

Engineering Specification

Job Name _____

Contractor _____

Job Location _____

Approval _____

Engineer _____

Contractor's P.O. No. _____

Approval _____

Representative _____

Model: 88

Ductile Iron Full Lug Butterfly Valves

Sizes: 2" – 24"

Typical Service

These soft-seated butterfly valves are designed for a variety of general applications in the control of water, air, oil, gases, and corrosive media. Examples of applications where these valves can be used are irrigation, cooling water, and fire protection systems. They are equally effective for on-off, throttling, or isolation service requirements. Lug style valves are designed for dead-end service to the full pressure rating of the valve. Model 88 butterfly valve is especially well suited for higher velocity service and vacuum service. All valves are 100% factory tested to guarantee bi-direction, drop 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 water-tight seal and long service life.

Features

- Phenolic backed (2" – 14"), aluminum backed (14" – 60")
- 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 14" – 60"
- Stem is a one-piece design for maximum strength and is retained in valve body for blowout proof operation. 316SS is standard for 316SS discs (2" – 12") and 431SS is standard for 316SS discs (14" – 60")
- 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" – 60" sizes.
- Stem seals prevent external contamination of stem area and provide backup for the primary shaft seal formed by the disc/seat interface.
- ASTM-A-536 ductile iron body available in full lug (Model 88) designed for use between ANSI 125 and 150 flanges. Face-to-face dimension comply with API 609 and MSS-SP-67.
- 10 position locking handle is standard for sizes 2"-6", IP67 rated gear operator is standard for sizes 8"-60", and available for 2"-6" by request.

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 at 1.1 times rated pressure.



Model 88 (Full Lug)

PRESSURE/TEMPERATURE - NON-SHOCK			
MODEL	SIZE	MATERIAL	RATING
88	2" - 12"	Ductile Iron	250psi
88	14" - 60"	Ductile Iron	150psi

Max. temp. can be limited by seat material. Consult Factory. Not Recommended for Steam Service.

Call customer service if you need assistance with technical details.

Materials

MODEL 88	
Body	Ductile Iron Epoxy Electrostatic Sprayed (RAL9005-NSF)
Stem	316SS (2"-12"), 431SS (14"-60")
Disc	316SS
Seat	EPDM - 5°F to 250°F (-15°C to +121°C)

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) Auxiliary, Open / Close, 6A 125/250VAC

Mounting: ISO 5211

Performance Guidelines

Guidelines for throttling service:

Liquids – Line velocity should not exceed 20ft./sec.

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

NOTICE

Do not use EPDM when hydrocarbons are present.

NOTICE

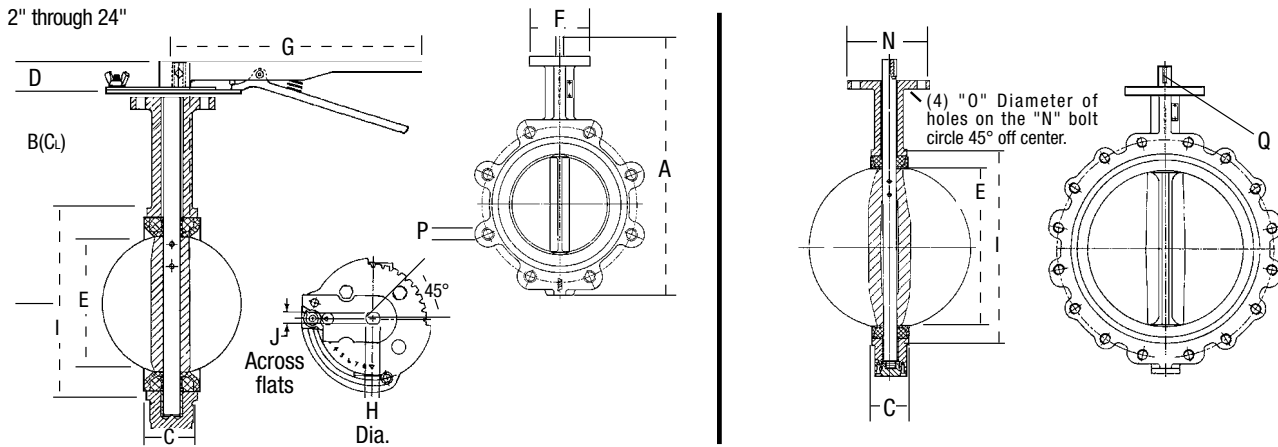
The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation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

Mueller Steam Specialty product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Mueller Steam Specialty Technical Service. Mueller Steam Specialty reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Mueller Steam Specialty products previously or subsequently sold.

