

CR-TEC Engineering

Automated Valve Solutions

BALLCENTRIC® PLUG VALVE

Engineering Creative Solutions for Fluid Systems Since 1901

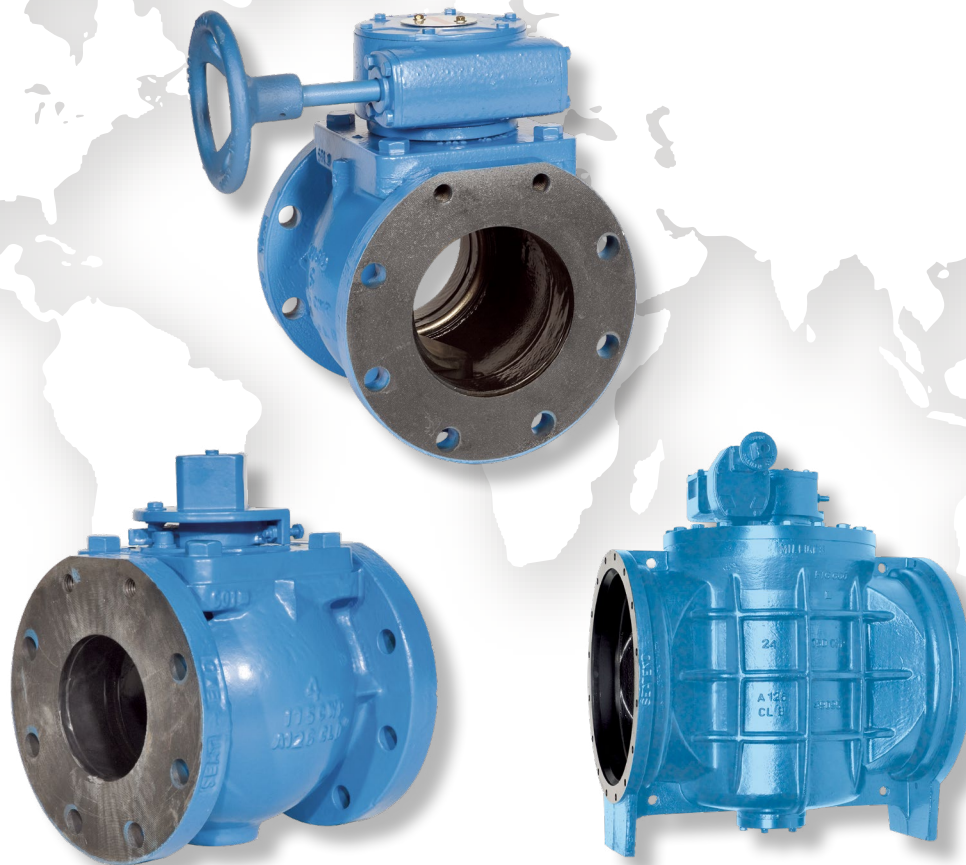


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SCOPE OF LINE

The criteria of quality, reliability, safety and value are embodied in the Ballcentric® plug valve, setting higher standards for dependable performance with excellent features achieved by the utilization of the very latest design and manufacturing techniques.

- Computer aided design
- High integrity casting
- CNC manufacturing delivers consistent sizes on all components

All complemented by rigorous Quality Control System

BODY

Conforming to AWWA C517 wall thickness, the Ballcentric® plug valve body casting is in ASTM A126 CL B cast iron using high pressure molding techniques. Alternative flanged, grooved or mechanical joint ends are available.

Flange diameter, thickness and drilling conform to ANSI B16.1 Class 125 or 250.

Grooved ends meet AWWA C-606 for ductile or steel pipe. Mechanical joints to AWWA C111 (ANSI A21.11).

SEAT

The Ballcentric® plug valve incorporates as standard, on 3" and larger, a 1/8" thick welded 99% nickel seat for corrosion and erosion resistance specifically profiled for low torque and extended seat life.

STEM SEAL

High integrity sealing by combining the advantages of a resilient and abrasion resistant U-Cup seal. From vacuum to high pressure, the self-adjusting sealing system (per AWWA C504) gives positive, trouble-free service and is retained independently of the plug stem or external torque device, thereby eliminating periodic maintenance.

BEARINGS

The plug rotates in permanently lubricated 316 grade stainless steel bearings, located in the body and bonnet, along with upper and lower PTFE thrust washers, which ensure consistently low operating torque.

PLUG

Supported on integral trunnions, the plug is totally encapsulated with an elastomer that is molded on 2-1/2" – 48" and vulcanized on 54" and larger to the casting providing tight shut off even under vacuum conditions. High integrity corrosion-free sealing is achieved by a variety of abrasion resistant elastomers which protect the plug right up to the trunnions. When assembled, the light compression of the elastomers onto PTFE thrust washers, prevents entry of abrasive materials into the bearings.

BONNET SEAL

Superior "O" ring sealing with metal / metal contact means lower bolting stresses compared with compression gaskets.

FLOW

The port design (round on 2-1/2" – 12" and rectangular on 14" and larger) with streamlined internal contours gives the highest industry capacity straight through flow in the full open position, reducing turbulence and pressure drop and the effect of erosive media. Handling of sludges and slurries is therefore enhanced.

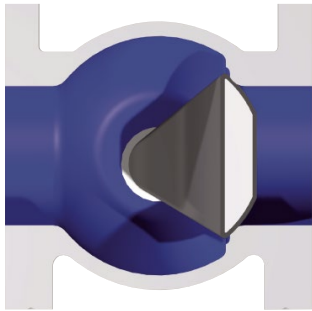
INTERCHANGEABLE

Because of the common face to face dimension with wedge gate valves (3" – 12"), fitting the tight shut-off rotary Ballcentric® plug valve into existing systems is accomplished without pipeline modifications.

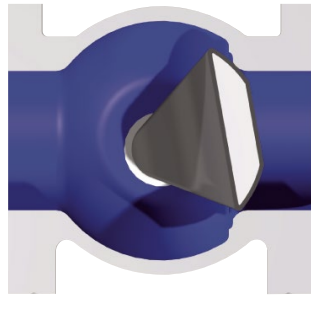
TRAVEL STOPS

Adjustable open and closed travel stops are fitted as standard on both wrench and gear operated Ballcentric® plug valves.

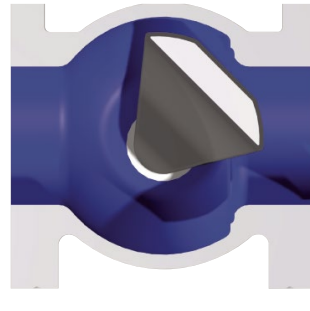
FEATURES AND BENEFITS



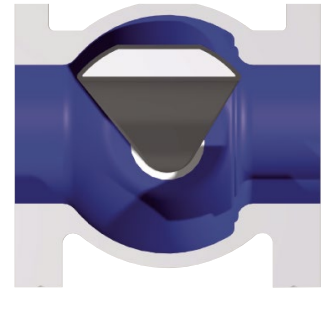
- Valve in closed position for bubble tight shut-off
- Normal flow direction gives pressure assisted sealing
- Torques are low even in reverse flow



- Plug rotates away from the seat for instant opening
- Seat wear and operating torque reduced
- No further seat contact until valve is closed again



- Design of Ballcentric® plug valve allows modulating control over the full 90° travel
- Ideally suited for balancing service
- Standard rotary valve provides control and tight shut off in one valve



- Plug is out of flow path when fully open
- Straight through, uninterrupted smooth flow
- Round port reduces turbulence and erosion, lowers pumping costs and can be “pigged” to clean the pipeline

INSTALLATION

The Ballcentric® plug valve is suitable for flow and shut-off in either direction. Seat end downstream is the preferred orientation and any reverse flow requirement should be stated at the time of order. For use on fluids with suspended solids, it is recommended that the valve should be installed with the seat upstream and the valve stem horizontal with plug rotation to the top of the valve ensuring smooth operation.

