

SATURN[®]
VALVES



ENGINEERING REDEFINED

Mevada Engineering Works Pvt. Ltd.

PISTON VALVE CATALOGUE

Piston Valves represent a modern evolution in isolation valve design. Featuring a seatless and gland less construction, they are engineered to replace conventional Gate and Globe Valves, while delivering superior reliability, safety, and service life.

At the heart of the design is a precision stainless steel piston operating in conjunction with resilient sealing rings. As the piston moves vertically, it forms a continuous, uniform seal, ensuring bubble-tight shut-off even under demanding operating conditions.

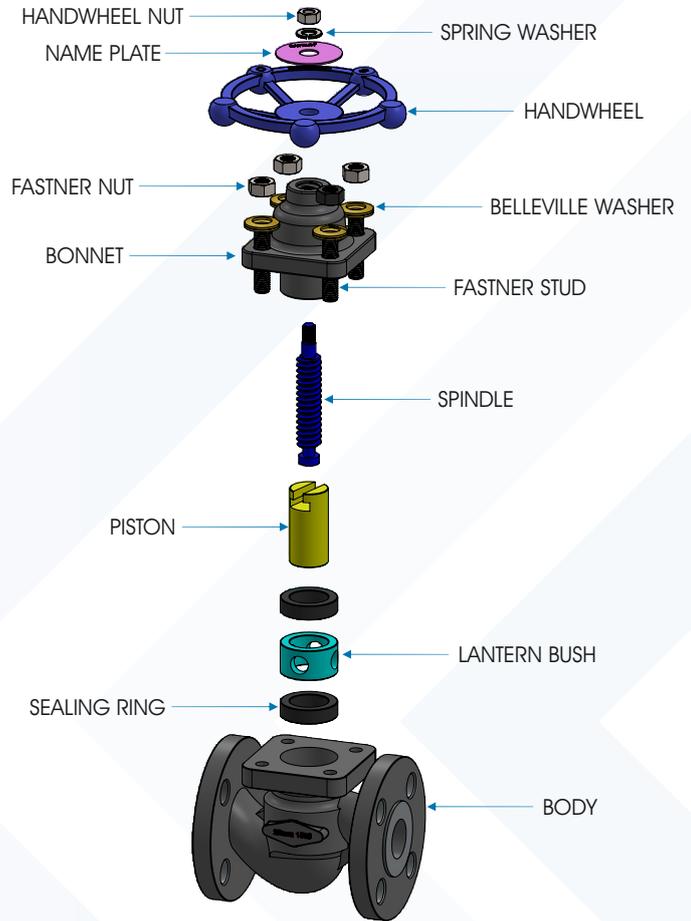
Unlike traditional valves, the Piston Valves eliminates typical leakage paths associated with seats and gland packings. This results in maintenance-free performance, reduced downtime, and consistent operation in high-temperature and high-pressure services, especially steam.

Why Choose a Piston Valve?

- Zero external leakage due to gland less design
- Bubble-tight internal sealing
- Reliable performance during thermal cycling
- Lower maintenance and lifecycle cost
- Ideal replacement for Gate & Globe Valves in steam and hazardous lines

Preferred Choice For:

Steam Distribution, Thermal Oil, Condensate, Hot Water, and Critical Process Services.



MATERIAL OF CONSTRUCTION

Part No.	Part Name	Material
1	Body	ASTM A 216 GR. WCB/A 351CF8 /A 351CF8M
2	Sealing Ring	GRAPHITE WITH SS304 REINFORCED
3	Lantern Bush	ASTM A 276 TYPE SS 410/ A 276 TYPE SS 304/ A 276 TYPE SS 316
4	Piston	ASTM A 276 TYPE SS 410/ A 276 TYPE SS 304/ A 276 TYPE SS 316
5	Spindle	ASTM A 276 TYPE SS 410/ A 276 TYPE SS 304/ A 276 TYPE SS 316
6	Bonnet	ASTM A 105/ ASTM A 216 GR. WCB/A 351CF8 /A 351CF8M
7	Belleville Washer	50CR V4/ASTM240 GR.302
8	Nut	ASTM A 194 GR. 2H/ASTM A 194 GR. B8/ASTM A 194 GR. B8M
9	Stud	ASTM A 193 GR. B7/ASTM A 193 GR. B8/ASTM A 193 GR. B8M
10	Hand Wheel	MI / SGIRON
11	Name Plate	STAINLESS STEEL
12	Spring Washer	MS
13	Handwheel Nut	ASTM A 194 GR. 2H/ASTM A 194 GR. B8/ASTM A 194 GR. B8M

