# Series 2600

## Pressure Relief Valves

# General Technical Information

## Standard Flanged Connections

1. All steel raised face flanges are supplied with a serrated spiral finish with 45 to 55 grooves per inch and a finish between 125 and 160 AARH.
2. All ring joint flanged facings are supplied for octagonal or oval gaskets.
3. Facings other than raised face or large male can be supplied at additional cost.
4. Flange ratings that conform to ANSI B16.5 are indicated on each Orifice Selection Table. Heavier outlet flanges can be supplied at additional cost. For flange dimensions, see ANSI Dimension Table, page 77.
5. Drilling of all flanges always straddles the valve center line.

## Valve Trim

Trim is a term that generally refers to internal parts of a pressure relief valve. Unless noted, valve trim in a Farris pressure relief valve specifically includes the nozzle and disc only. Standard bills of materials for all 2600 Series valves are located on pages 12 and 13. For low temperature and corrosive service materials, see pages 17 through 21. If other than standard trim or metallurgy is required, this must be specified.

## Differential Between Operating and Set Pressure

For best performance in process applications, we recommend pressure relief valves be set to open at a minimum of 10% or 25 psig above the operating pressure. A suitable margin above the operating pressure should be provided in order to prevent any unintended operation of the pressure relief valve. Refer to ASME Section VIII Pressure Vessel Code, Appendix M, Paragraph M-10, Pressure Differentials for Pressure Relief Valves as well as to Farris Technical Recommendations for complete information.

In the case of pump and compressor discharge lines, a greater differential is recommended if possible, since pulsations within the system can result in faulty valve operation. Consequently, the pressure relief valve should be set as high above the discharge line pressure as possible.

## Set Pressure Compensation for Temperature

An increase in temperature causes a reduction of valve set pressure as a result of the direct effect of temperature on the spring and expansion of body and bonnet which reduces spring loading. Since pressure relief valves are invariably tested at atmospheric temperature, it is customary to adjust the set pressure at ambient conditions to compensate for higher operating temperatures as indicated in the following table.

## All Service Fluids

| Operating Temperature | % Increase in Set Pressure At Atmospheric Temperature |
|---|---|
| -450° F to 300° F | None |
| 301° F to 600° F | 1% |
| 601° F to 900° F | 2% |
| 901° F to 1200° F | 3% |

Steam service valves are tested on steam by the manufacturer and require no additional temperature compensation. Where the set pressure is above the production steam test facility limits, Section VIII steam valves may be tested on air. When steam valves are tested on air, compensation shown in the All Service Fluids Table should be used.

## Low Pressure Settings

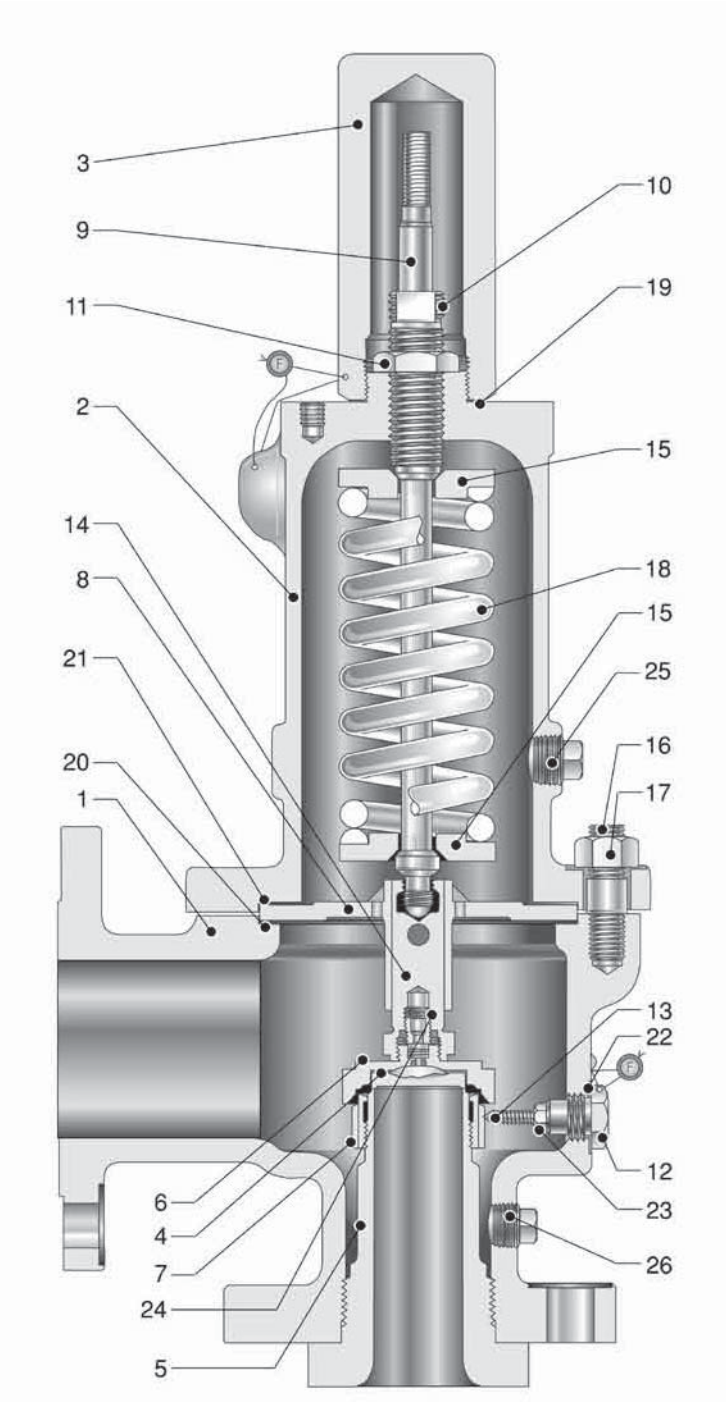
Low set pressure limits are indicated in the following table. These limits apply to both metal-to-metal and O-ring seat construction. Low pressure settings may be governed by valve design and performance and/or Code application limits. Pressure vessels having operating pressures not exceeding 15 psig are not considered within the scope of the ASME Code, Section VIII. Accordingly, pressure relief valve requirements for such applications are governed by other Codes and Standards that should be consulted.

The sizing equations for compressible fluids provided herein are valid for sonic flow conditions and should not be used to size pressure relief valves for applications in which subsonic (below 15 psig) flow conditions may exist. Low pressure applications can be reviewed by the Factory and special valves provided to meet those requirements.

| Valve Series | Construction | Low Set Pressure Limit (psig) |
|---|---|---|
| 2600<br>2600S<br>2600L | Conventional | 15 |
| 2600<br>2600S<br>2600L<br>2600 Bal/Piston | BalanSeal<br>BalanSeal/<br>Piston | 15* |

*Low set pressure limit for “D” and “E” orifice BalanSeal (balanced bellows) valves are 50 psig and 25 psig respectively.

# 2600/2600L Series Conventional



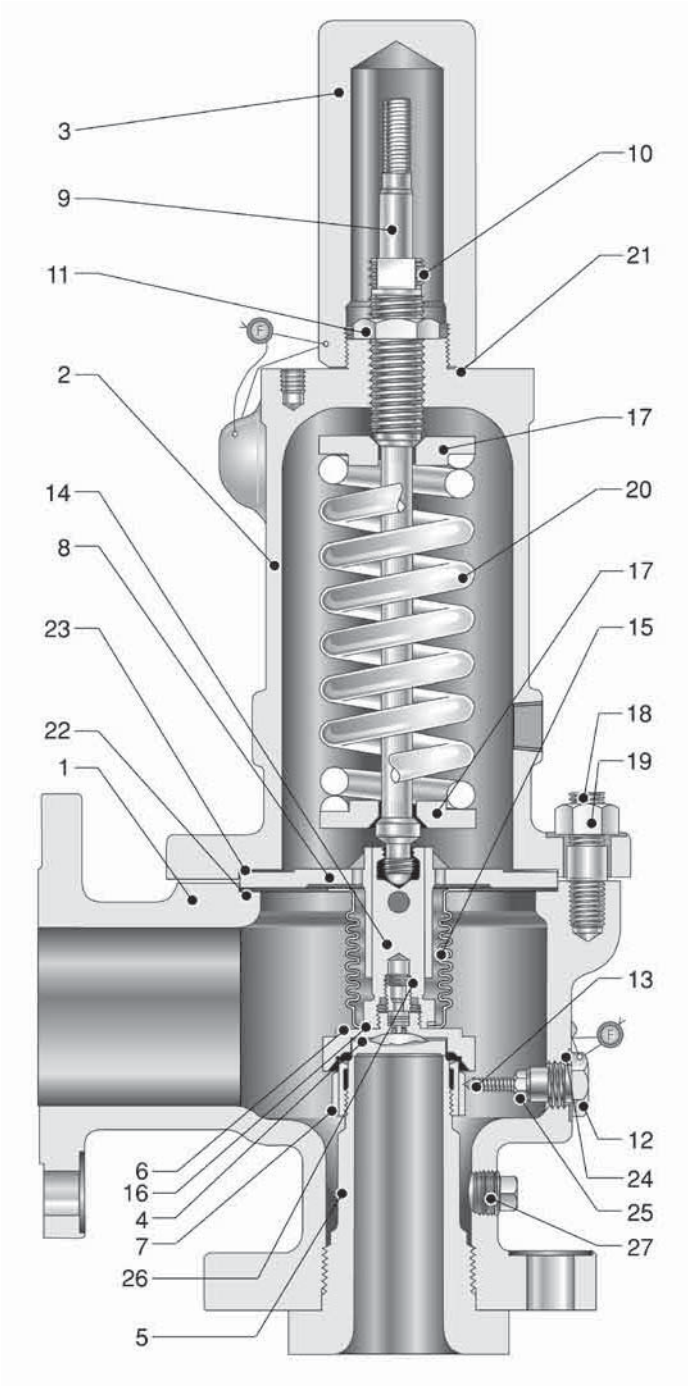

## Bill of Materials - Conventional

| Item | Part Name | Material |
|---|---|---|
| 1 | Body | SA-216 GR. WCB Carbon Steel[1] |
| | | SA-217 GR. WC6, Alloy St. (1-1/4 CR–1/2 Moly)[2] |
| 2 | Bonnet | SA-216 GR. WCB Carbon Steel[1] |
| | | SA-217 GR. WC6, Alloy St. (1-1/4 CR–1/2 Moly)[2] |
| 3 | Cap. Plain Screwed | Carbon Steel |
| 4 | Disc | 316 St. St. |
| 5 | Nozzle | 316 St. St. |
| 6 | Disc Holder | 316 St. St. |
| 7 | Blow Down Ring | 316 St. St. |
| 8 | Sleeve Guide | 316 St. St. |
| 9 | Stem | 316 St. St. |
| 10 | Spring Adjusting Screw | Stainless Steel |
| 11 | Jam Nut (Spr. Adj. Screw) | 316 St. St. |
| 12 | Lock Screw (B.D.R.) | 316 St. St. |
| 13 | Lock Screw Stud | 316 St. St. |
| 14 | Stem Retainer[8] | 17-4PH St. St. |
| 15 | Spring Button | Carbon St., Rust proofed or 316 St. St. |
| 16 | Body Stud | ASME SA-193 GR. B7 Alloy St. |
| 17 | Hex Nut (Body) | ASME SA-194 GR. 2H Alloy St. |
| 18 | Spring | Chrome Alloy Rust Proofed[1] |
| | | High Temperature Alloy Rust Proofed[2] |
| 19 | Cap Gasket | 316 St. St. |
| 20 | Body Gasket | 316 St. St. |
| 21 | Bonnet Gasket | 316 St. St. |
| 22 | Lock Screw Gasket | 316 St. St. |
| 23 | Hex Nut (B.D.R.L.S.) | Stainless Steel |
| 24 | Lock Screw (D.H.) | Stainless Steel |
| 25 | Pipe Plug (Bonnet) | Steel |
| 26 | Pipe Plug (Body) | Steel |

UV Built in conformance to ASME Code Section VIII, capacity certified by National Board

General Notes:
1. Applies to orifice sizes 26( ) A10 thru 26( ) A16.
2. Applies to orifice sizes 26( ) A32 thru 26( ) A36.
3. Parentheses in type number indicate orifice designation, as in 26FA10.
4. For corrosive and low temperature materials, see pages 17 through 21.
5. For open and packed lever materials and test gags, see accessories on pages 68 & 69.
6. For capacities, see pages 39-42 U.S. Units, 57-60 Metric Units.
7. For dimensions and weights, see pages 72-75.
8. For 316 Stem Retainer add S1 suffix to Type #.

# 2600/2600L Series BalanSeal




## Bill of Materials - BalanSeal

| Item | Part Name | Material |
|---|---|---|
| 1 | Body | SA-216 GR. WCB Carbon Steel[1] |
| | | SA-217 GR. WC6, Alloy St. (1-1/4 CR–1/2 Moly)[2] |
| 2 | Bonnet | SA-216 GR. WCB Carbon Steel[1] |
| | | SA-217 GR. WC6, Alloy St. (1-1/4 CR–1/2 Moly)[2] |
| 3 | Cap. Plain Screwed | Carbon Steel |
| 4 | Disc | 316 St. St. |
| 5 | Nozzle | 316 St. St. |
| 6 | Disc Holder | 316 St. St. |
| 7 | Blow Down Ring | 316 St. St. |
| 8 | Sleeve Guide | 316 St. St. |
| 9 | Stem | 316 St. St. |
| 10 | Spring Adjusting Screw | Stainless Steel |
| 11 | Jam Nut (Spr. Adj. Screw) | 316 St. St. |
| 12 | Lock Screw (B.D.R.) | 316 St. St. |
| 13 | Lock Screw Stud | 316 St. St. |
| 14 | Stem Retainer[8] | 17-4PH St. St. |
| 15 | Bellows | Inconel Composite |
| 16 | Bellows Gasket | Non-Asbestos |
| 17 | Spring Button | Carbon St., Rust proofed or 316 St. St |
| 18 | Body Stud | ASME SA-193 GR. B7 Alloy St. |
| 19 | Hex Nut (Body) | ASME SA-194 GR. 2H Alloy St. |
| 20 | Spring | Chrome Alloy Rust Proofed[1] |
| | | High Temperature Alloy Rust Proofed[2] |
| 21 | Cap Gasket | 316 St. St. |
| 22 | Body Gasket | 316 St. St. |
| 23 | Bonnet Gasket | 316 St. St. |
| 24 | Lock Screw Gasket | 316 St. St. |
| 25 | Hex Nut (B.D.R.L.S.) | Stainless Steel |
| 26 | Lock Screw (D.H.) | Stainless Steel |
| 27 | Pipe Plug (Body) | Steel |

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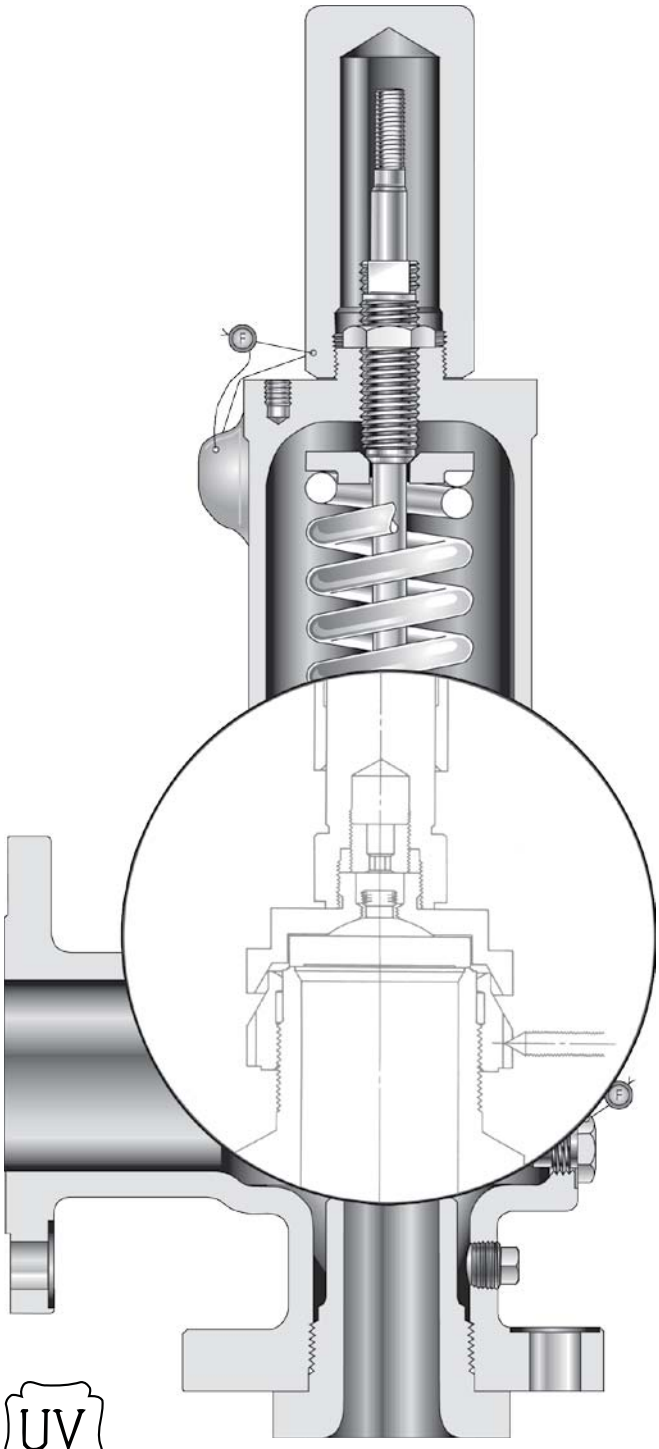
General Notes:
1. Applies to orifice sizes 26( ) A10 thru 26( ) A16.
2. Applies to orifice sizes 26( ) A32 thru 26( ) A36.
3. Parentheses in type number indicate orifice designation, as in 26FA10.
4. For corrosive and low temperature materials, see pages 17 through 21.
5. For open and packed lever materials and test gags, see accessories on pages 68 & 69.
6. For capacities, see pages 39-42 U.S. Units, 57-60 Metric Units.
7. For dimensions and weights, see pages 72-75.
8. For 316 Stem Retainer add S1 suffix to Type #.

# 2600L Series Certified Design



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The 2600L Series liquid relief valves are for use on ASME Section VIII Code applications and offer a superior valve with greater capacity at 10% overpressure than the traditional 2600 Series.

The 2600L Series complements a full line of pressure relief valves in orifices “D” through “T” to meet the ASME Code requirements for incompressible fluid services. The Code stamped construction requires liquid relief valves that have been capacity certified on water at 10% overpressure to carry the ASME UV and National Board NB symbols.

For compressible fluid services, the standard 2600 Series should be used. Liquid service applications that do not require the use of Code stamped liquid relief valves can still be satisfied with the standard 2600 series line. In most cases the standard 2600 should only be used in liquid service where an existing installation pipe size / orifice combination does not match the 2600L design.

The 2600L Series is also certified under ASME Code Section VIII for use in air, gas, steam, and vapor services. It may be used in those applications or where two phase or flashing fluid service is anticipated. The 2600L is certified as a fixed blow down design whether used in compressible or non-compressible services.

The type number is differentiated from the existing 2600 Series design by adding the letter “L” as a suffix. The letter “L” is used to specify all liquid trim type numbers and always appears in the seventh position of the type number, just before the three-digit option code for inlet facing/cap construction/test gag. Example: 26GA10L-120.

Optional trim material classes and other accessories are available, as with the 2600 Series, with the exceptions of the H2600. All types within the 2600L Series follow the size, pressure-temperature ratings, and center-to-face dimensions of the 2600 Series (API Std. 526).

Traditional Farris convertibility between conventional and bellows is maintained, as is the interchange-ability of parts.