IN-LINE MAINTENANCE

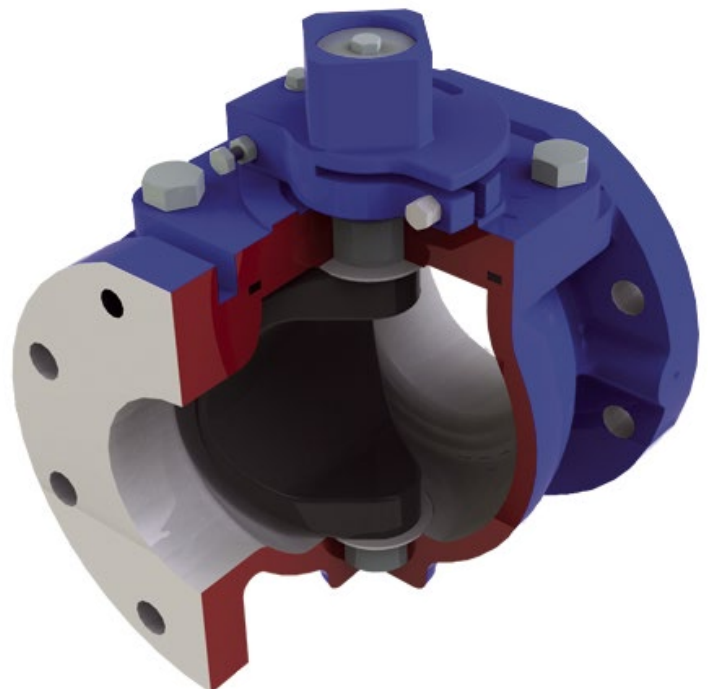
In the unlikely event of stem leakage, the stem seals can be easily replaced without removing the bonnet. Access to the body for cleaning or inspection does not require removal from the line.

MODULAR CONSTRUCTION

Design of the bonnet and stem allows for on-site adaption of gear operators, power actuators, or extension devices on to standard valves. Conversion can be easily undertaken without removing the valve bonnet, thereby minimizing downtime.

POWER OPERATION

Pneumatic, electric or hydraulic operation is available, complete with accessories such as limit switches, solenoid valves and positioners when required.



DIMENSIONAL DATA

ORDERING INFORMATION

VALVE TYPES	DESIGNATION
Mechanical Joint Cast Iron	600
Mechanical Joint Ductile Iron	620
ANSI 125 Flanged Cast Iron Flat Face	601
ANSI 125 Flanged Ductile Iron Flat Face	611
ANSI 150 Flanged Ductile Iron Raised Face	621
ANSI 250 Flanged Ductile Iron Raised Face	602
ANSI 125 Grooved for Steel Pipe	606S
ANSI 125 Grooved for Ductile Pipe	606D
ANSI 150 Flanged 316SS	601S
SEAT	
Nickel (3" & Larger)	N
Epoxy (2-1/2" ONLY)	E
316SS (On Stainless Steel Valve ONLY)	S
Rubberlined	RL
Glasslined	GL
ELASTOMER TRIM	
EPDM	0
Buna-Nitrile	1
Viton	2
Neoprene	3
Natural	4
MANUAL OPERATORS	
Above Ground Gear and Handwheel	AGHW
Above Ground Gear with 2" Nut	AGNUT
Buried Gear with 2" Nut	BG
Memory Stop Gear with Handwheel	MGHW
Lever / Wrench (8" & smaller)	L
Direct Nut (8" & smaller)	TC

Example: 4" 601N3AGHW = 4" ANSI 125 Flanged, Nickel Seat, Neoprene plug with Above Ground Gear and Handwheel.

Valves are only tested for bi-directional shut-off if specified at time of order. Contact Pratt for bi-directional ratings.

Note: We recommend mechanical joint or buried flanged valves to have gear operators.

Note: We recommend valves for bi-directional service to have gear operators.

PRESSURE RATING

Size	ANSI Class	Pressure Rating (psi)
12" and Smaller	ANSI 125	175 psi
14" and Larger	ANSI 125	150 psi
14" and Larger	ANSI 150	235 psi
20" and Smaller	ANSI 150	285 psi
12" and Smaller	ANSI 250	400 psi
14" and Larger	ANSI 250	300 psi

Body Hydrotest = 150% of Rated Pressure / Seat Test = 100% of Rated Pressure Testing per AWWA C517

ELASTOMER SELECTION CHART

SERVICE	ELASTOMER	AVERAGE USEFUL TEMP. RANGE	SERVICE	ELASTOMER	AVERAGE USEFUL TEMP. RANGE	SERVICE	ELASTOMER	AVERAGE USEFUL TEMP. RANGE
Acetone	EPDM	-35°F to 250°F	Cement Slurry	EPDM	-35°F to 250°F	Oil, Animal	Nitrile	-20°F to 212°F
Alcohol AMYL	EPDM	0°F to 212°F	Copper Sulphate	EPDM	-35°F to 250°F	Oil, Mobil Therm Light	Viton	10°F to 250°F
Alcohol Aromatic	Viton	10°F to 212°F	Creosote (Coal)	Nitrile	-20°F to 212°F	Oil, Mobil Therm 600	Viton	10°F to 250°F
Alcohol Butyl	Neoprene	-20°F to 225°F	Coal Slurry	Nitrile	-20°F to 212°F	Oil, Mobil Therm 603	Nitrile	-20°F to 212°F
Alcohol Denatured	Nitrile	-20°F to 212°F	Diesel Fuel No. 3	Nitrile	-20°F to 212°F	Oil, Lubricating	Nitrile	-20°F to 212°F
Alcohol Ethyl	EPDM	-20°F to 250°F	Diethylene Glycol	EPDM	-35°F to 250°F	Oil, Vegetable	Nitrile	-20°F to 212°F
Alcohol Grain	Nitrile	-20°F to 212°F	Ethylene Glycol	EPDM	-35°F to 250°F	Paint, Latex	Nitrile	-20°F to 212°F
Alcohol Isopropyl	Neoprene	-20°F to 225°F	Fatty Acid	Nitrile	-20°F to 212°F	Phosphate Ester	EPDM	-35°F to 250°F
Alcohol Methyl	EPDM	-20°F to 250°F	Fuel Oil No. 2	Nitrile	-20°F to 212°F	Propane	Nitrile	-20°F to 212°F
Ammonia Anhydrous	Neoprene	-20°F to 225°F	Fertilizer Liquid H4N2O2	EPDM	-35°F to 250°F	Rape Seed Oil	EPDM	-35°F to 250°F
Ammonium Nitrate	EPDM	-20°F to 250°F	Gasoline Keg	Nitrile	-20°F to 212°F	Sewage with Oils	Nitrile	-20°F to 212°F
Ammonia, Water	EPDM	-20°F to 250°F	Gas Natural	Nitrile	-20°F to 212°F	Sodium Hydroxide 20%	EPDM	-35°F to 250°F
Animal Fats	Nitrile	-20°F to 212°F	Glue, Animal	Nitrile	-20°F to 212°F	Starch	EPDM	-35°F to 250°F
Black Liquor	EPDM	-20°F to 250°F	Green Liquor	EPDM	-20°F to 212°F	Steam to 250°F	EPDM	-35°F to 250°F
Blast Furnace Gas	Neoprene	-20°F to 225°F	Hydraulic Oil (Petro)	Nitrile	-20°F to 212°F	Stoddard, Solvent	Nitrile	-20°F to 80°F
Butane	Nitrile	-20°F to 212°F	Hydrogen	Nitrile	-20°F to 212°F	Sulphuric Acid 10% 50%	Neoprene	-20°F to 158°F
Bunker Oil "C"	Nitrile	-20°F to 212°F	JF4, JP5	Viton	-20°F to 212°F	Sulphuric Acid 100%	Viton	10°F to 300°F
Calcium Chloride	EPDM	-20°F to 250°F	Kerosene	Nitrile	0°F to 212°F	Trichloroethylene Dry	Viton	10°F to 300°F
Carbon Dioxide	EPDM	-20°F to 250°F	Ketone	EPDM	-35°F to 250°F	Triethanol Amine	EPDM	-35°F to 250°F
Carbon Monoxide (Cold)	Neoprene	-20°F to 150°F	Lime Slurry	EPDM	-35°F to 250°F	Varnish	Viton	10°F to 300°F
Carbon Monoxide (Hot)	Viton	10°F to 300°F	Methane	Nitrile	-20°F to 212°F	Water, Fresh	EPDM	-35°F to 250°F
Carbon Tetrachloride	Viton	10°F to 300°F	Methyl Ethyl Ketone	EPDM	-35°F to 250°F	Water, Salt	EPDM	-35°F to 250°F
Caustic Soda	EPDM	-35°F to 250°F	Naphtha (Berzin)	Nitrile	-20°F to 212°F	Xylene	Viton	10°F to 300°F

Note: Above elastomer / temperature chart are guidelines only. Contact Pratt for specific applications.

