



Series 31

Pilot Operated Type
Pressure Safety Valve



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Salient Features:

- ▶ Comes with certified capacity by National Board
 - ▶ In code compliance to ASME section VIII Div-I & Section XIII
 - ▶ Replacable to existing valves manufactured as per B & C dimension as per API 526
 - ▶ Availabe in size and rating as per API 526 acceptable worldwide
 - ▶ Withstand max service temperature of 327 deg c
 - ▶ Assure leak free system operating close to set pressure
 - ▶ Reseat bubble tight with a short and stable blowdown
 - ▶ Soft seat design
- ▶ Externally adjustable blowdown
 - ▶ Lower height and weight profile as compared to spring loaded valve
 - ▶ Reduced installation costs
 - ▶ Available in flanged connection
 - ▶ Reduced product loss
 - ▶ Increased production level
 - ▶ Reduced maintenance cycle
 - ▶ Increased operating income
 - ▶ Remote sensing connection
 - ▶ Easy interchangeability of parts

Pilot Operated Type Pressure Safety Valve

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Introduction

This catalog is provided to aid in the proper selection of a Bliss 31 Series.

Bliss 31 Series valves feature an innovative, integrally cast, flanged body with a semi-nozzle design. Series 31 valves are self-contained units actuated by either the snap-acting or modulating style pilot controls. Valves in this series are certified under Section VIII & XIII of the ASME Code for Air, Gas, Vapor, and Liquid Service.

31 Series valves are available in API Orifice sizes D through T as well as full port models. Series 31 valves offers raised face or ring joint inlet flanges from 150 through 2500 ASME classes with 150, 300 and selected 600 class outlets. Standard options support applications in pressures range from 15 to 6170 psig with temperatures of -450°F to 450°F. For higher temperature and pressure requirements, please consult the Factory.

All Series 31 valves have non-flowing pilot controls. Standard materials of construction include a carbon steel main valve body with 316 stainless steel trim and all 316 stainless steel pilot control. The main valve is also available in optional materials in a full 316 stainless steel, NACE, Monel®, Hastelloy®, Duplex with other materials available upon request.

Viton® soft goods are standard in both pilot control and main valves. Buna-N, neoprene, ethylene propylene, silicone, PTFE and Kalrez® soft goods are available as options; contact Factory for more information.

Warranty

All products manufactured by Bliss are warranted free of defects in material and workmanship when used within the range recommended for a period of one year after installation or eighteen months from delivery.

When authorized, any defective product may be returned to the factory and if found defective will be repaired or replaced free of charge, solely at the discretion of Bliss, ex-works our factory.

No charge for labor or other expense incurred will be allowed, as the liability of Bliss is measured by the refund price of the defective product only. All warranties are based

on the product being used within the range recommended and does not cover damages or defects due to normal wear and tear, misuse, alteration or neglect.

The purchaser shall determine the suitability of the product for use and assumes all risks and liabilities in connection therewith.

This warranty does not cover the performance of valves tested at site on test equipment that is not to the same technical standard as that used by the manufacturer.



Selection Table Matrix

31 Series Pilot Control Application Summary							
Type of Actuation	Snap-Acting	SVN (2)	SLN (3)	MLN (4)	MLNS (5)	HMLN (6)	HMLN (7)
	Modulating			✓	✓	✓	✓
Blowdown	Adjustable	✓					
	Non-adjustable		✓	✓	✓	✓	✓
Set Pressure Ranges psig (barg)	15 to 740 (1.03 to 51.03)	✓	✓	✓	✓		
	741 to 2220 (51.1 to 153.1)	✓	✓			✓	
	2221 to 6170 (153.2 to 425.5)	✓	✓				✓
Fluid Services	Air/Gas/Vapor	✓		✓	✓	✓	✓
	Liquid		✓	✓	✓	✓	✓
	Steam				✓		
Temp. Range °F (°C)	-50 to 500 (-45 to 260)	✓	✓	✓	✓	✓	✓
	-450 to -51 (-267 to -46)	✓					
Soft Goods (O-Rings) °F (°C)	Fluorocarbon (Viton)	-20 to 450 (-29 to 232)	✓	✓	✓	✓	✓
	Ethylene Propylene (EPDM)	-65 to 250 (-54 to 121)	✓	✓	✓	✓	✓
	Nitrile (Buna)	-55 to 225 (-48 to 107)	✓	✓	✓	✓	✓
	Aflas	-20 to 450 (-29 to 232)	✓	✓	✓	✓	✓
	Kalrez	0 to 500 (-18 to 260)	✓	✓		✓	✓
	Kalrez Steam	212 to 500 (100 to 260)				✓	

Soft Goods Disclaimer

All PORVs use soft goods for their seats and seals. In selecting a soft good, please note the following guidelines:

- The main valve and pilot control soft goods selection is based on meeting the set pressure and temperature ranges shown as well as being chemically compatible with the process fluid.
- The soft goods selected should not exceed the above limits. For most applications both the operating and relieving temperatures should fall within the ranges shown. Where the sole relieving scenario is external fire, the relieving temperature may be ignored as long as the operating temperature falls within the range of the elastomer selected.
- Because of the wide variety of fluids and process conditions used in the process industry, it is the customer's responsibility to select the proper soft goods material for each specific application.



Numbering System

To simplify the selection and specifying of Bliss pressure relief valves, use the following type numbering system. The type numbering system is ideal as the digits which comprise a specific type number have a distinct significance. The digits describe the basic valve series, orifice, seat and internal construction, inlet temperature range, body, and spring material, inlet flange class as well as Code liquid design.

31 D C 1										2 X - 1 2 0 /S4													
Series Number		Orifice Area				Construction		Materials & Temperatures				Inlet Class		Special Construction (If applicable)		Inlet Facing		Pilot Control		Options		Special Material	
31	Orifice Letter	Area, in²		Area, mm²		Elastomer O-Ring Seat & Seals* PTFE O-Ring Seat & Seals (Main Valve Only)**	Designation	Material		Inlet Temperature Range °F		Designation	ASME Nominal Inlet Flange Class	L Liquid Service (Standard Connections) X Air & Vapor Service (Oversize Connections) Y Liquid Service (Oversize Connections) D Air & Vapor Service (Dual Outlet)* E Liquid Service (Dual Outlet)* U Air & Vapor Service (Non-Standard API Connections) N Air & Vapor Service (Non-Standard API Connections)	1 Raised Face, ASME Std. (125 to 160 AARH) 9 Ring Joint ASME Std. (Octagonal) H 63 to 83 AARH Raised Face (Inlet only) Although not applicable to the inlet facing only, the following first digit letters are also used: J 63 to 83 AARH (Outlet only) K 63 to 83 AARH (Inlet and outlet) X High Pressure Hub Connection*	2 PCF5 Snap Acting Control 3 PCL Liquid Snap Acting Control 4 PCM Modulating Control 5 PCMS Modulating Control 6 HPCM High Pressure Modulating Control 7 HPCM7 High Pressure Modulating Control	0 No Options 1 Test Gag 2 Dual Pilot Controls 3 Auxiliary Filter 4 Manual Depressurizing 5 Field Test Connection 6 Reverse Flow Preventer 7 Pressure Spike Snubbers 8 Remote Depressurizing F Field Test Connection with Indicator R Remote Sensing V Pilot Control Discharge Connected to Main Valve Outlet	S3 Complete 316 St. St. PH St. St. Piston S4 Complete 316 St. St. N1 NACE Compliant Carbon St. Body N3 NACE Compliant PH St. St. Piston N4 NACE Compliant Complete 316 St. St. M4* Complete Monel H4* Complete Hastelloy C D4* Duplex St. St. D8* Super Duplex St. St. LB* Low temperature carbon steel - LCB Body LC* Low temperature carbon steel - LCC Body					
		API	Actual	API	Actual			Body & Cover	Piston														
	D	0.110	0.156	71	97		1	Carbon Steel*	Stainless Steel	-20* to 450		0	150										
	E	0.196	0.232	126	145							2	300										
	F	0.307	0.379	198	239		2**	Carbon Steel	PH St. St.	-20 to 500		3	600										
												4	900										
	G	0.503	0.570	325	361		8***	Stainless Steel	Stainless Steel	-450 to -50		5	1500										
	H	0.785	0.886	506	563							6	2500										
	J	1.287	1.449	830	923																		
	K	1.838	2.061	1186	1317																		
	L	2.853	3.196	1841	2045																		
	M	3.60	4.030	2323	2581																		
	N	4.34	4.855	2800	3111																		
	P	6.38	7.126	4116	4572																		
	Q	11.05	12.318	7129	7916																		
	R	16.0	17.842	10323	11471																		
	T	26.0	29.018	16774	18671																		
						*For set pressures above 1480 psig, main seat seal for all valves with 900#, 1500# and 2500# inlet flanges use PTFE. **Required for steam services				*For temperature ranges down to -50F, specify LB, to -55F specify LC under special materials **Required for steam services ***Use for cryogenic applications, S4 special material suffix is not required.						*Available on 6" and 8" inlet size valves only. Other sizes consult factory		*Limited valve sizes and pressure classes. Consult factory.		See table below for combinations		*Add "N" for NACE E.g. M4N, H4N, etc.	

Ordering Information

To properly process your order and avoid delay please specify the following:

1. Quantity

2. Inlet and Outlet Size

3. Bliss Type Number*

4. Inlet and Outlet Flange Class and Facing

5. Materials of Construction, if other than Standard

6. O-Ring Seal Material (Viton is Standard)

7. Set Pressure*

8. Maximum Inlet Temperature*

9. Allowable Overpressure*

10. Fluid and Fluid State*
11. Backpressure, Superimposed Constant and/or Variable and Built-up*

12. Required Capacity*

13. Physical Properties of Fluid (Molecular Weight, Specific Gravity, etc.)*

14. Accessories, if any required such as:

a) Manual or Remote Depressurizing

b) Field Test Connection

c) Reverse Flow Preventer

d) Auxiliary Filter

e) Any other

15. Code Requirements, if any required
- If you would like Bliss to verify your selection and sizing, this information is required.