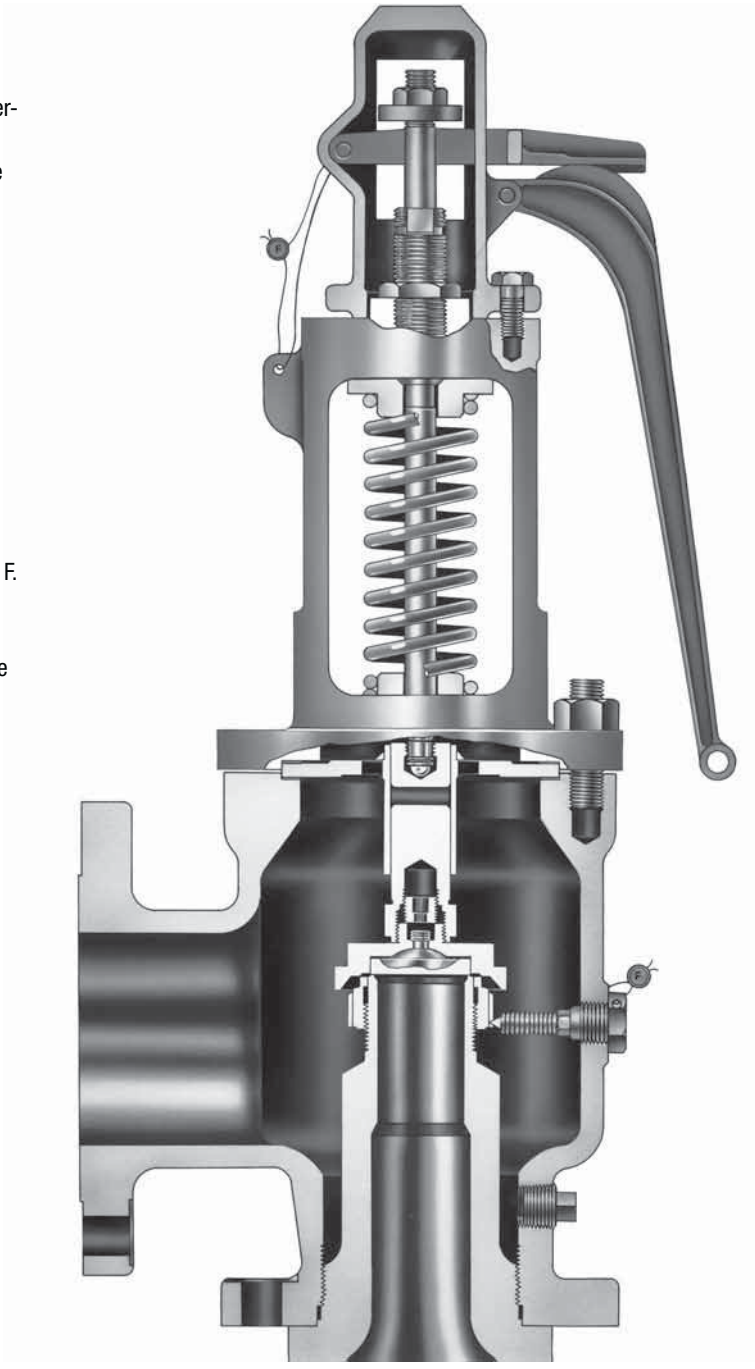
# 2600S Series Exposed Spring

The 2600S Series safety valves with exposed springs represent an enhancement of the standard 2600 Series and are designed to offer improved performance in steam service. They are built in conformance to Section VIII of the ASME Code and have capacities certified at 10% over-pressure by the National Board of Boiler and Pressure Vessel Inspectors. Series 2600S is available in the same “D” through “Z” orifices and flange classes as the standard 2600 Series, and have the same center-to-face dimensions (API Std. 526).

In steam service, you can encounter galling of the guiding surfaces. To minimize this problem, the guide and stem retainer are made from different materials: 316 stainless steel for the guide and hardened stainless steel for the stem retainer. Since the open bonnet is made from a standard 2600 Series bonnet, all other parts are identical to the 2600 Series to provide maximum interchangeability of parts and to reduce inventory costs.

An open lifting lever, required by ASME Code for steam and air service, is standard with the 2600S Series. Chrome alloy springs are used to 1000° F. They can also be used on air service or on other clean gases. Most other 2600 Series options can be supplied, including O-ring seats and bellows. For weather protection of the spring, use the standard 2600 vapor service valve with open lever.

The type number is differentiated from the 2600 Series by the addition of the suffix letter “S” in the seventh digit of the type number. Example: 26JA10S-170.



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# 2600/2600L Balanced Piston Design

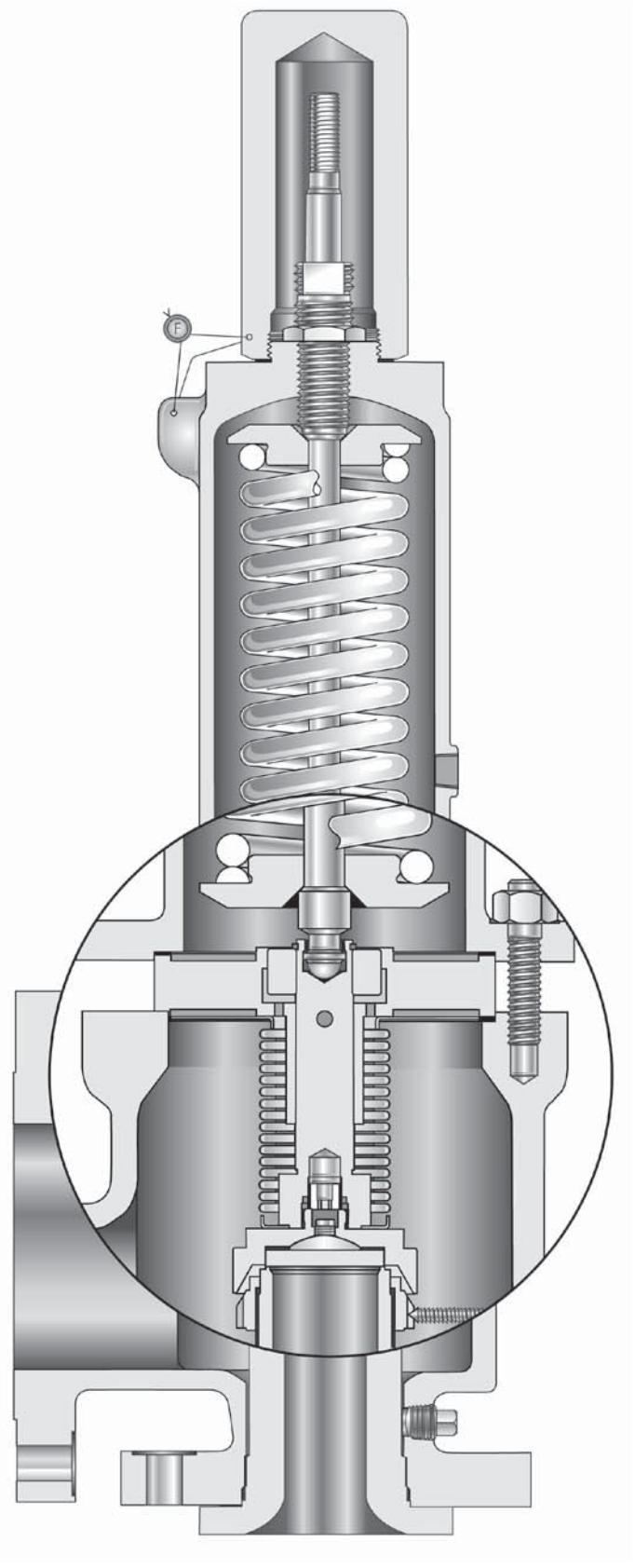
## Balanced Bellows with Auxiliary Balancing Piston

Under back pressure conditions, rupture of the bellows can cause an increase in set pressure of the pressure relief valve. Consistent with safety, Farris Engineering offers a BalanSeal/piston design to compensate for a broken or ruptured bellows. The valve features a piston guide that has an inside diameter equal to the average diameter of the bellows convolutions.

If the bellows fails, the effect of the back pressure is nullified by the use of the piston. Since there is a slight diametrical clearance between the piston and the guide, a small amount of lading fluid is permitted to pass through the bonnet vent, indicating a bellows rupture. Although the valve will continue to function as a Farris bellows pressure relief valve, the damaged bellows should be replaced to avoid further product loss.

When the proper orifice and corresponding letter designation have been determined, refer to the selection charts and choose the conventional pressure and temperature required. Sizes, set pressure, back pressure, temperature ratings and capacity data are the same as the BalanSeal construction.

To convert the conventional valve type number to the catalog number for balanced bellows valve with auxiliary balancing piston, insert the letter “E” in place of “A”. Example: 26FA12-120 conventional valve becomes 26FE12-120.



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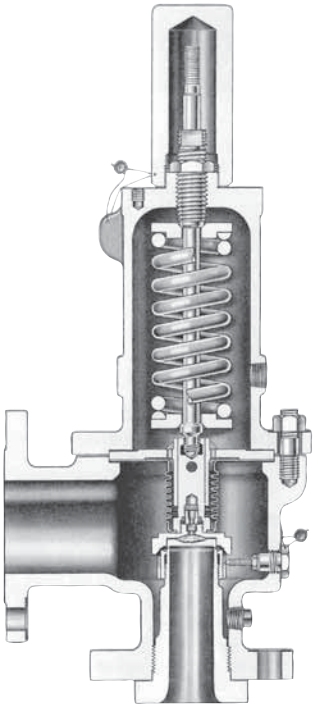
# 2600 Series Heat Transfer Fluid Service

The inherent features of engineering design in the Farris nozzle pressure relief valve make it ideal for heat transfer fluid service. Heat transfer fluids form solid on relief to atmosphere and exhibit non-lubricating qualities. Consequently the valve requires the ultimate in tightness and perfect guiding beyond that of a valve used in other services.

The Farris design includes a 2-1/2 to 1 guiding ratio, self-aligning, flat, easily replaceable disc and double universal joint for exact alignment. These valves have been proven in thousands of installations and are accepted as the industry standard for heat transfer fluid service.

For additional protection against deposit build-up on the guiding surfaces, a BalanSeal bellows can be provided to isolate internal working parts.

All heat transfer fluid service valves receive particular attention in the Farris assembly and testing departments. Special lapping, gasketing and sealing compounds are used to assure maximum tightness for this hard-to-hold service.



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# Materials for Corrosive and Low Temperature Service

Standard materials of construction for corrosive service and low temperature service are listed on pages 18-21. Our selection of these materials is a result of many years of research in metallurgy and, while not all-inclusive, covers the most frequently used construction materials. In the case of a special application that requires materials not listed in this catalog, consult the Farris Factory.

Note that Farris Engineering cannot guarantee valve service life, as there are many factors that can affect the life of any material and that are beyond our control.

**Corrosive Service.** A pressure relief valve is not expected to operate frequently; therefore, standard materials should prove satisfactory. Where severe corrosive conditions exist, the nozzle and disc, which are always exposed to the lading fluid, are available in more corrosive-resistant materials such as Monel (/M1) and Hastelloy C (/H1).

Where specific applications require complete internals to be more corrosion resistant due to frequent valve operation and where parts beyond the nozzle and disc are exposed to corrosive lading fluid, complete internals and the complete valve are available in 316, Monel and Hastelloy (/S3, /S4, /N1, /N4, /M2, /M3, /M4, /H2, /H3, /H4).

**Low Temperature Service.** For low temperature applications, Farris offers S3 and S4 trim categories, depending on the degree of sub-zero temperatures involved. Materials cover special metallurgy to maintain adequate impact resistance on all stressed parts at sub-zero temperatures.

# Standard Material for Corrosive Service 316 St. St.[6]

| Part Name | S3 Complete Valve Except Spring Assembly | | S4 Complete Valve | |
|---|---|---|---|---|
| | -75°F TO 800°F | | -450°F TO 450°F[3] | |
| | Conventional | BalanSeal | Conventional | BalanSeal |
| Body | SA-351 Gr. CF8M St. St. (316 St. St.) | SA-351 Gr. CF8M St. St. (316 St. St.) | SA-351 Gr. CF8M St. St. (316 St. St.) | SA-351 Gr. CF8M St. St. (316 St. St.) |
| Bonnet | SA-351 Gr. CF8M St. St. (316 St. St.) | SA-351 Gr. CF8M St. St. (316 St. St.) | SA-351 Gr. CF8M St. St. (316 St. St.) | SA-351 Gr. CF8M St. St. (316 St. St.) |
| Cap, Plain Screwed | 316 St. St. | 316 St. St. | 316 St. St. | 316 St. St. |
| Disc | | | | |
| Nozzle | | | | |
| Disc Holder | | | | |
| Blow Down Ring | | | | |
| Sleeve Guide | | | | |
| Stem | | | | |
| Spring Adj. Screw | 316 St. St. | 316 St. St. | 316 St. St. | 316 St. St. |
| Jam Nut (Spr. Adj. Scr.) | | | | |
| Blow Down Ring Lock Screw | | | | |
| Lock Screw Stud | | | | |
| Stem Retainer | 316 St. St. | 316 St. St. | 316 St. St. | 316 St. St. |
| Bellows | None | | None | |
| Bellows Gasket | None | Teflon Composite | None | Teflon Composite |
| Spring Button | 316 St. St. | 316 St. St. | 316 St. St. | 316 St. St. |
| Body Stud | ASTM A193 Gr. B8M St. St. | ASTM A193 Gr. B8M St. St. | ASTM A193 Gr. B8M St. St. | ASTM A193 Gr. B8M St. St. |
| Body Hex Nut | ASTM A194 Gr. 8M St. St. | ASTM A194 Gr. 8M St. St. | ASTM A194 Gr. 8M St. St. | ASTM A194 Gr. 8M St. St. |
| Spring | Chrome Alloy, Nickel Plated | Chrome Alloy, Nickel Plated | 316 St. St. | 316 St. St. |
| Cap Gasket | | | | |
| Bonnet Gasket | | | | |
| Body Gasket | | | | |
| Lock Screw Gasket | | | | |
| Hex. Nut (Lock Screw) | | | | |
| Disc Holder Lock Screw | | | | |
| Pipe Plug (Bonnet) | 316 St. St. | None | 316 St. St. | None |
| Pipe Plug (Body) | 316 St. St. | 316 St. St. | 316 St. St. | 316 St. St. |



General Notes:
1. Any part not specified is standard material.
2. Maximum set pressures for S1 trim are equal to the carbon steel valves in the selection tables.
3. Maximum set and back pressures for the S3 and S4 trim are equal to the 316 stainless valve limits shown on pages 24-37, 43-56, 79 and 80.
4. To designate valves with 316 stainless construction, add the appropriate suffix to the type number. Example: 26FA10-120 becomes 26FA10-120/S4.
5. For open and packed lever materials, see page 68.
6. Specify S1 trim to select a valve with a 316 St. St. stem retainer and standard carbon steel body and bonnet.

# Standard Material for Corrosive Service Monel

| Part Name | M1 Nozzle & Disc | | M2 Internal Parts Except Spring Assembly | | M3 Complete Valve Except Spring Assembly | | M4 Complete Valve | |
|---|---|---|---|---|---|---|---|---|
| | -20°F to 800°F[2] | | -20°F to 800°F[2] | | -75°F to 800°F[3] | | -325°F to 900°F[3] | |
| | Conventional | BalanSeal | Conventional | BalanSeal | Conventional | BalanSeal | Conventional | BalanSeal |
| Body | | | | | Monel | Monel | Monel | Monel |
| Bonnet | | | | | Monel | Monel | Monel | Monel |
| Cap, Plain Screwed | | | | | Monel | Monel | Monel | Monel |
| Disc | Monel | Monel | Monel | Monel | Monel | Monel | Monel | Monel |
| Nozzle | Monel | Monel | Monel | Monel | Monel | Monel | Monel | Monel |
| Disc Holder | | | Monel | Monel | Monel | Monel | Monel | Monel |
| Blow Down Ring | | | Monel | Monel | Monel | Monel | Monel | Monel |
| Sleeve Guide | | | Monel | | Monel | Monel | Monel | Monel |
| Stem | | | Monel | | Monel | Monel | Monel | Monel |
| Spring Adj. Screw | | | Monel | | Monel | Monel | Monel | Monel |
| Jam Nut (Spring Adj. Screw) | | | Monel | | Monel | Monel | Monel | Monel |
| Blow Down Ring Lock Screw | | | Monel | Monel | Monel | Monel | Monel | Monel |
| Lock Screw Stud | | | Monel | Monel | Monel | Monel | Monel | Monel |
| Stem Retainer | | | Monel | Monel | Monel | Monel | Monel | Monel |
| Bellows | None | | None | Monel | None | Monel | None | Monel |
| Bellows Gasket | None | | None | Teflon Composite | None | Teflon Composite | None | Teflon Composite |
| Spring Button | | | 316 St. St. | | 316 St. St. | 316 St. St. | Monel | Monel |
| Body Stud | | | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Body Hex Nut | | | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Spring | | | Chrome Alloy Nickel Plated | | Chrome Alloy Nickel Plated | Chrome Alloy Nickel Plated | Inconel X | Inconel X |
| Cap Gasket | | | Monel | | Monel | Monel | Monel | Monel |
| Bonnet Gasket | | | Monel | | Monel | Monel | Monel | Monel |
| Body Gasket | | | Monel | Monel | Monel | Monel | Monel | Monel |
| Lock Screw Gasket | | | Monel | Monel | Monel | Monel | Monel | Monel |
| Hex Nut (Lock Screw) | | | Monel | Monel | Monel | Monel | Monel | Monel |
| Disc Holder Lock Screw | | | Monel | Monel | Monel | Monel | Monel | Monel |
| Pipe Plug (Bonnet) | | None | | None | Monel | None | Monel | None |
| Pipe Plug (Body) | | | | | Monel | Monel | Monel | Monel |

General Notes:
1. Any part not specified is standard material.
2. Maximum set pressures for M1 and M2 trim are equal to the Monel flange limits as shown on page 83. Consult the factory for higher pressures.
3. Maximum set and back pressures for the M3 and M4 trim are equal to the Monel valve limits as shown on page 83.
4. To designate valves with Monel construction, add the appropriate suffix to the type number. Example: 26FA10-120 becomes 26FA10-120/M1.
5. For open and packed lever materials, see page 68.
6. Monel, Inconel and Inconel X are registered trademarks of Inco Alloys International. We reserve the right to substitute comparable materials from other manufacturers.

