

# Flanged Steel Pressure-relief Valves

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# Flanged Steel Pressure-relief Valves

## 1 Scope

This standard is a purchase specification for flanged steel pressure-relief valves. Basic requirements are given for direct spring-loaded pressure-relief valves and pilot-operated pressure-relief valves as follows:

- orifice designation and area;
- valve size and pressure rating, inlet and outlet;
- materials;
- pressure–temperature limits;
- center-to-face dimensions, inlet and outlet.

Nameplate nomenclature and requirements for stamping are detailed in Annex A [metric units (SI)] and Annex E [U.S. customary units (USC)].

## 2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Standard 520 (Part 1 and Part 2), *Sizing, Selection, and Installation of Pressure-relieving Devices in Refineries*

API Standard 527, *Seat Tightness of Pressure Relief Valves*

ASME B1.20.1<sup>1</sup>, *Pipe Threads, General Purpose (Inch)*

ASME B16.5, *Pipe Flanges and Flanged Fittings—NPS 1/2 Through NPS 24 Metric/Inch Standard*

ASME B16.34, *Valves—Flanged, Threaded, and Welding End*

ASME Boiler and Pressure Vessel Code (BPVC), *Section VIII: Pressure Vessels; Division 1 and Division 2*

ASME Boiler and Pressure Vessel Code (BPVC), *Section XIII: Rules for Overpressure Protection*

ASME BPVC, *Section II: Materials:*

ASME SA-216, *Carbon-Steel Castings Suitable for Fusion Welding for High-Temperature Service*

ASME SA-217, *Martensitic Stainless Steel and Alloy Steel Castings for Pressure-Containing Parts, Suitable for High-Temperature Service*

ASME SA-351, *Specification for Castings, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts*

ASME SA-494, *Specification for Castings, Nickel and Nickel Alloy*

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<sup>1</sup> ASME International, 2 Park Avenue, New York, NY 10016-5990, www.asme.org.

ISO 23936-1<sup>2</sup>, *Oil and gas industries including lower carbon energy—Non-metallic materials in contact with media related to oil and gas production—Part 1: Thermoplastics*

ISO 23936-2, *Petroleum, petrochemical and natural gas industries—Non-metallic materials in contact with media related to oil and gas production—Part 2: Elastomers*

NACE AMPP MR0103/ISO 17945<sup>3</sup>, *Petroleum, petrochemical and natural gas industries—Metallic materials resistant to sulfide stress cracking in corrosive petroleum refining environments*

NACE MR0175/ISO 15156, *Petroleum and natural gas industries—Materials for use in H<sub>2</sub>S-containing environments in oil and gas production*

NORSOK Standard M-710<sup>4</sup>, *Qualification of non-metallic materials and manufacturers—Polymers*

### 3 Terms and Definitions

Pressure-relief valve terminology is defined in API 520, Part 1.

### 4 Responsibility

**4.1** The purchaser is responsible for the following:

- a) selecting the type of pressure-relief valve and the required pressure–temperature ratings;
- b) specifying materials that will satisfactorily resist corrosion from the process fluid and environmental conditions;
- c) selecting the minimum required orifice area based upon relieving conditions derived from full knowledge of the pressure-relieving system and the requirements of the applicable codes and regulations;
- d) providing data for sizing and selection.

**4.2** The manufacturer is responsible for the following:

- a) designing and manufacturing pressure-relief valves to satisfy the requirements of this standard and the purchaser's specification;
- b) publishing relieving capacities based upon certified test data;
- c) advising the purchaser of any nonconformance to the purchaser's specification;
- d) relieving capacities of the selected pressure-relief valves shall be those established and guaranteed by the pressure-relief valve manufacturer for the applicable service conditions and be equal to or greater than the required relieving capacities.

### 5 Conflicting Requirements

Whenever the information included on the purchaser's specification sheet or purchase order conflicts with the provisions of this standard, the purchaser's specification sheet or purchase order shall govern. Where conflicting requirements exist, the manufacturer shall call them to the attention of the purchaser.

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<sup>2</sup> International Organization for Standardization, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, [www.iso.org](http://www.iso.org).

<sup>3</sup> Formerly NACE International, now known as The Association for Materials Protection and Performance (AMPP), 15835 Park Ten Place, Houston, TX 77084, [www.ampp.org/home](http://www.ampp.org/home).

<sup>4</sup> Standards Norway, PO Box 252, NO-1326 Lysaker, Norway, [www.standard.no/en/](http://www.standard.no/en/).



## 6 Orifice Areas and Designations

The standard effective orifice areas and the corresponding letter designations shall be selected from those detailed in Table 1. The effective orifice areas and designations shall be used in conjunction with the sizing equations contained in API 520, Part 1.

## 7 Design

### 7.1 General

Pressure-relief valves discussed in this standard shall be designed and manufactured in accordance with the applicable requirements of ASME *BPVC*, Section VIII pressure-relief devices.

**7.1.1** The nozzle shall not be welded to the valve body.

**7.1.2** The nozzle shall have an integral seat oversized to permit lapping or remachining operations, for metal seated valves only.

**7.1.3** The blowdown adjusting ring shall be secured by means of an adjusting ring set screw.

**7.1.4** The bonnet vent for bellows valves shall have a screwed vent fitting (see bug screen shown in Figure 1). The bug screen mesh holes size shall be 0.4 mm (0.015 in.) at a minimum to allow proper breathing with maximum 3.175 mm (0.125 in.) to prevent nesting insects from entering.

**7.1.5** Spring-loaded pressure-relief valves shall have a bolted bonnet and be full nozzle type.

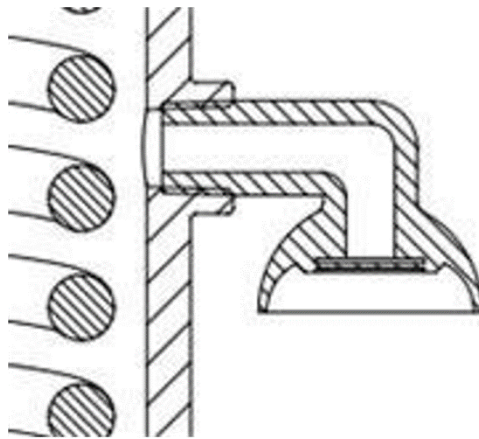


Figure 1—Typical Bug Screen

### 7.2 Determination of Orifice Area

The minimum required effective orifice area shall be determined in accordance with API 520, Part 1.

### 7.3 Valve Selection

For valves described in this standard, inlet and outlet flange sizes and pressure–temperature ratings shall conform to the data in Table 3 through Table 16 (SI) [Table 31 through Table 44 (USC)] for spring-loaded valves and Table 17 through Table 30 (SI) [Table 45 through Table 58 (USC)] for pilot-operated valves. Inlet and outlet pressure limits are governed by the flange pressure–temperature limits or by the manufacturer’s design limits, whichever is lower.

**Table 1—Standard Effective Orifice Areas and Letter Designations**

Designation	Effective Orifice Area mm <sup>2</sup>	Effective Orifice Area in. <sup>2</sup>
D	71	0.110
E	126	0.196
F	198	0.307
G	325	0.503
H	506	0.785
J	830	1.287
K	1,186	1.838
L	1,841	2.853
M	2,323	3.60
N	2,800	4.34
P	4,116	6.38
Q	7,129	11.05
R	10,323	16.00
T	16,774	26.00

#### 7.4 Dimensions

Center-to-face dimensions shall be in accordance with Table 3 through Table 30 (SI) [Table 31 through Table 58 (USC)] with tolerances of  $\pm 1.59$  mm ( $1/16$  in.) for valve inlet sizes up to and including 102 mm (4 in.), and  $\pm 3.18$  mm ( $1/8$  in.) for valve inlet sizes larger than 102 mm (4 in.)

Flange facings and dimensions shall be in accordance with ASME B16.5.

For some valve designs, the inlet raised face height may substantially exceed the nominal dimension specified in ASME B16.5. Consult the manufacturer for exact dimensions.

#### 7.5 Lifting Levers

Lifting levers shall be provided when required by ASME *BPVC* or when designated on the purchaser's specification sheet.

As allowed by code for pilot-operated pressure-relief valves, means in lieu of lifting levers may be specified for connecting and applying adequate pressure to the pilot to verify that the moving parts critical to proper operation are free to move.

#### 7.6 Special Construction Features

Construction features beyond the scope of this standard shall be provided as agreed upon by the manufacturer and the purchaser and shall be designated on the drawings provided to the purchaser. Pressure-relief valves with a steam-relief scenario, not designated in steam service, shall not have an open bonnet design.

## 7.7 Restricted Lift Pressure-relief Valves (See API 520, Part 1, Paragraph 4.2.4)

## 7.8 Threaded Auxiliary Connections

7.8.1 Bonnet vent and body drain plugs shall have NPT thread design.

7.8.2 Pressure-retaining plugs shall be designed in accordance with ASME B1.20.1 with a minimum of four turns of hand tightening prior to wrench tight engagement.

7.8.3 A calibrated manual torque wrench shall be used to apply the manufacturer's stated torques.

## 7.9 Lifting

7.9.1 The manufacturer shall provide lifting sketches and handling instructions for valves weighing from 22.7 kg (50 lb) to 250 kg (550 lb).

7.9.2 Lifting lugs shall be provided for pilot operated valve assemblies over 250 kg (550 lb).

# 8 Material

## 8.1 General

Materials generally used for construction are covered in this section. For special corrosion problems and applications beyond the pressure–temperature limits of this standard, construction materials shall be those agreed upon by the manufacturer and the purchaser. Material selection shall be based on the specified service and pressure–temperature envelope. Materials for sour service shall be in accordance with NACE MR0175/ISO 15156 or NACE AMPP MR0103. When explosive-decompression-resistant elastomers are specified, they shall meet the requirements of either NORSOK M-710 or ISO 23936-1 and ISO 23936-2, as specified by the purchaser. User shall specify which standard they will follow.

NOTE 1 Explosive decompression (also referred to as rapid gas decompression or RGD) is a failure mechanism of elastomer seals and O-rings that is caused by a rapid reduction in pressure of gaseous media.

NOTE 2 Explosive-decompression-resistant elastomer grades are to be considered for high pressure applications, as the probability of explosive decompression increases with pressure, pressure variations, temperature, and cross-section of the O-ring.

NOTE 3 The presence of methanol and H<sub>2</sub>S will make the elastomers significantly more prone to explosive decompression.

## 8.2 Spring-loaded Pressure-relief Valves

The body and bonnet materials shall be in accordance with Table 3 through Table 16 (SI) [Table 31 through Table 44 (USC)] for the required temperature range. The body and bonnet may be of different materials but must meet the minimum pressure–temperature requirement. The body and bonnet materials shall be equivalent to or better than the following types and grades:

- carbon steel, ASME SA-216, Grade WCB;
- austenitic stainless steel, ASME SA-351, Grade CF8M;
- chromium molybdenum steel, ASME SA-217, Grade WC6;
- nickel/copper alloy, ASME SA-494, Grade M35-1;
- alloy 20, ASME SA-351/SA-351M, Grade CN7M.

Materials for springs shall be selected per Table 2 on the basis of the operating temperature of the process fluid unless an analysis of the ambient or relieving conditions indicates a spring requiring a different material.

Material for the internal parts of the valve shall be in accordance with the manufacturer's standards for the temperature and service or as indicated on the purchaser's specification sheet.

**Table 2—Spring Materials**

Operating Temperature °C	Operating Temperature °F	Spring Material
−268 to −60	−450 to −76	Low-temperature alloy steel
−59 to 232	−75 to 450	Carbon steel or chrome alloy steel
233 to 538	451 to 1000	Chrome alloy or high-temperature alloy steel

### 8.3 Pilot-operated Pressure-relief Valves

The main valve body and cap material shall be in accordance with Table 17 through Table 30 (SI) [Table 45 through Table 58 (USC)] for the required temperature range. The body material shall be equivalent to or better than the following types and grades:

- carbon steel, ASME SA-216, Grade WCB;
- austenitic stainless steel, ASME SA-351, Grade CF8M;
- nickel/copper alloy, ASME SA-494, Grade M35-1;
- alloy 20, ASME SA-351, Grade CN7M.

Material for the pilot and internal parts of the valve shall be in accordance with the manufacturer's standards for the temperature and service or as indicated on the purchaser's specification sheet.

### 8.4 Material Marking

**8.4.1** Cast and forged body, bonnet, and cap shall have the heat number cast or stamped in the material.

**8.4.2** Springs used for the set pressure or cold differential test pressure (CDTP) adjustment shall have the spring number identified.

NOTE The spring number is either stamped directly on the spring, or if the wire diameter is smaller than 6 mm (<sup>1</sup>/<sub>4</sub> in.), it may be provided with a color code or by other traceable identification means.

## 9 Inspection and Shop Tests

### 9.1 Inspection

The purchaser reserves the right to witness the shop tests and inspect the valves in the manufacturer's plant to the extent specified on the purchase order.

### 9.2 Set Pressure Test

All pressure-relief valves shall be adjusted to the specified set pressure in accordance with the ASME *BPVC*, the manufacturer's standard practice as published, or as designated by the purchaser. All set pressure adjustments shall be sealed.

### 9.3 Seat Leakage Test

All pressure-relief valves shall be seat leakage tested in accordance with API 527 or as agreed upon by the manufacturer and the purchaser.

## 10 Identification and Preparation for Shipment

### 10.1 Identification

Each pressure-relief valve shall have a corrosion-resistant nameplate permanently attached to the body or bonnet. This nameplate shall be stamped with the data specified in Table A.1 (SI) [Table E.1 (USC)]. Pilot-operated pressure-relief valves shall have an additional nameplate permanently attached to the pilot. The pilot nameplate shall be stamped with the data specified in Table A.2 (SI) [Table E.2 (USC)]. The data may be stamped on the nameplate or on a separate corrosion-resistant tag that is permanently attached to the valve. On completion of pressure-relief valve coating process, the nameplate shall be securely fastened to the valve at a visible location. A separate tag nameplate fixed by a wire shall be used when space is a constraint on the nameplate as detailed in Annex A (SI)/Annex E (USC).

### 10.2 Preparation for Shipment

Each pressure-relief valve shall be prepared for shipment as follows.

- a) After test and inspection, all exterior surfaces, except flange facings, shall be painted as agreed upon by the manufacturer and the purchaser. Corrosion-resistant materials need not be painted. Flange facings shall be coated with a suitable corrosion inhibitor.
- b) Prior to packaging and shipment, valve internals shall be cleaned and dried to ensure test fluids, cleaning agents, particles, and contaminants are removed (excluding corrosion inhibitors).
- c) Threaded openings shall be plugged with suitable protective devices. Temporary plugs shall be distinguishable from permanent metal plugs to ensure they are removed during the installation process.
- d) Inlet and outlet flanges shall be protected to prevent damage from or entrance of foreign material during shipment with the use of distinguishable and temporary covers. Protective covers shall be made of plastic at least  $\frac{1}{8}$  in. (3 mm) thick or wood. The design of the covers shall prevent the valves from being installed without prior removal of the covers. Plastic covers with integral molded securing plugs shall be secured in bolt-holes.

## 11 Pressure–Temperature Tables

### 11.1 General

Table 3 through Table 30 (SI) [Table 31 through Table 58 (USC)] provide flange and bellows pressure limits, materials, and dimensions for pressure-relief valves. Table 3 through Table 16 (SI) [Table 31 through Table 44 (USC)] are specific to spring-loaded pressure-relief valves, while Table 17 through Table 30 (SI) [Table 45 through Table 58 (USC)] are specific to pilot-operated pressure-relief valves.

### 11.2 Materials

Materials for the body/bonnet and springs are indicated for spring-loaded pressure-relief valves. The material for the body is indicated for pilot-operated pressure-relief valves. For further description of body and bonnet materials, see 8.2 for spring-loaded pressure-relief valves and 8.3 for pilot-operated pressure-relief valves. Other combinations of pressure, temperature, size, and materials are outside the scope of this standard.

### 11.3 Temperature Ranges

Temperature ranges are provided to indicate distinct changes in body and/or spring material requirements.

### 11.4 Maximum Inlet Flange Pressure

The maximum inlet flange pressure is provided at specific temperatures. This represents the maximum set pressure for the temperature. The maximum inlet flange pressure values are per ASME B16.34 unless enclosed in parentheses. Values enclosed in parentheses are limited by this standard to a value less than the ASME B16.34 value. Inlet flange pressure values at other temperatures may be interpolated using the charts from Annex B (SI) [Annex F (USC)] or from tables in ASME B16.34 if these values do not exceed the limits in parentheses. The charts in Annex B (SI) [Annex F (USC)] are produced from ASME B16.34 with permission. Pressure changes within the temperature ranges above may not be linear.

### 11.5 Outlet Pressure Limit

#### 11.5.1 Outlet Flange Limit

Outlet flange pressure limits are shown in the “Flange Rating” column and correspond to the ASME B16.34 value unless enclosed in parentheses. If the value is shown in parentheses, the value is less than that provided in ASME B16.34. The values in the “Flange Rating” column at 38 °C (100 °F) are the limit for this standard. Outlet flange pressure values at other temperatures may be interpolated using charts from Annex B (SI) [Annex F (USC)] or from tables in ASME B16.34 if these values do not exceed the value at 38 °C (100 °F) above. The charts in Annex B (SI) [Annex F (USC)] are produced from ASME B16.34 with permission. Pressure changes within the temperature ranges above may not be linear.

#### 11.5.2 Bellows Limit

The bellows pressure limit is listed in the “Bellows Rating” column and represents the design pressure of the bellows at the outlet temperature of 38 °C (100 °F). The bellows pressure values at other temperatures may be determined by multiplying the above pressure value at 38 °C (100 °F) by the factor from Annex C (SI) [Annex G (USC)].

**Table 3—Spring-loaded Pressure-relief Valves “D” Orifice <sup>f</sup> (Effective Orifice Area = 71 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	1D2	150	150			1,965	1,275	550		1,965	1,585	105	114
	1D2 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	1,585	105	114
	1D2	300	150			5,100	4,275	2,825		1,965	1,585	105	114
	1D2	600	150			10,205	8,515	5,690		1,965	1,585	105	114
	1 <sup>1</sup> / <sub>2</sub> D2	900	300			15,305	12,790	8,515		(4,135)	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300			25,545	21,305	14,170		(4,135)	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> D3	2500	300			(41,370)	35,510	23,650		5,100	3,445	140	178
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	1D2	300	150					3,515	1,480	2,000	1,585	105	114
	1D2	600	150					7,000	2,965	2,000	1,585	105	114
	1 <sup>1</sup> / <sub>2</sub> D2	900	300					10,515	4,480	(4,135)	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300					17,515	7,445	(4,135)	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> D3	2500	300					29,165	12,410	5,170	3,445	140	178
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	1D2	150	150	1,895	1,895	1,895	1,240	550	140	1,895	1,585	105	114
	1D2 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	1,585	105	114
	1D2	300	150	4,965	4,965	4,965	3,415	2,895	2,515	1,895	1,585	105	114
	1D2	600	150	9,930	9,930	9,930	6,825	5,825	5,000	1,895	1,585	105	114
	1 <sup>1</sup> / <sub>2</sub> D2	900	300	14,895	14,895	14,895	10,240	8,720	7,515	(4,135)	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300	24,820	24,820	24,820	17,100	14,550	12,550	(4,135)	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> D3	2500	300	(27,580)	41,370	41,370	28,475	24,270	20,890	4,965	3,445	140	178

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C						
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1D2	150	150			1,585	1,205	550	345	1,585	1,585	105	114
	1D2 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	1,585	105	114
	1D2	300	150			4,135	3,275	3,170	1,895	1,585	1,585	105	114
	1D2	600	150			8,275	6,515	6,310	3,790	1,585	1,585	105	114
	1 <sup>1</sup> / <sub>2</sub> D2	900	300			12,410	9,790	9,480	5,690	4,135	3,445	105	140
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	1D2	150	150			1,585	1,240			1,585	1,585	105	114
	1D2 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	1,585	105	114
	1D2	300	150			4,135	3,205			1,585	1,585	105	114
	1D2	600	150			8,275	6,410			1,585	1,585	105	114
	1 <sup>1</sup> / <sub>2</sub> D2	900	300			12,410	9,620			4,135	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300			20,685	16,065			4,135	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> D3	2500	300			34,475	26,750			4,135	3,445	140	178

<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.

<sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.

<sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.

<sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.

<sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.

<sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME *BPVC*, Section XIII.



**Table 4—Spring-loaded Pressure-relief Valves “E” Orifice <sup>f</sup> (Effective Orifice Area = 126 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C		
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	1E2	150	150			1,965	1,275	550		1,965	1,585	105	114
	1E2 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	1,585	105	114
	1E2	300	150			5,100	4,275	2,825		1,965	1,585	105	114
	1E2	600	150			10,205	8,515	5,690		1,965	1,585	105	114
	1½E2	900	300			15,305	12,790	8,515		(4,135)	3,445	105	140
	1½E2	1500	300			25,545	21,305	14,170		(4,135)	3,445	105	140
	1½E3	2500	300			(41,370)	35,510	23,650		5,100	3,445	140	178
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	1E2	300	150					3,515	1,480	2,000	1,585	105	114
	1E2	600	150					7,000	2,965	2,000	1,585	105	114
	1½E2	900	300					10,515	4,480	(4,135)	3,445	105	140
	1½E2	1500	300					17,515	7,445	(4,135)	3,445	105	140
	1½E3	2500	300					29,165	12,410	5,170	3,445	140	178
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	1E2	150	150	1,895	1,895	1,895	1,240	550	140	1,895	1,585	105	114
	1E2 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	1,585	105	114
	1E2	300	150	4,965	4,965	4,965	3,415	2,895	2,515	1,895	1,585	105	114
	1E2	600	150	9,930	9,930	9,930	6,825	5,825	5,000	1,895	1,585	105	114
	1½E2	900	300	14,895	14,895	14,895	10,240	8,720	7,515	(4,135)	3,445	105	140
	1½E2	1500	300	24,820	24,820	24,820	17,100	14,550	12,550	(4,135)	3,445	105	140
	1½E3	2500	300	(27,580)	41,370	41,370	28,475	24,270	20,890	4,965	3,445	140	178

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1E2	150	150			1,585	1,205	550	345	1,585	1,585	105	114
	1E2 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	1,585	105	114
	1E2	300	150			4,135	3,275	3,170	1,895	1,585	1,585	105	114
	1E2	600	150			8,275	6,515	6,310	3,790	1,585	1,585	105	114
	1 <sup>1</sup> / <sub>2</sub> E2	900	300			12,410	9,790	9,480	5,690	4,135	3,445	105	140
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	1E2	150	150			1,585	1,240			1,585	1,585	105	114
	1E2 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	1,585	105	114
	1E2	300	150			4,135	3,205			1,585	1,585	105	114
	1E2	600	150			8,275	6,410			1,585	1,585	105	114
	1 <sup>1</sup> / <sub>2</sub> E2	900	300			12,410	9,620			4,135	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> E2	1500	300			20,685	16,065			4,135	3,445	105	140
	1 <sup>1</sup> / <sub>2</sub> E3	2500	300			34,475	26,750			4,135	3,445	140	178
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C. <sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.													

**Table 5—Spring-loaded Pressure-relief Valves “F” Orifice <sup>f</sup> (Effective Orifice Area = 198 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	1½F2	150	150			1,965	1,275	550		1,965	1,585	124	121
	1½F2 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	1,585	124	121
	1½F2	300	150			5,100	4,275	2,825		1,965	1,585	124	152
	1½F2	600	150			10,205	8,515	5,690		1,965	1,585	124	152
	1½F3	900	300			15,305	12,790	8,515		5,100	3,445	124	165
	1½F3	1500	300			25,545	21,305	14,170		5,100	3,445	124	165
	1½F3	2500	300			(34,475)	(34,475)	23,650		5,100	3,445	140	178
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	1½F2	300	150					3,515	1,480	2,000	1,585	124	152
	1½F2	600	150					7,000	2,965	2,000	1,585	124	152
	1½F3	900	300					10,515	4,480	5,170	3,445	124	165
	1½F3	1500	300					17,515	7,445	5,170	3,445	124	165
	1½F3	2500	300					29,165	12,410	5,170	3,445	140	178
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	1½F2	150	150	1,895	1,895	1,895	1,240	550	140	1,895	1,585	124	121
	1½F2 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	1,585	124	121
	1½F2	300	150	4,965	4,965	4,965	3,415	2,895	2,515	1,895	1,585	124	152
	1½F2	600	150	9,930	9,930	9,930	6,825	5,825	5,000	1,895	1,585	124	152
	1½F3	900	300	14,895	14,895	14,895	10,240	8,720	7,515	4,965	3,445	124	165
	1½F3	1500	300	(15,170)	24,820	24,820	17,100	14,550	12,550	4,965	3,445	124	165
	1½F3	2500	300	(23,440)	(34,475)	(34,475)	28,475	24,270	20,890	4,965	3,445	140	178

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
				-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1½F2	150	150			1,585	1,205	550	345	1,585	1,585	124	121
	1½F2 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	1,585	124	121
	1½F2	300	150			4,135	3,275	3,170	1,895	1,585	1,585	124	152
	1½F2	600	150			8,275	6,515	6,310	3,790	1,585	1,585	124	152
	1½F3	900	300			12,410	9,790	9,480	5,690	4,135	3,445	124	165
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	1½F2	150	150			1,585	1,240			1,585	1,585	124	121
	1½F2 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	1,585	124	121
	1½F2	300	150			4,135	3,205			1,585	1,585	124	152
	1½F2	600	150			8,275	6,410			1,585	1,585	124	152
	1½F3	900	300			12,410	9,620			4,135	3,445	124	165
	1½F3	1500	300			20,685	16,065			4,135	3,445	124	165
	1½F3	2500	300			34,475	26,750			4,135	3,445	140	178

<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.

<sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.

<sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.

<sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.

<sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.

<sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.

