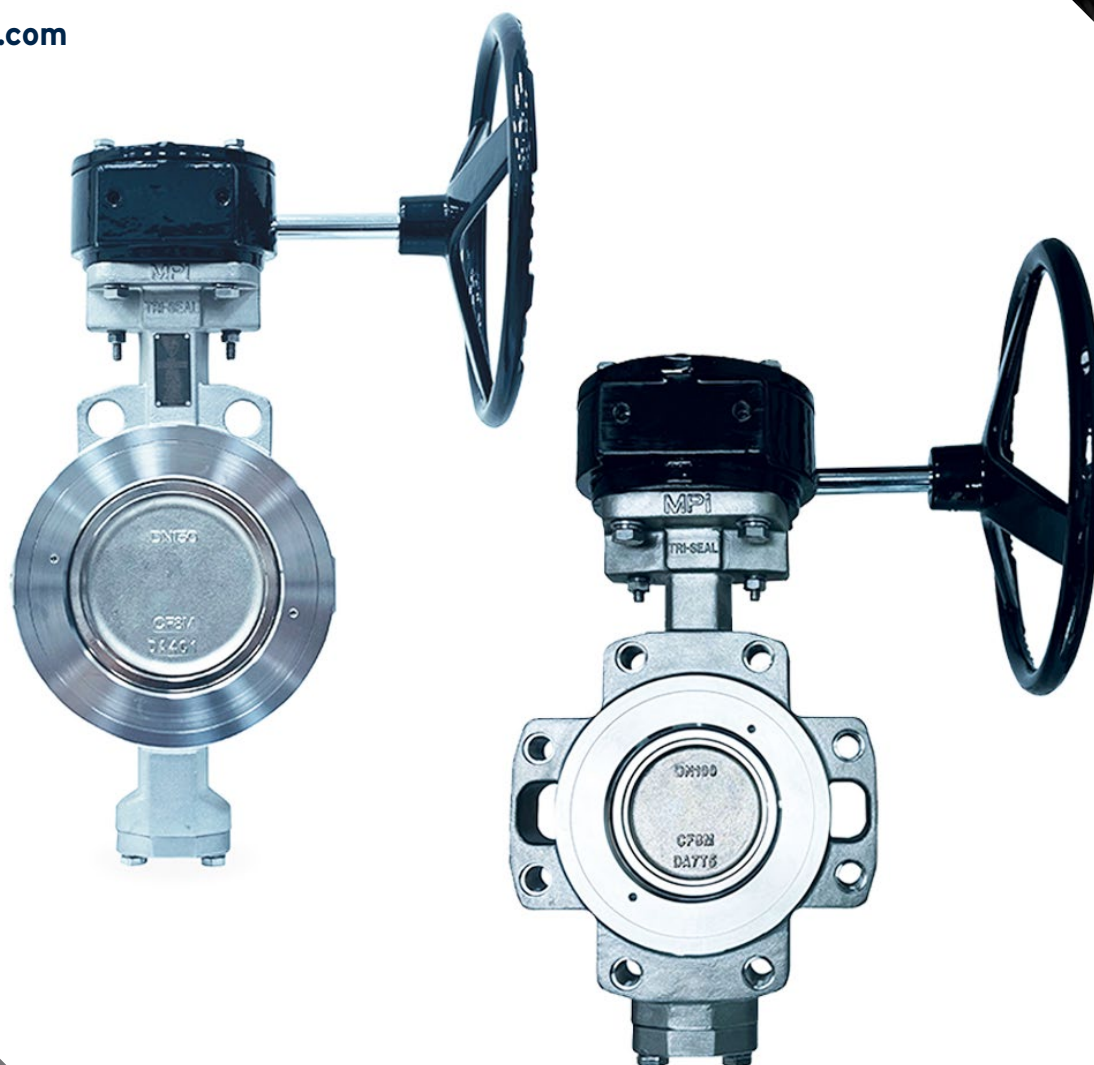


HIGH PERFORMANCE BUTTERFLY VALVES

TECHNICAL BULLETIN

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detailed drawings





THE INTEGRATED SOLUTION FOR YOUR FLOW CONTROL NEEDS

Combining expertise from eight key infrastructure brands in the McWane family of companies, McWane Plant & Industrial (MPI) provides a singular access point for the essential products and services required for any flow control project.

WHY MPI?

We're a new kind of company formed on the basis of three simple goals:

- To provide a primary source for best-in-class products from time-tested brands
- Offer veteran specialists as resources for any flow control project of any scale
- Increase the ease and efficiency of the planning and completion of our clients' projects

Our dedicated team of dozens of experienced specialists work cooperatively with industry partners to give each project the attention it

deserves, providing unprecedented levels of communication, access and collaboration. Our support teams work within dedicated service regions allowing our experts to apply regionally specific knowledge, including state regulations, codes and environmental specifications. Our nationally certified Associate Design-Build Professionals are a valuable asset to Design-Build projects.

The extended manufacturing capabilities of MPI mean your precise requirements are closer in reach and delivered faster with less legwork from you. We offer products that conform to rigorous industry standards and can work with your team to customize and fulfill unique requests. As part of our commitment to American workers and industries, we're proud of our ability to provide products from domestic facilities and to meet all domestic funding requirements.

**MPI – One Smart Source,
Ready to Work For You.**

DESIGN FEATURES

1. RECESSED GLAND: Our recessed gland packing eliminates the requirement for mounting kit and reduces overall package height. A rocker design gland flange and packing gland are utilized to ensure even compression of the packing.

2. EXTENDED NECK: Bonnet to flange clearance is a minimum of 2" allowing for piping insulation on all sizes of valves.

3. BODY: High quality one-piece casting provides consistent uniformity. Body is available in Wafer or Lug style. Body materials include carbon steel (WCB) and stainless steel (CF8M).

4. INTEGRALLY CAST DISC POSITION STOP: Machined position stop in the body locates the disc in the seat to achieve maximum sealing and seat life.

5. SEAT RETAINER PLATE: Constructed of the same material as the body, our seat retainer plate assures proper sealing and allows for full rated bi-directional dead end service.

6. SHAFT: Our 17-4PH Stainless Steel shaft provides maximum strength and stability for high pressure applications.

7. BONNET: Allows for direct mounting of all types of actuation. Standard drilling conforms to ISO 5211.

8. PACKING: Multi-layered, V-type PTFE packing allows for even compression against shaft and body, providing a positive seal even under high pressure / high cycle applications.

9. BLOWOUT PROOF STEM: Our shaft retention system is designed per API 609 standards.

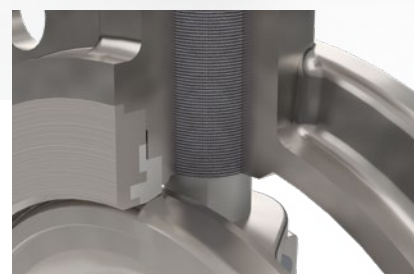
10. SEATS: High Performance Butterfly Valves feature an innovative free-floating, pressure-assisted, solid seat design that ensures a positive seal under both low and high pressure requirements. Unlike traditional valves, our seat does not rely on secondary components like O-rings or springs, resulting in a longer service life with minimal maintenance

The optional fire-safe seat ensures reliable sealing and safety in tough conditions, with a durable backup ring that seals post-fire, meeting API 607 standards. It offers low torque, great flow control, and resists corrosion and heat, making it ideal for multiple applications.

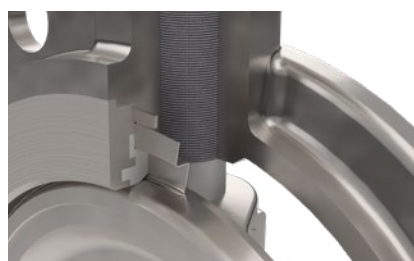
11. DISC TAPER PINS: Pins are offset from the center of the stem which places them in compression and gives them a yield point greater than the stem itself.

12. DISC: Standard construction is 316 stainless steel. Designed to have minimum deflection and movement under pressure, which reduces torque and improves cycle life. Double offset discs produce a camming motion, allowing it to release from the seat within the first few degrees of opening and reducing wear.

13. BEARINGS: Woven fabric steel backed bearings provide excellent load-bearing capabilities, are self lubricating to provide improved wear life, and are tolerant to harsh high pressure applications.



Standard Seat



Optional Fire-Safe Seat

GENERAL

Lug valves shall be designed for installation between ANSI 125/150 flanges. Wafer valves shall be designed for installation between ANSI 125/150, PN 10, and PN 16 flanges. All valves shall be capable of bi-directional, end of line, bubble tight service to rated pressure. Valves are also rated to full vacuum service. Design Standards: API 609 category B.

BODY

Valve body shall be a single-piece ASTM A351 - Gr. CF8M stainless steel or ASTM A216 - Gr. WCB construction with a laying length conforming to the latest revision of ISO 5752 and a flange connection B16.1/B16.5. Valve body shall include integrally cast position stop. Valve body shall provide minimum clearance of 2" between bonnet and actuator mounting flange.

DISC

Valve disc shall be double offset and constructed of ASTM A351 - Gr. CF8M stainless steel. Disc shall be affixed to the shaft with ASTM A182 - T316 stainless steel taper pins.

SHAFT

Valve shaft shall be single-piece and constructed of ASTM A182 - T630 (17-4PH) stainless steel. Shaft shall include anti-blowout pin constructed of ASTM A182-T316 stainless steel.

SEAT

Seat shall be of the free-floating, pressure-assisted, solid seat design and constructed of MPTFE. Seat shall not rely on secondary components for sealing, like O-rings or springs. Seat shall be retained with plate constructed of material matching the valve body.