ELASTOMERS AVAILABLE FOR BALLCENTRIC®

PLUG VALVE

Natural rubber is also available.

NITRILE

A general purpose material sometimes referred to as BUNA-N or HYCAR with a -20°F to 212°F temperature range. Used on sewage, water, hydrocarbon and mineral oils.

EPDM

An excellent polymer for use on chilled water through to LP steam applications having a temperature range of -35°F to 250°F. Resistance to many acids, alkalies, detergents, phosphate esters, alcohols and glycols is an added benefit.

NEOPRENE

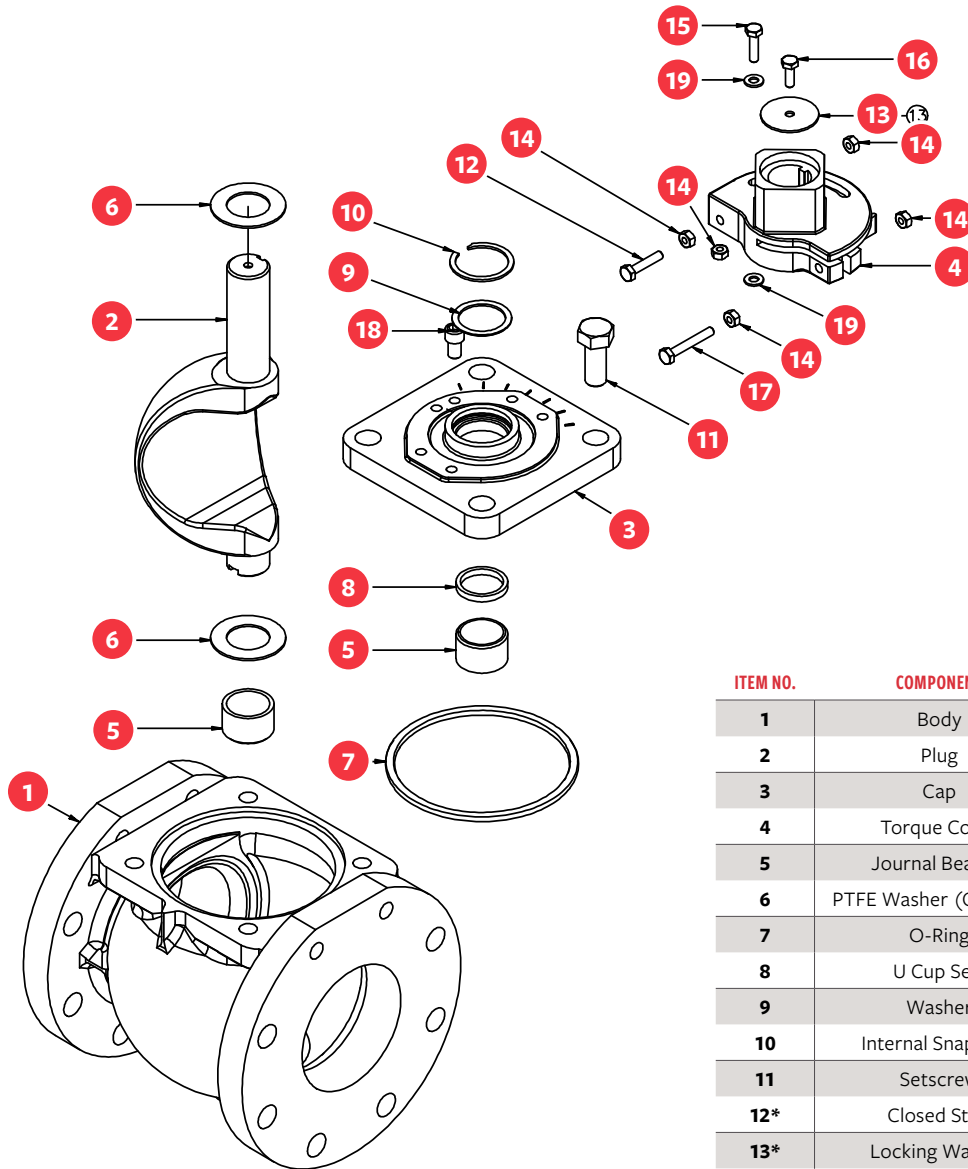
This versatile material shows outstanding resistance to abrasion and ozone. Chemical resistance to a wide range of petroleum base products and dilute acids and alkalies. Temperature range -20°F to 225°F.

VITON

Retention of mechanical properties at high temperature is an important feature of this elastomer: temperature range is -10°F to 300°F. It also has excellent resistance to oils, fuels, lubricants and most mineral acids and aromatic hydrocarbons.

Note: Not for water or steam applications.