**Table 6—Spring-loaded Pressure-relief Valves “G” Orifice <sup>f</sup> (Effective Orifice Area = 325 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C	38 °C	38 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	1½G3	150	150			1,965	1,275	550		1,965	1,585	124	121
	1½G3 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	1,585	124	121
	1½G3	300	150			5,100	4,275	2,825		1,965	1,585	124	152
	1½G3	600	150			10,205	8,515	5,690		1,965	1,585	124	152
	1½G3	900	300			15,305	12,790	8,515		5,100	3,240	124	165
	2G3	1500	300			25,545	21,305	14,170		5,100	3,240	156	171
	2G3	2500	300			(25,545)	(25,545)	23,650		5,100	3,240	156	171
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	1½G3	300	150					3,515	1,480	2,000	1,585	124	152
	1½G3	600	150					7,000	2,965	2,000	1,585	124	152
	1½G3	900	300					10,515	4,480	5,170	3,240	124	165
	2G3	1500	300					17,515	7,445	5,170	3,240	156	171
	2G3	2500	300					(25,545)	12,410	5,170	3,240	156	171
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	1½G3	150	150	1,895	1,895	1,895	1,240	550	140	1,895	1,585	124	121
	1½G3 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	1,585	124	121
	1½G3	300	150	4,965	4,965	4,965	3,415	2,895	2,515	1,895	1,585	124	152
	1½G3	600	150	9,930	9,930	9,930	6,825	5,825	5,000	1,895	1,585	124	152
	1½G3	900	300	14,895	14,895	14,895	10,240	8,720	7,515	4,965	3,240	124	165
	2G3	1500	300	(16,890)	24,820	24,820	17,100	14,550	12,550	4,965	3,240	156	171
	2G3	2500	300	(17,925)	(24,820)	(24,820)	(24,820)	24,270	20,890	4,965	3,240	156	171

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1½G3	150	150			1,585	1,205	550	345	1,585	1,585	124	121
	1½G3 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	1,585	124	121
	1½G3	300	150			4,135	3,275	3,170	1,895	1,585	1,585	124	152
	1½G3	600	150			8,275	6,515	6,310	3,790	1,585	1,585	124	152
	1½G3	900	300			12,410	9,790	9,480	5,690	4,135	3,240	124	165
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	1½G3	150	150			1,585	1,240			1,585	1,585	124	121
	1½G3 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	1,585	124	121
	1½G3	300	150			4,135	3,205			1,585	1,585	124	152
	1½G3	600	150			8,275	6,410			1,585	1,585	124	152
	1½G3	900	300			12,410	9,620			4,135	3,240	124	165
	2G3	1500	300			20,685	16,065			4,135	3,240	156	171
	2G3	2500	300			(25,545)	(25,545)			4,135	3,240	156	171
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.													
<sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.													
<sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.													
<sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.													
<sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.													
<sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.													

**Table 7—Spring-loaded Pressure-relief Valves “H” Orifice <sup>f</sup> (Effective Orifice Area = 506 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C	38 °C	38 °C		
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	1 1/2H3	150	150			1,965	1,275	550		1,965	1,585	130	124
	1 1/2H3 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	1,585	130	124
	2H3	300	150			5,100	4,275	2,825		1,965	1,585	130	124
	2H3	600	150			10,205	8,515	5,690		1,965	1,585	154	162
	2H3	900	150			15,305	12,790	8,515		1,965	1,585	154	162
	2H3	1500	300			(18,960)	(18,960)	14,170		5,100	2,860	154	162
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	2H3	300	150					3,515	1,480	2,000	1,585	130	124
	2H3	600	150					7,000	2,965	2,000	1,585	130	124
	2H3	900	150					10,515	4,480	2,000	1,585	154	162
	2H3	1500	300					17,515	7,445	5,170	2,860	154	162
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	1 1/2H3	150	150	1,895	1,895	1,895	1,240	550	140	1,895	1,585	130	124
	1 1/2H3 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	1,585	130	124
	2H3	300	150	4,965	4,965	4,965	3,415	2,895	2,515	1,895	1,585	130	124
	2H3	600	150	9,930	9,930	9,930	6,825	5,825	5,000	1,895	1,585	154	162
	2H3	900	150	(10,240)	14,895	14,895	10,240	8,720	7,515	1,895	1,585	154	162
	2H3	1500	300	(11,030)	(18,960)	(18,960)	17,100	14,550	12,550	(4,135)	2,860	154	162
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1 1/2H3	150	150			1,585	1,205	550	345	1,585	1,585	130	124
	1 1/2H3 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	1,585	130	124
	2H3	300	150			4,135	3,275	3,170	1,895	1,585	1,585	130	124
	2H3	600	150			8,275	6,515	6,310	3,790	1,585	1,585	154	162
	2H3	900	150			12,410	9,790	9,480	5,690	1,585	1,585	154	162

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	1 <sup>1</sup> / <sub>2</sub> H3	150	150			1,585	1,240			1,585	1,585	130	124
	1 <sup>1</sup> / <sub>2</sub> H3 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	1,585	130	124
	2H3	300	150			4,135	3,205			1,585	1,585	130	124
	2H3	600	150			8,275	6,410			1,585	1,585	154	162
	2H3	900	150			12,410	9,620			1,585	1,585	154	162
	2H3	1500	300			(18,960)	16,065			4,135	2,860	154	162
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.</p> <p><sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.</p>													



**Table 8—Spring-loaded Pressure-relief Valves “J” Orifice <sup>f</sup> (Effective Orifice Area = 830 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C						
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	2J3	150	150			1,965	1,275	550		1,965	1,585	137	124
	2J3 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	1,585	137	124
	3J4	300	150			5,100	4,275	2,825		1,965	1,585	184	181
	3J4	600	150			10,205	8,515	5,690		1,965	1,585	184	181
	3J4	900	150			15,305	12,790	8,515		1,965	1,585	184	181
	3J4	1500	300			(18,615)	(18,615)	14,170		(4,135)	1,585	184	181
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	3J4	300	150					3,515	1,480	2,000	1,585	184	181
	3J4	600	150					7,000	2,965	2,000	1,585	184	181
	3J4	900	150					10,515	4,480	2,000	1,585	184	181
	3J4	1500	300					17,515	7,445	(4,135)	1,585	184	181
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	2J3	150	150	1,895	1,895	1,895	1,240	550	140	1,895	1,585	137	124
	2J3 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	1,585	137	124
	3J4	300	150	(3,445)	4,965	4,965	3,415	2,895	2,515	1,895	1,585	184	181
	3J4	600	150	(4,310)	9,930	9,930	6,825	5,825	5,000	1,895	1,585	184	181
	3J4	900	150	(5,515)	14,895	14,895	10,240	8,720	7,515	1,895	1,585	184	181
	3J4	1500	300	(5,515)	(18,960)	(18,960)	17,100	14,550	12,550	(4,135)	1,585	184	181
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	2J3	150	150			1,585	1,205	550	345	1,585	1,585	137	124
	2J3 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	1,585	137	124
	3J4	300	150			4,135	3,275	3,170	1,895	1,585	1,585	184	181
	3J4	600	150			8,275	6,515	6,310	3,790	1,585	1,585	184	181
	3J4	900	150			12,410	9,790	9,480	5,690	1,585	1,585	184	181

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	2J3	150	150			1,585	1,240			1,585	1,585	137	124
	2J3 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	1,585	137	124
	3J4	300	150			4,135	3,205			1,585	1,585	184	181
	3J4	600	150			8,275	6,410			1,585	1,585	184	181
	3J4	900	150			12,410	9,620			1,585	1,585	184	181
	3J4	1500	300			(18,615)	16,065			4,135	1,585	184	181
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.</p> <p><sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.</p>													

**Table 9—Spring-loaded Pressure-relief Valves “K” Orifice <sup>f</sup> (Effective Orifice Area = 1,186 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C	38 °C	38 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	3K4	150	150			1,965	1,275	550		1,965	1,035	156	162
	3K4 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	1,035	156	162
	3K4	300	150			5,100	4,275	2,825		1,965	1,035	156	162
	3K4	600	150			10,205	8,515	5,690		1,965	1,380	184	181
	3K6	900	150			15,305	12,790	8,515		1,965	1,380	198	216
	3K6	1500	300			(15,305)	(15,305)	14,170		(4,135)	1,380	197	216
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	3K4	300	150					3,515	1,480	2,000	1,035	156	162
	3K4	600	150					7,000	2,965	2,000	1,380	184	181
	3K6	900	150					10,515	4,480	2,000	1,380	198	216
	3K6	1500	300					(15,305)	7,445	(4,135)	1,380	197	216
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	3K4	150	150	1,895	1,895	1,895	1,240	550	140	1,895	1,035	156	162
	3K4 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	1,035	156	162
	3K4	300	150	(3,620)	4,965	4,965	3,415	2,895	2,515	1,895	1,035	156	162
	3K4	600	150	(4,135)	9,930	9,930	6,825	5,825	5,000	1,895	1,380	184	181
	3K6	900	150	(4,135)	14,895	14,895	10,240	8,720	7,515	1,895	1,380	198	216
	3K6	1500	300	(5,170)	(15,305)	(15,305)	(15,305)	14,550	12,550	(4,135)	1,380	197	216
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	3K4	150	150			1,585	1,205	550	345	1,585	1,035	156	162
	3K4 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	1,035	156	162
	3K4	300	150			4,135	3,275	3,170	1,895	1,585	1,035	156	162
	3K4	600	150			8,275	6,515	6,310	3,790	1,585	1,380	184	181
	3K6	900	150			12,410	9,790	9,480	5,690	1,585	1,380	198	216

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	3K4	150	150			1,585	1,240			1,585	1,035	156	162
	3K4 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	1,035	156	162
	3K4	300	150			4,135	3,205			1,585	1,035	156	162
	3K4	600	150			8,275	6,410			1,585	1,380	184	181
	3K6	900	150			12,410	9,620			1,585	1,380	198	216
	3K6	1500	300			(15,305)	(15,305)			4,135	1,380	197	216
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.</p> <p><sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>													

**Table 10—Spring-loaded Pressure-relief Valves “L” Orifice <sup>f</sup> (Effective Orifice Area = 1,841 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C	38 °C	38 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	3L4	150	150			1,965	1,275	550		1,965	690	156	165
	3L4 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	690	156	165
	4L6	300	150			5,100	4,275	2,825		1,965	1,170	179	181
	4L6	600	150			(6,895)	(6,895)	5,690		1,965	1,170	179	203
	4L6	900	150			(10,340)	(10,340)	8,515		1,965	1,170	197	222
	4L6	1500	150			(10,340)	(10,340)	(10,340)		1,965	1,170	197	222
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	4L6	300	150					3,515	1,480	2,000	1,170	179	181
	4L6	600	150					(6,895)	2,965	2,000	1,170	179	203
	4L6	900	150					(10,340)	4,480	2,000	1,170	197	222
	4L6	1500	150					(10,340)	7,445	2,000	1,170	197	222
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	3L4	150	150	1,895	1,895	1,895	1,240	550	140	1,895	690	156	165
	3L4 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	690	156	165
	4L6	300	150	(3,690)	4,965	4,965	3,415	2,895	2,515	1,895	1,170	179	181
	4L6	600	150	(3,690)	(6,895)	(6,895)	6,825	5,825	5,000	1,895	1,170	179	203
	4L6	900	150	(4,825)	(10,340)	(10,340)	10,240	8,720	7,515	1,895	1,170	197	222
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	3L4	150	150			1,585	1,205	550	345	1,585	690	156	165
	3L4 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	690	156	165
	4L6	300	150			4,135	3,275	3,170	1,895	1,585	1,170	179	181
	4L6	600	150			8,275	6,515	6,310	3,790	1,585	1,170	179	203
	4L6	900	150			12,410	9,790	9,480	5,690	1,585	1,170	197	222

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	3L4	150	150			1,585	1,240			1,585	690	156	165
	3L4 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	690	156	165
	4L6	300	150			4,135	3,205			1,585	1,170	179	181
	4L6	600	150			8,275	6,410			1,585	1,170	179	203
	4L6	900	150			(10,340)	9,620			1,585	1,170	197	222
	4L6	1500	150			(10,340)	(10,340)			1,585	1,170	197	222
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.</p> <p><sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.</p>													

**Table 11—Spring-loaded Pressure-relief Valves “M” Orifice <sup>f</sup> (Effective Orifice Area = 2,323 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C						
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	4M6	150	150			1,965	1,275	550		1,965	550	178	184
	4M6 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	550	178	184
	4M6	300	150			5,100	4,275	2,825		1,965	1,105	178	184
	4M6	600	150			(7,585)	(7,585)	5,690		1,965	1,105	178	203
	4M6	900	150			(7,585)	(7,585)	(7,585)		1,965	1,105	197	222
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	4M6	300	150					3,515	1,480	2,000	1,105	178	184
	4M6	600	150					(6,895)	2,965	2,000	1,105	178	203
	4M6	900	150					(7,585)	4,480	2,000	1,105	197	222
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	4M6	150	150	1,895	1,895	1,895	1,240	550	140	1,895	550	178	184
	4M6 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	550	178	184
	4M6	300	150	(3,620)	4,965	4,965	3,415	2,895	2,515	1,895	1,105	178	184
	4M6	600	150	(4,135)	(7,585)	(7,585)	6,825	5,825	5,000	1,895	1,105	178	203
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	4M6	150	150			1,585	1,205	550	345	1,585	550	178	184
	4M6 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	550	178	184
	4M6	300	150			4,135	3,275	3,170	1,895	1,585	1,105	178	184
	4M6	600	150			(7,585)	6,515	6,310	3,790	1,585	1,105	178	203
	4M6	900	150			(7,585)	(7,585)	(7,585)	5,690	1,585	1,105	197	222

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Alloy 20 <sup>e</sup>	4M6	150	150			1,585	1,240			1,585	550	178	184
	4M6 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	550	178	184
	4M6	300	150			4,135	3,205			1,585	1,105	178	184
	4M6	600	150			(7,585)	6,410			1,585	1,105	178	203
	4M6	900	150			(7,585)	(7,585)			1,585	1,105	197	222

<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.

<sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.

<sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.

<sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.

<sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.

<sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME *BPVC*, Section XIII.



**Table 12—Spring-loaded Pressure-relief Valves “N” Orifice <sup>f</sup> (Effective Orifice Area = 2,800 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	4N6	150	150			1,965	1,275	550		1,965	550	197	210
	4N6 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	550	197	210
	4N6	300	150			5,100	4,275	2,825		1,965	1,105	197	210
	4N6	600	150			(6,895)	(6,895)	5,690		1,965	1,105	197	222
	4N6	900	150			(6,895)	(6,895)	(6,895)		1,965	1,105	197	222
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	4N6	300	150					3,515	1,480	2,000	1,105	197	210
	4N6	600	150					(6,895)	2,965	2,000	1,105	197	222
	4N6	900	150					(6,895)	4,480	2,000	1,105	197	222
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	4N6	150	150	1,895	1,895	1,895	1,240	550	140	1,895	550	197	210
	4N6 <sup>c</sup>	300	150	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	550	197	210
	4N6	300	150	(3,105)	4,965	4,965	3,415	2,895	2,515	1,895	1,105	197	210
	4N6	600	150	(3,445)	(6,895)	(6,895)	6,825	5,825	5,000	1,895	1,105	197	222
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	4N6	150	150			1,585	1,205	550	345	1,585	550	197	210
	4N6 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	550	197	210
	4N6	300	150			4,135	3,275	3,170	1,895	1,585	1,105	197	210
	4N6	600	150			(6,895)	6,515	6,310	3,790	1,585	1,105	197	222
	4N6	900	150			(6,895)	(6,895)	(6,895)	5,690	1,585	1,105	197	222

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	4N6	150	150			1,585	1,240			1,585	550	197	210
	4N6 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	550	197	210
	4N6	300	150			4,135	3,205			1,585	1,105	197	210
	4N6	600	150			(6,895)	6,410			1,585	1,105	197	222
	4N6	900	150			(6,895)	(6,895)			1,585	1,105	197	222
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.</p> <p><sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>													

**Table 13—Spring-loaded Pressure-relief Valves “P” Orifice <sup>f</sup> (Effective Orifice Area = 4,116 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	4P6	150	150			1,965	1,275	550		1,965	550	181	229
	4P6 <sup>c</sup>	300	150			(1,965)	(1,965)	(1,965)		1,965	550	181	229
	4P6	300	150			(3,620)	(3,620)	2,825		1,965	1,035	225	254
	4P6	600	150			(6,895)	(6,895)	5,690		1,965	1,035	225	254
	4P6	900	150			(6,895)	(6,895)	(6,895)		1,965	1,035	225	254
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	4P6	300	150					3,515	1,480	2,000	1,035	225	254
	4P6	600	150					(6,895)	2,965	2,000	1,035	225	254
	4P6	900	150					(6,895)	4,480	2,000	1,035	225	254
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	4P6	150	150	(1,205)	1,895	1,895	1,240	550	140	1,895	550	181	229
	4P6 <sup>c</sup>	300	150	(1,205)	(1,895)	(1,895)	(1,895)	(1,895)	(1,895)	1,895	550	181	229
	4P6	300	150	(2,070)	(3,620)	(3,620)	3,415	2,895	2,515	1,895	1,035	225	254
	4P6	600	150	(3,310)	(6,895)	(6,895)	6,825	5,825	5,000	1,895	1,035	225	254
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	4P6	150	150			1,585	1,205	550	345	1,585	550	181	229
	4P6 <sup>c</sup>	300	150			(1,585)	(1,585)	(1,585)	(1,585)	1,585	550	181	229
	4P6	300	150			(3,620)	3,275	3,170	1,895	1,585	1,035	225	254
	4P6	600	150			(6,895)	6,515	6,310	3,790	1,585	1,035	225	254
	4P6	900	150			(6,895)	(6,895)	(6,895)	5,690	1,585	1,035	225	254

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -60 °C	-59 °C to -30 °C	-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C				
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	4P6	150	150			1,585	1,240			1,585	550	181	229
	4P6 <sup>c</sup>	300	150			(1,585)	(1,240)			1,585	550	181	229
	4P6	300	150			(3,620)	3,205			1,585	1,035	225	254
	4P6	600	150			(6,895)	6,410			1,585	1,035	225	254
	4P6	900	150			(6,895)	(6,895)			1,585	1,035	225	254
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.</p> <p><sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>													

**Table 14—Spring-loaded Pressure-relief Valves “Q” Orifice <sup>f</sup> (Effective Orifice Area = 7,129 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C	38 °C	38 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	6Q8	150	150			(1,140)	(1,140)	550		(795)	485	240	241
	6Q8 <sup>c</sup>	300	150			(1,140)	(1,140)	(1,140)		(795)	485	240	241
	6Q8	300	150			(2,070)	(2,070)	(2,070)		(795)	795	240	241
	6Q8	600	150			(4,135)	(4,135)	(4,135)		(795)	795	240	241
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	6Q8	300	150					(1,140)	(1,140)	(795)	795	240	241
	6Q8	600	150					(4,135)	2,965	(795)	795	240	241
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	6Q8	150	150	(1,140)	(1,140)	(1,140)	(1,140)	550	140	(795)	485	240	241
	6Q8 <sup>c</sup>	300	150	(1,140)	(1,140)	(1,140)	(1,140)	(1,140)	(1,140)	(795)	485	240	241
	6Q8	300	150	(1,725)	(2,070)	(2,070)	(2,070)	(2,070)	(2,070)	(795)	795	240	241
	6Q8	600	150	(2,070)	(4,135)	(4,135)	(4,135)	(4,135)	(4,135)	(795)	795	240	241
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	6Q8	150	150			(1,140)	(1,140)	550	345	(795)	485	240	241
	6Q8 <sup>c</sup>	300	150			(1,140)	(1,140)	(1,140)	(965)	(795)	485	240	241
	6Q8	300	150			(2,070)	(2,070)	(2,070)	1,895	(795)	795	240	241
	6Q8	600	150			(4,135)	(4,135)	(4,135)	3,790	(795)	795	240	241

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C						
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	6Q8	150	150			(1,140)	(1,140)			(795)	485	240	241
	6Q8 <sup>c</sup>	300	150			(1,140)	(1,140)			(795)	485	240	241
	6Q8	300	150			(2,070)	(2,070)			(795)	795	240	241
	6Q8	600	150			(4,135)	(4,135)			(795)	795	240	241
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C. <sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.													

**Table 15—Spring-loaded Pressure-relief Valves “R” Orifice <sup>f</sup> (Effective Orifice Area = 10,323 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C	38 °C	38 °C				
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	6R8	150	150			(690)	(690)	550		(415)	415	240	241
	6R8 <sup>c</sup>	300	150			(690)	(690)	(690)		(415)	415	240	241
	6R10	300	150			(1,585)	(1,585)	(1,585)		(690)	690	240	267
	6R10	600	150			(2,070)	(2,070)	(2,070)		(690)	690	240	267
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	6R8 <sup>c</sup>	300	150					(690)	(690)	(690)	690	240	241
	6R10	600	150					(2,070)	(2,070)	(690)	690	240	267
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	6R8	150	150	(380)	(690)	(690)	(690)	550	140	(415)	415	240	241
	6R8 <sup>c</sup>	300	150	(380)	(690)	(690)	(690)	(690)	(690)	(415)	415	240	241
	6R10	300	150	(1,035)	(1,585)	(1,585)	(1,585)	(1,585)	(1,585)	(690)	690	240	267
	6R10	600	150	(1,380)	(2,070)	(2,070)	(2,070)	(2,070)	(2,070)	(690)	690	240	267
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	6R8	150	150			(690)	(690)	550	345	(415)	415	240	241
	6R8 <sup>c</sup>	300	150			(690)	(690)	(690)	(690)	(415)	415	240	241
	6R10	300	150			(1,585)	(1,585)	(1,585)	(1,585)	(690)	690	240	267
	6R10	600	150			(2,070)	(2,070)	(2,070)	(2,070)	(690)	690	240	267

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C						
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	6R8	150	150			(690)	(690)			(415)	415	240	241
	6R8 <sup>c</sup>	300	150			(690)	(690)			(415)	415	240	241
	6R10	300	150			(1,585)	(1,585)			(690)	690	240	267
	6R10	600	150			(2,070)	(2,070)			(690)	690	240	267
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C. <sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.													



