

PPV

PISTON VALVE



DESCRIPTION:

The Pennant Piston Valve (PPV) is a linear movement valve in which a stainless steel piston travels between the upper and lower seal ring. These rings are separated by a lantern bushing, which supports the piston and creates a bubble tight seal. When the valve is in the open position, the upper seal ring in conjunction with the piston prevents leakage through the stem. In the closed position, the lower seal ring seals the valve - passage and provides a tight shutoff. Known for their extraordinary performance and long life, Piston Valves can handle a variety of media such as steam, thermal fluid, condensate and many other liquids and gasses. They can be used in on/off and throttling applications.

FEATURES:

- Bubble tight (ANSI leakage class VI) shutoff
- Can be used for throttling applications
- Robust and maintenance free
- Long service life
- Effective sealing area is large, as compared to the conventional linear movement valves
- Compensates for thermal expansions with reinforced Grafoil sealing rings and Belleville washers
- Can be easily serviced inline
- Easy to repair: The only wearing parts are sealing rings which are easily replaceable
- Low cost of ownership
- * (Cost of ownership includes maintenance, inventory cost in addition to the purchase cost)

SIZES AND CONNECTIONS:

| MOC & END CONNECTION | Sizes | | | | | | | | | |
|--|-------|------|----|--------|----|--------|----|----|----|----|
| | 1/2" | 3/4" | 1" | 1 1/2" | 2" | 2 1/2" | 3" | 4" | 6" | 8" |
| * Forged #800 (Screwed/Socket weld) | • | • | • | • | | | | | | |
| Cast # 300 (Screwed/Socket weld) | • | • | • | | | | | | | |
| Cast #150 (FLANGED ENDS) | • | • | • | • | • | | • | • | • | • |
| Cast #300 (FLANGED ENDS) | • | • | • | • | • | • | • | • | • | • |
| Cast PN40 (FLANGED ENDS) | • | • | • | • | • | | | | | |

* Forged #800: 1/2", 3/4", 1" – Angle pattern; 1", 1 1/2" – Straight pattern. Welded-on flanged connections available.

Socket weld ends – as per ASME B16.11 Integral flanged ends - as per ASME B16.5 (#150, #300) - as per BS EN1092-1 PN40

INSTALLATION:

The valve should be installed in the direction of flow indicated on the body. The valve can be installed in any plane, provided it is accessible for operation.

MAINTENANCE:

In case any leakage is observed the bonnet nuts should be tightened with the valve in the fully closed position. Tightening the bonnet nuts may be repeated as and when required until the rings are worn out and no further adjustment or tightening is possible. At this stage the sealing rings need to be replaced.

No undue force should be used when tightening the nuts, as they should rotate easily with a standard spanner. Care should be taken while tightening the nuts to avoid tilting of the bonnet. Undue force should not be used to shut the valve as this may damage the spindle or the wheel.

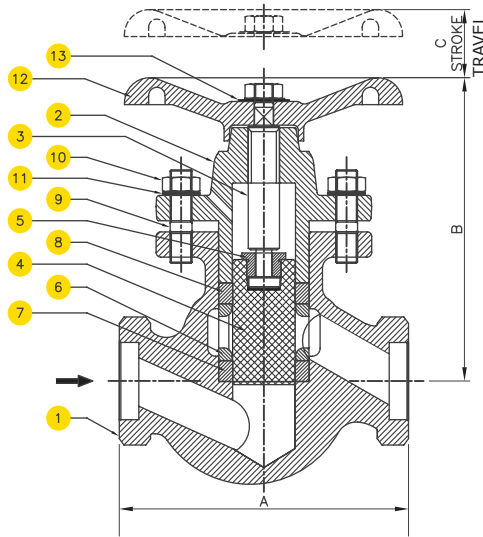
IMPORTANT:

Always use the recommended tightening torque. Avoid excessive tightening, as this may reduce the life of the sealing rings. Care should be taken while removing the old sealing rings for replacement.

LIMITING CONDITIONS:

| | | |
|----------------------------------|--|-------------------------|
| Forged | Body design rating | #800 as per API 602 |
| | PMA - Max. permissible pressure | 1935 psig @ 100 °F |
| | PMO - Max. permissible operating pressure | 1080 psig @ 800 °F |
| Cast - Screwed/SW | Body design rating | #300 as per ASME B16.34 |
| | PMA - Max. permissible pressure | 725 psig @ 100 °F |
| | PMO - Max. permissible operating pressure | 398 psig @ 800 °F |
| Cast - Integral/ Flange #150 | Body design rating | #150 as per ASME B16.34 |
| | PMA - Max. permissible pressure | 285 psig @ 100 °F |
| | PMO - Max. permissible operating pressure | 78 psig @ 800 °F |
| Cast - Integral/ Flange #300 | Body design rating | #300 as per ASME B16.34 |
| | PMA - Max. permissible pressure | 725 psig @ 100 °F |
| | PMO - Max. permissible operating pressure | 398 psig @ 800 °F |
| Cast - Integral/ Flange #PN40 | Body design rating | PN40 as per NBSE 1092-1 |
| | PMA - Max. permissible pressure | 570 psig @ 100 °F |
| | PMO - Max. permissible operating pressure | 331 psig @ 100 °F |
| Hydrostatic Shell Test | 1.5 times the max. rated pressure at 100 °F. | |
| Seat Leakage Test | 85 psig | |

