

# PRATT

Henry Pratt Company

## Ballcentric® Plug Valve



**Engineering Creative Solutions  
for Fluid Systems Since 1901**

## A Tradition of Excellence

With the development of the first rubber seated butterfly valve more than 70 years ago, the Henry Pratt Company became a trusted name in the flow control industry, setting the standard for product quality and customer service. Today Pratt provides the following range of superior products to the water, wastewater and power generation industries.

**Butterfly Valves:** from 3" to 162"

**Rectangular Valves:** 1' x 1' to 14' x 16'

**Ball Valves –**

**Rubber Seated:** from 4" to 60"

**Metal Seated:** from 6" to 48"

**Plug Valves:** from 1/2" to 36", 3 ways

**Hydraulic Control Systems**

**Valve Controls**

**Energy Dissipating Valves  
and Fixed Energy Dissipaters**

**Cone Valves**

**Check Valves**

## A Commitment to Meeting The Customers' Needs

Henry Pratt valves represent a long-term commitment to both the customer and to a tradition of product excellence. This commitment is evident in the number of innovations we have brought to the industries we serve. In fact, the Henry Pratt Company was the first to introduce many of the flow control products in use today, including the first rubber seated butterfly valve, one of the first nuclear N-Stamp valves, and the bonded seat butterfly valve.

## Innovative Products For Unique Applications

Though many of the standard valves we produce are used in water filtration and distribution applications, Pratt has built a reputation on the ability to develop specialized products that help customers to meet their individual operational challenges.

## Creative Engineering for Fluid Systems

Pratt's ability to provide practical solutions to complex issues is demonstrated by the following case histories.

### Earthquake Proof Valves

Pratt designed and manufactured hydraulically actuated valves for a water storage application so that the valves would automatically operate in the event of earthquakes. This led to the development of a valve that will withstand acceleration forces of up to 6g's.

### Custom Actuation/Isolation Valves

Pratt designed and manufactured valves that would isolate a working chamber in the event of a nuclear emergency during the decommissioning of armed nuclear warheads. The valves were able to close in a millisecond using specially designed Pratt electro-pneumatic actuators.

### Valves Designed for Harsh Environments

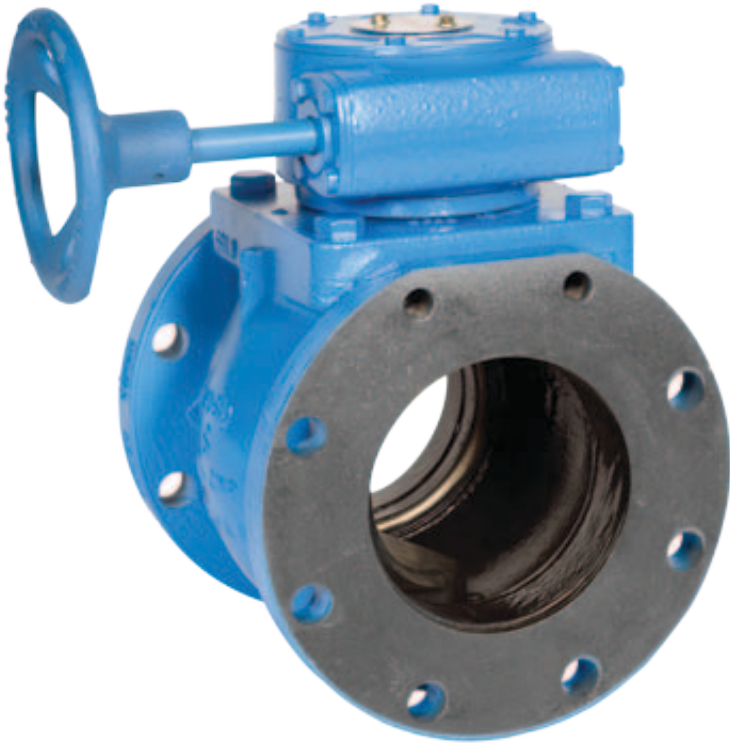
Pratt designed and manufactured a 144" diameter butterfly valve for the emergency cooling system at a jet engine test facility. The valve was designed to supply water to help dissipate the tremendous heat generated by the engines during testing.



**PRATT**  
Henry Pratt Company

**Through experience, commitment and creative engineering, Pratt is uniquely suited to provide superior products for our customers' special needs. For more information, contact our corporate headquarters in Aurora, Illinois.**

# Scope of Line: Pratt Ballcentric® Plug Valve



Note: Manual actuators will be worm and gear type.