**Table 16—Spring-loaded Pressure-relief Valves “T” Orifice <sup>f</sup> (Effective Orifice Area = 16,774 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 38 °C	Bellows Rating Limit <sup>a</sup> 38 °C	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C						
Temperature Range Inclusive -29 °C to 427 °C													
Carbon steel	8T10	150	150			(450)	(450)	(450)		(205)	205	276	279
	8T10 <sup>c</sup>	300	150			(450)	(450)	(450)		(205)	205	276	279
	8T10	300	150			(825)	(825)	(825)		(415)	415	276	279
	8T10	300	150			(2,070)	(2,070)	(2,070)		(690)	690	276	279
Temperature Range Inclusive 427 °C to 538 °C													
Chrome molybdenum steel	8T10	300	150					(825)	690	(415)	415	276	279
	8T10	300	150					(2,070)	(1,480)	(690)	690	276	279
Temperature Range Inclusive -268 °C to 538 °C													
Austenitic stainless steel	8T10	150	150	(345)	(450)	(450)	(450)	(450)	(140)	(205)	205	276	279
	8T10 <sup>c</sup>	300	150	(345)	(450)	(450)	(450)	(450)	(450)	(205)	205	276	279
	8T10	300	150	(450)	(825)	(825)	(825)	(825)	(825)	(415)	415	276	279
Temperature Range Inclusive -29 °C to 482 °C <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	8T10	150	150			(450)	(450)	(450)	345	(205)	205	276	279
	8T10 <sup>c</sup>	300	150			(450)	(450)	(450)	(450)	(205)	205	276	279
	8T10	300	150			(825)	(825)	(825)	(825)	(415)	415	276	279

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> [kPa (gauge)]						Outlet Pressure Limit <sup>a</sup> [kPa (gauge)]		Center-to-face Dimensions (mm)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-268 °C to -60 °C	-59 °C to -30 °C			-29 °C to 38 °C	39 °C to 232 °C	233 °C to 427 °C	428 °C to 538 °C	38 °C	38 °C				
Temperature Range Inclusive -29 °C to 149 °C <sup>e</sup>													
Alloy 20 <sup>e</sup>	8T10	150	150			(450)	(450)			(205)	205	276	279
	8T10 <sup>c</sup>	300	150			(450)	(450)			(205)	205	276	279
	8T10	300	150			(825)	(825)			(415)	415	276	279
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 38 °C, and pressure values at other temperatures may be determined from Annex C. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 482 °C. Pressure ratings indicated in the 538 °C column are limited to 482 °C.</p> <p><sup>e</sup> Materials limited to 149 °C. Pressure ratings indicated in the 232 °C column are limited to 149 °C.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.</p>													

**Table 17—Pilot-operated Pressure-relief Valves “D” Orifice <sup>d</sup> (Effective Orifice Area = 71 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C	Inlet	Outlet
Temperature Range Inclusive -29 °C to 260 °C									
Carbon steel	1D2	150	150		1,965	1,170	1,965	105	114
	1D2	300	150		5,100	4,170	1,965	111	114
	1D2	600	150		10,205	8,310	1,965	111	114
	1D2	900	300		15,305	12,480	5,100	125	121
	1D2	1500	300		25,545	20,790	5,100	125	121
	1D2	2500	300		42,540	34,645	5,100	125	121
	1½D2	150	150		1,965	1,170	1,965	124	121
	1½D2	300	150		5,100	4,170	1,965	124	121
	1½D2	600	150		10,205	8,310	1,965	124	121
	1½D2	900	300		15,305	12,480	5,100	149	140
	1½D2	1500	300		25,545	20,790	5,100	149	140
	1½D2	2500	300		42,540	34,645	5,100	149	140

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C		38 °C	Inlet
Temperature Range Inclusive -268 °C to 260 °C									
Austenitic stainless steel	1D2	150	150	1,895	1,895	1,170	1,895	105	114
	1D2	300	150	4,965	4,965	3,310	1,895	111	114
	1D2	600	150	9,930	9,930	6,585	1,895	111	114
	1D2	900	300	14,895	14,895	9,895	4,965	125	121
	1D2	1500	300	24,820	24,820	16,480	4,965	125	121
	1D2	2500	300	41,370	41,370	27,440	4,965	125	121
	1½D2	150	150	1,895	1,895	1,170	1,895	124	121
	1½D2	300	150	4,965	4,965	3,310	1,895	124	121
	1½D2	600	150	9,930	9,930	6,585	1,895	124	121
	1½D2	900	300	14,895	14,895	9,895	4,965	149	140
	1½D2	1500	300	24,820	24,820	16,480	4,965	149	140
1½D2	2500	300	41,370	41,370	27,440	4,965	149	140	
Temperature Range Inclusive -29 °C to 260 °C									
Nickel/copper alloy	1D2	150	150		1,585	1,170	1,585	105	114
	1D2	300	150		4,135	3,275	1,585	111	114
	1D2	600	150		8,275	6,515	1,585	111	114
	1D2	900	300		12,410	9,790	4,135	125	121
	1½D2	150	150		1,585	1,170	1,585	124	121
	1½D2	300	150		4,135	3,275	1,585	124	121
	1½D2	600	150		8,275	6,515	1,585	124	121
	1½D2	900	300		12,410	9,790	4,135	149	140

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C		38 °C	Inlet
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	1D2	150	150		1,585	1,240	1,585	105	114
	1D2	300	150		4,135	3,205	1,585	111	114
	1D2	600	150		8,275	6,410	1,585	111	114
	1D2	900	300		12,410	9,620	4,135	125	121
	1D2	1500	300		20,685	16,065	4,135	125	121
	1D2	2500	300		34,475	26,750	4,135	125	121
	1½D2	150	150		1,585	1,240	1,585	124	121
	1½D2	300	150		4,135	3,205	1,585	124	121
	1½D2	600	150		8,275	6,410	1,585	124	121
	1½D2	900	300		12,410	9,620	4,135	149	140
	1½D2	1500	300		20,685	16,065	4,135	149	140
	1½D2	2500	300		34,475	26,750	4,135	149	140
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

Table 18—Pilot-operated Pressure-relief Valves “E” Orifice <sup>d</sup> (Effective Orifice Area = 126 mm<sup>2</sup>) (SI)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
							-268 °C to -30 °C		-29 °C to 38 °C
Temperature Range Inclusive -29 °C to 260 °C									
Carbon steel	1E2	150	150		1,965	1,170	1,965	105	114
	1E2	300	150		5,100	4,170	1,965	111	114
	1E2	600	150		10,205	8,310	1,965	111	114
	1E2	900	300		15,305	12,480	5,100	125	121
	1E2	1500	300		25,545	20,790	5,100	125	121
	1E2	2500	300		42,540	34,645	5,100	125	121
	1½E2	150	150		1,965	1,170	1,965	124	121
	1½E2	300	150		5,100	4,170	1,965	124	121
	1½E2	600	150		10,205	8,310	1,965	124	121
	1½E2	900	300		15,305	12,480	5,100	149	140
	1½E2	1500	300		25,545	20,790	5,100	149	140
	1½E2	2500	300		42,540	34,645	5,100	149	140

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C							
Temperature Range Inclusive -268 °C to 260 °C									
Austenitic stainless steel	1E2	150	150	1,895	1,895	1,170	1,895	105	114
	1E2	300	150	4,965	4,965	3,310	1,895	111	114
	1E2	600	150	9,930	9,930	6,585	1,895	111	114
	1E2	900	300	14,895	14,895	9,895	4,965	125	121
	1E2	1500	300	24,820	24,820	16,480	4,965	125	121
	1E2	2500	300	41,370	41,370	27,440	4,965	125	121
	1½E2	150	150	1,895	1,895	1,170	1,895	124	121
	1½E2	300	150	4,965	4,965	3,310	1,895	124	121
	1½E2	600	150	9,930	9,930	6,585	1,895	124	121
	1½E2	900	300	14,895	14,895	9,895	4,965	149	140
	1½E2	1500	300	24,820	24,820	16,480	4,965	149	140
1½E2	2500	300	41,370	41,370	27,440	4,965	149	140	
Temperature Range Inclusive -29 °C to 260 °C									
Nickel/copper alloy	1E2	150	150		1,585	1,170	1,585	105	114
	1E2	300	150		4,135	3,275	1,585	111	114
	1E2	600	150		8,275	6,515	1,585	111	114
	1E2	900	300		12,410	9,790	4,135	125	121
	1½E2	150	150		1,585	1,170	1,585	124	121
	1½E2	300	150		4,135	3,275	1,585	124	121
	1½E2	600	150		8,275	6,515	1,585	124	121
	1½E2	900	300		12,410	9,790	4,135	149	140

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C		38 °C	Inlet
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	1E2	150	150		1,585	1,240	1,585	105	114
	1E2	300	150		4,135	3,205	1,585	111	114
	1E2	600	150		8,275	6,410	1,585	111	114
	1E2	900	300		12,410	9,620	4,135	125	121
	1E2	1500	300		20,685	16,065	4,135	125	121
	1E2	2500	300		34,475	26,750	4,135	125	121
	1½E2	150	150		1,585	1,240	1,585	124	121
	1½E2	300	150		4,135	3,205	1,585	124	121
	1½E2	600	150		8,275	6,410	1,585	124	121
	1½E2	900	300		12,410	9,620	4,135	149	140
	1½E2	1500	300		20,685	16,065	4,135	149	140
	1½E2	2500	300		34,475	26,750	4,135	149	140
<sup>a</sup>	Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.								
<sup>b</sup>	Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.								
<sup>c</sup>	Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.								
<sup>d</sup>	Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i> , Section XIII.								



**Table 19—Pilot-operated Pressure-relief Valves “F” Orifice <sup>d</sup> (Effective Orifice Area = 198 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
							-268 °C to -30 °C		-29 °C to 38 °C
Temperature Range Inclusive -29 °C to 260 °C									
Carbon steel	1F2	150	150		1,965	1,170	1,965	105	114
	1F2	300	150		5,100	4,170	1,965	111	114
	1F2	600	150		10,205	8,310	1,965	111	114
	1F2	900	300		15,305	12,480	5,100	125	121
	1F2	1500	300		25,545	20,790	5,100	125	121
	1F2	2500	300		42,540	34,645	5,100	125	121
	1½F2	150	150		1,965	1,170	1,965	124	121
	1½F2	300	150		5,100	4,170	1,965	124	121
	1½F2	600	150		10,205	8,310	1,965	124	121
	1½F2	900	300		15,305	12,480	5,100	149	140
	1½F2	1500	300		25,545	20,790	5,100	149	140
	1½F2	2500	300		42,540	34,645	5,100	149	140

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C	Inlet	Outlet
Temperature Range Inclusive -268 °C to 260 °C									
Austenitic stainless steel	1F2	150	150	1,895	1,895	1,170	1,895	105	114
	1F2	300	150	4,965	4,965	3,310	1,895	111	114
	1F2	600	150	9,930	9,930	6,585	1,895	111	114
	1F2	900	300	14,895	14,895	9,895	4,965	125	121
	1F2	1500	300	24,820	24,820	16,480	4,965	125	121
	1F2	2500	300	41,370	41,370	27,440	4,965	125	121
	1½F2	150	150	1,895	1,895	1,170	1,895	124	121
	1½F2	300	150	4,965	4,965	3,310	1,895	124	121
	1½F2	600	150	9,930	9,930	6,585	1,895	124	121
	1½F2	900	300	14,895	14,895	9,895	4,965	149	140
	1½F2	1500	300	24,820	24,820	16,480	4,965	149	140
	1½F2	2500	300	41,370	41,370	27,440	4,965	149	140
Temperature Range Inclusive -29 °C to 260 °C									
Nickel/copper alloy	1F2	150	150		1,585	1,170	1,585	105	114
	1F2	300	150		4,135	3,275	1,585	111	114
	1F2	600	150		8,275	6,515	1,585	111	114
	1F2	900	300		12,410	9,790	4,135	125	121
	1½F2	150	150		1,585	1,170	1,585	124	121
	1½F2	300	150		4,135	3,275	1,585	124	121
	1½F2	600	150		8,275	6,515	1,585	124	121
	1½F2	900	300		12,410	9,790	4,135	149	140

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C						
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	1F2	150	150		1,585	1,240	1,585	105	114
	1F2	300	150		4,135	3,205	1,585	111	114
	1F2	600	150		8,275	6,410	1,585	111	114
	1F2	900	300		12,410	9,620	4,135	125	121
	1F2	1500	300		20,685	16,065	4,135	125	121
	1F2	2500	300		34,475	26,750	4,135	125	121
	1 <sup>1</sup> / <sub>2</sub> F2	150	150		1,585	1,240	1,585	124	121
	1 <sup>1</sup> / <sub>2</sub> F2	300	150		4,135	3,205	1,585	124	121
	1 <sup>1</sup> / <sub>2</sub> F2	600	150		8,275	6,410	1,585	124	121
	1 <sup>1</sup> / <sub>2</sub> F2	900	300		12,410	9,620	4,135	149	140
	1 <sup>1</sup> / <sub>2</sub> F2	1500	300		20,685	16,065	4,135	149	140
	1 <sup>1</sup> / <sub>2</sub> F2	2500	300		34,475	26,750	4,135	149	140

<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.

<sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.

<sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.

<sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.

Table 20—Pilot-operated Pressure-relief Valves “G” Orifice <sup>d</sup> (Effective Orifice Area = 325 mm<sup>2</sup>) (SI)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
							–268 °C to –30 °C		–29 °C to 38 °C
Temperature Range Inclusive –29 °C to 260 °C									
Carbon steel	1 <sup>1</sup> / <sub>2</sub> G3	150	150		1,965	1,170	1,965	130	124
	1 <sup>1</sup> / <sub>2</sub> G3	300	150		5,100	4,170	1,965	130	124
	1 <sup>1</sup> / <sub>2</sub> G3	600	150		10,205	8,310	1,965	130	124
	1 <sup>1</sup> / <sub>2</sub> G3	900	300		15,305	12,480	5,100	162	171
	1 <sup>1</sup> / <sub>2</sub> G3	1500	300		25,545	20,790	5,100	162	171
	1 <sup>1</sup> / <sub>2</sub> G3	2500	300		42,540	34,645	5,100	162	171
	2G3	150	150		1,965	1,170	1,965	137	124
	2G3	300	150		5,100	4,170	1,965	137	124
	2G3	600	150		10,205	8,310	1,965	137	124
	2G3	900	300		15,305	12,480	5,100	167	171
	2G3	1500	300		25,545	20,790	5,100	167	171
	2G3	2500	300		42,540	34,645	5,100	178	171

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C						
Temperature Range Inclusive -268 °C to 260 °C									
Austenitic stainless steel	1 1/2G3	150	150	1,895	1,895	1,170	1,895	130	124
	1 1/2G3	300	150	4,965	4,965	3,310	1,895	130	124
	1 1/2G3	600	150	9,930	9,930	6,585	1,895	130	124
	1 1/2G3	900	300	14,895	14,895	9,895	4,965	162	171
	1 1/2G3	1500	300	24,820	24,820	16,480	4,965	162	171
	1 1/2G3	2500	300	41,370	41,370	27,440	4,965	162	171
	2G3	150	150	1,895	1,895	1,170	1,895	137	124
	2G3	300	150	4,965	4,965	3,310	1,895	137	124
	2G3	600	150	9,930	9,930	6,585	1,895	137	124
	2G3	900	300	14,895	14,895	9,895	4,965	167	171
	2G3	1500	300	24,820	24,820	16,480	4,965	167	171
	2G3	2500	300	41,370	41,370	27,440	4,965	178	171
Temperature Range Inclusive -29 °C to 260 °C									
Nickel/copper alloy	1 1/2G3	150	150		1,585	1,170	1,585	130	124
	1 1/2G3	300	150		4,135	3,275	1,585	130	124
	1 1/2G3	600	150		8,275	6,515	1,585	130	124
	1 1/2G3	900	300		12,410	9,790	4,135	162	171
	2G3	150	150		1,585	1,170	1,585	137	124
	2G3	300	150		4,135	3,275	1,585	137	124
	2G3	600	150		8,275	6,515	1,585	137	124
	2G3	900	300		12,410	9,790	4,135	167	171

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	1½G3	150	150		1,585	1,240	1,585	130	124
	1½G3	300	150		4,135	3,205	1,585	130	124
	1½G3	600	150		8,275	6,410	1,585	130	124
	1½G3	900	300		12,410	9,620	4,135	162	171
	1½G3	1500	300		20,685	16,065	4,135	162	171
	1½G3	2500	300		34,475	26,750	4,135	162	171
	2G3	150	150		1,585	1,240	1,585	137	124
	2G3	300	150		4,135	3,205	1,585	137	124
	2G3	600	150		8,275	6,410	1,585	137	124
	2G3	900	300		12,410	9,620	4,135	167	171
	2G3	1500	300		20,685	16,065	4,135	167	171
	2G3	2500	300		34,475	26,750	4,135	178	171
<sup>a</sup>	Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.								
<sup>b</sup>	Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.								
<sup>c</sup>	Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.								
<sup>d</sup>	Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.								

**Table 21—Pilot-operated Pressure-relief Valves “H” Orifice <sup>d</sup> (Effective Orifice Area = 506 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C							
Temperature Range Inclusive -29 °C to 260 °C									
Carbon steel	1 <sup>1</sup> / <sub>2</sub> H3	150	150		1,965	1,170	1,965	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	300	150		5,100	4,170	1,965	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	600	150		10,205	8,310	1,965	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	900	300		15,305	12,480	5,100	162	171
	1 <sup>1</sup> / <sub>2</sub> H3	1500	300		25,545	20,790	5,100	162	171
	1 <sup>1</sup> / <sub>2</sub> H3	2500	300		42,540	34,645	5,100	162	171
	2H3	150	150		1,965	1,170	1,965	137	124
	2H3	300	150		5,100	4,170	1,965	137	124
	2H3	600	150		10,205	8,310	1,965	137	124
	2H3	900	300		15,305	12,480	5,100	167	171
	2H3	1500	300		25,545	20,790	5,100	167	171
	2H3	2500	300		42,540	34,645	5,100	178	171

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C	Inlet	Outlet
Temperature Range Inclusive -268 °C to 260 °C									
Austenitic stainless steel	1 <sup>1</sup> / <sub>2</sub> H3	150	150	1,895	1,895	1,170	1,895	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	300	150	4,965	4,965	3,310	1,895	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	600	150	9,930	9,930	6,585	1,895	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	900	300	14,895	14,895	9,895	4,965	162	171
	1 <sup>1</sup> / <sub>2</sub> H3	1500	300	24,820	24,820	16,480	4,965	162	171
	1 <sup>1</sup> / <sub>2</sub> H3	2500	300	41,370	41,370	27,440	4,965	162	171
	2H3	150	150	1,895	1,895	1,170	1,895	137	124
	2H3	300	150	4,965	4,965	3,310	1,895	137	124
	2H3	600	150	9,930	9,930	6,585	1,895	137	124
	2H3	900	300	14,895	14,895	9,895	4,965	167	171
	2H3	1500	300	24,820	24,820	16,480	4,965	167	171
	2H3	2500	300	41,370	41,370	27,440	4,965	178	171
Temperature Range Inclusive -29 °C to 260 °C									
Nickel/copper alloy	1 <sup>1</sup> / <sub>2</sub> H3	150	150		1,585	1,170	1,585	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	300	150		4,135	3,275	1,585	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	600	150		8,275	6,515	1,585	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	900	300		12,410	9,790	4,135	162	171
	2H3	150	150		1,585	1,170	1,585	137	124
	2H3	300	150		4,135	3,275	1,585	137	124
	2H3	600	150		8,275	6,515	1,585	137	124
	2H3	900	300		12,410	9,790	4,135	167	171



Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	1 <sup>1</sup> / <sub>2</sub> H3	150	150		1,585	1,240	1,585	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	300	150		4,135	3,205	1,585	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	600	150		8,275	6,410	1,585	130	124
	1 <sup>1</sup> / <sub>2</sub> H3	900	300		12,410	9,620	4,135	162	171
	1 <sup>1</sup> / <sub>2</sub> H3	1500	300		20,685	16,065	4,135	162	171
	1 <sup>1</sup> / <sub>2</sub> H3	2500	300		34,475	26,750	4,135	162	171
	2H3	150	150		1,585	1,240	1,585	137	124
	2H3	300	150		4,135	3,205	1,585	137	124
	2H3	600	150		8,275	6,410	1,585	137	124
	2H3	900	300		12,410	9,620	4,135	167	171
	2H3	1500	300		20,685	16,065	4,135	167	171
	2H3	2500	300		34,475	26,750	4,135	178	171
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

Table 22—Pilot-operated Pressure-relief Valves “J” Orifice <sup>d</sup> (Effective Orifice Area = 830 mm<sup>2</sup>) (SI)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -30 °C	-29 °C to 38 °C
Temperature Range Inclusive -29 °C to 260 °C									
Carbon steel	2J3	150	150		1,965	1,170	1,965	137	124
	2J3	300	150		5,100	4,170	1,965	137	124
	2J3	600	150		10,205	8,310	1,965	137	124
	2J3	900	300		15,305	12,480	5,100	167	171
	2J3	1500	300		25,545	20,790	5,100	167	171
	2J3	2500	300		(31,855)	(31,855)	5,100	178	171
	3J4	150	150		1,965	1,170	1,965	156	162
	3J4	300	150		5,100	4,170	1,965	156	162
	3J4	600	150		10,205	8,310	1,965	162	162
	3J4	900	300		15,305	12,480	5,100	191	181
3J4	1500	300		25,545	20,790	5,100	191	181	

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Inlet Flange (Set) Pressure Limit					
Body	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C	Inlet	Outlet
Temperature Range Inclusive -268 °C to 260 °C									
Austenitic stainless steel	2J3	150	150	1,895	1,895	1,170	1,895	137	124
	2J3	300	150	4,965	4,965	3,310	1,895	137	124
	2J3	600	150	9,930	9,930	6,585	1,895	137	124
	2J3	900	300	14,895	14,895	9,895	4,965	167	171
	2J3	1500	300	24,820	24,820	16,480	4,965	167	171
	2J3	2500	300	(30,990)	(30,990)	27,440	4,965	178	171
	3J4	150	150	1,895	1,895	1,170	1,895	156	162
	3J4	300	150	4,965	4,965	3,310	1,895	156	162
	3J4	600	150	9,930	9,930	6,585	1,895	162	162
	3J4	900	300	14,895	14,895	9,895	4,965	191	181
	3J4	1500	300	24,820	24,820	16,480	4,965	191	181
Temperature Range Inclusive -29 °C to 260 °C									
Nickel/copper alloy	2J3	150	150		1,585	1,170	1,585	137	124
	2J3	300	150		4,135	3,275	1,585	137	124
	2J3	600	150		8,275	6,515	1,585	137	124
	2J3	900	300		12,410	9,790	4,135	167	171
	3J4	150	150		1,585	1,170	1,585	156	162
	3J4	300	150		4,135	3,275	1,585	156	162
	3J4	600	150		8,275	6,515	1,585	162	162
	3J4	900	300		12,410	9,790	4,135	191	181

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)			
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>			Inlet	Outlet
				Inlet Flange (Set) Pressure Limit							
Body	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C				
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>											
Alloy 20 <sup>c</sup>	2J3	150	150		1,585	1,240	1,585	137	124		
	2J3	300	150		4,135	3,205	1,585	137	124		
	2J3	600	150		8,275	6,410	1,585	137	124		
	2J3	900	300		12,410	9,620	4,135	167	171		
	2J3	1500	300		20,685	16,065	4,135	167	171		
	2J3	2500	300		(25,855)	(25,855)	4,135	178	171		
	3J4	150	150		1,585	1,240	1,585	156	162		
	3J4	300	150		4,135	3,205	1,585	156	162		
	3J4	600	150		8,275	6,410	1,585	162	162		
	3J4	900	300		12,410	9,620	4,135	191	181		
	3J4	1500	300		20,685	16,065	4,135	191	181		
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.</p>											

**Table 23—Pilot-operated Pressure-relief Valves “K” Orifice <sup>d</sup> (Effective Orifice Area = 1,186 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	Inlet Flange (Set) Pressure Limit			38 °C
–268 °C to –30 °C	–29 °C to 38 °C	39 °C to 260 °C							
Temperature Range Inclusive –29 °C to 260 °C									
Carbon steel	3K4	150	150		1,965	1,170	1,965	156	162
	3K4	300	150		5,100	4,170	1,965	156	162
	3K4	600	150		10,205	8,310	1,965	162	162
	3K4	900	300		15,305	12,480	5,100	191	181
	3K4	1500	300		25,545	20,790	5,100	191	181
Temperature Range Inclusive –268 °C to 260 °C									
Austenitic stainless steel	3K4	150	150	1,895	1,895	1,170	1,895	156	162
	3K4	300	150	4,965	4,965	3,310	1,895	156	162
	3K4	600	150	9,930	9,930	6,585	1,895	162	162
	3K4	900	300	14,895	14,895	9,895	4,965	191	181
	3K4	1500	300	24,820	24,820	16,480	4,965	191	181
Temperature Range Inclusive –29 °C to 260 °C									
Nickel/copper alloy	3K4	150	150		1,585	1,170	1,585	156	162
	3K4	300	150		4,135	3,275	1,585	156	162
	3K4	600	150		8,275	6,515	1,585	162	162
	3K4	900	300		12,410	9,790	4,135	191	181

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
						-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	3K4	150	150		1,585	1,240	1,585	156	162
	3K4	300	150		4,135	3,205	1,585	156	162
	3K4	600	150		8,275	6,410	1,585	162	162
	3K4	900	300		12,410	9,620	4,135	191	181
	3K4	1500	300		20,685	16,065	4,135	191	181
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

**Table 24—Pilot-operated Pressure-relief Valves “L” Orifice <sup>d</sup> (Effective Orifice Area = 1,841 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup> 38 °C	Inlet	Outlet
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C			
Temperature Range Inclusive -29 °C to 260 °C									
Carbon steel	3L4	150	150		1,965	1,170	1,965	156	162
	3L4	300	150		5,100	4,170	1,965	156	162
	3L4	600	150		(9,825)	8,310	1,965	162	162
	3L4	900	300		15,305	12,480	5,100	191	181
	3L4	1500	300		(25,030)	20,790	5,100	191	181
	4L6	150	150		1,965	1,170	1,965	197	210
	4L6	300	150		5,100	4,170	1,965	197	210
	4L6	600	150		10,205	8,310	1,965	197	210
	4L6	900	300		15,305	12,480	5,100	249	233
	4L6	1500	300		25,545	20,790	5,100	249	233

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C							
Temperature Range Inclusive -268 °C to 260 °C									
Austenitic stainless steel	3L4	150	150	1,895	1,895	1,170	1,895	156	162
	3L4	300	150	4,965	4,965	3,310	1,895	156	162
	3L4	600	150	(9,480)	(9,480)	6,585	1,895	162	162
	3L4	900	300	14,895	14,895	9,895	4,965	191	181
	3L4	1500	300	(24,340)	(24,340)	16,480	4,965	191	181
	4L6	150	150	1,895	1,895	1,170	1,895	197	210
	4L6	300	150	4,965	4,965	3,310	1,895	197	210
	4L6	600	150	9,930	9,930	6,585	1,895	197	210
	4L6	900	300	14,895	14,895	9,895	4,965	249	233
	4L6	1500	300	24,820	24,820	16,480	4,965	249	233
Temperature Range Inclusive -29 °C to 260 °C									
Nickel/copper alloy	3L4	150	150		1,585	1,170	1,585	156	162
	3L4	300	150		4,135	3,275	1,585	156	162
	3L4	600	150		(7,930)	6,515	1,585	162	162
	3L4	900	300		12,410	9,790	4,135	191	181
	4L6	150	150		1,585	1,170	1,585	197	210
	4L6	300	150		4,135	3,275	1,585	197	210
	4L6	600	150		8,275	6,515	1,585	197	210
	4L6	900	300		12,410	9,790	4,135	249	233



Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C		38 °C	Inlet
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	3L4	150	150		1,585	1,240	1,585	156	162
	3L4	300	150		4,135	3,205	1,585	156	162
	3L4	600	150		(7,930)	6,410	1,585	162	162
	3L4	900	300		12,410	9,620	4,135	191	181
	3L4	1500	300		(20,270)	16,065	4,135	191	181
	4L6	150	150		1,585	1,240	1,585	197	210
	4L6	300	150		4,135	3,205	1,585	197	210
	4L6	600	150		8,275	6,410	1,585	197	210
	4L6	900	300		12,410	9,620	4,135	249	233
	4L6	1500	300		20,685	16,065	4,135	249	233
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

Table 25—Pilot-operated Pressure-relief Valves “M” Orifice <sup>d</sup> (Effective Orifice Area = 2,323 mm<sup>2</sup>) (SI)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	Inlet Flange (Set) Pressure Limit			38 °C
–268 °C to –30 °C	–29 °C to 38 °C	39 °C to 260 °C							
Temperature Range Inclusive –29 °C to 260 °C									
Carbon steel	4M6	150	150		1,965	1,170	1,965	197	210
	4M6	300	150		5,100	4,170	1,965	197	210
	4M6	600	150		10,205	8,310	1,965	197	210
	4M6	900	300		15,305	12,480	5,100	249	233
	4M6	1500	300		25,545	20,790	5,100	249	233
Temperature Range Inclusive –268 °C to 260 °C									
Austenitic stainless steel	4M6	150	150	1,895	1,895	1,170	1,895	197	210
	4M6	300	150	4,965	4,965	3,310	1,895	197	210
	4M6	600	150	9,930	9,930	6,585	1,895	197	210
	4M6	900	300	14,895	14,895	9,895	4,965	249	233
	4M6	1500	300	24,820	24,820	16,480	4,965	249	233
Temperature Range Inclusive –29 °C to 260 °C									
Nickel/copper alloy	4M6	150	150		1,585	1,170	1,585	197	210
	4M6	300	150		4,135	3,275	1,585	197	210
	4M6	600	150		8,275	6,515	1,585	197	210
	4M6	900	300		12,410	9,790	4,135	249	233