General Notes:
If valve modification or set pressure changes are required, consideration must be given to correct the nameplate and other data.



Numbering System

Parts Replacement

Valves: If an exact replacement valve is required, the valve type, size and serial number must be specified to assure proper dimensions and material being supplied. If a specific valve has become obsolete, a recommendation for the current equivalent, if any, will be made.

Spare Parts: When ordering parts, use part names as listed in the bills of material in this catalog. Specify valve type, size and serial number. If serial number is not available, the original Bliss factory order number will assist in our supplying the proper part and material.

Springs: Order as an assembly to include spring with upper and lower spring buttons. Specify valve type, size, serial number, set pressure and back pressure, if any.

Codes for Common Accessory Combinations

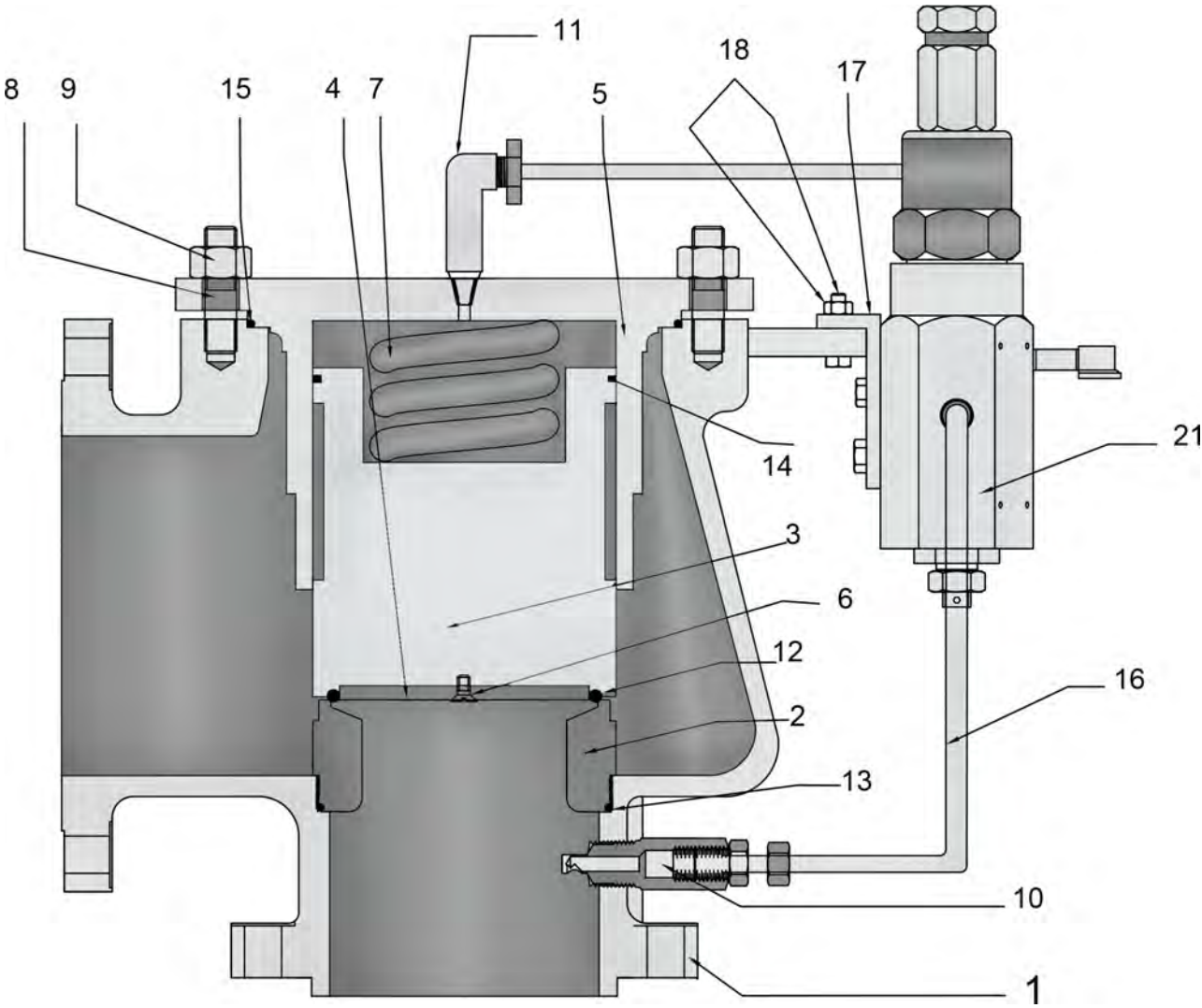
9	Four Auxiliary Functions: Options 4, 5 or F*, 6 & 8
A	Combo – Auxiliary Filter (3) & Field Test Connection (5 or F)*
B	Combo – Field Test Connection (5 or F)* & Reverse Flow Preventer (6)
E	Combo – Auxiliary Filter (3), Field Test Connection (5 or F)* & Reverse Flow Preventer (6)
C	Designation for combinations of options not listed

* For Modulating Controls, Field Test Connection w/ Indicator (F) is automatically supplied, unless specified otherwise.



Main Valve: Advantage Bliss

31 Series Bill of Materials – Main Valve



Bill of Materials – Main Valve									
Item No.	Part Name	Standard Material	S3/S4	N1 NACE	N3/N4 NACE	M4	H4	D4	D8
1	Body	SA-216 Gr. WCB Carbon St.	SA-351 Gr. CF8M St. St.	SA-216 Gr. WCB Carbon St. ²	SA-351 Gr. CF8M St. St. ²	SA-494 Gr. M35-1 Monel	SA-494 Gr. CW-12MW Hastelloy	SA-995 Gr. 4A Duplex	SA-995 Gr. 6A Duplex
2	Nozzle	316 St. St.	316 St. St.	316 St. St. ²	316 St. St. ²	Monel	Hastelloy C	Duplex	Duplex
3	Piston	316 St. St.	S3 = PH St. St. S4 = 316 St. St.	316 St. St. ²	N3 = PH St. St. N4 = 316 St. St.	Monel	Hastelloy C	Duplex	Duplex
4	O-Ring Retainer	316 St. St.	316 St. St.	316 St. St. ²	316 St. St. ²	Monel	Hastelloy C	Duplex	Duplex
5	Cover/Guide	SA-351 Gr. CF8M St. St.	SA-351 Gr. CF8M St. St.	SA-351 Gr. CF8M St. St. ²	SA-351 Gr. CF8M St. St. ²	SA-494 Gr. M35-1 Monel	SA-494 Gr. CW-12MW Hastelloy	SA-995 Gr. 4A Duplex	SA-995 Gr. 6A Duplex
5a	Cover ¹	Carbon St.	316 St. St.	Carbon St. ²	316 St. St. ²	Monel	Hastelloy C	Duplex	Duplex
5b	Guide ¹	316 St. St.	316 St. St.	316 St. St. ²	316 St. St. ²	Monel	Hastelloy C	Duplex	Duplex
6	Retainer Screw	St. St.	St. St.	St. St.	St. St.	Monel	Hastelloy C	Duplex	Duplex
7	Return Spring	316 St. St.	316 St. St.	Inconel [™] X750	Inconel X750	Inconel X750	Inconel X750	Inconel X750	Inconel X750
8	Body Stud	ASME SA-193 Gr. B7 Alloy St.	ASME SA-193 Gr. B8M St. St.	ASME SA-193 Gr. B7M Alloy Steel	ASME SA-193 Gr. B8MA St. St.	ASME SB-574 UNS N10276 Hastelloy	ASME SB-574 UNS N10276 Hastelloy	Duplex UNS S31803	Duplex UNS S31803
9	Hex Nut (Body)	ASME SA-194 Gr. 2H Alloy St.	ASME SA-194 Gr. 8M St. St.	ASME SA-194 Gr. 2HM Alloy St.	ASME SA-194 Gr. 8MA St. St.	ASME SB-574 UNS N10276 Hastelloy	ASME SB-574 UNS N10276 Hastelloy	Duplex UNS S31803	Duplex UNS S31803
10	Pressure Pickup	316 St. St.	316 St. St.	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex	Duplex
11	Tube Fittings	316 St. St.	316 St. St.	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex	Duplex
12	Main Seat Seal ⁴	Viton ⁵	Viton ⁵	EPDM ⁶	EPDM ⁶	Viton ⁵	Viton ⁵	Viton ⁵	Viton ⁵
13	Nozzle Seal	Viton ⁵	Viton ⁵	EPDM ⁶	EPDM ⁶	Viton ⁵	Viton ⁵	Viton ⁵	Viton ⁵
14	Piston Seal	Viton ⁵	Viton ⁵	EPDM ⁶	EPDM ⁶	Viton ⁵	Viton ⁵	Viton ⁵	Viton ⁵
14a	Energized Piston Seal	PTFE / SS ⁷	PTFE / SS ⁷	PTFE / SS ⁷	PTFE / SS ⁷	PTFE / SS ⁷	PTFE / SS ⁷	PTFE/SS ⁷	PTFE/SS ⁷
15	Cover Seal	Viton ⁵	Viton ⁵	EPDM ⁶	EPDM ⁶	Viton ⁵	Viton ⁵	Viton ⁵	Viton ⁵
15a	Guide Seal ¹	Viton ⁵	Viton ⁵	EPDM ⁶	EPDM ⁶	Viton ⁵	Viton ⁵	Viton ⁵	Viton ⁵
16	Tubing	316 St. St.	316 St. St.	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex	Duplex
17	Bracket	St. St.	St. St.	St. St.	St. St.	St. St.	St. St.	St. St.	St. St.
18	Cap Screws, Mounting Bracket	Plated Steel	St. St.	Plated Steel	St. St.	St. St.	St. St.	Plated Steel	Plated Steel
19	Pipe Plug, Outlet	Carbon St.	St. St.	Carbon St.	St. St.	Monel	Hastelloy C	Duplex	Duplex
20	Pipe Plug, Body (not shown)	Carbon St.	St. St.	Carbon St.	St. St.	Monel	Hastelloy C	Duplex	Duplex
21	Pilot Control	St. St.	St. St.	St. St.	St. St.	Monel	Hastelloy C	Duplex	Duplex

Threaded Convertible Design: the unique convertible design minimizes the number of components and maximizes their interchangeability, reducing parts inventories and overall costs.