NOTE : Alloy Steel, Stainless Steel, Duplex, Super Duplex is also available on request.

FORGED STEEL PISTON VALVE – 800#



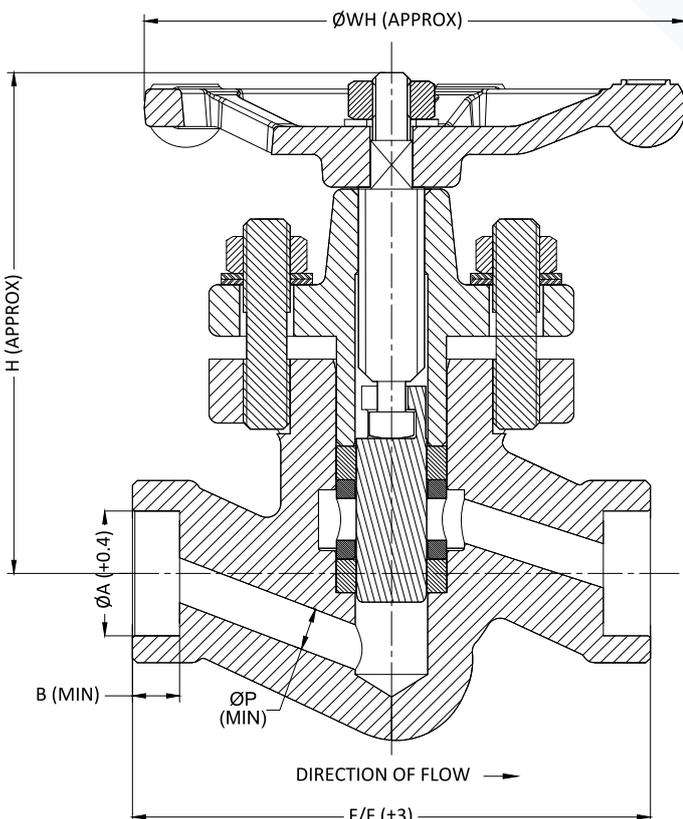
Technical Specification

Design Standard	B16.34/EN12516.2
Testing Standard	API 598
Face to Face Standard	Manufacturer's Standard
Socket Weld Standard	ASME B16.11
Screwed End Standard	ASME B1.20.1
Butt Weld Standard	ASME B16.25
Flange End Standard	ASME B16.5

Material Of Construction

Part No.	Part Name	Material
1	Body	ASTM A 105/ASTM A 182 F-304/ASTM A 182 F-316
6	Bonnet	ASTM A 105/ASTM A 182 GR. F-304/ASTM A 182 GR. F-316

NOTE : For remaining Parts refer Page 1.



Maximum & minimum Operating Pressure & Temperature

Maximum Operating Pressure	136.2 Bar
Maximum Operating Temperature	425° C
Maximum Hydraulic Test Pressure	209 Bar

Maximum Hydrostatic Testing Pressure

Pressure Rating for 800#	
Hydro Test Pressure (Body) kg/cm ²	209
Pneumatic Test Pressure kg/cm ²	7

CLASS 800# (in mm)

Size	F/F	ØP	ØA	B(min)	ØWH	H(close)	H(open)	Weight(kg)
15 MM	110	9	21.8	9.5	86	104	127	1.9
20 MM	112	12	27.2	12.5	86	104	127	1.9
25 MM	126	17	33.9	12.5	116	141	175	3.7
40 MM	180	28	48.8	12.5	231	150	185	9.1