Mueller Steam Specialty™

A WATTS Brand

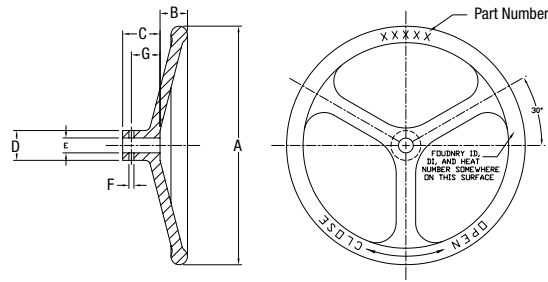
Dimensions and Weights *Top Works Detail Per ISO 5211



SIZE	DIMENSIONS																			
	A		B		C		D		E		F		G		H		B		J	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2"	10 ³ / ₄	273	6 ³ / ₈	161	1 ¹ / ₂	42	1 ¹ / ₄	32	2 ¹ / ₂	54	3 ¹ / ₁₆	77	10 ¹ / ₂	267	1 ¹ / ₂	13	3 ³ / ₄	95	3 ³ / ₈	9
2 ¹ / ₂ "	11 ¹ / ₂	295	6 ⁷ / ₈	175	1 ³ / ₄	45	1 ¹ / ₄	32	2 ¹ / ₂	64	3 ¹ / ₁₆	77	10 ¹ / ₂	267	1 ¹ / ₂	13	4 ¹ / ₄	108	3 ³ / ₈	9
3"	12 ¹ / ₂	308	7 ¹ / ₈	181	1 ³ / ₄	45	1 ¹ / ₄	32	3 ¹ / ₈	79	3 ¹ / ₁₆	77	10 ¹ / ₂	267	1 ¹ / ₂	13	4 ³ / ₄	120	3 ³ / ₈	9
4"	13 ³ / ₈	346	7 ⁷ / ₈	200	2	52	1 ¹ / ₄	32	4 ¹ / ₈	105	3 ³ / ₈	92	10 ¹ / ₂	267	5 ¹ / ₈	16	6 ¹ / ₁₆	154	7 ¹ / ₁₆	11
5"	14 ³ / ₈	372	8 ³ / ₈	213	2 ¹ / ₁₆	56	1 ¹ / ₄	32	4 ¹ / ₈	124	3 ³ / ₈	92	10 ¹ / ₂	267	3 ³ / ₄	19	7 ¹ / ₈	181	1 ¹ / ₂	13
6"	15 ³ / ₈	397	8 ⁷ / ₈	226	2 ¹ / ₁₆	56	1 ¹ / ₄	32	6 ¹ / ₈	156	3 ³ / ₈	92	10 ¹ / ₂	267	3 ³ / ₄	19	8 ³ / ₁₆	208	1 ¹ / ₂	13
8"	18 ¹ / ₈	479	10 ¹ / ₄	260	2 ³ / ₈	60	1 ³ / ₄	45	8	202	5	125	14	356	7 ¹ / ₈	22	10 ¹ / ₄	260	5 ¹ / ₈	16
10"	21 ¹ / ₄	540	11 ¹ / ₂	292	2 ³ / ₈	66	1 ³ / ₄	45	9 ¹ / ₈	251	5	125	14	356	1 ¹ / ₈	29	12 ³ / ₈	320	1 ³ / ₁₆	21
12"	24 ³ / ₈	626	13 ¹ / ₄	337	3	76	1 ³ / ₄	45	11 ¹ / ₈	301	6	150	14	356	1 ¹ / ₄	32	14 ³ / ₄	375	-	-
14"	26 ³ / ₄	679	14 ¹ / ₂	368	3	76	1 ³ / ₄	45	13 ¹ / ₈	333	6	150	-	-	1 ¹ / ₄	32	15 ¹ / ₁₆	405	-	-
16"	30	762	15 ³ / ₄	400	3 ³ / ₈	87	2	50	15 ³ / ₈	391	6 ¹ / ₈	175	-	-	1 ¹ / ₁₆	33	18 ¹ / ₂	470	-	-
18"	31 ¹ / ₂	800	16 ³ / ₈	422	4 ¹ / ₈	105	2	50	17 ³ / ₈	442	6 ¹ / ₈	175	-	-	1 ¹ / ₂	38	20 ¹ / ₁₆	525	-	-
20"	35 ¹ / ₁₆	897	18 ⁷ / ₈	480	5 ¹ / ₈	130	2 ¹ / ₈	53	19 ³ / ₈	493	8 ¹ / ₄	210	-	-	1 ¹ / ₈	41	22 ¹ / ₄	565	-	-
24"	42 ⁷ / ₈	1088	22 ¹ / ₁₆	562	6	152	2 ¹ / ₄	58	23 ³ / ₈	594	8 ¹ / ₄	210	-	-	2	50	27 ⁷ / ₁₆	693	-	-
30"	50 ³ / ₈	1286	26	660	6 ¹ / ₂	167	2.5984	66	29 ³ / ₈	747	11 ¹ / ₈	300	NA	NA	2 ¹ / ₂	63.35	33 ³ / ₄	859	NA	NA
36"	58 ³ / ₈	1494	28 ³ / ₈	720	8	203	4.6456	118	35 ³ / ₈	899	11 ¹ / ₈	300	NA	NA	3	75	40 ¹ / ₄	1025	NA	NA
42"	69 ³ / ₄	1773	33 ³ / ₄	858	9 ¹ / ₈	251	5.1181	130	41 ¹ / ₈	1051	11 ¹ / ₈	300	NA	NA	3 ³ / ₄	95	47	1196	NA	NA
48"	77 ³ / ₄	1976	37	941	10 ¹ / ₈	276	5.9055	150	47 ³ / ₈	1203	13 ³ / ₄	350	NA	NA	4 ¹ / ₈	105	53 ¹ / ₂	1363	NA	NA
54"	84 ³ / ₈	2150	40	1015	15	381	7.0866	180	53 ³ / ₈	1356	14	356	NA	NA	4 ³ / ₄	120	59 ¹ / ₂	1515	NA	NA
60"	88 ³ / ₈	2240	41 ³ / ₈	1050	15	381	7.0866	180	59 ³ / ₈	1508	14	356	NA	NA	6 ¹ / ₄	160	61 ¹ / ₈	1564	NA	NA