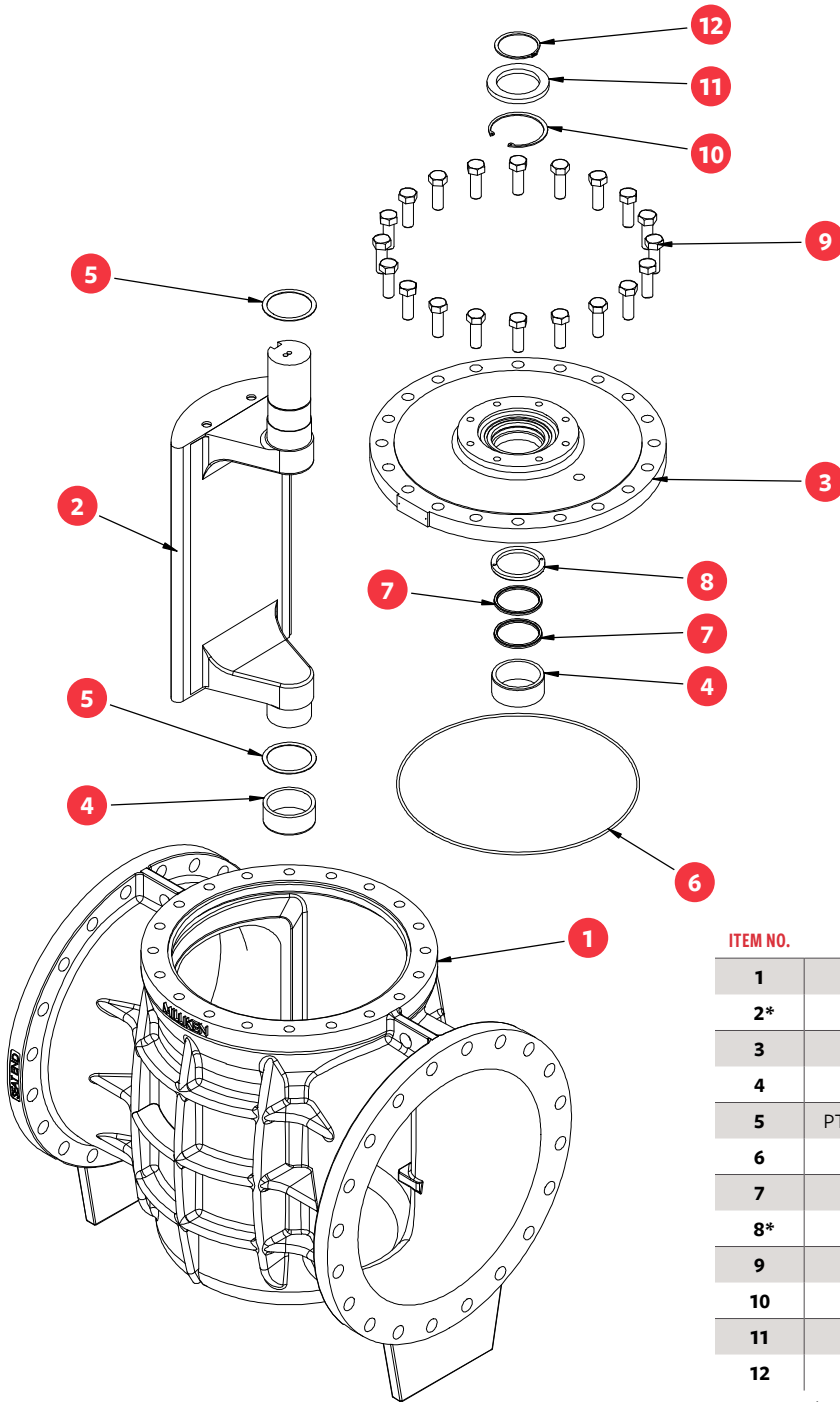
STANDARD MATERIALS OF CONSTRUCTION, FIG. 601 / 600, 12" & SMALLER



ITEM NO.	COMPONENT	MATERIAL
1	Body	Cast Iron A126 Class B
2	Plug	Rubber Coated Ductile Iron ASTM A536
3	Cap	Cast Iron A126 Class B
4	Torque Collar	Ductile Iron ASTM A536
5	Journal Bearing	St. Steel — ANSI 316
6	PTFE Washer (Grit Seal)	PTFE
7	O-Ring	Elas. as Spec.
8	U Cup Seal	Elas. as Spec.
9	Washer	Brass — ASTM B-138-675
10	Internal Snap Ring	Spring Steel
11	Setscrew	Steel (Zinc Plated)
12*	Closed Stop	Steel (Zinc Plated)
13*	Locking Washer	Steel
14*	Nut	Steel (Zinc Plated)
15*	Open Stop	Steel (Zinc Plated)
16*	Setscrew	Steel (Zinc Plated)
17*	Torque Bolt	Steel (Zinc Plated)
18*	Travel Stop	Steel
19*	Washer	Steel

*Note: Torque Collar Assembly on 8" and Smaller

STANDARD MATERIALS OF CONSTRUCTION, FIG. 601 / 600, 14" & LARGER



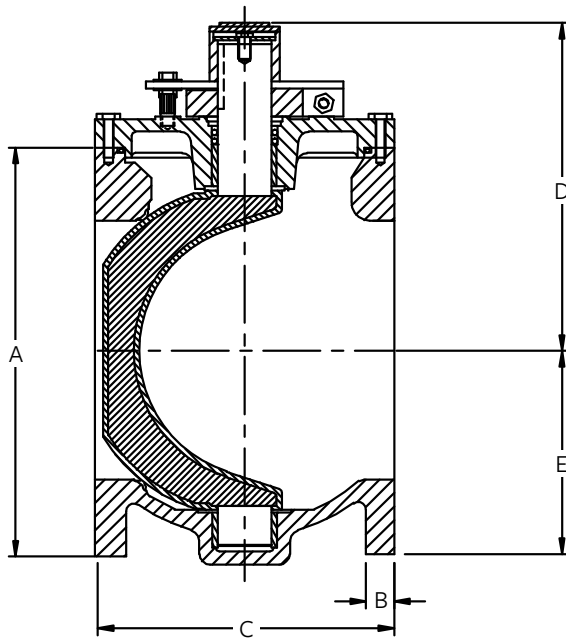
ITEM NO.	COMPONENT	MATERIAL	QTY.
1	Body	Cast Iron A126 Class B	1
2*	Plug	Rubber Coated See Note 1	1
3	Cap	Cast Iron A126 Class B	1
4	Sleeve Bearing	Stainless Steel / Bronze	2
5	PTFE Washer (Grit Seal)	PTFE	2
6	Cap "O" Ring	Elas. as Spec.	1
7	U Cup Seal	Elas. as Spec.	2
8*	Seal Retaining Ring	See Note 2	1
9	Cap Screw	Steel (Zinc Plated)	A/R
10	Internal Snap Ring	Spring Steel	1
11	Support Collar	Steel	1
12	External Snap Ring	Spring Seal	1

*Note 1: Plugs: Ductile Iron — ASTM A536 on 14" – 20"

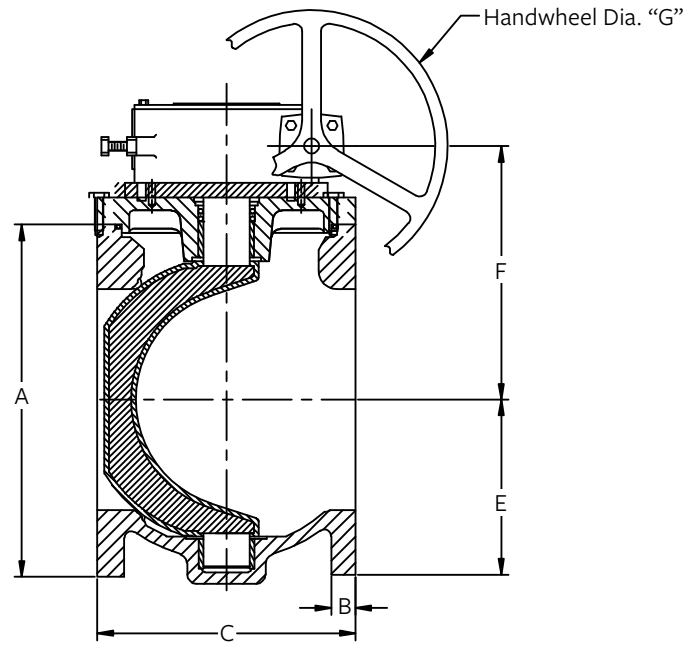
Cast Iron — A126 Class B on 24" and larger

*Note 2: Seal Retaining Ring: Brass — ASTM B-138-675 on 14" – 20"
Steel on 24" and larger

FIG. 601 CAST IRON / 611 DUCTILE IRON – FLANGED END (175 PSI) / 621 DUCTILE IRON RAISED FACE (285 PSI) 2 1/2" – 12"



2-1/2" – 8" VALVES ONLY



2-1/2" – 12" VALVES

FLANGED END – ANSI 125

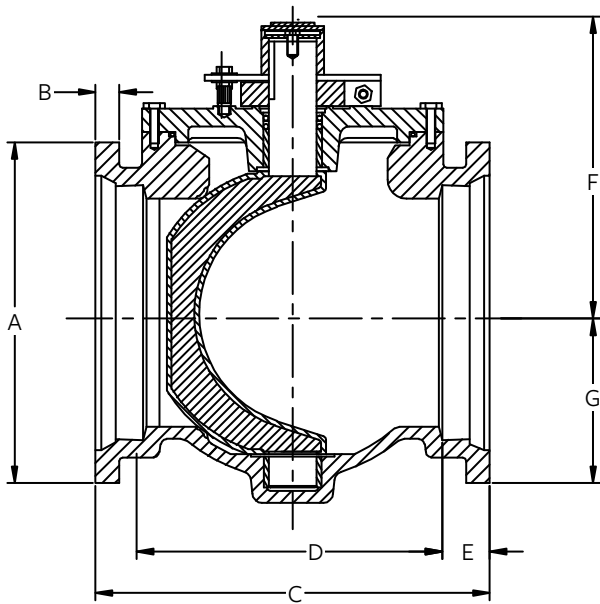
SIZE	2.50	3	4	5	6	8	10*	12*
A	7.00	7.50	9.00	10.00	11.00	13.50	16.00	19.00
B	.69	.75	.94	.94	1.00	1.13	1.19	1.25
C	7.50	8.00	9.00	10.00	10.50	11.50	13.00	14.00
D	6.19	6.19	7.25	8.38	8.38	10.69	—	—
E	3.50	3.75	4.50	5.75	5.75	7.63	8.88	10.00
F	5.35	5.35	6.31	7.56	7.56	9.63	11.13	12.81
G	6.00	6.00	6.00	6.00	6.00	12.00	12.00	12.00
WEIGHT (approx.)	30	40	70	105	115	190	345**	440**