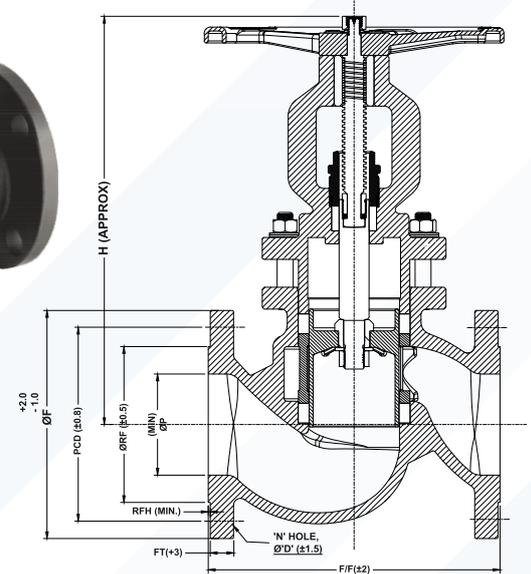
CAST STEEL PISTON VALVE



Technical Specification	
Design Standard	B16.34/EN12516.2
Testing Standard	API 598
Face to Face Standard	ASME B 16.10
Flange End Standard	ASME B 16.5

Technical Specification		
Pressure Rating	150#	300#
Hydro Test Pressure (Body) kg/cm ²	32	78
Hydro Test Pressure (Seat) kg/cm ²	22	56
Pneumatic Test Pressure kg/cm ²	7	7

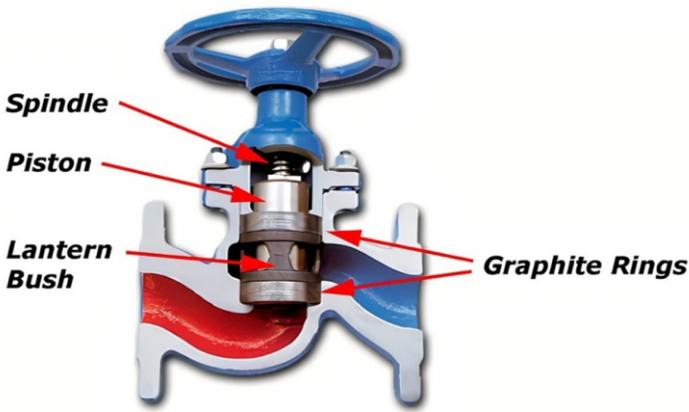
Maximum & minimum Operating Pressure & Temperature	
Cast Steel # 150 (Flanged)	
Maximum Operating Pressure	19.6 Bar
Maximum Operating Temperature	425° C
Maximum Hydraulic Test Pressure	32 Bar
Cast Steel #300 (Flanged)	
Maximum Operating Pressure	51.1 Bar
Maximum Operating Temperature	425° C
Maximum Hydraulic Test Pressure	78 Bar



DIMENSIONS & WEIGHT CHART

CLASS 150#													
SIZE	F/F	ØP	ØRF	RFH	ØF	FT	PCD	N	ØD	H(CLOSE)	H(OPEN)	ØWH	WEIGHT(KG)
15 MM	108	12	34.9	1.5	90	8.0	60.3	4	15.9	108	134	86	2.3
20 MM	117	17	42.9	1.5	100	8.9	69.9	4	15.9	108	134	86	2.7
25 MM	127	25	50.8	1.5	110	12.9	79.4	4	15.9	140	174	116	4.6
32 MM	140	28	63.5	1.5	117	11.32	88.9	4	15.9	195	242	150	6.45
40 MM	165	40	73	1.5	125	12.7	98.4	4	15.9	195	242	150	9.6
50 MM	203	50	92.1	1.5	150	14.3	120.7	4	19.0	208	254	200	13.8
65 MM	216	65	104.8	1.5	180	15.7	139.7	4	19.0	243	303	250	20
80 MM	241	80	127	1.5	190	17.5	152.4	4	19.0	270	345	250	26
100 MM	292	100	157.2	1.5	230	22.3	190.5	8	19.0	400	476	300	46
125 MM	356	125	185.7	1.5	254	22.5	215.9	8	22.2	495	615	400	68
150 MM	406	152	215.9	1.5	280	23.9	241.3	8	22.2	495	615	400	90.4
200 MM	495	200	269.9	1.5	343	26.9	298.4	8	22.2	591	725	400	156