SHAFT SEALS

Upper shaft seal shall be self-adjusting V-type packing and shall be suitable for pressure or vacuum service. Packing shall be located above the bushing and shall create a positive seal against the top cap. Packing shall be of PTFE construction. Bottom end cap contains a captive, PTFE gasket creating a positive seal against external leakage. Packing gland to be recessed from actuator mounting surface.

BUSHINGS

Valve shall consist of (2) full length 316 SS/RTFE lined bushings (upper and lower) offering superior protection against friction, corrosion, and impacts providing protection against shaft side loading.

TESTING

All valves shall be leak tested in the factory at their rated pressure per API 598.



Valve Size	Flow Coefficients (Cv) at Various Valve Operating Angles								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	0	8	22	36	51	60	69	72	70
2.5	2	16	38	61	83	109	135	146	150
3	6	33	62	94	118	143	176	208	227
4	16	58	106	155	213	274	349	433	473
5	20	94	167	230	310	391	488	561	605
6	40	147	242	335	422	560	729	925	1,010
8	66	237	368	509	712	985	1,296	1,640	2,004
10	139	390	595	807	1,168	1,606	2,134	2,814	3,199
12	204	548	820	1,138	1,591	2,219	3,067	4,085	4,672
14	264	674	972	1,386	1,994	2,840	3,925	5,164	5,947
16	384	864	1,196	1,765	2,611	3,755	5,105	6,975	8,182
18	508	1,092	1,551	2,341	3,522	5,125	7,134	9,511	11,548
20	626	1,294	1,792	2,651	4,082	5,919	8,256	11,429	13,813
24	1,047	2,251	3,178	4,563	6,568	9,277	12,932	17,093	19,021
28	1,295	2,664	4,326	6,211	8,940	12,627	17,602	23,266	27,184
30	1,487	3,058	4,966	7,130	10,262	14,495	20,206	26,708	31,206
32	1,692	3,479	5,651	8,112	11,676	16,492	22,990	30,388	35,506
36	2,141	4,403	7,152	10,267	14,778	20,873	29,097	38,460	44,937

DESCRIPTION:

Flow Coefficients - API 609 High Performance Butterfly Valve

DATE:

07/01/2024

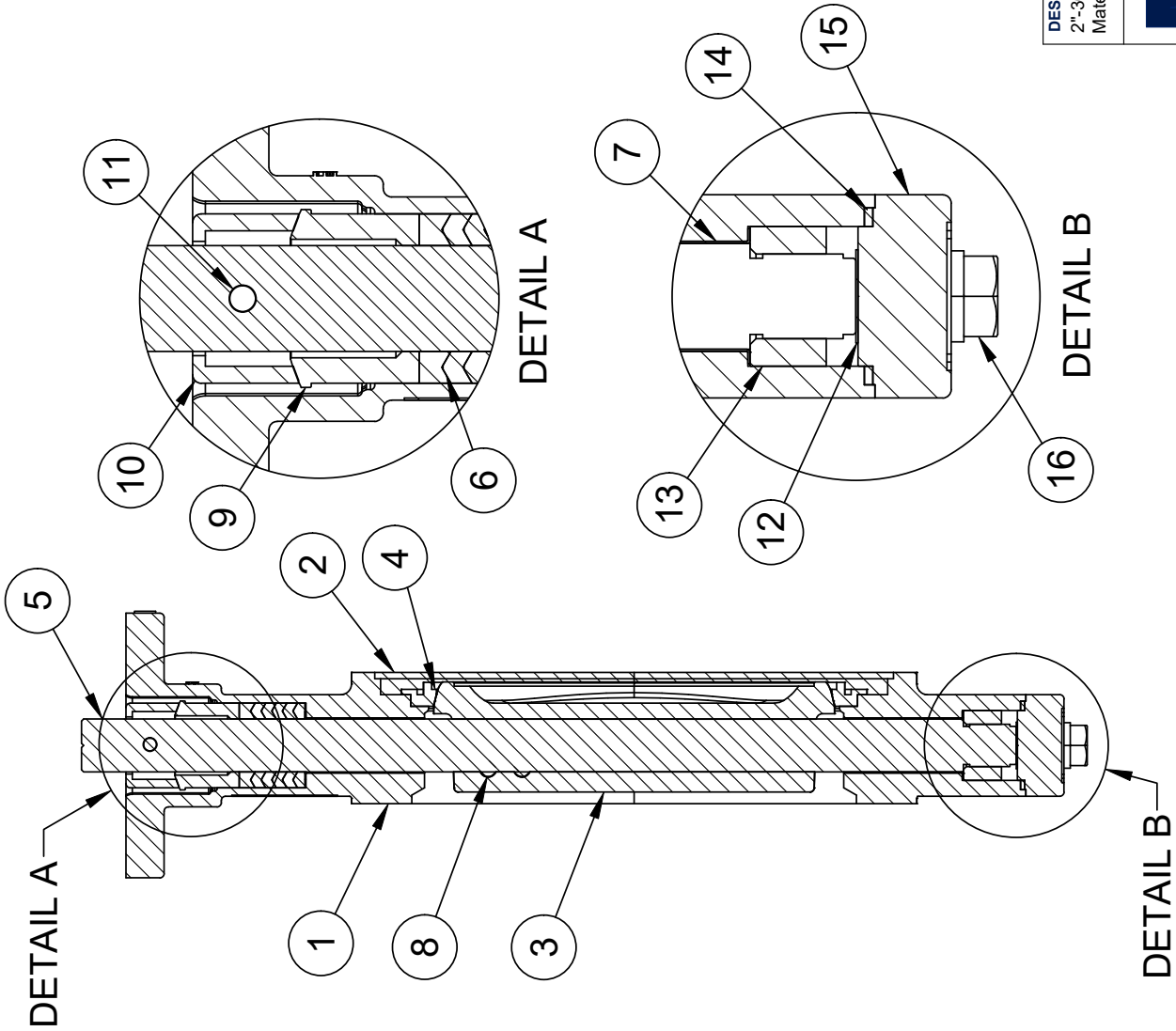
DRAWING:

TS-TD0005-A



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No.	PART	MATERIAL
1	Body	Carbon Steel, ASTM A216 - GR WCB, or Stainless Steel, ASTM A351 - GR CF8M
2	Retainer Ring	Carbon Steel, ASTM A216 - GR WCB, or Stainless Steel, ASTM A351 - GR CF8M
3	Disc	Stainless Steel, ASTM A351 - GR CF8M
4	Seat	MPTFE
5	Stem	Stainless Steel, ASTM A564 - T630
6	V-Packing	PTFE
7	Bushing	Stainless Steel Backed RTFE
8	Taper Pin	Stainless Steel, ASTM A182 - T316
9	Gland Bushing	Stainless Steel, ASTM A351 - GR CF8M
10	Gland Flange	Stainless Steel, ASTM A351 - GR CF8M
11	Anti-Blowout Pin	Stainless Steel, ASTM A182 - T316
12	Thrust Bearing	PTFE
13	Thrust Ring	Stainless Steel, ASTM A351 - GR CF8M
14	Gasket	PTFE
15	End Plate	Carbon Steel, ASTM A216 - GR WCB, or Stainless Steel, ASTM A351 - GR CF8M
16	Hardware	Stainless Steel, ASTM A182 - T316



DESCRIPTION:
2"-36" API 609 High Performance Butterfly Valve
Materials of Construction

DATE:
09/02/24

DRAWING:
TS-MC0004-A

MPI MCWANE
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1201 Vanderbilt Road
Birmingham, AL 35234

Valve Size	Valve Torque (in-lbs)			
	87 PSI	145 PSI	230 PSI	290 PSI
2	136	167	204	235
2.5	136	173	217	248
3	173	223	266	310
4	217	260	341	415
5	273	397	582	706
6	378	520	781	954
8	626	967	1,475	1,803
10	985	1,536	2,360	2,906
12	1,586	2,435	3,705	4,541
14	2,385	3,612	4,901	5,997
16	3,500	5,285	7,162	8,742
18	4,386	6,759	9,287	11,394
20	6,617	9,956	13,450	16,455
24	10,439	15,551	20,891	25,674
28	14,944	19,943	30,420	42,291
30	20,148	26,566	37,948	52,792
32	24,200	31,882	45,531	62,215
36	32,954	43,474	61,968	86,669

NOTE:

1. Torque are measured with water media.
2. Safety factor is not included in listed torque values.
3. Installing seat on upstream side will result in lower torque values and extended valve life.