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C	Inlet	Outlet
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	4M6	150	150		1,585	1,240	1,585	197	210
	4M6	300	150		4,135	3,205	1,585	197	210
	4M6	600	150		8,275	6,410	1,585	197	210
	4M6	900	300		12,410	9,620	4,135	249	233
	4M6	1500	300		20,685	16,065	4,135	249	233
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

Table 26—Pilot-operated Pressure-relief Valves “N” Orifice <sup>d</sup> (Effective Orifice Area = 2,800 mm<sup>2</sup>) (SI)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
							–268 °C to –30 °C		–29 °C to 38 °C
Temperature Range Inclusive –29 °C to 260 °C									
Carbon steel	4N6	150	150		1,965	1,170	1,965	197	210
	4N6	300	150		5,100	4,170	1,965	197	210
	4N6	600	150		10,205	8,310	1,965	197	210
	4N6	900	300		15,305	12,480	5,100	249	233
	4N6	1500	300		25,545	20,790	5,100	249	233
Temperature Range Inclusive –268 °C to 260 °C									
Austenitic stainless steel	4N6	150	150	1,895	1,895	1,170	1,895	197	210
	4N6	300	150	4,965	4,965	3,310	1,895	197	210
	4N6	600	150	9,930	9,930	6,585	1,895	197	210
	4N6	900	300	14,895	14,895	9,895	4,965	249	233
	4N6	1500	300	24,820	24,820	16,480	4,965	249	233
Temperature Range Inclusive –29 °C to 260 °C									
Nickel/copper alloy	4N6	150	150		1,585	1,170	1,585	197	210
	4N6	300	150		4,135	3,275	1,585	197	210
	4N6	600	150		8,275	6,515	1,585	197	210
	4N6	900	300		12,410	9,790	4,135	249	233

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
							-268 °C to -30 °C		-29 °C to 38 °C
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	4N6	150	150		1,585	1,240	1,585	197	210
	4N6	300	150		4,135	3,205	1,585	197	210
	4N6	600	150		8,275	6,410	1,585	197	210
	4N6	900	300		12,410	9,620	4,135	249	233
	4N6	1500	300		20,685	16,065	4,135	249	233
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

Table 27—Pilot-operated Pressure-relief Valves “P” Orifice <sup>d</sup> (Effective Orifice Area = 4,116 mm<sup>2</sup>) (SI)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
						–268 °C to –30 °C	–29 °C to 38 °C	39 °C to 260 °C	38 °C
Temperature Range Inclusive –29 °C to 260 °C									
Carbon steel	4P6	150	150		1,965	1,170	1,965	197	210
	4P6	300	150		5,100	4,170	1,965	197	210
	4P6	600	150		(9,825)	8,310	1,965	197	210
	4P6	600	300		10,205	8,310	5,100	249	233
	4P6	900	300		15,305	12,480	5,100	249	233
	4P6	1500	300		(25,030)	20,790	5,100	249	233
	4P6	1500	600		25,545	20,790	10,205	249	264
Temperature Range Inclusive –268 °C to 260 °C									
Austenitic stainless steel	4P6	150	150	1,895	1,895	1,170	1,895	197	210
	4P6	300	150	4,965	4,965	3,310	1,895	197	210
	4P6	600	150	(9,480)	(9,480)	6,585	1,895	197	210
	4P6	600	300	9,930	9,930	6,585	4,965	249	233
	4P6	900	300	14,895	14,895	9,895	4,965	249	233
	4P6	1500	300	(24,270)	(24,270)	16,480	4,965	249	233
	4P6	1500	600	24,820	24,820	16,480	9,930	249	264

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>	Inlet	Outlet
				-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C			
Temperature Range Inclusive -29 °C to 260 °C									
Nickel/copper alloy	4P6	150	150		1,585	1,170	1,585	197	210
	4P6	300	150		4,135	3,275	1,585	197	210
	4P6	600	150		(7,930)	6,515	1,585	197	210
	4P6	900	300		12,410	9,790	4,135	249	233
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	4P6	150	150		1,585	1,240	1,585	197	210
	4P6	300	150		4,135	3,205	1,585	197	210
	4P6	600	150		(7,930)	6,410	1,585	197	210
	4P6	600	300		8,275	6,410	4,135	249	233
	4P6	900	300		12,410	9,620	4,135	249	233
	4P6	1500	300		(20,270)	16,065	4,135	249	233
	4P6	1500	600		20,685	16,065	8,275	249	264
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

Table 28—Pilot-operated Pressure-relief Valves “Q” Orifice <sup>d</sup> (Effective Orifice Area = 7,129 mm<sup>2</sup>) (SI)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
							–268 °C to –30 °C		–29 °C to 38 °C
Temperature Range Inclusive –29 °C to 260 °C									
Carbon steel	6Q8	150	150		1,965	1,170	1,965	240	241
	6Q8	300	150		5,100	4,170	1,965	240	241
	6Q8	600	150		(9,995)	8,310	1,965	246	241
	6Q8	600	300		10,205	8,310	5,100	246	265
Temperature Range Inclusive –268 °C to 260 °C									
Austenitic stainless steel	6Q8	150	150	1,895	1,895	1,170	1,895	240	241
	6Q8	300	150	4,965	4,965	3,310	1,895	240	241
	6Q8	600	150	(9,655)	(9,655)	6,585	1,895	246	241
	6Q8	600	300	9,930	9,930	6,585	4,965	246	265
Temperature Range Inclusive –29 °C to 260 °C									
Nickel/copper alloy	6Q8	150	150		1,585	1,170	1,585	240	241
	6Q8	300	150		4,135	3,275	1,585	240	241
	6Q8	600	150		(8,065)	6,515	1,585	246	241
	6Q8	600	300		8,275	6,515	4,135	246	265



Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				[kPa (gauge)]			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
							-268 °C to -30 °C		-29 °C to 38 °C
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	6Q8	150	150		1,585	1,240	1,585	240	241
	6Q8	300	150		4,135	3,205	1,585	240	241
	6Q8	600	150		(8,065)	6,410	1,585	246	241
	6Q8	600	300		8,275	6,410	4,135	246	265
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

**Table 29—Pilot-operated Pressure-relief Valves “R” Orifice <sup>d</sup> (Effective Orifice Area = 10,323 mm<sup>2</sup>) (SI)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (mm)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	–268 °C to –30 °C	–29 °C to 38 °C	39 °C to 260 °C	38 °C
Temperature Range Inclusive –29 °C to 260 °C									
Carbon steel	6R8	150	150		1,965	1,170	1,965	240	241
	6R8	300	150		5,100	4,170	1,965	240	241
	6R8	600	150		(7,035)	(7,035)	1,965	246	241
Temperature Range Inclusive –268 °C to 260 °C									
Austenitic stainless steel	6R8	150	150	1,895	1,895	1,170	1,895	240	241
	6R8	300	150	4,965	4,965	3,310	1,895	240	241
	6R8	600	150	(6,790)	(6,790)	6,585	1,895	246	241
Temperature Range Inclusive –29 °C to 260 °C									
Nickel/copper alloy	6R8	150	150		1,585	1,170	1,585	240	241
	6R8	300	150		4,135	3,275	1,585	240	241
	6R8	600	150		(5,655)	(5,655)	1,585	246	241

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-268 °C to -30 °C	-29 °C to 38 °C	39 °C to 260 °C	38 °C
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	6R8	150	150		1,585	1,240	1,585	240	241
	6R8	300	150		4,135	3,205	1,585	240	241
	6R8	600	150		(5,655)	(5,655)	1,585	246	241
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

Table 30—Pilot-operated Pressure-relief Valves “T” Orifice <sup>d</sup> (Effective Orifice Area = 16,774 mm<sup>2</sup>) (SI)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>	Inlet	Outlet
				–268 °C to –30 °C	–29 °C to 38 °C	39 °C to 260 °C			
Temperature Range Inclusive –29 °C to 260 °C									
Carbon steel	8T10	150	150		1,965	1,170	1,965	276	279
	8T10	300	150		5,100	4,170	1,965	276	279
	8T10	600	150		(6,790)	(6,790)	1,965	297	279
Temperature Range Inclusive –268 °C to 260 °C									
Austenitic stainless steel	8T10	150	150	1,895	1,895	1,170	1,895	276	279
	8T10	300	150	4,965	4,965	3,310	1,895	276	279
	8T10	600	150	(6,790)	(6,550)	(6,550)	1,895	297	279
Temperature Range Inclusive –29 °C to 260 °C									
Nickel/copper alloy	8T10	150	150		1,585	1,170	1,585	276	279
	8T10	300	150		4,135	3,275	1,585	276	279
	8T10	600	150		(5,480)	(5,480)	1,585	297	279

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> [kPa (gauge)]				Center-to-face Dimensions (mm)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-268 °C to -30 °C	-29 °C to 38 °C
Temperature Range Inclusive -29 °C to 149 °C <sup>c</sup>									
Alloy 20 <sup>c</sup>	8T10	150	150		1,585	1,240	1,585	276	279
	8T10	300	150		4,135	3,205	1,585	276	279
	8T10	600	150		(5,480)	(5,480)	1,585	297	279
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 38 °C above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex B or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 38 °C above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 149 °C. Pressure ratings indicated in the 260 °C column are limited to 149 °C.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

Table 31—Spring-loaded Pressure-relief Valves “D” Orifice <sup>f</sup> (Effective Orifice Area = 0.110 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive -20 °F to 800 °F													
Carbon steel	1D2	150	150			285	185	80		285	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2 <sup>c</sup>	300	150			(285)	(285)	(285)		285	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	300	150			740	620	410		285	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	600	150			1,480	1,235	825		285	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	900	300			2,220	1,855	1,235		(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300			3,705	3,090	2,055		(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D3	2500	300			(6,000)	5,150	3,430		740	500	5 <sup>1</sup> / <sub>2</sub>	7
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	1D2	300	150					510	215	290	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	600	150					1,015	430	290	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	900	300					1,525	650	(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300					2,540	1,080	(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D3	2500	300					4,230	1,800	750	500	5 <sup>1</sup> / <sub>2</sub>	7
Temperature Range Inclusive -450 °F to 1,000 °F													
Austenitic stainless steel	1D2	150	150	275	275	275	180	80	20	275	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	300	150	720	720	720	495	420	365	275	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	600	150	1,440	1,440	1,440	990	845	725	275	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	900	300	2,160	2,160	2,160	1,485	1,265	1,090	(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300	3,600	3,600	3,600	2,480	2,110	1,820	(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D3	2500	300	(4,000)	6,000	6,000	4,130	3,520	3,030	720	500	5 <sup>1</sup> / <sub>2</sub>	7

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 100 °F	Bellows Rating Limit <sup>a</sup> 100 °F	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1D2	150	150			230	175	80	50	230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	300	150			600	475	460	275	230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	600	150			1,200	945	915	550	230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	900	300			1,800	1,420	1,375	825	600	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	1D2	150	150			230	180			230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2 <sup>c</sup>	300	150			(230)	(180)			230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	300	150			600	465			230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	600	150			1,200	930			230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	900	300			1,800	1,395			600	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300			3,000	2,330			600	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D3	2500	300			5,000	3,880			600	500	5 <sup>1</sup> / <sub>2</sub>	7
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F. <sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.													

**Table 32—Spring-loaded Pressure-relief Valves “E” Orifice <sup>f</sup> (Effective Orifice Area = 0.196 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-450 °F to -76 °F	-75 °F to -21 °F			-20 °F to 100 °F	450 °F	800 °F	1,000 °F	100 °F	100 °F				
Temperature Range Inclusive -20 °F to 800 °F													
Carbon steel	1E2	150	150			285	185	80		285	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2 <sup>c</sup>	300	150			(285)	(285)	(285)		285	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	300	150			740	620	410		285	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	600	150			1,480	1,235	825		285	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	900	300			2,220	1,855	1,235		(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	1500	300			3,705	3,090	2,055		(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E3	2500	300			(6,000)	5,150	3,430		740	500	5 <sup>1</sup> / <sub>2</sub>	7
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	1E2	300	150					510	215	290	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	600	150					1,015	430	290	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	900	300					1,525	650	(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	1500	300					2,540	1,080	(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E3	2500	300					4,230	1,800	750	500	5 <sup>1</sup> / <sub>2</sub>	7
Temperature Range Inclusive -450 °F to 1,000 °F													
Austenitic stainless steel	1E2	150	150	275	275	275	180	80	20	275	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	300	150	720	720	720	495	420	365	275	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	600	150	1,440	1,440	1,440	990	845	725	275	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	900	300	2,160	2,160	2,160	1,485	1,265	1,090	(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	1500	300	3,600	3,600	3,600	2,480	2,110	1,820	(600)	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E3	2500	300	(4,000)	6,000	6,000	4,130	3,520	3,030	720	500	5 <sup>1</sup> / <sub>2</sub>	7



Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 100 °F	Bellows Rating Limit <sup>a</sup> 100 °F
-450 °F to -76 °F	-75 °F to -21 °F					-20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1E2	150	150			230	175	80	50	230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	300	150			600	475	460	275	230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	600	150			1,200	945	915	550	230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	900	300			1,800	1,420	1,375	825	600	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	1E2	150	150			230	180			230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2 <sup>c</sup>	300	150			(230)	(180)			230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	300	150			600	465			230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	600	150			1,200	930			230	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	900	300			1,800	1,395			600	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	1500	300			3,000	2,330			600	500	4 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E3	2500	300			5,000	3,880			600	500	5 <sup>1</sup> / <sub>2</sub>	7
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F. <sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.													

**Table 33—Spring-loaded Pressure-relief Valves “F” Orifice <sup>f</sup> (Effective Orifice Area = 0.307 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)		
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet	
-450 °F to -76 °F	-75 °F to -21 °F			-20 °F to 100 °F	450 °F	800 °F	1,000 °F	100 °F	100 °F					
Temperature Range Inclusive -20 °F to 800 °F														
Carbon steel	1½F2	150	150			285	185	80			285	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½F2 <sup>c</sup>	300	150			(285)	(285)	(285)			285	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½F2	300	150			740	620	410			285	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½F2	600	150			1,480	1,235	825			285	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½F3	900	300			2,220	1,855	1,235			740	500	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	1½F3	1500	300			3,705	3,090	2,055			740	500	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	1½F3	2500	300			(5,000)	(5,000)	3,430			740	500	5 <sup>1</sup> / <sub>2</sub>	7
Temperature Range Inclusive 801 °F to 1,000 °F														
Chrome molybdenum steel	1½F2	300	150					510	215		290	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½F2	600	150					1,015	430		290	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½F3	900	300					1,525	650		750	500	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	1½F3	1500	300					2,540	1,080		750	500	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	1½F3	2500	300					4,230	1,800		750	500	5 <sup>1</sup> / <sub>2</sub>	7
Temperature Range Inclusive -450 °F to 1,000 °F														
Austenitic stainless steel	1½F2	150	150	275	275	275	180	80	20		275	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½F2 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)		275	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½F2	300	150	720	720	720	495	420	365		275	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½F2	600	150	1,440	1,440	1,440	990	845	725		275	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½F3	900	300	2,160	2,160	2,160	1,485	1,265	1,090		720	500	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	1½F3	1500	300	(2,200)	3,600	3,600	2,480	2,110	1,820		720	500	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	1½F3	2500	300	(3,400)	(5,000)	(5,000)	4,130	3,520	3,030		720	500	5 <sup>1</sup> / <sub>2</sub>	7

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 100 °F	Bellows Rating Limit <sup>a</sup> 100 °F	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1 1/2F2	150	150			230	175	80	50	230	230	4 7/8	4 3/4
	1 1/2F2 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	230	4 7/8	4 3/4
	1 1/2F2	300	150			600	475	460	275	230	230	4 7/8	6
	1 1/2F2	600	150			1,200	945	915	550	230	230	4 7/8	6
	1 1/2F3	900	300			1,800	1,420	1,375	825	600	500	4 7/8	6 1/2
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	1 1/2F2	150	150			230	180			230	230	4 7/8	4 3/4
	1 1/2F2 <sup>c</sup>	300	150			(230)	(180)			230	230	4 7/8	4 3/4
	1 1/2F2	300	150			600	465			230	230	4 7/8	6
	1 1/2F2	600	150			1,200	930			230	230	4 7/8	6
	1 1/2F3	900	300			1,800	1,395			600	500	4 7/8	6 1/2
	1 1/2F3	1500	300			3,000	2,330			600	500	4 7/8	6 1/2
	1 1/2F3	2500	300			5,000	3,880			600	500	5 1/2	7

<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.

<sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.

<sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.

<sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F.

<sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F.

<sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.

Table 34—Spring-loaded Pressure-relief Valves “G” Orifice <sup>f</sup> (Effective Orifice Area = 0.503 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			–450 °F to –76 °F	–75 °F to –21 °F	–20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive –20 °F to 800 °F													
Carbon steel	1½G3	150	150			285	185	80		285	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½G3 <sup>c</sup>	300	150			(285)	(285)	(285)		285	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½G3	300	150			740	620	410		285	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	600	150			1,480	1,235	825		285	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	900	300			2,220	1,855	1,235		740	470	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	2G3	1500	300			3,705	3,090	2,055		740	470	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	2G3	2500	300			(3,705)	(3,705)	3,430		740	470	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	1½G3	300	150					510	215	290	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	600	150					1,015	430	290	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	900	300					1,525	650	750	470	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	2G3	1500	300					2,540	1,080	750	470	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	2G3	2500	300					(3,705)	1,800	750	470	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive –450 °F to 1,000 °F													
Austenitic stainless steel	1½G3	150	150	275	275	275	180	80	20	275	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½G3 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½G3	300	150	720	720	720	495	420	365	275	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	600	150	1,440	1,440	1,440	990	845	725	275	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	900	300	2,160	2,160	2,160	1,485	1,265	1,090	720	470	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	2G3	1500	300	(2,450)	3,600	3,600	2,480	2,110	1,820	720	470	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	2G3	2500	300	(2,600)	(3,600)	(3,600)	(3,600)	3,520	3,030	720	470	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 100 °F	Bellows Rating Limit <sup>a</sup> 100 °F	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1½G3	150	150			230	175	80	50	230	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½G3 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½G3	300	150			600	475	460	275	230	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	600	150			1,200	945	915	550	230	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	900	300			1,800	1,420	1,375	825	600	470	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	1½G3	150	150			230	180			230	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½G3 <sup>c</sup>	300	150			(230)	(180)			230	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1½G3	300	150			600	465			230	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	600	150			1,200	930			230	230	4 <sup>7</sup> / <sub>8</sub>	6
	1½G3	900	300			1,800	1,395			600	470	4 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	2G3	1500	300			3,000	2,330			600	470	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	2G3	2500	300			(3,705)	(3,705)			600	470	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F. <sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.													

**Table 35—Spring-loaded Pressure-relief Valves “H” Orifice <sup>f</sup> (Effective Orifice Area = 0.785 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-450 °F to -76 °F	-75 °F to -21 °F			-20 °F to 100 °F	450 °F	800 °F	1,000 °F	100 °F	100 °F				
Temperature Range Inclusive -20 °F to 800 °F													
Carbon steel	1½H3	150	150			285	185	80		285	230	5⅞	4⅞
	1½H3 <sup>c</sup>	300	150			(285)	(285)	(285)		285	230	5⅞	4⅞
	2H3	300	150			740	620	410		285	230	5⅞	4⅞
	2H3	600	150			1,480	1,235	825		285	230	6⅞	6⅞
	2H3	900	150			2,220	1,855	1,235		285	230	6⅞	6⅞
	2H3	1500	300			(2,750)	(2,750)	2,055		740	415	6⅞	6⅞
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	2H3	300	150					510	215	290	230	5⅞	4⅞
	2H3	600	150					1,015	430	290	230	5⅞	4⅞
	2H3	900	150					1,525	650	290	230	6⅞	6⅞
	2H3	1500	300					2,540	1,080	750	415	6⅞	6⅞
Temperature Range Inclusive -450 °F to 1,000 °F													
Austenitic stainless steel	1½H3	150	150	275	275	275	180	80	20	275	230	5⅞	4⅞
	1½H3 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	230	5⅞	4⅞
	2H3	300	150	720	720	720	495	420	365	275	230	5⅞	4⅞
	2H3	600	150	1,440	1,440	1,440	990	845	725	275	230	6⅞	6⅞
	2H3	900	150	(1,485)	2,160	2,160	1,485	1,265	1,090	275	230	6⅞	6⅞
	2H3	1500	300	(1,600)	(2,750)	(2,750)	2,480	2,110	1,820	(600)	415	6⅞	6⅞
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	1½H3	150	150			230	175	80	50	230	230	5⅞	4⅞
	1½H3 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	230	5⅞	4⅞
	2H3	300	150			600	475	460	275	230	230	5⅞	4⅞
	2H3	600	150			1,200	945	915	550	230	230	6⅞	6⅞
	2H3	900	150			1,800	1,420	1,375	825	230	230	6⅞	6⅞

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F				
				Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>									
Alloy 20 <sup>e</sup>	1½H3	150	150			230	180			230	230	5⅛	4⅞
	1½H3 <sup>c</sup>	300	150			(230)	(180)			230	230	5⅛	4⅞
	2H3	300	150			600	465			230	230	5⅛	4⅞
	2H3	600	150			1,200	930			230	230	6⅛	6⅜
	2H3	900	150			1,800	1,395			230	230	6⅛	6⅜
	2H3	1500	300			(2,750)	2,330			600	415	6⅛	6⅜

<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.

<sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.

<sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.

<sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F.

<sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F.

<sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.

Table 36—Spring-loaded Pressure-relief Valves “J” Orifice <sup>f</sup> (Effective Orifice Area = 1.287 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 100 °F	Bellows Rating Limit <sup>a</sup> 100 °F	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			–450 °F to –76 °F	–75 °F to –21 °F	–20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive –20 °F to 800 °F													
Carbon steel	2J3	150	150			285	185	80		285	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3 <sup>c</sup>	300	150			(285)	(285)	(285)		285	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	3J4	300	150			740	620	410		285	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	600	150			1,480	1,235	825		285	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	900	150			2,220	1,855	1,235		285	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	1500	300			(2,700)	(2,700)	2,055		(600)	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	3J4	300	150					510	215	290	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	600	150					1,015	430	290	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	900	150					1,525	650	290	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	1500	300					2,540	1,080	(600)	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
Temperature Range Inclusive –450 °F to 1,000 °F													
Austenitic stainless steel	2J3	150	150	275	275	275	180	80	20	275	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	3J4	300	150	(500)	720	720	495	420	365	275	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	600	150	(625)	1,440	1,440	990	845	725	275	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	900	150	(800)	2,160	2,160	1,485	1,265	1,090	275	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	1500	300	(800)	(2,750)	(2,750)	2,480	2,110	1,820	(600)	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
Temperature Range Inclusive –20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	2J3	150	150			230	175	80	50	230	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	3J4	300	150			600	475	460	275	230	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	600	150			1,200	945	915	550	230	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	900	150			1,800	1,420	1,375	825	230	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>



Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves									
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F	Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
										100 °F	100 °F		
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	2J3	150	150			230	180			230	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3 <sup>c</sup>	300	150			(230)	(180)			230	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	3J4	300	150			600	465			230	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	600	150			1,200	930			230	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	900	150			1,800	1,395			230	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	1500	300			(2,700)	2,330			600	230	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F.</p> <p><sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.</p>													

Table 37—Spring-loaded Pressure-relief Valves “K” Orifice <sup>f</sup> (Effective Orifice Area = 1.838 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves									
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F	Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
										100 °F	100 °F		
Temperature Range Inclusive -20 °F to 800 °F													
Carbon steel	3K4	150	150			285	185	80		285	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4 <sup>c</sup>	300	150			(285)	(285)	(285)		285	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	300	150			740	620	410		285	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	600	150			1,480	1,235	825		285	200	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3K6	900	150			2,220	1,855	1,235		285	200	7 <sup>13</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>2</sub>
	3K6	1500	300			(2,220)	(2,220)	2,055		(600)	200	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	3K4	300	150					510	215	290	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	600	150					1,015	430	290	200	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3K6	900	150					1,525	650	290	200	7 <sup>13</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>2</sub>
	3K6	1500	300					(2,220)	1,080	(600)	200	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -450 °F to 1,000 °F													
Austenitic stainless steel	3K4	150	150	275	275	275	180	80	20	275	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	300	150	(525)	720	720	495	420	365	275	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	600	150	(600)	1,440	1,440	990	845	725	275	200	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3K6	900	150	(600)	2,160	2,160	1,485	1,265	1,090	275	200	7 <sup>13</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>2</sub>
	3K6	1500	300	(750)	(2,220)	(2,220)	(2,220)	2,110	1,820	(600)	200	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	3K4	150	150			230	175	80	50	230	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	300	150			600	475	460	275	230	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	600	150			1,200	945	915	550	230	200	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3K6	900	150			1,800	1,420	1,375	825	230	200	7 <sup>13</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>2</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 100 °F	Bellows Rating Limit <sup>a</sup> 100 °F	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	3K4	150	150			230	180			230	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4 <sup>c</sup>	300	150			(230)	(180)			230	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	300	150			600	465			230	150	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	600	150			1,200	930			230	200	7 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>
	3K6	900	150			1,800	1,395			230	200	7 <sup>13</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>2</sub>
	3K6	1500	300			(2,220)	(2,220)			600	200	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>2</sub>
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F.</p> <p><sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.</p>													

