

YARWAY

Designed for blow-off service in boiler systems with pressures of 3,206 psig.

Features

- Designed according ASME section 1, ANSI B31.1, ANSI B16.34
- For boiler systems up to 3.206 psig
- Rugged construction to withstand high pressure and high velocities
- Excellent resistance to cleaning acids and wear caused by precipitated solids
- No seat so will not score nor plug with dirt
- Seatless valves
 - will not score nor plug with dirt and will not leak
 - 'live-loaded' packing will not leak after packing water
 - slow opening will not rapidly drain boiler drum
- Unit tandem valves
 - A combination of hardseat-hardseat or hardseat-seatless valves in a single body
 - eliminates pipe joints, reduces potential leaks, fits into a confined space
- Hardseat valves
 - Stellite valve and seat
 - resists to wear
 - provides long service life



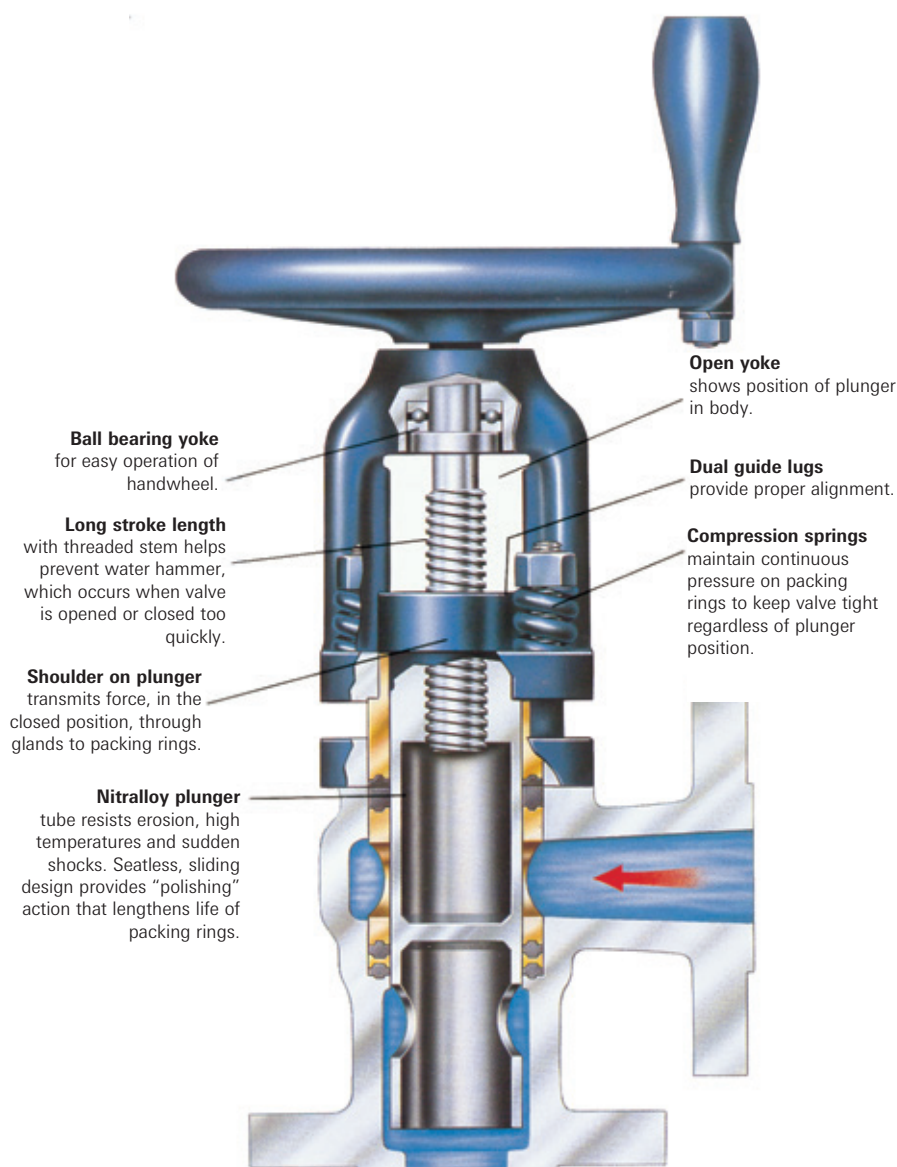
General application

Blow-off service in boiler systems where the primary purpose is to remove dirt, sediment and scale up to pressures of 3.206 psig

Technical data

Size range	: 1", 1¼", 1½", 2" and 2½"
Pressure class	: 250, 300 and 600
Materials	: ASTM A126, ASME SA 216 WCB

Type B seatless blow-off valve



General description

Basic requirements for the design and use of blow-off valves are established by the ASME Power Boiler Code, Section I. The general form of a valve, the materials of its construction, allowable boiler pressures, and the installation of the valve are all determined by the code. Yarway blow-off valves are designed in conformance with all code requirements (ASME Section I, ANSI B31.1, ANSI B16.34).

Because the primary purpose of a blow-off valve is removal of dirt, sediment and scale, the boiler code requires that valves which have dams or pockets in which sediment can accumulate cannot be used in blow-off service. This means that ordinary globe valves cannot be used as blow-off valves.

Yarway valves are especially designed for the punishment of blow-off service in boiler systems with pressures of 3,206 psi.

The rugged construction of these valves can successfully withstand the combination of problems inherent in the service – a service in which high pressures result in high velocities which can cause wire drawing and cavitation of metal surfaces.

The valves must also withstand the corrosive environment created by acid cleaning of boilers, and the potential wear problems caused by precipitated solids.

The valves are also helpful in maintaining boiler level surge within desirable limits during quick startup of high pressure systems.

Two broad categories of Yarway blow-off valves are available; those that operate on a sliding principle and those that operate on a seat-and-disc principle.

Flange and drilling data common to all Yarway valve designs are shown below. All dimensions are consistent with ANSI standards and supplied as listed unless otherwise specified.

Blow-off valve Flange Data - Flange Dimensions

Size (in.)	Diameter			Thickness			Diameter of raised face		
	Class	Class	Class	Class	Class	Class	Class	Class	Class
	250-600	1500	2500	250-300	400-600	1500	2500	250	300-2500
1	4 ⁷ / ₈	5 ⁷ / ₈	6 ¹ / ₄	1 ¹ / ₁₆	1 ⁵ / ₁₆ ²	1 ³ / ₈	1 ⁵ / ₈	2 ¹¹ / ₁₆	2
1 ¹ / ₂	6 ¹ / ₈	7	8	1 ³ / ₁₆	1 ¹ / ₈	1 ¹ / ₂	2	3 ⁹ / ₁₆	2 ⁷ / ₈
2	6 ¹ / ₂	8 ¹ / ₂	9 ¹ / ₄	7 ⁷ / ₈	1 ¹ / ₄	1 ³ / ₄	2 ¹ / ₄	4 ³ / ₁₆	3 ⁵ / ₈
2 ¹ / ₂	7 ¹ / ₂	9 ⁵ / ₈	10 ¹ / ₂	1	1 ³ / ₈	1 ⁷ / ₈	2 ¹ / ₂	4 ¹⁵ / ₁₆	4 ¹ / ₈

Drilling data

Size (in.)	No. of holes ³	Diameter			Bolt circle diameter		
		Class 250-600	Class 1500	Class 2500	Class 250-600	Class 1500	Class 2500
1	4	3 ³ / ₄	1	1	3 ¹ / ₂	4	4 ¹ / ₄
1 ¹ / ₂	4	7 ⁷ / ₈	1 ¹ / ₈	1 ¹ / ₄	4 ¹ / ₂	4 ³ / ₈	5 ³ / ₄
2	8	3 ³ / ₄	1	1 ¹ / ₈	5	6 ¹ / ₂	6 ³ / ₄
2 ¹ / ₂	8	7 ⁷ / ₈	1 ¹ / ₈	1 ¹ / ₄	5 ⁷ / ₈	7 ¹ / ₂	7 ³ / ₄

Notes:

1. Includes 1/16" raised face 250-400 psi valves, 1/4" raised face 600-2500 psi.
2. 600 psi only, no 1" 400 psi valve available.
3. Bolt holes straddle center lines.

Seatless valves for pressures to 935 psi - class 250 to 600

The seatless blow-off valve is a sliding plunger type, opened and closed by means of a handwheel and non-rising stem, and sealed against leakage by packing rings above and below the ports.

This valve is provided with heavy coil compression springs under the yoke nuts. Designed to help prevent leaking when the valve is open, yoke nuts are screwed down evenly and tightly placing compression on the springs and the packing rings.