**Sizes:** 1/2" through 72"

**Body Styles:** End connections

- Flanged (2-1/2" - 72")
- Mechanical Joint (3" - 48")
- Grooved (3" - 12")
- Threaded (1/2" - 2")
- Flanged 3-way (3" - 16")

**Pressure Class:**

- 175 psi, 12" and smaller
- 150 psi, 14" and larger
- Higher pressure on request

**Port Shape/Area:**

- 1/2" to 12" round
- 14" - 36" rectangular
- 100% port area available

**Actuation Options:**

- Direct nut
- Buried Service
- Handwheel
- Chainwheel
- Cylinder
- Electric Motor

**Plug Elastomers:**

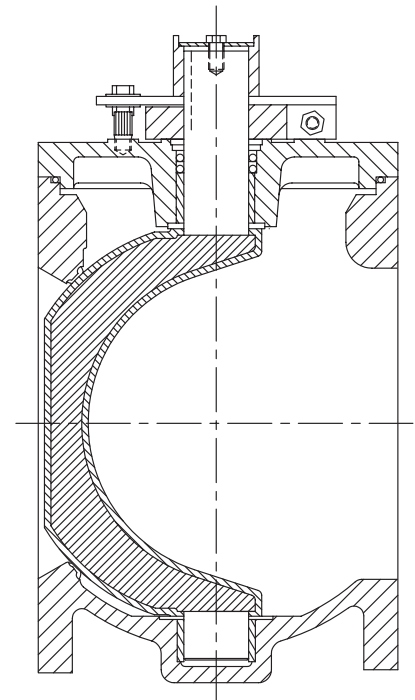
- Buna
- Neoprene
- EPDM

**Linings:**

- Glass
- Natural Rubber
- Neoprene
- 2-Part Epoxy

## Design Details

- Welded Nickel Seat
- Elastomer Coated Plug
- Permanently Lubricated, Stainless Steel or Bronze Bearings
- Self Adjusting Stem Seal



# Advantages of Plug Valves

Feature	Benefit
<b>Efficient economical flow</b>	Better flow characteristics resulting in less pressure drop across the valve
<b>Port passes larger solids</b>	Reduces plugging problems
<b>Port offers less resistance to slurry, sludge and fluid flow</b>	Less erosion, longer service life and reduced pumping costs
<b>Large nominal port size</b>	Less resistance to flow resulting in reduced operating costs
<b>Unobstructed, direct flow path</b>	Plug is hidden from flow stream so no debris buildup on plug. Also allows for in-line pigging

## Discussion of Cv's

The specification of valve port area has been bounced around with the notion that the larger the port area, the higher the flow rate, or in other words, the greater the Cv value in gallons per minute. This argument of flow has also pulled in the specific shape of the port. Whether its round or rectangle, the port area and associated shape of the port seems to be taking precedence in specifications without taking into consideration the actual Cv of the valve. Cv is defined as the amount of flow through a valve, in gallons per minute, with a 1 psi pressure drop across the valve. The greater the Cv the more efficient the valve will perform in terms of reduced headloss or energy consumption.

The shape of the port, whether round or rectangular, is important from an understanding of what shape is best to efficiently manufacture plug valves. The issue of effective seat design plays a huge role in determining the shape of the port. In smaller size valves - up to 12" - the most cost effective approach to produce plug valves is with round ports. As you get into larger sizes, the most cost effective approach to producing plug valves is with rectangular ports. However, this comes with a caveat. The more divergent from center the flow must take in a rectangular port, the greater the amount of head loss the valve generates. To measure or compare one valve manufacturer to another in terms of head loss, the plug manufacturer who has the larger port width, on the surface, will have less head loss than a manufacturer with a narrower port width.

# Suggested Specification for Ballcentric® Plug Valve

## General

Plug valves shall be of the non-lubricating, eccentric type and shall be designed for a working pressure of 175 psi for valves 12" and smaller, 150 psi for valves 14" and larger. Valves shall provide tight shut-off at rated pressure. Valves shall be manufactured by Henry Pratt.

Valves 12" and smaller shall have round port design. 14" and larger valves shall have rectangular port design.

## Valve Body

The plug valve body shall be cast iron ASTM A126 Class B with welded-in overlay of 99% nickel alloy content on all surfaces contacting the face of the plug. Sprayed, plated, nickel welded rings or seats screwed into the body are not acceptable.

## Valve Plug

The valve plug shall be ductile iron ASTM A-536, Grade 65-45-12 with Buna N resilient seating surface to mate with the body seat.

## Valve End

Valve flanges shall be in strict accordance with ANSI B16.1, Class 125.

## Valve Bearings

Plug valve shall be furnished with permanently lubricated sleeve type bearings conforming to AWWA C517. Bearings shall be of sintered, oil impregnated type 316 stainless steel ASTM A-743 Grade CF-8M or bronze ASTM B-127.