DESCRIPTION:

Torque Table - API 609 Class 150 High
Performance Butterfly Valve (Soft Seat)

DATE:

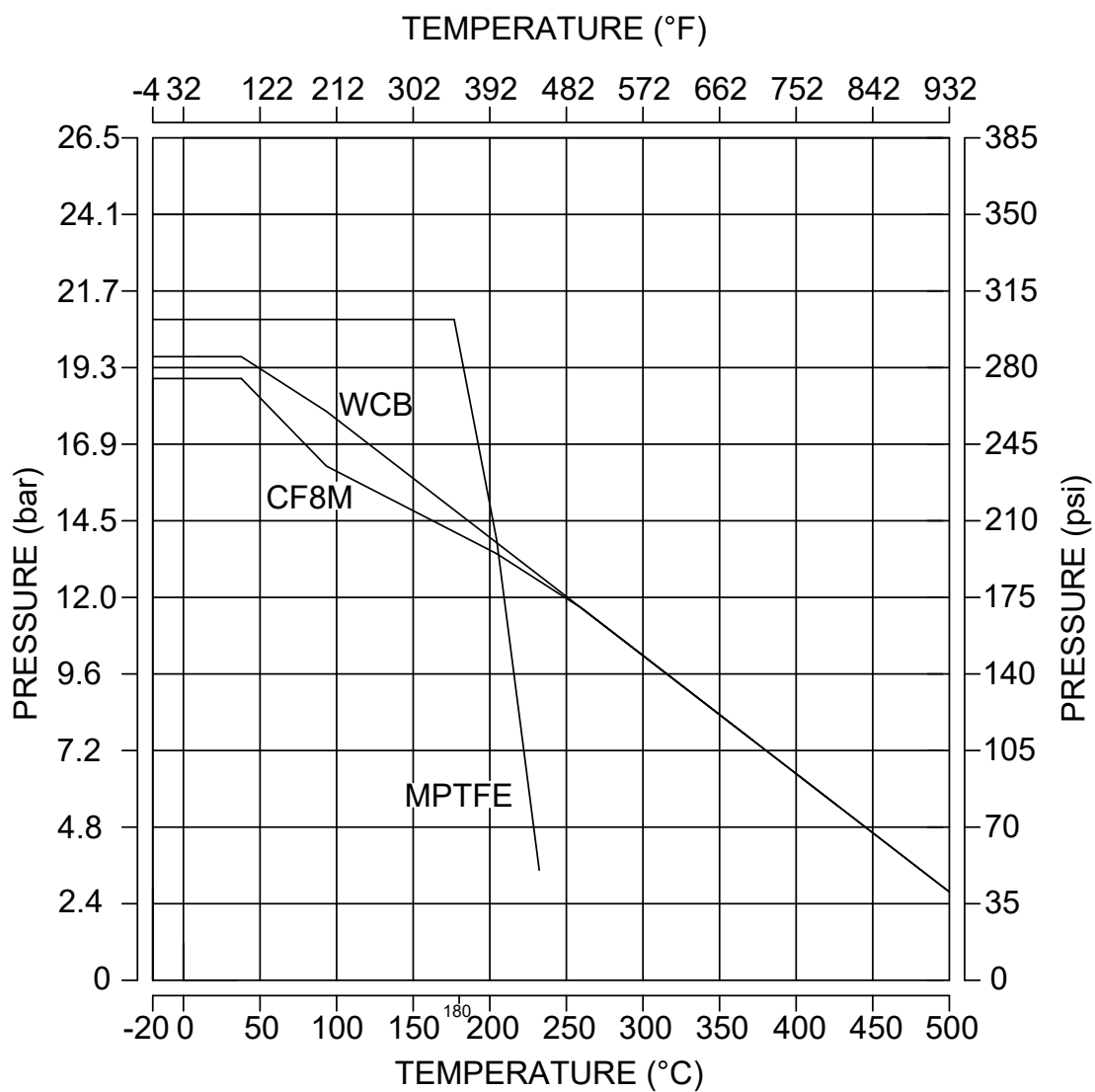
07/01/2024

DRAWING:

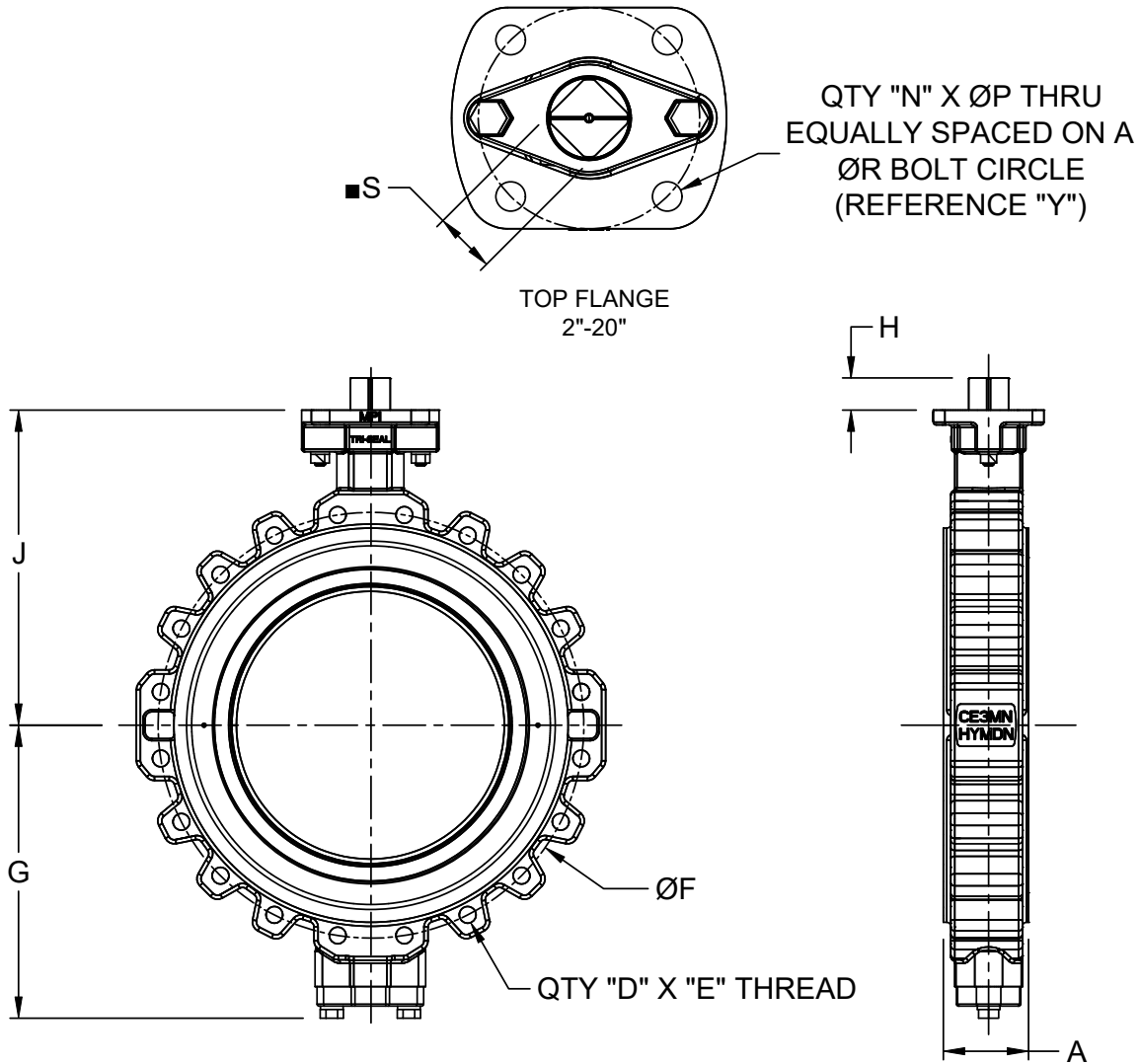
TS-TD0006-A



McWane Plant & Industrial
1201 Vanderbilt Road
Birmingham, AL 35234



DESCRIPTION: Pressure-Temperature Curve - API 609 Class 150 High Performance Butterfly Valve	DATE: 07/01/2024	DRAWING: TS-TD0007-A
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DIMENSIONS (Inches)													
SIZE	A	D	E	F	G	H	J	N	P	R	S	Y	WT (lbs)
2	1.77	4	5/8"-11	4.75	4.65	0.63	5.55	4	0.50	4.02	0.551	F10	16
2.5	1.89	4	5/8"-11	5.50	4.96	0.63	5.87	4	0.50	4.02	0.551	F10	18
3	1.89	4	5/8"-11	6.00	5.28	0.63	6.30	4	0.50	4.02	0.551	F10	20
4	2.13	8	5/8"-11	7.50	5.67	0.63	7.00	4	0.50	4.02	0.551	F10	29
5	2.24	8	3/4"-10	8.50	7.00	0.75	7.91	4	0.50	4.02	0.669	F10	40
6	2.24	8	3/4"-10	9.50	7.48	0.75	8.39	4	0.50	4.02	0.669	F10	45
8	2.44	8	3/4"-10	11.75	8.43	0.83	9.45	4	0.63	4.92	0.748	F12	64
10	2.76	12	7/8"-9	14.25	10.00	0.95	11.02	4	0.63	4.92	0.866	F12	104
12	3.19	12	7/8"-9	17.00	11.73	1.14	12.20	4	0.75	5.51	1.063	F14	153
14	3.62	12	1"-8	18.75	12.91	1.50	13.50	4	0.75	5.51	1.260	F14	203
16	4.02	16	1"-8	21.25	14.84	1.50	15.55	4	0.87	6.50	1.417	F16	303
18	4.49	16	1 1/8"-8	22.75	15.83	1.50	16.54	4	0.87	6.50	1.417	F16	382
20	5.00	20	1 1/8"-8	25.00	17.20	1.89	18.50	4	0.87	6.50	1.811	F16	534

DESCRIPTION:

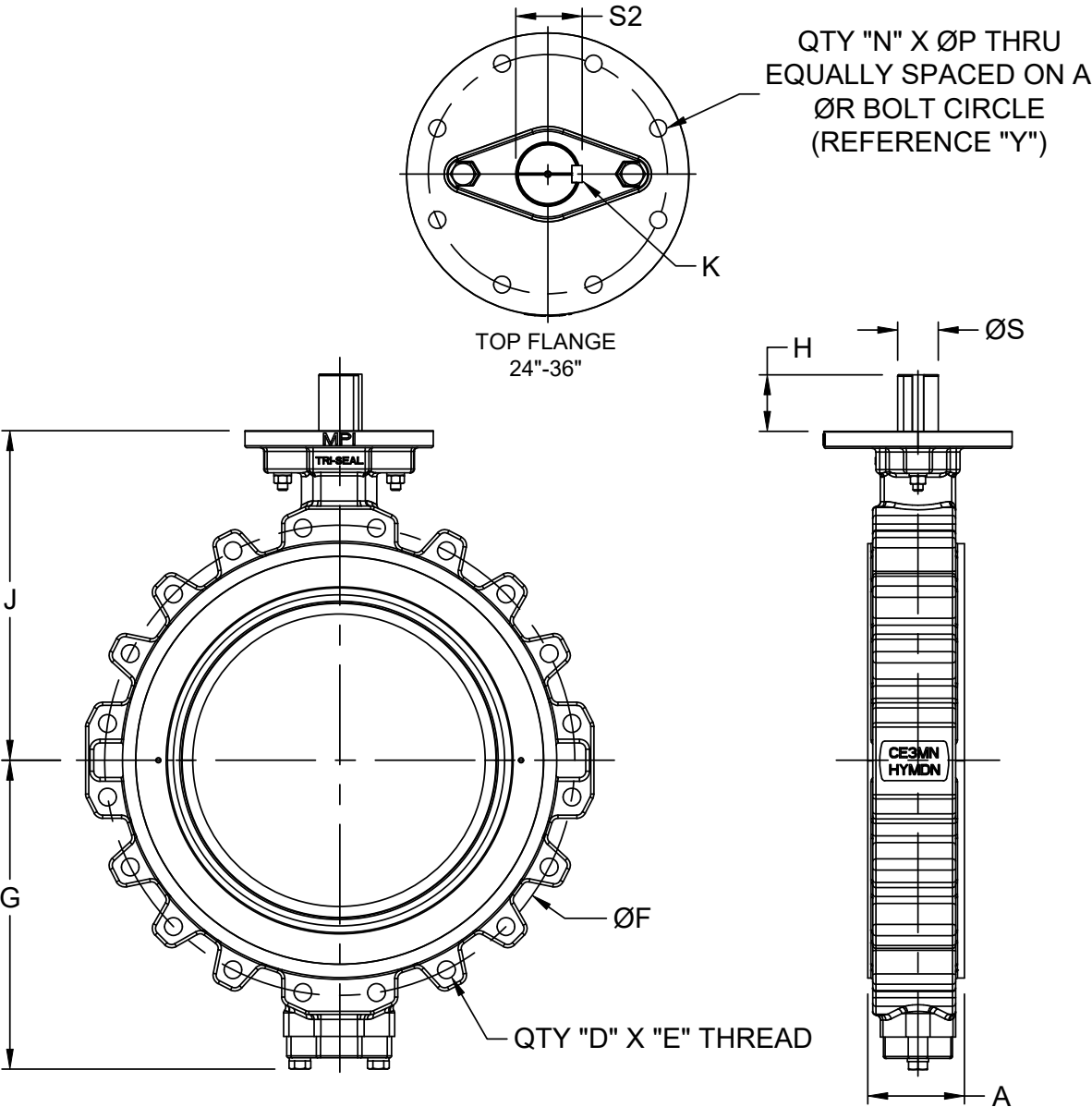
2"-20" API 609, 150# Lug Body Bare Stem High Performance BFV

DATE:

08/01/2024

DRAWING:

TS-DD0015-A

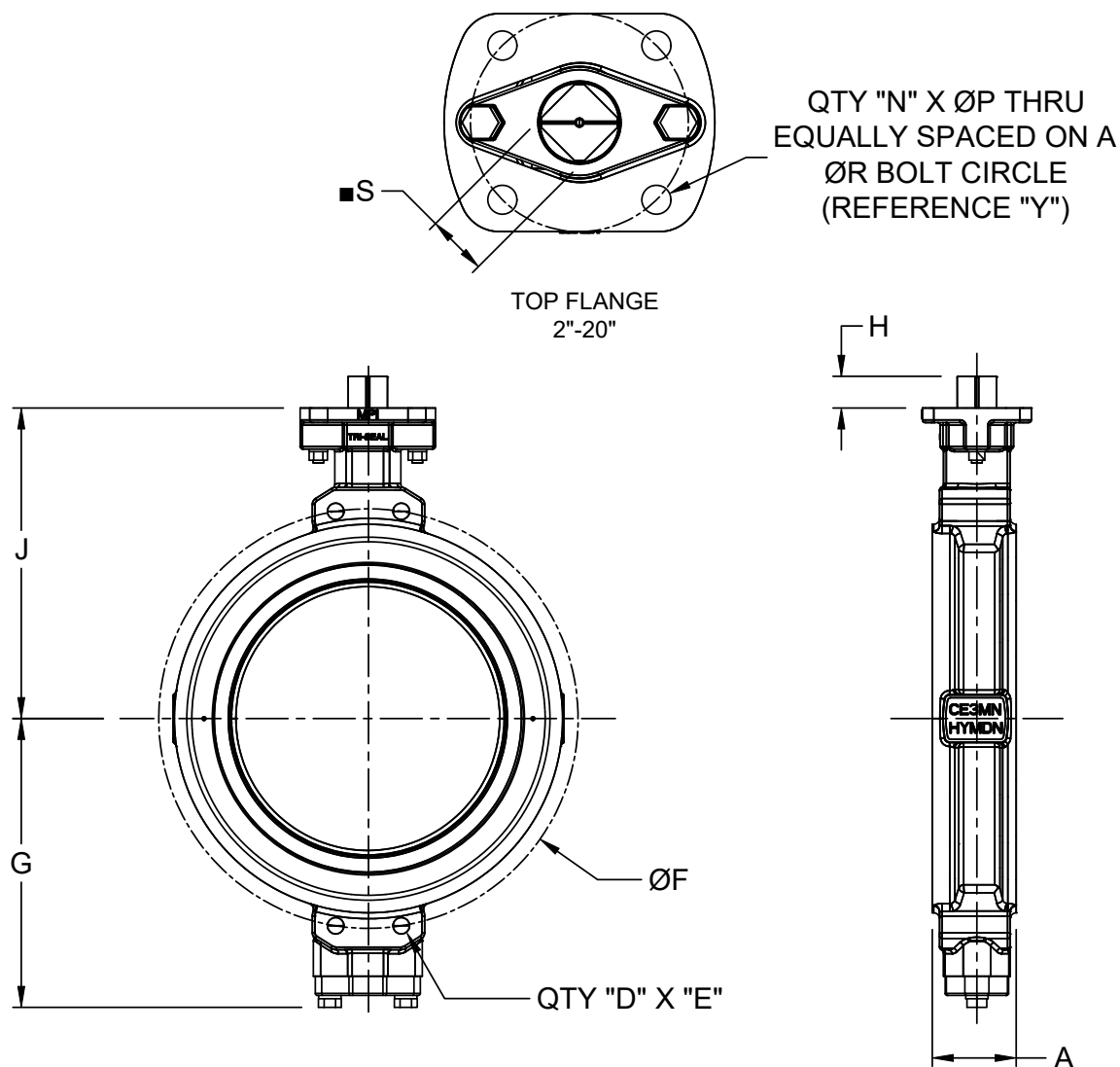


DIMENSIONS (Inches)															
SIZE	A	D	E	F	G	H	J	K	N	P	R	S	S2	Y	WT (lbs)
24	6.06	20	1 1/4"-8	29.50	19.37	3.54	20.67	0.709x0.433	8	0.75	10.00	2.559	2.732	F25	834
28	6.50	28	1 1/4"-8	34.00	22.44	3.74	23.62	0.787x0.472	8	0.75	10.00	2.953	3.146	F25	1,158
30	7.48	28	1 1/4"-8	36.00	23.82	4.33	25.40	0.984x0.551	8	0.88	11.73	3.346	3.559	F30	1,367
32	7.48	28	1 1/2"-8	28.50	24.80	4.33	26.38	0.984x0.551	8	0.88	11.73	3.346	3.559	F30	1,694
36	8.00	32	1 1/2"-8	42.75	27.16	4.33	28.74	0.984x0.551	8	0.88	11.73	3.346	3.559	F30	2,113

DESCRIPTION:
24"-36" API 609, 150# Lug Body Bare Stem High
Performance BFV

DATE:
08/01/2024

DRAWING:
TS-DD0016-A



DIMENSIONS (Inches)													
SIZE	A	D	E	F	G	H	J	N	P	R	S	Y	WT (lbs)
2	1.77	2	0.75 THRU	4.75	4.65	0.63	5.55	4	0.50	4.02	0.551	F10	14
2.5	1.89	2	0.75 THRU	5.50	4.96	0.63	5.87	4	0.50	4.02	0.551	F10	16
3	1.89	2	0.75 THRU	6.00	5.28	0.63	6.30	4	0.50	4.02	0.551	F10	18
4	2.13	2	0.75 THRU	7.50	5.67	0.63	7.00	4	0.50	4.02	0.551	F10	20
5	2.24	2	0.91 THRU	8.50	7.00	0.75	7.91	4	0.50	4.02	0.669	F10	27
6	2.24	2	0.91 THRU	9.50	7.48	0.75	8.39	4	0.50	4.02	0.669	F10	31
8	2.44	2	0.91 THRU	11.75	8.43	0.83	9.45	4	0.63	4.92	0.748	F12	45
10	2.76	2	1.00 THRU	14.25	10.00	0.95	11.02	4	0.63	4.92	0.866	F12	71
12	3.19	4	1.00 THRU	17.00	11.73	1.14	12.20	4	0.75	5.51	1.063	F14	106
14	3.62	4	1.14 THRU	18.75	12.91	1.50	13.50	4	0.75	5.51	1.260	F14	144
16	4.02	4	1.14 THRU	21.25	14.84	1.50	15.55	4	0.87	6.50	1.417	F16	217
18	4.49	4	1 1/8"-8	22.75	15.83	1.50	16.54	4	0.87	6.50	1.417	F16	289
20	5.00	4	1 1/8"-8	25.00	17.20	1.89	18.50	4	0.87	6.50	1.811	F16	377

