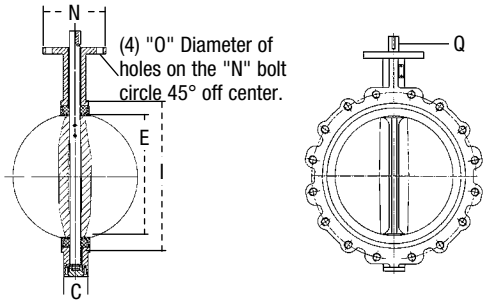
Mueller Steam Specialty™

A WATTS Brand

Dimensions and Weights *Top Works Detail Per ISO 5211

2" through 24"



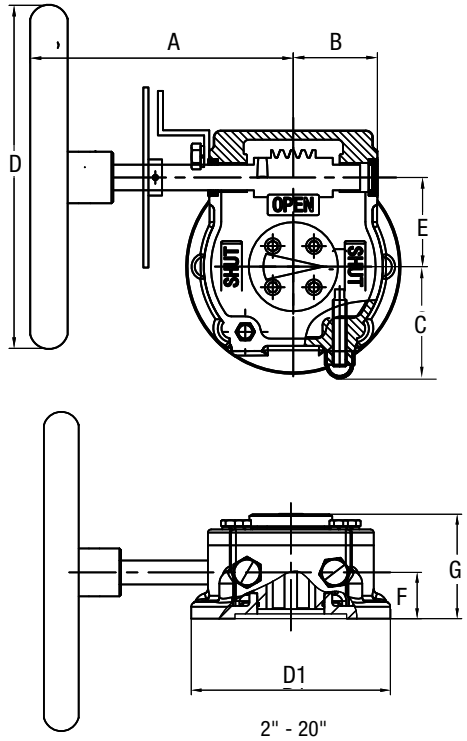


SIZE	DIMENSIONS																			
	A		B		C		D		E		F		G		H		I		J	
	in.	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*
2"	10¾	273	6⅜	161	1⅝	42	1¼	32	2⅛	54	3 1/16	77	10½	267	½	13	3¾	95	⅜	9
2½"	11⅝	295	6⅞	175	1¾	45	1¼	32	2½	64	3 1/16	77	10½	267	½	13	4¼	108	⅜	9
3"	12⅛	308	7⅛	181	1¾	45	1¼	32	3⅛	79	3 1/16	77	10½	267	½	13	4¾	120	⅜	9
4"	13⅝	346	7⅞	200	2	52	1¼	32	4⅛	105	3⅝	92	10½	267	⅝	16	6 1/16	154	7/16	11
5"	14⅝	372	8⅜	213	2 3/16	56	1¼	32	4⅞	124	3⅝	92	10½	267	¾	19	7⅛	181	½	13
6"	15⅝	397	8⅞	226	2 3/16	56	1¼	32	6⅛	156	3⅝	92	10½	267	¾	19	8 3/16	208	½	13
8"	18⅞	479	10¼	260	2⅜	60	1¾	45	8	202	5	125	14	356	⅞	22	10¼	260	⅝	16
10"	21¼	540	11½	292	2⅝	66	1¾	45	9⅞	251	5	125	14	356	1⅛	29	12⅝	320	13/16	21
12"	24⅝	626	13¼	337	3	76	1¾	45	11⅞	301	6	150	14	356	1¼	32	14¾	375	–	–
14"	26¾	679	14½	368	3	76	1¾	45	13⅛	333	6	150	–	–	1¼	32	15 15/16	405	–	–
16"	30	762	15¾	400	3⅜	87	2	50	15⅜	391	6⅞	175	–	–	1 5/16	33	18½	470	–	–
18"	31½	800	16⅝	422	4⅛	105	2	50	17⅜	442	6⅞	175	–	–	1½	38	20 11/16	525	–	–
20"	35 5/16	897	18⅞	480	5⅛	130	2⅛	53	19⅜	493	8¼	210	–	–	1⅝	41	22¼	565	–	–
24"	42⅞	1088	22⅛	562	6	152	2¼	58	23⅜	594	8¼	210	–	–	2	50	27 5/16	693	–	–
30"	50⅝	1286	26	660	6½	167	2.5984	66	29⅜	747	11⅞	300	NA	NA	2½	63.35	33¾	859	NA	NA
36"	58⅝	1494	28⅜	720	8	203	4.6456	118	35⅜	899	11⅞	300	NA	NA	3	75	40¼	1025	NA	NA
42"	69¾	1773	33¾	858	9⅞	251	5.1181	130	41⅜	1051	11⅞	300	NA	NA	3¾	95	47	1196	NA	NA
48"	77¾	1976	37	941	10⅞	276	5.9055	150	47⅜	1203	13¾	350	NA	NA	4⅛	105	53½	1363	NA	NA