## Valve Shaft Seals

Valve shaft seals shall be of the "U" cup type, in accordance with AWWA C517. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

## Valve Actuators

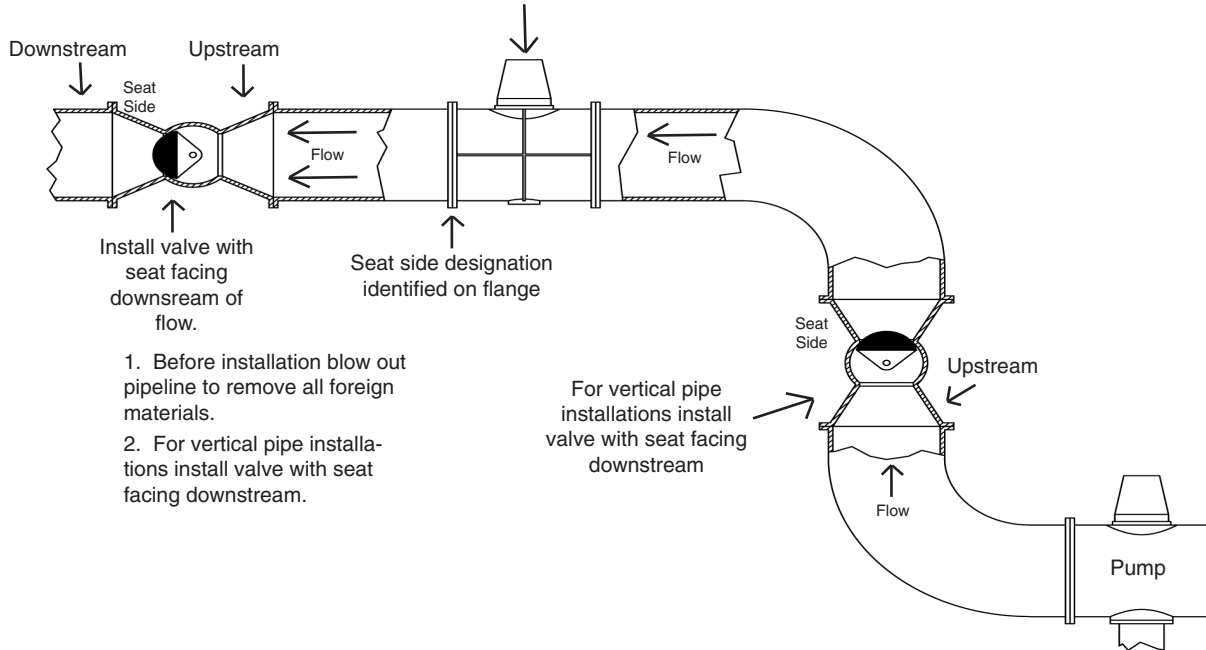
6" and smaller exposed valves shall be provided with wrench actuators. 8" and larger exposed valves shall be provided with worm gear type manual actuators. All buried valves shall be provided with worm and gear actuators suited for the intended service. Valve actuators shall be fully grease packed and have stops in the open/close position. The actuator shall have a mechanical stop which will withstand an input torque of 450 lbs. against the stop. The actuator shall be able to provide 1.25 times the required operating torque under full rated line pressure combined with a flow velocity of 8 feet per second.

# Installation Options

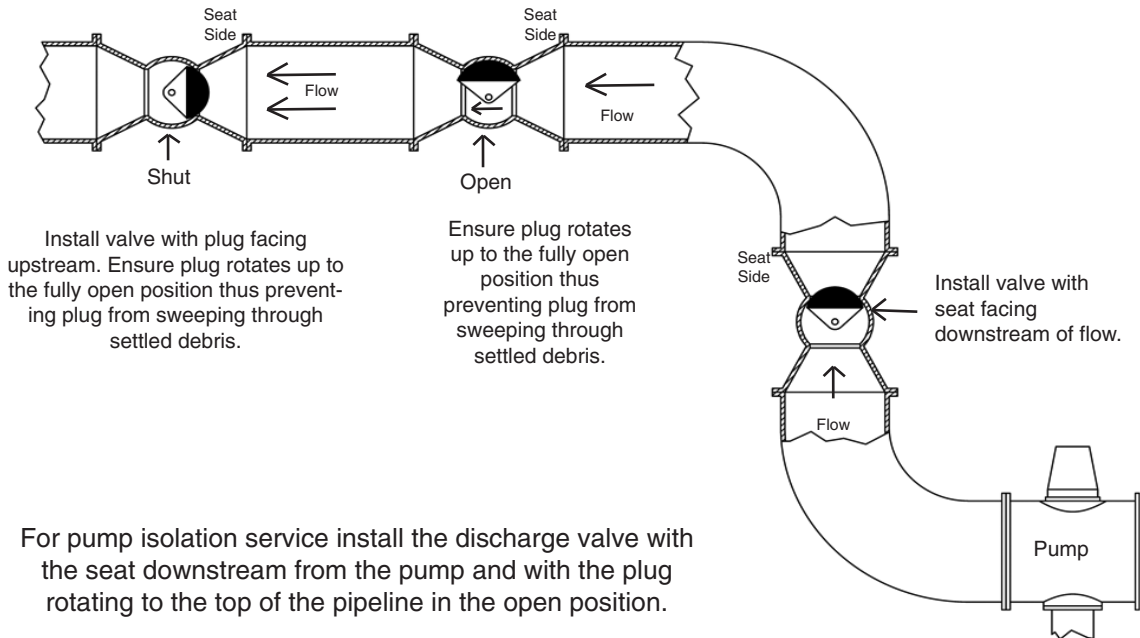
The type of materials carried in the pipeline and the location of the valve determine the correct installation orientation:

## Liquids without suspended solids

Valve may be installed with plug shaft vertical or horizontal.