Table 38—Spring-loaded Pressure-relief Valves “L” Orifice <sup>f</sup> (Effective Orifice Area = 2.853 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>
-450 °F to -76 °F	-75 °F to -21 °F					-20 °F to 100 °F	450 °F	800 °F	1,000 °F	100 °F	100 °F		
Temperature Range Inclusive -20 °F to 800 °F													
Carbon steel	3L4	150	150			285	185	80		285	100	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	3L4 <sup>c</sup>	300	150			(285)	(285)	(285)		285	100	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	4L6	300	150			740	620	410		285	170	7 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>
	4L6	600	150			(1,000)	(1,000)	825		285	170	7 <sup>1</sup> / <sub>16</sub>	8
	4L6	900	150			(1,500)	(1,500)	1,235		285	170	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
	4L6	1500	150			(1,500)	(1,500)	(1,500)		285	170	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	4L6	300	150					510	215	290	170	7 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>
	4L6	600	150					(1,000)	430	290	170	7 <sup>1</sup> / <sub>16</sub>	8
	4L6	900	150					(1,500)	650	290	170	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
	4L6	1500	150					(1,500)	1,080	290	170	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive -450 °F to 1,000 °F													
Austenitic stainless steel	3L4	150	150	275	275	275	180	80	20	275	100	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	3L4 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	100	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	4L6	300	150	(535)	720	720	495	420	365	275	170	7 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>
	4L6	600	150	(535)	(1,000)	(1,000)	990	845	725	275	170	7 <sup>1</sup> / <sub>16</sub>	8
	4L6	900	150	(700)	(1,500)	(1,500)	1,485	1,265	1,090	275	170	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	3L4	150	150			230	175	80	50	230	100	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	3L4 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	100	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	4L6	300	150			600	475	460	275	230	170	7 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>
	4L6	600	150			1,200	945	915	550	230	170	7 <sup>1</sup> / <sub>16</sub>	8
	4L6	900	150			1,800	1,420	1,375	825	230	170	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 100 °F	Bellows Rating Limit <sup>a</sup> 100 °F	Inlet	Outlet
-450 °F to -76 °F	-75 °F to -21 °F			-20 °F to 100 °F	450 °F	800 °F	1,000 °F						
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	3L4	150	150			230	180			230	100	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	3L4 <sup>c</sup>	300	150			(230)	(180)			230	100	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>
	4L6	300	150			600	465			230	170	7 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>
	4L6	600	150			1,200	930			230	170	7 <sup>1</sup> / <sub>16</sub>	8
	4L6	900	150			(1,500)	1,395			230	170	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
	4L6	1500	150			(1,500)	(1,500)			230	170	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F.</p> <p><sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.</p>													

Table 39—Spring-loaded Pressure-relief Valves “M” Orifice <sup>f</sup> (Effective Orifice Area = 3.60 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>
–450 °F to –76 °F	–75 °F to –21 °F					–20 °F to 100 °F	450 °F	800 °F	1,000 °F	100 °F	100 °F		
Temperature Range Inclusive –20 °F to 800 °F													
Carbon steel	4M6	150	150			285	185	80		285	80	7	7 <sup>1</sup> / <sub>4</sub>
	4M6 <sup>c</sup>	300	150			(285)	(285)	(285)		285	80	7	7 <sup>1</sup> / <sub>4</sub>
	4M6	300	150			740	620	410		285	160	7	7 <sup>1</sup> / <sub>4</sub>
	4M6	600	150			(1,100)	(1,100)	825		285	160	7	8
	4M6	900	150			(1,100)	(1,100)	(1,100)		285	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	4M6	300	150					510	215	290	160	7	7 <sup>1</sup> / <sub>4</sub>
	4M6	600	150					(1,000)	430	290	160	7	8
	4M6	900	150					(1,100)	650	290	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive –450 °F to 1,000 °F													
Austenitic stainless steel	4M6	150	150	275	275	275	180	80	20	275	80	7	7 <sup>1</sup> / <sub>4</sub>
	4M6 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	80	7	7 <sup>1</sup> / <sub>4</sub>
	4M6	300	150	(525)	720	720	495	420	365	275	160	7	7 <sup>1</sup> / <sub>4</sub>
	4M6	600	150	(600)	(1,100)	(1,100)	990	845	725	275	160	7	8
Temperature Range Inclusive –20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	4M6	150	150			230	175	80	50	230	80	7	7 <sup>1</sup> / <sub>4</sub>
	4M6 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	80	7	7 <sup>1</sup> / <sub>4</sub>
	4M6	300	150			600	475	460	275	230	160	7	7 <sup>1</sup> / <sub>4</sub>
	4M6	600	150			(1,100)	945	915	550	230	160	7	8
	4M6	900	150			(1,100)	(1,100)	(1,100)	825	230	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 100 °F	Bellows Rating Limit <sup>a</sup> 100 °F	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	4M6	150	150			230	180			230	80	7	7 <sup>1</sup> / <sub>4</sub>
	4M6 <sup>c</sup>	300	150			(230)	(180)			230	80	7	7 <sup>1</sup> / <sub>4</sub>
	4M6	300	150			600	465			230	160	7	7 <sup>1</sup> / <sub>4</sub>
	4M6	600	150			(1,100)	930			230	160	7	8
	4M6	900	150			(1,100)	(1,100)			230	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F. <sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.													

Table 40—Spring-loaded Pressure-relief Valves “N” Orifice <sup>f</sup> (Effective Orifice Area = 4.34 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-450 °F to -76 °F	-75 °F to -21 °F			-20 °F to 100 °F	450 °F	800 °F	1,000 °F	100 °F	100 °F				
Temperature Range Inclusive -20 °F to 800 °F													
Carbon steel	4N6	150	150			285	185	80		285	80	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6 <sup>c</sup>	300	150			(285)	(285)	(285)		285	80	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	300	150			740	620	410		285	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	600	150			(1,000)	(1,000)	825		285	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
	4N6	900	150			(1,000)	(1,000)	(1,000)		285	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	4N6	300	150					510	215	290	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	600	150					(1,000)	430	290	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
	4N6	900	150					(1,000)	650	290	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive -450 °F to 1,000 °F													
Austenitic stainless steel	4N6	150	150	275	275	275	180	80	20	275	80	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6 <sup>c</sup>	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	80	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	300	150	(450)	720	720	495	420	365	275	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	600	150	(500)	(1,000)	(1,000)	990	845	725	275	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	4N6	150	150			230	175	80	50	230	80	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	80	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	300	150			600	475	460	275	230	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	600	150			(1,000)	945	915	550	230	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
	4N6	900	150			(1,000)	(1,000)	(1,000)	825	230	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>



Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves									
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F	Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
										100 °F	100 °F		
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	4N6	150	150			230	180			230	80	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6 <sup>c</sup>	300	150			(230)	(180)			230	80	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	300	150			600	465			230	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	600	150			(1,000)	930			230	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
	4N6	900	150			(1,000)	(1,000)			230	160	7 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F. <sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.													

Table 41—Spring-loaded Pressure-relief Valves “P” Orifice <sup>f</sup> (Effective Orifice Area = 6.38 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-450 °F to -76 °F	-75 °F to -21 °F			-20 °F to 100 °F	450 °F	800 °F	1,000 °F	100 °F	100 °F				
Temperature Range Inclusive -20 °F to 800 °F													
Carbon steel	4P6	150	150			285	185	80		285	80	7 <sup>1</sup> / <sub>8</sub>	9
	4P6 <sup>c</sup>	300	150			(285)	(285)	(285)		285	80	7 <sup>1</sup> / <sub>8</sub>	9
	4P6	300	150			(525)	(525)	410		285	150	8 <sup>7</sup> / <sub>8</sub>	10
	4P6	600	150			(1,000)	(1,000)	825		285	150	8 <sup>7</sup> / <sub>8</sub>	10
	4P6	900	150			(1,000)	(1,000)	(1,000)		285	150	8 <sup>7</sup> / <sub>8</sub>	10
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	4P6	300	150					510	215	290	150	8 <sup>7</sup> / <sub>8</sub>	10
	4P6	600	150					(1,000)	430	290	150	8 <sup>7</sup> / <sub>8</sub>	10
	4P6	900	150					(1,000)	650	290	150	8 <sup>7</sup> / <sub>8</sub>	10
Temperature Range Inclusive -450 °F to 1,000 °F													
Austenitic stainless steel	4P6	150	150	(175)	275	275	180	80	20	275	80	7 <sup>1</sup> / <sub>8</sub>	9
	4P6 <sup>c</sup>	300	150	(175)	(275)	(275)	(275)	(275)	(275)	275	80	7 <sup>1</sup> / <sub>8</sub>	9
	4P6	300	150	(300)	(525)	(525)	495	420	365	275	150	8 <sup>7</sup> / <sub>8</sub>	10
	4P6	600	150	(480)	(1,000)	(1,000)	990	845	725	275	150	8 <sup>7</sup> / <sub>8</sub>	10
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	4P6	150	150			230	175	80	50	230	80	7 <sup>1</sup> / <sub>8</sub>	9
	4P6 <sup>c</sup>	300	150			(230)	(230)	(230)	(230)	230	80	7 <sup>1</sup> / <sub>8</sub>	9
	4P6	300	150			(525)	475	460	275	230	150	8 <sup>7</sup> / <sub>8</sub>	10
	4P6	600	150			(1,000)	945	915	550	230	150	8 <sup>7</sup> / <sub>8</sub>	10
	4P6	900	150			(1,000)	(1,000)	(1,000)	825	230	150	8 <sup>7</sup> / <sub>8</sub>	10

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves									
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F	Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
										100 °F	100 °F		
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	4P6	150	150			230	180			230	80	7 <sup>1</sup> / <sub>8</sub>	9
	4P6 <sup>c</sup>	300	150			(230)	(180)			230	80	7 <sup>1</sup> / <sub>8</sub>	9
	4P6	300	150			(525)	465			230	150	8 <sup>7</sup> / <sub>8</sub>	10
	4P6	600	150			(1,000)	930			230	150	8 <sup>7</sup> / <sub>8</sub>	10
	4P6	900	150			(1,000)	(1,000)			230	150	8 <sup>7</sup> / <sub>8</sub>	10
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F. <sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.													

Table 42—Spring-loaded Pressure-relief Valves “Q” Orifice <sup>f</sup> (Effective Orifice Area = 11.05 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
–450 °F to –76 °F	–75 °F to –21 °F			–20 °F to 100 °F	450 °F	800 °F	1,000 °F	100 °F	100 °F				
Temperature Range Inclusive –20 °F to 800 °F													
Carbon steel	6Q8	150	150			(165)	(165)	80		(115)	70	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8 <sup>c</sup>	300	150			(165)	(165)	(165)		(115)	70	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	300	150			(300)	(300)	(300)		(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	150			(600)	(600)	(600)		(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	6Q8	300	150					(165)	(165)	(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	150					(600)	430	(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive –450 °F to 1,000 °F													
Austenitic stainless steel	6Q8	150	150	(165)	(165)	(165)	(165)	80	20	(115)	70	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8 <sup>c</sup>	300	150	(165)	(165)	(165)	(165)	(165)	(165)	(115)	70	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	300	150	(250)	(300)	(300)	(300)	(300)	(300)	(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	150	(300)	(600)	(600)	(600)	(600)	(600)	(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive –20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	6Q8	150	150			(165)	(165)	80	50	(115)	70	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8 <sup>c</sup>	300	150			(165)	(165)	(165)	(140)	(115)	70	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	300	150			(300)	(300)	(300)	275	(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	150			(600)	(600)	(600)	550	(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves									
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F	Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
										100 °F	100 °F		
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	6Q8	150	150			(165)	(165)			(115)	70	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8 <sup>c</sup>	300	150			(165)	(165)			(115)	70	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	300	150			(300)	(300)			(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	150			(600)	(600)			(115)	115	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F. <sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.													

**Table 43—Spring-loaded Pressure-relief Valves “R” Orifice <sup>f</sup> (Effective Orifice Area = 16.00 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup> 100 °F	Bellows Rating Limit <sup>a</sup> 100 °F	Inlet	Outlet
Body/Bonnet	Inlet by Orifice by Outlet			–450 °F to –76 °F	–75 °F to –21 °F	–20 °F to 100 °F	450 °F	800 °F	1,000 °F				
Temperature Range Inclusive –20 °F to 800 °F													
Carbon steel	6R8	150	150			(100)	(100)	80		(60)	60	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8 <sup>c</sup>	300	150			(100)	(100)	(100)		(60)	60	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R10	300	150			(230)	(230)	(230)		(100)	100	9 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>
	6R10	600	150			(300)	(300)	(300)		(100)	100	9 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	6R8	300	150					(100)	(100)	(100)	100	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R10	600	150					(300)	(300)	(100)	100	9 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive –450 °F to 1,000 °F													
Austenitic stainless steel	6R8	150	150	(55)	(100)	(100)	(100)	80	20	(60)	60	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8 <sup>c</sup>	300	150	(55)	(100)	(100)	(100)	(100)	(100)	(60)	60	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R10	300	150	(150)	(230)	(230)	(230)	(230)	(230)	(100)	100	9 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>
	6R10	600	150	(200)	(300)	(300)	(300)	(300)	(300)	(100)	100	9 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive –20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	6R8	150	150			(100)	(100)	80	50	(60)	60	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8 <sup>c</sup>	300	150			(100)	(100)	(100)	(100)	(60)	60	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R10	300	150			(230)	(230)	(230)	(230)	(100)	100	9 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>
	6R10	600	150			(300)	(300)	(300)	(300)	(100)	100	9 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)		
				Conventional and Balanced Bellows Valves										
				Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F	Flange Rating Limit <sup>a</sup>
										100 °F	100 °F			
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>														
Alloy 20 <sup>e</sup>	6R8	150	150			(100)	(100)				(60)	60	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8 <sup>c</sup>	300	150			(100)	(100)				(60)	60	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R10	300	150			(230)	(230)				(100)	100	9 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>
	6R10	600	150			(300)	(300)				(100)	100	9 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials. <sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved. <sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange. <sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F. <sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F. <sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.														

**Table 44—Spring-loaded Pressure-relief Valves “T” Orifice <sup>f</sup> (Effective Orifice Area = 26.00 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
		Inlet	Outlet	Conventional and Balanced Bellows Valves						Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
-450 °F to -76 °F	-75 °F to -21 °F			-20 °F to 100 °F	450 °F	800 °F	1,000 °F	100 °F	100 °F				
Temperature Range Inclusive -20 °F to 800 °F													
Carbon steel	8T10	150	150			(65)	(65)	(65)		(30)	30	10 <sup>7</sup> / <sub>8</sub>	11
	8T10 <sup>c</sup>	300	150			(65)	(65)	(65)		(30)	30	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150			(120)	(120)	(120)		(60)	60	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150			(300)	(300)	(300)		(100)	100	10 <sup>7</sup> / <sub>8</sub>	11
Temperature Range Inclusive 801 °F to 1,000 °F													
Chrome molybdenum steel	8T10	300	150					(120)	100	(60)	60	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150					(300)	(215)	(100)	100	10 <sup>7</sup> / <sub>8</sub>	11
Temperature Range Inclusive -450 °F to 1,000 °F													
Austenitic stainless steel	8T10	150	150	(50)	(65)	(65)	(65)	(65)	(20)	(30)	30	10 <sup>7</sup> / <sub>8</sub>	11
	8T10 <sup>c</sup>	300	150	(50)	(65)	(65)	(65)	(65)	(65)	(30)	30	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150	(65)	(120)	(120)	(120)	(120)	(120)	(60)	60	10 <sup>7</sup> / <sub>8</sub>	11
Temperature Range Inclusive -20 °F to 900 °F <sup>d</sup>													
Nickel/copper alloy <sup>d</sup>	8T10	150	150			(65)	(65)	(65)	50	(30)	30	10 <sup>7</sup> / <sub>8</sub>	11
	8T10 <sup>c</sup>	300	150			(65)	(65)	(65)	(65)	(30)	30	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150			(120)	(120)	(120)	(120)	(60)	60	10 <sup>7</sup> / <sub>8</sub>	11



Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Inlet Flange (Set) Pressure Limit <sup>a</sup> (psig)						Outlet Pressure Limit <sup>a</sup> (psig)		Center-to-face Dimensions (in.)	
				Conventional and Balanced Bellows Valves									
Body/Bonnet	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -76 °F	-75 °F to -21 °F	-20 °F to 100 °F	450 °F	800 °F	1,000 °F	Flange Rating Limit <sup>a</sup>	Bellows Rating Limit <sup>a</sup>	Inlet	Outlet
										100 °F	100 °F		
Temperature Range Inclusive -20 °F to 300 °F <sup>e</sup>													
Alloy 20 <sup>e</sup>	8T10	150	150		(65)	(65)				(30)	30	10 <sup>7</sup> / <sub>8</sub>	11
	8T10 <sup>c</sup>	300	150		(65)	(65)				(30)	30	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150		(120)	(120)				(60)	60	10 <sup>7</sup> / <sub>8</sub>	11
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than that provided in ASME B16.34. The outlet flange values at 100 °F above are the limits for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using graphs from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. Bellows outlet pressure limits are the design pressure of the bellows at the outlet temperature of 100 °F, and pressure values at other temperatures may be determined from Annex G. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Set pressure limited for low-pressure applications where a Class 300 inlet flange is preferred over a Class 150 flange.</p> <p><sup>d</sup> Materials limited to 900 °F. Pressure ratings indicated in the 1,000 °F column are limited to 900 °F.</p> <p><sup>e</sup> Materials limited to 300 °F. Pressure ratings indicated in the 450 °F column are limited to 300 °F.</p> <p><sup>f</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC Section XIII.</p>													

Table 45—Pilot-operated Pressure-relief Valves “D” Orifice <sup>d</sup> (Effective Orifice Area = 0.110 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>	Inlet	Outlet
				−450 °F to −21 °F	−20 °F to 100 °F	500 °F	100 °F		
Temperature Range Inclusive −20 °F to 500 °F									
Carbon steel	1D2	150	150		285	170	285	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	300	150		740	605	285	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	600	150		1,480	1,205	285	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	900	300		2,220	1,810	740	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1D2	1500	300		3,705	3,015	740	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1D2	2500	300		6,170	5,025	740	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	150	150		285	170	285	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	300	150		740	605	285	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	600	150		1,480	1,205	285	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	900	300		2,220	1,810	740	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300		3,705	3,015	740	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
1 <sup>1</sup> / <sub>2</sub> D2	2500	300		6,170	5,025	740	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	
Temperature Range Inclusive −450 °F to 500 °F									
Austenitic stainless steel	1D2	150	150	275	275	170	275	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	300	150	720	720	480	275	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	600	150	1,440	1,440	955	275	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	900	300	2,160	2,160	1,435	720	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1D2	1500	300	3,600	3,600	2,390	720	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1D2	2500	300	6,000	6,000	3,980	720	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	150	150	275	275	170	275	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	300	150	720	720	480	275	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	600	150	1,440	1,440	955	275	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	900	300	2,160	2,160	1,435	720	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300	3,600	3,600	2,390	720	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	2500	300	6,000	6,000	3,980	720	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	1D2	150	150		230	170	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	300	150		600	475	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	600	150		1,200	945	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	900	300		1,800	1,420	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	150	150		230	170	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	300	150		600	475	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	600	150		1,200	945	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	900	300		1,800	1,420	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	1D2	150	150		230	180	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	300	150		600	465	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	600	150		1,200	930	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1D2	900	300		1,800	1,395	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1D2	1500	300		3,000	2,330	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1D2	2500	300		5,000	3,880	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	150	150		230	180	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	300	150		600	465	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	600	150		1,200	930	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	900	300		1,800	1,395	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	1500	300		3,000	2,330	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> D2	2500	300		5,000	3,880	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F	Inlet	Outlet
				<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>					

**Table 46—Pilot-operated Pressure-relief Valves “E” Orifice <sup>d</sup> (Effective Orifice Area = 0.196 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive -20 °F to 500 °F									
Carbon steel	1E2	150	150		285	170	285	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	300	150		740	605	285	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	600	150		1,480	1,205	285	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	900	300		2,220	1,810	740	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1E2	1500	300		3,705	3,015	740	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1E2	2500	300		6,170	5,025	740	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	150	150		285	170	285	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	300	150		740	605	285	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	600	150		1,480	1,205	285	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	900	300		2,220	1,810	740	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	1500	300		3,705	3,015	740	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	2500	300		6,170	5,025	740	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -450 °F to 500 °F									
Austenitic stainless steel	1E2	150	150	275	275	170	275	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	300	150	720	720	480	275	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	600	150	1,440	1,440	955	275	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	900	300	2,160	2,160	1,435	720	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1E2	1500	300	3,600	3,600	2,390	720	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1E2	2500	300	6,000	6,000	3,980	720	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	150	150	275	275	170	275	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	300	150	720	720	480	275	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	600	150	1,440	1,440	955	275	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	900	300	2,160	2,160	1,435	720	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	1500	300	3,600	3,600	2,390	720	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	2500	300	6,000	6,000	3,980	720	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	1E2	150	150		230	170	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	300	150		600	475	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	600	150		1,200	945	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	900	300		1,800	1,420	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	150	150		230	170	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	300	150		600	475	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	600	150		1,200	945	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	900	300		1,800	1,420	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	1E2	150	150		230	180	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	300	150		600	465	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	600	150		1,200	930	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1E2	900	300		1,800	1,395	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1E2	1500	300		3,000	2,330	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1E2	2500	300		5,000	3,880	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	150	150		230	180	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	300	150		600	465	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	600	150		1,200	930	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	900	300		1,800	1,395	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	1500	300		3,000	2,330	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> E2	2500	300		5,000	3,880	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F	Inlet	Outlet
				<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>					

Table 47—Pilot-operated Pressure-relief Valves “F” Orifice <sup>d</sup> (Effective Orifice Area = 0.307 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>	Inlet	Outlet
				-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F		
Temperature Range Inclusive -20 °F to 500 °F									
Carbon steel	1F2	150	150		285	170	285	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	300	150		740	605	285	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	600	150		1,480	1,205	285	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	900	300		2,220	1,810	740	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1F2	1500	300		3,705	3,015	740	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1F2	2500	300		6,170	5,025	740	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	150	150		285	170	285	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	300	150		740	605	285	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	600	150		1,480	1,205	285	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	900	300		2,220	1,810	740	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	1500	300		3,705	3,015	740	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	2500	300		6,170	5,025	740	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>



Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive -450 °F to 500 °F									
Austenitic stainless steel	1F2	150	150	275	275	170	275	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	300	150	720	720	480	275	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	600	150	1,440	1,440	955	275	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	900	300	2,160	2,160	1,435	720	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1F2	1500	300	3,600	3,600	2,390	720	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1F2	2500	300	6,000	6,000	3,980	720	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	150	150	275	275	170	275	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	300	150	720	720	480	275	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	600	150	1,440	1,440	955	275	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	900	300	2,160	2,160	1,435	720	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	1500	300	3,600	3,600	2,390	720	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
1 <sup>1</sup> / <sub>2</sub> F2	2500	300	6,000	6,000	3,980	720	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	1F2	150	150		230	170	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	300	150		600	475	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	600	150		1,200	945	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	900	300		1,800	1,420	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	150	150		230	170	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	300	150		600	475	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	600	150		1,200	945	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	900	300		1,800	1,420	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	1F2	150	150		230	180	230	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	300	150		600	465	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	600	150		1,200	930	230	4 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
	1F2	900	300		1,800	1,395	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1F2	1500	300		3,000	2,330	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1F2	2500	300		5,000	3,880	600	4 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	150	150		230	180	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	300	150		600	465	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	600	150		1,200	930	230	4 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	900	300		1,800	1,395	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
	1 <sup>1</sup> / <sub>2</sub> F2	1500	300		3,000	2,330	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>
1 <sup>1</sup> / <sub>2</sub> F2	2500	300		5,000	3,880	600	5 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	
<sup>a</sup>	Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.								
<sup>b</sup>	Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.								
<sup>c</sup>	Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.								
<sup>d</sup>	Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i> , Section XIII.								