*10" & above have gear operators as standard

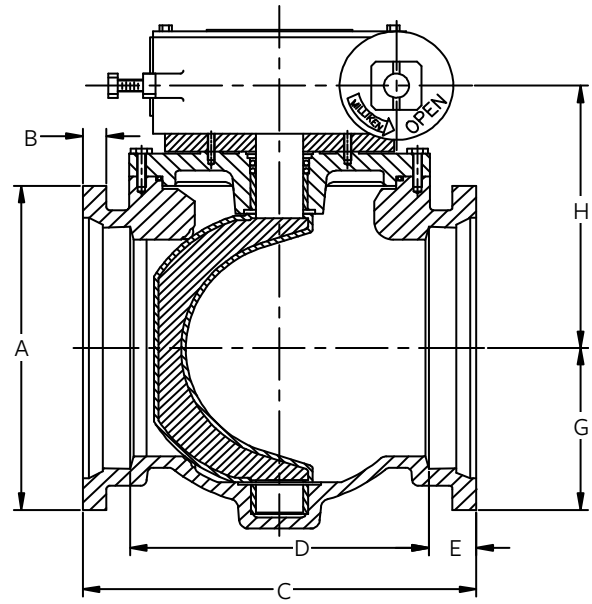
**Weight includes gear operator

Note: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

FIG. 600 CAST IRON (175 PSI) / 620 DUCTILE IRON (285 PSI) – MECHANICAL JOINT 3" – 12"



3" – 8" VALVES ONLY



3" – 12" VALVES

MECHANICAL JOINT END

SIZE	3	4	6	8	10*	12*
A	7.69	9.00	11.13	13.38	15.63	17.94
B	.94	1.00	1.06	1.13	1.19	1.25
C	11.50	14.25	15.75	17.38	19.38	20.75
D	6.00	9.25	10.75	12.39	14.39	15.75
E	2.75	2.50	2.50	2.50	2.50	2.50
F	6.19	7.25	8.38	10.69	—	—
G	3.84	4.50	5.56	6.69	7.81	8.97
H	5.16	6.31	7.56	9.63	11.13	12.81
WEIGHT (approx.)	50	80	125	200	360**	480**

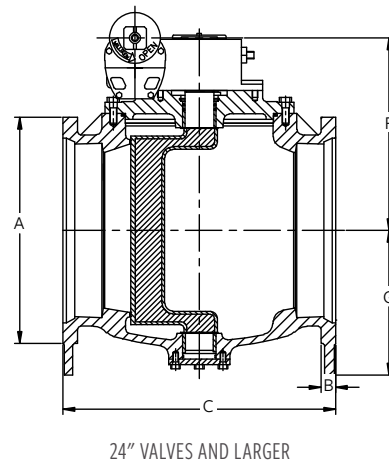
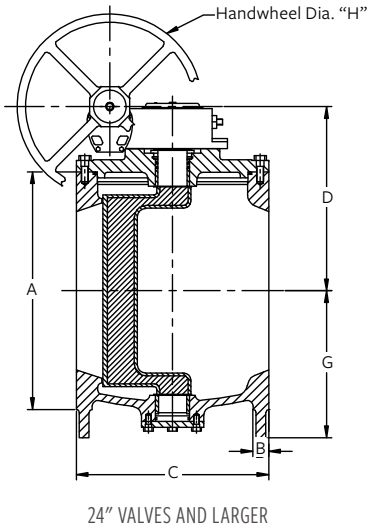
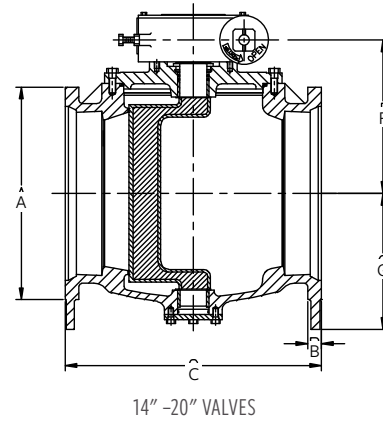
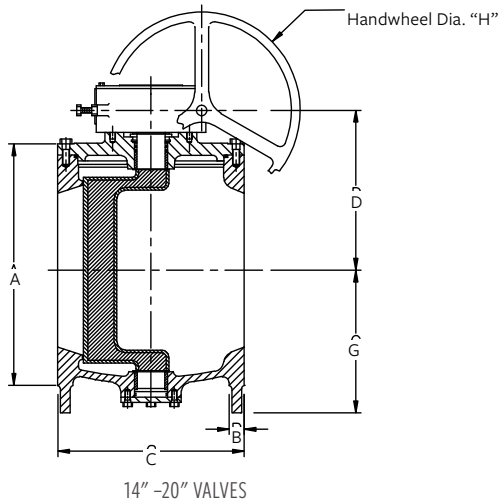
*10" & above have gear operators as standard

**Weight includes gear operator

We recommend gears on all mechanical joint valves

Note: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

FIG. 601 CAST IRON / 611 DUCTILE IRON FLANGED END (150 PSI) FIG. 600 (150 PSI) / 620 (250 PSI) DUCTILE IRON MECHANICAL JOINT END 14" & LARGER



FLANGED END — ANSI 125

SIZE	14	16	18	20	24	30	36	42	48	54
A	21.00	23.50	25.00	27.50	32.00	38.75	46.00	53.00	59.00	66.25
B	1.38	1.44	1.56	1.69	1.88	2.13	2.38	2.63	2.75	3.00
C	17.00	17.75	21.50	23.50	42.00	51.00	60.00	72.00	84.00	96.00
D	14.56	15.81	16.36	17.63	25.13	29.00	33.51	33.88	39.57	50.86
G	13.00	14.00	15.00	16.00	21.62	24.43	29.00	29.00	36.00	36.00
H	18.00	18.00	18.00	18.00	24.00	24.00	24.00	30.33	30.00	30.00
WEIGHT (approx.)	905	1030	1355	1880	3800	5200	6950	10160	13350	15100

Flanged Valves Meet ANSI B16.1

Weight includes gear operator

Note: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams.

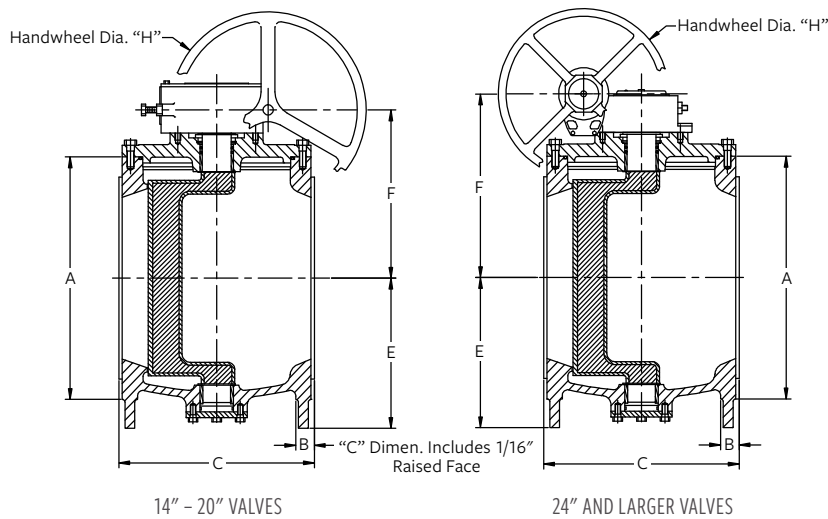
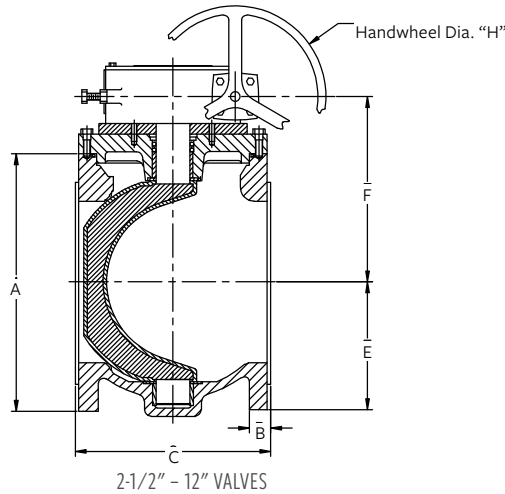
Note: Dimensions on 60" and larger available upon request.