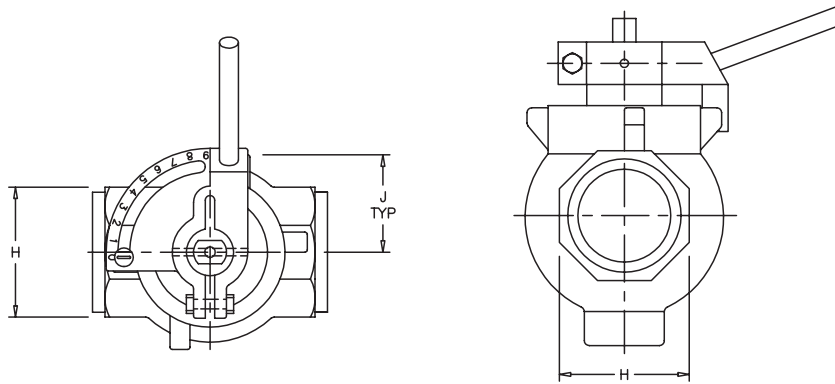
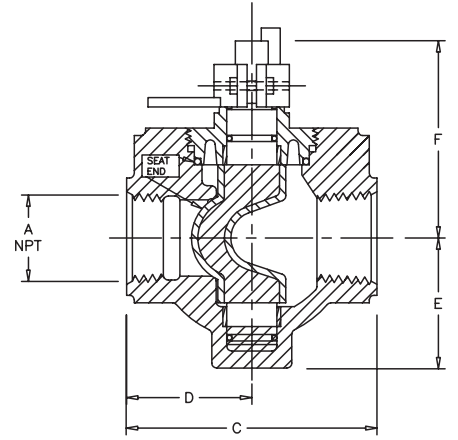
## Suspended solids and dirty gases



For pump isolation service install the discharge valve with the seat downstream from the pump and with the plug rotating to the top of the pipeline in the open position.

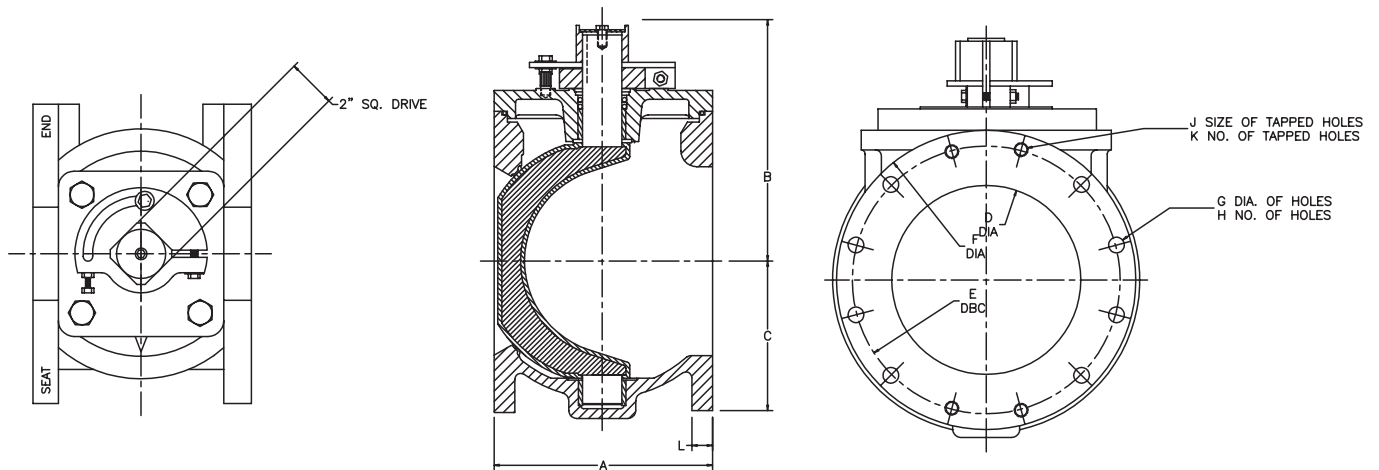
## 1/2" - 2" Plug Valve Threaded Ends

Valve Size	A	C	D	E	F	H	J
1/2	0.50	3.75	2.00	2.00	3.75	1.88	2.0
3/4	0.75	3.80	2.00	2.00	3.75	1.88	2.0
1	1.00	3.75	2.00	2.00	3.75	1.88	2.0
1-1/4	1.25	4.75	2.63	2.38	4.45	2.75	2.3
1-1/2	1.50	4.90	2.63	2.38	4.30	2.75	2.3
2	2.00	5.25	2.90	3.30	5.30	3.25	2.5