DESCRIPTION:

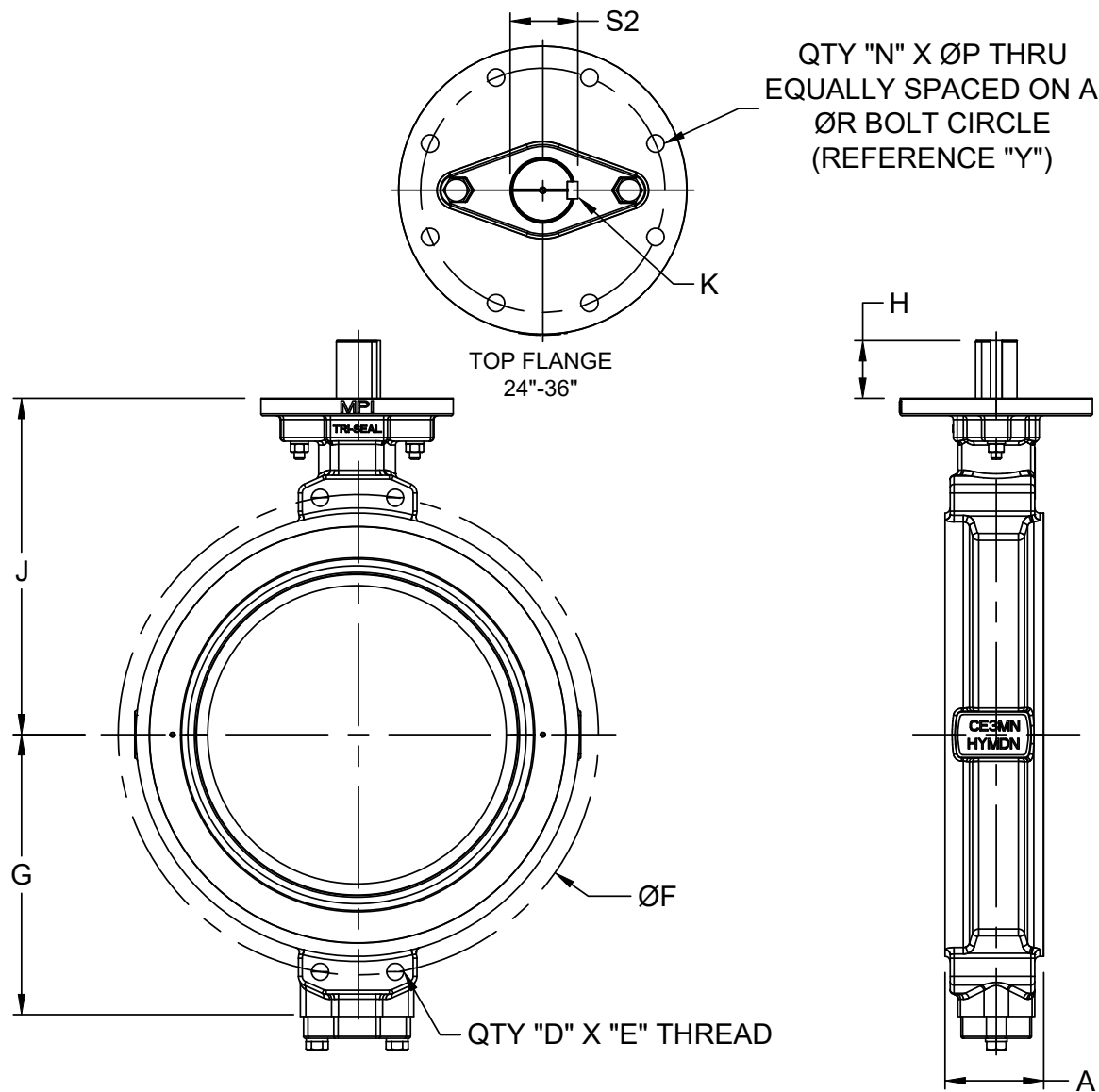
2"-20" API 609, 150# Wafer Body Bare Stem High Performance BFV

DATE:

08/01/2024

DRAWING:

TS-DD0017-A



DIMENSIONS (Inches)															
SIZE	A	D	E	F	G	H	J	K	N	P	R	S	S2	Y	WT (lbs)
24	6.06	4	1 1/4"-8	29.50	19.37	3.54	20.67	0.709x0.433	8	0.70	10.00	2.559	2.732	F25	607
28	6.50	4	1 1/4"-8	34.00	22.44	3.74	23.62	0.787x0.472	8	0.70	10.00	2.953	3.146	F25	849
30	7.48	4	1 1/4"-8	36.00	23.82	4.33	25.40	0.984x0.551	8	0.87	11.73	3.346	3.559	F30	1,124
32	7.48	4	1 1/2"-8	38.50	24.80	4.33	26.38	0.984x0.551	8	0.87	11.73	3.346	3.559	F30	1,215
36	8.00	4	1 1/2"-8	42.75	27.16	4.33	28.74	0.984x0.551	8	0.87	11.73	3.346	3.559	F30	1,471

DESCRIPTION:

24"-36" API 609, 150# Wafer Body Bare Stem High Performance BFV

DATE:

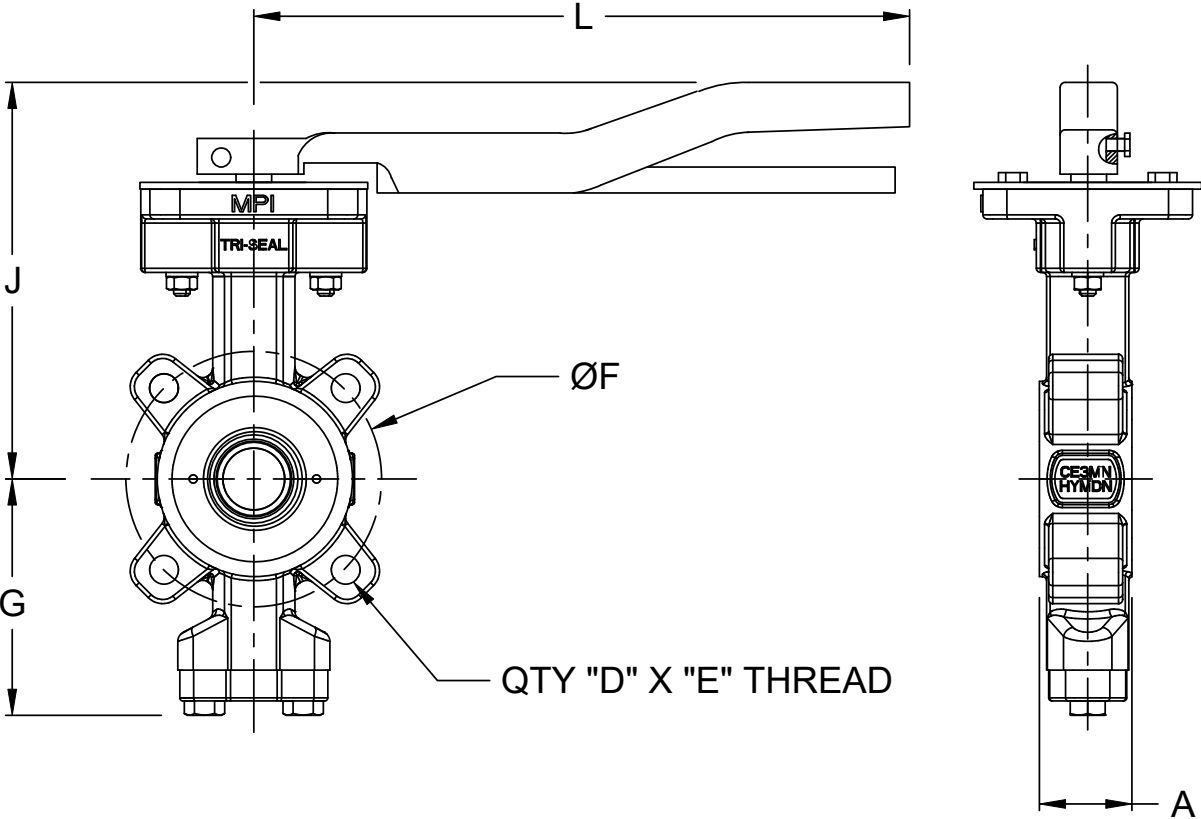
08/01/2024

DRAWING:

TS-DD0018-A

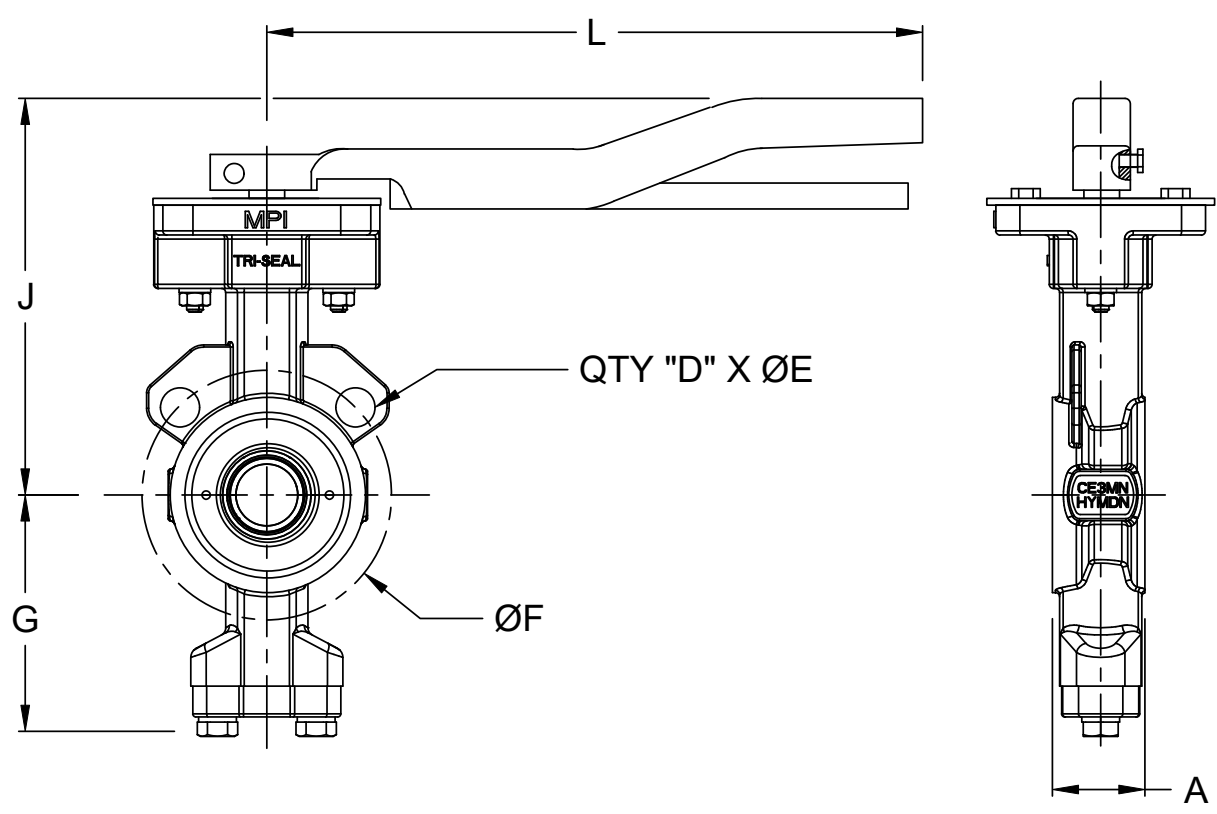


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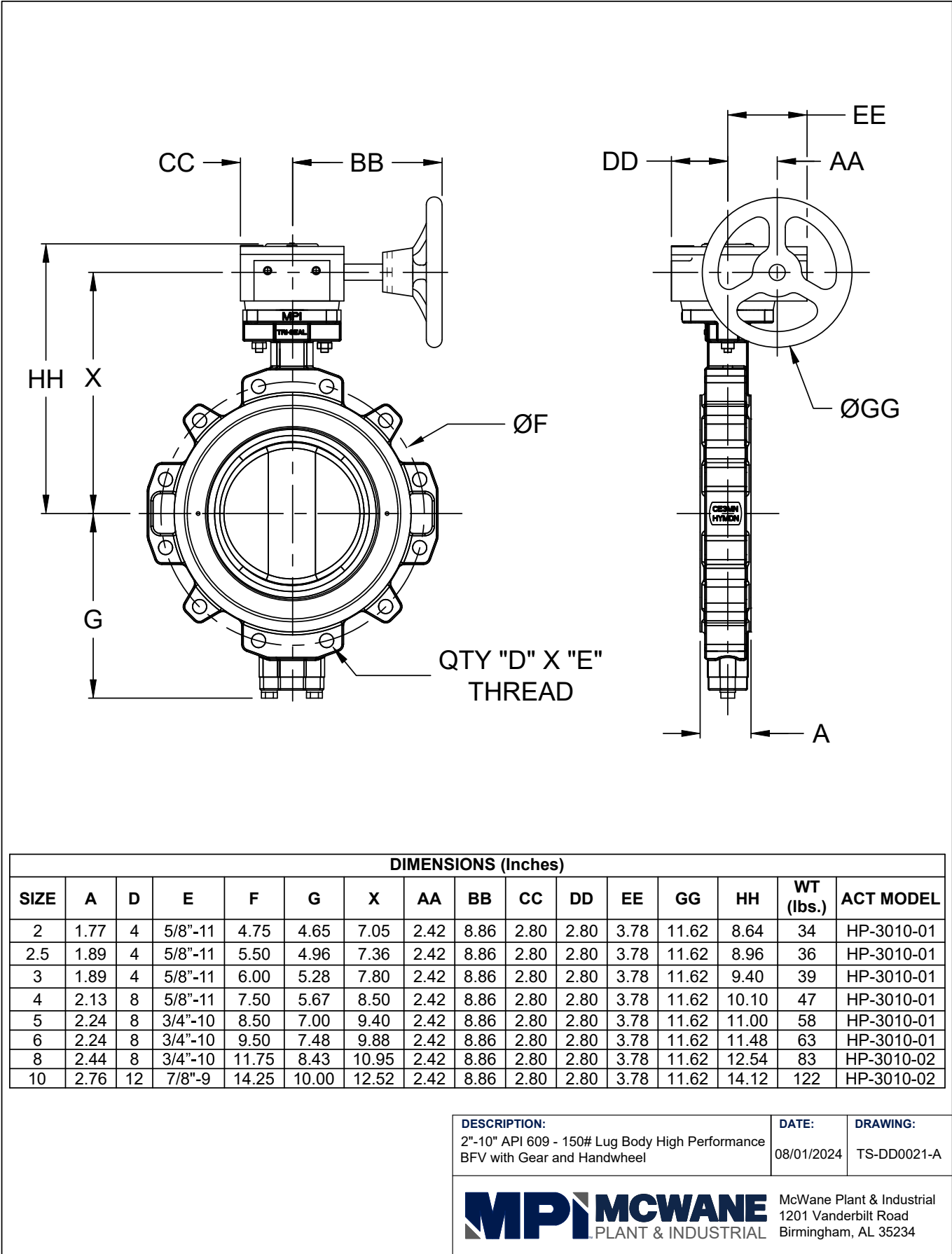
DIMENSIONS (Inches)								
SIZE	A	D	E	F	G	J	L	WT (lbs.)
2	1.77	4	5/8"-11	4.75	4.65	7.72	8.66	20
2.5	1.89	4	5/8"-11	5.50	4.96	8.03	8.66	23
3	1.89	4	5/8"-11	6.00	5.28	8.47	8.66	25
4	2.13	8	5/8"-11	7.50	5.67	9.17	8.66	34
5	2.24	8	3/4"-10	8.50	7.00	10.08	11.81	47
6	2.24	8	3/4"-10	9.50	7.48	10.55	11.81	51
8	2.44	8	3/4"-10	11.75	8.43	11.61	15.75	75

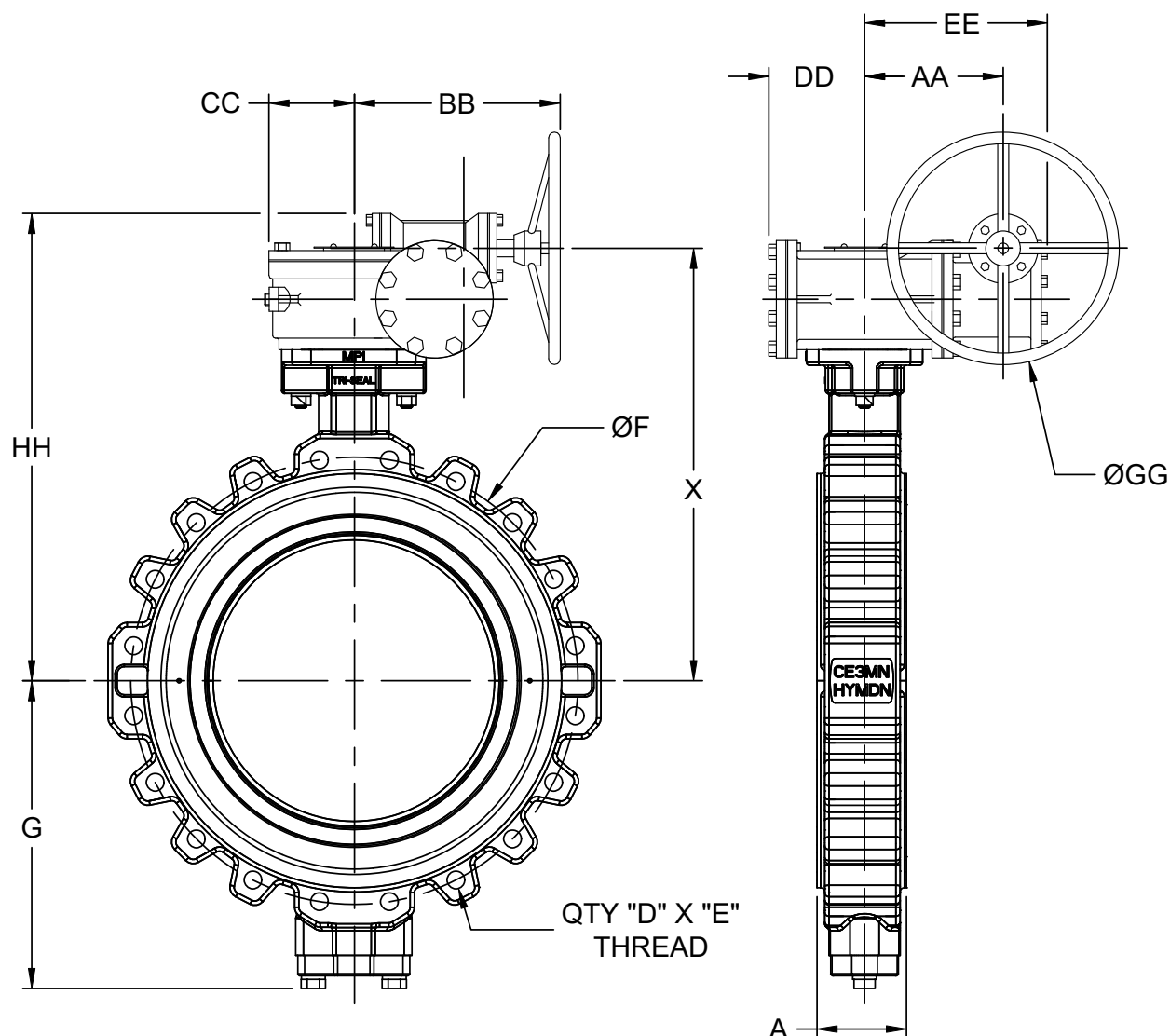
DESCRIPTION: 2"-8" API 609, 150# Lug Body High Performance BFV w/ Lever Operator	DATE: 08/01/2024	DRAWING: TS-DD0019-A
	 McWane Plant & Industrial 1201 Vanderbilt Road Birmingham, AL 35234	