MECHANICAL JOINT END

SIZE	14	16	18	20	24	30	36	42	48
A	20.13	22.56	24.84	27.06	31.50	39.13	46.00	53.13	60.00
B	1.31	1.38	1.43	1.50	1.62	1.68	2.00	2.00	2.00
C	24.50	27.25	29.25	31.00	42.00	51.00	60.00	72.00	84.00
F	14.56	15.81	16.36	17.63	25.13	29.00	33.51	33.88	39.57
G	13.00	14.00	15.00	16.00	21.62	24.75	29.00	29.00	36.00
WEIGHT (approx.)	905	1030	1355	1880	3800	5200	6950	10160	13350

Mechanical Joint Valves Meet ANSI 21.11 & AWWA C-111

FIG. 602 CLASS 250 RAISED FACE FLANGED END 2 1/2" – 12", 400 PSI, 14" – 36", 300 PSI



FLANGED END – ANSI 250

SIZE	2.50	3	4	5	6	8	10	12	14	16	18	20	24	30	36
A	7.50	8.25	10.00	11.00	12.50	15.00	17.50	20.50	23.00	25.50	28.00	30.50	36.00	43.00	50.00
B	1.06	1.13	1.25	1.38	1.44	1.63	1.88	2.00	2.12	2.25	2.38	2.50	2.75	3.00	3.38
C	9.50	11.13	12.00	15.00	15.88	16.50	18.00	19.75	18.50	19.38	23.13	25.00	42.88	51.88	61.00
E	3.50	3.75	4.50	5.75	5.75	17.63	8.88	10.00	13.00	14.00	15.00	16.00	21.62	24.75	29.00
F	5.16	5.16	6.31	7.56	7.56	9.63	11.13	12.81	14.56	15.81	16.36	17.63	22.81	27.59	33.00
H	6.00	6.00	6.00	6.00	6.00	12.00	12.00	12.00	18.00	18.00	18.00	18.00	24.00	24.00	24.00
WEIGHT (approx.)	70	80	120	162	170	275	398	590	980	1125	1830	2060	4160	5700	7670

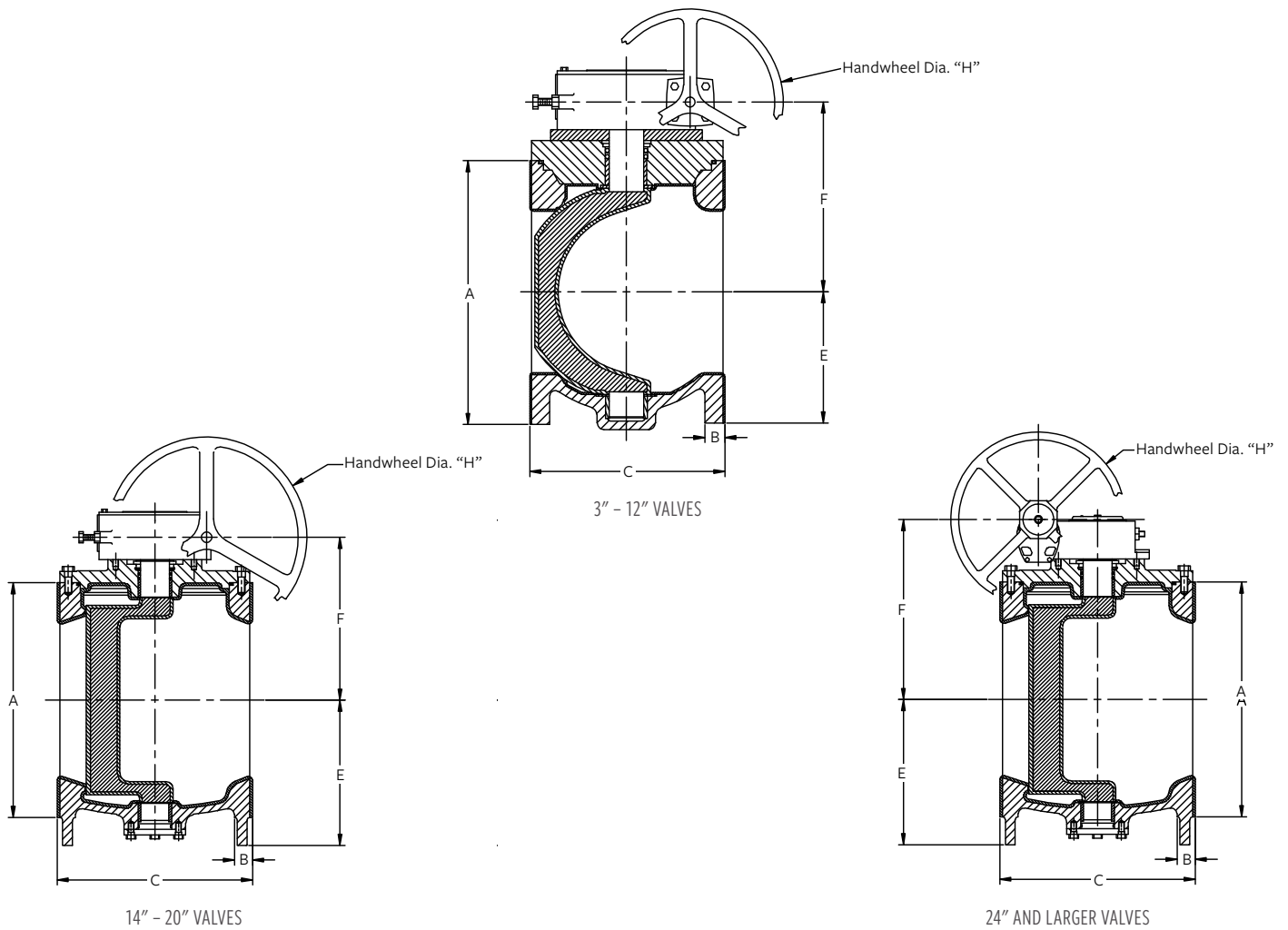
All above have gear operators as standard

Weight includes gear operator

Note: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

Note: Dimensions on 42" and larger available upon request

RUBBERLINED – FLANGED END – 3" – 12", 175 PSI, 14" & LARGER, 150 PSI



FLANGED END – ANSI 125 RUBBER LINED

SIZE	3	4	5	6	8	10	12	14	16	18	20	24	30	36	42
A	7.50	9.00	10.00	11.00	13.50	16.00	19.00	21.00	23.25	25.00	27.50	32	38.75	46.00	53.00
B	.88	1.07	1.07	1.13	1.26	1.32	1.38	1.26	2.25	2.38	2.50	2.75	3.00	3.38	3.38
C	8.25	9.25	10.25	10.75	11.75	13.25	14.25	17.25	18.00	21.75	23.75	42.25	51.25	60.25	72.25
E	3.75	4.50	7.75	7.75	7.63	8.88	10.00	13.00	14.00	15.00	16.00	21.63	24.75	29.00	29.00
F	5.16	6.31	7.56	7.56	9.63	11.13	12.81	14.56	15.81	16.36	17.63	25.13	29.00	33.51	33.88
H	6.00	6.00	6.00	6.00	12.00	12.00	12.00	18.00	18.00	18.00	18.00	24.00	24.00	24.00	24.00
WEIGHT (approx.)	70	100	135	145	240	345	440	905	1030	1355	1880	3800	5200	6940	10160