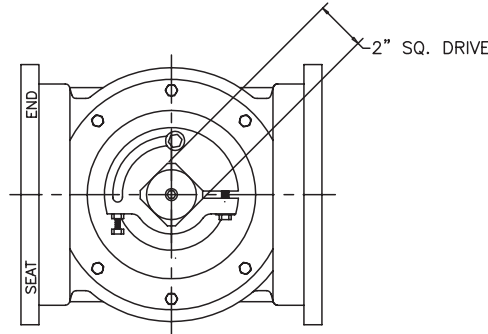
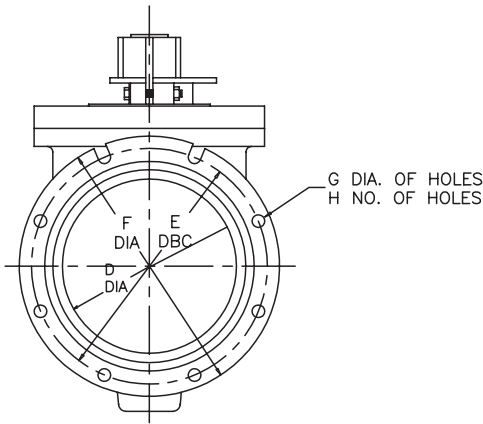
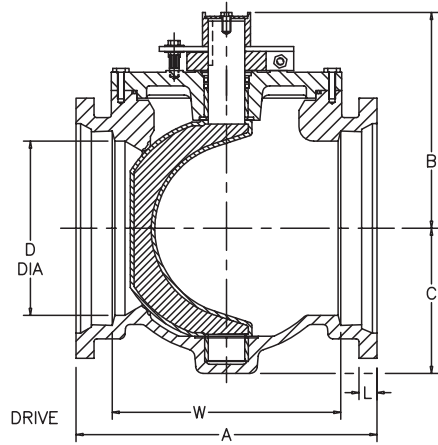
## 2-1/2" - 8" Plug Valve Flanged, Direct Nut

Valve Size	A	B	C	D	E	F	G	H	J	K	L
2.5	7.50	6.19	3.50	2.50	5.50	7	0.75	4	-	-	0.69
3	8	6.19	3.75	3	6.00	7.50	0.75	4	-	-	0.75
4	9	7.25	4.50	4	7.50	9	0.75	6	0.63	2	0.94
5	10	8.38	5.75	5	8.50	10	0.88	6	0.75	2	0.94
6	10.50	8.38	5.75	6	9.50	11	0.88	6	0.75	2	1
8	11.50	10.69	7.63	8	11.75	13.50	0.88	6	0.75	2	1.13



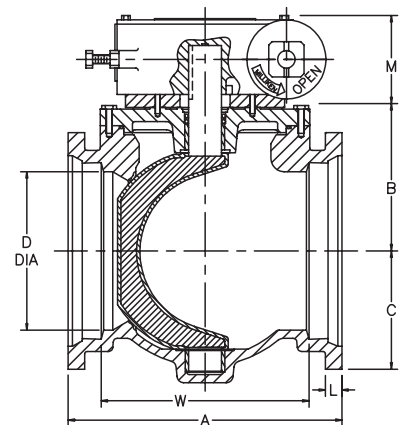
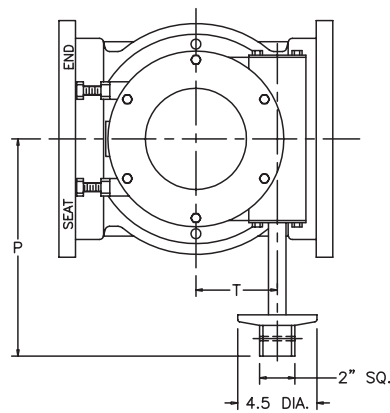
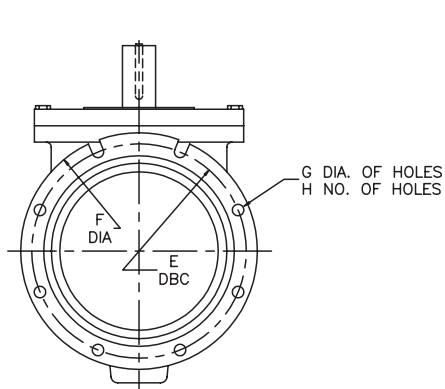
## 3" - 8" Mechanical Joint, Direct Nut