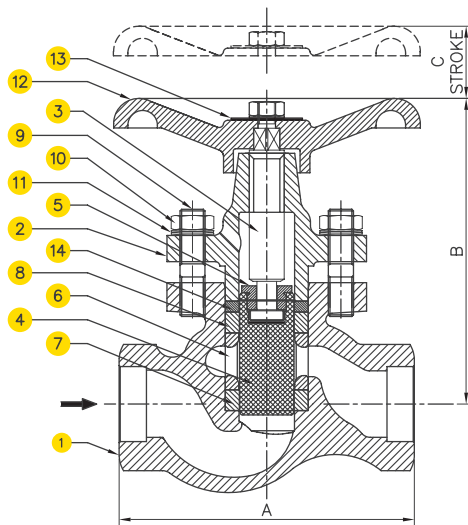
FORGED CONSTRUCTION - #800 Scr./SW:



MATERIAL:

| NO. | PART | MATERIAL | QTY. |
|-----|-------------------|----------------------------------|------|
| 1. | BODY | ASTM A105 | 1 |
| 2. | BONNET | ASTM A105 | 1 |
| 3. | SPINDLE | AISI 410 | 1 |
| 4. | PISTON | AISI 304 | 1 |
| 5. | SPLIT NUT | BRASS | 1 |
| 6. | LANTERN BUSH | AISI 304/ ASTM A743 CA15 | 1 |
| 7. | LOWER VALVE RING | GRAFOIL WITH SS REINFORCEMENT | 1 |
| 8. | UPPER VALVE RING | REINFORCEMENT | 1 |
| 9. | STUD | ASTM A193 Gr.B7 | 4 |
| 10. | NUT | ASTM A194 Gr.2H | 4 |
| 11. | BELLEVILLE WASHER | 50 Cr V4 | 8 |
| 12. | HANDWHEEL | CAST IRON | 1 |
| 13. | LABEL | AISI 304 | 1 |

CAST CONSTRUCTION - #300 Scr./SW:



MATERIAL:

| NO. | PART | MATERIAL | QTY. |
|-----|---------------------------------------|----------------------------------|------|
| 1. | BODY | ASTM A216 Gr. WCB | 1 |
| 2. | BONNET | ASTM A216 Gr. WCB | 1 |
| 3. | SPINDLE | AISI 410 | 1 |
| 4. | PISTON | AISI 304 | 1 |
| 5. | SPLIT NUT | BRASS | 1 |
| 6. | LANTERN BUSH | AISI 304/ ASTM A743 CA15 | 1 |
| 7. | LOWER VALVE RING | GRAFOIL WITH SS REINFORCEMENT | 1 |
| 8. | UPPER VALVE RING | REINFORCEMENT | 1 |
| 9. | STUD | ASTM A193 Gr. B7 | * |
| 10. | NUT | ASTM A194 Gr. 2H | * |
| 11. | BELLEVILLE WASHER | 50 Cr V4 | ** |
| 12. | HANDWHEEL | CAST IRON | 1 |
| 13. | LABEL | AISI 304 | 1 |
| 14. | SPACER | MS | 1 |
| * | 1/2" : 2 NOS, 3/4" : 3NOS, 1" : 4 NOS | | |
| ** | 1/2" : 4 NOS, 3/4" : 6NOS, 1" : 8 NOS | | |

DIMENSION TABLE:

| SIZE | FORGED CONSTRUCTION - #800 SCR./ SW | | | | CAST CONSTRUCTION - #300 SCR. / SW | | | |
|--------|-------------------------------------|------|------|-------------|------------------------------------|------|------|-------------|
| | A | B | C | APPROX. WT. | A | B | C | APPROX. WT. |
| 1/2" | 4 | 4.32 | 0.92 | 6.2 | 4.08 | 4.32 | 0.92 | 6.16 |
| 3/4" | 4 | 5 | 1.12 | 6.6 | 4.8 | 5 | 1.12 | 6.6 |
| 1" | 5.4 | 5.2 | 1.32 | 12 | 5.4 | 5.6 | 1.32 | 12 |
| 1 1/2" | 7.4 | 7.64 | 1.76 | 18.8 | - | - | - | - |