Convertible Nozzle: threaded convertible nozzles can be removed and replaced easily without factory service. They can be installed with common tools while the valve is in line, saving time and money.

Fewer Internal Components: the valve design requires no lift stops and the main valve opens fully at set pressure. The orifice area is controlled by the nozzle, eliminating the need for additional parts to restrict lift.

One Piece Body: integrally cast flanges assure the highest material integrity and eliminate problems that may occur with welding.

Full Port Option: the full port option provides maximum capacity per inlet size.

- General Notes:
1. Part used on 3" inlet sizes and larger.
 2. Materials certified in compliance with NACE specifications.
 3. PTFE for seals required in main valve for temperatures below -20°F. Consult the Factory.
 4. PTFE used for Main Seat Seal (item 12) for all valves with 900#, 1500#, and 2500# inlet flanges.

Main Valve Soft Seat: unlike metal seated valves which require costly machining and lapping procedures, the main valve soft seat is easily maintained and repaired.

Less Weight, Lower Profile: system pressure provides the seating force in pilot operated relief valves so pilot valves are smaller in size and weight than direct spring loaded valves.

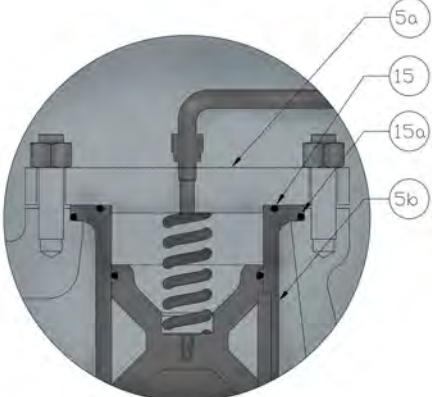
Full 316 Stainless Steel Trim: this trim is standard and includes nozzle, piston, retainer and guide for long and versatile service life.

Suitable for NACE Service: for high quality materials of construction that meet NACE MR0103 or MR0175/ISO 15156 service, refer to N1 trim for carbon steel body and N4 trim for stainless steel.

5. We reserve the right to substitute comparable fluorocarbon materials.
6. EPDM is standard offering for NACE; other materials can be selected. Please specify at time of order.
7. Graphite reinforced PTFE with stainless steel spring.

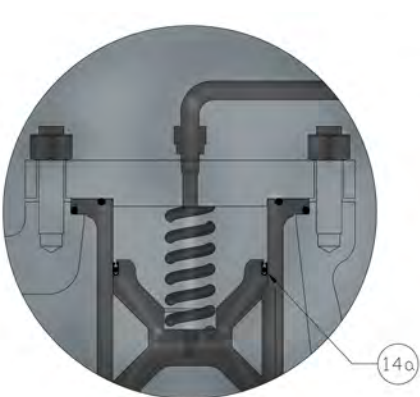
Inconel is a registered trademark of Inco Alloys International, Inc.

(A) Two Piece Cover and Guide



Valve with 3" inlet and larger

(B) Energized Piston Seal



used for cryogenic, steam and special service



Built in conformance to ASME Code Section VIII for Air, Gas, Steam, and Liquid Service.
ASME Code stamping not available on full port design in liquid service.



Snap Acting Pilot Control Features

Snap-Acting, Non-Flowing: the SVN and SLN pilot controls are snap acting and non-flowing, minimizing the flow of process media through the pilot for reduced fugitive emissions and extended valve life.

Full 316 Stainless Steel Construction: resists corrosion and extends the life and versatility of the SVN and SLN controls.

Adjustable Blowdown: allows setting blowdown at 3% of set pressure so that product loss is minimized and fugitive emissions reduced.

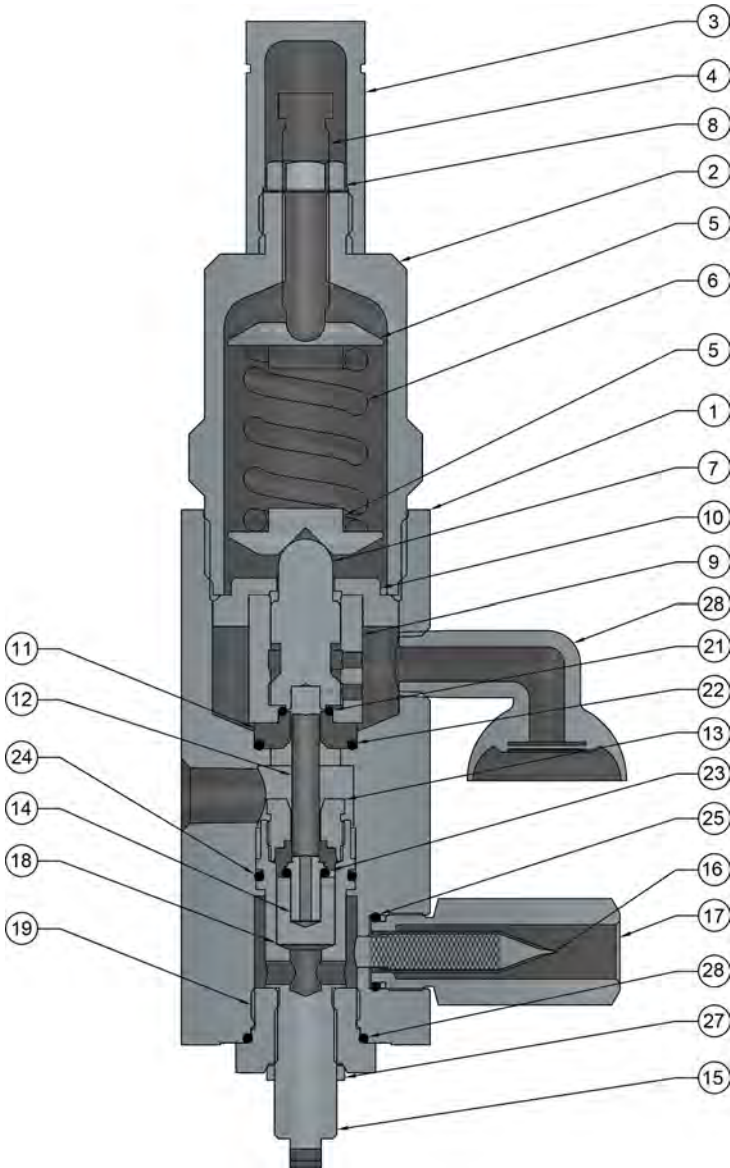
Viton Seats and Seals: these chemical-resistant seals and seats enhance a control's life. Neoprene, ethylene propylene, silicone, and Buna-N soft goods are optional and extend temperature ranges from -65°F to 450°F. Kalrez available when maximum resistance to chemical attack is required. Contact factory for more information.

Set Pressures and Blowdown Set at Pilot Control: in line service, settings and blowdown adjustments are completed quickly and easily without main valve intrusion. Subsequent reduction in product loss and fugitive emissions add to system profitability.

Accessory Options for Bliss' snap acting controls are outlined on pages 19 of this brochure.

SVN (2): Snap Acting Control – Air, Gas, Vapor Service

SLN (3): Snap Acting Control – Liquid Service



31 Series Bill of Materials – Snap Acting Control



Bill of Materials – SVN and SLN						
Item No.	Part Name	Standard	NACE	Monel	Hastelloy	Duplex
1	Body	316 St. St.	316 St. St. ²	Monel	Hastelloy C	Duplex
2	Bonnet	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
3	Cap	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
4	Spring Adjusting Screw	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
5	Spring Buttons	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
6	Spring	316 St. St.	Inconel X750	Inconel X750	Inconel X750	Inconel X750
7	Disc	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
8	Jam Nut	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
9	Guide	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
10	Guide Flange ¹	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
11	Upper Seat	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
12	Blowdown Relay	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
13	Lower Seat	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
14	Retainer, Lower Seat Seal	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
15	Blowdown Adjuster	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
16	Filter	St. St.	St. St.	Monel	Monel	Monel
17	Filter Housing	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
18	Poppet	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
19	Blowdown Adjuster Cap	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
20	Blowdown Adjuster Lock Nut	316 St. St.	316 St. St.	Monel	Hastelloy C	Duplex
21	Upper Seat Seal	Viton ³	EPDM ⁴	Viton ³	Viton ³	Viton ³
22	Static Seal, Body	Viton ³	EPDM ⁴	Viton ³	Viton ³	Viton ³
23	Lower Seat Seal	Viton ³	EPDM ⁴	Viton ³	Viton ³	Viton ³
24	Static Seal, Adjuster	Viton ³	EPDM ⁴	Viton ³	Viton ³	Viton ³
25	Static Seal, Filter	Viton ³	EPDM ⁴	Viton ³	Viton ³	Viton ³
26	Adjuster Cap Seal	Viton ³	EPDM ⁴	Viton ³	Viton ³	Viton ³
27	Thread Seal, O-Ring	PTFE	PTFE	PTFE	PTFE	PTFE
28	Bug Vent	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum

General Notes:
1. Part used on SVN only.
2. Materials certified in compliance with NACE specifications.
3. We reserve the right to substitute comparable fluorocarbon materials.
4. EPDM is standard offering for NACE; other materials can be selected. Please specify at time of order.