Valve Size	A	B	C	D	E	F	G	H	L	W
3	11.50	6.19	3.84	3	6.19	7.63	0.75	4	0.94	6.50
4	14.25	7.25	4.50	4	7.50	9.13	0.88	4	1	9.25
6	15.75	8.38	5.75	6	9.50	11.13	0.88	6	1.06	10.75
8	17.38	10.69	7.63	8	11.75	13.38	0.88	6	1.13	12.38



## 3" - 12" Mechanical Joint, Buried Service Actuator

Valve Size	A	B	C	D	E	F	G	H	L	M	P	T	W
3	11.50	3.34	3.84	3	6.19	7.63	0.75	4	0.94	3.44	8	2.56	6.50
4	14.25	4.31	4.50	4	7.50	9.13	0.88	4	1	3.44	8	2.56	9.25
6	15.75	5.56	5.75	6	9.50	11.13	0.88	6	1.06	3.44	8	2.56	10.75
8	17.38	7.38	7.63	8	11.75	13.38	0.88	6	1.13	3.56	8	3.16	12.38
10	19.38	9.13	8.88	10	14	15.63	0.88	8	1.19	4.72	10	4.63	14.38
12	20.75	10.81	10	12	16.25	17.94	0.88	8	1.25	4.72	10	4.63	15.75

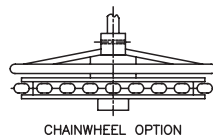
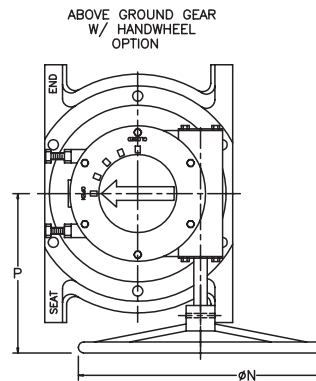
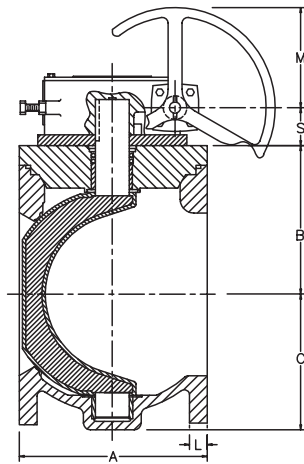




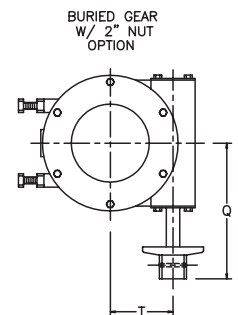
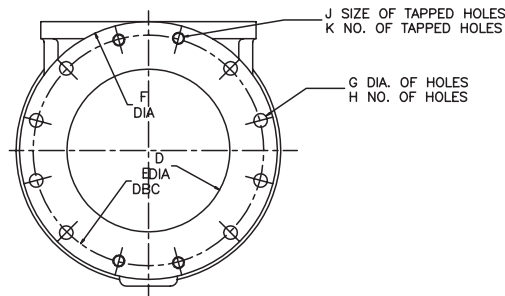
# 2 1/2" - 12" Flanged End, Handwheel & Buried Service Actuator

Valve Size	A	B	C	D	E	F	G	H
2.5	7.5	3.25	3.50	2.5	5.50	7.00	0.75	4
3	8	3.34	3.75	3	6.00	7.50	0.75	4
4	9	4.31	4.50	4	7.50	9	0.75	6
5	10	5.56	5.75	5	8.50	10	0.88	6
6	10.50	5.56	5.75	6	9.50	11	0.88	6
8	11.50	7.38	7.63	8	11.75	13.50	0.88	6
10	13	9.13	8.88	10	14.25	16	1	8
12	14	10.81	10	12	17.00	19	1	8