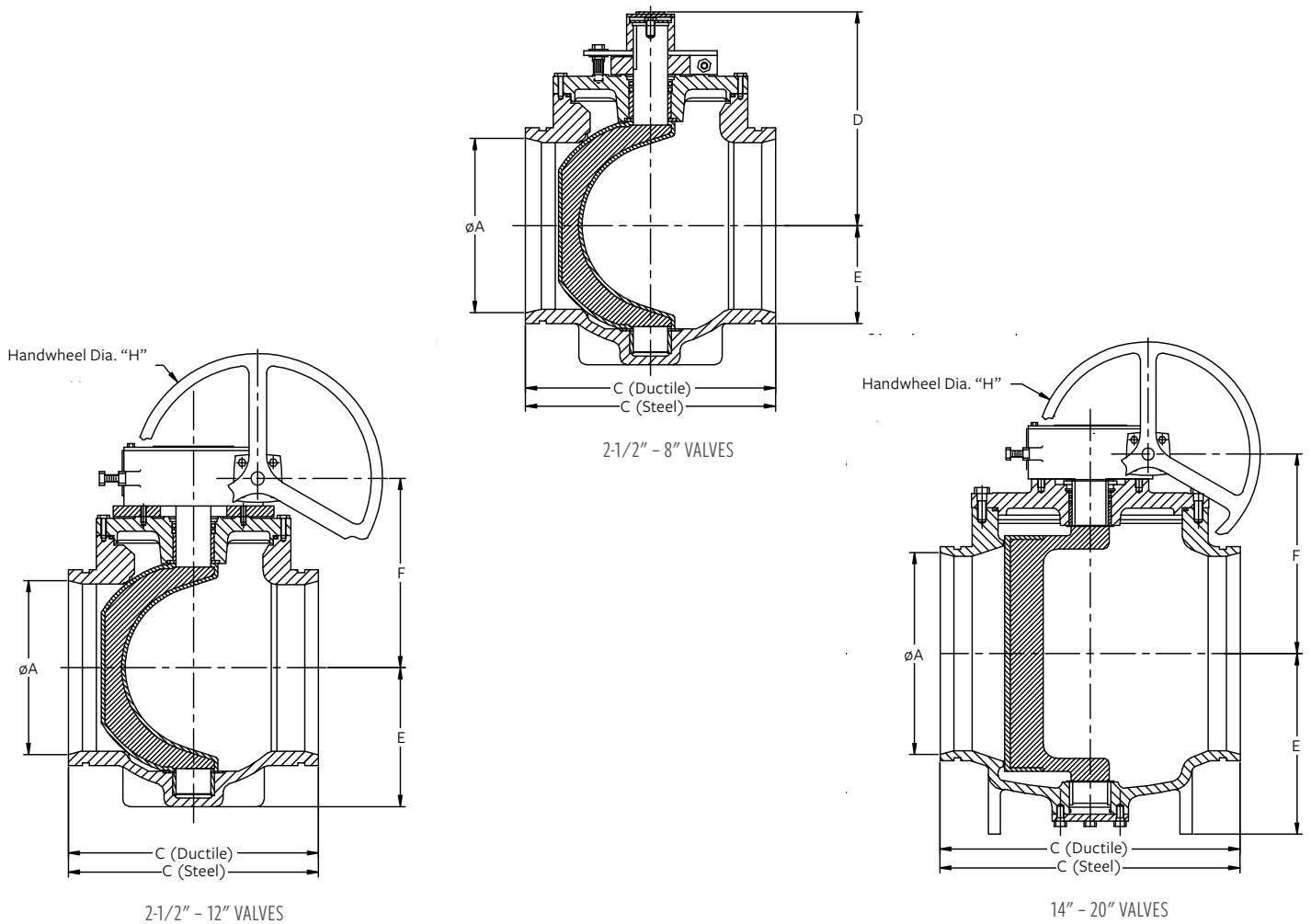
All above have gear operators as standard

Weight includes gear operator

Note: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

Note: Dimensions on 48" and larger available upon request

FIG. 606 GROOVED END – 2 1/2" – 12", 175 PSI, 14" – 20", 150 PSI



GROOVED END – AWWA 606

SIZE	2.50	3	4	5	6	8	10*	12*	14*	16*	18*	20*
A	2.50	3.00	4.00	5.00	6.00	8.00	10.00	12.00	14.00	15.25	16.19	18.06
C (Duct.)	N/A	9.06	10.25	N/A	12.50	14.00	16.56	18.00	21.63	N/A	27.50	30.00
C (Steel)	7.13	8.50	10.13	12.38	12.38	13.88	16.44	17.88	21.63	22.50	27.50	30.00
D	6.19	6.19	7.25	8.38	8.38	10.69	—	—	—	—	—	—
E	3.50	3.75	4.50	5.75	5.75	7.63	8.88	10.00	10.00	14.00	15.00	16.00
F	5.16	5.16	6.31	7.56	7.56	9.63	11.13	12.86	13.56	15.81	16.35	17.63
H	6.00	6.00	6.00	6.00	6.00	12.00	12.00	12.00	12.00	18.00	18.00	18.00
WEIGHT (approx.)	20	30	50	70	80	145	325**	420**	RTF	RTF	RTF	RTF

*10" & above have gear operators as standard

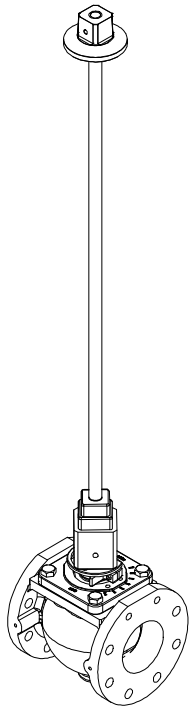
**Weight includes gear operator

Note: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

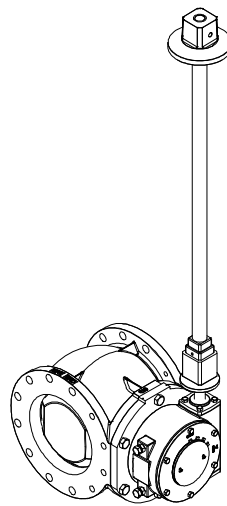
Note: Larger sizes are available. Contact Pratt Valve for data.

ADAPTION

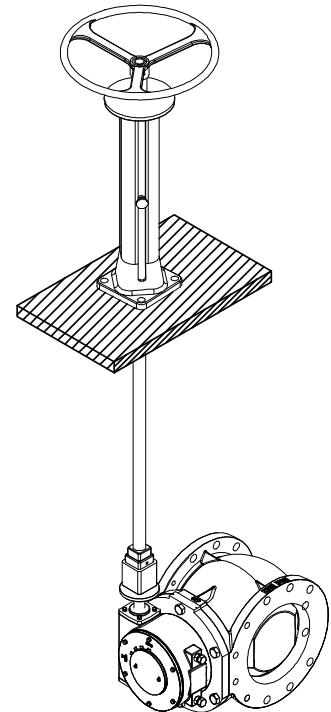
A range of extended stems & floor mounted stands for remote operation, particularly in buried service, are available. Chainwheels & locking devices are readily incorporated onto the Ballcentric® Plug Valve.



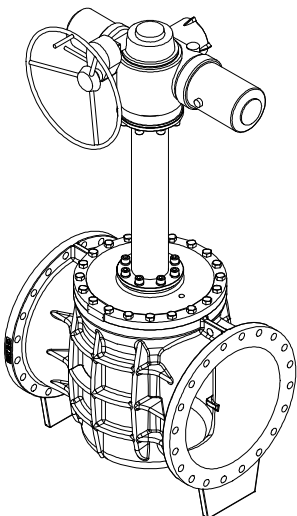
VALVE WITH EXTENDED STEM & 2" NUT
(ONLY FOR 8" AND SMALLER VALVES)



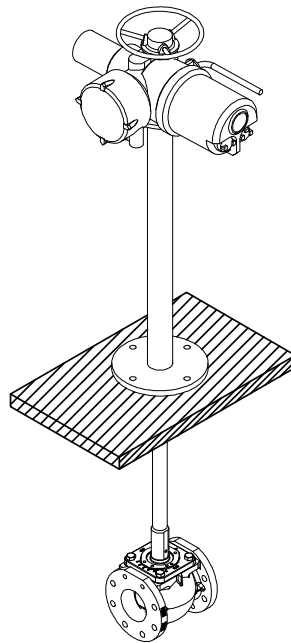
VALVE WITH EXTENDED STEM,
BURIED GEAR AND 2" NUT



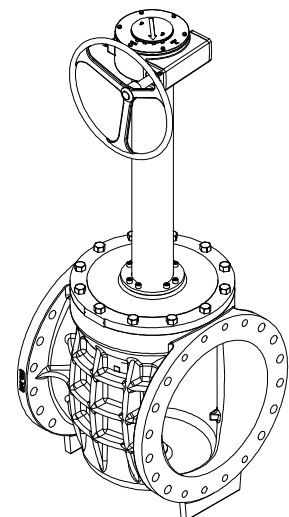
VALVE WITH INDICATING FLOORSTAND



VALVE WITH EXTENDED BONNET & MOTOR OPERATOR



VALVE WITH NON-INDICATING FLOORSTAND
AND MOTOR OPERATOR



VALVE WITH EXTENDED BONNET WITH GEAR

TECHNICAL SPECIFICATION

Ballcentric® Series 601 / 600 Plug Valves

AWWA C-517 STANDARDS

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125 / 150** including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with **AWWA / ANSI C-111**. Grooved ends shall be manufactured to the dimensions of **ANSI / AWWA C606** for ductile or steel pipe as required. Ports shall be round on sizes 2-1/2"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **ASTM A-126 Class B** cast iron and thickness in accordance with **AWWA C-517 Section 4.4.1.4**. Valves 3" and larger shall be furnished with a welded-in overlay seat of 1/8" thick of not less than 99% nickel in accordance with **AWWA C-517, Section 4.3.3.4**. Sprayed, plated or screwed-in seats are not acceptable.