Ample flow area is provided in the hollow plunger; absence of projections or pockets prevents accumulation of scale and sediment that can impede flow and shorten the life of the valve. Annular space in the body permits pressure to surround the plunger, making the valve a fully balanced unit easy to operate at high pressures.

For complete protection of the packing, the valve has a long-stroke plunger so that the packing is never exposed to the mainstream flow. The gland and plunger have double inlet ports to balance flow pressures.

This valve is available in angle or straightway styles, cast iron or steel construction, and flanged ends.

Operation

When the valve is open (plunger raised), discharge occurs through double ports in the lower gland and plunger. The slotted plunger head slides on guides in the valve yoke, preventing rotation of the plunger.

A stop screw keeps the lower gland in alignment. The yoke permits visual indication of the position of the plunger within the valve body.

Upon closing, the shoulder on the plunger exerts a thrust force compressing the packing rings above and below the port in the body. A final hard turn of the handwheel gives additional compression of the packing around the plunger, ensuring drop tight shutoff.

End connections

Flange dimensions per ANSI B 16.5

Actuation

Manual handwheel only.

Standard options

Acid wash trim:

1. Standard upper gland is replaced with nickel plated steel upper gland.
2. Standard lower gland is replaced with Ni-resist lower gland.
3. Standard plunger is replaced with nickel plated nitralloy plunger.

Stop screw with lubrication fitting.

Caution plate for tandem sets.

Special flanges only when dimensions are within standard flange maximum metal conditions.

How to specify

To specify seatless valves for nominal pressures to 600 psi, use figure number shown.

Describe as long stroke, balanced sliding plunger type seatless valve.

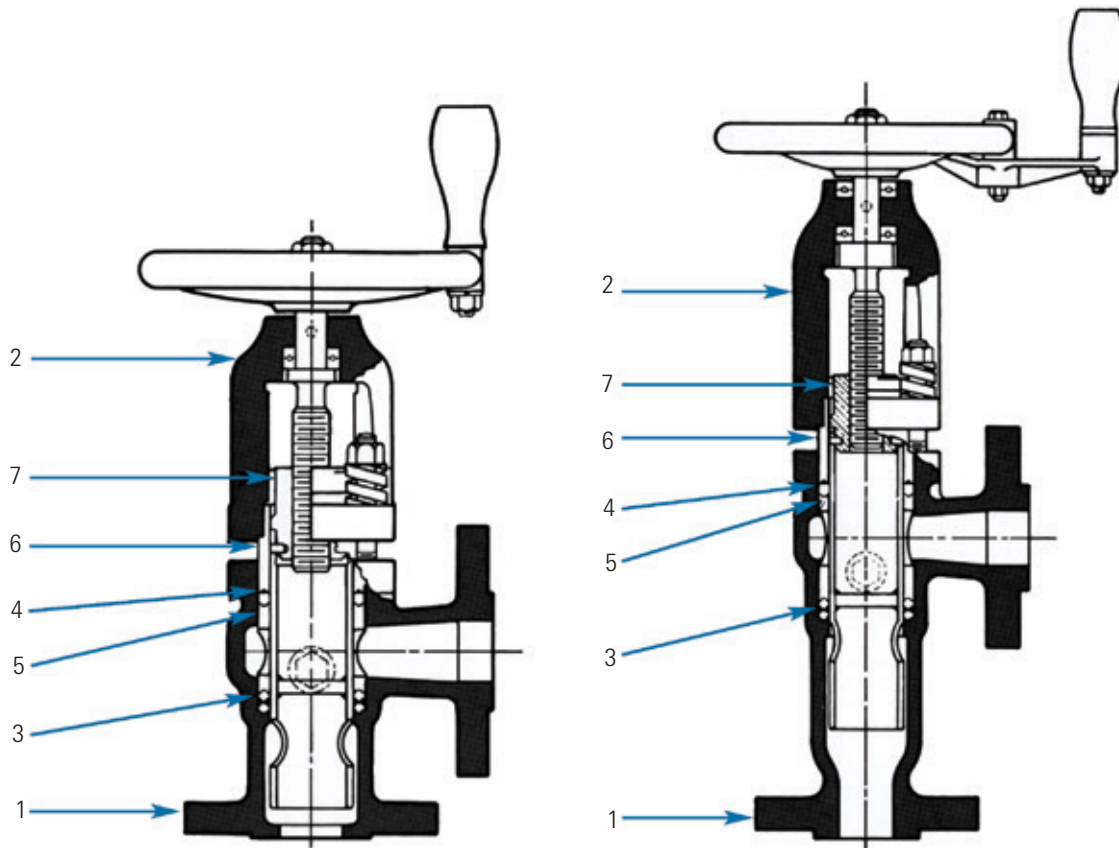
How to order

Order by stating:

- a. Size
- b. Figure number
- c. Basic pressure rating
- d. Connections – flanged
- e. Angle or straightway style



Seatless Valves for Pressures to 935 psi - Class 250 to 600



Materials of construction (pressure containing envelope)

Valve type	Class	1 body	2 yoke	3 and 4 packing rings	5 and 6 glands	7 plunger
B	250	Cast Iron ASTM A126 Class B	Cast Iron ASTM A395 60-40-18	Graphite, SS Filled PTFE, Brass or SS Support Ring'	Hard Brass B135 Alloy 3	Nitralloy Grade H
B	300	Cast Steel ASME SA216 Grade WCB	Cast Steel ASME SA216 Grade WCB	Graphite, SS Filled PTFE, Brass or SS Support Ring'	Hard Brass B135 Alloy 3	Nitralloy Grade H
C	600	Cast Steel ASME SA216 Grade WCB	Cast Steel ASME SA216 Grade WCB	Graphite, SS Filled PTFE, SS Support Ring	Low Carbon Steel	Nitralloy Grade H

Note: 1. 316 SS for acid wash trim.

Seatless Valves for Pressures to 935 psi - Class 250 to 600

Figure 3482-R and 3486-R

Type B

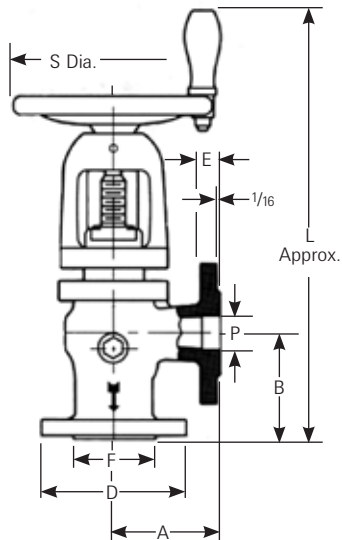


Figure 3484-R and 3488-R

Type B

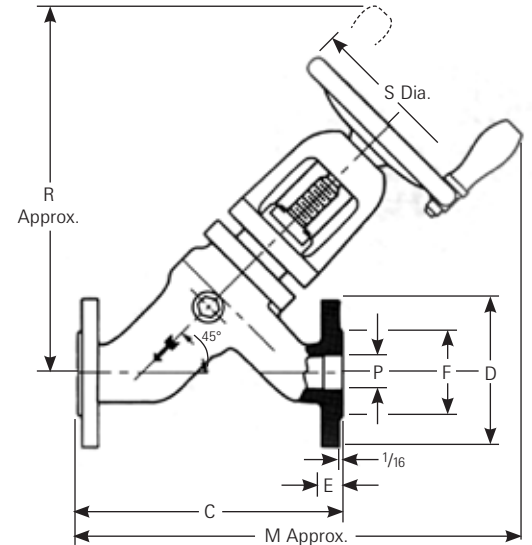


Figure 3910-R

Type C

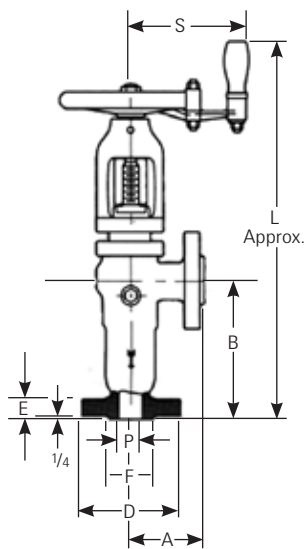
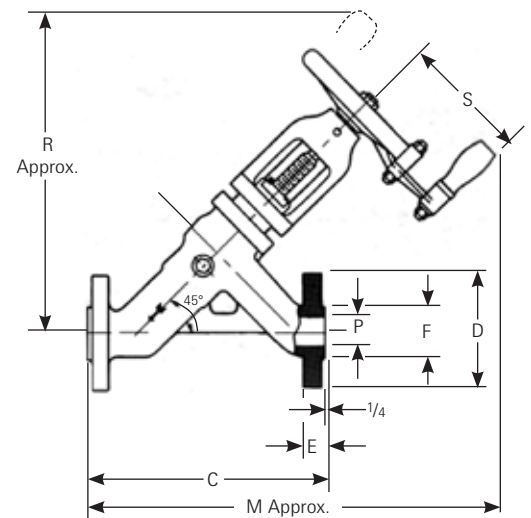