SIZE	TOP PLATE DRILLING				TAPPED LUG DATA				KEY WAY		WEIGHT (LBS.)†		
	N		O		Bolt Circle		No	Bolt		Q		lb	kg
	in.	mm	in.	mm	in.	mm	in.	mm		in.	mm		
2"	2	50	1/4	7	4 ³ / ₄	121	4	5/8"-11UNC x 1 ¹ / ₂ "		-	-	8	6
2 ¹ / ₂ "	2	50	1/4	7	5 ¹ / ₂	140	4	5/8"-11UNC x 1 ³ / ₄ "		-	-	10	7
3"	2	50	1/4	7	6	150	4	5/8"-11UNC x 1 ³ / ₄ "		-	-	10	7
4"	2 ³ / ₄	70	3/8	10	7 ¹ / ₂	191	8	5/8"-11UNC x 2"		-	-	17	12
5"	2 ³ / ₄	70	3/8	10	8 ¹ / ₂	216	8	3/4"-10UNC x 2 ³ / ₁₆ "		-	-	25	16
6"	2 ³ / ₄	70	3/8	10	9 ¹ / ₂	241	8	3/4"-10UNC x 2 ³ / ₁₆ "		-	-	27	20
8"	4	102	1/2	13	11 ³ / ₄	298	8	3/4"-10UNC x 2 ³ / ₈ "		-	-	40	29
10"	4	102	1/2	13	14 ¹ / ₄	362	12	7/8"-9UNC x 2 ³ / ₈ "		-	-	63	48
12"	5	125	1/2	13	17	432	12	7/8"-9UNC x 3"		1/4 x 1 ¹ / ₄	6 x 32	107	78
14"	5	125	1/2	13	18 ³ / ₄	476	12	1"-8UNC x 3"		1/4 x 1 ¹ / ₄	6 x 32	156	99
16"	5 ¹ / ₂	140	1 ¹ / ₁₆	18	21 ¹ / ₄	540	16	1"-8UNC x 3 ³ / ₈ "		5/16 x 1 ¹ / ₁₆	8 x 46	203	140
18"	5 ¹ / ₂	140	1 ¹ / ₁₆	18	22 ³ / ₄	578	16	1 ¹ / ₈ "-7UNC x 4 ¹ / ₈ "		3/8 x 1 ¹ / ₁₆	10 x 40	269	188
20"	6 ¹ / ₂	165	7/8	22	25	635	20	1 ¹ / ₈ "-7UNC x 5 ¹ / ₈ "		3/8 x 1 ¹ / ₁₆	10 x 40	392	248
24"	6 ¹ / ₂	165	7/8	22	29 ¹ / ₂	750	20	1 ¹ / ₄ "-7UNC x 6"		1/2 x 2 ³ / ₈	13 x 60	593	450
30"	10	254	1 ¹ / ₁₆	18	36	915	28	1 ¹ / ₄ "-7UNC x 9 ¹ / ₄ "			2-18	1389	630
36"	10	254	1 ¹ / ₁₆	18	42 ³ / ₄	1086	32	1 ¹ / ₂ "-6UNC x 11 ¹ / ₄ "			2-20	1389	630
42"	10	254	1 ¹ / ₁₆	18	49 ¹ / ₂	1258	36	1 ¹ / ₂ "-6UNC x 11 ¹ / ₄ "			2-25	2795	1268
48"	11 ³ / ₄	298	7/8	22	56	1425	44	1 ¹ / ₂ "-6UNC x 12 ³ / ₄ "			2-28	3955	1794
54"	14	356	1 ¹ / ₄	32	62 ³ / ₄	1594	44	1 ³ / ₄ "-5UNC x 14 ¹ / ₄ "			2-32	5057	2294
60"	14	356	1 ¹ / ₄	32	69 ¹ / ₄	1759	52	1 ³ / ₄ "-5UNC x 15"			2-40	6382	2895