Built in conformance to ASME Code Section VIII & XIII for Air, Gas, and Liquid Service.
ASME Code stamping not available on full port design in liquid service.



Modulating Pilot Control Features

Modulating, Non-Flowing: the MLN, MLNS and HMLN pilot controls are modulating and non-flowing, minimizing the flow of process media through the pilot for reduced fugitive emissions and extended valve life. Also suitable for 2-phase flow applications.

Full 316 Stainless Steel Construction: resists corrosion and extends the operation and versatility of the modulating control.

Fixed Blowdown: The modulating controls are a fixed blowdown pilot control with no external adjustment. Depending on fluid service, a blowdown of 3% to 6% is typical.

Viton Seats and Seals: have a wide spectrum of chemical compatibility and temperature range to meet most applications and enhance valve life. Buna-N and ethylene propylene soft goods are optional and extend temperature ranges from -65°F to 450°F. Contact the Bliss factory for more information on other construction materials.

Set Pressure Set at Pilot Control: in-line service and setting adjustments are done quickly and easily without main valve intrusion. Subsequent reduction in product loss and fugitive emissions adds to the system’s profitability.

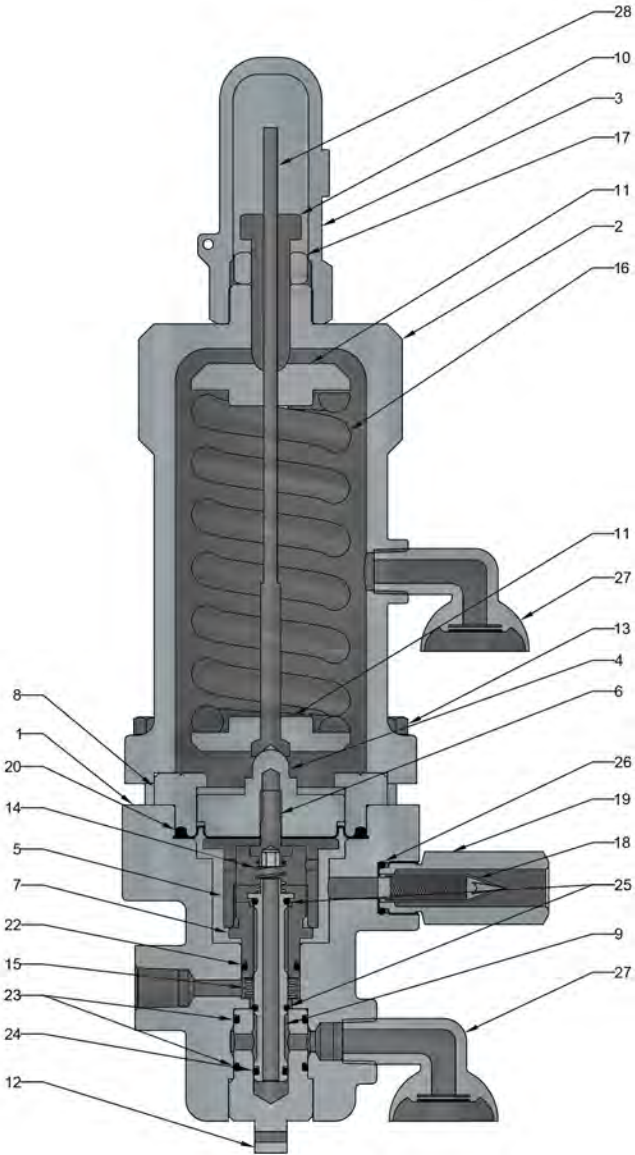
Accessory Options for Bliss’ modulating pilot controls are outlined on pages 19 of this brochure.

MLN (4): Modulating Control – 15 to 740 psig used for Air, Gas, Vapor and liquid service.

MLNS (5): Modulating Control – 15 to 740 psig used for Air, Gas, Vapor liquid and steam service.

HMLN (6): Modulating Control – 740 to 2220 psig used for Air, Gas, Vapor and liquid service.

HMLN (7): Modulating Control – 2220 to 6170 psig used for Air, Gas, Vapor and liquid service.



31 Series Bill of Materials – Modulating Control



Bill of Materials – MLN, MLNS and HMLN					
Item No.	Part Name	Standard	NACE	Monel	Hastelloy
1	Body	316 St. St.	316 St. St. ²	Monel	Hastelloy C
2	Bonnet	316 St. St.	316 St. St.	Monel	Hastelloy C
3	Cap	316 St. St.	316 St. St.	Monel	Hastelloy C
4	Piston	316 St. St.	316 St. St.	Monel	Hastelloy C
5	Retainer ¹	316 St. St.	316 St. St.	Monel	Hastelloy C
6	Retainer Screw ¹	316 St. St.	316 St. St.	Monel	Hastelloy C
7	Inlet Seat	316 St. St.	316 St. St.	Monel	Hastelloy C
8	Guide	316 St. St.	316 St. St.	Monel	Hastelloy C
9	Spool	316 St. St.	316 St. St.	Monel	Hastelloy C
10	Spring Adjusting Screw	316 St. St.	316 St. St.	Monel	Hastelloy C
11	Spring Buttons	316 St. St.	316 St. St.	Monel	Hastelloy C
12	Spool Cap	316 St. St.	316 St. St.	Monel	Hastelloy C
13	Bonnet Cap Screw	316 St. St.	316 St. St.	Monel	Hastelloy C
14	Spool Return Spring	316 St. St.	Inconel X750	Inconel X750	Inconel X750
15	Lower Return Spring	316 St. St.	Inconel X750	Inconel X750	Inconel X750
16	Spring	St. St.	St. St.	St. St.	St. St.
17	Jam Nut	316 St. St.	316 St. St.	316 St. St.	316 St. St.
18	Filter	St. St.	St. St.	Monel	Monel
19	Filter Housing	316 St. St.	316 St. St.	Monel	Hastelloy C
20	Diaphragm	Viton ³	EPDM ⁶	Viton ³	Viton ³
20a	Spring Energized Seal ⁴	PTFE/HC ⁷	PTFE/HC ⁷	PTFE/HC ⁷	PTFE/HC ⁷
20b	Piston Seal ⁵	Viton ³	EPDM ⁶	Viton ³	Viton ³
21	Guide Seal ⁴	Viton ³	EPDM ⁶	Viton ³	Viton ³
21a	Backup Ring ⁵	PTFE	PTFE	PTFE	PTFE
22	Body Seal	Viton ³	EPDM ⁶	Viton ³	Viton ³
23	Spool Cap Seal	Viton ³	EPDM ⁶	Viton ³	Viton ³
24	Spool Seal	Viton ³	EPDM ⁶	Viton ³	Viton ³
25	Seat Seal	Viton ³	EPDM ⁶	Viton ³	Viton ³
26	Filter Seal	Viton ³	EPDM ⁶	Viton ³	Viton ³
27	Bug Vent	Aluminum	Aluminum	Aluminum	Aluminum
28	Stem	316 St. St.	316 St. St.	Monel	Hastelloy C

- General Notes:
- 1. Part used on MLN and MLNS only.
 - 2. Materials certified in compliance with NACE specifications.
 - 3. We reserve the right to substitute comparable fluorocarbon materials.
 - 4. Part used on MLNS only.
 - 5. Part used on HMLN only.
 - 6. EPDM is standard offering for NACE; other materials can be selected. Please specify at time of order.
 - 7. Graphite reinforced PTFE with Hastelloy C spring.



Built in conformance to ASME Code Section VIII for Air, Gas, Steam, and Liquid Service. ASME Code stamping not available on full port design in liquid service.