Figure 3912-R

Type C



Dimensions and Weights

Press. Rating Class	Blow-off (max. psi)	Figure Number		Size (in.)	Dimensions										C _v	S	Wt. (lb.)
		Angle	Straight- way		A	B	C	D	E	F	L	M	P	R			
250	200	3482-R	3484-R	1	4	6	10 ¹ / ₄	47/8	11/16	21 ¹ / ₁₆	18 ¹ / ₄	17 ¹ / ₄	1	14 ¹³ / ₁₆	8 ³ / ₈	24	30
250	200	3482-R	3484-R	1 ¹ / ₂	4 ¹ / ₂	4 ¹ / ₂	11	6 ¹ / ₈	13/16	39/16	18 ¹ / ₄	18 ¹ / ₂	1 ¹ / ₂	16	8 ³ / ₈	30	38
250	200	3482-R	3484-R	2	5	5	12	6 ¹ / ₂	7/8	4 ³ / ₁₆	19 ³ / ₈	19 ⁷ / ₈	2	17	9 ³ / ₈	58	55
250	200	3482-R	3484-R	2 ¹ / ₂	5 ³ / ₄	5 ³ / ₄	13 ¹ / ₂	7 ¹ / ₂	1	4 ¹⁵ / ₁₆	21 ⁷ / ₈	22 ¹ / ₈	2 ¹ / ₂	19 ¹ / ₂	11	73	85
300	490	3486-R	3488-R	1	3 ¹⁵ / ₁₆	5 ⁵ / ₈	9 ⁷ / ₈	47/8	11/16	2	17 ³ / ₄	16 ⁷ / ₈	1	14 ¹³ / ₁₆	8 ³ / ₈	27	38
300	490	3486-R	3488-R	1 ¹ / ₂	47/16	4 ⁹ / ₁₆	11	6 ¹ / ₈	13/16	27/8	18 ¹ / ₁₆	18 ¹ / ₂	1 ¹ / ₂	15 ⁷ / ₈	8 ³ / ₈	30	45
300	490	3486-R	3488-R	2	5	5 ¹ / ₄	12	6 ¹ / ₂	7/8	3 ⁵ / ₈	19 ⁹ / ₁₆	19 ¹⁵ / ₁₆	2	17 ³ / ₈	9 ³ / ₈	58	65
300	490	3486-R	3488-R	2 ¹ / ₂	5 ³ / ₄	6	13 ¹ / ₂	7 ¹ / ₂	1	4 ¹ / ₈	22 ¹ / ₈	22 ¹ / ₈	2 ¹ / ₂	19 ¹ / ₂	11	79	90
600	935	3910-R	3912-R	1 ¹ / ₂	4 ¹ / ₂	8 ¹ / ₄	13	6 ¹ / ₈	1 ¹ / ₈	27/8	22 ⁷ / ₈	22 ¹ / ₂	1 ¹ / ₂	19 ⁵ / ₈	8 ³ / ₈	30	53
600	935	3910-R	3912-R	2	5 ¹ / ₄	9 ¹ / ₄	15	6 ¹ / ₂	1 ¹ / ₄	3 ⁵ / ₈	25 ¹ / ₄	22 ⁵ / ₁₆	2	22 ⁵ / ₁₆	9 ³ / ₈	59	75
600	935	3910-R	3912-R	2 ¹ / ₂	5 ³ / ₄	9 ¹ / ₂	17	7 ¹ / ₂	1 ³ / ₈	4 ¹ / ₈	27 ³ / ₄	28 ¹ / ₂	2 ¹ / ₂	25 ³ / ₈	11	79	105

Hardseat Valves for Pressures to 2455 psi - Class 600 and 1500

The hardseat valve has a seat and disc design with flow entering under the seat. It is opened and closed by means of a handwheel and threaded rising stem. The stuffing box bushing and threaded yoke bushing provide a simple, sturdy guide for the stem. This valve has been designed with thick Stellite facings on the disc and seat to provide the hard wearing, anti-galling surfaces characteristic of Stellite.

Operation

Hardseat valves are available in angle or straightway styles, socketweld or flanged end connections with manual or electric motor actuation. Usual installation of this valve allows the flow to enter below the seat. As the valve is opened, the lip on the end of the disc restricts the flow until the beveled edge or seating surface of the disc is well away from the seat. This minimizes wiredrawing and protects the sealing faces. The valve should be opened rapidly and fully to help increase the life of the internal parts.

Tandem Usage

Any two Yarway hardseat valves may be used in tandem for pressures to 2455 psi. The valve nearest the boiler is used as the blowing valve (opened last and closed first) and the valve farthest from the boiler is the sealing valve (opened first and closed last). For pressures to 935 psi, hardseat valves may be used in tandem with Yarway Type C seatless valves.

How to Specify

For single valves, describe as seat and disc type hardseat valve. Use size and figure number shown.

For tandem valves (pressures to 2455 psi), describe as: blow-off valves shall consist of one angle and one straightway (or two angle or two straightway) seat and disc type hardseat valves, installed in tandem arrangement, to conform with requirements of ASME Boiler Code and suitable for basic pressure rating of _____ psi.

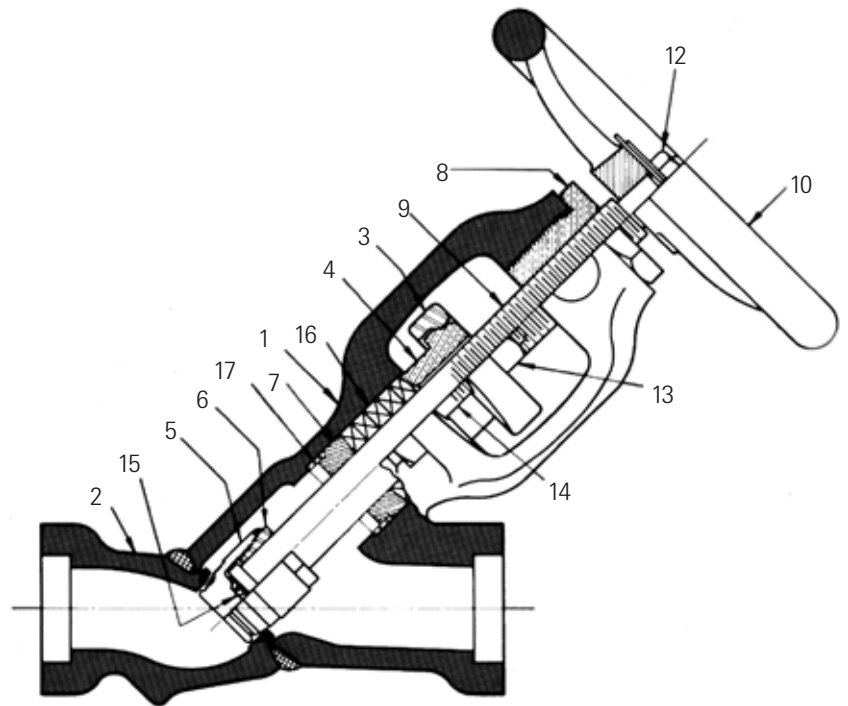
How to Order

Order by stating:

- a. Size
- b. Figure number
- c. Basic pressure rating
- d. Connections – flanged and socketweld for 600 class valves; socketweld for 1500 class valves.
As an option, buttweld ends are available for 2" and 2½" 1500 class valves only.
- e. Angle or straightway style