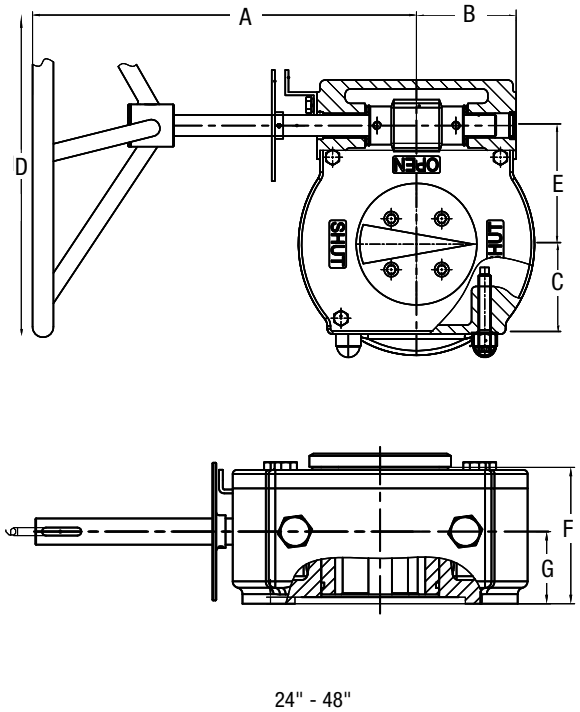
SIZE	TOP PLATE DRILLING						TAPPED LUG DATA		KEY WAY		WEIGHT (LB)†	
	N		O		P		No	Lug Thread	Q			
	in.	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lb*	*kg*
2"	2	50	¼	7	4¾	121	4	⅝"-11UNC	–	–	8	6
2½"	2	50	¼	7	5½	140	4	⅝"-11UNC	–	–	10	7
3"	2	50	¼	7	6	150	4	⅝"-11UNC	–	–	10	7
4"	2¾	70	⅜	10	7½	191	8	⅝"-11UNC	–	–	17	12
5"	2¾	70	⅜	10	8½	216	8	¾"-10UNC	–	–	25	16
6"	2¾	70	⅜	10	9½	241	8	¾"-10UNC	–	–	27	20
8"	4	102	½	13	11¾	298	8	¾"-10UNC	–	–	40	29
10"	4	102	½	13	14¼	362	12	⅞"-9UNC	–	–	63	48
12"	5	125	½	13	17	432	12	⅞"-9UNC	¼ x 1¼	6 x 32	107	78
14"	5	125	½	13	18¾	476	12	1"-8UNC	¼ x 1¼	6 x 32	156	99
16"	5½	140	1 1/16	18	21¼	540	16	1"-8UNC	5/16 x 1 13/16	8 x 46	203	140
18"	5½	140	1 1/16	18	22¾	578	16	1⅛"-7UNC	⅜ x 1 9/16	10 x 40	269	188
20"	6½	165	⅞	22	25	635	20	1⅛"-7UNC	⅜ x 1 9/16	10 x 40	392	248
24"	6½	165	⅞	22	29½	750	20	1¼"-7UNC	½ x 2⅜	13 x 60	593	450
30"	10	254	1 1/16	18	36	915	28	1¼"-7UNC		2-18	1389	630
36"	10	254	1 1/16	18	42¾	1086	32	1½"-6UNC		2-20	1389	630
42"	10	254	1 1/16	18	49½	1258	36	1½"-6UNC		2-25	2795	1268
48"	11¾	298	⅞	22	56	1425	44	1½"-6UNC		2-28	3955	1794