Selection Table – API

API – U.S. Customary and Metric												
Orifice			Valve Size Inlet x Outlet	ASME Flange Class		Type Number	Maximum Set Pressure				Maximum Back Pressure	
Letter	API Area Sq. In. (mm)	Actual Area Sq. In. (mm)		Inlet RF or RJ	Outlet RF		psig -20°F 100°F	psig 500°F (note 1)	barg -29°C 38°C	barg 260°C (note 1)	psig @ 100°F	barg @ 38°C
D	0.110 (71)	0.156 (101)	1 x 2	150#	150#	31DC10	285	170	19.6	11.7	285	19.6
						31DC12	740	605	51.0	41.7		
						31DC13	1480	1205	102	83		
			1-1/2 x 2	300#	300#	31DC14	2220	1810	153	125	740	51.0
						31DC15	3705	3015	255	208		
						31DC16	6170	5025	425	346		
				150#	150#	31DC10X	285	170	19.6	11.7	285	19.6
						31DC12X	740	605	51.0	41.7		
31DC13X	1480	1205	102			83						
31DC14X	2220	1810	153			125						
300#	300#	31DC15X	3705	3015	255	208	740	51.0				
		31DC16X	6170	5025	425	346						
		2500#										
E	0.196 (126)	0.232 (150)	1 x 2	150#	150#	31EC10	285	170	19.6	11.7	285	19.6
						31EC12	740	605	51.0	41.7		
						31EC13	1480	1205	102	83		
			1-1/2 x 2	300#	300#	31EC14	2220	1810	153	125	740	51.0
						31EC15	3705	3015	255	208		
						31EC16	6170	5025	425	346		
				150#	150#	31EC10X	285	170	19.6	11.7	285	19.6
						31EC12X	740	605	51.0	41.7		
31EC13X	1480	1205	102			83						
31EC14X	2220	1810	153			125						
300#	300#	31EC15X	3705	3015	255	208	740	51.0				
		31EC16X	6170	5025	425	346						
		2500#										
F	0.307 (198)	0.379 (245)	1 x 2	150#	150#	31FC10	285	170	19.6	11.7	285	19.6
						31FC12	740	605	51.0	41.7		
						31FC13	1480	1205	102	83		
			1-1/2 x 2	300#	300#	31FC14	2220	1810	153	125	740	51.0
						31FC15	3705	3015	255	208		
						31FC16	6170	5025	425	346		
				150#	150#	31FC10X	285	170	19.6	11.7	285	19.6
						31FC12X	740	605	51.0	41.7		
31FC13X	1480	1205	102			83						
31FC14X	2220	1810	153			125						
300#	300#	31FC15X	3705	3015	255	208	740	51.0				
		31FC16X	6170	5025	425	346						
		2500#										
G	0.503 (325)	0.570 (368)	1-1/2 x 3	150#	150#	31GC10	285	170	19.6	11.7	285	19.6
						31GC12	740	605	51.0	41.7		
						31GC13	1480	1205	102	83		
			2 x 3	300#	300#	31GC14	2220	1810	153	125	740	51.0
						31GC15	3705	3015	255	208		
						31GC16	6170	5025	425	346		
				150#	150#	31GC10X	285	170	19.6	11.7	285	19.6
						31GC12X	740	605	51.0	41.7		
31GC13X	1480	1205	102			83						
31GC14X	2220	1810	153			125						
300/600# (note 2)	300/600# (note 2)	31GC15X	3705	3015	255	208	1480	102				
		31GC16X	6170	5025	425	346						
		2500#										
H	0.785 (506)	0.886 (572)	1-1/2 x 3	150#	150#	31HC10	285	170	19.6	11.7	285	19.6
						31HC12	740	605	51.0	41.7		
						31HC13	1480	1205	102	83		
			2 x 3	300#	300#	31HC14	2220	1810	153	125	740	51.0
						31HC15	3705	3015	255	208		
						31HC16	6170	5025	425	346		
				150#	150#	31HC10X	285	170	19.6	11.7	285	19.6
						31HC12X	740	605	51.0	41.7		
31HC13X	1480	1205	102			83						
31HC14X	2220	1810	153			125						
300/600# (note 2)	300/600# (note 2)	31HC15X	3705	3015	255	208	1480	102				
		31HC16X	6170	5025	425	346						
		2500#										

General Notes:
1. Standard elastomer is Viton which is suitable to a maximum temperature of 450°F. For temperatures above 450°F the o-ring seals must be specified as Kalrez.
2. The 300# and 600# flanges have identical drilling with flange thickness equal to the 600# class.
3. For liquid service applications, add "L" to the end of the base type number for valves with standard size connections. Change the "X" to a "Y" for valves with oversize connections and change "D" to an "E" for valves with dual outlet. Examples: 31FC10L-120, 31FC10Y-120, 31TC10E-120.



Selection Table – API, continued

API – U.S. Customary and Metric																			
Orifice			Valve Size Inlet x Outlet	ASME Flange Class		Type Number	Maximum Set Pressure				Maximum Back Pressure								
Letter	API Area Sq. In. (mm)	Actual Area Sq. In. (mm)		Inlet RF or RJ	Outlet RF		psig -20°F 100°F	psig 500°F (note 1)	barg -29°C 38°C	barg 260°C (note 1)	psig @ 100°F	barg @ 38°C							
J	1.287 (830)	1.449 (935)	2 x 3	150#	150#	31JC10	285	170	19.6	11.7	285	19.6							
				300#		31JC12	740	605	51.0	41.7									
				600#		31JC13	1480	1205	102	83									
				300/600# (note 2)	31JC14	2220	1810	153	125	1480			102						
			1500#		31JC15	3705	3015	255	208										
			2500#		31JC16	6170	5025	425	346										
			3 x 4		150#	31JC10X	285	170	19.6		11.7	285		19.6					
				300#	31JC12X	740	605	51.0	41.7										
600#	31JC13X	1480		1205	102	83													
900#	31JC14X	2220		1810	153	125	740	51.0											
1500#	31JC15X	3705	3015	255	208														
	K	1.838 (1186)	2.061 (1330)	3 x 4	150#	150#			31KC10	285	170	19.6	11.7	285	19.6				
					300#				31KC12	740	605	51.0	41.7						
					600#		31KC13	1480	1205	102	83								
900#					300#	31KC14	2220	1810	153	125	740	51.0							
				1500#		31KC15	3705	3015	255	208									
				L		2.853 (1841)	3.196 (2062)	3 x 4	150#	150#			31LC10	285	170	19.6	11.7	285	19.6
									300#				31LC12	740	605	51.0	41.7		
600#					31LC13				1480		1205	102	83						
900#	300#	31LC14	2220		1810				153	125	740	51.0							
		1500#	31LC15		3705			3015	255	208									
		4 x 6	150#		31LC10X			285	170	19.6			11.7	285	19.6				
			300#		31LC12X			740	605	51.0			41.7						
600#	31LC13X		1480		1205			102	83										
900#	31LC14X		2220	1810	153	125	740	51.0											
1500#	31LC15X	3705	3015	255	208														
	M	3.60 (2323)	4.030 (2600)	4 x 6	150#	150#			31MC10	285	170	19.6	11.7	285	19.6				
					300#				31MC12	740	605	51.0	41.7						
					600#		31MC13	1480	1205	102	83								
900#					300#	31MC14	2220	1810	153	125	740	51.0							
				1500#		31MC15	3705	3015	255	208									
				N		4.34 (2800)	4.855 (3132)	4 x 6	150#	150#			31NC10	285	170	19.6	11.7	285	19.6
									300#				31NC12	740	605	51.0	41.7		
600#					31NC13				1480		1205	102	83						
900#	300#	31NC14	2220		1810				153	125	740	51.0							
		1500#	31NC15		3705			3015	255	208									
		P	6.38 (4116)		7.126 (4597)			4 x 6	150#	150#			31PC10	285	170	19.6	11.7	285	19.6
									300#				31PC12	740	605	51.0	41.7		
600#	31PC13								1480		1205	102	83						
900#	300#			31PC14		2220	1810		153	125	740	51.0							
				1500#		31PC15	3080	3015	212	208									
				Q		11.05 (7129)	12.318 (7947)	6 x 8	150#	150#			31QC10	285	170	19.6	11.7	285	19.6
									300#				31QC12	740	605	51.0	41.7		
600#	31QC13								1480		1205	102	83						
6 x 8 x 8	150#	31QC10D	285		170			19.6	11.7	285	19.6								
	300#	31QC12D	740		605			51.0	41.7										
	600#	31QC13D	1480		1205			102	83										
R	16.0 (10323)	17.842 (11511)	6 x 8		150#			150#	31RC10	285	170	19.6	11.7	285	19.6				
					300#				31RC12	740	605	51.0	41.7						
				600#	31RC13	1480	1205		102	83									
			6 x 8 x 8	150#	31RC10D	285	170	19.6	11.7	285	19.6								
				300#	31RC12D	740	605	51.0	41.7										
				600#	31RC13D	1480	1205	102	83										
			T	26 (16774)	29.018 (18721)	8 x 10	150#	150#	31TC10	285	170	19.6	11.7	285	19.6				
							300#		31TC12	740	605	51.0	41.7						
600#	31TC13	1480					1205		102	83									
8 x 10 x 10	150#	31TC10D				285	170	19.6	11.7	285	19.6								
	300#	31TC12D				740	605	51.0	41.7										
	600#	31TC13D				1480	1205	102	83										