Hardseat Valves for Pressures to 2455 psi - Class 600 and 1500



Materials of Construction

Figures 6909, 6911, 6912, 6929-C, 6931-C

Item	Part	Material	Specifications
1	Body	Steel	ASME SA-216 WCB
2	Nozzle with Integral Seat	Steel with Integral Stellite Face	ASME SA-216 WCB
3	Gland	Steel	ASME SA-216 WCB ²
4	Split Gland Bushing	Naval Brass ²	–
5	Disc	Steel with Stellite Seating Face	ASME SA-182 Grade F11
6	Disc Nut	Stainless Steel	AISI 410 ²
7	Stuffing Box Bushing	Nickel Alloy	Ni-Resist No. 1
8	Yoke Bushing	Naval Brass	
9	Stem	Stainless Steel	ASTM A-582 Type 416
10	Handwheel	Cast Iron	ASTM A-47 Gr. 32510
12	Hex Nut	Steel	ASME SA-194 Gr. 2H
13	Hex Nut	Steel	ASME SA-194 Gr. 2H
14	Bolt	Steel	ASME SA-193 Gr. B7
15	Disc Insert	Stainless Steel (heat treated)	AISI 410
16	Packing	Flexible Graphite	–
17	Sleeve Insert ³	Steel	–

Figures 6929, 6931

Material	Specifications
Steel	ASME SA-105 ¹
Steel with Integral Stellite Face	ASME SA-1051
Steel	ASME SA-105 ¹
Stainless Steel	AISI 416
Steel with Stellite Seating Face	ASME SA-182 Grade F11
Stainless Steel	AISI 410 ²
Nickel Alloy	Ni-Resist No. 1
Naval Brass	B-371 Alloy 694
Stainless Steel	ASTM A-582 Type 416
Cast Iron	ASTM A-47 Gr. 32510
Steel	ASME SA-194 Gr. 2H
Steel	ASME SA-194 Gr. 2H
Steel	ASME SA-193 Gr. B7
Stainless Steel (heat treated)	AISI 410
Flexible Graphite	–
Steel	–

Notes:

1. 1½" 6929 and 2931 only. 2" and 2½" 6929-C and 6931-C body and nozzle are cast ASME SA216 WCB ("C" in Figure Number designates cast material); gland ASME SA217 WCB.
2. 1½" valve gland material is ASME SA181 Gr. II; split gland bushing and disc nut material is AISI 416.
3. 2" and 2½" valve only.

Hardseat valves for pressures to 2455 psi - class 600 and 1500

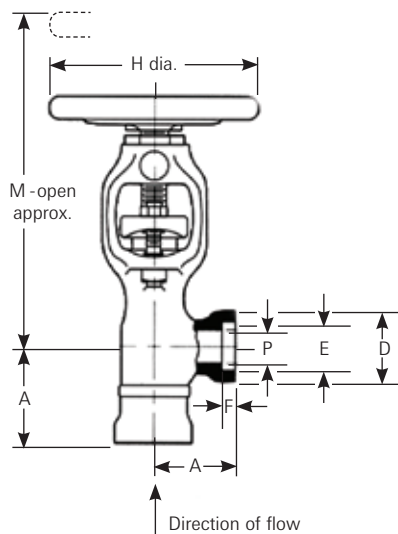


Figure 6909-C

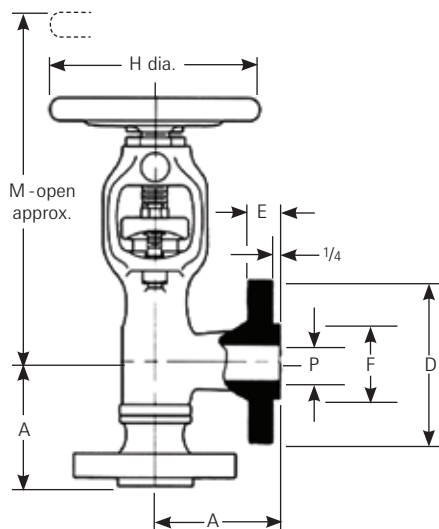


Figure 6910-C

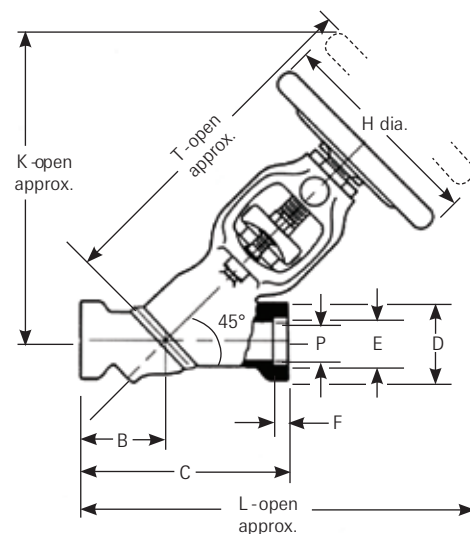


Figure 6911-C

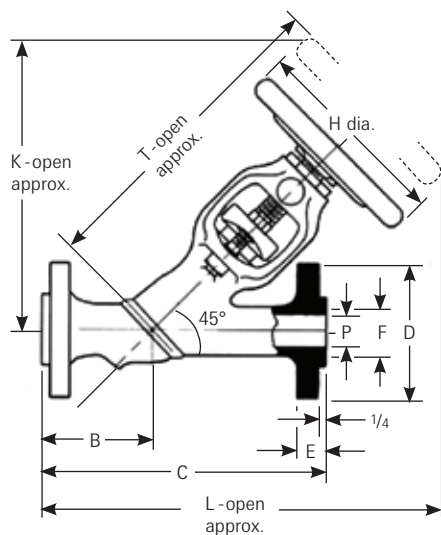


Figure 6912-C

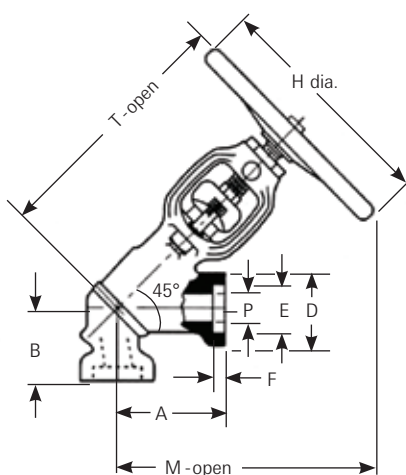


Figure 6929 and 6929-C

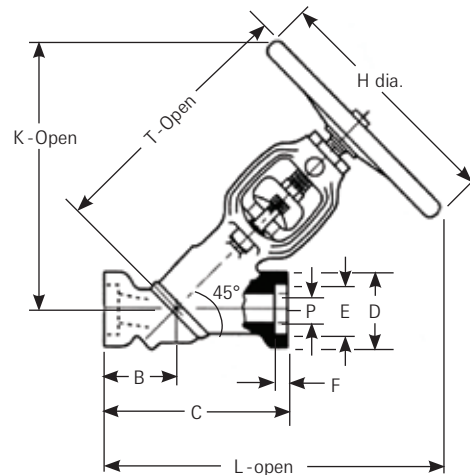


Figure 6931 and 6931-C

Dimensions and weights

Press. class rating	Blow-off (max. psi)	Figure number	Size straight- way	(in.)	Dimensions												C _v	Wt (lb.)
					A	B	C	D	E	F	H	K	L	M	P	T		
600	935	6909-C	6911-C	1½	3¼	3⅜	8¼	3	1.92	½	11½	12⅞	16⅛	11⅛	1½	12⅜	41	25
600	935	6909-C	6911-C	2	3⅝	3¾	9	3½	2.41	⅝	11½	14¾	18⅜	13⅜	2	15	96	44
600	935	6909-C	6911-C	2½	4	4⅜	10½	4	2.91	⅝	11½	16⅜	20½	15½	2½	17⅜	125	75
600	935	6910-C	6912-C	1½	4¾	4½	12	6⅛	1⅞	2⅞	11½	12⅞	17¼	11⅛	1½	12⅜	41	36
600	935	6910-C	6912-C	2	5¾	5	14	6½	1¼	3⅝	11½	14¾	19⅝	13⅜	2	15	96	55
600	935	6910-C	6912-C	2½	6½	5⅞	16	7½	1⅜	4⅞	11½	16⅜	21¾	15½	2½	17⅜	125	85
1500	2455	6929	6931	1½	5⅞	3⅞	9	2⅝	1.92	½	11½	16	19½	16	1⅜	17	41	33
1500	2455	6929-C	6931-C	2	5⅜	3⅞	9¼	4⅞	2.41	⅝	13½	17⅞	21⅞	17⅞	1⅞	18⅞	95	60
1500	2455	6929-C	6931-C	2½	5⅜	3⅞	9¼	4⅞	2.91	⅝	13½	17⅞	21⅞	17⅞	2⅞	18⅞	95	60

Unit Tandem Valves for Pressures to 3206 psi - Class 300 to 2500

The Yarway unit tandem valve features a one-piece steel block which serves as a common body for both blowing and sealing valves. This construction eliminates interconnecting welds, or bolts and gaskets where flanged valves are required, and makes the unit tandem a compact design.