# Standard Material for Corrosive Service Hastelloy C

| Part Name | H1 Nozzle & Disc | | H2 Internal Parts Except Spring Assembly | | H3 Complete Valve Except Spring Assembly | | H4 Complete Valve | |
|---|---|---|---|---|---|---|---|---|
| | -20°F to 800°F[2] | | -20°F to 800°F[2] | | -75°F to 800°F[3] | | -325°F to 800°F[3] | |
| | Conventional | BalanSeal | Conventional | BalanSeal | Conventional | BalanSeal | Conventional | BalanSeal |
| Body | | | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Bonnet | | | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Cap, Plain Screwed | | | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Disc | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Nozzle | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Disc Holder | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Blow Down Ring | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Sleeve Guide | | | Hastelloy C | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Stem | | | Monel | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Spring Adj. Screw | | | Monel | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Jam Nut (Spring Adj. Screw) | | | Monel | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Blowdown Ring Lock Screw | | | Monel | Monel | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Lock Screw Stud | | | Monel | Monel | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Stem Retainer | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Bellows | None | | None | Inconel Composite Teflon Coated | None | Inconel Composite Teflon Coasted | None | Inconel Composite Teflon Coated |
| Bellows Gasket | None | | None | Teflon Composite | None | Teflon Composite | None | Teflon Composite |
| Spring Button | | | 316 St. St. | | 316 St. St. | 316 St. St. | Hastelloy C | Hastelloy C |
| Body Stud | | | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Body Hex Nut | | | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Spring | | | Chrome Alloy Nickel Plated | | Chrome Alloy Nickel Plated | Chrome Alloy Nickel Plated | Hastelloy C | Hastelloy C |
| Cap Gasket | | | Monel | | Teflon Composite | Teflon Composite | Teflon Composite | Teflon Composite |
| Bonnet Gasket | | | Monel | | Teflon Composite | Teflon Composite | Teflon Composite | Teflon Composite |
| Body Gasket | | | Monel | Monel | Teflon Composite | Teflon Composite | Teflon Composite | Teflon Composite |
| Lock Screw Gasket | | | Monel | Monel | Teflon Composite | Teflon Composite | Teflon Composite | Teflon Composite |
| Hex Nut (Lock Screw) | | | Monel | Monel | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Disc Holder Lock Screw | | | Monel | Monel | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |
| Pipe Plug (Bonnet) | | None | | None | Hastelloy C | None | Hastelloy C | None |
| Pipe Plug (Body) | | | | | Hastelloy C | Hastelloy C | Hastelloy C | Hastelloy C |



General Notes:
1. Any part not specified is standard material.
2. Maximum set pressures for H1 and H2 trim are equal to the carbon steel valves in the Selection Tables.
3. Maximum set and back pressures for the H3 and H4 trim are equal to the Hastelloy C valve limits shown on pages 81 and 82.
4. To designate valves with Hastelloy C construction, add the appropriate suffix to the type number. Example: 26FA10-120 becomes 26FA10-120/H1.
5. For open and packed lever materials, see page 68.
6. Hastelloy and Hastelloy C are registered trademarks of Haynes International. We reserve the right to substitute comparable materials from other manufacturers.

# Pressure Relief Valves for Sour Gas Service
# NACE MR0103 and MR0175/ISO 15156

NACE International (formerly The National Association of Corrosion Engineers) publishes two standards covering the use of equipment in environments containing $H_2S$ (Hydrogen Sulfide). The standards are: MR0103, Standard Material Requirements – Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments; and MR0175/ISO 15156, Petroleum and Natural Gas Industries – Materials for Use in $H_2S$-Containing Environments in Oil and Gas Production.

The material requirements of the NACE Standards have resulted in various constructions. 2600 Series valves constructed of standard carbon steel (SA216 Grade WCB) and 316 stainless steel (SA351 Grade CF8M or SA479 Type 316) will be dual certified to NACE MR0103 and NACE MR0175/ISO 15156. For non-standard materials, Farris Engineering will have to review the materials on a case-by-case basis to determine NACE compliance.

The customer must decide whether his application requires a valve in compliance with NACE standards. Farris Engineering is responsible for supplying materials in compliance with the applicable NACE specification. As part of the order requirement, Farris will verify that material hardness values are in compliance with the NACE standard on the body, bonnet, nozzle and disc as applicable. Additionally, we will offer bolting and springs (for conventional and pilot operated valves only) in compliance with NACE specifications.

To specify a valve with materials compliant to NACE specifications, add the suffix /N1 or /N4 to the standard type number. Example: 26LB12-120/N1.

| Part Name | N1 Suffix | | N4 Suffix | |
|---|---|---|---|---|
| | Conventional | Bellows | Conventional | Bellows |
| Body | SA216 Gr. WCB (NACE) | SA216 Gr. WCB (NACE) | SA351 Gr. CF8M (NACE) | SA351 Gr. CF8M (NACE) |
| Bonnet | SA216 Gr. WCB (NACE) | SA216 Gr. WCB (NACE) | SA351 Gr. CF8M (NACE) | SA351 Gr. CF8M (NACE) |
| Cap, Plain Screwed | | | | |
| Disc | 316 Stainless Steel (NACE) | 316 Stainless Steel (NACE) | 316 Stainless Steel (NACE) | 316 Stainless Steel (NACE) |
| Nozzle | 316 Stainless Steel (NACE) | 316 Stainless Steel (NACE) | 316 Stainless Steel (NACE) | 316 Stainless Steel (NACE) |
| Disc Holder | | | | |
| Blow Down Ring | | | | |
| Sleeve Guide | | | | |
| Stem | | | | |
| Spring Adj. Screw | | | | |
| Jam Nut (Spr. Adj. Scr.) | | | | |
| Blow Down Ring | | | | |
| Lock Screw | | | | |
| Lock Screw Stud | | | | |
| Stem Retainer | | | | |
| Bellows | None | | None | |
| Bellows Gasket | None | | None | |
| Spring Button | 316 Stainless Steel | | 316 Stainless Steel | |
| Body Stud | ASME SA-193 Gr. B7M Alloy Steel | ASME SA-193 Gr. B7M Alloy Steel | ASME SA-193 Gr. B8MA Stainless Steel | ASME SA-193 Gr. B8MA Stainless Steel |
| Body Hex Nut | ASME SA-194 Gr. 2HM Alloy Steel | ASME SA-194 Gr. 2HM Alloy Steel | ASME SA-194 Gr. 8MA Stainless Steel | ASME SA-194 Gr. 8MA Stainless Steel |
| Spring | Inconel | | Inconel | |
| Cap Gasket | | | | |
| Bonnet Gasket | | | | |
| Body Gasket | | | | |
| Lock Screw Gasket | | | | |
| Hex. Nut (Lock Screw) | | | | |
| Disc Holder Lock Screw | | | | |
| Pipe Plug (Bonnet) | | None | | None |
| Pipe Plug (Body) | | | | |



Notes:
1. Any part not specified is standard material. For N1 standard valve, see pages 12-13. For N4, see page 18 S4 trim.
2. For open and packed lever materials, see page 68.
3. For a valve with complete Inconel bellows, use “N1/SP” type number suffix. Example: 26JB10-120/N1/SP.
4. For a valve in complete stainless steel, add “N4” to suffix. Example: 26HB10-120/N4. For optional complete Inconel bellows, add “N4/SP”. Example: 26HB10-120/N4/SP.

# Farris O-Ring Seat Pressure Seal for Conventional or BalanSeal

The O-ring seat pressure seal minimizes leakage and costly product loss as well as reduces downtime and maintenance on troublesome applications such as:

- Operation too close to set pressure
- Light, hard-to-hold fluids
- Entrained foreign particles and solids
- Vibratory applications
- Corrosive fluids
- Nozzle icing conditions
- Discharge piping strains

Recognizing the need for a resilient seat in a pressure relief valve for extreme tightness, Farris Engineering first produced an O-ring seat in early 1950. The O-ring design received and continues to receive phenomenal acceptance and use because it makes possible complete tightness at pressures much closer to valve set pressure. This tightness is not possible with the standard metal-to-metal seat.

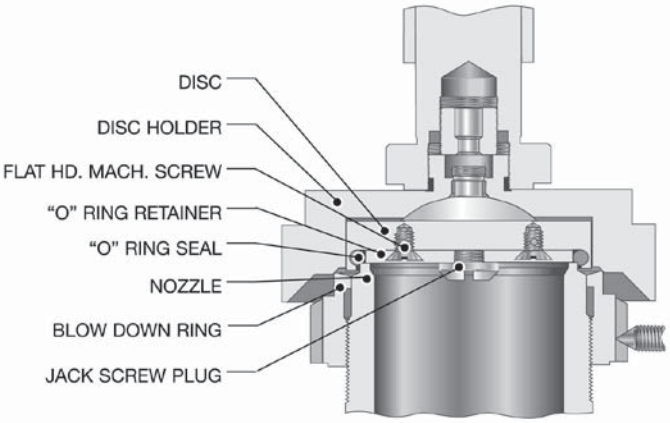
The present Farris O-ring seat seal permits set pressure as high as 1500 psig. Equally important, the spring load is carried solely by the metal-to-metal portion of the seat with the O-ring becoming a pressure seal within its recessed chamber, assuring maximum tightness.

The O-ring seat seal option is available for the 2600/2600L/2600S Series of flanged pressure relief valves in the conventional, BalanSeal, and BalanSeal/piston constructions. Refer to the Selection Tables on pages 24 through 37. Substitute a “C” for the fourth digit “A” in the type number for the conventional valve, a “D” for the fourth digit “B” in the type number for a BalanSeal valve, and an “F” for the fourth digit in the type number for the BalanSeal/piston construction when an O-ring seat seal is required. Valves with Teflon seat seals are available on application.

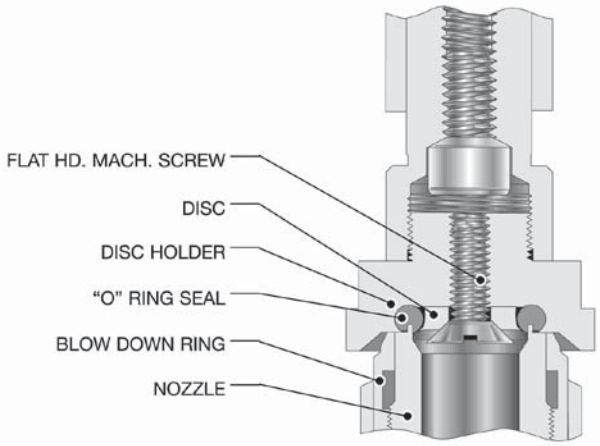
The same type number changes apply to the 2600L Series. Examples:

| | |
|---|---|
| 26FA10 | becomes 26FC10 (conventional). |
| 26FB10 | becomes 26FD10 (BalanSeal). |
| 26FA10L | becomes 26FC10L (conventional–liquid service). |
| 26FE10L | becomes 26FF10L (BalanSeal/piston–liquid service). |

The set pressure limits of the conventional, BalanSeal, and BalanSeal/piston valves covered in the Selection Tables are the same for the O-ring design in all type numbers and orifices with the class 150, 300, and 600 inlet flanges. Above class 600 inlet flanges, 1500 psig is the limit for the O-ring design, not the conventional limit shown in the Selection Charts and Tables. Refer to the O-Ring Material Selection Chart on page 23 for temperature and pressure ratings of the various elastomeric O-ring materials available.




**2600 L Through T Orifice O-Ring Details**




**2600 D Through K Orifice O-Ring Details**

## Why use an O-ring seat pressure seal?

In the normal operation of a pressure relief valve, the disc must lift off the nozzle very slightly to simmer, allowing pressure build-up within the secondary orifice (huddling chamber), causing the valve to pop fully open. Simmering occurs many times in the process industries where, as a result of process changes, minor upsets, etc., operating pressure fluctuates higher than normal, causing pressure relief valves to simmer but not fully open. This can cause serious misalignment in the valve, and after the pressure drops, the valve will very often continue to leak below the normal operating pressure. The leaking can be overcome by actually popping the valve, but sometimes this is not possible. Use of a Farris O-ring seat pressure seal will always correct this problem.

Frequently operating pressures are too close to valve set pressures. As the operating pressure nears the set pressure, seat loading is diminished, reducing the force that affects tightness. The Farris O-ring seat pressure seal ensures that tightness is achieved at relatively higher operating pressures, much more so than with metal-to-metal or other soft seat pressure relief valves.

On light, hard-to-hold fluids such as hydrogen, helium, light hydrocarbon, anhydrous ammonia, and others, metal-to-metal seats are often penetrated, causing leakage problems. The Farris O-ring seat pressure seal overcomes leakage on these hard-to-hold fluids.

In applications where heavy vibrations occur such as barges, tankers, pumps, and compressors, leakage of metal-to-metal seats develops. This occurs because, as the set pressure nears, the spring force is equalized and the vibration reduces the effect of seat loading, causing leakage. The Farris O-ring seat pressure seal maintains tightness because the spring force is not a factor in the tightness of the O-ring design.

Where occasional minute foreign particles are carried in the flowing medium, metal-to-metal seats are usually marred or scratched when the valve is blowing. This creates leakage problems after the valve closes. The Farris O-ring seat pressure seal absorbs the impact of these particles without damage, and eliminates disc separation from the mating metal seating surface on the nozzle as the valve closes. This reduces the incidence of leakage on most process units. When necessary, simply replace the Farris O-ring to maintain tightness.

Due to corrosion, metal-to-metal seats can eventually leak. With the proper selection of the Farris O-ring seat pressure seal, tightness can be improved and maintained.

Nozzle icing results from the refrigerant effect of the flowing media when a valve relieves. Ice actually forms on the seat, causing leakage. The Farris O-ring seat pressure seal reduces this type of leakage.

### "O" RING MATERIAL SELECTION TABLE

| Material | Temperature Range °F | D to K Orifice | | L to T Orifice | |
|---|---|---|---|---|---|
| | | Set Pressure (psig) | Durometer (Shore A) | Set Pressure (psig) | Durometer (Shore A) |
| Viton[4] | -20 to 450 | 15 to 100 | 50 | 15 to 150 | 50 |
| | -20 to 450 | 101 to 650 | 75 | 150 to 450 | 75 |
| | -20 to 125 | 650 to 950 | 75 | 450 to 750 | 75 |
| | 125 to 450 | | 90 | | 90 |
| | -20 to 450 | 950 to 1500 | 90 | 750 to 1500 | 90 |
| Ethylene Propylene | 0 to 350 | 15 to 100 | 50 | 15 to 150 | 50 |
| | 0 to 350 | 101 to 650 | 70 | 150 to 450 | 70 |
| | 0 to 125 | 650 to 950 | 70 | 450 to 750 | 70 |
| | 125 to 350 | | 80 | | 80 |
| | 0 to 350 | 950 to 1500 | 80 | 750 to 1500 | 80 |
| Buna N | 0 to 200 | 15 to 100 | 50 | 15 to 100 | 50 |
| | 0 to 200 | 101 to 650 | 70 | 100 to 450 | 70 |
| | 0 to 125 | 650 to 950 | 70 | 150 to 750 | 70 |
| | 125 to 200 | | 90 | | 90 |
| | 0 to 200 | 950 to 1500 | 90 | 750 to 1500 | 90 |
| Silicone | -150 to 450 | 15 to 100 | 50 | 15 to 100 | 50 |
| | -150 to 0 | 101 to 600 | 50 | 100 to 200 | 50 |
| | 0 to 450 | | 70 | | 70 |
| | -150 to 450 | 600 to 850 | 70 | 200 to 450 | 70 |
| | -150 to 125 | 850 to 1100 | 70 | 450 to 750 | 70 |
| | 125 to 450 | | 80 | | 80 |
| | -150 to 450 | 1100 to 1500 | 80 | 750 to 1500 | 80 |
| Kalrez | -20 to 550 | 15 to 200 | 65 | 15 to 150 | 65 |
| | -20 to 550 | 201 to 650 | 80 | 150 to 450 | 80 |
| | -20 to 200 | 650 to 950 | 80 | 450 to 750 | 80 |
| | 200 to 550 | | 90 | | 90 |
| | -20 to 550 | 950 to 1500 | 90 | 750 to 1500 | 90 |
| Neoprene | -45 to 300 | 50 to 750 | 70 | 50 to 750 | 70 |
| | -45 to 300 | 751 to 1500 | 80 | 751 to 1500 | 80 |



General Notes:
1. Standard seat tightness for "O" ring valves is no bubbles at 90% of set pressure for both conventional and bellows valves. At set pressures of 50 psig and below, leakage test shall be made at 5 psig below set pressure.
2. Ethylene Propylene is acceptable for steam service up to 350 ºF.
3. Teflon seat seals available on an application basis. Consult the factory.
4. Viton and Kalrez are registered trademarks of DuPont Performance Elastomers. We reserve the right to substitute comparable fluorocarbon materials.

# 2600 Series Super Capacity Pressure Relief Valves

Farris Engineering offers a complete line of large orifice, spring-loaded safety relief valves for applications requiring flows larger than the standard API "T" orifice. These large orifice valves offer the same superior design, construction, metallurgy, and options as the standard 2600 Series. Features include full nozzle, balanced bellows, isolation of bonnet spring chamber, integral one-piece sleeve guide, temperature equalizing disc, and positive connection of internal parts. Six sizes with inlets ranging from 8" to 20" and effective orifice areas from 31.5 to 176.7 square inches are available.

The 2600 Series large orifice valves are offered in both conventional and BalanSeal construction with ANSI Class 300 RF flanged inlet by ANSI Class 150 RF flanged outlet, and temperature range from -20° to 800° F. They are designed and built in accordance with the ASME Boiler and Pressure Vessel Code, Section VIII. Capacity ratings are certified by the National Board of Boiler and Pressure Vessel Inspectors.

| Orifice | Actual Orifice Area | | Type Number | | Valve Size Inlet X Outlet (inches) | Maximum Set Pressure, psig | | Maximum Set Pressure, barg | | Maximum Back Pressure All Designs | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Square Inches | Square Centimeters | Conventional | BalanSeal | | -20°F to +450°F | +451°F to +800°F | -29°C to +232°C | +233°C to +427°C | psig @ 100°F | barg @ 38°C |
| U | 31.5 | 203.2 | 26UA10 | 26UB10 | 8 x 10 | 65 | 65 | 4.5 | 4.5 | 30 | 2.1 |
| | | | 26UA11 | 26UB11 | | 65 | 65 | 4.5 | 4.5 | 30 | 2.1 |
| | | | 26UA12 | 26UB12 | | 120 | 120 | 8.3 | 8.3 | 60 | 4.1 |
| | | | H26UA12 | H26UB12 | | 300 | 300 | 20.7 | 20.7 | 100 | 6.9 |
| W | 63.6 | 410.2 | 26WA12 | 26WB12 | 12 x 16 | 300 | 300 | 20.7 | 20.7 | 100 | 6.9 |
| W2 | 104.0 | 670.8 | 26W2A12 | 26W2B12 | 16 x 18 | 300 | 300 | 20.7 | 20.7 | 100 | 6.9 |
| X | 113.1 | 729.5 | 26XA12 | 26XB12 | 16 x 20 | 300 | 300 | 20.7 | 20.7 | 100 | 6.9 |
| Y | 143.1 | 923.0 | 26YA12 | 26YB12 | 18 x 24 | 300 | 300 | 20.7 | 20.7 | 100 | 6.9 |
| Z | 176.7 | 1139.7 | 26ZA12 | 26ZB12 | 20 x 24 | 300 | 200 | 20.7 | 13.8 | 100 | 6.9 |

**Materials of Construction:** Carbon steel body and bonnet, stainless steel trim and chrome alloy spring. Other materials available on application. Consult the factory.