Selection Table – Non Standard API

Non Standard API – U.S. Customary and Metric												
Orifice			Valve Size Inlet x Outlet	ASME Flange Class		Type Number	Maximum Set Pressure				Maximum Back Pressure	
Letter	API Area Sq. In. (mm)	Actual Area Sq. In. (mm)		Inlet RF or RJ	Outlet RF		psig -20°F 100°F	psig 500°F (note 1)	barg -29°C 38°C	barg 260°C (note 1)	psig @ 100°F	barg @ 38°C
G ^s	0.503 (325)	0.570 (368)	1 x 2	150#	150#	31GC10U	285	170	19.6	11.7	285	19.6
				300#		31GC12U	740	605	51.0	41.3		
				600#		31GC13U	1480	1205	102	82.7		
				900#	300#	31GC14U	2220	1810	153	124	740	51.0
			1500#	31GC15U		3705	3015	255	206			
			2500#	31GC16U		6170	5025	425	344			
			1-1/2 x 2	150#	150#	31GC10N	285	170	19.6	11.7	285	19.6
				300#		31GC12N	740	605	51.0	41.3		
600#	31GC13N	1480		1205		102	82.7					
900#	300#	31GC14N		2220	1810	153	124	740	51.0			
1500#		31GC15N	3705	3015	255	206						
2500#		31GC16N	6170	5025	425	344						
H	0.785 (506)	0.886 (572)	1-1/2 x 2	150#	150#	31HC10N	285	170	19.6	11.7	285	19.6
				300#		31HC12N	740	605	51.0	41.3		
				600#		31HC13N	1480	1205	102	82.7		
				900#	300#	31HC14N	2220	1810	153	124	740	51.0
1500#	31HC15N	3705	3015	255		206						
2500#	31HC16N	6170	5025	425		344						
J	1.287 (830)	1.449 (935)	1-1/2 x 2	150#	150#	31JC10U	285	170	19.6	11.7	285	19.6
				300#		31JC12U	740	605	51.0	41.3		
				600#		31JC13U	1480	1205	102	82.7		
				900#	300#	31JC14U	2220	1810	153	124	740	51.0
			1500#	31JC15U		3705	3015	255	206			
			2500#	31JC16U		6170	5025	425	344			
			1-1/2 x 3	150#	150#	31JC10N	285	170	19.6	11.7	285	19.6
				300#		31JC12N	740	605	51.0	41.3		
600#	31JC13N	1480		1205		102	82.7					
900#	300#	31JC14N		2220	1810	153	124	740	51.0			
1500#		31JC15N	3705	3015	255	206						
2500#		31JC16N	6170	5025	425	344						
K	1.838 (1186)	2.061 (1330)	2 x 3	150#	150#	31KC10N	285	170	19.6	11.7	285	19.6
				300#		31KC12N	740	605	51.0	41.3		
				600#		31KC13N	1480	1205	102	82.7		
				900#	300/600# (note 2)	31KC14N	2220	1810	153	124	1480	102
1500#	31KC15N	3705	3015	255		206						
2500#	31KC16N	6170	5025	425		344						
M	3.60 (2323)	4.030 (2600)	3 x 4	150#	150#	31MC10N	285	170	19.6	11.7	285	19.6
				300#		31MC12N	740	605	51.0	41.3		
			600#	31MC13N		1480	1205	102	82.7			
			900#	300#	31MC14N	2220	1810	153	123.7	740	51.0	
1500#	31MC15N	3705	3015		255	206						
N	4.34 (2800)	4.855 (3132)	3 x 4	150#	150#	31NC10N	285	170	19.6	11.7	285	19.6
				300#		31NC12N	740	605	51.0	41.3		
				600#		31NC13N	1480	1205	102	82.7		
				900#	300#	31NC14N	2220	1810	153	124	740	51.0
1500#	31NC15N	3705	3015	255		206						

- General Notes:
- Standard elastomer is Viton which is suitable to a maximum temperature of 450°F. For temperatures above 450°F the o-ring seals must be specified as Kalrez.
 - The 300# and 600# flanges have identical drilling with flange thickness equal to the 600# class.
 - Valves only certified for air, gas, vapor and steam service.
 - Valves with ring joint inlet connections available. Consult the Factory for final dimensions.
 - A 1" x 2" valve with an "G" orifice is only available when configured with a remote sensing option.



Air Capacities – 31 Series: 10% Overpressure, API

ASME Pressure Vessel Code (UV) – Capacities in Standard Cubic Feet Per Minute at 60°F – U.S. Customary Units														
Set Pressure (psig)														
Areas	D	E	F	G	H	J	K	L	M	N	P	Q	R	T
API	0.110	0.196	0.307	0.503	0.785	1.287	1.838	2.853	3.600	4.34	6.38	11.05	16.00	26.0
Actual	0.156	0.232	0.379	0.57	0.886	1.449	2.061	3.196	4.03	4.855	7.126	12.318	17.842	29.018
15	80	118	195	292	455	744	1058	1642	2070	2493	3661	6327	9166	14906
20	92	137	224	337	524	857	1220	1892	2386	2875	4220	7294	10566	17185
30	116	173	283	426	663	1086	1544	2394	3019	3637	5340	9230	13369	21744
40	143	213	349	525	816	1335	1900	2947	3716	4477	6571	11359	16453	26759
50	170	253	415	624	970	1586	2257	3499	4413	5316	7803	13487	19535	31773
60	197	293	480	722	1123	1837	2612	4052	5108	6155	9033	15616	22619	36787
70	224	333	545	821	1276	2087	2969	4604	5805	6993	10265	17745	25703	41802
80	251	373	610	919	1429	2337	3325	5156	6501	7832	11496	19873	28785	46817
90	278	414	677	1017	1582	2588	3680	5708	7198	8672	12728	22002	31869	51831
100	305	454	742	1116	1735	2838	4037	6260	7894	9511	13959	24130	34952	56845
150	440	654	1069	1608	2501	4090	5818	9022	11376	13705	20116	34774	50368	81919
200	575	855	1397	2101	3266	5342	7598	11784	14858	17900	26274	45416	65784	106991
250	710	1055	1724	2593	4032	6594	9380	14545	18340	22095	32430	56060	81200	132063
300	845	1256	2052	3087	4797	7846	11160	17306	21823	26290	38588	66703	96616	157136
350	979	1457	2380	3579	5563	9098	12940	20068	25305	30485	44745	77347	112032	182208
400	1113	1656	2707	4071	6328	10350	14722	22829	28787	34679	50901	87989	127448	207281
450	1248	1857	3034	4564	7094	11602	16502	25591	32268	38874	57059	98632	142864	232353
500	1383	2057	3361	5056	7859	12854	18283	28352	35750	43069	63216	109276	158280	257426
550	1518	2258	3689	5548	8625	14105	20064	31113	39233	47265	69373	119919	173697	282498
600	1653	2459	4017	6041	9390	15358	21845	33875	42715	51460	75530	130562	189112	307570
650	1788	2659	4344	6533	10156	16610	23625	36636	46197	55654	81687	141205	204528	332643
700	1923	2860	4672	7027	10921	17862	25406	39397	49679	59849	87844	151848	219945	357715
750	2058	3059	4999	7519	11687	19114	27187	42159	53161	64044	94001	162491	235361	382788
800	2192	3260	5326	8011	12453	20366	28968	44920	56642	68239	100159	173134	250776	407860
850	2327	3461	5654	8504	13219	21618	30748	47683	60125	72433	106316	183778	266193	432933
900	2462	3661	5982	8996	13984	22870	32530	50444	63607	76628	112473	194421	281609	458005
950	2596	3862	6309	9488	14749	24122	34310	53205	67089	80823	118630	205063	297024	483077
1000	2731	4062	6636	9981	15515	25373	36091	55967	70571	85018	124787	215707	312441	508150
1050	2866	4263	6964	10473	16280	26626	37872	58728	74053	89213	130944	226350	327857	533222
1100	3001	4464	7291	10967	17046	27877	39653	61489	77536	93407	137101	236994	343273	558295
1150	3136	4663	7618	11459	17811	29130	41433	64251	81017	97603	143259	247636	358689	583367
1200	3270	4864	7947	11951	18577	30381	43213	67012	84499	101798	149415	258279	374105	608440
1250	3405	5064	8274	12444	19342	31634	44995	69774	87981	105993	155572	268923	389521	633512
1300	3540	5265	8601	12936	20108	32885	46775	72535	91463	110188	161730	279566	404937	658585
1350	3675	5466	8929	13428	20873	34138	48556	75296	94946	114382	167886	290209	420353	683657
1400	3810	5666	9256	13921	21639	35390	50337	78058	98428	118577	174044	300852	435769	708730
1450	3945	5867	9583	14413	22404	36642	52118	80819	101910	122772	180201	311496	451186	733803
1550	4214	6267	10239	15399	23935	39145	55680	86343	108873	131162	192515	General Notes: 1. Capacities at 30 PSIG and below are based on 3 PSI overpressure. For sizing purposes the effective coefficient of discharge, K_d for air, gas, and steam is 0.952 when sizing using the API effective areas. When sizing using the ASME actual areas, the certified coefficient of discharge K for air and gas, service is 0.857.		
1600	4348	6468	10566	15891	24701	40398	57460	89104	112356	135356	198672			
1650	4483	6668	10893	16384	25467	41649	59241	91866	115838	139551	204829			
1700	4618	6869	11221	16876	26233	42902	61021	94627	119320	143747	210986			
1750	4753	7069	11548	17368	26998	44153	62803	97388	122802	147942	217143			
1800	4888	7270	11876	17861	27764	45406	64583	100150	126284	152136	223301			
1850	5023	7469	12204	18353	28529	46657	66364	102911	129766	156331	229457			
1900	5158	7670	12531	18846	29294	47910	68145	105672	133248	160626	235615			
2000	5428	8071	13186	19831	30825	50413	71706	111195	140212	168916	247928			
2100	5696	8472	13841	20816	32356	52917	75268	116718	147176	177305	260243			
2200	5966	8873	14496	21801	33887	55421	78829	122241	154140	185695	272557			
2300	6236	9274	15150	22786	35418	57925	82391	127764	161104	194085	284871			
2400	6506	9675	15806	23771	36949	60429	85953	133287	168069	202475	297186			
2500	6775	10076	16461	24756	38481	62933	89514	138810	175033	210865	309500			
2600	7044	10476	17115	25741	40012	65437	93076	144333	181996	219254	321813			
2700	7314	10878	17771	26726	41543	67941	96637	149855	188961	227644	334128			
2800	7584	11279	18425	27711	43074	70445	100198	155378	195925	236033	346442			
2900	7853	11680	19080	28696	44605	72950	103760	160902	202889	244424	358757			
3000	8123	12080	19735	29681	46136	75453	107321	166425	209853	252813	371071			
3500	9471	14085	23010	34606	53792	87973	125129	194038	246674	294762	432642			
4000	10819	16089	26285	39531	61446	100492	142937	221653	279494	336710	494213			
5000	13514	20099	32834	49381	76758	125532								
5500	14862	22103	36109	54306	84412	138052								
6000	16210	24108	39383	59230	92068	150572								
6170	16669	24789	40496	60905	94670	154829								