For valves with basic pressure rating to 600 psi (medium pressure unit tandem), the inlet valve is a hardseat type and the discharge valve is of the seatless type. For basic pressure ratings above 600 to 2500 psi, both inlet and discharge valves are hardseat type.

All features of the Yarway single valves are contained in the unit tandem design with the additional advantage of a one-piece, heavy duty construction.

These valves are available in right-hand or left-hand body assemblies, carbon steel (ASME SA-105), socketweld or flanged end connections. All hardseat unit tandem valves include acid wash trim. In hardseat seatless unit tandem valves, acid wash trim is optional.

The hardseat valve of any unit tandem can be equipped with an electric motor actuator (230/460-volt, three-phase, 60-Hertz).

Special voltage and standard actuator accessories are available.

How to Specify

To specify unit tandem valves use size and figure numbers shown. Describe as: valve assembly shall consist of one seat and disc type hardseat valve and one balanced, sliding plunger type seatless valve (or two seat and disc hardseat valves) assembled in tandem arrangement as part of one common body conforming with requirements of ASME Boiler Code and suitable for pressure rating of ____ psi.

When motor actuation is desired, describe as: ...with electric motor actuation (230/460-volt, three-phase, 60-Hertz).

How to Order

Order by stating:

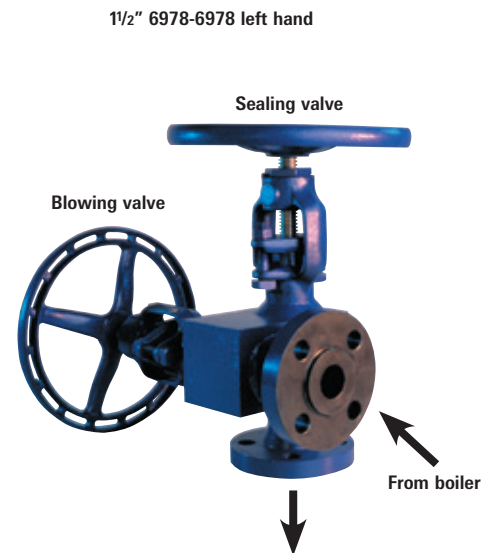
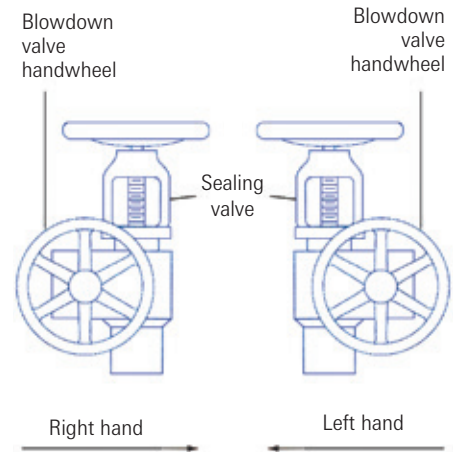
- Size
- Figure number
- Basic pressure rating
- Connectors - flanged or socketwelding ends
(if buttwelding ends are required, include description of profile)
- Hand: right-hand or left-hand
- Trim: standard or acid wash

How to "Hand" Unit Tandem Valves

Because the construction and installation of a unit tandem valve is inherently "off-center" with respect to the centerline of the boiler outlet, opening and closing of the valve can become difficult if operating space is inadequate on the side of the blowing valve.

Therefore, the practice of "handing" a valve has become part of its specification. This is essentially a statement of planned position for the valve, to the left-hand or right-hand of the centerline of the boiler outlet, by specifying the location of the sealing valve when facing the handwheel of the blowing valve (next to boiler). The drawing shown below should help you to "hand" or orient your valves correctly.

Specify location (right or left) of sealing valve when facing handwheel of next-to boiler hardseat blowing valve.



Materials of construction (see pages 8 - 11 for drawing references)			
Item	Part	Material	Specification
1	Body	Carbon Steel - 0.35% Max. C (Stellited Seat)	ASME SA-105
13	Spring	Steel	SAE 6150
14	Stud	Steel	ASME SA 193 Gr. B7
15	Extension Lever	Malleable Iron	–
16	Nozzle	Forged Steel - 0.35% Max. C	ASME SA-105
17	Yoke	Steel	ASME SA-1051
19	Gland	Steel	ASTM A-181 Grade II1
20	Disc	Steel (Stellited)	ASME SA-182 Grade F11
21	Split Gland Bushing	Stainless Steel	Type 4162
22	Disc Nut	Stainless Steel	Type 410
23	Stuffing Box Bushing	Nickel Alloy	Ni-Resist No. 1
24	Yoke Bushing	Bronze	ASTM B-371 Alloy 6942
25	Stern	Stainless Steel	ASTM A-582 Type 416
26	Bolt	Stainless Steel	ASTM A-193-B63
27	Handwheel	Cast Iron	ASTM A-48
28	Packing	Flexible Graphite (Carbon Braid End Rings)	–
31	Disc Insert	Stainless Steel (Heat Treated)	AISI 410

- Notes:**
- 600 psi and lower rated valve; ASME SA-216 Gr. WCB.
 - 600 psi and lower rated valve; Naval Brass.
 - 600 psi and lower rated valve; ASME SA-193 B7.