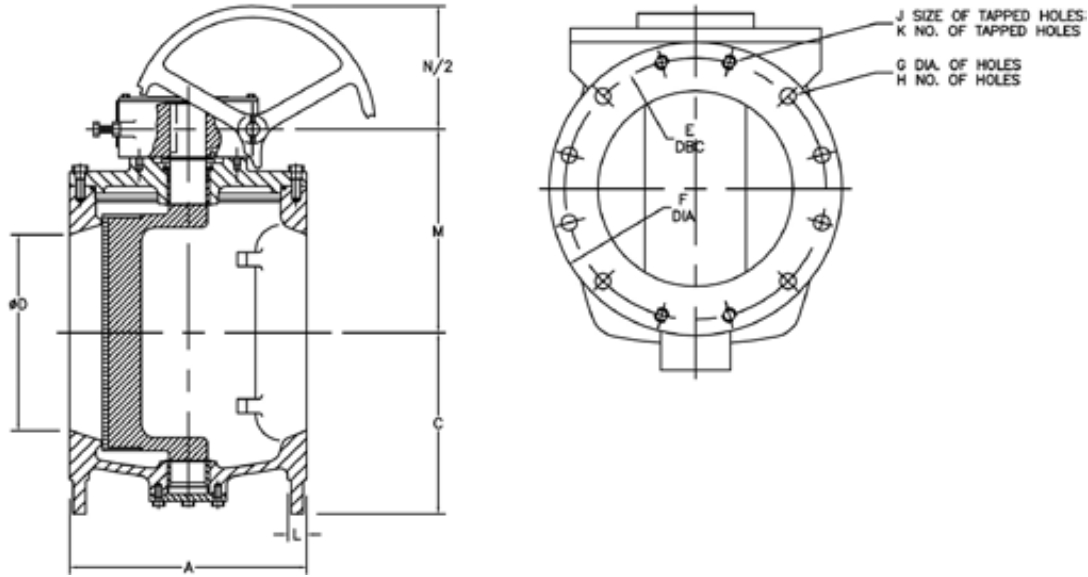
Valve Size	J	K	L	M	N	P	Q	S	T
2.5	—	—	0.69	2.5	5	4.75	4.75	2.0	2.00
3	—	—	0.75	2.5	5	4.75	4.75	2.0	2.00
4	0.63	2	0.94	3	6	9.50	8	2	2.56
5	0.75	2	0.94	3	6	9.50	8	2	2.56
6	0.75	2	1	3	6	9.50	8	2	2.56
8	0.75	2	1.13	6	12	11.25	8	2.3	3.16
10	0.88	4	1.19	6	12	11.63	10	2.5	4.63
12	0.88	4	1.25	6	12	11.63	10	2.5	4.63



CHAINWHEEL OPTION

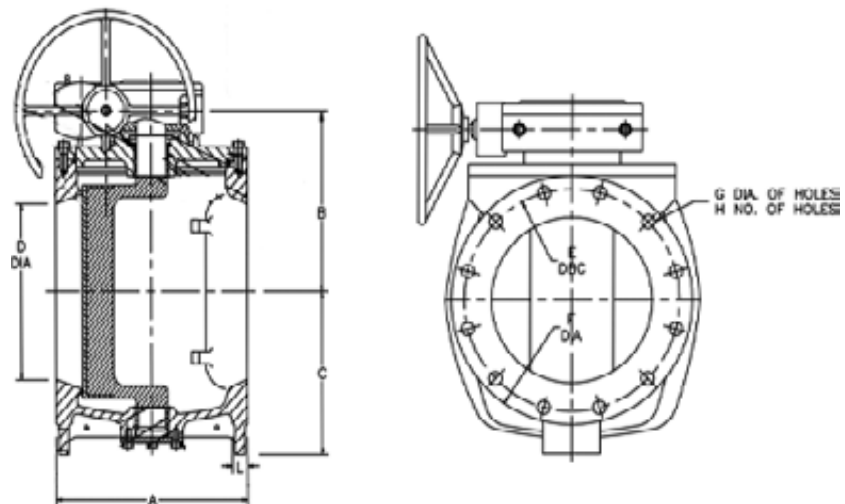


## 14" - 20" Flanged End, Gear, Handwheel



Valve Size	A	C	D	E	F	G	H	J	K	L	M	N
14	17	13	14	18.75	21	1.13	8	1	4	1.13	15.06	18
16	17.75	14	16	21.25	23.25	1.13	8	1	8	1.44	15.81	18
18	21.50	15	18	22.75	25	1.25	8	1.13	8	1.56	17	18
20	23.50	16	20	25	27.5	1.25	12	1.13	8	1.69	20.44	18

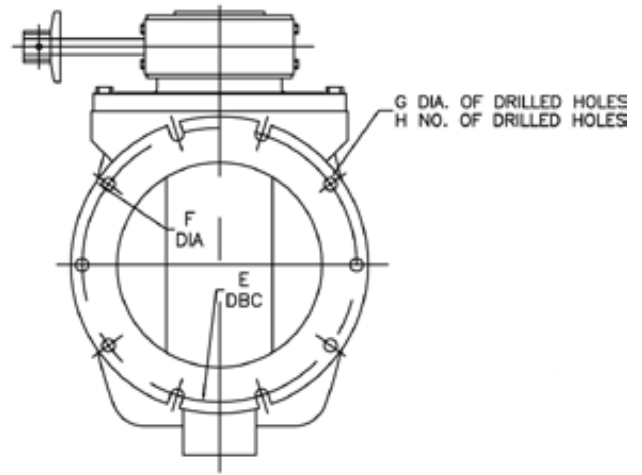
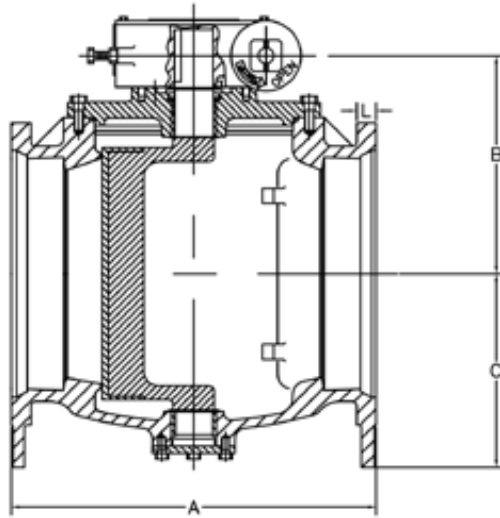
## 24" - 36" Flanged End, Handwheel