SEATING TORQUE	
Buna-N, EPDM (in./lb) Normal Conditions	
Size	*WET/DRY*
2"	134/214
2½"	190/289
3"	250/387
4"	390/644
5"	600/959
6"	907/1,542
8"	1,697/2,919
10"	2,500/4,857
12"	3,300/7,071
14"	3,500/7,305
16"	5,500/10,027
18"	8,200/13,437
20"	10,000/17,925
24"	18,680/28,020
30"	33,475/50,125
36"	46,575/69,885
42"	80,105/120,374
48"	112,504/167,675

(FULL OPEN)	
Size	CV Rating
2"	135
2½"	220
3"	302
4"	600
5"	1,022
6"	1,579
8"	3,136
10"	5,340
12"	8,250
14"	11,917
16"	16,388
18"	21,705
20"	27,908
24"	43,116
30"	58,255
36"	86,380
42"	135,540
48"	176,675



2" - 20"

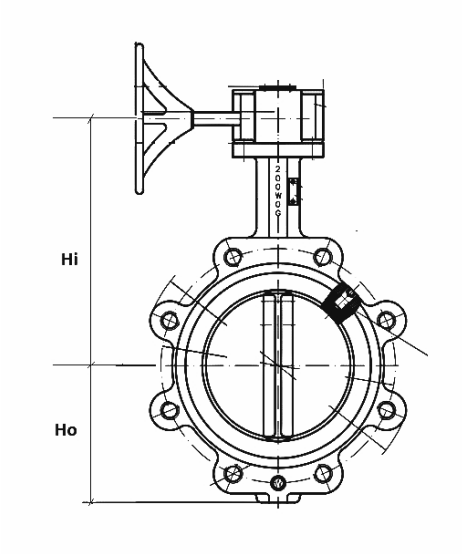


24" - 48"

Gearbox Dimensions

SIZE (IN.)	RATIO	DIMENSIONS														WEIGHT	
		A		B		C		D		E		F		G			
		in.	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lb*	*kg*
2"	27:1	5¼	136	1¾	45	1¾	45	5½	140	1¼	35	1	27.5	2	52	4	1¾
2½"	27:1	5¼	136	1¾	45	1¾	45	5½	140	1¼	35	1	27.5	2	52	4	1¾
3"	27:1	5¼	136	1¾	45	1¾	45	5½	140	1¼	35	1	27.5	2	52	4	1¾
4"	37:1	5½	140	2	52	2½	65	6¼	160	2	52	1¼	32	2¾	69	10¼	4¾
5"	37:1	5½	140	2	52	2½	65	6¼	160	2	52	1¼	32	2¾	69	10¼	4¾
6"	37:1	5½	140	2	52	2½	65	6¼	160	2	52	1¼	32	2¾	69	10	4⅝
8"	37:1	8¼	212	2⅝	63	2½	65	7¾	200	2	52	1¼	32	2¾	69	10	4½
10"	37:1	8¼	212	2⅝	63	2½	65	7¾	200	2	52	1¼	32	2¾	69	9¾	4½
12"	38:1	9	230	3	75	2¾	72	11	280	2 7/16	62	1¼	32	2¾	71	15	6¾
14"	38:1	9	230	3	75	2¾	72	11	280	2 7/16	62	1¼	32	2¾	71	14¾	6¾
16"	40:1	11¾	300	3½	88	3½	88	15¾	400	3	79	1¾	46	3¾	95	27	12¼
18"	47:1	12½	317	3½	88	4	100	15¾	400	3½	89	2	50	4	101	34 9/16	15¾
20"	61:1	14 7/16	366	4½	113	4¼	105	15¾	400	4 6/16	112	2¼	55	2¾	118	54¼	24⅝
24"	167:1	14 9/16	370	4½	113	4¼	105	15¾	400	4 6/16	112	2¼	55	2¾	118	64 7/16	29¼
26"	167:1	14 9/16	370	4½	113	4¼	105	15¾	400	4 7/16	112	2¼	55	2¾	118	64 7/16	29¼
28"	208:1	14¼	360	6	150	6	150	15¾	400	5	129	2 7/16	62	5	127	90 6/16	41
30"	208:1	14¼	360	6	150	6	150	15¾	400	5	129	2 7/16	62	5	127	90 6/16	41
32"	208:1	14¼	360	6	150	6	150	15¾	400	5	129	2 7/16	62	5	127	90 6/16	41
36"	290:1	15¼	385	6½	165	6	150	23½	600	6¼	157	2¾	70	6¼	160	139	63
40"	290:1	15¼	385	6½	165	6	150	23½	600	6¼	157	2¾	70	6¼	160	139	63
42"	348:1	15¼	385	6½	165	6	150	23½	600	6¼	157	2¾	70	6¼	160	147¾	67
48"	519:1	18	455	7¾	195	7¾	196	23½	600	7¼	182	2¾	71	6 6/16	165	209 7/16	95