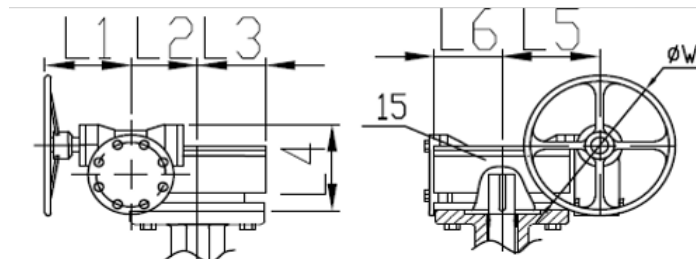
SEATING TORQUE		(FULL OPEN)	
Buna-N, EPDM (in./lbs.)		Size	CV Rating
Size	Normal Conditions WET/DRY		
2"	134/214	2"	135
2 ¹ / ₂ "	190/289	2 ¹ / ₂ "	220
3"	250/387	3"	302
4"	390/644	4"	600
5"	600/959	5"	1,022
6"	907/1,542	6"	1,579
8"	1,697/2,919	8"	3,136
10"	2,500/4,857	10"	5,340
12"	3,300/7,071	12"	8,250
14"	3,500/7,305	14"	11,917
16"	5,500/10,027	16"	16,388
18"	8,200/13,437	18"	21,705
20"	10,000/17,925	20"	27,908
24"	18,680/28,020	24"	43,116
30"	33,475/50,125	30"	58,255
36"	46,575/69,885	36"	86,380
42"	80,105/120,374	42"	135,540
48"	112,504/167,675	48"	176,675
54"	145,670/197,805	54"	205,125
60"	211,540/255,890	60"	245,744