CAST CONSTRUCTION - INTEGRAL FLGD.:

MATERIAL:

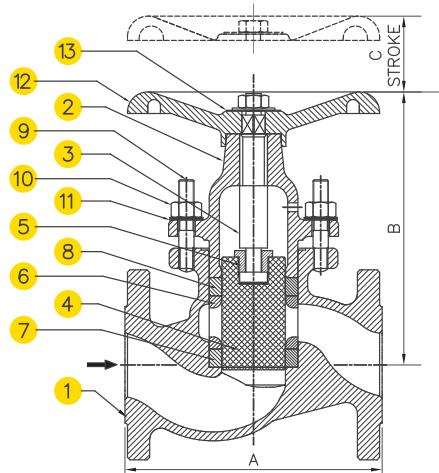


FIG. - 1/2" ~ 2"

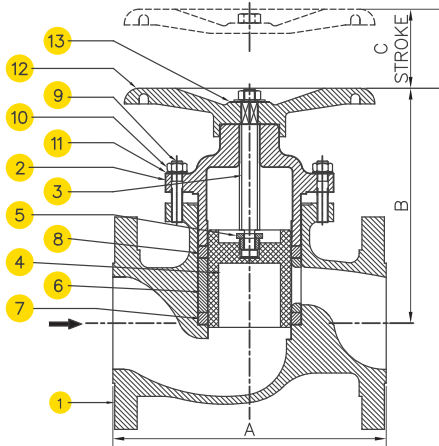


FIG. - 3" ~ 6" (UNBALANCED)

| NO. | PART | MATERIAL | QTY. |
|-----|---|----------------------------------|------|
| 1. | BODY | ASTM A216 Gr. WCB | 1 |
| 2. | BONNET | ASTM A216 Gr. WCB | 1 |
| 3. | SPINDLE | AISI 410 | 1 |
| 4. | PISTON | AISI 304 | 1 |
| 5. | SPLIT NUT | BRASS | 1 |
| 6. | LANTERN BUSH | AISI 304/ ASTM A743 CA15 | 1 |
| 7. | LOWER VALVE RING | GRAFOIL WITH SS REINFORCEMENT | 1 |
| 8. | UPPER VALVE RING | | 1 |
| 9. | STUD | ASTM A193 Gr. B7 | * |
| 10. | NUT | ASTM A194 Gr. 2H | * |
| 11. | BELLEVILLE WASHER | 50 Cr V4 | ** |
| 12. | HANDWHEEL | CAST IRON | 1 |
| 13. | LABEL | AISI 304 | 1 |
| * | 1/2" ~ 2": 4 nos., 3": 6 nos., 4" ~ 6": 8 nos. | | |
| ** | 1/2" ~ 2": 8 nos., 3": 12 nos., 4" ~ 6": 16 nos. | | |

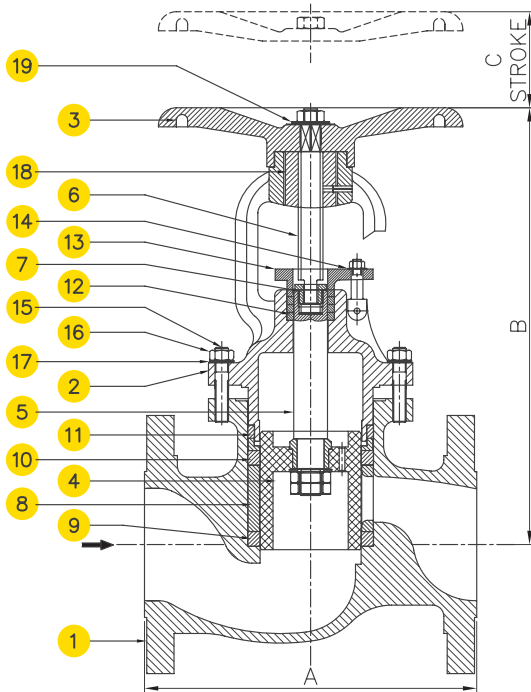
DIMENSION TABLE:

| SIZE | Piston Valve - Integral Flgd Cast Construction | | | | | APPROX. WT. | | |
|--------|--|-------|------|------|------|-------------|-------|-------|
| | A | | | B | C | #150 | #300 | PN40 |
| | #150 | #300 | PN40 | | | | | |
| 1/2" | 4.32 | 6.08 | 5.2 | 4.2 | 0.92 | 5.5 | 7.5 | 7 |
| 3/4" | 4.68 | 7.12 | 6 | 4.96 | 1.12 | 6.5 | 12 | 10.56 |
| 1" | 5.08 | 8.12 | 6.4 | 5.5 | 1.32 | 9.25 | 16.28 | 15.4 |
| 1 1/2" | 6.6 | 9.16 | 8 | 7.56 | 1.76 | 18.7 | 32 | 28.16 |
| 2" | 8.12 | 10.68 | 9.2 | 8.6 | 2.04 | 28.6 | 45 | 39.6 |
| 3" | 9.64 | - | - | 9.2 | 2.32 | 53 | - | - |
| 4" | 11.68 | - | - | 10.2 | 2.6 | 99 | - | - |
| 6" | 16.24 | - | - | 13.4 | 3.8 | 189.2 | - | - |