Dimensions and weights (see pages 8 - 11 for drawing references)																
Press. rating class	Blow-off (max. psi)	Figure No.	Size (in.)	Dimensions										Stem rise	C _V	Wt. (lb.)
				A	B	D	E	G	H	K (closed)	L (closed)	M	P			
300	490	3947-3927 ¹	1	5 ¹³ / ₁₆	5 ¹ / ₂	2 ³ / ₈	1.33	8 ³ / ₈	1 ¹ / ₂	10 ⁵ / ₈	16 ⁷ / ₁₆	8 ³ / ₈	31 ¹ / ₃₂	15 ¹ / ₁₆	17	50
300	490	3947-3927 ¹	1 ¹ / ₂	5 ¹³ / ₁₆	5 ¹ / ₂	3 ¹ / ₈	1.92	8 ³ / ₈	1 ¹ / ₂	10 ⁵ / ₈	16 ⁷ / ₁₆	8 ³ / ₈	1 ¹ / ₂	15 ¹ / ₁₆	22	65
300	490	3947-3927 ¹	2	6 ³ / ₁₆	5 ¹⁵ / ₁₆	3 ³ / ₈	2.41	9 ³ / ₈	5 ⁵ / ₈	12 ⁵ / ₁₆	18 ¹ / ₂	9 ³ / ₈	1 ¹⁵ / ₁₆	1 ³ / ₁₆	38	108
300	490	3947-3927 ¹	2 ¹ / ₂	7 ¹ / ₁₆	7 ¹ / ₁₆	4	2.91	11	5 ⁵ / ₈	14 ¹¹ / ₁₆	21 ³ / ₄	11	2 ¹ / ₂	1 ¹ / ₄	47	150
300	490	3948-3928 ²	1	4 ³ / ₄	7 ¹ / ₈	4 ⁷ / ₈	1 ¹ / ₁₆	8 ³ / ₈	–	10 ⁵ / ₈	15 ³ / ₈	8 ³ / ₈	1	15 ¹ / ₁₆	17	55
300	490	3948-3928 ²	1 ¹ / ₂	5 ¹ / ₂	5 ³ / ₁₆	6 ¹ / ₈	1 ³ / ₁₆	8 ³ / ₈	–	10 ⁵ / ₈	16 ¹ / ₈	8 ³ / ₈	1 ¹ / ₂	15 ¹ / ₁₆	25	70
300	490	3948-3928 ²	2	5 ¹³ / ₁₆	5 ⁹ / ₁₆	6 ¹ / ₂	7 ⁸ / ₈	9 ³ / ₈	–	12 ⁵ / ₁₆	18 ¹ / ₈	9 ³ / ₈	2	1 ³ / ₁₆	39	113
300	490	3948-3928 ²	2 ¹ / ₂	6 ¹¹ / ₁₆	6 ¹¹ / ₁₆	7 ¹ / ₂	1	11	–	14 ¹¹ / ₁₆	21 ³ / ₈	11	2 ¹ / ₂	1 ¹ / ₄	47	163
600	935	6977-6953 ³	1	4 ⁷ / ₈	5 ¹ / ₂	2	1.33	8 ³ / ₄	1 ¹ / ₂	9 ³ / ₈	14 ¹ / ₄	6	1	15 ¹ / ₁₆	9	50
600	935	6977-6953 ³	1 ¹ / ₂	5 ¹³ / ₁₆	7 ¹ / ₈	3	1.92	7 ¹ / ₄	1 ¹ / ₂	10 ⁵ / ₈	16 ⁷ / ₁₆	11 ¹ / ₂	1 ¹ / ₂	15 ¹ / ₁₆	17	82
600	935	6977-6953 ³	2	6 ³ / ₁₆	8 ⁷ / ₈	3 ³ / ₈	2.41	8 ¹ / ₂	5 ⁵ / ₈	12 ⁵ / ₁₆	18 ¹ / ₂	11 ¹ / ₂	2	1 ³ / ₁₆	39	125
600	935	6977-6953 ³	2 ¹ / ₂	7 ¹ / ₁₆	10 ⁷ / ₈	4	2.91	9 ⁵ / ₁₆	5 ⁵ / ₈	14 ¹¹ / ₁₆	21 ³ / ₄	11 ¹ / ₂	2 ¹ / ₂	1 ¹ / ₄	75	174
600	935	6978-6954 ⁴	1	4 ⁷ / ₈	5 ¹ / ₂	4 ⁷ / ₈	1 ¹ / ₁₆	8 ³ / ₄	–	9 ³ / ₈	14 ¹ / ₄	6	1	15 ¹ / ₁₆	9	50
600	935	6978-6954 ⁴	1 ¹ / ₂	5 ¹³ / ₁₆	7 ¹ / ₈	6 ¹ / ₈	1 ³ / ₁₆	7 ¹ / ₄	–	10 ⁵ / ₈	16 ⁷ / ₁₆	11 ¹ / ₂	1 ¹ / ₂	15 ¹ / ₁₆	17	82
600	935	6978-6954 ⁴	2	6 ³ / ₁₆	8 ⁷ / ₈	6 ¹ / ₂	7 ⁸ / ₈	8 ¹ / ₂	–	12 ⁵ / ₁₆	18 ¹ / ₂	11 ¹ / ₂	2	1 ³ / ₁₆	39	125
600	935	6978-6954 ⁴	2 ¹ / ₂	7 ¹ / ₁₆	10 ⁷ / ₈	7 ¹ / ₂	1	9 ⁵ / ₁₆	–	14 ¹¹ / ₁₆	21 ³ / ₄	11 ¹ / ₂	2 ¹ / ₂	1 ¹ / ₄	75	174
600	935	6977-6977 ²	1	4 ⁷ / ₈	5 ¹ / ₂	2	1.33	–	1 ¹ / ₂	9 ³ / ₈	14 ¹ / ₄	6	1	15 ¹ / ₁₆	9	50
600	935	6977-6977 ²	1 ¹ / ₂	5 ¹³ / ₁₆	7 ¹ / ₈	3	1.92	–	1 ¹ / ₂	10 ⁵ / ₈	16 ⁷ / ₁₆	11 ¹ / ₂	1 ¹ / ₂	15 ¹ / ₁₆	29	82
600	935	6977-6977 ²	2	6 ³ / ₁₆	8 ⁷ / ₈	3 ³ / ₈	2.41	–	5 ⁵ / ₈	12 ⁵ / ₁₆	18 ¹ / ₂	11 ¹ / ₂	2	1 ³ / ₁₆	41	125
600	935	6977-6977 ²	2 ¹ / ₂	7 ¹ / ₁₆	10 ⁷ / ₈	4	2.91	–	5 ⁵ / ₈	14 ¹¹ / ₁₆	21 ³ / ₄	11 ¹ / ₂	2 ¹ / ₂	1 ¹ / ₄	48	174
600	935	6978-6978 ²	1	4 ⁷ / ₈	–	4 ⁷ / ₈	1 ¹ / ₁₆	–	–	9 ³ / ₈	14 ¹ / ₄	6	1	15 ¹ / ₁₆	9	75
600	935	6978-6978 ²	1 ¹ / ₂	5 ¹³ / ₁₆	–	6 ¹ / ₈	1 ³ / ₁₆	–	–	10 ⁵ / ₈	16 ⁷ / ₁₆	11 ¹ / ₂	1 ¹ / ₂	15 ¹ / ₁₆	29	112
600	935	6978-6978 ²	2	6 ³ / ₁₆	–	6 ¹ / ₂	7 ⁸ / ₈	–	–	12 ⁵ / ₁₆	18 ¹ / ₂	11 ¹ / ₂	2	1 ³ / ₁₆	41	230
600	935	6978-6978 ²	2 ¹ / ₂	7 ¹ / ₁₆	–	7 ¹ / ₂	1	–	–	14 ¹¹ / ₁₆	21 ³ / ₄	11 ¹ / ₂	2 ¹ / ₂	1 ¹ / ₄	48	240
1500	2455	6982-6982 ²	1	5 ⁵ / ₁₆	–	5 ⁷ / ₈	1 ³ / ₈	–	–	13 ⁵ / ₈	18 ¹⁵ / ₁₆	6	7 ⁸ / ₈	1	9	80
1500	2455	6982-6982 ²	1 ¹ / ₂	5 ⁷ / ₈	–	7	1 ¹ / ₂	–	–	16 ¹ / ₂	22 ³ / ₈	11	1 ³ / ₈	1 ¹ / ₁₆	25	130
1500	2455	6982-6982 ²	2	7 ³ / ₈	–	8 ¹ / ₂	1 ³ / ₄	–	–	20 ⁹ / ₁₆	27 ¹⁵ / ₁₆	14 ¹ / ₂	17 ⁸ / ₈	1 ¹ / ₄	50	270
1500	2455	6982-6982 ²	2 ¹ / ₂	8	–	9 ⁵ / ₈	17 ⁸ / ₈	–	–	20 ⁹ / ₁₆	28 ⁹ / ₁₆	14 ¹ / ₂	17 ⁸ / ₈	1 ¹ / ₄	50	300
1500	2455	6981-6981 ²	1	4	–	2	1.33	–	1 ¹ / ₂	13 ⁵ / ₈	17 ⁵ / ₈	6	7 ⁸ / ₈	1	9	75
1500	2455	6981-6981 ²	1 ¹ / ₂	5	–	2 ⁷ / ₈	1.92	–	1 ¹ / ₂	16 ¹ / ₂	21 ¹ / ₂	11	1 ³ / ₈	1 ¹ / ₁₆	26	115
1500	2455	6981-6981 ²	2	6	–	3 ¹ / ₂	2.41	–	5 ⁵ / ₈	20 ⁹ / ₁₆	26 ⁹ / ₁₆	14 ¹ / ₂	17 ⁸ / ₈	1 ¹ / ₄	49	238
1500	2455	6981-6981 ²	2 ¹ / ₂	6	–	4 ⁵ / ₁₆	2.91	–	5 ⁵ / ₈	20 ⁹ / ₁₆	26 ⁹ / ₁₆	14 ¹ / ₂	17 ⁸ / ₈	1 ¹ / ₄	49	238
2500	3206	6983-6983 ²	1	4	–	2 ¹ / ₄	1.33	–	1 ¹ / ₂	13 ⁵ / ₈	17 ⁵ / ₈	6	7 ⁸ / ₈	1	9	75
2500	3206	6983-6983 ²	1 ¹ / ₂	5	–	3 ³ / ₁₆	1.92	–	1 ¹ / ₂	16 ¹ / ₂	21 ¹ / ₂	11	1 ³ / ₈	1 ¹ / ₁₆	26	115
2500	3206	6983-6983 ²	2	6	–	3 ⁷ / ₈	2.41	–	5 ⁵ / ₈	20 ⁹ / ₁₆	26 ⁹ / ₁₆	14 ¹ / ₂	17 ⁸ / ₈	1 ¹ / ₄	49	238
2500	3206	6983-6983 ²	2 ¹ / ₂	6	–	4 ¹ / ₂	2.91	–	5 ⁵ / ₈	20 ⁹ / ₁₆	26 ⁹ / ₁₆	14 ¹ / ₂	17 ⁸ / ₈	1 ¹ / ₄	49	238