Key:

- F = Mounting Flange Diameter
- N = Mounting Bolt Circle Diameter
- O = Diameter of Holes
- D = Length of Stem Sticking Out From the Top of the Flange Surface
- J = Across Flats, Stem Dimension for Sizes 2" to 10"
- H = Shaft Diameter for Sizes 2" to 10"
- Q = Stem Key Dimension for Sizes 12" to 24"

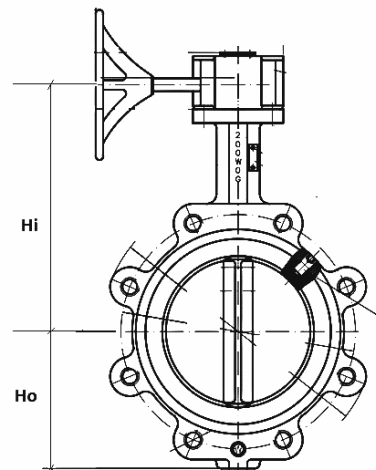
A	B	C	D	E	F	G	WEIGHT	BFV SIZE
Ø6.00	1.25	1.88	Ø1.50	Ø.64 - Ø.66 1.44	Ø.183 - Ø.193	1.44	4 lbs	2" - 6"
Ø12.00	1.38	1.88	Ø1.50	Ø.75 - Ø.77	Ø.245 - Ø.255	1.44	7 lbs	8" - 12"
Ø18.00	1.62	1.88	Ø2.19	Ø.75 - Ø.77	Ø.245 - Ø.255	1.44	12 lbs	14" - 16"
Ø18.00	1.62	1.88	Ø2.19	Ø1.00 - Ø1.02	Ø.245 - Ø.255	1.44	18 lbs	18" - 20"
Ø24.00	1.62	2.38	Ø2.00	Ø1.00 - Ø1.02	Ø.245 - Ø.255	1.44	26 lbs	24" - 36"



Gear Actuator Dimensions (mm)

SIZE	ØW	L1	L2	L3	L4	L5	L6
30"	400	190	140	160	208	223	146
36"	400	190	162	170	230	238	170
42"	400	190	162	170	230	238	170
48"	450	245	236	180	279	310	250
54"	810	280	316	223	350	385	319
60"	810	280	316	223	350	385	319

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
54"	43.41	1103	35.52	902
60"	43.41	1103	35.52	902



Recommended Bolt Torque Values

Size	Thread Size	Number Required	Bolt Length (in)	Torque min. (Ft-lbs)	Torque max. (Ft-lbs)
2"	5/8"-11UNC	4	1 1/4"	20	60
2 1/2"	5/8"-11UNC	4	1 1/2"	20	60
3"	5/8"-11UNC	4	1 1/2"	20	60
4"	5/8"-11UNC	8	1 3/4"	20	60
5"	3/4"-10UNC	8	1 3/4"	30	100
6"	3/4"-10UNC	8	2"	30	100
8"	3/4"-10UNC	8	2 1/4"	30	100
10"	7/8"-9UNC	12	2 1/4"	50	200
12"	7/8"-UNC	12	2 1/2"	50	200
14"	1"-8UNC	12	2 3/4"	70	300
16"	1"-8UNC	16	2 3/4"	70	300
18"	1 1/8"-7UNC	16	3 1/2"	100	400
20"	1 1/8"-7UNC	20	3 1/2"	100	400
24"	1 1/4"-7UNC	20	3 3/4"	150	500
30"	1 1/4"-7UNC	28	7"	140	520
36"	1 1/2"-6UNC	32	9"	200	800
42"	1 1/2"-6UNC	36	9 1/4"	200	800
48"	1 1/2"-6UNC	44	10 1/4"	200	800
54"	1 3/4"-5UNC	44	12 1/4"	700	1400
60"	1 3/4"-5UNC	52	13"	700	1400

How to order Mueller Steam Specialty Model 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" - 24")

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



A WATTS Brand

USA: Tel: (800) 334-6259 • MuellerSteam.com
 Latin America: Tel: (52) 55-4122-0138 • MuellerSteam.com