**Table 48—Pilot-operated Pressure-relief Valves “G” Orifice <sup>d</sup> (Effective Orifice Area = 0.503 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive -20 °F to 500 °F									
Carbon steel	1½G3	150	150		285	170	285	5⅛	4⅞
	1½G3	300	150		740	605	285	5⅛	4⅞
	1½G3	600	150		1,480	1,205	285	5⅛	4⅞
	1½G3	900	300		2,220	1,810	740	6¾	6¾
	1½G3	1500	300		3,705	3,015	740	6¾	6¾
	1½G3	2500	300		6,170	5,025	740	6¾	6¾
	2G3	150	150		285	170	285	5⅜	4⅞
	2G3	300	150		740	605	285	5⅜	4⅞
	2G3	600	150		1,480	1,205	285	5⅜	4⅞
	2G3	900	300		2,220	1,810	740	6⅑/16	6¾
	2G3	1500	300		3,705	3,015	740	6⅑/16	6¾
	2G3	2500	300		6,170	5,025	740	7	6¾

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (in.)	
				(psig)			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
							–450 °F to –21 °F		–20 °F to 100 °F
Temperature Range Inclusive –450 °F to 500 °F									
Austenitic stainless steel	1½G3	150	150	275	275	170	275	5½/8	4¾/8
	1½G3	300	150	720	720	480	275	5½/8	4¾/8
	1½G3	600	150	1,440	1,440	955	275	5½/8	4¾/8
	1½G3	900	300	2,160	2,160	1,435	720	6¾/8	6¾/4
	1½G3	1500	300	3,600	3,600	2,390	720	6¾/8	6¾/4
	1½G3	2500	300	6,000	6,000	3,980	720	6¾/8	6¾/4
	2G3	150	150	275	275	170	275	5¾/8	4¾/8
	2G3	300	150	720	720	480	275	5¾/8	4¾/8
	2G3	600	150	1,440	1,440	955	275	5¾/8	4¾/8
	2G3	900	300	2,160	2,160	1,435	720	6⁹/₁₆	6¾/4
	2G3	1500	300	3,600	3,600	2,390	720	6⁹/₁₆	6¾/4
	2G3	2500	300	6,000	6,000	3,980	720	7	6¾/4
Temperature Range Inclusive –20 °F to 500 °F									
Nickel/copper alloy	1½G3	150	150		230	170	230	5½/8	4¾/8
	1½G3	300	150		600	475	230	5½/8	4¾/8
	1½G3	600	150		1,200	945	230	5½/8	4¾/8
	1½G3	900	300		1,800	1,420	600	6¾/8	6¾/4
	2G3	150	150		230	170	230	5¾/8	4¾/8
	2G3	300	150		600	475	230	5¾/8	4¾/8
	2G3	600	150		1,200	945	230	5¾/8	4¾/8
	2G3	900	300		1,800	1,420	600	6⁹/₁₆	6¾/4

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	1½G3	150	150		230	180	230	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½G3	300	150		600	465	230	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½G3	600	150		1,200	930	230	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½G3	900	300		1,800	1,395	600	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	1½G3	1500	300		3,000	2,330	600	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	1½G3	2500	300		5,000	3,880	600	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	2G3	150	150		230	180	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2G3	300	150		600	465	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2G3	600	150		1,200	930	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2G3	900	300		1,800	1,395	600	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2G3	1500	300		3,000	2,330	600	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
2G3	2500	300		5,000	3,880	600	7	6 <sup>3</sup> / <sub>4</sub>	
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

**Table 49—Pilot-operated Pressure-relief Valves “H” Orifice<sup>d</sup> (Effective Orifice Area = 0.785 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	–450 °F to –21 °F	–20 °F to 100 °F
Temperature Range Inclusive –20 °F to 500 °F									
Carbon steel	1½H3	150	150		285	170	285	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	300	150		740	605	285	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	600	150		1,480	1,205	285	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	900	300		2,220	1,810	740	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	1½H3	1500	300		3,705	3,015	740	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	1½H3	2500	300		6,170	5,025	740	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	2H3	150	150		285	170	285	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	300	150		740	605	285	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	600	150		1,480	1,205	285	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	900	300		2,220	1,810	740	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2H3	1500	300		3,705	3,015	740	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2H3	2500	300		6,170	5,025	740	7	6 <sup>3</sup> / <sub>4</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive -450 °F to 500 °F									
Austenitic stainless steel	1½H3	150	150	275	275	170	275	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	300	150	720	720	480	275	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	600	150	1,440	1,440	955	275	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	900	300	2,160	2,160	1,435	720	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	1½H3	1500	300	3,600	3,600	2,390	720	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	1½H3	2500	300	6,000	6,000	3,980	720	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	2H3	150	150	275	275	170	275	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	300	150	720	720	480	275	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	600	150	1,440	1,440	955	275	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	900	300	2,160	2,160	1,435	720	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2H3	1500	300	3,600	3,600	2,390	720	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2H3	2500	300	6,000	6,000	3,980	720	7	6 <sup>3</sup> / <sub>4</sub>
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	1½H3	150	150		230	170	230	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	300	150		600	475	230	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	600	150		1,200	945	230	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	900	300		1,800	1,420	600	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	2H3	150	150		230	170	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	300	150		600	475	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	600	150		1,200	945	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	900	300		1,800	1,420	600	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	–450 °F to –21 °F	–20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive –20 °F to 300 °F									
Alloy 20 <sup>c</sup>	1½H3	150	150		230	180	230	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	300	150		600	465	230	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	600	150		1,200	930	230	5 <sup>1</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	1½H3	900	300		1,800	1,395	600	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	1½H3	1500	300		3,000	2,330	600	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	1½H3	2500	300		5,000	3,880	600	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>
	2H3	150	150		230	180	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	300	150		600	465	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	600	150		1,200	930	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2H3	900	300		1,800	1,395	600	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2H3	1500	300		3,000	2,330	600	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
2H3	2500	300		5,000	3,880	600	7	6 <sup>3</sup> / <sub>4</sub>	
<sup>a</sup>	Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.								
<sup>b</sup>	Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.								
<sup>c</sup>	Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.								
<sup>d</sup>	Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i> , Section XIII.								



**Table 50—Pilot-operated Pressure-relief Valves “J” Orifice <sup>d</sup> (Effective Orifice Area = 1.287 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive -20 °F to 500 °F									
Carbon steel	2J3	150	150		285	170	285	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	300	150		740	605	285	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	600	150		1,480	1,205	285	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	900	300		2,220	1,810	740	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2J3	1500	300		3,705	3,015	740	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2J3	2500	300		(4,620)	(4,620)	740	7	6 <sup>3</sup> / <sub>4</sub>
	3J4	150	150		285	170	285	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	300	150		740	605	285	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	600	150		1,480	1,205	285	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	900	300		2,220	1,810	740	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	1500	300		3,705	3,015	740	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F
Temperature Range Inclusive -450 °F to 500 °F									
Austenitic stainless steel	2J3	150	150	275	275	170	275	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	300	150	720	720	480	275	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	600	150	1,440	1,440	955	275	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	900	300	2,160	2,160	1,435	720	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2J3	1500	300	3,600	3,600	2,390	720	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2J3	2500	300	(4,495)	(4,495)	3,980	720	7	6 <sup>3</sup> / <sub>4</sub>
	3J4	150	150	275	275	170	275	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	300	150	720	720	480	275	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	600	150	1,440	1,440	955	275	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	900	300	2,160	2,160	1,435	720	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
3J4	1500	300	3,600	3,600	2,390	720	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>	
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	2J3	150	150		230	170	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	300	150		600	475	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	600	150		1,200	945	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	900	300		1,800	1,420	600	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	3J4	150	150		230	170	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	300	150		600	475	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	600	150		1,200	945	230	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	900	300		1,800	1,420	600	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	2J3	150	150		230	180	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	300	150		600	465	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	600	150		1,200	930	230	5 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>
	2J3	900	300		1,800	1,395	600	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2J3	1500	300		3,000	2,330	600	6 <sup>9</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>
	2J3	2500	300		(3,750)	(3,750)	600	7	6 <sup>3</sup> / <sub>4</sub>
	3J4	150	150		230	180	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	300	150		600	465	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	600	150		1,200	930	230	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3J4	900	300		1,800	1,395	600	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	3J4	1500	300		3,000	2,330	600	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>

<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.

<sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.

<sup>c</sup> Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.

<sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.

Table 51—Pilot-operated Pressure-relief Valves “K” Orifice <sup>d</sup> (Effective Orifice Area = 1.838 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (in.)	
				(psig)			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	Inlet Flange (Set) Pressure Limit			100 °F
Body	Inlet by Orifice by Outlet	Inlet	Outlet			–450 °F to –21 °F	–20 °F to 100 °F	500 °F	
Temperature Range Inclusive –20 °F to 500 °F									
Carbon steel	3K4	150	150		285	170	285	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	300	150		740	605	285	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	600	150		1,480	1,205	285	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	900	300		2,220	1,810	740	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	3K4	1500	300		3,705	3,015	740	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
Temperature Range Inclusive –450 °F to 500 °F									
Austenitic stainless steel	3K4	150	150	275	275	170	275	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	300	150	720	720	480	275	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	600	150	1,440	1,440	955	275	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	900	300	2,160	2,160	1,435	720	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	3K4	1500	300	3,600	3,600	2,390	720	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
Temperature Range Inclusive –20 °F to 500 °F									
Nickel/copper alloy	3K4	150	150		230	170	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	300	150		600	475	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	600	150		1,200	945	230	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	900	300		1,800	1,420	600	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	3K4	150	150		230	180	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	300	150		600	465	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	600	150		1,200	930	230	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3K4	900	300		1,800	1,395	600	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	3K4	1500	300		3,000	2,330	600	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

Table 52—Pilot-operated Pressure-relief Valves “L” Orifice <sup>d</sup> (Effective Orifice Area = 2.853 in.<sup>2</sup>) (USC)

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup>				Center-to-face Dimensions (in.)	
				(psig)			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet		Outlet	Inlet Flange (Set) Pressure Limit
							–450 °F to –21 °F		–20 °F to 100 °F
Temperature Range Inclusive –20 °F to 500 °F									
Carbon steel	3L4	150	150		285	170	285	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	300	150		740	605	285	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	600	150		(1,425)	1,205	285	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	900	300		2,220	1,810	740	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	3L4	1500	300		(3,630)	3,015	740	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	4L6	150	150		285	170	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	300	150		740	605	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	600	150		1,480	1,205	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	900	300		2,220	1,810	740	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4L6	1500	300		3,705	3,015	740	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
Temperature Range Inclusive –450 °F to 500 °F									
Austenitic stainless steel	3L4	150	150	275	275	170	275	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	300	150	720	720	480	275	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	600	150	(1,375)	(1,375)	955	275	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	900	300	2,160	2,160	1,435	720	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	3L4	1500	300	(3,530)	(3,530)	2,390	720	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	4L6	150	150	275	275	170	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	300	150	720	720	480	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	600	150	1,440	1,440	955	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	900	300	2,160	2,160	1,435	720	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4L6	1500	300	3,600	3,600	2,390	720	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	3L4	150	150		230	170	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	300	150		600	475	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	600	150		(1,150)	945	230	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	900	300		1,800	1,420	600	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	4L6	150	150		230	170	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	300	150		600	475	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	600	150		1,200	945	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	900	300		1,800	1,420	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	3L4	150	150		230	180	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	300	150		600	465	230	6 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	600	150		(1,150)	930	230	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>
	3L4	900	300		1,800	1,395	600	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	3L4	1500	300		(2,940)	2,330	600	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	4L6	150	150		230	180	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	300	150		600	465	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	600	150		1,200	930	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4L6	900	300		1,800	1,395	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4L6	1500	300		3,000	2,330	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F	Inlet	Outlet
				<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>					



**Table 53—Pilot-operated Pressure-relief Valves “M” Orifice <sup>d</sup> (Effective Orifice Area = 3.60 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive -20 °F to 500 °F									
Carbon steel	4M6	150	150		285	170	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	300	150		740	605	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	600	150		1,480	1,205	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	900	300		2,220	1,810	740	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4M6	1500	300		3,705	3,015	740	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
Temperature Range Inclusive -450 °F to 500 °F									
Austenitic stainless steel	4M6	150	150	275	275	170	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	300	150	720	720	480	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	600	150	1,440	1,440	955	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	900	300	2,160	2,160	1,435	720	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4M6	1500	300	3,600	3,600	2,390	720	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	4M6	150	150		230	170	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	300	150		600	475	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	600	150		1,200	945	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	900	300		1,800	1,420	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	4M6	150	150		230	180	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	300	150		600	465	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	600	150		1,200	930	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4M6	900	300		1,800	1,395	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4M6	1500	300		3,000	2,330	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
<sup>a</sup>	Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.								
<sup>b</sup>	Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.								
<sup>c</sup>	Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.								
<sup>d</sup>	Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i> , Section XIII.								

**Table 54—Pilot-operated Pressure-relief Valves “N” Orifice <sup>d</sup> (Effective Orifice Area = 4.34 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F
Temperature Range Inclusive -20 °F to 500 °F									
Carbon steel	4N6	150	150		285	170	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	300	150		740	605	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	600	150		1,480	1,205	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	900	300		2,220	1,810	740	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4N6	1500	300		3,705	3,015	740	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
Temperature Range Inclusive -450 °F to 500 °F									
Austenitic stainless steel	4N6	150	150	275	275	170	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	300	150	720	720	480	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	600	150	1,440	1,440	955	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	900	300	2,160	2,160	1,435	720	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4N6	1500	300	3,600	3,600	2,390	720	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	4N6	150	150		230	170	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	300	150		600	475	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	600	150		1,200	945	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	900	300		1,800	1,420	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	4N6	150	150		230	180	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	300	150		600	465	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	600	150		1,200	930	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4N6	900	300		1,800	1,395	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4N6	1500	300		3,000	2,330	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
<sup>a</sup>	Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.								
<sup>b</sup>	Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.								
<sup>c</sup>	Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.								
<sup>d</sup>	Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i> , Section XIII.								

**Table 55—Pilot-operated Pressure-relief Valves “P” Orifice <sup>d</sup> (Effective Orifice Area = 6.38 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				–450 °F to –21 °F	–20 °F to 100 °F	500 °F	100 °F	Inlet	Outlet
Temperature Range Inclusive –20 °F to 500 °F									
Carbon steel	4P6	150	150		285	170	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4P6	300	150		740	605	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4P6	600	150		(1,425)	1,205	285	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4P6	600	300		1,480	1,205	740	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4P6	900	300		2,220	1,810	740	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4P6	1500	300		(3,630)	3,015	740	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4P6	1500	600		3,705	3,015	1,480	9 <sup>13</sup> / <sub>16</sub>	10 <sup>3</sup> / <sub>8</sub>
Temperature Range Inclusive –450 °F to 500 °F									
Austenitic stainless steel	4P6	150	150	275	275	170	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4P6	300	150	720	720	480	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4P6	600	150	(1,375)	(1,375)	955	275	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4P6	600	300	1,440	1,440	955	720	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4P6	900	300	2,160	2,160	1,435	720	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4P6	1500	300	(3,520)	(3,520)	2,390	720	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
	4P6	1500	600	3,600	3,600	2,390	1,440	9 <sup>13</sup> / <sub>16</sub>	10 <sup>3</sup> / <sub>8</sub>
Temperature Range Inclusive –20 °F to 500 °F									
Nickel/copper alloy	4P6	150	150		230	170	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4P6	300	150		600	475	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4P6	600	150		(1,150)	945	230	7 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>
	4P6	900	300		1,800	1,420	600	9 <sup>13</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>



**Table 56—Pilot-operated Pressure-relief Valves “Q” Orifice <sup>d</sup> (Effective Orifice Area = 11.05 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F	Inlet	Outlet
Temperature Range Inclusive -20 °F to 500 °F									
Carbon steel	6Q8	150	150		285	170	285	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	300	150		740	605	285	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	150		(1,450)	1,205	285	9 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	300		1,480	1,205	740	9 <sup>11</sup> / <sub>16</sub>	10 <sup>7</sup> / <sub>16</sub>
Temperature Range Inclusive -450 °F to 500 °F									
Austenitic stainless steel	6Q8	150	150	275	275	170	275	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	300	150	720	720	480	275	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	150	(1,400)	(1,400)	955	275	9 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	300	1,440	1,440	955	720	9 <sup>11</sup> / <sub>16</sub>	10 <sup>7</sup> / <sub>16</sub>
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	6Q8	150	150		230	170	230	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	300	150		600	475	230	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	150		(1,170)	945	230	9 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	300		1,200	945	600	9 <sup>11</sup> / <sub>16</sub>	10 <sup>7</sup> / <sub>16</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Inlet	Outlet				
Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F		
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	6Q8	150	150		230	180	230	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	300	150		600	465	230	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	150		(1,170)	930	230	9 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6Q8	600	300		1,200	930	600	9 <sup>11</sup> / <sub>16</sub>	10 <sup>7</sup> / <sub>16</sub>
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									



**Table 57—Pilot-operated Pressure-relief Valves “R” Orifice <sup>d</sup> (Effective Orifice Area = 16.00 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>	Inlet	Outlet
				-450 °F to -21 °F	-20 °F to 100 °F	500 °F	100 °F		
Temperature Range Inclusive -20 °F to 500 °F									
Carbon steel	6R8	150	150		285	170	285	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8	300	150		740	605	285	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8	600	150		(1,020)	(1,020)	285	9 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -450 °F to 500 °F									
Austenitic stainless steel	6R8	150	150	275	275	170	275	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8	300	150	720	720	480	275	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8	600	150	(985)	(985)	955	275	9 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	6R8	150	150		230	170	230	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8	300	150		600	475	230	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8	600	150		(820)	(820)	230	9 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
				Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>		
				Body	Inlet by Orifice by Outlet	Inlet	Outlet	-450 °F to -21 °F	-20 °F to 100 °F
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	6R8	150	150		230	180	230	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8	300	150		600	465	230	9 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
	6R8	600	150		(820)	(820)	230	9 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>
<p><sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.</p> <p><sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.</p> <p><sup>c</sup> Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.</p> <p><sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME <i>BPVC</i>, Section XIII.</p>									

**Table 58—Pilot-operated Pressure-relief Valves “T” Orifice <sup>d</sup> (Effective Orifice Area = 26.00 in.<sup>2</sup>) (USC)**

Materials <sup>b</sup>	Valve Size	ASME Flange Class		Maximum Pressure Limits <sup>a</sup> (psig)				Center-to-face Dimensions (in.)	
		Inlet	Outlet	Inlet Flange (Set) Pressure Limit			Outlet Pressure Limit <sup>a</sup>	Inlet	Outlet
				-450 °F to -21 °F	-20 °F to 100 °F	500 °F			
Temperature Range Inclusive -20 °F to 500 °F									
Carbon steel	8T10	150	150		285	170	285	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150		740	605	285	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	600	150		(985)	(985)	285	11 <sup>11</sup> / <sub>16</sub>	11
Temperature Range Inclusive -450 °F to 500 °F									
Austenitic stainless steel	8T10	150	150	275	275	170	275	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150	720	720	480	275	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	600	150	(950)	(950)	(950)	275	11 <sup>11</sup> / <sub>16</sub>	11
Temperature Range Inclusive -20 °F to 500 °F									
Nickel/copper alloy	8T10	150	150		230	170	230	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150		600	475	230	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	600	150		(795)	(795)	230	11 <sup>11</sup> / <sub>16</sub>	11
Temperature Range Inclusive -20 °F to 300 °F									
Alloy 20 <sup>c</sup>	8T10	150	150		230	180	230	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	300	150		600	465	230	10 <sup>7</sup> / <sub>8</sub>	11
	8T10	600	150		(795)	(795)	230	11 <sup>11</sup> / <sub>16</sub>	11
<sup>a</sup> Inlet and outlet flange pressure limits correspond to the values in ASME B16.34 unless enclosed in parentheses. A value that is shown in parentheses is less than provided in ASME B16.34. The outlet flange values at 100 °F above are the limit for this standard. Inlet and outlet flange pressure values at other temperatures may only be interpolated using charts from Annex F or from tables in ASME B16.34 if these values do not exceed the values in parentheses or the outlet flange values at 100 °F above. Pressure changes within the temperature ranges above may not be linear. User is cautioned to review the outlet temperature for possible cryogenic applications and select the appropriate materials.									
<sup>b</sup> Materials given are minimum requirements for the pressure and temperature ratings. Other suitable materials may be used, as required for the service involved.									
<sup>c</sup> Materials limited to 300 °F. Pressure ratings indicated in the 500 °F column are limited to 300 °F.									
<sup>d</sup> Restricted lift pressure-relief valves, as described in paragraph 4.2.4 of API 520, Part 1, may be specified. The valves supplied shall have a reduction in effective area and meet the restricted lift requirements per ASME BPVC, Section XIII.									

## Annex A (normative)

### Pressure-relief Valve Nameplate Nomenclature (SI)

Markings for the pressure-relief valves shall be detailed on a nameplate with the information as per Table A.1.

**Table A.1—PRV Nameplate Nomenclature Table (SI)**

Nomenclature	Description
Tag number	Project specific tag
Manufacturer's name or identifying trademark	Identification of manufacturer
Size	Nominal pipe size, inlet by outlet
Type, style, model, or figure number	Manufacturer's designation
Orifice	Valve orifice size, standardized letter designations [for restricted lift orifice add "-RL" suffix (i.e. "P-RL") or use the manufacturer's designation]
Capacity at 10 % overpressure	Kilograms per hour of saturated steam, standard cubic meter per minute of air, at 15.6 °C and 101 kPag or liters per minute of water at 20 °C
Serial number or shop number	Manufacturer's identification
Set pressure, kPag	Valve inlet pressure at which the pressure-relief valve is adjusted to open under service conditions
Back pressure, kPag	Constant (e.g. 345 kPag), variable (e.g. 0 kPag to 345 kPag)
Cold differential test pressure, kPag	The pressure at which the pressure-relief valve is adjusted gauge (if applicable) to open on the test stand. The cold differential test pressure includes corrections to the set pressure for the service conditions of back pressure or temperature or both (see examples below)
Lift, mm, for restricted lift valves	See API 520, Part 1, paragraph 4.2.4
Year built	Year built, e.g. 2020, or another coding method, e.g. part of serial number
Certification mark	(optional) e.g. ASME Certification Mark with UV Designator
<b>Example 1—Conventional Valve</b>	
Set pressure, kPag	1380
Back pressure, kPag	Atmospheric (or 0)
Temperature, °C	204.4
Cold differential test pressure, kPag	1380 + manufacturer's recommended temperature correction
<b>Example 2—Balanced Bellows Valve</b>	
Set pressure, kPag	1380
Back pressure, kPag	345, or 0 to 345
Temperature, °C	204.4
Cold differential test pressure, kPag	1380 + manufacturer's recommended temperature correction
<b>Example 3—Conventional Valve</b>	
Set pressure, kPag	1380
Back pressure, kPag	345, constant superimposed
Temperature, °C	204.4
Cold differential test pressure, kPag	1380 – 345 + manufacturer's recommended temperature correction

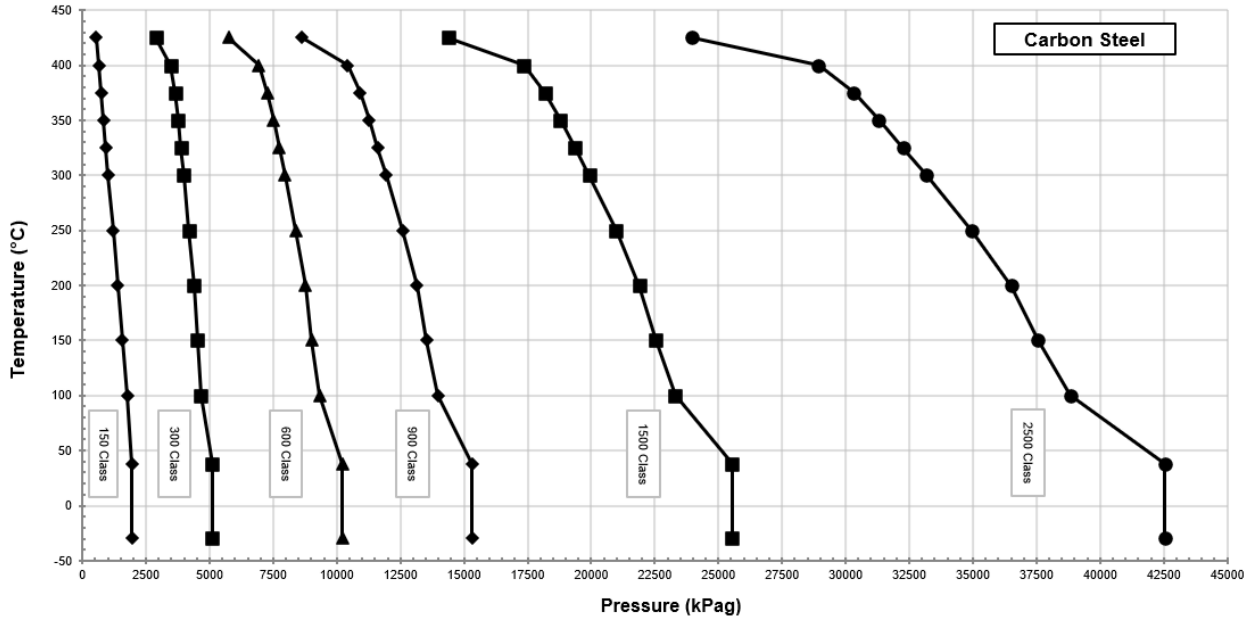
In addition to the nameplate detailed in Table A.1, for pilot-operated pressure-relief valves, the pilot itself shall bear an additional nameplate with the information as per Table A.2.