- Notes:**
- Hardseat-seatless
 - Hardseat-hardseat

Hardseat-seatless unit tandem valves

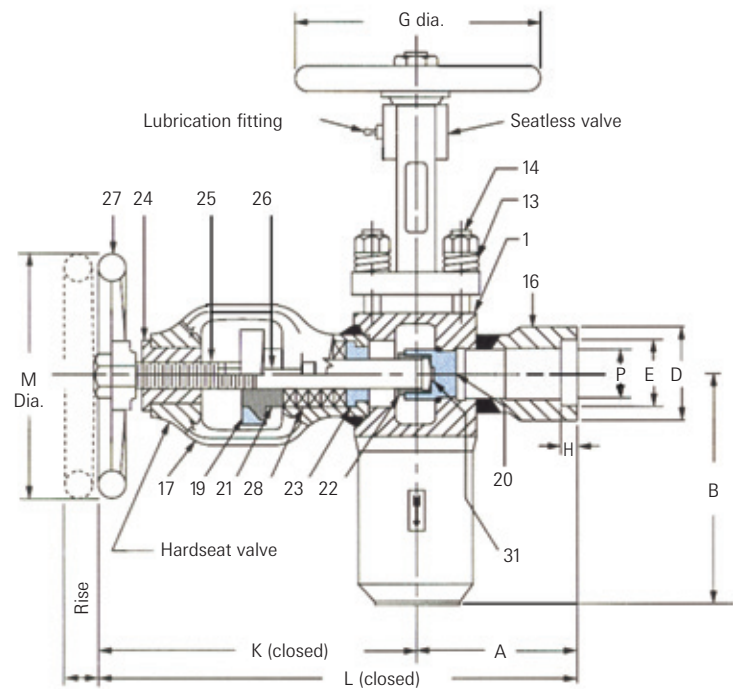


Figure 3947-3927

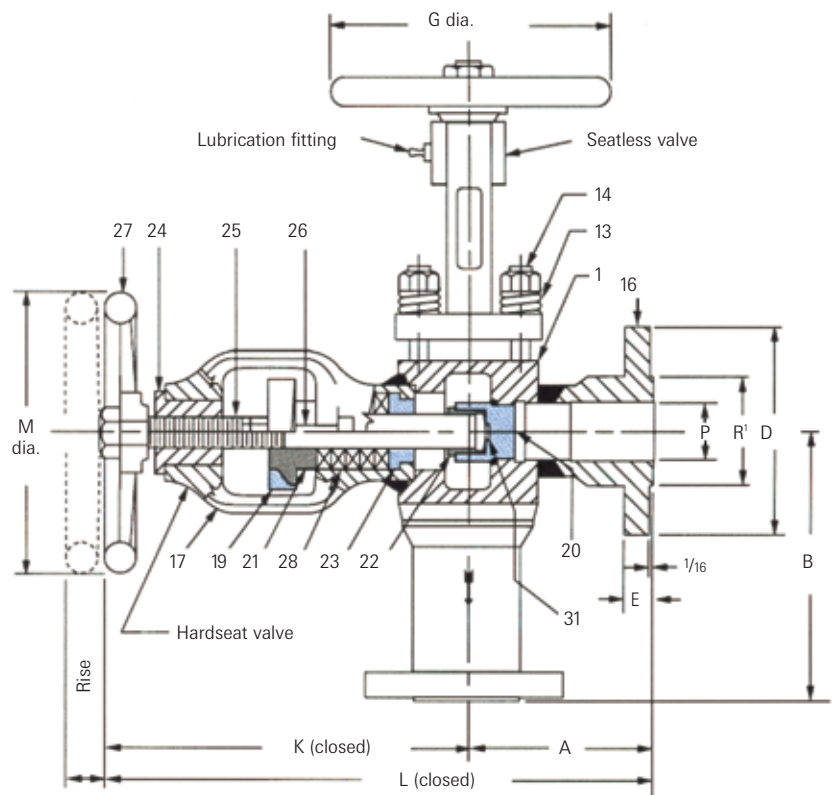


Figure 3948-3928

Note: 1. See page 3 "diameter of raised face" (in flange dimensions table) for "R" dimensions.

Hardseat-seatless unit tandem valves

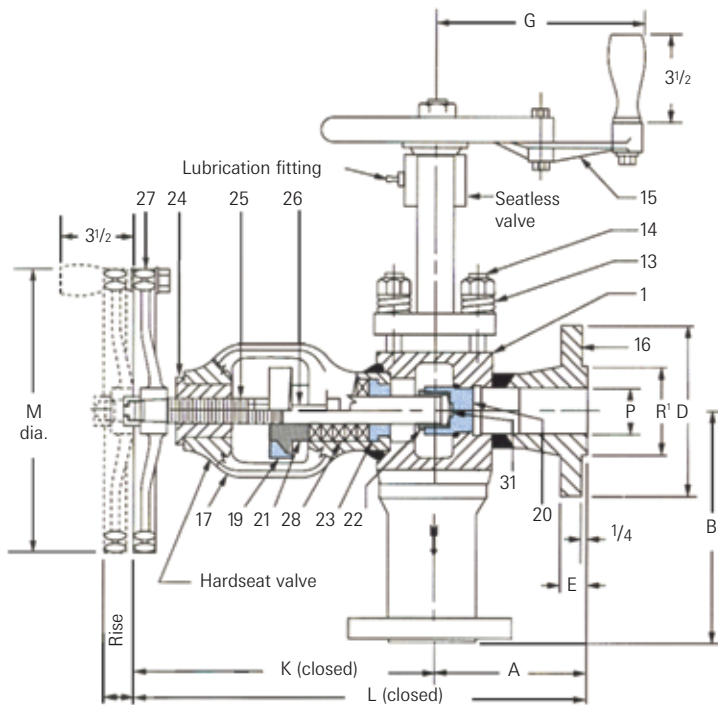


Figure 6978-6954

Note: 1. See page 3 "diameter of raised face" (in flange dimensions table) for "R" dimensions.