**Connections:** ANSI Class 300#RF inlet x 150#RF. Other connection types available on application. Consult the factory.

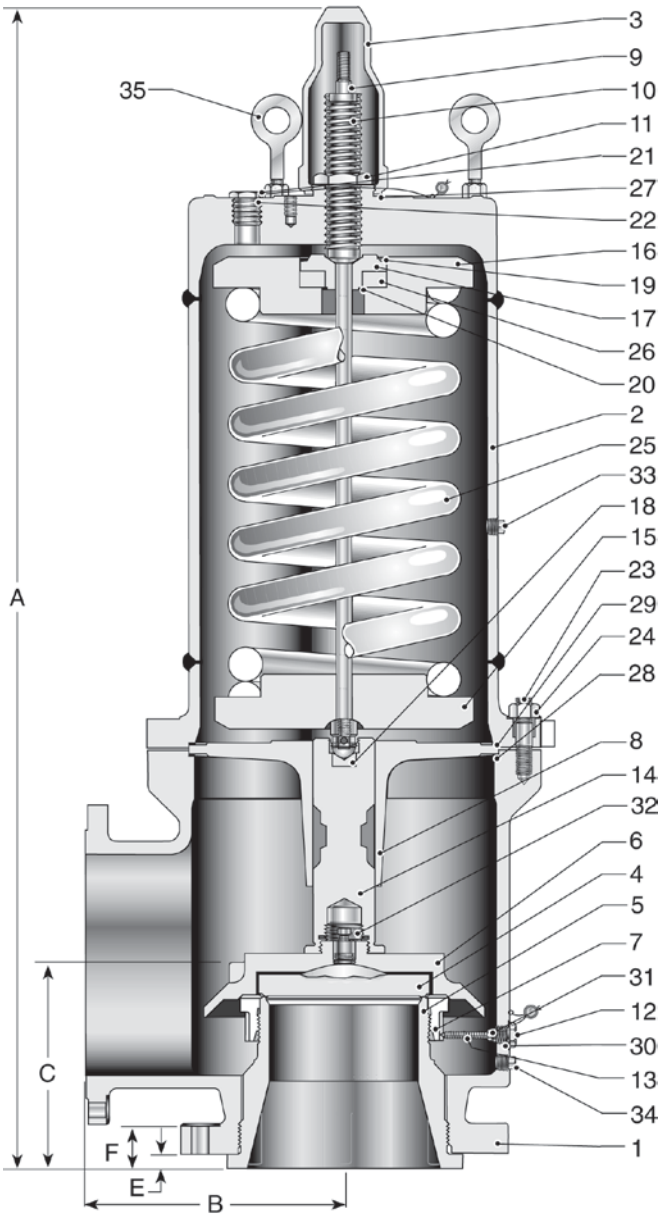
General Notes:
1. All valves supplied with plain caps unless otherwise specified. Standard suffix for type number is "-120". For other cap construction, refer to page 69.
2. For set pressures under 20 psig (1.4 barg) consult the factory.
3. ASME Boiler and Pressure Vessel Code Section VIII requires all valves have a lifting lever when used for air, steam and hot water (over 140°F).
4. For corrosive, low and high temperature materials, ANSI Class 150 inlet flange and open bonnet designs, consult the Factory.
5. Standard flange finish is serrated unless otherwise specified.
6. Optional equipment includes: air set device for set pressure testing, extra large lapping glass for valve seat maintenance, spring compression device for set pressure adjustment, and special disassembly and reassembly equipment.
7. The "U" orifice with 300# inlet flange is available up to 1000°F. Set pressures are the same as the comparable "T" orifice.

# 2600 Series Super Capacity Conventional

## Bill of Materials–Conventional

| Item | Part Name | Material |
|---|---|---|
| 1 | Body 26( )A12 | ASTM A216 Gr. WCB. Carb. St. |
| 2 | Bonnet 26( )A12 | ASTM A216 Gr. WCB. Carb. St. |
| 3 | Cap, Plain Screwed | ASTM A216 Gr. WCB. Carb. St. |
| 4 | Disc | Stainless Steel |
| 5 | Nozzle | 316 St. St. |
| 6 | Disc Holder | Stainless Steel |
| 7 | Blowdown Ring | Stainless Steel |
| 8 | Sleeve Guide 26( )A12 | Stainless Steel |
| 9 | Stem | Stainless Steel |
| 10 | Spring Adjusting Screw | Stainless Steel |
| 11 | Jam Nut (Spr. Adj. Screw) | Stainless Steel |
| 12 | Lock Screw (B.D.R.) | Stainless Steel |
| 13 | Lock Screw Stud | Stainless Steel |
| 14 | Stem Retainer | Stainless Steel |
| 15 | Spring Button, Lower | Carbon St. Rust Proofed |
| 16 | Spring Button, Upper | Carbon St. Rust Proofed |
| 17* | Insert, Spring Button Upper | Stainless Steel |
| 18 | Stem Insert | Stainless Steel |
| 19* | Retaining Ring | Stainless Steel |
| 20* | Back-Up Ring | Teflon |
| 21* | Cylinder Plug | Stainless Steel |
| 22* | O-Ring, Cylinder Plug | Ethylene Propylene |
| 23 | Body Stud | ASTM A193 Gr. B7, Alloy St. |
| 24 | Hex Nut (Body) | ASTM A194 Gr. 2H, Alloy St. |
| 25 | Spring 26( )A12 | Chrome Alloy, Rust Proofed |
| 26* | Roller Thrust Bearing | Hardened Alloy Steel |
| 27 | Cap Gasket | Soft Iron or Steel |
| 28 | Body Gasket | Soft Iron or Steel |
| 29 | Bonnet Gasket | Soft Iron or Steel |
| 30 | Lock Screw Gasket | Soft Iron or Steel |
| 31 | Hex Nut (B.D.R.L.S.) | Stainless Steel |
| 32 | Lock Screw (D.H.) | Stainless Steel |
| 33 | Pipe Plug (Bonnet) | Steel |
| 34 | Pipe Plug (Body) | Steel |
| 35* | Forged Eye Bolt | Steel, Galvanized |

*Not supplied on U & W orifice




| Valve Size Inlet X Outlet | ANSI Flange Class | | Type Number Conv. | Dimensions, in/mm | | | | | Approx. Weight Lbs/Kg |
|---|---|---|---|---|---|---|---|---|---|
| | Inlet RF | Outlet RF | | A (max.) | B | C | E | F | |
| 8 U 10 | 300 | 150 | 26UA12 | 54-1/2<br>*1385* | 11<br>*279* | 10-7/8<br>*276* | 13/16<br>*21* | 2-7/16<br>*62* | 650<br>*295* |
| 12 W 16 | 300 | 150 | 26WA12 | 70-1/2<br>*1791* | 16<br>*406* | 14-1/8<br>*359* | 13/16<br>*21* | 2-13/16<br>*71* | 2800<br>*1270* |
| 16 W2 18 | 300 | 150 | 26W2A12 | 90-3/4<br>*2305* | 20<br>*508* | 16<br>*406* | 1-1/4<br>*32* | 3-1/2<br>*89* | 4200<br>*1905* |
| 16 X 20 | 300 | 150 | 26XA12 | 93-1/2<br>*2375* | 21<br>*533* | 17<br>*432* | 1-1/4<br>*32* | 3-1/2<br>*89* | 5500<br>*2495* |
| 18 Y 24 | 300 | 150 | 26YA12 | 97-1/2<br>*2477* | 25<br>*635* | 20<br>*508* | 1-1/4<br>*32* | 3-5/8<br>*92* | 7000<br>*3175* |
| 20 Z 24 | 300 | 150 | 26ZA12 | 109<br>*2769* | 25<br>*635* | 20<br>*508* | 1-1/4<br>*32* | 3-3/4<br>*95* | 7500<br>*3402* |

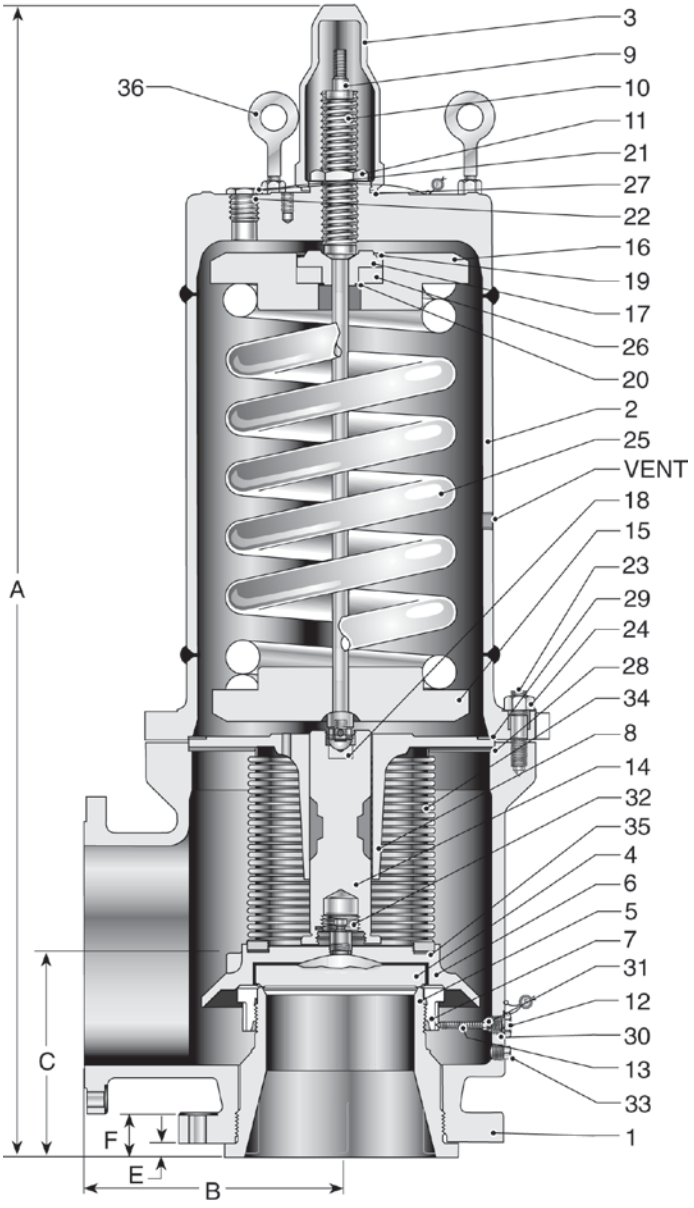
Note: The “U” orifice weights and dimensions are identical to the “T” orifice on page 75.

# 2600 Series Super Capacity BalanSeal

## Bill of Materials–BalanSeal

| Item | Part Name | Material |
|---|---|---|
| 1 | Body 26( )B12 | ASTM A216 Gr. WCB. Carb. St. |
| 2 | Bonnet 26( )B12 | ASTM A216 Gr. WCB. Carb. St. |
| 3 | Cap, Plain Screwed | ASTM A216 Gr. WCB. Carb. St. |
| 4 | Disc | Stainless Steel |
| 5 | Nozzle | 316 St. St. |
| 6 | Disc Holder | Stainless Steel |
| 7 | Blowdown Ring | Stainless Steel |
| 8 | Sleeve Guide 26( )B12 | Stainless Steel |
| 9 | Stem | Stainless Steel |
| 10 | Spring Adjusting Screw | Stainless Steel |
| 11 | Jam Nut (Spr. Adj. Screw) | Stainless Steel |
| 12 | Lock Screw (B.D.R.) | Stainless Steel |
| 13 | Lock Screw Stud | Stainless Steel |
| 14 | Stem Retainer | Stainless Steel |
| 15 | Spring Button, Lower | Carbon St. Rust Proofed |
| 16 | Spring Button, Upper | Carbon St. Rust Proofed |
| 17* | Insert, Spring Button Upper | Stainless Steel |
| 18 | Stem Insert | Stainless Steel |
| 19* | Retaining Ring | Stainless Steel |
| 20* | Back-Up Ring | Teflon |
| 21* | Cylinder Plug | Stainless Steel |
| 22* | O-Ring, Cylinder Plug | Ethylene Propylene |
| 23 | Body Stud | ASTM A193 Gr. B7, Alloy St. |
| 24 | Hex Nut (Body) | ASTM A194 Gr. 2H, Alloy St. |
| 25 | Spring 26( )B12 | Chrome Alloy, Rust Proofed |
| 26* | Roller Thrust Bearing | Hardened Alloy Steel |
| 27 | Cap Gasket | Soft Iron or Steel |
| 28 | Body Gasket | Soft Iron or Steel |
| 29 | Bonnet Gasket | Soft Iron or Steel |
| 30 | Lock Screw Gasket | Soft Iron or Steel |
| 31 | Hex Nut (B.D.R.L.S.) | Stainless Steel |
| 32 | Lock Screw (D.H.) | Stainless Steel |
| 33 | Pipe Plug (Body) | Steel |
| 34 | Bellows | Inconel Composite |
| 35* | Bellows Gasket | Flexible Graphite |
| 36* | Forged Eye Bolt | Steel, Galvanized |

*Not supplied on U & W orifice




| Valve Size Inlet X Outlet | ANSI Flange Class | | Type Number Conv. | Dimensions, in/mm | | | | | Approx. Weight Lbs/Kg |
|---|---|---|---|---|---|---|---|---|---|
| | Inlet RF | Outlet RF | | A (max.) | B | C | E | F | |
| 8 U 10 | 300 | 150 | 26UB12 | 54-1/2<br>*1385* | 11<br>*279* | 10-7/8<br>*276* | 13/16<br>*21* | 2-7/16<br>*62* | 700<br>*317* |
| 12 W 16 | 300 | 150 | 26WB12 | 70-1/2<br>*1791* | 16<br>*406* | 14-1/8<br>*359* | 13/16<br>*21* | 2-13/16<br>*71* | 2850<br>*1293* |
| 16 W2 18 | 300 | 150 | 26W2B12 | 90-3/4<br>*2305* | 20<br>*508* | 16<br>*406* | 1-1/4<br>*32* | 3-1/2<br>*89* | 4250<br>*1927* |
| 16 X 20 | 300 | 150 | 26XB12 | 93-1/2<br>*2375* | 21<br>*533* | 17<br>*432* | 1-1/4<br>*32* | 3-1/2<br>*89* | 5550<br>*2517* |
| 18 Y 24 | 300 | 150 | 26YB12 | 97-1/2<br>*2477* | 25<br>*635* | 20<br>*508* | 1-1/4<br>*32* | 3-5/8<br>*92* | 7050<br>*3197* |
| 20 Z 24 | 300 | 150 | 26ZB12 | 109<br>*2769* | 25<br>*635* | 20<br>*508* | 1-1/4<br>*32* | 3-3/4<br>*95* | 7550<br>*3424* |

Note: The “U” orifice weights and dimensions are identical to the “T” orifice on page 75.

# Air Capacities – 2600 Series Super Capacity: 10% Overpressure, API

| ASME Pressure Vessel Code (UV), Capacities In Standard Cubic Feet Per Minute At 60 °F | | | | | | |
|---|---|---|---|---|---|---|
| Set Pressure (psig) | Orifice Letter Designation & Areas, Sq. Inches | | | | | |
| | U 31.5 | W 63.62 | W2 104.0 | X 113.1 | Y 143.1 | Z 176.7 |
| 20 | 18677 | 37723 | 61666 | 67062 | 84850 | 104773 |
| 30 | 23632 | 47729 | 78023 | 84850 | 107357 | 132564 |
| 40 | 29081 | 58736 | 96016 | 104417 | 132114 | 163135 |
| 50 | 34531 | 69742 | 114009 | 123984 | 156872 | 193705 |
| 60 | 39981 | 80749 | 132001 | 143552 | 181629 | 224276 |
| 70 | 45431 | 91756 | 149994 | 163119 | 206387 | 254846 |
| 80 | 50880 | 102763 | 167987 | 182686 | 231144 | 285417 |
| 90 | 56330 | 113769 | 185980 | 202253 | 255901 | 315987 |
| 100 | 61780 | 124776 | 203973 | 221820 | 280659 | 346558 |
| 125 | 75404 | 152293 | 248955 | 270738 | 342552 | 422984 |
| 150 | 89029 | 179810 | 293937 | 319656 | 404446 | 499410 |
| 175 | 102653 | 207327 | 338919 | 368574 | 466340 | 575837 |
| 200 | 116277 | 234844 | 383901 | 417492 | 528233 | 652263 |
| 250 | 143526 | 289878 | 473865 | 515328 | 652020 | 805116 |
| 300 | 170775 | 344912 | 563829 | 613164 | 775808 | 957968 |

# Steam Capacities – 2600 Series Super Capacity: 10% Overpressure, API

| ASME Pressure Vessel Code (UV), Capacities In Pounds Per Hour At Saturation Temperature | | | | | | |
|---|---|---|---|---|---|---|
| Set Pressure (psig) | Orifice Letter Designation & Areas, Sq. Inches | | | | | |
| | U 31.5 | W 63.62 | W2 104.0 | X 113.1 | Y 143.1 | Z 176.7 |
| 20 | 52474 | 105981 | 173248 | 188407 | 238383 | 294355 |
| 30 | 66393 | 134093 | 219202 | 238383 | 238383 | 372434 |
| 40 | 81703 | 165016 | 269752 | 293356 | 371169 | 458320 |
| 50 | 97014 | 195939 | 320302 | 348329 | 440724 | 544206 |
| 60 | 112325 | 226861 | 370852 | 403302 | 510278 | 630092 |
| 70 | 127636 | 257784 | 421402 | 458275 | 579833 | 715979 |
| 80 | 142947 | 288707 | 471952 | 513248 | 649388 | 801865 |
| 90 | 158257 | 319630 | 522502 | 568221 | 718943 | 887751 |
| 100 | 173568 | 350553 | 573052 | 623194 | 788498 | 973638 |
| 125 | 211845 | 427861 | 699427 | 760627 | 962384 | 1188353 |
| 150 | 250122 | 505168 | 825802 | 898059 | 1136271 | 1403069 |
| 175 | 288399 | 582475 | 952176 | 1035492 | 1310158 | 1617785 |
| 200 | 326676 | 659783 | 1078551 | 1172924 | 1484045 | 1832500 |
| 250 | 403230 | 814397 | 1331301 | 1447790 | 1831819 | 2261932 |
| 300 | 479784 | 969012 | 1584050 | 1722655 | 2179593 | 2691363 |

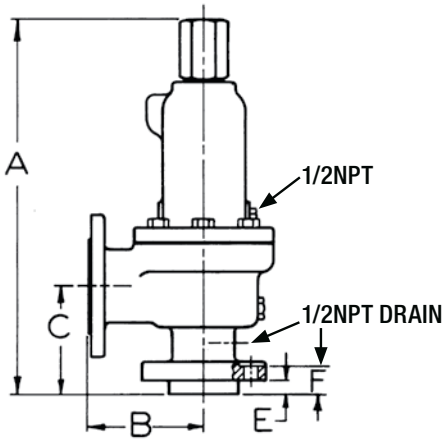
# Water Capacities – 2600 Series Super Capacity: 25% Overpressure, API[4]

| Capacities In Gallons Per Minute At 70 °F, Non Code | | | | | | |
|---|---|---|---|---|---|---|
| Set Pressure (psig) | Orifice Letter Designation & Areas, Sq. Inches | | | | | |
| | U 31.5 | W 63.62 | W2 104.0 | X 113.1 | Y 143.1 | Z 176.7 |
| 20 | 3742 | 6962 | 11381 | 12377 | 15660 | 19337 |
| 30 | 4483 | 8527 | 13939 | 15159 | 19179 | 23683 |
| 40 | 5176 | 9846 | 16095 | 17504 | 22147 | 27347 |
| 50 | 5787 | 11008 | 17995 | 19570 | 24761 | 30575 |
| 60 | 6340 | 12059 | 19713 | 21438 | 27124 | 33493 |
| 70 | 6848 | 13025 | 21292 | 23155 | 29297 | 36177 |
| 80 | 7320 | 13924 | 22762 | 24754 | 31320 | 38674 |
| 90 | 7765 | 14769 | 24143 | 26256 | 33220 | 41020 |
| 100 | 8185 | 15568 | 25449 | 27676 | 35017 | 43239 |
| 125 | 9151 | 17405 | 28453 | 30943 | 39150 | 48343 |
| 150 | 10024 | 19067 | 31169 | 33896 | 42887 | 52957 |
| 175 | 10827 | 20594 | 33666 | 36612 | 46324 | 57200 |
| 200 | 11575 | 22016 | 35991 | 39140 | 49522 | 61150 |
| 250 | 12941 | 24615 | 40239 | 43760 | 55367 | 68368 |
| 300 | 14177 | 26965 | 44080 | 47937 | 60652 | 74893 |



General Notes:
1. Capacities at 30 psig and below are based on 3 PSI overpressure.
2. For sizing purposes using the ASME actual areas, the certified coefficient of discharge K for air, gas, and steam service is 0.858.
3. For sizing purposes using the actual areas, the coefficient of discharge K for water is 0.576.
4. The “U” orifice meets the requirements of ASME Code Section VIII. Capacities listed in the table for the “U” orifice are based on 10% overpressure.