**Table A.2—Pilot Nameplate Nomenclature Table (SI)**

Nomenclature	Description
Type, style, model, or figure number	Manufacturer's designation
Set pressure, kPag	Valve inlet pressure at which the pressure-relief valve is adjusted to open under service conditions
Serial number or shop number	Manufacturer's identification

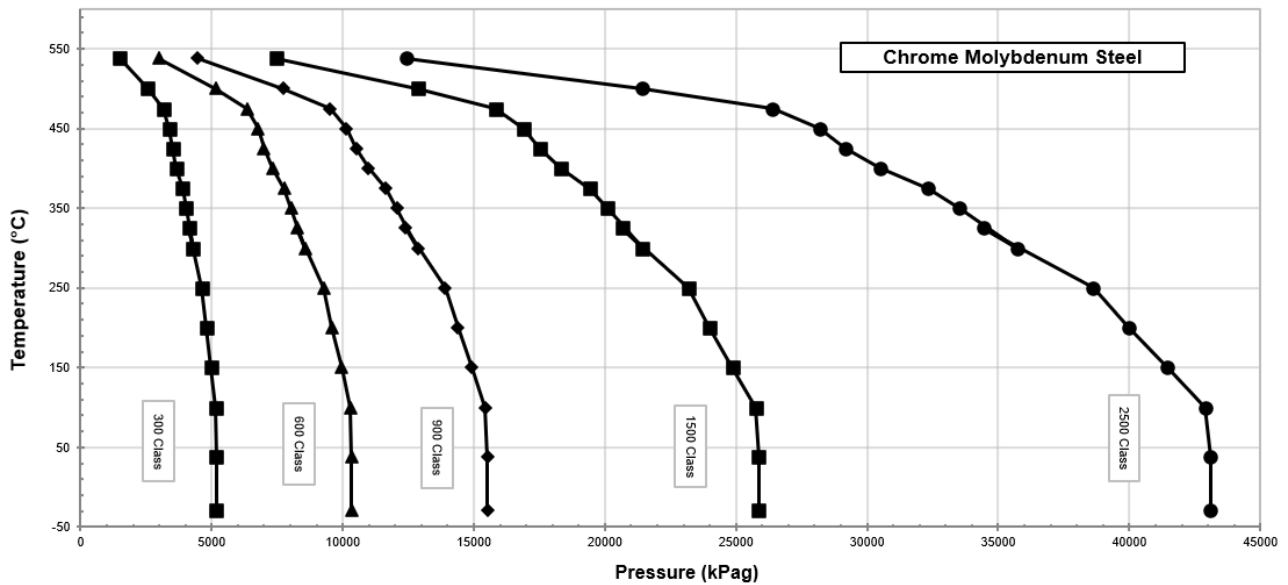
## Annex B (normative)

### Pressure–Temperature Rating Charts (SI)



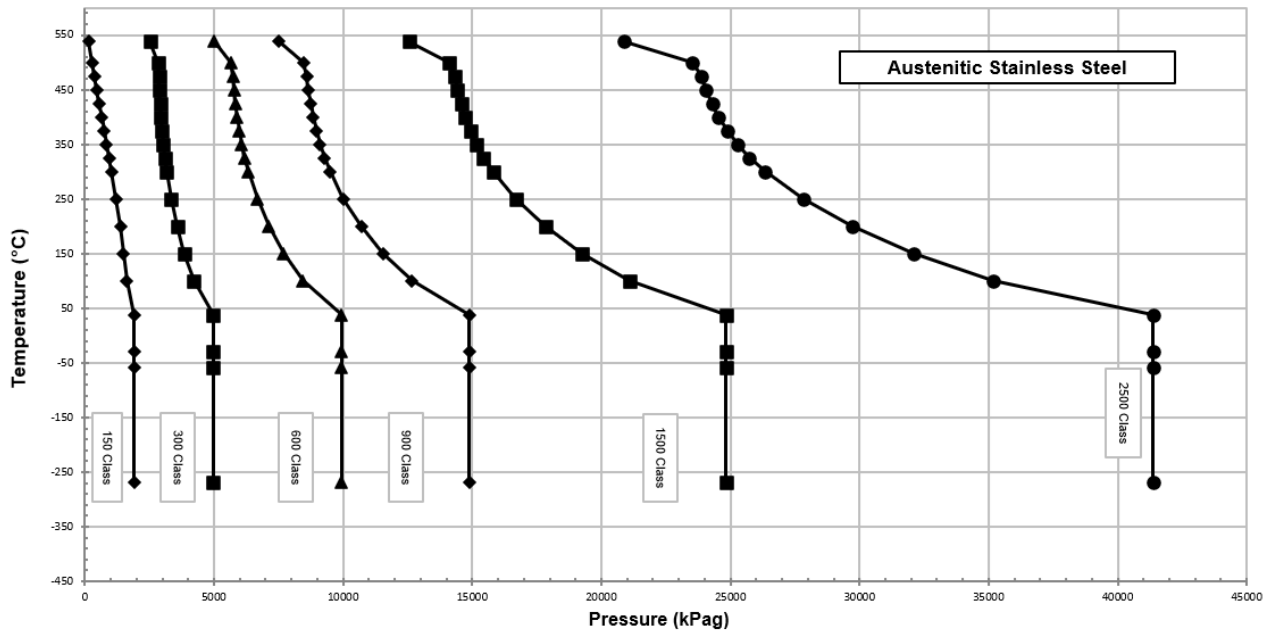
<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-1.1. The bar values of Table 2-1.1 are converted into kPa values. These values do not reflect the modifications made in Table 3 to Table 30 of this document. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure B.1—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 3 to Table 30 of This Standard (SI)**



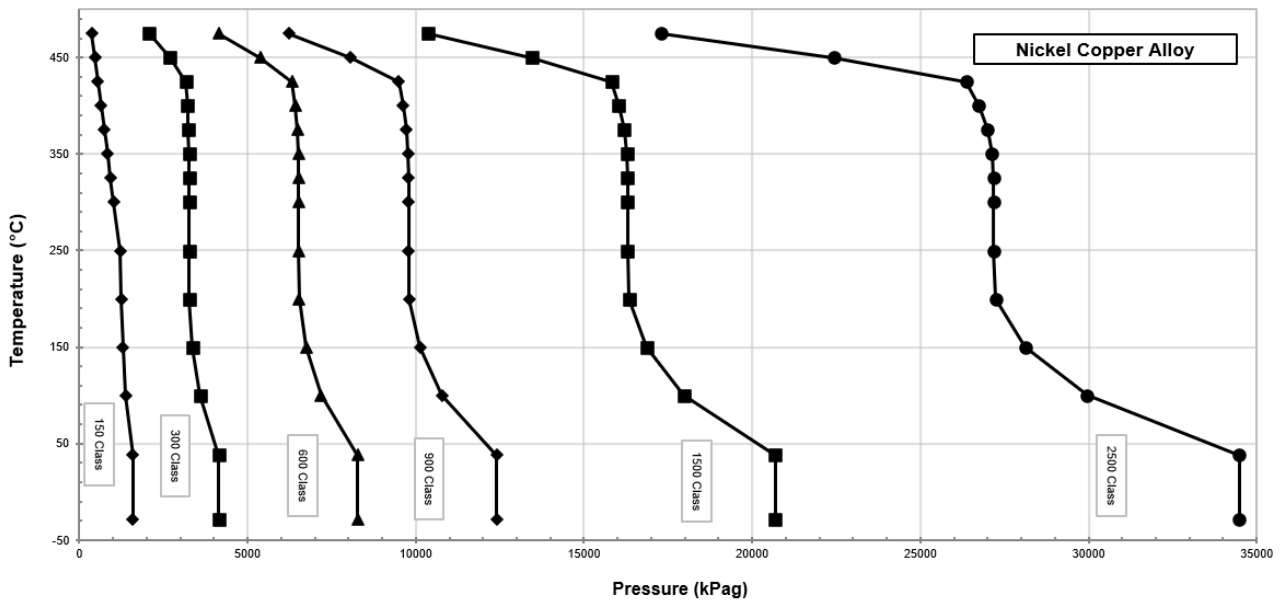
<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-1.9. The bar values of Table 2-1.9 are converted into kPa values. These values do not reflect the modifications made in Table 3 to Table 30 of this document. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure B.2—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 3 to Table 30 of This Standard (SI)**



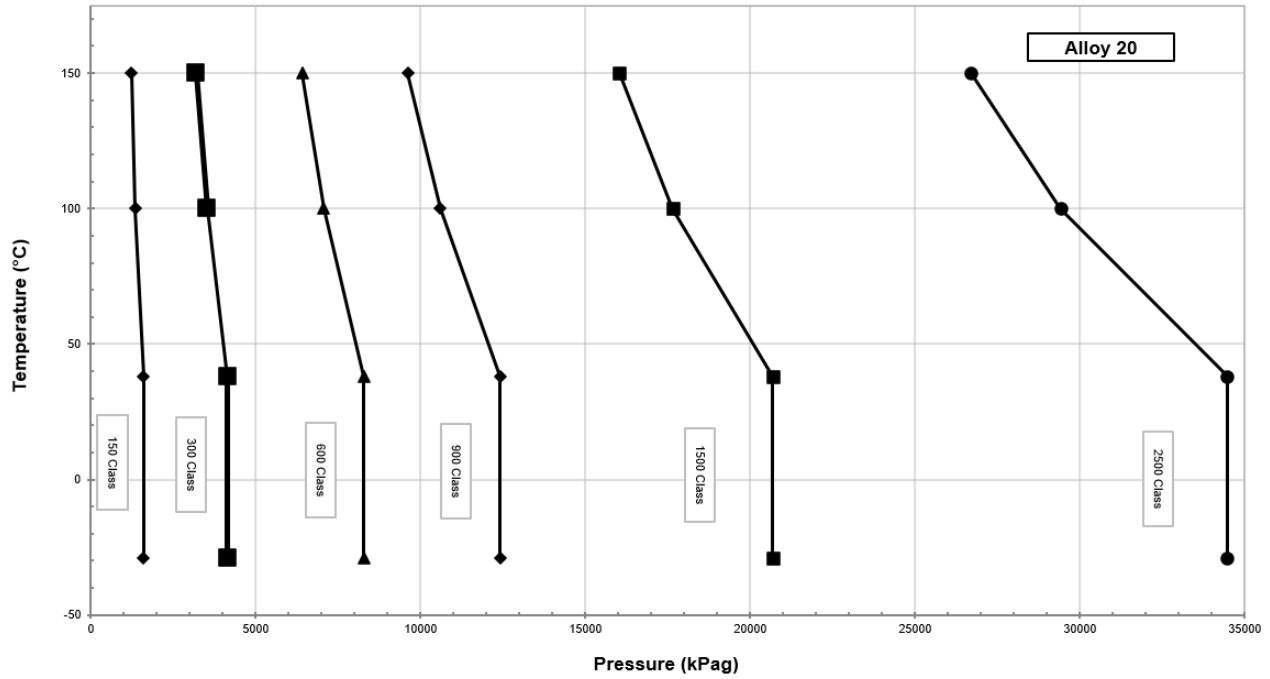
<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-2.2. These values do not reflect the modifications made in Table 3 to Table 30 of this document. The austenitic stainless steel figure has been extended down to -268 °C. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure B.3—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 3 to Table 30 of This Standard (SI)**



<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-3.4. The bar values of Table 2-3.4 are converted into kPa values. These values do not reflect the modifications made in Table 3 to Table 30 of this document. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure B.4—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 3 to Table 30 of This Standard (SI)**



<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-3.17. The bar values of Table 2-3.17 are converted into kPa values. These values do not reflect the modifications made in Table 3 to Table 30 of this document. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure B.5—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 3 to Table 30 of This Standard (SI)**



## Annex C (normative)

### Bellows Pressure–Temperature Requested Rating Factors (SI)

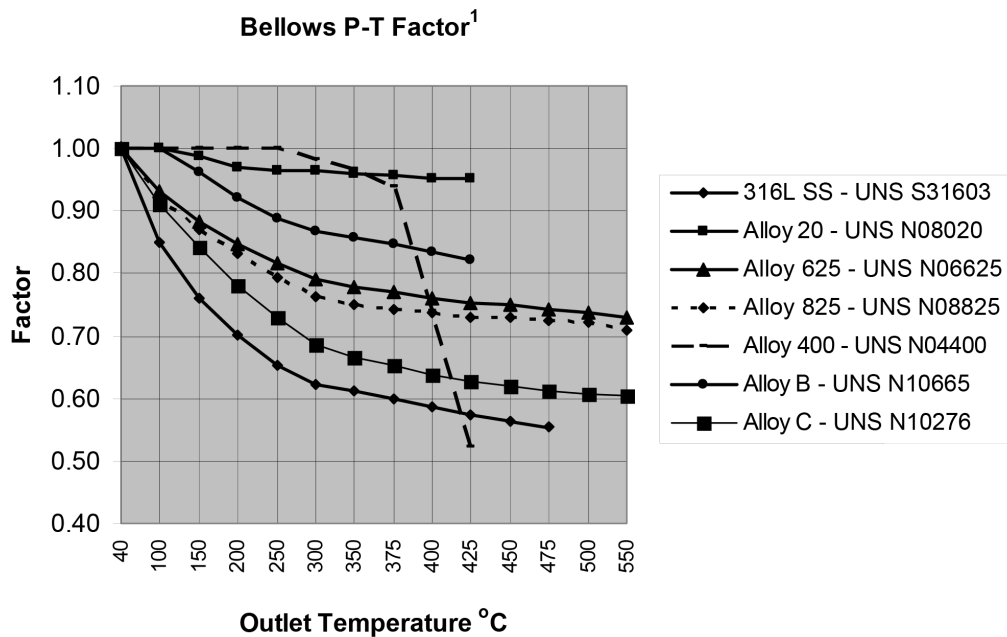
When the outlet pressure limit for the bellows is lower than the outlet pressure limit of the flange rating, it is the bellows that controls the suitability of the relief device for the specified back pressure and temperature.

The chart in this annex is to be used to modify the outlet pressure limit for spring-loaded bellows design pressure-relief valves for outlet temperatures other than 38 °C. This chart was prepared using data from ASME *BPVC*, Section II, Part D.

The values of this chart are based on the bellows pressure rating being equal to the 38 °C rating of this standard. The pressure-relief valve manufacturer should be consulted for the actual pressure–temperature rating of the bellows.

The outlet pressure limit for spring-loaded bellows design pressure-relief valves is determined using the selected bellows design pressure-relief valve’s outlet pressure limit, outlet temperature, and bellows material as follows.

- 1) From the appropriate table for the selected valve (Table 3 through Table 16), note the “outlet pressure limit.”
- 2) In the chart, locate the line for the bellows material.
- 3) Locate the outlet temperature on the x-axis and extend this point vertically to the intersection of the material chart line. At this intersection, go horizontally to the y-axis and locate the factor.
- 4) Multiply the 38 °C outlet pressure limit by the factor from Item 3) above to determine the outlet pressure limit at the outlet temperature.



<sup>1</sup> Data derived from ASME *BPVC*, Section II, Part D-M.

**Figure C.1—Bellows Pressure–Temperature Rating Factor (SI)**

## Annex D (informative)

### Valve Selection Examples (SI)

NOTE These examples in Annex D were prepared to demonstrate the use of the charts of Annex B and Annex C. The values used in these examples may or may not be an example of an actual pressure-relief application.

#### EXAMPLE 1

##### Data

Set pressure: 4135 kPag

Back pressure: 1035 kPag

Operating temperature: 177 °C

Design temperature: 232 °C

Outlet temperature: 38 °C

Body/bonnet material: Carbon steel

Orifice: F

Type: Bellows

##### Selection

F orifice: Use Table 5

Spring: Select carbon steel or chrome alloy steel for –59 °C to 232 °C from Table 2

Valve selection: Line 3, 1<sup>1</sup>/<sub>2</sub> F2 Class 300 inlet × Class 150 outlet (rated 4275 kPag @ 232 °C)

Bellows: Use Annex C, select any material (all materials are acceptable for 1585 kPag @ 38 °C)

#### EXAMPLE 2

##### Data

Set pressure: 415 kPag

Total back pressure: 170 kPag

Operating temperature: 371 °C

Design temperature: 454 °C

Outlet temperature: 204 °C

Body/bonnet material: Chrome molybdenum

Orifice: T

Type: Bellows, Alloy 625 material

##### Selection

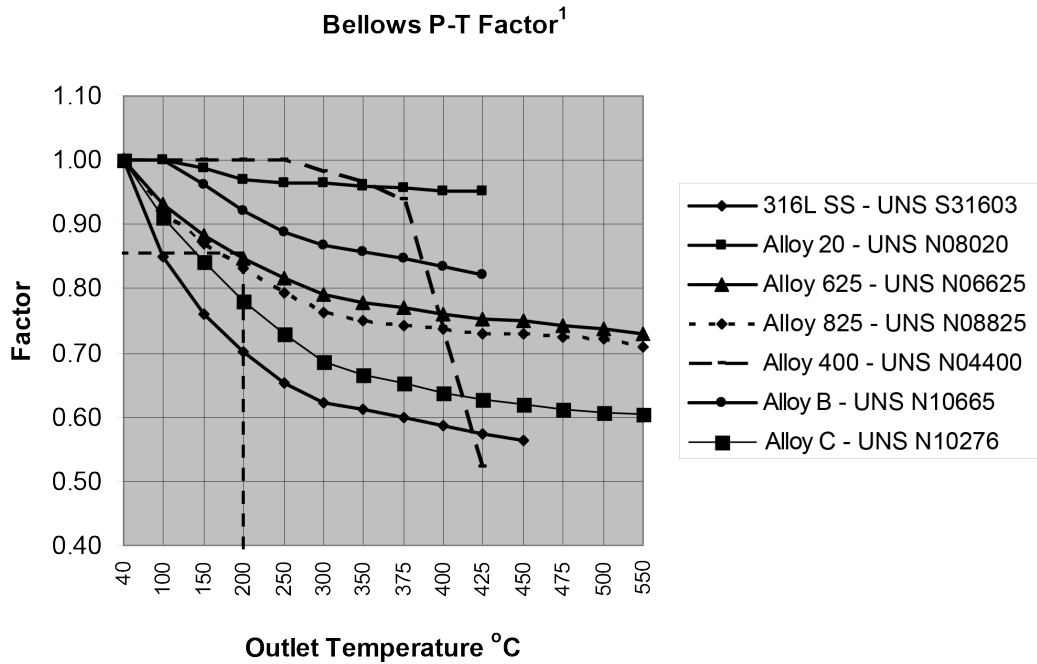
T orifice: Use Table 16

Spring: Select high temperature alloy steel for 232 °C to 538 °C from Table 2

Valve selection: 8T10 Class 300 inlet × Class 150 outlet (rated 825 psig @ 443 °C and 690 kPag @ 538 °C)

Bellows: Use Annex C (see example of Figure D.1)

- 1) Locate 204 °C on outlet temperature axis.
- 2) Move vertically to the intersection of the Alloy 625 curve.
- 3) From the intersection with the Alloy 625 curve, move horizontally and intersect the Factor axis.
- 4) At the intersection with the Factor axis, read the bellows pressure–temperature (P-T) factor of 0.85.
- 5) Bellows rating at 38 °C is 415 kPag (see Table 16).
- 6) Bellows rating at 204 °C  $415 \times 0.85 = 353 \text{ kPag} \geq$  required 170 kPag.



<sup>1</sup> Data derived from ASME *BPVC*, Section II, Part D-M.

**Figure D.1—Bellows Pressure–Temperature Rating Factor for Example 2 (SI)**

**EXAMPLE 3**

**Data**

Set pressure: 9310 kPag

Back pressure: 170 kPag

Operating temperature: 371 °C

Design temperature: 399 °C

Outlet temperature: –160 °C

Body/bonnet material: Austenitic stainless steel

Orifice: F

Type: Conventional

**Selection**

F Orifice: Use Table 5

Spring: Select low temperature alloy steel due to outlet temperature from Table 2

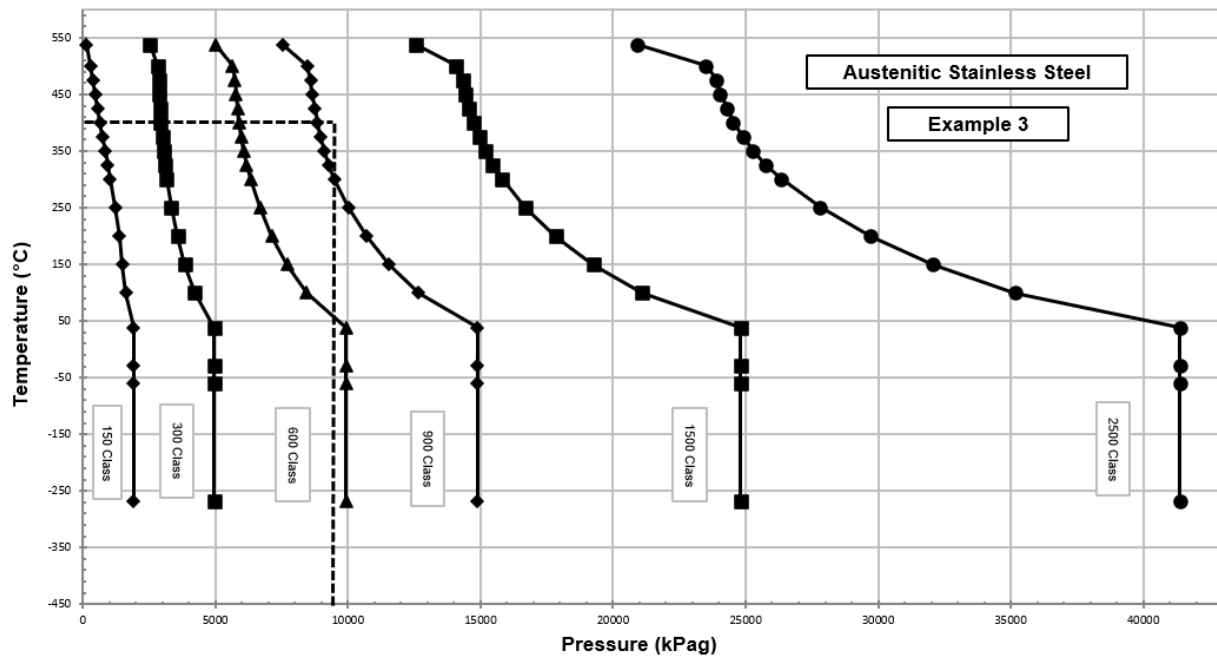
Valve selection: 1½ F3 Class 1500 inlet × Class 300 outlet

From Table 5 it cannot be determined if the 900 Class inlet is acceptable as the set pressure of 9310 kPag exceeds the allowable pressure at 427 °C for austenitic stainless steel

Referring the example of Figure D.2 below:

- 1) note that the set pressure (9310 kPag) and temperature (399 °C) lies to the right of the 900 Class line;
- 2) therefore, the 1500 Class inlet is required. The user is advised to consult ASME B16.34 for more detailed pressure–temperature information.

Bellows: No selection required



- <sup>1</sup> Produced from data in ASME B16.34-2020, Table 2-2.2. The bar values of Table 2-2.2 are converted into kPa values. These values do not reflect the modifications made in Table 3 to Table 30 of this document. The austenitic stainless steel figure has been extended down to -268 °C. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure D.2—Pressure–Temperature Limits <sup>1</sup> for Example 3 (SI)**

## Annex E (normative)

### Pressure-relief Valve Nameplate Nomenclature (USC)

Markings for the pressure-relief valves shall be detailed on a nameplate with the information as per Table E.1.

**Table E.1—PRV Nameplate Nomenclature Table (USC)**

Nomenclature	Description
Tag number	Project specific tag
Manufacturer's name or identifying trademark	Identification of manufacturer
Size	Nominal pipe size, inlet by outlet
Type, style, model, or figure number	Manufacturer's designation
Orifice	Valve orifice size, standardized letter designations [for restricted lift orifice add "-RL" suffix (i.e. "P-RL") or use the manufacturer's designation]
Capacity at 10 % overpressure	Pounds per hour of saturated steam, standard cubic feet per minute of air, at 60 °F and 14.7 psia or U.S. gallons per minute of water at 70 °F
Serial number or shop number	Manufacturer's identification
Set pressure, psig	Valve inlet pressure at which the pressure-relief valve is adjusted to open under service conditions
Back pressure, psig	Constant (e.g. 50 psig), variable (e.g. 0 psig to 50 psig)
Cold differential test pressure, psig	The pressure at which the pressure-relief valve is adjusted gauge (if applicable) to open on the test stand. The cold differential test pressure includes corrections to the set pressure for the service conditions of back pressure or temperature or both (see examples below)
Lift, inch, for restricted lift valves	See API 520, Part 1, paragraph 4.2.4
Year built	Year built, e.g. 2020, or another coding method, e.g. part of serial number
Certification mark	(optional) e.g. ASME Certification Mark with UV Designator
<b>Example 1—Conventional Valve</b>	
Set pressure, psig	200
Back pressure, psig	Atmospheric (or 0)
Temperature, °F	400
Cold differential test pressure, psig	200 + manufacturer's recommended temperature correction
<b>Example 2—Balanced Bellows Valve</b>	
Set pressure, psig	200
Back pressure, psig	50, or 0 to 50
Temperature, °F	400
Cold differential test pressure, psig	200 + manufacturer's recommended temperature correction
<b>Example 3—Conventional Valve</b>	
Set pressure, psig	200
Back pressure, psig	50, constant superimposed
Temperature, °F	400
Cold differential test pressure, psig	200 – 50 + manufacturer's recommended temperature correction

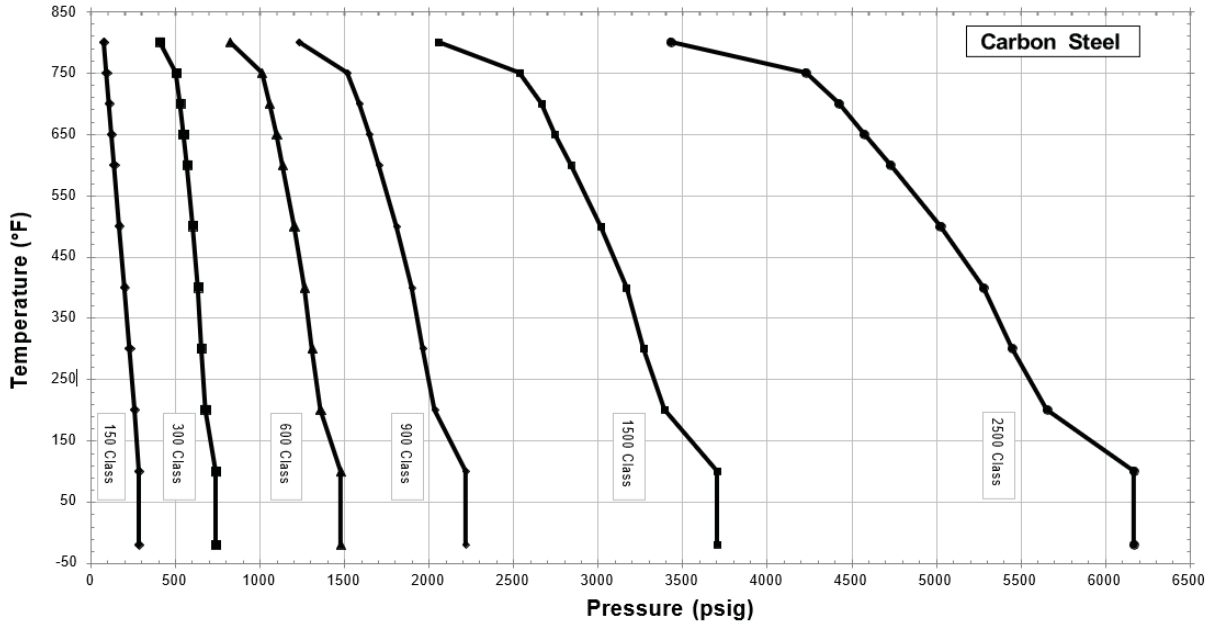
In addition to the nameplate detailed in Table E.1, for pilot-operated pressure-relief valves, the pilot itself shall bear an additional nameplate with the information as per Table E.2.