Water Capacities – 31L Series: 10%Overpressure, API

Dimensions & Weights: API Nozzle Design

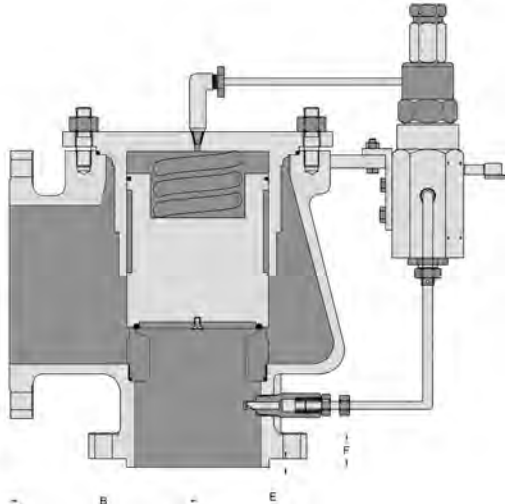


ASME Pressure Vessel Code (UV) – Capacities in Gallons Per Minute at 60°F – U.S.
Customary Units

Set Pressure (psig)														
Areas	D	E	F	G	H	J	K	L	M	N	P	Q	R	T
API	0.110	0.196	0.307	0.503	0.785	1.287	1.838	2.853	3.600	4.34	6.38	11.05	16.00	26.0
Actual	0.156	0.232	0.379	0.57	0.886	1.449	2.061	3.196	4.03	4.855	7.126	12.318	17.842	29.018
15	18.6	27.5	45.0	67.7	105.4	172.1	244.8	379.6	479.2	576.8	847.4	1464.7	2122.3	3452.0
20	20.9	31.1	50.9	76.6	118.8	194.1	277.2	429.1	542.0	652.8	957.5	1656.1	2398.8	3902.4
30	25.1	37.4	61.0	91.8	142.7	233.3	331.5	514.7	648.5	782.0	1147.3	1983.9	2874.2	4674.6
40	29.0	43.1	70.5	105.9	164.7	268.7	382.9	593.7	749.2	902.7	1324.7	2290.9	3318.4	5397.6
50	32.4	48.2	78.8	118.4	183.9	301.2	428.6	664.1	837.7	1009.1	1481.3	2560.9	3710.4	6034.4
60	35.5	52.8	86.3	128.9	201.1	329.9	468.6	727.9	917.5	1106.0	1622.7	2806.3	4064.6	6610.7
70	38.4	57.0	93.2	139.5	217.4	355.7	506.7	785.9	990.7	1194.4	1752.7	3030.8	4390.4	7140.6
80	41.0	61.0	99.3	149.2	232.7	380.6	542.0	840.2	1060.2	1277.1	1874.1	3240.2	4693.5	7633.6
90	43.5	64.7	105.1	158.8	247.1	403.5	574.4	891.5	1123.9	1354.0	1988.0	3436.3	4977.6	8096.4
100	45.8	68.2	110.9	167.4	260.5	425.5	605.8	939.1	1184.7	1427.2	2095.2	3623.0	5247.5	8534.5
150	56.1	83.5	135.9	205.0	318.9	521.2	742.0	1150.3	1450.9	1748.4	2566.8	4436.8	6426.5	10452.6
200	64.9	96.4	157.1	236.7	367.8	602.5	857.3	1329.2	1675.3	2019.2	2963.5	5122.7	7420.9	12069.8
250	72.5	107.0	175.5	264.6	411.8	673.2	958.2	1486.2	1874.1	2257.7	3313.7	5728.1	8296.9	13493.9
300	79.4	117.7	192.8	289.7	451.1	737.3	1049.7	1628.0	2052.8	2472.4	3629.6	6274.8	9088.6	14781.8
350	85.8	127.5	208.2	312.7	487.5	796.6	1133.5	1758.3	2217.3	2671.0	3921.0	6777.9	9816.9	15966.5
400	91.7	136.2	222.7	334.9	521.0	852.0	1211.6	1879.2	2370.4	2855.3	4191.4	7245.9	10494.9	17069.0
450	97.3	144.0	236.2	355.1	552.6	903.7	1285.9	1993.3	2513.9	3028.3	4445.7	7684.6	11131.3	18104.2
500	102.1	151.8	248.7	374.3	582.3	952.4	1355.4	2101.8	2649.9	3192.6	4685.8	8100.5	11733.6	19083.6
550	107.0	159.6	261.3	392.6	611.1	999.3	1421.2	2203.6	2779.2	3348.5	4914.5	8496.5	12306.6	20015.7
600	111.9	166.4	272.8	409.9	637.9	1043.3	1484.0	2301.6	2902.8	3497.7	5133.7	8873.6	12854.0	20905.2
650	116.8	173.2	283.4	427.3	663.7	1086.3	1545.0	2395.8	3021.7	3640.2	5343.4	9236.5	13378.6	21758.7
700	120.7	180.0	294.0	442.7	688.6	1127.4	1603.1	2486.2	3135.8	3778.0	5544.6	9585.1	13883.4	22580.1
750	125.6	186.8	304.7	459.0	713.6	1166.7	1659.3	2573.7	3246.1	3910.0	5739.1	9921.4	14371.1	23373.1
800	129.6	192.7	315.3	473.5	736.5	1204.9	1714.5	2658.4	3351.6	4038.3	5927.9	10246.4	14841.8	24139.5
850	133.5	198.5	324.9	487.9	759.5	1242.2	1766.9	2740.2	3455.3	4162.8	6110.1	10561.9	15299.2	24882.4
900	137.4	204.3	333.6	502.3	781.6	1277.6	1818.4	2819.2	3555.1	4283.5	6287.6	10868.9	15742.4	25603.4
950	141.3	210.2	343.2	515.8	802.6	1313.0	1867.9	2897.2	3653.0	4400.3	6459.3	11166.4	16174.2	26305.6
1000	144.3	215.1	351.9	529.3	823.7	1347.4	1916.5	2972.4	3748.1	4515.3	6627.3	11456.3	16593.8	26988.8
1050	148.2	220.9	360.6	542.7	843.8	1380.9	1964.1	3045.7	3840.3	4626.5	6790.5	11739.6	17003.8	27655.0
1100	152.1	225.8	369.2	555.2	863.9	1413.4	2009.8	3117.0	3930.7	4735.8	6950.9	12015.3	17404.4	28306.0
1150	155.1	230.6	377.9	567.8	883.1	1444.9	2055.5	3187.4	4019.1	4842.2	7107.5	12285.3	17795.5	28941.9
1200	158.0	235.5	385.6	580.3	902.2	1475.5	2099.3	3255.9	4105.6	4945.8	7260.2	12549.6	18178.1	29564.6
1250	161.9	240.4	393.3	591.8	920.4	1506.1	2143.2	3322.5	4190.2	5048.4	7409.2	12808.3	18553.2	30174.0
1300	164.9	245.2	401.1	604.3	938.6	1535.8	2185.1	3389.2	4272.9	5148.1	7556.3	13062.2	18920.6	30772.0
1350	167.8	250.1	408.8	615.9	956.8	1565.4	2227.0	3452.9	4354.7	5246.0	7700.5	13311.3	19280.5	31357.7
1400	170.8	255.0	416.5	626.5	975.0	1594.1	2267.9	3516.6	4434.6	5342.0	7841.9	13555.8	19634.7	31934.0
1450	174.7	259.8	424.2	638.0	992.3	1622.8	2307.9	3578.5	4512.6	5437.0	7980.5	13795.5	19982.2	32499.0
1500	177.6	263.7	430.9	648.6	1008.6	1650.5	2347.0	3640.3	4590.5	5530.1	8117.1			
1550	180.6	268.6	438.7	659.2	1025.8	1677.3	2386.1	3700.3	4665.6	5621.3	8250.9			
1600	182.6	272.5	445.4	669.8	1042.1	1704.1	2424.2	3759.3	4740.7	5711.6	8382.8			
1650	185.5	276.4	452.2	680.3	1058.4	1730.9	2462.3	3818.3	4814.0	5800.0	8512.8			
1700	188.4	281.2	458.9	690.9	1073.7	1756.7	2498.4	3875.4	4886.2	5887.4	8640.9			
1750	191.4	285.1	465.7	700.6	1090.0	1782.5	2535.6	3931.5	4957.5	5972.9	8767.1			
1800	194.3	289.0	472.4	711.1	1105.3	1807.4	2571.8	3987.6	5027.9	6057.5	8891.4			
1850	197.3	292.9	479.1	720.8	1120.6	1832.2	2607.0	4042.8	5097.3	6141.1	9013.9			
1900	199.2	296.8	484.9	730.4	1135.0	1857.1	2641.3	4097.0	5165.8	6223.8	9135.3			
2000	205.1	304.6	498.4	749.6	1164.7	1905.9	2710.9	4203.6	5300.8	6385.3	9372.6			
2100	210.0	312.4	510.0	767.9	1193.4	1952.7	2777.5	4307.3	5431.0	6543.0	9604.1			
2200	214.9	319.2	522.5	786.2	1222.1	1998.6	2842.3	4408.2	5559.4	6697.0	9829.9			
2300	219.9	327.0	534.1	803.5	1249.0	2043.6	2907.1	4508.1	5684.0	6848.0	10051.0			
2400	224.8	333.8	545.7	820.8	1275.8	2087.5	2969.0	4604.2	5806.6	6995.3	10267.4			
2500	228.7	340.6	557.2	838.2	1302.6	2130.6	3030.0	4699.3	5926.4	7138.8	10479.0			
2600	233.6	347.4	567.8	854.5	1328.5	2172.7	3090.9	4792.6	6043.4	7280.4	10686.8			
2700	237.5	354.2	578.5	870.9	1353.4	2213.8	3149.0	4883.9	6158.4	7419.1	10889.9			
2800	242.4	361.0	589.1	886.3	1378.3	2254.9	3207.1	4973.4	6271.6	7555.9	11090.1			
2900	246.4	366.9	599.7	902.6	1403.2	2294.1	3264.3	5061.8	6382.8	7689.0	11286.5			
3000	251.3	373.7	610.3	918.0	1427.1	2334.3	3319.5	5148.4	6492.1	7821.0	11479.2			
3500	270.9	402.9	659.4	991.2	1541.1	2520.7	3585.3	5560.4	7012.2	8447.2	12398.7			
4000	289.5	431.1	704.7	1059.5	1647.4	2694.8	3832.9	5944.8	7496.2	9030.6	13255.6			
4500	307.2	457.4	747.2	1124.0	1748.0	2858.3								
5000	323.9	481.7	787.7	1184.6	1841.8	3013.2								
5500	339.6	506.0	826.2	1243.3	1931.9	3160.5								
6000	355.3	528.4	862.9	1298.1	2018.1	3301.1								
6170	360.2	535.2	875.4	1316.4	2046.8	3347.0								