SIZE	Hi		Ho	
	in.	*mm*	*in.*	*mm*
2"	7.76	197	4.41	112
2-1/2"	8.31	211	4.76	121
3"	8.54	217	5.00	127
4"	9.29	236	5.75	146
5"	9.80	249	6.26	159
6"	10.31	262	6.73	171
8"	11.89	302	8.66	220
10"	13.15	334	9.76	248
12"	14.94	380	11.30	287
14"	16.16	411	12.28	312
16"	18.29	465	14.29	363
18"	19.15	487	14.88	378
20"	21.44	545	16.42	417
24"	24.98	635	20.71	526
30"	29.32	745	22.05	560
36"	31.95	812	25.83	656
42"	38.65	982	30.60	777
48"	41.91	1064	34.02	864



Recommended Bolt Torque Values

Size	Thread Size	Number Required	Bolt Length (in.)	Torque min. (ft-lb)	Torque max. (ft-lb)
2"	⅝"-11UNC	8	1¼"	20	60
2½"	⅝"-11UNC	8	1½"	20	60
3"	⅝"-11UNC	8	1½"	20	60
4"	⅝"-11UNC	16	1¾"	20	60
5"	¾"-10UNC	16	1¾"	30	100
6"	¾"-10UNC	16	1¾"	30	100
8"	¾"-10UNC	16	2"	30	100
10"	⅞"-9UNC	24	2"	50	200
12"	⅞"-UNC	24	2¼"	50	200
14"	1"-8UNC	24	2¼"	70	300
16"	1"-8UNC	32	2½"	70	300
18"	1⅛"-7UNC	32	2¾"	100	400
20"	1⅛"-7UNC	40	3"	100	400
24"	1¼"-7UNC	40	4"	150	500
30"	1¼"-7UNC	48 8*	4½ 4¼*	140	520
36"	1½"-6UNC	56 8*	6 5¼*	200	800
42"	1½"-6UNC	64 8*	6½ 5½*	200	800
48"	1½"-6UNC	44	8"	200	800

Bolt length based on nominal mid length between max bolt length, and a minimum length of 1.5 diameter thread engagement.
*Quantity and length required for blind holes drilled at top and bottom of valve.

How to order Mueller Steam Specialty Series 88 Butterfly Valves

Example: 04.0-88IHH61

This is a 4 lugged body valve with a ductile iron body, 316 SS stem, 316 SS Disc, EPDM Seat and a ten position handle

4.0 - 88 - I H H - 6 - 1

SIZE:

MODEL:

88 - Full Lug (Replaces previous Model 66M)

BODY:

I - Ductile Iron

STEM:

H - 316SS (Standard 2" – 12")
P - 431SS (Standard 14" – 48")

DISC:

H - 316SS

SEAT:

4 - Viton
6 - EPDM

OPERATOR:

1 - 10-Position Lever handle (Lockable in both open and closed positions)
5 - Gear Operator (Recommended for 10 and above)
E - Electric Actuator

Mueller Steam Specialty™

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