**Table E.2—Pilot Nameplate Nomenclature Table (USC)**

<b>Nomenclature</b>	<b>Description</b>
Type, style, model, or figure number	Manufacturer's designation
Set pressure, psig	Valve inlet pressure at which the pressure-relief valve is adjusted to open under service conditions
Serial number or shop number	Manufacturer's identification

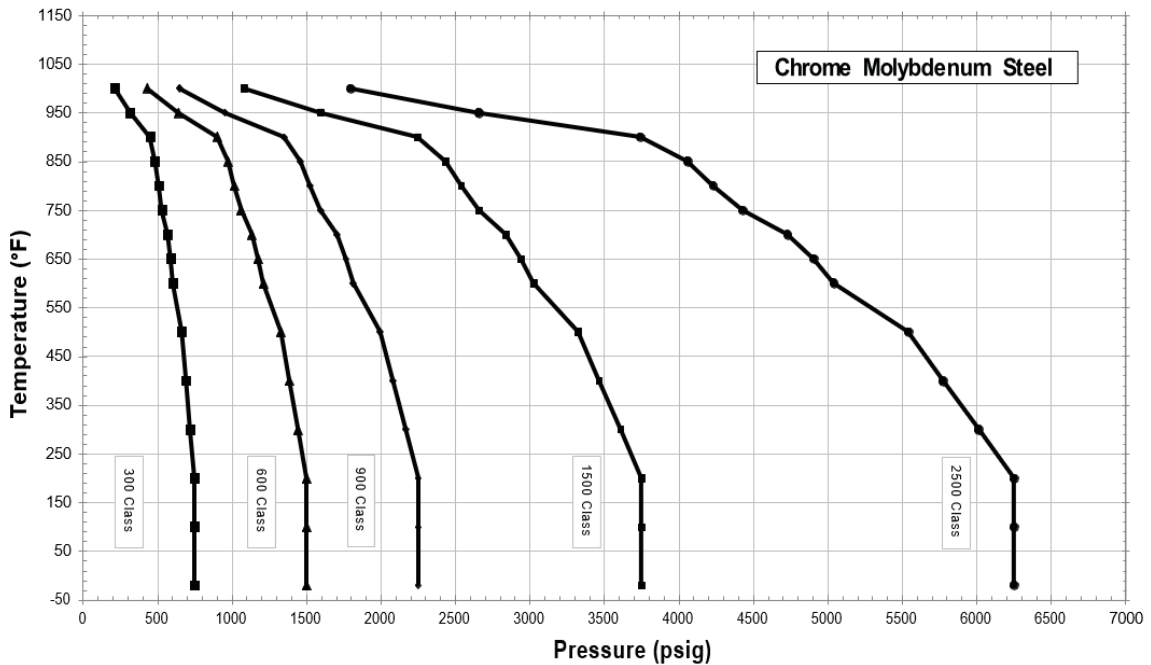
# Annex F (normative)

## Pressure–Temperature Rating Charts (USC)



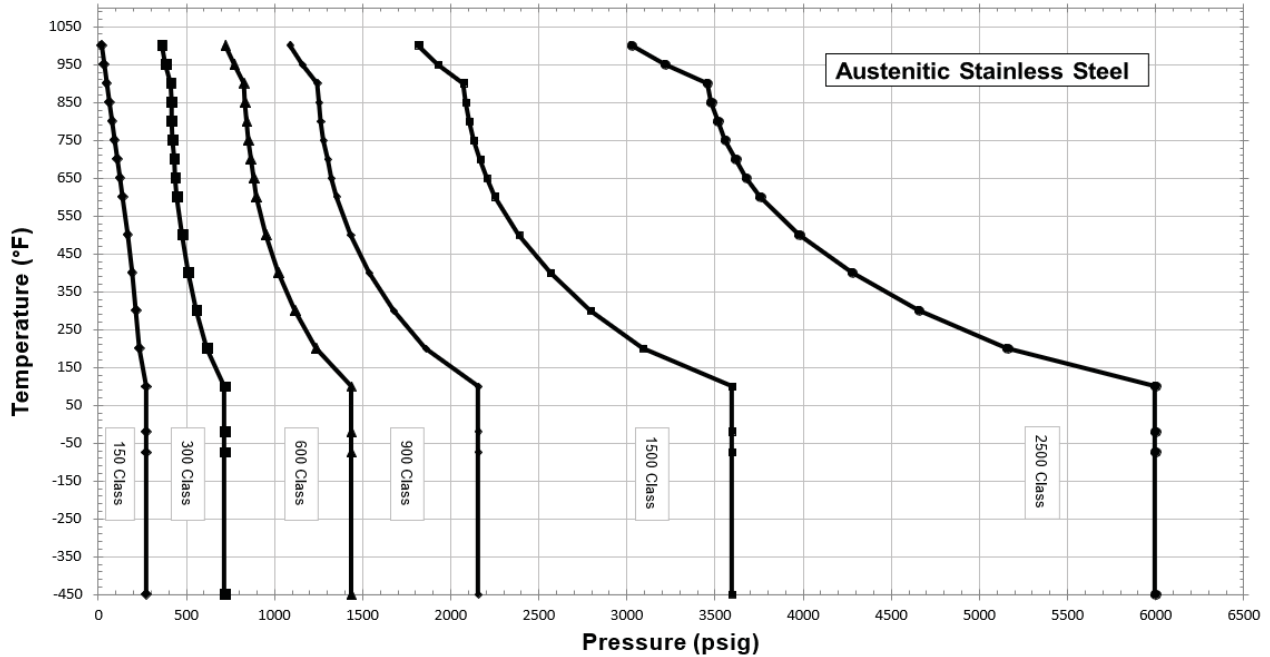
<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-1.1C. These values do not reflect the modifications made in Table 31 to Table 58 of this document. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure F.1—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 31 to Table 58 of This Standard (USC)**



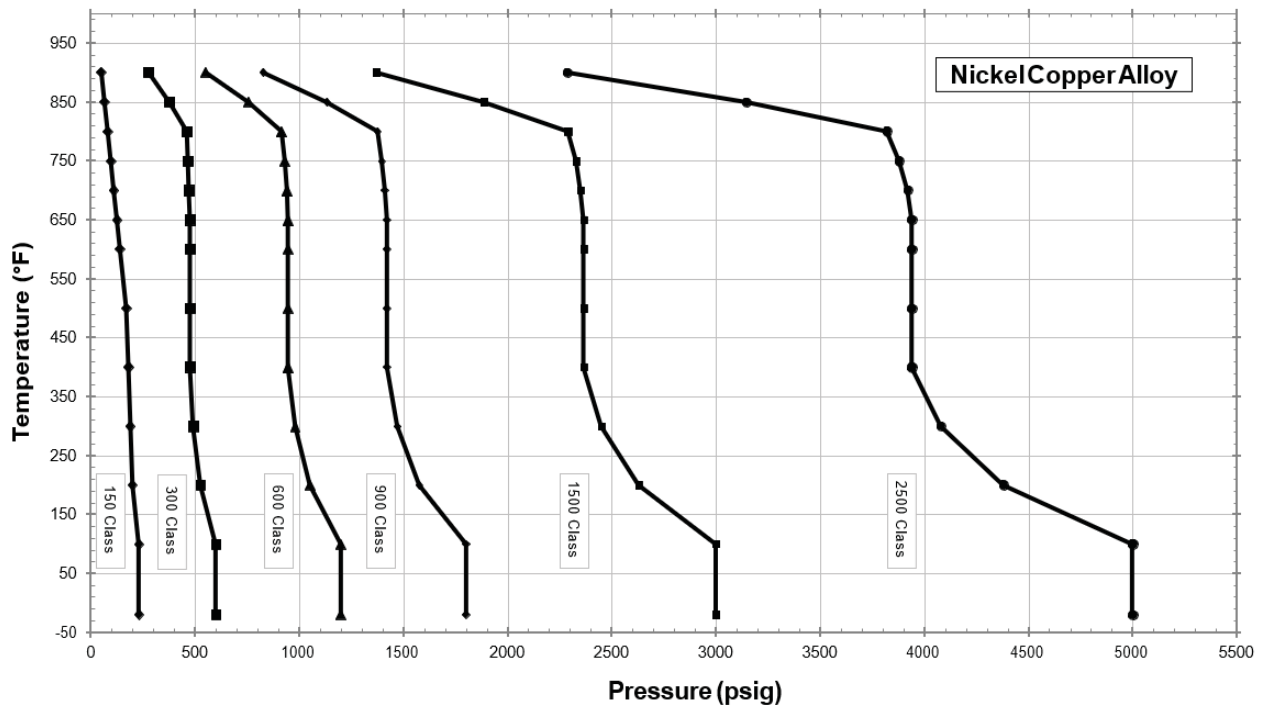
<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-1.9C. These values do not reflect the modifications made in Table 31 to Table 58 of this document. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure F.2—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 31 to Table 58 of This Standard (USC)**



<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-2.2C. These values do not reflect the modifications made in Table 31 to Table 58 of this document. The austenitic stainless steel figure has been extended down to -450 °F. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

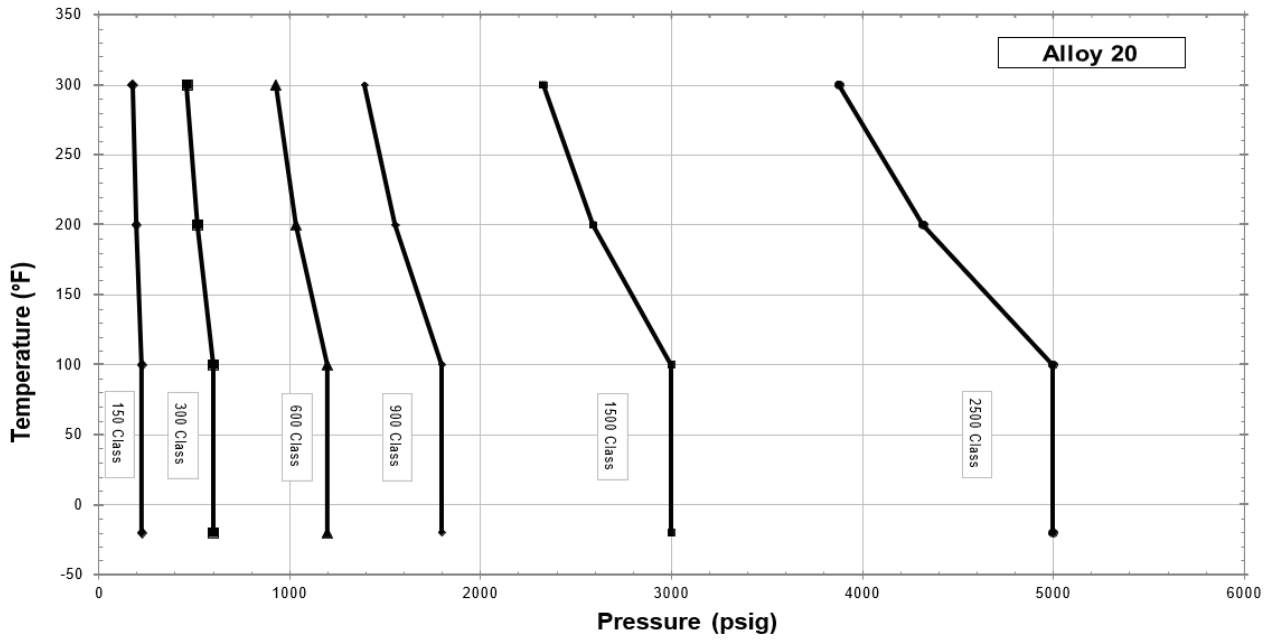
**Figure F.3—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 31 to Table 58 of This Standard (USC)**



<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-3.4C. These values do not reflect the modifications made in Table 31 to Table 58 of this document. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure F.4—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 31 to Table 58 of This Standard (USC)**





<sup>1</sup> Data derived from ASME B16.34-2020, Table 2-3.17C. These values do not reflect the modifications made in Table 31 to Table 58 of this document. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure F.5—Pressure–Temperature Limits <sup>1</sup> to Be Used with Table 31 to Table 58 of This Standard (USC)**

## Annex G (normative)

### Bellows Pressure–Temperature Requested Rating Factors (USC)

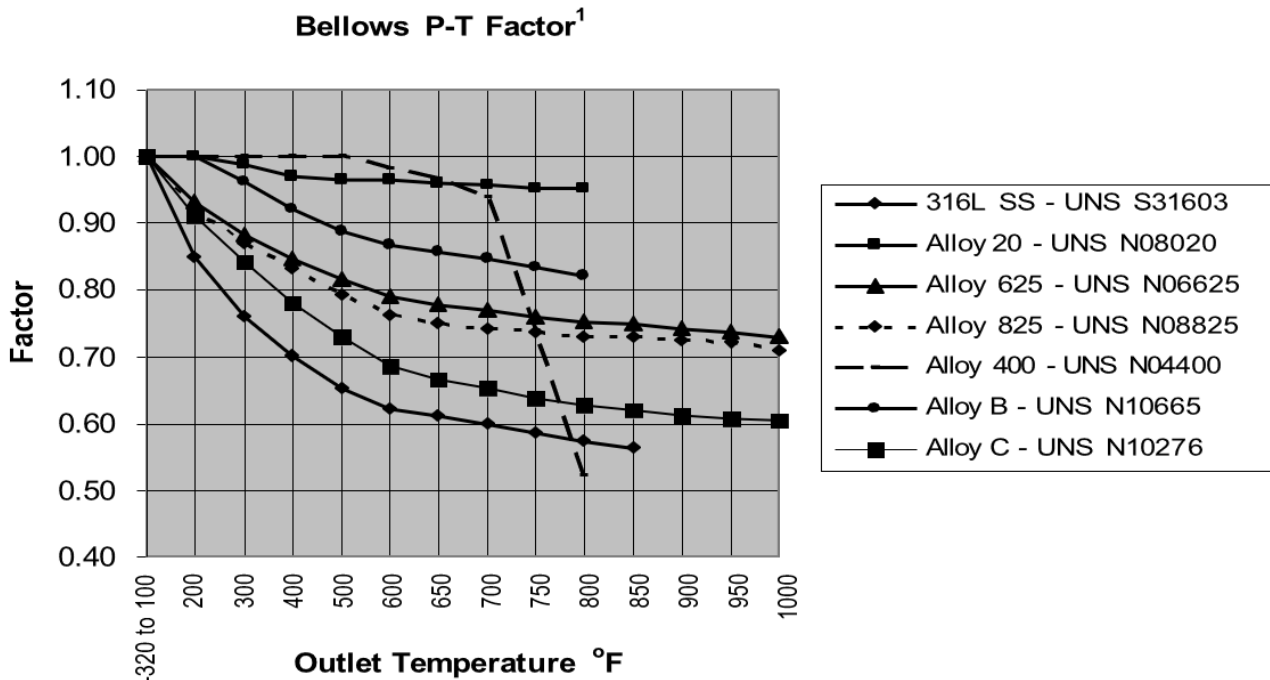
When the outlet pressure limit for the bellows is lower than the outlet pressure limit of the flange rating, it is the bellows that controls the suitability of the relief device for the specified back pressure and temperature.

The chart in this annex is to be used to modify the outlet pressure limit for spring-loaded bellows design pressure-relief valves for outlet temperatures other than 100 °F. This chart was prepared using data from ASME *BPVC*, Section II, Part D.

The values of this chart are based on the bellows pressure rating being equal to the 100 °F rating of this standard. The pressure-relief valve manufacturer should be consulted for the actual pressure–temperature rating of the bellows.

The outlet pressure limit for spring-loaded bellows design pressure-relief valves is determined using the selected bellows design pressure-relief valve’s outlet pressure limit, outlet temperature, and bellows material as follows.

- 1) From the appropriate table for the selected valve (Table 31 through Table 44), note the “outlet pressure limit.”
- 2) In the chart, locate the line for the bellows material.
- 3) Locate the outlet temperature on the x-axis and extend this point vertically to the intersection of the material chart line. At this intersection, go horizontally to the y-axis and locate the factor.
- 4) Multiply the 100 °F outlet pressure limit by the factor from Item 3) above to determine the outlet pressure limit at the outlet temperature.



<sup>1</sup> Data derived from ASME *BPVC*, Section II, Part D-C.

**Figure G.1—Bellows Pressure–Temperature Rating Factor (USC)**

## Annex H (informative)

### Valve Selection Examples (USC)

NOTE These examples in Annex H were prepared to demonstrate the use of the charts of Annex F and Annex G. The values used in these examples may or may not be an example of an actual pressure-relief application.

#### EXAMPLE 1

##### Data

Set pressure: 600 psig

Back pressure: 150 psig

Operating temperature: 350 °F

Design temperature: 450 °F

Outlet temperature: 100 °F

Body/bonnet material: Carbon steel

Orifice: F

Type: Bellows

##### Selection

F orifice: Use Table 33

Spring: Select carbon steel or chrome alloy steel for –75 °F to 450 °F from Table 2

Valve selection: Line 3, 1<sup>1</sup>/<sub>2</sub> F2 Class 300 inlet × Class 150 outlet (rated 620 psi @ 450 °F)

Bellows: Use Annex G, select any material (all materials are acceptable for 230 psi @ 100 °F)

#### EXAMPLE 2

##### Data

Set pressure: 60 psig

Total back pressure: 25 psig

Operating temperature: 700 °F

Design temperature: 850 °F

Outlet temperature: 400 °F

Body/bonnet material: Chrome molybdenum

Orifice: T

Type: Bellows, Alloy 625 material

##### Selection

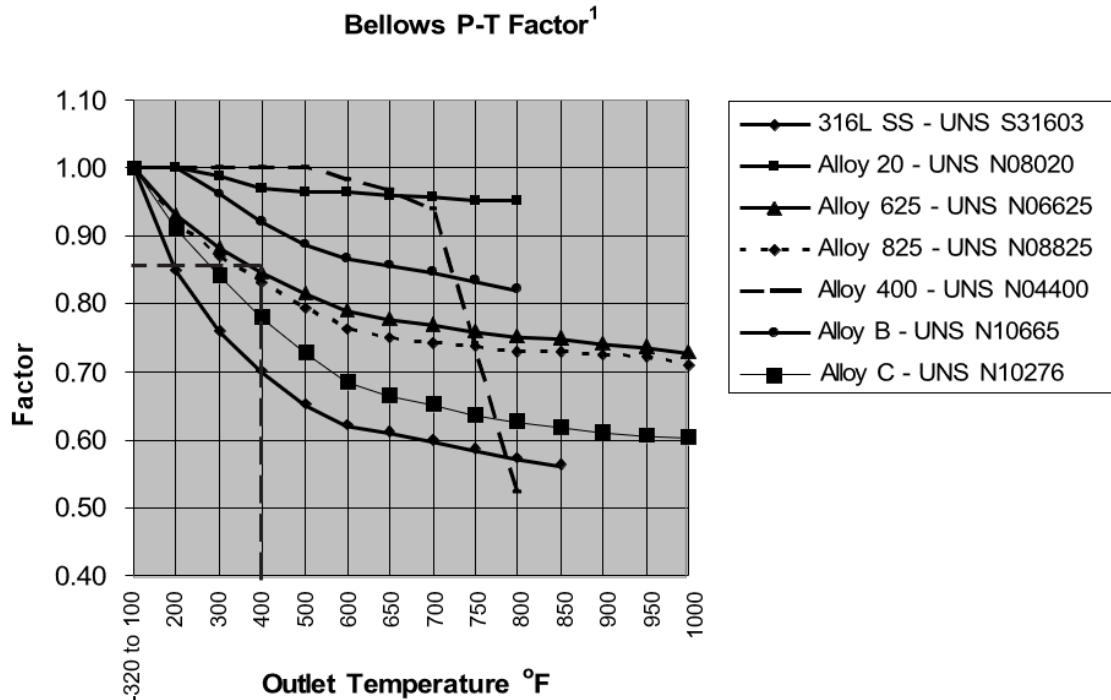
T orifice: Use Table 44

Spring: Select high temperature alloy steel for 450 °F to 1000 °F from Table 2

Valve selection: 8T10 Class 300 inlet × Class 150 outlet (rated 120 psig @ 800 °F and 100 psig @ 1000 °F)

Bellows: Use Annex G (see example of Figure H.1)

- 1) Locate 400 °F on outlet temperature axis.
- 2) Move vertically to the intersection of the Alloy 625 curve.
- 3) From the intersection with the Alloy 625 curve, move horizontally and intersect the Factor axis.
- 4) At the intersection with the Factor axis, read the bellows pressure–temperature (P-T) factor of 0.85.
- 5) Bellows rating at 100 °F is 60 psig (see Table 44).
- 6) Bellows rating at 400 °F  $60 \times 0.85 = 51.0$  psig  $\geq$  required 25 psig.



<sup>1</sup> Data derived from ASME *BPVC*, Section II, Part D-C.

**Figure H.1—Bellows Pressure–Temperature Rating Factor for Example 2 (USC)**

### EXAMPLE 3

#### Data

Set pressure: 1350 psig

Back pressure: 25 psig

Operating temperature: 700 °F

Design temperature: 750 °F

Outlet temperature: –250 °F

Body/bonnet material: Austenitic stainless steel

Orifice: F

Type: Conventional

#### Selection

F Orifice: Use Table 33

Spring: Select low temperature alloy steel due to outlet temperature from Table 2

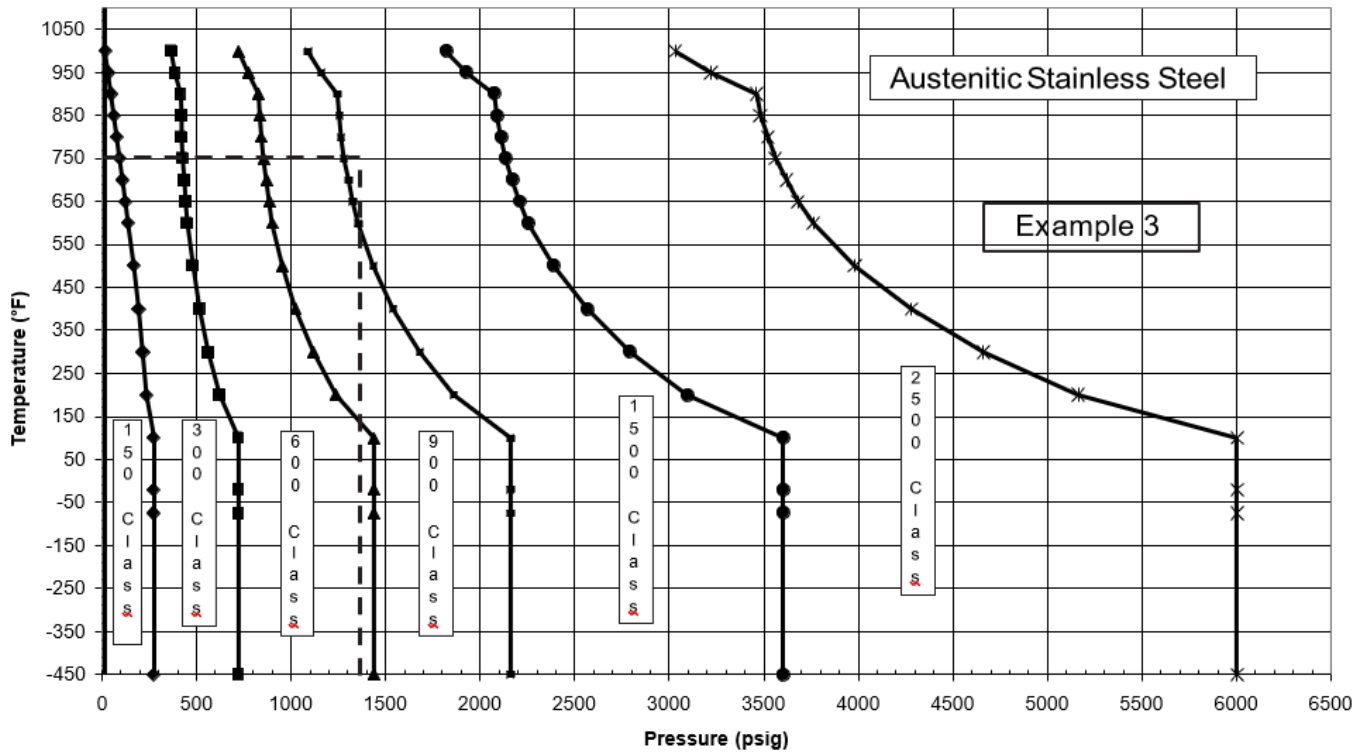
Valve selection: 1½ F3 Class 1500 inlet × Class 300 outlet

From Table 33 it cannot be determined if the 900 Class inlet is acceptable as the set pressure of 1350 psig exceeds the allowable pressure at 800 °F for austenitic stainless steel

Referring the example of Figure H.2 below:

- 1) note that the set pressure (1350 psi) and temperature (750 °F) lies to the right of the 900 Class line;
- 2) therefore, the 1500 Class inlet is required. The user is advised to consult ASME B16.34 for more detailed pressure–temperature information.

Bellows: No selection required



<sup>1</sup> Produced from data in ASME B16.34-2020, Table 2-2.2C. Printed with permission of The American Society of Mechanical Engineers. All rights reserved.

**Figure H.2—Pressure–Temperature Limits <sup>1</sup> for Example 3 (USC)**

## Bibliography

- [1] ASME *Boiler and Pressure Vessel Code (BPVC)* <sup>5</sup>, *Section II: Materials*
- [2] NACE AMPP MR0103 <sup>6</sup>, *Petroleum, petrochemical and natural gas industries—Metallic materials resistant to sulfide stress cracking in corrosive petroleum refining environments*
- [3] NACE MR0175/ISO <sup>7</sup> 15156, *Petroleum and natural gas industries—Materials for use in H<sub>2</sub>S-containing environments in oil and gas production*

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<sup>5</sup> ASME International, 2 Park Avenue, New York, NY 10016-5990, [www.asme.org](http://www.asme.org).

<sup>6</sup> Formerly NACE International, now known as The Association for Materials Protection and Performance (AMPP), 15835 Park Ten Place, Houston, TX 77084, [www.ampp.org/home](http://www.ampp.org/home).

<sup>7</sup> International Organization for Standardization, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, [www.iso.org](http://www.iso.org).





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