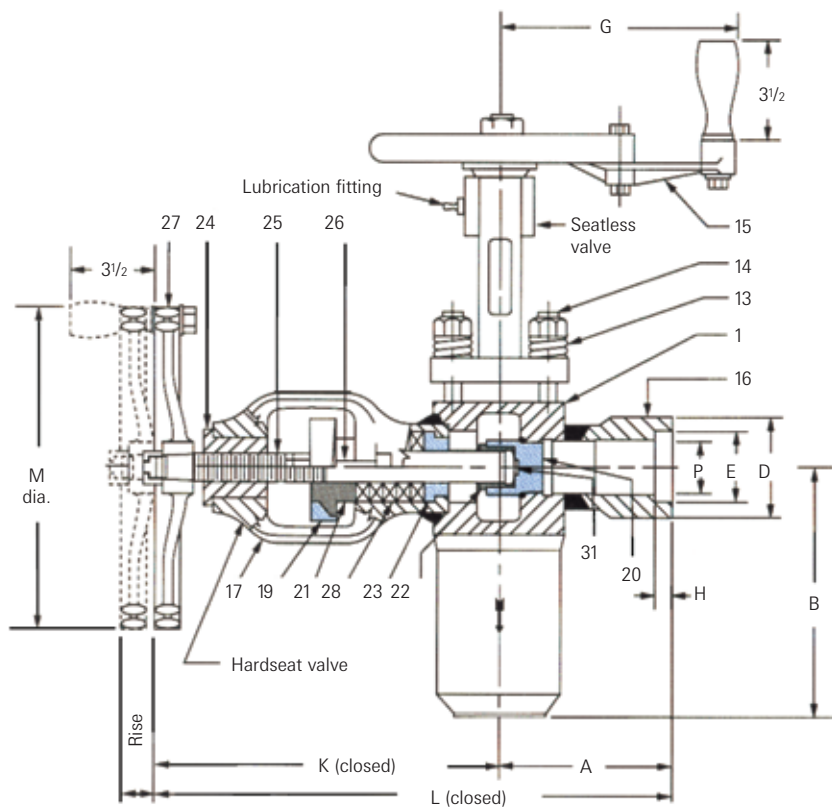


Figure 6977-6953

Hardseat-hardseat unit tandem valves

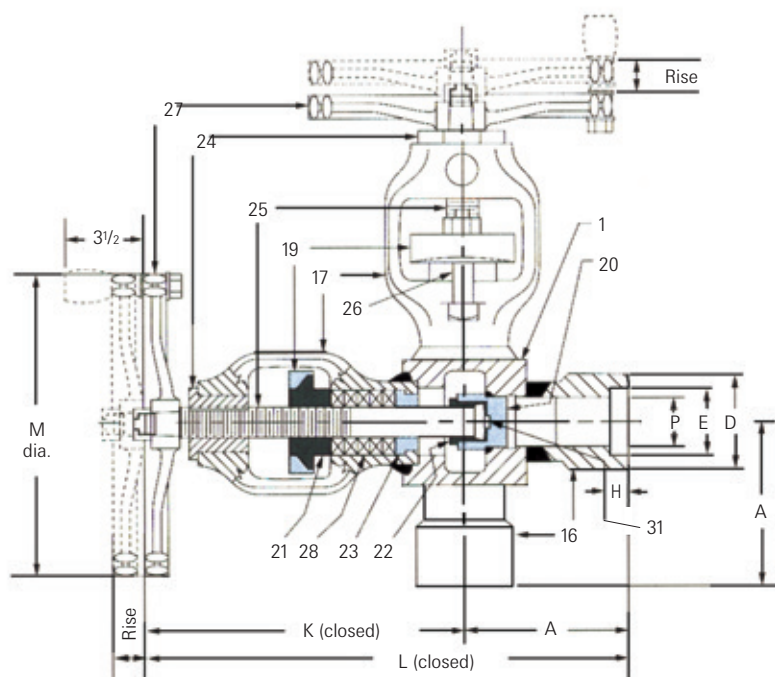


Figure 6977-6977

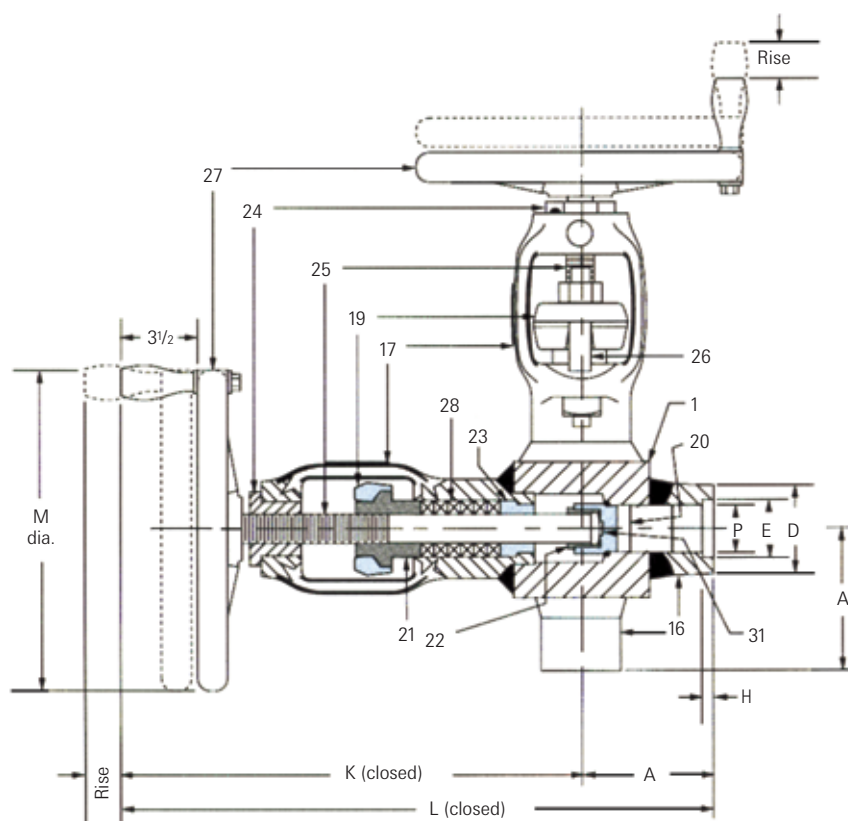


Figure 6981-6981 and 6983-6983

Hardseat-hardseat unit tandem valves

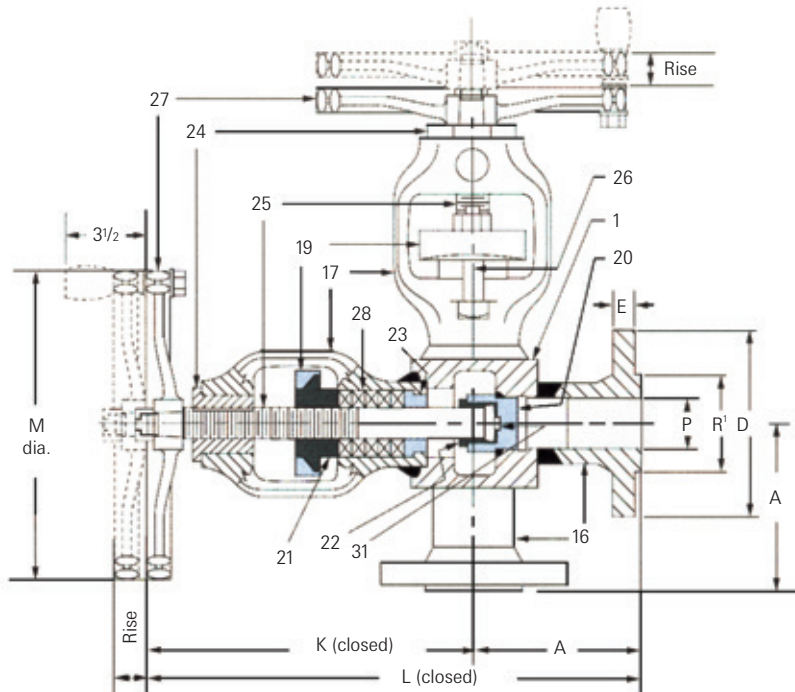


Figure 6978-6978

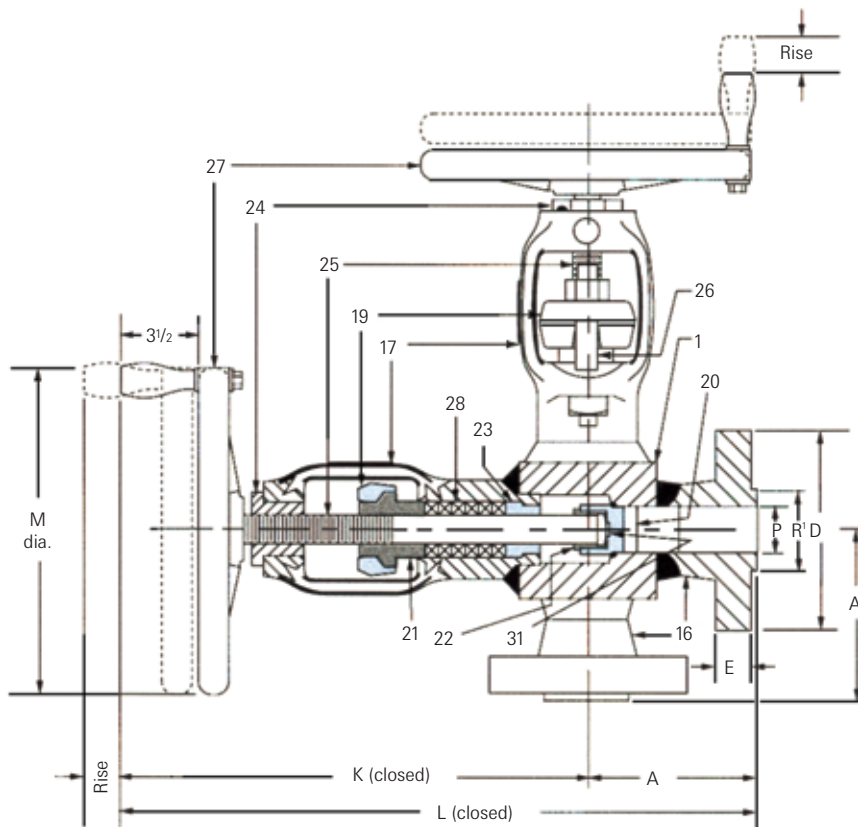
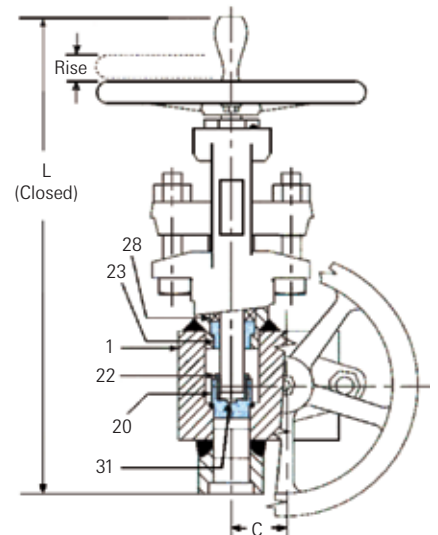


Figure 6982-6982



The "C" dimension for flanged and socketweld valves is pipe-inlet-to-pipe-outlet offset.

Note:

1. See page 3 "diameter of raised face" (in flange dimensions table) for "R" dimensions.