CLASS 300#													
SIZE	F/F	ØP	ØRF	RFH	ØF	FT	PCD	N	ØD	H(CLOSE)	H(OPEN)	ØWH	WEIGHT(KG)
15 MM	152	12	34.9	1.5	95	12.5	66.7	4	15.9	108	134	86	3.12
20 MM	178	17	42.9	1.5	115	14.2	82.6	4	15.9	108	134	86	4.25
25 MM	203	25	50.8	1.5	125	15.9	88.9	4	19	140	174	116	6.8
32 MM	216	28	63.5	1.5	133	19.1	98.6	4	19	193	240	150	7.45
40 MM	229	40	73	1.5	155	19.1	114.3	4	22.2	195	242	150	13.7
50 MM	267	50	92.1	1.5	165	20.7	127	8	19.0	208	254	200	16.6
65 MM	292	65	104.8	1.5	190	23.9	149.4	8	22.2	243	303	250	24
80 MM	318	80	127	1.5	210	27	168.3	8	22.2	270	345	250	32
100 MM	356	100	157.2	1.5	255	30.2	200	8	22.2	400	476	300	56
125 MM	400	125	185.7	1.5	279	33.3	235	8	22.2	195	615	400	85
150 MM	444	150	215.9	1.5	320	35.1	269.9	12	22.2	495	615	400	112
200 MM	559	200	269.7	1.5	381	39.6	330.2	12	25.4	591	725	400	185



(to repair just replace lantern bush and rings)

Installation

- The valve shall be installed in the direction of flow as indicated on the valve body.
- Installation is permissible in any orientation, except with the hand wheel positioned downward.
- Proper alignment of the pipeline is essential to ensure smooth valve operation and long service life.

Operation & Sealing Principle

- Sealing is achieved by the linear movement of the stainless steel piston between the upper and lower sealing rings.
- When the piston engages with the lower sealing ring, the valve is in the fully closed position.
- When the piston aligns with the upper sealing ring, the valve is in the fully open position.
- The piston, in conjunction with the upper sealing ring, also provides an effective seal against leakage to atmosphere.

Maintenance

- In the event of any leakage, the bonnet nuts should be tightened with the valve in the fully closed position.
- Tightening may be carried out periodically, as required, until the sealing rings reach the end of their service life.
- Once further adjustment is no longer possible, the sealing rings must be replaced.
- Bonnet nuts should be tightened uniformly and gradually, ensuring the bonnet remains properly aligned.
- Nuts should rotate freely using a standard spanner; excessive force must be avoided.
- Do not apply excessive force while closing the valve, as this may damage the spindle or hand wheel.

Important Notes

- Always follow the recommended tightening torque.
- Avoid over-tightening, as this may reduce the life of the sealing rings.
- Exercise care while removing worn sealing rings to prevent damage to the piston or valve body.

GATE VS GLOBE VS PISTON VALVE – COMPARISON TABLE

Parameter	Gate Valve	Globe Valve	Piston Valve
Valve Type	Linear Isolation	Linear Regulation/Isolation	Linear Isolation
Seat Design	Metal/Soft Seat	Metal/Soft Seat	Seatless
Gland Packing	Yes	Yes	No (Glandless)
Shut-off Tightness	Moderate	Good	Excellent (Bubble-tight)
Leakage Risk	High Over Time	Moderate	Very Low
Pressure Drop	Very Low	High	Moderate
Throttling Capability	Not Suitable	Suitable	Not Recommended
Maintenance	High	Moderate-High	Poor
Thermal Cycling	Poor	Moderate	Excellent
Steam Service Suitability	Limited	Good	Excellent
Operating Life	Moderate	Moderate	Long



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