BALANCED VALVE (2½" ~ 8"):

For higher size piston valves - NPS. 2½", 3", 4", 6", 8", higher torques will be required to operate (close/open) an unbalanced valve against inlet pressure. Balanced

piston valves overcome this higher torque requirement, by balancing the pressure above and below the piston.



MATERIAL:

| NO. | PART | MATERIAL | QTY. |
|-----|--------------------------------------|----------------------------------|------|
| 1. | BODY | ASTM A216 Gr. WCB | 1 |
| 2. | BONNET | ASTM A216 Gr. WCB | 1 |
| 3. | HANDWHEEL | CAST IRON | 1 |
| 4. | PISTON | AISI 316/ ASTM A351 Gr. CF8M | 1 |
| 5. | PISTON SHAFT | AISI 316 | 1 |
| 6. | SPINDLE | AISI 410 | 1 |
| 7. | SPLIT NUT | BRASS | 1 |
| 8. | LANTERN BUSH | CAST IRON/AISI 304 | 1 |
| 9. | LOWER VALVE RING | | 1 |
| 10. | UPPER VALVE RING | GRAFOIL WITH SS REINFORCEMENT | 1 |
| 11. | BONNET VALVE RING | | 1 |
| 12. | GLAND VALVE RING | | 3 |
| 13. | GLAND COVER | ASTM A216 Gr. WCB | 1 |
| 14. | BELLEVILLE WASHER | 50 Cr V4 (GLAND) | 4 |
| 15. | STUD | ASTM A193 Gr. B7 | * |
| 16. | NUT | ASTM A194 Gr. 2H | * |
| 17. | BELLEVILLE WASHER | 50 Cr V4 (BONNET) | ** |
| 18. | THREADED BUSH | CAST IRON | 1 |
| 19. | LABEL | AISI 304 | 1 |
| * | 2½": 4 Nos, 3": 6 Nos, 4"~6" : 8 Nos | | |
| ** | 2½": 8 Nos, 3":12 Nos, 4"~6" :16 Nos | | |

DIMENSION TABLE:

| SIZE | Piston Valve - Balanced Design | | | B | C | Approx. Wt. | | |
|------|--------------------------------|-------|------|-------|------|-------------|-------|-------|
| | #150 | #300 | PN40 | | | #150 | #300 | PN40 |
| 2½" | - | 11.68 | 11.6 | 12.32 | 2 | - | 61.6 | 59.4 |
| 3" | 9.64 | 12.72 | 12.4 | 13 | 2.32 | 68.2 | 85.8 | 83.6 |
| 4" | 11.68 | 14.24 | 14 | 15.6 | 2.6 | 105.6 | 129.8 | 125.4 |
| 6" | 16.24 | 17.8 | - | 18.8 | - | 206.8 | 259.6 | - |
| 8" | 19.8 | 22.36 | - | 22.6 | - | 385 | 473 | - |

AVAILABLE SPARES:

½" ~ 2"

Sealing ring set
Piston
Spindle

2½" ~ 8"

Sealing ring set
Bonnet sealing ring
Gland sealing ring set
Piston
Spindle

HOW TO ORDER:

Example: PPV/FCS/1/2"/SW, Where

| Product Code | Body MOC | Sizes Available | End Connections |
|--------------|---|--|------------------------|
| PPV | FCS : FORGED CARBON STEEL (ASTM A105) | FORGED (SW/SCR): 1/2", 3/4", 1", 1 1/2" | SW: Socket Weld |
| | | | NPT: SCR NPT |
| | | | BSP:SCR BSP |
| | | | BSPT:SCR BSPT |
| | | | Welded Flange |
| | CCS : CAST CARBON STEEL (ASTM A 216 Gr. WCB) | CAST (SW/SCR): 1/2", 3/4", 1" | SW: Socket Weld |
| | | | NPT: SCR NPT |
| | | | BSP:SCR BSP |
| | | | BSPT:SCR BSPT |
| | | CAST (Flanged End): 1/2", 3/4", 1", 1 1/2", 2", 2 1/2", 3", 4", 6", 8" | F1: Flanged End #150 |
| | | | F3: Flanged End #300 |
| | | | PN40: Flanged End PN40 |

ORDERING INFORMATION:

1. Service Fluid
2. Maximum Operating Pressure
3. Maximum Operating Temperature
4. Size
5. End Connections