Plugs shall be of **ASTM A-536-Grade 65-45-12** for all sizes in compliance with **AWWA C-517 Section 4.3.3.2**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517, Section 4.3.3.6**. Bearings shall be

of sintered, oil impregnated type stainless steel. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves 2-1/2"-8" shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with removeable levers or extended "T" handles.

Worm gear operators, where required, shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2-1/2"-12" and 150 psi for valves 14" and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517 Section 5.2.2** when requested.

Plug valves shall be Ballcentric® Plug Valve **Series 601 / 600** as manufactured by Pratt.

TECHNICAL SPECIFICATION

Ballcentric® Series 602 ANSI Class 250 Raised Face Plug Valves

AWWA C-517 STANDARDS

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 250** including facing, drilling and flange thickness. Ports shall be round on sizes 2-1/2" through 12" to facilitate "pigging" when required. Valves 14" and larger shall be of a rectangular port design.

Valve bodies shall be of **ASTM A-536 Grade 65-45-12** ductile iron and thickness in accordance with **AWWA C-517 Section 4.4.1.4**.

Valves 3" and larger shall be furnished with a welded-in overlay seat of 1/8" thick of not less than 99% nickel in accordance with **AWWA C-517 Section 4.3.3.4**. Sprayed, plated or screwed-in seats are not acceptable.

Plugs shall be of **ASTM A-536-Grade 65-45-12** in compliance with **AWWA C-517 Section 4.3.3.2**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517 Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type stainless steel. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Worm gear operators shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bi-directional shutoff at the valves design pressure rating.

Valves shall be designed and manufactured to shut off bubble tight at 400 psi for valves 2-1/2"-12" and 300 psi for valves 14"-36" with pressure behind the plug.

Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517 Section 5.2.2** when requested.

Plug valves shall be Ballcentric® Plug Valve **Series 602** as manufactured by Pratt.

TECHNICAL SPECIFICATION

Ballcentric® Rubberlined Plug Valves

AWWA C-517 STANDARDS

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125 / 150** including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with **AWWA / ANSI C-111- 92**. Grooved ends shall be manufactured to the dimensions of **ANSI / AWWA C606** for ductile or steel pipe as required. Ports shall be round on sizes 2-1/2"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **ASTM A-126 Class B** cast iron and thickness in accordance with **AWWA C-517 Section 4.4.1.4**. The interior of the valve bodies shall be covered with a suitable elastomer with a minimum thickness of 1/8". The elastomer shall extend through the valve flow way and onto the flanges to ensure a positive seal.

Plugs shall be of **ASTM A-536-Grade 65-45-12** for all sizes in compliance with AWWA C-517 Section 4.3.3.2. The plugs shall be of one piece solid construction with PTFE thrust bearings on the

upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517, Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type stainless steel. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Worm gear operators shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bi-directional shutoff at the valves design pressure rating.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2-1/2"-12" and 150 psi for valves 14" and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517 Section 5.2.2** when requested.

Plug valves shall be Ballcentric® Plug Valve as manufactured by Pratt.

TECHNICAL SPECIFICATION

Ballcentric® Series 601S – Stainless Steel Plug Valves

AWWA C-517 STANDARDS

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with ANSI B16.1 Class 125 including facing, drilling and flange thickness. Ports shall be round on sizes 2-1/2"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **CF8M (316 stainless steel)**. Valves shall be furnished with 316 stainless steel seat in accordance with **AWWA C-517 Section 4.3.3.4**.

Plugs shall be of **CF8M (316 stainless steel)**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517 Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type stainless steel. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves 2-1/2"-8" shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with removable levers or extended "T" handles.

Worm gear operators, where required, shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bi-directional shutoff at the valves design pressure rating.

Valves shall be designed and manufactured to shut off bubble tight at 275 psi. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517 Section 5.2.2** when requested.

Plug valves shall be Ballcentric® Plug Valve **Series 601S** as manufactured by Pratt.

TECHNICAL SPECIFICATION

Ballcentric® Series 611 – Ductile Iron Plug Valves

AWWA C-517 STANDARDS

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125 / 150** including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with **AWWA / ANSI C-111-92**. Grooved ends shall be manufactured to the dimensions of **ANSI / AWWA C606** for ductile or steel pipe as required. Ports shall be round on sizes 2-1/2"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **ASTM A-536 Grade 65-45-12** and thickness in accordance with **AWWA C-517 Section 4.4.1.4**. Valves 3" and larger shall be furnished with a welded-in overlay seat of 1/8" thick of not less than 99% nickel in accordance with **AWWA C-517, Section 4.3.3.4**. Sprayed, plated or screwed-in seats are not acceptable.

Plugs shall be of **ASTM A-536-Grade 65-45-12** for all sizes in accordance with **AWWA C-517 Section 4.3.3.2**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517, Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type stainless steel. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves 2-1/2"-8" shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with removeable levers or extended "T" handles.

Worm gear operators, where required, shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bidirectional shutoff at the valves design pressure rating.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2-1/2"-12" and 150 psi for valves 14" and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517 Section 5.2.2** when requested.

Plug valves shall be Ballcentric® Plug Valve **Series 611** as manufactured by Pratt.

TECHNICAL SPECIFICATION

Ballcentric® Glass Lined Plug Valves

AWWA C517-09 STANDARDS

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125 / 150** including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with **AWWA / ANSI C-111-92**. Grooved ends shall be manufactured to the dimensions of **ANSI / AWWA C606** for ductile or steel pipe as required. Ports shall be round on sizes 3"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **ASTM A-126 Class B** cast iron and thickness in accordance with **AWWA C-517 Section 4.4.1.4**. Interior of valves shall be glass lined at .008-.012 mils thickness, covering the entire interior of valve bodies and stopping at the flange faces.

Plugs shall be of **ASTM A-536-Grade 65-45-12** for all sizes in compliance with AWWA C-517 Section 4.3.3.2. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517, Section 4.3.3.6**. Bearings shall be

of sintered, oil impregnated type stainless steel. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves 2-1/2"-8" shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with removeable levers or extended "T" handles.

Worm gear operators, where required, shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bi-directional shutoff at the valves design pressure rating.

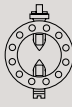

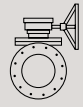
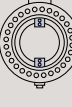
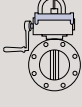



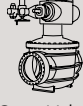


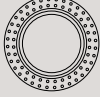





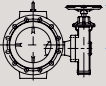

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2-1/2"-12" and 150 psi for valves 14" and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in AWWA C-517 Section 5.2.2 when requested.

Plug valves shall be Ballcentric® Plug Valve Series as manufactured by Pratt.

NOTES

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NOTES

 Model 2FII	 Monoflange MKII	 Plug Valve
 Triton® XR70	 Indicating Butterfly Valve UL & FM approved	 Tilting Disc Check Valve
 Knife Gate Valve	 N-Stamp Nuclear Butterfly Valve	 Cone Valve
 Rectangular	 PIVA Post Indicating Valve Assembly UL & FM approved	 Sleeve Valve
 Rubber Seated Ball Valve	 Triton® HP250	 Check Valve
 Metal Seated Ball Valve	 Control Systems	 Plunger Valve
	 Air Valve	

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