# Dimensions & Weights




| Size | Type | U.S. Standard Dimensions (inches) | | | | | | Approx. Weight Lbs. | Metric Dimensions (millimeters) | | | | | | Approx. Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inlet x Outlet | Conventional | A | | B | C | E | F | | A | | B | C | E | F | |
| | | Vapor | Liquid | | | | | | Vapor | Liquid | | | | | |
| 1 x 2 | 26DA10 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26DA11 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26DA12 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26DA13 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 1/2 x 2 | 26DA14 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 | 26DA15 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 1/2 | 26DA16 | 23 1/2 | 23 1/2 | 6 1/2 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 166 | 140 | 18 | 62 | 37 |
| 1 1/2 x 3 | 26DA16A | 23 1/2 | 23 1/2 | 7 | 5 1/2 | 11/16 | 2 5/8 | 80 | 597 | 597 | 178 | 140 | 18 | 67 | 37 |
| 1 x 2 | 26DA20 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26DA21 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26DA22 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26DA23 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 1/2 x 2 | 26DA24 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 | 26DA25 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 1/2 | 26DA26 | 23 1/2 | 23 1/2 | 6 1/2 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 166 | 140 | 18 | 62 | 37 |
| 1 1/2 x 3 | 26DA26A | 23 1/2 | 23 1/2 | 7 | 5 1/2 | 11/16 | 2 5/8 | 80 | 597 | 597 | 178 | 140 | 18 | 67 | 37 |
| 1 x 2 | 26DA32 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26DA33 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 1/2 x 2 | 26DA34 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 | 26DA35 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 1/2 | 26DA36 | 23 1/2 | 23 1/2 | 6 1/2 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 166 | 140 | 18 | 62 | 37 |
| 1 1/2 x 3 | 26DA36A | 23 1/2 | 23 1/2 | 7 | 5 1/2 | 11/16 | 2 5/8 | 80 | 597 | 597 | 178 | 140 | 18 | 67 | 37 |
| 1 x 2 | 26EA10 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26EA11 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26EA12 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26EA13 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 1/2 x 2 | 26EA14 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 | 26EA15 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 1/2 | 26EA16 | 23 1/2 | 23 1/2 | 6 1/2 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 166 | 140 | 18 | 62 | 37 |
| 1 1/2 x 3 | 26EA16A | 23 1/2 | 23 1/2 | 7 | 5 1/2 | 11/16 | 2 5/8 | 80 | 597 | 597 | 178 | 140 | 18 | 67 | 37 |
| 1 x 2 | 26EA20 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26EA21 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26EA22 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26EA23 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 1/2 x 2 | 26EA24 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 | 26EA25 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 1/2 | 26EA26 | 23 1/2 | 23 1/2 | 6 1/2 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 166 | 140 | 18 | 62 | 37 |
| 1 1/2 x 3 | 26EA26A | 23 1/2 | 23 1/2 | 7 | 5 1/2 | 11/16 | 2 5/8 | 80 | 597 | 597 | 178 | 140 | 18 | 67 | 37 |
| 1 x 2 | 26EA32 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 x 2 | 26EA33 | 19 | 19 | 4 1/2 | 4 1/8 | 1/2 | 1 3/16 | 42 | 483 | 483 | 115 | 105 | 13 | 31 | 20 |
| 1 1/2 x 2 | 26EA34 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 | 26EA35 | 23 1/2 | 23 1/2 | 5 1/2 | 4 1/8 | 11/16 | 1 15/16 | 50 | 597 | 597 | 140 | 105 | 18 | 50 | 23 |
| 1 1/2 x 2 1/2 | 26EA36 | 23 1/2 | 23 1/2 | 6 1/2 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 166 | 140 | 18 | 62 | 37 |
| 1 1/2 x 3 | 26EA36A | 23 1/2 | 23 1/2 | 7 | 5 1/2 | 11/16 | 2 5/8 | 80 | 597 | 597 | 178 | 140 | 18 | 67 | 37 |

# Dimensions & Weights

| Size | Type | U.S. Standard Dimensions (inches) | | | | | | Approx. Weight Lbs. | Metric Dimensions (millimeters) | | | | | | Approx. Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inlet x Outlet | Conventional | A | | B | C | E | F | | A | | B | C | E | F | |
| | | Vapor | Liquid | | | | | | Vapor | Liquid | | | | | |
| 1 1/2 x 2 | 26FA10 | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 1/4 | 44 | 496 | 496 | 121 | 124 | 18 | 32 | 20 |
| 1 1/2 x 2 | 26FA11 | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 9/16 | 44 | 496 | 496 | 121 | 124 | 18 | 40 | 20 |
| 1 1/2 x 2 | 26FA12 | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 | 26FA13 | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26FA14 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 153 | 124 | 18 | 50 | 32 |
| 1 1/2 x 3 | 26FA14A | 23 1/2 | 23 1/2 | 6 1/2 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 166 | 124 | 18 | 50 | 32 |
| 1 1/2 x 2 1/2 | 26FA15 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 153 | 124 | 18 | 50 | 32 |
| 1 1/2 x 3 | 26FA15A | 23 1/2 | 23 1/2 | 6 1/2 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 166 | 124 | 18 | 50 | 32 |
| 1 1/2 x 2 1/2 | 26FA16 | 23 1/2 | 23 1/2 | 6 1/2 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 166 | 140 | 18 | 62 | 37 |
| 1 1/2 x 3 | 26FA16A | 23 1/2 | 23 1/2 | 7 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 178 | 140 | 18 | 62 | 37 |
| 1 1/2 x 2 | 26FA20 | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 1/4 | 44 | 496 | 496 | 121 | 124 | 18 | 32 | 20 |
| 1 1/2 x 2 | 26FA21 | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 9/16 | 44 | 496 | 496 | 121 | 124 | 18 | 40 | 20 |
| 1 1/2 x 2 | 26FA22 | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 | 26FA23 | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26FA24 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 153 | 124 | 18 | 50 | 32 |
| 1 1/2 x 3 | 26FA24A | 23 1/2 | 23 1/2 | 6 1/2 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 166 | 124 | 18 | 50 | 32 |
| 1 1/2 x 2 1/2 | 26FA25 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 153 | 124 | 18 | 50 | 32 |
| 1 1/2 x 3 | 26FA25A | 23 1/2 | 23 1/2 | 6 1/2 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 166 | 124 | 18 | 50 | 32 |
| 1 1/2 x 2 1/2 | 26FA26 | 23 1/2 | 23 1/2 | 6 1/2 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 166 | 140 | 18 | 62 | 37 |
| 1 1/2 x 3 | 26FA26A | 23 1/2 | 23 1/2 | 7 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 178 | 140 | 18 | 62 | 37 |
| 1 1/2 x 2 | 26FA32 | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 | 26FA33 | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26FA34 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 153 | 124 | 18 | 50 | 32 |
| 1 1/2 x 3 | 26FA34A | 23 1/2 | 23 1/2 | 6 1/2 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 166 | 124 | 18 | 50 | 32 |
| 1 1/2 x 2 1/2 | 26FA35 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 153 | 124 | 18 | 50 | 32 |
| 1 1/2 x 3 | 26FA35A | 23 1/2 | 23 1/2 | 6 1/2 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 166 | 124 | 18 | 50 | 32 |
| 1 1/2 x 2 1/2 | 26FA36 | 23 1/2 | 23 1/2 | 6 1/2 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 166 | 140 | 18 | 62 | 37 |
| 1 1/2 x 3 | 26FA36A | 23 1/2 | 23 1/2 | 7 | 5 1/2 | 11/16 | 2 7/16 | 80 | 597 | 597 | 178 | 140 | 18 | 62 | 37 |
| 1 1/2 x 2 1/2 | 26GA10 | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 1/4 | 50 | 496 | 496 | 121 | 124 | 18 | 32 | 23 |
| 1 1/2 x 3 | 26GA10A | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 1/4 | 50 | 496 | 496 | 121 | 124 | 18 | 32 | 23 |
| 1 1/2 x 2 1/2 | 26GA11 | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 9/16 | 50 | 496 | 496 | 121 | 124 | 18 | 40 | 23 |
| 1 1/2 x 3 | 26GA11A | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 9/16 | 50 | 496 | 496 | 121 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26GA12 | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 3 | 26GA12A | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26GA13 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 597 | 597 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 3 | 26GA13A | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 597 | 597 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26GA14 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 153 | 124 | 18 | 50 | 32 |
| 1 1/2 x 3 | 26GA14A | 23 1/2 | 23 1/2 | 6 1/2 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 166 | 124 | 18 | 50 | 32 |
| 2 x 3 | 26GA15 | 24 | 24 | 6 3/4 | 6 1/8 | 11/16 | 2 3/16 | 85 | 610 | 610 | 172 | 156 | 18 | 56 | 39 |
| 2 x 3 | 26GA16 | 24 | 24 | 6 3/4 | 6 1/8 | 11/16 | 2 11/16 | 95 | 610 | 610 | 172 | 156 | 18 | 69 | 44 |
| 1 1/2 x 2 1/2 | 26GA20 | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 1/4 | 50 | 496 | 496 | 121 | 124 | 18 | 32 | 23 |
| 1 1/2 x 3 | 26GA20A | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 1/4 | 50 | 496 | 496 | 121 | 124 | 18 | 32 | 23 |
| 1 1/2 x 2 1/2 | 26GA21 | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 9/16 | 50 | 496 | 496 | 121 | 124 | 18 | 40 | 23 |
| 1 1/2 x 3 | 26GA21A | 19 1/2 | 19 1/2 | 4 3/4 | 4 7/8 | 11/16 | 1 9/16 | 50 | 496 | 496 | 121 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26GA22 | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 3 | 26GA22A | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26GA23 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 597 | 597 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 3 | 26GA23A | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 597 | 597 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26GA24 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 153 | 124 | 18 | 50 | 32 |
| 1 1/2 x 3 | 26GA24A | 23 1/2 | 23 1/2 | 6 1/2 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 166 | 124 | 18 | 50 | 32 |
| 2 x 3 | 26GA25 | 24 | 24 | 6 3/4 | 6 1/8 | 11/16 | 2 3/16 | 85 | 610 | 610 | 172 | 156 | 18 | 56 | 39 |
| 2 x 3 | 26GA26 | 24 | 24 | 6 3/4 | 6 1/8 | 11/16 | 2 11/16 | 95 | 610 | 610 | 172 | 156 | 18 | 69 | 44 |
| 1 1/2 x 2 1/2 | 26GA32 | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 3 | 26GA32A | 23 | 23 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 585 | 585 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26GA33 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 597 | 597 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 3 | 26GA33A | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 9/16 | 50 | 597 | 597 | 153 | 124 | 18 | 40 | 23 |
| 1 1/2 x 2 1/2 | 26GA34 | 23 1/2 | 23 1/2 | 6 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 153 | 124 | 18 | 50 | 32 |
| 1 1/2 x 3 | 26GA34A | 23 1/2 | 23 1/2 | 6 1/2 | 4 7/8 | 11/16 | 1 15/16 | 70 | 597 | 597 | 166 | 124 | 18 | 50 | 32 |
| 2 x 3 | 26GA35 | 24 | 24 | 6 3/4 | 6 1/8 | 11/16 | 2 3/16 | 85 | 610 | 610 | 172 | 156 | 18 | 56 | 39 |
| 2 x 3 | 26GA36 | 24 | 24 | 6 3/4 | 6 1/8 | 11/16 | 2 11/16 | 95 | 610 | 610 | 172 | 156 | 18 | 69 | 44 |
| 1 1/2 x 3 | 26HA10 | 20 | 20 | 4 7/8 | 5 1/8 | 11/16 | 1 1/4 | 54 | 508 | 508 | 124 | 131 | 18 | 32 | 25 |
| 1 1/2 x 3 | 26HA11 | 20 | 20 | 4 7/8 | 5 1/8 | 11/16 | 1 1/2 | 54 | 508 | 508 | 124 | 131 | 18 | 39 | 25 |
| 2 x 3 | 26HA12 | 23 | 23 | 4 7/8 | 5 1/8 | 11/16 | 1 11/16 | 70 | 585 | 585 | 124 | 131 | 18 | 43 | 32 |
| 2 x 3 | 26HA13 | 24 | 24 | 6 3/8 | 6 1/16 | 11/16 | 1 11/16 | 70 | 610 | 610 | 162 | 154 | 18 | 43 | 32 |
| 2 x 3 | 26HA14 | 24 | 24 | 6 3/8 | 6 1/16 | 11/16 | 2 3/16 | 85 | 610 | 610 | 162 | 154 | 18 | 56 | 39 |
| 2 x 3 | 26HA15 | 24 | 24 | 6 3/8 | 6 1/16 | 11/16 | 2 3/16 | 85 | 610 | 610 | 162 | 154 | 18 | 56 | 39 |

# Dimensions & Weights

| Size | Type | U.S. Standard Dimensions (inches) | | | | | | Approx. Weight Lbs. | Metric Dimensions (millimeters) | | | | | | Approx. Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inlet x Outlet | Conventional | A | | B | C | E | F | | A | | B | C | E | F | |
| | | Vapor | Liquid | | | | | | Vapor | Liquid | | | | | |
| 1 1/2 x 3 | 26HA20 | 20 | 20 | 4 7/8 | 5 1/8 | 11/16 | 1 1/4 | 54 | 508 | 508 | 124 | 131 | 18 | 32 | 25 |
| 1 1/2 x 3 | 26HA21 | 20 | 20 | 4 7/8 | 5 1/8 | 11/16 | 1 1/2 | 54 | 508 | 508 | 124 | 131 | 18 | 39 | 25 |
| 2 x 3 | 26HA22 | 23 | 23 | 4 7/8 | 5 1/8 | 11/16 | 1 11/16 | 70 | 585 | 585 | 124 | 131 | 18 | 43 | 32 |
| 2 x 3 | 26HA23 | 24 | 24 | 6 3/8 | 6 1/16 | 11/16 | 1 11/16 | 70 | 610 | 610 | 162 | 154 | 18 | 43 | 32 |
| 2 x 3 | 26HA24 | 24 | 24 | 6 3/8 | 6 1/16 | 11/16 | 2 3/16 | 85 | 610 | 610 | 162 | 154 | 18 | 56 | 39 |
| 2 x 3 | 26HA25 | 24 | 24 | 6 3/8 | 6 1/16 | 11/16 | 2 3/16 | 85 | 610 | 610 | 162 | 154 | 18 | 56 | 39 |
| 2 x 3 | 26HA32 | 23 | 23 | 4 7/8 | 5 1/8 | 11/16 | 1 11/16 | 70 | 585 | 585 | 124 | 131 | 18 | 43 | 32 |
| 2 x 3 | 26HA33 | 23 | 23 | 6 3/8 | 6 1/16 | 11/16 | 1 11/16 | 70 | 585 | 585 | 162 | 154 | 18 | 43 | 32 |
| 2 x 3 | 26HA34 | 24 | 24 | 6 3/8 | 6 1/16 | 11/16 | 2 3/16 | 85 | 610 | 610 | 162 | 154 | 18 | 56 | 39 |
| 2 x 3 | 26HA35 | 24 | 24 | 6 3/8 | 6 1/16 | 11/16 | 2 3/16 | 85 | 610 | 610 | 162 | 154 | 18 | 56 | 39 |
| 2 x 3 | 26JA10 | 23 | 23 | 4 7/8 | 5 3/8 | 11/16 | 1 5/16 | 58 | 585 | 585 | 124 | 137 | 18 | 34 | 27 |
| 2 x 3 | 26JA11 | 23 | 23 | 4 7/8 | 5 3/8 | 11/16 | 1 11/16 | 58 | 585 | 585 | 124 | 137 | 18 | 43 | 27 |
| 2 1/2 x 4 | 26JA12 | 25 | 27 | 5 5/8 | 5 3/8 | 11/16 | 1 13/16 | 150 | 635 | 686 | 143 | 137 | 18 | 47 | 69 |
| 3 x 4 | 26JA12A | 26 | 28 1/2 | 7 1/8 | 7 1/4 | 11/16 | 2 1/8 | 150 | 661 | 724 | 181 | 185 | 18 | 54 | 69 |
| 2 1/2 x 4 | 26JA13 | 27 1/2 | 34 1/2 | 6 3/4 | 6 1/8 | 11/16 | 1 13/16 | 150 | 699 | 877 | 172 | 156 | 18 | 47 | 69 |
| 3 x 4 | 26JA13A | 28 1/2 | 35 1/2 | 7 1/8 | 7 1/4 | 11/16 | 2 1/8 | 150 | 724 | 902 | 181 | 185 | 18 | 54 | 69 |
| 3 x 4 | 26JA14 | 36 | 36 | 7 1/8 | 7 1/4 | 11/16 | 2 3/16 | 175 | 915 | 915 | 181 | 185 | 18 | 56 | 80 |
| 3 x 4 | 26JA15 | 36 | 36 | 7 1/8 | 7 1/4 | 11/16 | 2 9/16 | 175 | 915 | 915 | 181 | 185 | 18 | 66 | 80 |
| 2 x 3 | 26JA20 | 23 | 23 | 4 7/8 | 5 3/8 | 11/16 | 1 5/16 | 58 | 585 | 585 | 124 | 137 | 18 | 34 | 27 |
| 2 x 3 | 26JA21 | 23 | 23 | 4 7/8 | 5 3/8 | 11/16 | 1 11/16 | 58 | 585 | 585 | 124 | 137 | 18 | 43 | 27 |
| 2 1/2 x 4 | 26JA22 | 25 | 27 | 5 5/8 | 5 3/8 | 11/16 | 1 13/16 | 150 | 635 | 686 | 143 | 137 | 18 | 47 | 69 |
| 3 x 4 | 26JA22A | 26 | 28 1/2 | 7 1/8 | 7 1/4 | 11/16 | 2 1/8 | 150 | 661 | 724 | 181 | 185 | 18 | 54 | 69 |
| 2 1/2 x 4 | 26JA23 | 27 1/2 | 34 1/2 | 6 3/4 | 6 1/8 | 11/16 | 1 13/16 | 150 | 699 | 877 | 172 | 156 | 18 | 47 | 69 |
| 3 x 4 | 26JA23A | 28 1/2 | 35 1/2 | 7 1/8 | 7 1/4 | 11/16 | 2 1/8 | 150 | 724 | 902 | 181 | 185 | 18 | 54 | 69 |
| 3 x 4 | 26JA24 | 36 | 36 | 7 1/8 | 7 1/4 | 11/16 | 2 3/16 | 175 | 915 | 915 | 181 | 185 | 18 | 56 | 80 |
| 3 x 4 | 26JA25 | 36 | 36 | 7 1/8 | 7 1/4 | 11/16 | 2 3/16 | 175 | 915 | 915 | 181 | 185 | 18 | 56 | 80 |
| 2 1/2 x 4 | 26JA32 | 25 | 27 | 5 5/8 | 5 3/8 | 11/16 | 1 13/16 | 150 | 635 | 686 | 143 | 137 | 18 | 47 | 69 |
| 3 x 4 | 26JA32A | 26 | 28 1/2 | 7 1/8 | 7 1/4 | 11/16 | 2 1/8 | 150 | 661 | 724 | 181 | 185 | 18 | 54 | 69 |
| 2 1/2 x 4 | 26JA33 | 27 1/2 | 34 1/2 | 5 5/8 | 5 3/8 | 11/16 | 1 13/16 | 150 | 699 | 877 | 143 | 137 | 18 | 47 | 69 |
| 3 x 4 | 26JA33A | 28 1/2 | 35 1/2 | 7 1/8 | 7 1/4 | 11/16 | 2 1/8 | 150 | 724 | 902 | 181 | 185 | 18 | 54 | 69 |
| 2 1/2 x 4 | 26JA34 | 25 | 25 | 6 3/4 | 6 1/8 | 11/16 | 2 5/16 | 175 | 635 | 635 | 172 | 156 | 18 | 59 | 80 |
| 3 x 4 | 26JA34A | 26 | 26 | 7 1/8 | 7 1/4 | 11/16 | 2 3/8 | 175 | 661 | 661 | 181 | 185 | 18 | 61 | 80 |
| 3 x 4 | 26JA35 | 36 | 36 | 7 1/4 | 7 1/8 | 11/16 | 2 9/16 | 175 | 915 | 915 | 185 | 181 | 18 | 66 | 80 |
| 3 x 4 | 26KA10 | 26 1/2 | 28 1/2 | 6 3/8 | 6 1/8 | 11/16 | 1 1/2 | 145 | 674 | 724 | 162 | 156 | 18 | 39 | 66 |
| 3 x 4 | 26KA11 | 26 1/2 | 28 1/2 | 6 3/8 | 6 1/8 | 11/16 | 1 15/16 | 145 | 674 | 724 | 162 | 156 | 18 | 50 | 66 |
| 3 x 4 | 26KA12 | 28 1/2 | 32 | 6 3/8 | 6 1/8 | 11/16 | 1 15/16 | 160 | 724 | 813 | 162 | 156 | 18 | 50 | 73 |
| 3 x 4 | 26KA13 | 35 1/2 | 35 1/2 | 7 1/8 | 7 1/4 | 11/16 | 1 15/16 | 160 | 902 | 902 | 181 | 185 | 18 | 50 | 73 |
| 3 x 6 | 26KA14 | 37 1/2 | 37 1/2 | 8 1/2 | 7 13/16 | 11/16 | 2 3/16 | 230 | 953 | 953 | 216 | 199 | 18 | 56 | 105 |
| 3 x 6 | 26KA15 | 37 1/2 | 37 1/2 | 8 1/2 | 7 3/4 | 11/16 | 2 9/16 | 230 | 953 | 953 | 216 | 197 | 18 | 66 | 105 |
| 3 x 4 | 26KA20 | 26 1/2 | 28 1/2 | 6 3/8 | 6 1/8 | 11/16 | 1 1/2 | 145 | 674 | 724 | 162 | 156 | 18 | 39 | 66 |
| 3 x 4 | 26KA21 | 26 1/2 | 28 1/2 | 6 3/8 | 6 1/8 | 11/16 | 1 15/16 | 145 | 674 | 724 | 162 | 156 | 18 | 50 | 66 |
| 3 x 4 | 26KA22 | 28 1/2 | 32 | 6 3/8 | 6 1/8 | 11/16 | 1 15/16 | 160 | 724 | 813 | 162 | 156 | 18 | 50 | 73 |
| 3 x 4 | 26KA23 | 35 1/2 | 35 1/2 | 7 1/8 | 7 1/4 | 11/16 | 1 15/16 | 160 | 902 | 902 | 181 | 185 | 18 | 50 | 73 |
| 3 x 6 | 26KA24 | 37 1/2 | 37 1/2 | 8 1/2 | 7 13/16 | 11/16 | 2 3/16 | 230 | 953 | 953 | 216 | 199 | 18 | 56 | 105 |
| 3 x 6 | 26KA25 | 37 1/2 | 37 1/2 | 8 1/2 | 7 3/4 | 11/16 | 2 9/16 | 230 | 953 | 953 | 216 | 197 | 18 | 66 | 105 |
| 3 x 4 | 26KA32 | 28 1/2 | 32 | 6 3/8 | 6 1/8 | 11/16 | 1 15/16 | 160 | 724 | 813 | 162 | 156 | 18 | 50 | 73 |
| 3 x 4 | 26KA33 | 28 1/2 | 28 1/2 | 6 3/8 | 6 1/8 | 11/16 | 1 15/16 | 160 | 724 | 724 | 162 | 156 | 18 | 50 | 73 |
| 3 x 4 | 26KA34 | 34 | 34 | 7 1/8 | 7 1/4 | 11/16 | 2 3/16 | 230 | 864 | 864 | 181 | 185 | 18 | 56 | 105 |
| 3 x 6 | 26KA34A | 35 1/2 | 35 1/2 | 8 1/2 | 7 13/16 | 11/16 | 2 3/8 | 175 | 902 | 902 | 216 | 199 | 18 | 61 | 80 |
| 3 x 6 | 26KA35 | 37 1/2 | 37 1/2 | 8 1/2 | 7 3/4 | 11/16 | 2 9/16 | 230 | 953 | 953 | 216 | 197 | 18 | 66 | 105 |
| 3 x 4 | 26LA10 | 26 1/2 | 28 1/2 | 6 1/2 | 6 1/8 | 11/16 | 1 1/2 | 145 | 674 | 724 | 166 | 156 | 18 | 39 | 66 |
| 3 x 4 | 26LA11 | 26 1/2 | 28 1/2 | 6 1/2 | 6 1/8 | 11/16 | 1 15/16 | 145 | 674 | 724 | 166 | 156 | 18 | 50 | 66 |
| 4 x 6 | 26LA12 | 38 1/2 | 38 1/2 | 7 1/8 | 7 1/16 | 11/16 | 1 15/16 | 230 | 978 | 978 | 181 | 180 | 18 | 50 | 105 |
| 4 x 6 | 26LA13 | 38 1/2 | 38 1/2 | 8 | 7 1/16 | 11/16 | 2 3/16 | 230 | 978 | 978 | 204 | 180 | 18 | 56 | 105 |
| 4 x 6 | 26LA14 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 62 | 114 |
| 3 x 4 | 26LA20 | 26 1/2 | 28 1/2 | 6 1/2 | 6 1/8 | 11/16 | 1 1/2 | 145 | 674 | 724 | 166 | 156 | 18 | 39 | 66 |
| 3 x 4 | 26LA21 | 26 1/2 | 28 1/2 | 6 1/2 | 6 1/8 | 11/16 | 1 15/16 | 145 | 674 | 724 | 166 | 156 | 18 | 50 | 66 |
| 4 x 6 | 26LA22 | 38 1/2 | 38 1/2 | 7 1/8 | 7 1/16 | 11/16 | 1 15/16 | 230 | 978 | 978 | 181 | 180 | 18 | 50 | 105 |
| 4 x 6 | 26LA23 | 38 1/2 | 38 1/2 | 8 | 7 1/16 | 11/16 | 2 3/16 | 230 | 978 | 978 | 204 | 180 | 18 | 56 | 105 |
| 4 x 6 | 26LA24 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 62 | 114 |
| 4 x 6 | 26LA25 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 13/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 72 | 114 |
| 4 x 6 | 26LA32 | 38 1/2 | 38 1/2 | 7 1/8 | 7 1/16 | 11/16 | 1 15/16 | 230 | 978 | 978 | 181 | 180 | 18 | 50 | 105 |
| 4 x 6 | 26LA33 | 38 1/2 | 38 1/2 | 8 | 7 1/16 | 11/16 | 2 3/16 | 230 | 978 | 978 | 204 | 180 | 18 | 56 | 105 |
| 4 x 6 | 26LA34 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 62 | 114 |
| 4 x 6 | 26LA35 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 13/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 72 | 114 |