Valve Size	A	B	C	D	E	F	G	H	L
24	42	22.88	21.63	24	29.50	32.00	1.38	20	1.88
30	51	27.59	24.75	30	36	38.75	1.38	28	2.13
36	60	33.00	29.00	36	42.75	46.00	1.63	32	2.38

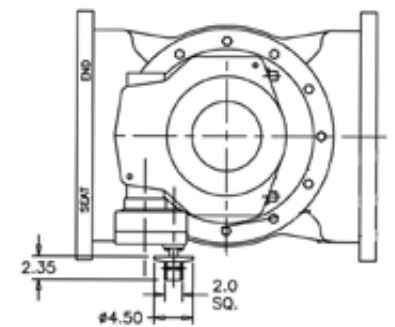
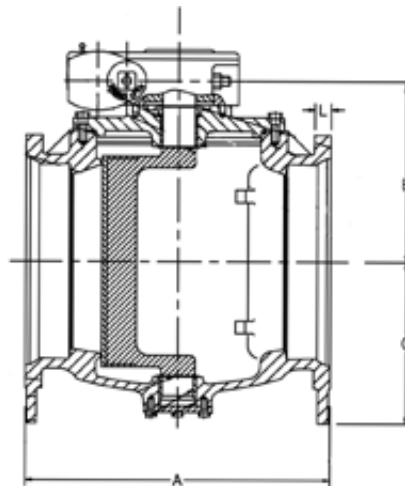
\*Consult Henry Pratt for sizes 42" and above

## 14" - 20" Mechanical Joint with Buried Gear, 2" Nut



Valve Size	A	B	C	E	F	G	H	L
14	24.50	15.06	13	18.75	20.31	0.88	10	1.31
16	27.25	15.81	14	21	22.56	0.88	12	1.38
18	29.25	17	15	23.25	24.84	0.88	12	1.44
20	31	20.44	16	25.5	27.06	0.88	14	1.50

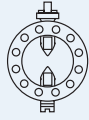
## 24" - 36" Mechanical Joint, Gear



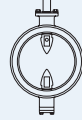
Valve Size	A	B	C	E	F	G	H	L
24	42	22.88	21.63	30	31.50	0.88	16	1.88
30	51	25.93	24.75	36.88	39.13	1.13	20	2.12
36	60	33.00	29	43.75	43	1.13	24	2.38

\*Consult Henry Pratt for sizes 42" and above

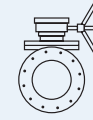
# PRATT PRODUCT GUIDE



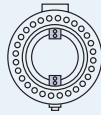
**Model  
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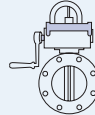
**Monoflange  
MKII**



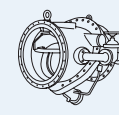
**Plug  
Valve**



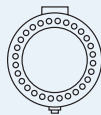
**Triton®  
XR70**



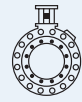
**Indicating Butterfly Valve  
UL & FM approved**



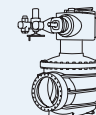
**Tilting Disc  
Check Valve**



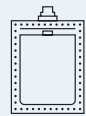
**Triton®  
XL**



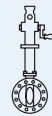
**N-Stamp Nuclear  
Butterfly Valve**



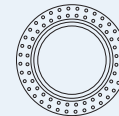
**Cone  
Valve**



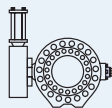
**Rectangular**



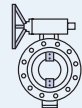
**PIVA Post Indicating Valve Assembly  
UL & FM approved**



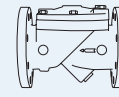
**Sleeve  
Valve**



**Rubber Seated  
Ball Valve**



**Triton®  
HP250**



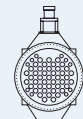
**Check  
Valve**



**Groundhog®  
Valve**

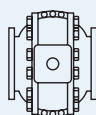


**Control  
Systems**



**Compact Controllable  
Energy Dissipater**

**PRATT**



**Metal Seated  
Ball Valve**

**Henry Pratt Company**

401 South Highland Avenue  
Aurora, Illinois 60506-5563  
United States  
630-844-4000  
Fax 630-844-4160  
www.henrypratt.com  
ISO 9001: 2000 Certified