DIMENSIONS (Inches)								
SIZE	A	D	E	F	G	J	L	WT (lbs.)
2	1.77	2	0.75	4.75	4.65	7.72	8.66	18
2.5	1.89	2	0.75	5.50	4.96	8.03	8.66	20
3	1.89	2	0.75	6.00	5.28	8.47	8.66	23
4	2.13	2	0.75	7.50	5.67	9.17	8.66	25
5	2.24	2	0.91	8.50	7.00	10.08	11.81	34
6	2.24	2	0.91	9.50	7.48	10.55	11.81	38
8	2.44	2	0.91	11.75	8.43	11.61	15.75	56

DESCRIPTION: 2"-8" API 609, 150# Wafer Body High Performance BFV w/ Lever Operator	DATE: 08/01/2024	DRAWING: TS-DD0020-A
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DIMENSIONS (Inches)

SIZE	A	D	E	F	G	X	AA	BB	CC	DD	EE	GG	HH	WT (lbs.)	ACT MODEL
12	3.19	12	7/8"-9	17.00	11.73	16.54	6.14	9.72	4.92	4.92	8.15	11.81	18.27	213	HP-5321-01
14	3.62	12	1"-8	18.75	12.91	17.83	6.14	9.72	4.92	4.92	8.15	11.81	19.56	264	HP-5321-02
16	4.02	16	1"-8	21.25	14.84	19.88	6.14	9.72	4.92	4.92	8.15	11.81	21.61	363	HP-5321-03
18	4.49	16	1 1/8"-8	22.75	15.83	20.87	6.14	9.72	4.92	4.92	8.15	11.81	22.60	442	HP-5321-03
20	5.00	20	1 1/8"-8	25.00	17.21	23.54	7.36	11.81	5.75	5.75	9.65	11.81	25.40	637	HP-6401-02
24	6.06	20	1 1/4"-8	29.50	19.37	26.70	9.17	13.78	6.30	6.30	10.63	17.72	29.09	997	HP-7041-01
28	6.50	28	1 1/4"-8	34.00	22.44	29.64	9.17	13.78	6.30	6.30	10.63	17.72	32.04	1,321	HP-7041-02
30	7.48	28	1 1/4"-8	36.00	23.82	32.28	9.73	14.67	6.69	6.69	11.62	17.72	34.45	1,567	HP-8321-02
32	7.48	28	1 1/2"-8	38.50	24.80	33.27	9.73	14.67	6.69	6.69	11.62	17.72	35.44	1,893	HP-8321-02
36	7.99	32	1 1/2"-8	42.75	27.17	35.63	9.73	14.67	6.69	6.69	11.62	17.72	37.80	2,312	HP-8321-02

DESCRIPTION:

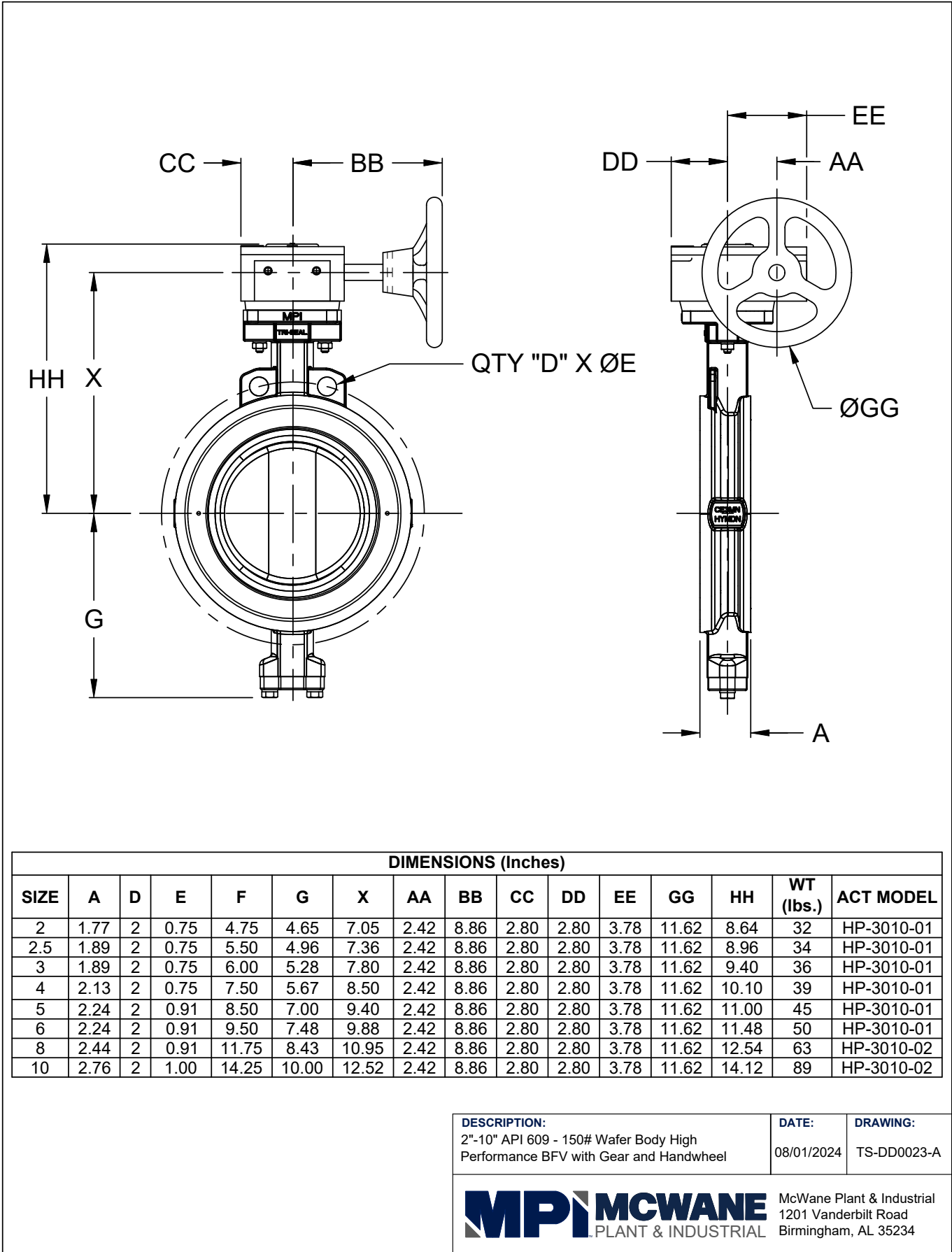
12"-36" API 609 - 150# Lug Body High Performance BFV with Gear and Handwheel