# Dimensions & Weights

| Size | Type | U.S. Standard Dimensions (inches) | | | | | | Approx. Weight Lbs. | Metric Dimensions (millimeters) | | | | | | Approx. Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inlet x Outlet | Conventional | A | | B | C | E | F | | A | | B | C | E | F | |
| | | Vapor | Liquid | | | | | | Vapor | Liquid | | | | | |
| 4 x 6 | 26MA10 | 31 1/2 | 38 1/2 | 7 1/4 | 7 | 11/16 | 1 15/16 | 190 | 801 | 978 | 185 | 178 | 18 | 50 | 87 |
| 4 x 6 | 26MA11 | 31 1/2 | 38 1/2 | 7 1/4 | 7 | 11/16 | 1 15/16 | 190 | 801 | 978 | 185 | 178 | 18 | 50 | 87 |
| 4 x 6 | 26MA12 | 38 1/2 | 38 1/2 | 7 1/4 | 7 | 11/16 | 1 15/16 | 230 | 978 | 978 | 185 | 178 | 18 | 50 | 105 |
| 4 x 6 | 26MA13 | 43 | 43 | 8 | 7 | 11/16 | 2 3/16 | 250 | 1093 | 1093 | 204 | 178 | 18 | 56 | 114 |
| 4 x 6 | 26MA20 | 31 1/2 | 38 1/2 | 7 1/4 | 7 | 11/16 | 1 15/16 | 190 | 801 | 978 | 185 | 178 | 18 | 50 | 87 |
| 4 x 6 | 26MA21 | 31 1/2 | 38 1/2 | 7 1/4 | 7 | 11/16 | 1 15/16 | 190 | 801 | 978 | 185 | 178 | 18 | 50 | 87 |
| 4 x 6 | 26MA22 | 38 1/2 | 38 1/2 | 7 1/4 | 7 | 11/16 | 1 15/16 | 230 | 978 | 978 | 185 | 178 | 18 | 50 | 105 |
| 4 x 6 | 26MA23 | 43 | 43 | 8 | 7 | 11/16 | 2 3/16 | 250 | 1093 | 1093 | 204 | 178 | 18 | 56 | 114 |
| 4 x 6 | 26MA24 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 62 | 114 |
| 4 x 6 | 26MA32 | 37 1/2 | 37 1/2 | 7 1/4 | 7 | 11/16 | 1 15/16 | 230 | 953 | 953 | 185 | 178 | 18 | 50 | 105 |
| 4 x 6 | 26MA33 | 37 1/2 | 37 1/2 | 8 | 7 | 11/16 | 2 3/16 | 250 | 953 | 953 | 204 | 178 | 18 | 56 | 114 |
| 4 x 6 | 26MA34 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 62 | 114 |
| 4 x 6 | 26NA10 | 31 1/2 | 38 1/2 | 8 1/4 | 7 3/4 | 11/16 | 1 15/16 | 190 | 801 | 978 | 210 | 197 | 18 | 50 | 87 |
| 4 x 6 | 26NA11 | 31 1/2 | 38 1/2 | 8 1/4 | 7 3/4 | 11/16 | 1 15/16 | 190 | 801 | 978 | 210 | 197 | 18 | 50 | 87 |
| 4 x 6 | 26NA12 | 38 1/2 | 38 1/2 | 8 1/4 | 7 3/4 | 11/16 | 1 15/16 | 230 | 978 | 978 | 210 | 197 | 18 | 50 | 105 |
| 4 x 6 | 26NA13 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 3/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 56 | 114 |
| 4 x 6 | 26NA14 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 62 | 114 |
| 4 x 6 | 26NA20 | 31 1/2 | 38 1/2 | 8 1/4 | 7 3/4 | 11/16 | 1 15/16 | 190 | 801 | 978 | 210 | 197 | 18 | 50 | 87 |
| 4 x 6 | 26NA21 | 31 1/2 | 38 1/2 | 8 1/4 | 7 3/4 | 11/16 | 1 15/16 | 190 | 801 | 978 | 210 | 197 | 18 | 50 | 87 |
| 4 x 6 | 26NA22 | 38 1/2 | 38 1/2 | 8 1/4 | 7 3/4 | 11/16 | 1 15/16 | 230 | 978 | 978 | 210 | 197 | 18 | 50 | 105 |
| 4 x 6 | 26NA23 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 15/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 75 | 114 |
| 4 x 6 | 26NA24 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 62 | 114 |
| 4 x 6 | 26NA32 | 38 1/2 | 38 1/2 | 8 1/4 | 7 3/4 | 11/16 | 1 15/16 | 230 | 978 | 978 | 210 | 197 | 18 | 50 | 105 |
| 4 x 6 | 26NA33 | 38 1/2 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 3/16 | 250 | 978 | 1093 | 223 | 197 | 18 | 56 | 114 |
| 4 x 6 | 26NA34 | 43 | 43 | 8 3/4 | 7 3/4 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 223 | 197 | 18 | 62 | 114 |
| 4 x 6 | 26PA10 | 31 1/2 | 38 1/2 | 9 | 7 1/8 | 11/16 | 1 5/8 | 190 | 801 | 978 | 229 | 181 | 18 | 42 | 87 |
| 4 x 6 | 26PA11 | 31 1/2 | 38 1/2 | 9 | 7 1/8 | 11/16 | 1 15/16 | 190 | 801 | 978 | 229 | 181 | 18 | 50 | 87 |
| 4 x 6 | 26PA12 | 38 1/2 | 38 1/2 | 10 | 8 7/8 | 11/16 | 2 3/16 | 230 | 978 | 978 | 254 | 226 | 18 | 56 | 105 |
| 4 x 6 | 26PA13 | 43 | 43 | 10 | 8 7/8 | 11/16 | 2 3/16 | 250 | 1093 | 1093 | 254 | 226 | 18 | 56 | 114 |
| 4 x 6 | 26PA14 | 43 | 43 | 10 | 8 7/8 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 254 | 226 | 18 | 62 | 114 |
| 4 x 6 | 26PA20 | 31 1/2 | 38 1/2 | 9 | 7 1/8 | 11/16 | 1 5/8 | 190 | 801 | 978 | 229 | 181 | 18 | 42 | 87 |
| 4 x 6 | 26PA21 | 31 1/2 | 38 1/2 | 9 | 7 1/8 | 11/16 | 1 15/16 | 190 | 801 | 978 | 229 | 181 | 18 | 50 | 87 |
| 4 x 6 | 26PA22 | 38 1/2 | 38 1/2 | 10 | 8 7/8 | 11/16 | 2 3/16 | 230 | 978 | 978 | 254 | 226 | 18 | 56 | 105 |
| 4 x 6 | 26PA23 | 43 | 43 | 10 | 8 7/8 | 11/16 | 2 3/16 | 250 | 1093 | 1093 | 254 | 226 | 18 | 56 | 114 |
| 4 x 6 | 26PA24 | 43 | 43 | 10 | 8 7/8 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 254 | 226 | 18 | 62 | 114 |
| 4 x 6 | 26PA32 | 38 1/2 | 38 1/2 | 10 | 8 7/8 | 11/16 | 2 3/16 | 230 | 978 | 978 | 254 | 226 | 18 | 56 | 105 |
| 4 x 6 | 26PA33 | 43 | 43 | 10 | 8 7/8 | 11/16 | 2 3/16 | 250 | 1093 | 1093 | 254 | 226 | 18 | 56 | 114 |
| 4 x 6 | 26PA34 | 43 | 43 | 10 | 8 7/8 | 11/16 | 2 7/16 | 250 | 1093 | 1093 | 254 | 226 | 18 | 62 | 114 |
| 6 x 8 | 26QA10 | 40 1/2 | 51 | 9 1/2 | 9 7/16 | 13/16 | 1 7/8 | 345 | 1029 | 1296 | 242 | 240 | 21 | 48 | 157 |
| 6 x 8 | 26QA11 | 40 1/2 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 1/4 | 345 | 1029 | 1296 | 242 | 240 | 21 | 58 | 157 |
| 6 x 8 | 26QA12 | 45 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 1/4 | 430 | 1143 | 1296 | 242 | 240 | 21 | 58 | 196 |
| 6 x 8 | 26QA13 | 51 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 11/16 | 430 | 1296 | 1296 | 242 | 240 | 21 | 69 | 196 |
| 6 x 8 | 26QA20 | 40 1/2 | 51 | 9 1/2 | 9 7/16 | 13/16 | 1 7/8 | 345 | 1029 | 1296 | 242 | 240 | 21 | 48 | 157 |
| 6 x 8 | 26QA21 | 40 1/2 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 1/4 | 345 | 1029 | 1296 | 242 | 240 | 21 | 58 | 157 |
| 6 x 8 | 26QA22 | 45 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 1/4 | 430 | 1143 | 1296 | 242 | 240 | 21 | 58 | 196 |
| 6 x 8 | 26QA23 | 51 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 11/16 | 430 | 1296 | 1296 | 242 | 240 | 21 | 69 | 196 |
| 6 x 8 | 26QA32 | 45 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 1/4 | 430 | 1143 | 1296 | 242 | 240 | 21 | 58 | 196 |
| 6 x 8 | 26QA33 | 51 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 11/16 | 430 | 1296 | 1296 | 242 | 240 | 21 | 69 | 196 |
| 6 x 8 | H26QA13, 23, 33 | 51 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 11/16 | 530 | 1296 | 1296 | 242 | 240 | 21 | 69 | 241 |
| 6 x 8 | 26RA10 | 40 1/2 | 51 | 9 1/2 | 9 7/16 | 13/16 | 1 7/8 | 345 | 1029 | 1296 | 242 | 240 | 21 | 48 | 157 |
| 6 x 8 | 26RA11 | 40 1/2 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 1/4 | 345 | 1029 | 1296 | 242 | 240 | 21 | 58 | 157 |
| 6 x 10 | 26RA12 | 45 | 51 | 10 1/2 | 9 7/16 | 13/16 | 2 1/4 | 500 | 1143 | 1296 | 267 | 240 | 21 | 58 | 227 |
| 6 x 10 | 26RA13 | 51 | 51 | 10 1/2 | 9 7/16 | 13/16 | 2 11/16 | 500 | 1296 | 1296 | 267 | 240 | 21 | 69 | 227 |
| 6 x 8 | 26RA20 | 40 1/2 | 51 | 9 1/2 | 9 7/16 | 13/16 | 1 7/8 | 345 | 1029 | 1296 | 242 | 240 | 21 | 48 | 157 |
| 6 x 8 | 26RA21 | 40 1/2 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 1/4 | 345 | 1029 | 1296 | 242 | 240 | 21 | 58 | 157 |
| 6 x 10 | 26RA22 | 45 | 51 | 10 1/2 | 9 7/16 | 13/16 | 2 1/4 | 500 | 1143 | 1296 | 267 | 240 | 21 | 58 | 227 |
| 6 x 10 | 26RA23 | 51 | 51 | 10 1/2 | 9 7/16 | 13/16 | 2 11/16 | 500 | 1296 | 1296 | 267 | 240 | 21 | 69 | 227 |
| 6 x 8 | 26RA32 | 45 | 51 | 9 1/2 | 9 7/16 | 13/16 | 2 1/4 | 430 | 1143 | 1296 | 242 | 240 | 21 | 58 | 196 |
| 6 x 10 | 26RA33 | 51 | 51 | 10 1/2 | 9 7/16 | 13/16 | 2 11/16 | 500 | 1296 | 1296 | 267 | 240 | 21 | 69 | 227 |
| 6 x 10 | H26RA13, 23, 33 | 51 | 51 | 10 1/2 | 9 7/16 | 13/16 | 2 11/16 | 600 | 1296 | 1296 | 267 | 240 | 21 | 69 | 273 |
| 8 x 10 | 26TA10 | 49 | 54 1/2 | 11 | 10 7/8 | 13/16 | 2 7/16 | 600 | 1245 | 1385 | 280 | 277 | 21 | 62 | 273 |
| 8 x 10 | 26TA11 | 49 | 54 1/2 | 11 | 10 7/8 | 13/16 | 2 7/16 | 650 | 1245 | 1385 | 280 | 277 | 21 | 62 | 295 |
| 8 x 10 | 26TA12 | 49 | 54 1/2 | 11 | 10 7/8 | 13/16 | 2 7/16 | 650 | 1245 | 1385 | 280 | 277 | 21 | 62 | 295 |
| 8 x 10 | 26TA20 | 49 | 54 1/2 | 11 | 10 7/8 | 13/16 | 2 7/16 | 600 | 1245 | 1385 | 280 | 277 | 21 | 62 | 273 |
| 8 x 10 | 26TA21 | 49 | 54 1/2 | 11 | 10 7/8 | 13/16 | 2 7/16 | 650 | 1245 | 1385 | 280 | 277 | 21 | 62 | 295 |
| 8 x 10 | 26TA22 | 49 | 54 1/2 | 11 | 10 7/8 | 13/16 | 2 7/16 | 650 | 1245 | 1385 | 280 | 277 | 21 | 62 | 295 |
| 8 x 10 | 26TA32 | 49 | 54 1/2 | 11 | 10 7/8 | 13/16 | 2 7/16 | 650 | 1245 | 1385 | 280 | 277 | 21 | 62 | 295 |
| 8 x 10 | H26TA12, 22, 32 | 54 1/2 | 54 1/2 | 11 | 10 7/8 | 13/16 | 2 7/16 | 750 | 1385 | 1385 | 280 | 277 | 21 | 62 | 341 |