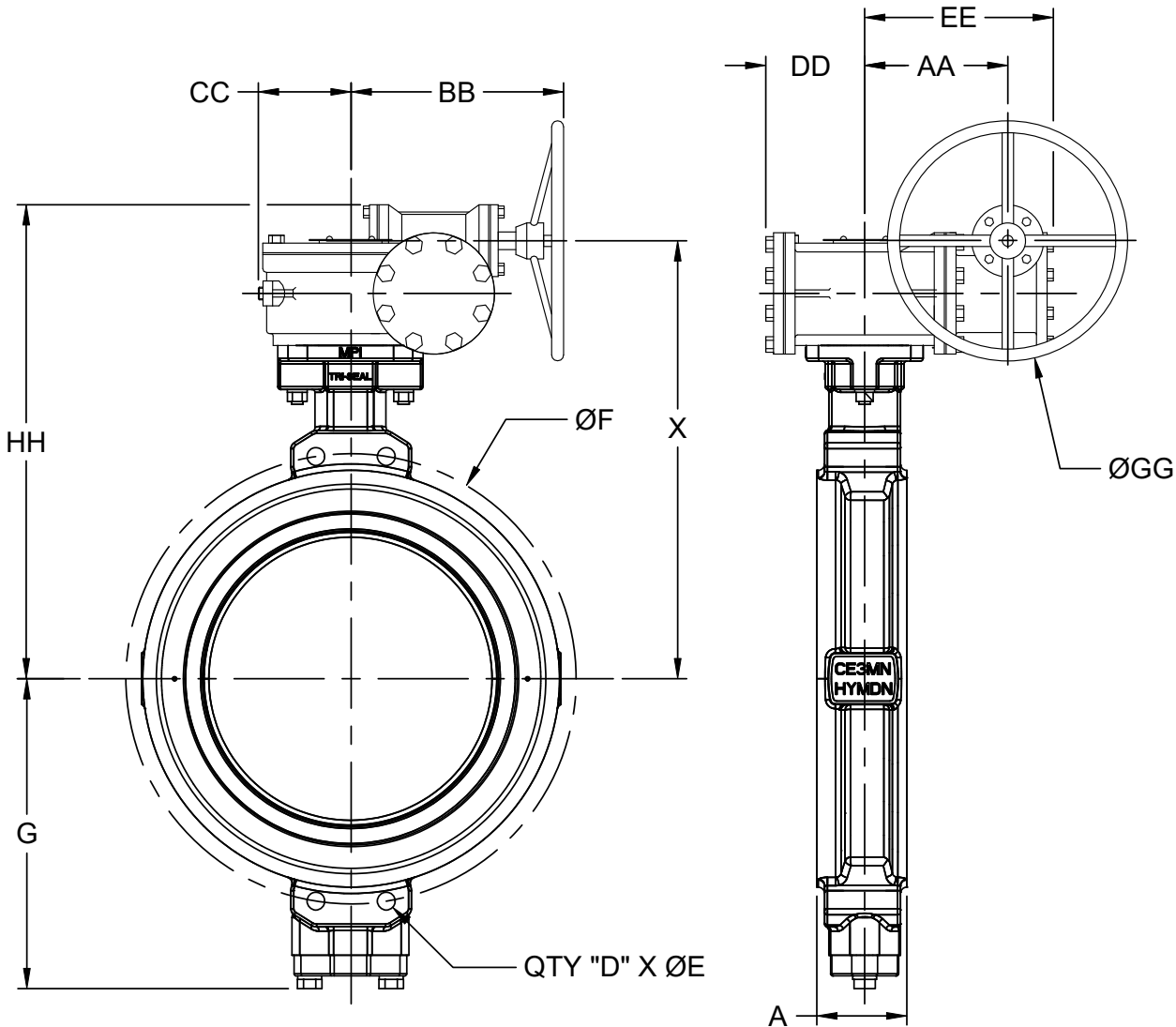
DATE:

08/01/2024

DRAWING:

TS-DD0022-A





DIMENSIONS (Inches)															
SIZE	A	D	E	F	G	X	AA	BB	CC	DD	EE	GG	HH	WT (lbs.)	ACT MODEL
12	3.19	4	1.00 THRU	17.00	11.73	16.54	6.14	9.72	4.92	4.92	8.15	11.81	18.27	167	HP-5321-01
14	3.62	4	1.14 THRU	18.75	12.91	17.83	6.14	9.72	4.92	4.92	8.15	11.81	19.56	204	HP-5321-02
16	4.02	4	1.14 THRU	21.25	14.84	19.88	6.14	9.72	4.92	4.92	8.15	11.81	21.61	277	HP-5321-03
18	4.49	4	1 1/8"-8	22.75	15.83	20.87	6.14	9.72	4.92	4.92	8.15	11.81	22.60	349	HP-5321-03
20	5.00	4	1 1/8"-8	25.00	17.21	23.54	7.36	11.81	5.75	5.75	9.65	11.81	25.40	480	HP-6401-02
24	6.06	4	1 1/4"-8	29.50	19.37	26.70	9.17	13.78	6.30	6.30	10.63	17.72	29.09	770	HP-7041-01
28	6.50	4	1 1/4"-8	34.00	22.44	29.64	9.17	13.78	6.30	6.30	10.63	17.72	32.04	1,012	HP-7041-02
30	7.48	4	1 1/4"-8	36.00	23.82	32.28	9.73	14.67	6.69	6.69	11.62	17.72	34.45	1,324	HP-8321-02
32	7.48	4	1 1/2"-8	38.50	24.80	33.27	9.73	14.67	6.69	6.69	11.62	17.72	35.44	1,414	HP-8321-02
36	7.99	4	1 1/2"-8	42.75	27.17	35.63	9.73	14.67	6.69	6.69	11.62	17.72	37.80	1,670	HP-8321-02

DESCRIPTION: 12"-36" API 609 - 150# Wafer Body High Performance BFV with Gear and Handwheel	DATE: 07/29/2024	DRAWING: TS-DD0024-A

1	2	3	4	5	6	7	8
HPTL	1	080	9	9	9	9	7

EXAMPLE:

The above example is for a High Performance BFV - Lug pattern (HPTL), ASME Class 150 (1), 8" size (080), WCB Body (9), CF8M Disc (9), 630SS (17-4) Shaft (9), MPTFE Seat (9) and a gear operator with hand wheel (7)

Sign 1	Model
HPTL	Lug
HPTW	Wafer

Sign 2	Class
1	Class 150

Sign 3	Size
020	2"
025	2.5"
030	3"
040	4"
050	5"
060	6"
080	8"
100	10"
120	12"
140	14"
160	16"
180	18"
200	20"
240	24"
300	30"
360	36"

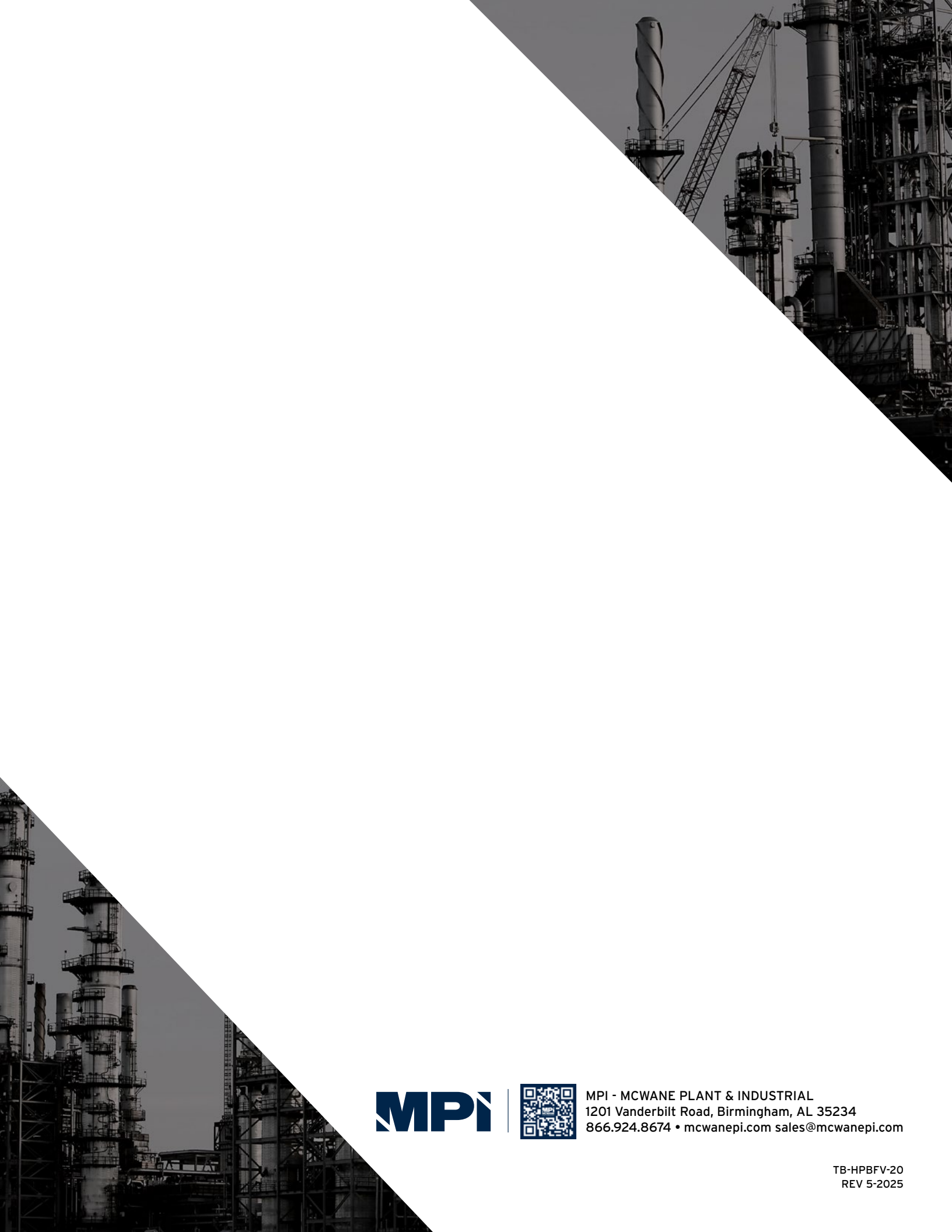
Sign 4	Body
9	ASTM A216 gr. WCB/Black Oxide
8	ASTM A351 gr. CF8M

Sign 5	Disc
9	ASTM A351 gr. CF8M

Sign 6	Shaft
9	ASTM A564 gr. 630SS (17-4)

Sign 7	Seat
9	MPTFE

Sign 8	Operator
9	Bare Stem
8	Lever Kit
7	Gear w/Handwheel
6	IP68 Gear (Buried Service)
5	Pneumatic Actuator
4	Electric Actuator



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TB-HPBFV-20
REV 5-2025