# Valve Pressure Limits

## Austenitic Stainless Steel: ASME SA-351 Grade CF8M[1]–316 St. St

| Orifice Letter | Valve Size | ANSI Flange Class | | Maximum Pressure (psig) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Temperature Range | | | | | Back Pressure Limit[6] | |
| | Inlet by Orifice by Outlet | Inlet | Outlet | -450°F to -76°F | -75°F to 100°F | 450°F | 800°F | 1000°F | Conventional Type | BalanSeal Type |
| D | 1D2 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 230 |
| | 1D2[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 230 |
| | 1D2 | 300 | 150 | 720 | 720 | 495 | 420 | 350 | 275 | 230 |
| | 1D2 | 600 | 150 | 1440 | 1440 | 990 | 845 | 700 | 275 | 230 |
| | 1-1/2 D2 | 900 | 300 | 2160 | 2160 | 1485 | 1265 | 1050 | 600 | 500 |
| | 1-1/2 D2 | 1500 | 300 | 3600 | 3600 | 2480 | 2110 | 1750 | 600 | 500 |
| | 1-1/2 D3 | 2500 | 300 | 4000 | 6000 | 4130 | 3520 | 2915 | 720 | 500 |
| E | 1E2 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 230 |
| | 1E2[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 230 |
| | 1E2 | 300 | 150 | 720 | 720 | 495 | 420 | 350 | 275 | 230 |
| | 1E2 | 600 | 150 | 1440 | 1440 | 975 | 845 | 700 | 275 | 230 |
| | 1-1/2 E2 | 900 | 300 | 2160 | 2160 | 1485 | 1265 | 1050 | 600 | 500 |
| | 1-1/2 E2 | 1500 | 300 | 3600 | 3600 | 2480 | 2110 | 1750 | 600 | 500 |
| | 1-1/2 E3 | 2500 | 300 | 4000 | 6000 | 4130 | 3520 | 2915 | 720 | 500 |
| F | 1-1/2 F2 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 230 |
| | 1-1/2 F2[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 230 |
| | 1-1/2 F2 | 300 | 150 | 720 | 720 | 495 | 420 | 350 | 275 | 230 |
| | 1-1/2 F2 | 600 | 150 | 1440 | 1440 | 975 | 845 | 700 | 275 | 230 |
| | 1-1/2 F3 | 900 | 300 | 2160 | 2160 | 1485 | 1265 | 1050 | 600 | 500 |
| | 1-1/2 F3 | 1500 | 300 | 2200 | 3600 | 2480 | 2110 | 1750 | 600 | 500 |
| | 1-1/2 F3 | 2500 | 300 | 3400 | 5000 | 4130 | 3520 | 2915 | 720 | 500 |
| G | 1-1/2 G3 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 230 |
| | 1-1/2 G3[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 230 |
| | 1-1/2 G3 | 300 | 150 | 720 | 720 | 495 | 420 | 350 | 275 | 230 |
| | 1-1/2 G3 | 600 | 150 | 1440 | 1440 | 975 | 845 | 700 | 275 | 230 |
| | 1-1/2 G3 | 900 | 300 | 2160 | 2160 | 1485 | 1265 | 1050 | 600 | 470 |
| | 2G3 | 1500 | 300 | 2450 | 3600 | 2480 | 2110 | 1750 | 600 | 470 |
| | 2G3 | 2500 | 300 | 2600 | 3600 | 3600 | 3520 | 2915 | 720 | 470 |
| H | 1-1/2 H3 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 230 |
| | 1-1/2 H3[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 230 |
| | 2H3 | 300 | 150 | 720 | 720 | 495 | 420 | 350 | 275 | 230 |
| | 2H3 | 600 | 150 | 1440 | 1440 | 975 | 845 | 700 | 275 | 230 |
| | 2H3 | 900 | 150 | 1485 | 2160 | 1485 | 1265 | 1050 | 275 | 230 |
| | 2H3 | 1500 | 300 | 1600 | 2750 | 2480 | 2110 | 1750 | 600 | 415 |
| J | 2J3 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 230 |
| | 2J3[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 230 |
| | 3J4 | 300 | 150 | 500 | 720 | 495 | 420 | 350 | 275 | 230 |
| | 3J4 | 600 | 150 | 625 | 1440 | 975 | 845 | 700 | 275 | 230 |
| | 3J4 | 900 | 150 | 800 | 2160 | 1485 | 1265 | 1050 | 275 | 230 |
| | 3J4 | 1500 | 300 | 800 | 2700 | 2480 | 2110 | 1750 | 600 | 230 |

General Notes:
1. Material limited to 1500°F.
2. Pressure less than rating for 300# class flange to designate maximum pressure limit when used on Farris 300# lightweight design valves.
3. High pressure version
4. Material commonly designated as 316 Stainless Steel.
5. Pressures shown represent values shown in API Standard 526 and/or ASME B16.34.
6. Back pressure limits based on temperature of 100°F.

# Valve Pressure Limits

## Austenitic Stainless Steel: ASME SA-351 Grade CF8M[1]–316 St. St

| Orifice Letter | Valve Size | ANSI Flange Class | | Maximum Pressure (psig) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Temperature Range | | | | | Back Pressure Limit [6] | |
| | Inlet by Orifice by Outlet | Inlet | Outlet | -450°F to -76°F | -75°F to 100°F | 450°F | 800°F | 1000°F | Conventional Type | BalanSeal Type |
| K | 3K4 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 150 |
| | 3K4[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 150 |
| | 3K4 | 300 | 150 | 525 | 720 | 495 | 420 | 350 | 275 | 150 |
| | 3K4 | 600 | 150 | 600 | 1440 | 975 | 845 | 700 | 275 | 200 |
| | 3K6 | 900 | 150 | 600 | 2160 | 1485 | 1265 | 1050 | 275 | 200 |
| | 3K6 | 1500 | 300 | 750 | 2220 | 2220 | 2110 | 1750 | 600 | 200 |
| L | 3L4 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 100 |
| | 3L4[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 100 |
| | 4L6 | 300 | 150 | 535 | 720 | 495 | 420 | 350 | 275 | 170 |
| | 4L6 | 600 | 150 | 535 | 1000 | 975 | 845 | 700 | 275 | 170 |
| | 4L6 | 900 | 150 | 700 | 1500 | 1485 | 1265 | 1050 | 275 | 170 |
| | 4L6 | 1500 | 150 | 700 | 1500 | 1500 | 1500 | 1500 | 275 | 170 |
| M | 4M6 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 80 |
| | 4M6[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 80 |
| | 4M6 | 300 | 150 | 525 | 720 | 495 | 420 | 350 | 275 | 160 |
| | 4M6 | 600 | 150 | 600 | 1000 | 975 | 845 | 700 | 275 | 160 |
| | 4M6 | 900 | 150 | 600 | 1100 | 1100 | 1100 | 1050 | 275 | 160 |
| N | 4N6 | 150 | 150 | 275 | 275 | 180 | 80 | 20 | 275 | 80 |
| | 4N6[2] | 300 | 150 | 275 | 275 | 275 | 275 | 275 | 275 | 80 |
| | 4N6 | 300 | 150 | 450 | 720 | 495 | 420 | 350 | 275 | 160 |
| | 4N6 | 600 | 150 | 500 | 1000 | 975 | 845 | 700 | 275 | 160 |
| | 4N6 | 900 | 150 | 500 | 1000 | 1000 | 1000 | 1000 | 275 | 160 |
| P | 4P6 | 150 | 150 | 175 | 275 | 180 | 80 | 20 | 275 | 80 |
| | 4P6[2] | 300 | 150 | 175 | 275 | 275 | 275 | 275 | 275 | 80 |
| | 4P6 | 300 | 150 | 300 | 525 | 495 | 420 | 350 | 275 | 150 |
| | 4P6 | 600 | 150 | 480 | 1000 | 975 | 845 | 700 | 275 | 150 |
| | 4P6 | 900 | 150 | 480 | 1000 | 1000 | 1000 | 1000 | 275 | 150 |
| Q | 6Q8 | 150 | 150 | 165 | 165 | 165 | 80 | 20 | 115 | 70 |
| | 6Q8[2] | 300 | 150 | 165 | 165 | 165 | 165 | 165 | 115 | 70 |
| | 6Q8 | 300 | 150 | 250 | 300 | 300 | 300 | 300 | 115 | 115 |
| | 6Q8 | 600 | 150 | 300 | 600 | 600 | 600 | 600 | 115 | 115 |
| | 6Q8[3] | 600 | 150 | 300 | 900 | 900 | 845 | 700 | 275 | 200 |
| R | 6R8 | 150 | 150 | 55 | 100 | 100 | 80 | 20 | 60 | 60 |
| | 6R8[2] | 300 | 150 | 55 | 100 | 100 | 100 | 100 | 60 | 60 |
| | 6R10 | 300 | 150 | 150 | 230 | 230 | 230 | 230 | 100 | 100 |
| | 6R10 | 600 | 150 | 200 | 300 | 300 | 300 | 300 | 100 | 100 |
| | 6R10[3] | 600 | 150 | 200 | 600 | 600 | 600 | 600 | 275 | 200 |
| T | 8T10 | 150 | 150 | 50 | 65 | 65 | 65 | 20 | 30 | 30 |
| | 8T10[2] | 300 | 150 | 50 | 65 | 65 | 65 | 65 | 30 | 30 |
| | 8T10 | 300 | 150 | 65 | 120 | 120 | 120 | 120 | 60 | 60 |
| | 8T10[3] | 300 | 150 | 65 | 300 | 300 | 300 | 300 | 100 | 100 |



General Notes:
1. Material limited to 1500°F.
2. Pressure less than rating for 300# class flange to designate maximum pressure limit when used on Farris 300# lightweight design valves.
3. High pressure version
4. Material commonly designated as 316 Stainless Steel.
5. Pressures shown represent values shown in API Standard 526 and/or ASME B16.34.
6. Back pressure limits based on temperature of 100°F.

# Valve Pressure Limits

## Nickel Alloy: ASME SA-494 Grade CW-12MW[1]– Hastelloy C

| Orifice Letter | Valve Size | ANSI Flange Class | | Maximum Pressure (psig) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Temperature Range | | | Back Pressure Limit [6] | |
| | Inlet by Orifice by Outlet | Inlet | Outlet | -20°F to 100°F | 450°F | 800°F | Conventional Type | BalanSeal Type |
| D | 1D2 | 150 | 150 | 230 | 180 | 80 | 230 | 230 |
| | 1D2[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 |
| | 1D2 | 300 | 150 | 600 | 477 | 400 | 230 | 230 |
| | 1D2 | 600 | 150 | 1200 | 952 | 800 | 230 | 230 |
| | 1-1/2 D2 | 900 | 300 | 1800 | 1430 | 1200 | 600 | 500 |
| | 1-1/2 D2 | 1500 | 300 | 3000 | 2382 | 2005 | 600 | 500 |
| | 1-1/2 D3 | 2500 | 300 | 5000 | 3970 | 3340 | 600 | 500 |
| E | 1E2 | 150 | 150 | 230 | 180 | 80 | 230 | 230 |
| | 1E2[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 |
| | 1E2 | 300 | 150 | 600 | 477 | 400 | 230 | 230 |
| | 1E2 | 600 | 150 | 1200 | 952 | 800 | 230 | 230 |
| | 1-1/2 E2 | 900 | 300 | 1800 | 1430 | 1200 | 600 | 500 |
| | 1-1/2 E2 | 1500 | 300 | 3000 | 2382 | 2005 | 600 | 500 |
| | 1-1/2 E3 | 2500 | 300 | 5000 | 3970 | 3340 | 600 | 500 |
| F | 1-1/2 F2 | 150 | 150 | 230 | 180 | 80 | 230 | 230 |
| | 1-1/2 F2[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 |
| | 1-1/2 F2 | 300 | 150 | 600 | 477 | 400 | 230 | 230 |
| | 1-1/2 F2 | 600 | 150 | 1200 | 952 | 800 | 230 | 230 |
| | 1-1/2 F3 | 900 | 300 | 1800 | 1430 | 1200 | 600 | 500 |
| | 1-1/2 F3 | 1500 | 300 | 3000 | 2382 | 2005 | 600 | 500 |
| | 1-1/2 F3 | 2500 | 300 | 5000 | 3970 | 3340 | 600 | 500 |
| G | 1-1/2 G3 | 150 | 150 | 180 | 180 | 80 | 230 | 230 |
| | 1-1/2 G3[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 |
| | 1-1/2 G3 | 300 | 150 | 477 | 477 | 400 | 230 | 230 |
| | 1-1/2 G3 | 600 | 150 | 952 | 952 | 800 | 230 | 230 |
| | 1-1/2 G3 | 900 | 300 | 1430 | 1430 | 1200 | 600 | 470 |
| | 2G3 | 1500 | 300 | 2382 | 2382 | 2005 | 600 | 470 |
| | 2G3 | 2500 | 300 | 3970 | 3705 | 3340 | 600 | 470 |
| H | 1-1/2 H3 | 150 | 150 | 180 | 180 | 80 | 230 | 230 |
| | 1-1/2 H3[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 |
| | 2H3 | 300 | 150 | 477 | 477 | 400 | 230 | 230 |
| | 2H3 | 600 | 150 | 952 | 952 | 800 | 230 | 230 |
| | 2H3 | 900 | 150 | 1430 | 1430 | 1200 | 230 | 230 |
| | 2H3 | 1500 | 300 | 2382 | 2382 | 2005 | 600 | 415 |
| J | 2J3 | 150 | 150 | 180 | 180 | 80 | 230 | 230 |
| | 2J3[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 |
| | 3J4 | 300 | 150 | 477 | 477 | 400 | 230 | 230 |
| | 3J4 | 600 | 150 | 952 | 952 | 800 | 230 | 230 |
| | 3J4 | 900 | 150 | 1430 | 1430 | 1200 | 230 | 230 |
| | 3J4 | 1500 | 300 | 2382 | 2382 | 2005 | 600 | 230 |

General Notes:
1. Valve limited to 800°F.
2. Pressure less than rating for 300# class flange to designate maximum pressure limit when used on Farris 300# lightweight design valves.
3. High pressure version.
4. Material commonly sold under the trade name of Hastelloy C™.
5. Pressure shown represent the carbon steel valve limits or Hastelloy C flange limit (per ASME B16.34), whichever is lower.
6. Back pressure limits based on temperature of 100°F.

# Valve Pressure Limits

## Nickel Alloy: ASME SA-494 Grade CW-12MW[1] – Hastelloy C

| Orifice Letter | Valve Size | ANSI Flange Class | | Maximum Pressure (psig) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Temperature Range | | | Back Pressure Limit [6] | |
| | Inlet by Orifice by Outlet | Inlet | Outlet | -20°F to 100°F | 450°F | 800°F | Conventional Type | BalanSeal Type |
| K | 3K4 | 150 | 150 | 230 | 180 | 80 | 230 | 150 |
| | 3K4[2] | 300 | 150 | 230 | 230 | 230 | 230 | 150 |
| | 3K4 | 300 | 150 | 600 | 477 | 400 | 230 | 150 |
| | 3K4 | 600 | 150 | 1200 | 952 | 800 | 230 | 200 |
| | 3K6 | 900 | 150 | 1800 | 1430 | 1200 | 230 | 200 |
| | 3K6 | 1500 | 300 | 2220 | 2382 | 2005 | 600 | 200 |
| L | 3L4 | 150 | 150 | 230 | 180 | 80 | 230 | 100 |
| | 3L4[2] | 300 | 150 | 230 | 230 | 230 | 230 | 100 |
| | 4L6 | 300 | 150 | 600 | 477 | 400 | 230 | 170 |
| | 4L6 | 600 | 150 | 1000 | 952 | 800 | 230 | 170 |
| | 4L6 | 900 | 150 | 1500 | 1430 | 1200 | 230 | 170 |
| | 4L6 | 1500 | 150 | 1500 | 1500 | 1500 | 230 | 170 |
| M | 4M6 | 150 | 150 | 230 | 180 | 80 | 230 | 80 |
| | 4M6[2] | 300 | 150 | 230 | 230 | 230 | 230 | 80 |
| | 4M6 | 300 | 150 | 600 | 477 | 400 | 230 | 160 |
| | 4M6 | 600 | 150 | 1100 | 952 | 800 | 230 | 160 |
| | 4M6 | 900 | 150 | 1100 | 1100 | 1100 | 230 | 160 |
| N | 4N6 | 150 | 150 | 230 | 180 | 80 | 230 | 80 |
| | 4N6[2] | 300 | 150 | 230 | 230 | 230 | 230 | 80 |
| | 4N6 | 300 | 150 | 600 | 477 | 400 | 230 | 160 |
| | 4N6 | 600 | 150 | 1000 | 952 | 800 | 230 | 160 |
| | 4N6 | 900 | 150 | 1000 | 1000 | 1000 | 230 | 160 |
| P | 4P6 | 150 | 150 | 230 | 180 | 80 | 230 | 80 |
| | 4P6[2] | 300 | 150 | 230 | 230 | 230 | 230 | 80 |
| | 4P6 | 300 | 150 | 525 | 477 | 400 | 230 | 150 |
| | 4P6 | 600 | 150 | 1000 | 952 | 800 | 230 | 150 |
| | 4P6 | 900 | 150 | 1000 | 1000 | 1000 | 230 | 150 |
| Q | 6Q8 | 150 | 150 | 165 | 165 | 80 | 140 | 70 |
| | 6Q8[2] | 300 | 150 | 165 | 165 | 165 | 115 | 70 |
| | 6Q8 | 300 | 150 | 300 | 300 | 300 | 115 | 115 |
| | 6Q8 | 600 | 150 | 600 | 600 | 600 | 115 | 115 |
| | 6Q8[3] | 600 | 150 | 900 | 900 | 825 | 230 | 200 |
| R | 6R8 | 150 | 150 | 100 | 100 | 80 | 100 | 60 |
| | 6R8[2] | 300 | 150 | 100 | 100 | 100 | 60 | 60 |
| | 6R10 | 300 | 150 | 230 | 230 | 230 | 100 | 100 |
| | 6R10 | 600 | 150 | 300 | 300 | 300 | 100 | 100 |
| | 6R10[3] | 600 | 150 | 600 | 600 | 600 | 230 | 200 |
| T | 8T10 | 150 | 150 | 65 | 65 | 65 | 65 | 30 |
| | 8T10[2] | 300 | 150 | 65 | 65 | 65 | 30 | 30 |
| | 8T10 | 300 | 150 | 120 | 120 | 120 | 60 | 60 |
| | 8T10[3] | 300 | 150 | 300 | 300 | 300 | 100 | 100 |



General Notes:
1. Valve limited to 800°F.
2. Pressure less than rating for 300# class flange to designate maximum pressure limit when used on Farris 300# lightweight design valves.
3. High pressure version.
4. Material commonly sold under the trade name of Hastelloy C™
5. Pressures shown represent the carbon steel valve limits or Hastelloy C flange limit (per ASME B16.34), whichever is lower.
6. Back pressure limits based on temperature of 100°F.

# Valve Pressure Limits

## Nickel / Copper Alloy: ASME SA-494 Grade M-35-1[1] – Monel

| Orifice Letter | Valve Size | ANSI Flange Class | | Maximum Pressure (psig) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Temperature Range | | | | Back Pressure Limit [5] | |
| | Inlet by Orifice by Outlet | Inlet | Outlet | -20°F to 100°F | 450°F | 800°F | 900°F | Conventional Type | BalanSeal Type |
| D | 1D2 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 230 |
| | 1D2[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 230 |
| | 1D2 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 230 |
| | 1D2 | 600 | 150 | 1200 | 945 | 915 | 550 | 230 | 230 |
| | 1-1/2 D2 | 900 | 300 | 1800 | 1420 | 1375 | 825 | 600 | 500 |
| E | 1E2 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 230 |
| | 1E2[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 230 |
| | 1E2 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 230 |
| | 1E2 | 600 | 150 | 1200 | 945 | 915 | 550 | 230 | 230 |
| | 1-1/2 E2 | 900 | 300 | 1800 | 1420 | 1375 | 825 | 600 | 500 |
| F | 1-1/2 F2 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 230 |
| | 1-1/2 F2[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 230 |
| | 1-1/2 F2 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 230 |
| | 1-1/2 F2 | 600 | 150 | 1200 | 945 | 915 | 550 | 230 | 230 |
| | 1-1/2 F3 | 900 | 300 | 1800 | 1420 | 1375 | 825 | 600 | 500 |
| G | 1-1/2 G3 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 230 |
| | 1-1/2 G3[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 230 |
| | 1-1/2 G3 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 230 |
| | 1-1/2 G3 | 600 | 150 | 1200 | 945 | 915 | 550 | 230 | 230 |
| | 1-1/2 G3 | 900 | 300 | 1800 | 1420 | 1375 | 825 | 600 | 470 |
| H | 1-1/2 H3 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 230 |
| | 1-1/2 H3[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 230 |
| | 2H3 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 230 |
| | 2H3 | 600 | 150 | 1200 | 945 | 915 | 550 | 230 | 230 |
| | 2H3 | 900 | 150 | 1800 | 1420 | 1375 | 825 | 230 | 230 |
| J | 2J3 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 230 |
| | 2J3[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 230 |
| | 3J4 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 230 |
| | 3J4 | 600 | 150 | 1200 | 945 | 915 | 550 | 230 | 230 |
| | 3J4 | 900 | 150 | 1800 | 1420 | 1375 | 825 | 230 | 230 |
| K | 3K4 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 150 |
| | 3K4[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 150 |
| | 3K4 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 150 |
| | 3K4 | 600 | 150 | 1200 | 945 | 915 | 550 | 230 | 200 |
| | 3K6 | 900 | 150 | 1800 | 1420 | 1375 | 825 | 230 | 200 |
| L | 3L4 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 100 |
| | 3L4[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 100 |
| | 4L6 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 170 |
| | 4L6 | 600 | 150 | 1200 | 945 | 915 | 550 | 230 | 170 |
| | 4L6 | 900 | 150 | 1800 | 1420 | 1375 | 825 | 230 | 170 |
| M | 4M6 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 80 |
| | 4M6[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 80 |
| | 4M6 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 160 |
| | 4M6 | 600 | 150 | 1100 | 945 | 915 | 550 | 230 | 160 |
| | 4M6 | 900 | 150 | 1100 | 1100 | 1100 | 825 | 230 | 160 |
| N | 4N6 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 80 |
| | 4N6[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 80 |
| | 4N6 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 160 |
| | 4N6 | 600 | 150 | 1000 | 945 | 915 | 550 | 230 | 160 |
| | 4N6 | 900 | 150 | 1100 | 1100 | 1100 | 825 | 230 | 160 |
| P | 4P6 | 150 | 150 | 230 | 175 | 80 | 50 | 230 | 80 |
| | 4P6[2] | 300 | 150 | 230 | 230 | 230 | 230 | 230 | 80 |
| | 4P6 | 300 | 150 | 600 | 475 | 460 | 275 | 230 | 160 |
| | 4P6 | 600 | 150 | 1000 | 945 | 915 | 550 | 230 | 160 |
| | 4P6 | 900 | 150 | 1000 | 1000 | 1000 | 825 | 230 | 150 |
| Q | 6Q8 | 150 | 150 | 140 | 165 | 80 | 50 | 115 | 70 |
| | 6Q8[2] | 300 | 150 | 140 | 165 | 165 | 165 | 115 | 70 |
| | 6Q8 | 300 | 150 | 300 | 300 | 300 | 275 | 115 | 115 |
| | 6Q8 | 600 | 150 | 600 | 600 | 600 | 550 | 115 | 115 |
| R | 6R8 | 150 | 150 | 100 | 100 | 80 | 50 | 60 | 60 |
| | 6R8[2] | 300 | 150 | 100 | 100 | 100 | 100 | 60 | 60 |
| | 6R10 | 300 | 150 | 230 | 230 | 230 | 230 | 100 | 100 |
| | 6R10 | 600 | 150 | 300 | 300 | 300 | 300 | 100 | 100 |
| T | 8T10 | 150 | 150 | 65 | 65 | 65 | 65 | 30 | 30 |
| | 8T10[2] | 300 | 150 | 65 | 65 | 65 | 65 | 30 | 30 |
| | 8T10 | 300 | 150 | 120 | 120 | 120 | 120 | 60 | 60 |

General Notes:
1. Valve material limited to 900°F.
2. Pressure less than rating for 300# class flange to designate maximum pressure limit when used on Farris 300# lightweight design valves.
3. Material commonly sold under the trade name of Monel™.
4. Pressure and temperature limits per API Standard 526.
5. Back pressure limits based on temperature of 100°F.

# Sizing

## General Equations

Before beginning any calculations, it is necessary to establish the general category of the pressure relief valve to be used. This section covers conventional spring-loaded types and BalanSeal spring-loaded types. Pilot-operated valves are covered in a separate catalog.

Given the rate of fluid flow to be relieved, the usual procedure is to first calculate the minimum area required in the valve orifice for the conditions contained in one of the following equations. In the case of steam, air or water, the selection of an orifice may be made directly from the capacity tables.

The second step is to select the specific type of valve that meets the pressure and temperature requirements.

General equations are given first, to identify the basic terms that correlate with ASME Pressure Vessel Code, Section VIII.

Since these equations are conservative, it is recommended that computations of relieving loads avoid cascading of safety factors or multiple contingencies beyond the reasonable flow needed to protect the pressure vessel.

## Conventional Valves – Constant Back Pressure Only

The conventional valve may be used when the variation in back pressure does not exceed 10% of the set pressure, provided the corresponding variation in set pressure is acceptable.

| Orifice Area Calculations | Constant Back Pressure |
|---|---|
| **VAPORS or GASES – Lbs./hr.:** $A = \frac{W\sqrt{T}\sqrt{Z}}{C K_d P \sqrt{M} K_b}$ | $K_b$ = 1 when back pressure is below 55% of abs. relieving pressure. |
| **VAPORS or GASES – S.C.F.M.:** $A = \frac{V\sqrt{G}\sqrt{T}\sqrt{Z}}{1.175\, C K_d P K_b}$ | $K_b$ = 1 when back pressure is below 55% of abs. relieving pressure. |
| **STEAM – Lbs./hr.:** $A = \frac{W_s}{51.5\, K_d P K_b K_{sh} K_n}$ | $K_b$ = 1 when back pressure is below 55% of abs. relieving pressure.<br>$K_{sh}$ = 1 for Sat. Steam |
| **AIR – S.C.F.M.:** $A = \frac{V_a\sqrt{T}}{418\, K_d P K_b}$ | $K_b$ = 1 when back pressure is below 55% of abs. relieving pressure. |
| **LIQUIDS – 2600L Series, G.P.M, ASME Code:** $A = \frac{V_L\sqrt{G}}{38.0\, K_d\sqrt{\Delta P}\, K_u}$ | $K_p$ = 1 at 25% overpressure<br>$K_u$ = 1 at normal viscosities |
| **LIQUIDS – 2600 Series, G.P.M, Non-ASME Code:** $A = \frac{V_L\sqrt{G}}{38.0\, K_d\sqrt{1.25\,(P_1 - P_2)}\, K_p K_u}$ | |

## Nomenclature

A = Required orifice area in square inches. This value may be compared with the API effective areas included in this catalog and defined in ANSI/API Standard 526 or the ASME actual area.

W = Required vapor capacity in pounds per hour.

$W_s$ = Required steam capacity in pounds per hour.

V = Required gas capacity in S.C.F.M.

$V_a$ = Required air capacity in S.C.F.M.

$V_L$ = Required liquid capacity in U.S. gallons per minute.

G = Specific gravity of gas (air=1) or specific gravity of liquid (water=1) at actual discharge temperature will obtain a safe valve size.

M = Average molecular weight of vapor.

P = Relieving pressure in pounds per square inch absolute=set pressure+overpressure+14.7. Minimum overpressure is 3 psi.

$P_1$ = Set pressure at inlet, psig.

$P_2$ = Back pressure at outlet, psig.

$\Delta P$ = Set pressure + overpressure, psig – back pressure, psig. At 10% overpressure $\Delta P = 1.1P_1 - P_2$. Below 30 psig set, $\Delta P = P_1 + 3 - P_2$.

T = Inlet temperature absolute (°F+460).

Z = Compressibility factor corresponding to T and P (if this factor is not available, compressibility correction can be safely ignored by using a value of Z=1.0).

C = Gas or vapor flow constant. Select from table on page 86 or use the curve and table on page 85.

k = Ratio of specific heats, $C_p/C_v$. This value is constant for an ideal gas. If this ratio is unknown, the value k=1.001, C=315 will result in a safe valve size. Isentropic coefficient n may be used instead of k. See curve and table on page 85.

$K_p$ = Liquid capacity correction factor for overpressures lower than 25%. See curve on page 89. Non-Code equations only.

$K_b$ = Vapor or gas flow correction factor for constant back pressures above critical pressure. See curve on page 87.

$K_v$ = Vapor or gas flow factor for variable back pressures. See curve on page 87. BalanSeal valves only.

$K_w$ = Liquid flow factor for variable and constant back pressures. See curve on page 89. BalanSeal valves only.

$K_u$ = Liquid viscosity correction factor. See chart on page 90 or curve on page 91.

$K_{sh}$ = Steam superheat correction factor. See table on page 88.

$K_n$ = Napier steam correction factor for set pressures between 1500 and 2900 psig. See table on page 88.

$K_d$ = Coeffcient of Discharge, where:

| Service Fluid | Coeffcient of Discharge When Sizing Using | |
|---|---|---|
| | API Effective Areas | ASME Actual Areas |
| Air, Steam, Vapor & Gas | 0.953 | 0.858 |
| Liquid (2600L, ASME Code) | 0.724 | 0.652 |
| Liquid (2600 Non Code) | 0.640 | 0.576 |

# Sizing

## BalanSeal Valves – Variable or Constant Back Pressure

The BalanSeal (balanced bellows) valve is used to prevent corrosion of the guiding surfaces of a pressure relief valve, to confine the lading fluid and prevent contamination, or to make the valve suitable for variable back pressure service. When the BalanSeal valve is under constant or variable back pressure conditions, the valve capacity is affected. Depending on the percentage of maximum back pressure to the flowing pressure of the valve, a factor for the correction of valve capacity is necessary. The effect on valve capacity is different in liquid service than in vapor and gas service, so correction factors vary. In the calculations that follow, use $K_v$ for vapors and gases as shown on page 87 and $K_w$ for liquids as shown on page 89.

When sizing and selecting a BalanSeal valve, follow the same procedures as for conventional valves, but use the following equations that incorporate the correction factors $K_v$ and $K_w$.

**The BalanSeal valve must be used when the variation in back pressure exceeds 10% of set pressure.**

## Orifice Area Calculations

**VAPORS or GASES – Lbs./hr.:**

$$A = \frac{W\sqrt{T}\sqrt{Z}}{CK_d P\sqrt{M}K_v}$$

**VAPORS or GASES – S.C.F.M.:**

$$A = \frac{V\sqrt{G}\sqrt{T}\sqrt{Z}}{1.175\,CK_d P K_v}$$

**STEAM – Lbs./hr.:**

$$A = \frac{W_s}{51.5\,K_d P K_v K_{sh} K_n}$$

**AIR – S.C.F.M.:**

$$A = \frac{V_a\sqrt{T}}{418\,K_d P K_v}$$

**LIQUIDS – 2600L Series, G.P.M., ASME Code:**

$$A = \frac{V_L\sqrt{G}}{38.0\,K_d\sqrt{\Delta P}\,K_w K_u}$$

**LIQUIDS – 2600 Series, G.P.M., Non-ASME Code[2]:**

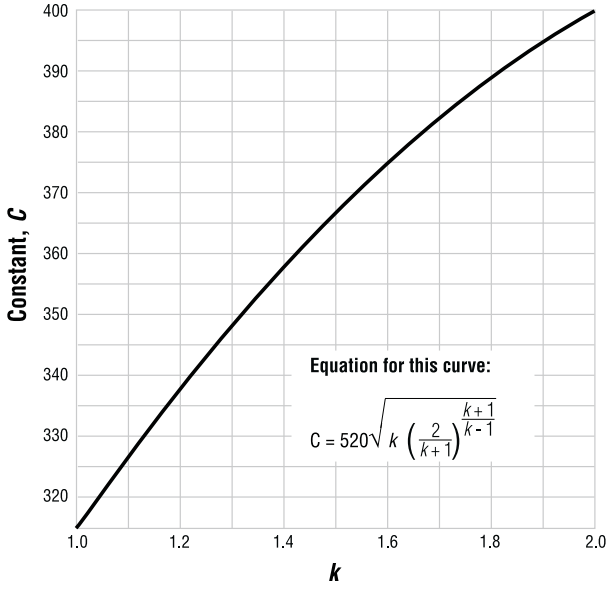
$$A = \frac{V_L\sqrt{G}}{38.0\,K_d\sqrt{1.25\,(P_1 - P_2)}\,K_p K_w K_u}$$

2. When back pressure $P_2$ is variable, use the maximum value.

## Gas or Vapor Flow Constant C for Gas or Vapor Related to Ratio of Specific Heats ($k = C_p/C_v$)

| k | Constant C | k | Constant C | k | Constant C |
|---|---|---|---|---|---|
| 1.00 | 315 | 1.26 | 343 | 1.52 | 366 |
| 1.02 | 318 | 1.28 | 345 | 1.54 | 368 |
| 1.04 | 320 | 1.30 | 347 | 1.56 | 369 |
| 1.06 | 322 | 1.32 | 349 | 1.58 | 371 |
| 1.08 | 324 | 1.34 | 351 | 1.60 | 372 |
| 1.10 | 327 | 1.36 | 352 | 1.62 | 374 |
| 1.12 | 329 | 1.38 | 354 | 1.64 | 376 |
| 1.14 | 331 | 1.40 | 356 | 1.66 | 377 |
| 1.16 | 333 | 1.42 | 358 | 1.68 | 379 |
| 1.18 | 335 | 1.44 | 359 | 1.70 | 380 |
| 1.20 | 337 | 1.46 | 361 | 2.00 | 400 |
| 1.22 | 339 | 1.48 | 363 | 2.20 | 412 |
| 1.24 | 341 | 1.50 | 364 | — | — |

## Constant C for Gas or Vapor Related to Ratio of Specific Heats ($k = C_p/C_v$)



# Fluid Data

| Fluid | Formula | Molecular Weight | Specific Gravity | | k ($C_p/C_v$) | C (Constant) |
|---|---|---|---|---|---|---|
| | | | Liquid | Gas | | |
| Acetic Acid | $HC_2H_3O_2$ | 60.05 | 1.049 | 2.073 | 1.15 | 332 |
| Acetone | $C_3H_6O$ | 58.08 | 0.791 | – | – | – |
| Acetylene | $C_2H_2$ | 26.04 | 0.62 | 0.899 | 1.26 | 343 |
| Air | – | 28.97 | 0.86 | 1 | 1.4 | 356 |
| Ammonia | $NH_3$ | 17.03 | 0.817 | 0.588 | 1.33 | 350 |
| Argon | A | 39.94 | 1.65 | 1.388 | 1.67 | 378 |
| Benzene | $C_6H_6$ | 78.11 | 0.879 | 2.696 | 1.12 | 329 |
| Butane/n-Butane | $C_4H_{10}$ | 58.12 | 0.579 | 2.006 | 1.094 | 326 |
| Carbon Dioxide | $CO_2$ | 44.01 | 1.101 | 1.519 | 1.3 | 347 |
| Carbon Disulfide | $CS_2$ | 76.13 | 1.263 | 2.628 | 1.21 | 338 |
| Carbon Monoxide | CO | 28 | 0.814 | 0966 | 1.4 | 356 |
| Chlorine | $Cl_2$ | 70.9 | 1.58 | 2.45 | 1.36 | 353 |
| Cyclohexane | $C_6H_{12}$ | 84.16 | 0.779 | 2.905 | 1.09 | 326 |
| Dowtherm A | – | 165 | 1.064 | – | – | – |
| Dowtherm J | – | 134 | 0.931 | – | – | – |
| Ethane | $C_2H_6$ | 30.07 | 0.546 | 1.04 | 1.22 | 339 |
| Ethyl Alcohol (Ethanol) | $C_2H_6O$ | 46.07 | 0.789 | 1.59 | 1.13 | 330 |
| Ethyl Chloride | $C_2H_5Cl$ | 64.52 | 0.903 | 2.227 | 1.19 | 336 |
| Ethylene (Ethene) | $C_2H_4$ | 28.05 | 0.566 | 0.968 | 1.26 | 343 |
| Freon 12 | $CCl_2F_2$ | 120.9 | 1.35 | 4.17 | 1.14 | 331 |
| Helium | He | 4 | – | 0.138 | 1.66 | 377 |
| Hexane | $C_6H_{14}$ | 86.17 | 0.659 | 2.974 | 1.06 | 322 |
| Hydrochloric Acid | HCl | 36.5 | 1.64 | – | – | – |
| Hydrofluoric Acid | HF | 20.01 | 0.92 | – | – | – |
| Hydrogen | $H_2$ | 2.016 | 0.0709 | 0.069 | 1.14 | 357 |
| Hydrogen Sulfide | $H_2S$ | 34.07 | 0.79 | 1.176 | 1.32 | 349 |
| Kerosene | $C_9H_2O$ | 128.3 | 0.815 | – | – | – |
| Methane | $CH_4$ | 16.04 | 0.415 | 0.554 | 1.31 | 348 |
| Methyl Alcohol | $CH_4O$ | 32.04 | 0.792 | 1.111 | 1.2 | 337 |
| Methyl Chloride | $CH_3Cl$ | 50.49 | 0.952 | 1.743 | 1.2 | 337 |
| Natural Gas (typical) | – | 19 | 0.45 | 0.656 | 1.27 | 344 |
| Nitric Acid | $HNO_3$ | 63.02 | 1.502 | – | – | – |
| Nitrogen | $N_2$ | 28 | 1.026 | 0.967 | 1.4 | 356 |
| Nitrous Oxide | $N_2O$ | 44 | 1.226 | 1.519 | 1.3 | 347 |
| Oxygen | $O_2$ | 32 | 1.426 | 1.104 | 1.4 | 356 |
| Pentane | $C_5H_{12}$ | 72.15 | 0.631 | 2.49 | 1.07 | 323 |
| Propane | $C_3H_8$ | 44.09 | 0.585 | 1.522 | 1.13 | 330 |
| Styrene | $C_8H_8$ | 104.14 | 0.906 | 3.6 | 1.07 | 323 |
| Sulfur Dioxide | $SO_2$ | 64.06 | 1.434 | 2.21 | 1.29 | 346 |
| Sulfuric Acid | $H_2SO_4$ | 98.08 | 1.83 | – | – | – |
| Therminol D-12 | – | 162 | 0.76 | – | – | – |
| Therminol VP-1 | – | 166 | 1.061 | – | – | – |
| Toluene | $C_7H_8$ | 92.1 | 0.87 | 3.18 | 1.1 | 327 |
| Water | $H_2O$ | 18.02 | 1 | 0.622 | 1.31 | 348 |

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