General Notes:

- Capacities at 30 PSIG and below are based on 3 PSI overpressure. For sizing purposes the effective coefficient of discharge, K_d for liquids is 0.82 when sizing using the API effective areas.
- When sizing using the ASME actual areas, the certified coefficient of discharge K for water is 0.738.
- Values in this table assume no backpressure



API Nozzle Design																	
Valve Size Inlet x Outlet	Type Number	ASME Flange Class		Dimensions, Inches						Approx. Wt. Lbs. ^a	Dimensions, mm						Approx. Wt. Kg. ^c
		Inlet RF	Outlet RF	A ³	B	C	E	F ⁴	G		A ³	B	C	E	F ⁴	G	
1 x 2	31 (D, E, F) C10	150#	150#	12-5/8	4-1/2	4-1/8	1/16	11/16	8 3/4	35	321	115	105	2	18	223	16
	31 (D, E, F) C12	300#		12-7/8	4-1/2	4-3/8	1/4	15/16	8 3/4	36	328	115	112	7	24	223	17
	31 (D, E, F) C13	600#		12-7/8	4-1/2	4-3/8	1/4	15/16	8 3/4	36	328	115	112	7	24	223	17
	31 (D, E, F) C14	900#	300#	13 3/8	4-3/4	4-15/16	1/4	1-7/16	9	49	340	121	126	7	37	229	23
	31 (D, E, F) C15	1500#		13 3/8	4-3/4	4-15/16	1/4	1-7/16	9	49	340	121	126	7	37	229	23
	31 (D, E, F) C16	2500#		13-1/2	4-3/4	4-15/16	1/4	1-11/16	9	55	343	121	126	7	43	229	25
1 x 2 ⁵	31GC10U	150#	150#	12-5/8	4-1/2	4-1/8	1/16	11/16	8 3/4	35	321	115	105	2	18	223	16
	31GC12U	300#		12-7/8	4-1/2	4-3/8	1/4	15/16	8 3/4	36	328	115	112	7	24	223	17
	31GC13U	600#		12-7/8	4-1/2	4-3/8	1/4	15/16	8 3/4	36	328	115	112	7	24	223	17
	31GC14U	900#	300#	13-3/8	4-3/4	4-15/16	1/4	1-7/16	9	49	340	121	126	7	37	229	23
	31GC15U	1500#		13-3/8	4-3/4	4-15/16	1/4	1-7/16	9	49	340	121	126	7	37	229	23
	31GC16U	2500#		13-1/2	4-3/4	4-15/16	1/4	1-11/16	9	55	343	121	126	7	43	229	25
1-1/2 x 2	31 (D, E, F) C10X	150#	150#	14	4-3/4	4-7/8	1/16	1-1/8	9 1/4	48	356	121	124	2	29	235	22
	31 (D, E, F) C12X	300#		14	4-3/4	4-7/8	1/4	1-1/8	9 1/4	50	356	121	124	7	29	235	23
	31 (D, E, F) C13X	600#		14	4-3/4	4-7/8	1/4	1-1/8	9 1/4	50	356	121	124	7	29	235	23
	31 (D, E, F) C14X	900#	300#	15	5-1/2	5 7/8	1/4	1-9/16	9 1/2	71	381	140	150	7	40	242	33
	31 (D, E, F) C15X	1500#		15	5-1/2	5 7/8	1/4	1-9/16	9 1/2	71	381	140	150	7	40	242	33
	31 (D, E, F) C16X	2500#		15-1/8	5-1/2	5 7/8	1/4	2-1/8	9 1/2	85	385	140	150	7	54	242	39
1-1/2 x 2	31 (G, H) C10N	150#	150#	14	4-3/4	4-7/8	1/16	1-1/8	9 1/4	48	356	121	124	2	29	235	22
	31 (G, H) C12N	300#		14	4-3/4	4-7/8	1/4	1-1/8	9 1/4	50	356	121	124	7	29	235	23
	31 (G, H) C13N	600#		14	4-3/4	4-7/8	1/4	1-1/8	9 1/4	50	356	121	124	7	29	235	23
	31 (G, H) C14N	900#	300#	15	5-1/2	5 7/8	1/4	1-9/16	9 1/2	71	381	140	150	7	40	242	33
	31 (G, H) C15N	1500#		15	5-1/2	5 7/8	1/4	1-9/16	9 1/2	71	381	140	150	7	40	242	33
	31 (G, H) C16N	2500#		15-1/8	5-1/2	5 7/8	1/4	2-1/8	9 1/2	85	385	140	150	7	54	242	39
1-1/2 x 2	31JC10U	150#	150#	14	4-3/4	4-7/8	1/16	1-1/8	9 1/4	48	356	121	124	2	29	235	22
	31JC12U	300#		14	4-3/4	4-7/8	1/4	1-1/8	9 1/4	50	356	121	124	7	29	235	23
	31JC13U	600#		14	4-3/4	4-7/8	1/4	1-1/8	9 1/4	50	356	121	124	7	29	235	23
	31JC14U	900#	300#	15	5-1/2	5 7/8	1/4	1-9/16	9 1/2	71	381	140	150	7	40	242	33
	31JC15U	1500#		15	5-1/2	5 7/8	1/4	1-9/16	9 1/2	71	381	140	150	7	40	242	33
	31JC16U	2500#		15-1/8	5-1/2	5 7/8	1/4	2-1/8	9 1/2	85	385	140	150	7	54	242	39
1-1/2 x 3	31 (G, H) C10	150#	150#	14	4-7/8	5-1/8	1/16	1 3/16	9 1/4	50	356	124	131	2	31	235	23
	31 (G, H) C12	300#		14	4-7/8	5-1/8	1/4	1 3/16	9 1/4	52	356	124	131	7	31	235	24
	31 (G, H) C13	600#		14	4-7/8	5-1/8	1/4	1 3/16	9 1/4	52	356	124	131	7	31	235	24
	31 (G, H) C14	900#	300#	15-1/4	6-3/4	6-3/8	1/4	1-9/16	9 1/2	75	388	172	162	7	40	242	35
	31 (G, H) C15	1500#		15-1/4	6-3/4	6-3/8	1/4	1-9/16	9 1/2	75	388	172	162	7	40	242	35
	31 (G, H) C16	2500#		15-3/8	6-3/4	6-3/8	1/4	2-1/8	9 1/2	96	391	172	162	7	54	242	44
1-1/2 x 3	31JC10N	150#	150#	14	4-7/8	5-1/8	1/16	1-3/16	9 1/4	50	356	124	131	2	31	235	23
	31JC12N	300#		14	4-7/8	5-1/8	1/4	1-3/16	9 1/4	52	356	124	131	7	31	235	24
	31JC13N	600#		14	4-7/8	5-1/8	1/4	1-3/16	9 1/4	52	356	124	131	7	31	235	24
	31JC14N	900#	300#	15-1/4	6-3/4	6-3/8	1/4	1-9/16	9 1/2	75	388	172	162	7	40	242	35
	31JC15N	1500#		15-1/4	6-3/4	6-3/8	1/4	1-9/16	9 1/2	75	388	172	162	7	40	242	35
	31JC16N	2500#		15-3/8	6-3/4	6-3/8	1/4	2-1/8	9 1/2	96	391	172	162	7	54	242	44



Dimensions & Weights:
API Nozzle Design, continued

Optional Accessories



API Nozzle Design																	
Valve Size Inlet x Outlet	Type Number	ASME Flange Class		Dimensions, Inches						Approx. Wt. Lbs. ^s	Dimensions, mm						Approx. Wt. Kg ^s
		Inlet RF	Outlet RF	A ³	B	C	E	F ⁴	G		A ³	B	C	E	F ⁴	G	
2 x 3	31 (G, H) C10X	150#	150#	15	4-7/8	5-3/8	1/16	1-1/4	9 1/2	65	381	124	137	2	32	242	30
	31 (G, H) C12X	300#		15	4-7/8	5-3/8	1/4	1-1/4	9 1/2	65	381	124	137	7	32	242	30
	31 (G, H) C13X	600#		15	4-7/8	5-3/8	1/4	1-1/4	9 1/2	65	381	124	137	7	32	242	30
	31 (G, H) C14X	900#	300#	16-1/8	6-3/4	6-9/16	1/4	1-7/8	9 3/4	102	410	172	167	7	48	248	47
	31 (G, H) C15X	1500#		16-1/8	6-3/4	6-9/16	1/4	1-7/8	9 3/4	102	410	172	167	7	48	248	47
	31 (G, H) C16X	2500#		16-3/4	6-3/4	7	1/4	2-3/8	9 3/4	130	426	172	178	7	61	248	59
2 x 3	31JC10	150#	150#	15	4-7/8	5-3/8	1/16	1-1/4	9 1/2	65	381	124	137	2	32	242	30
	31JC12	300#		15	4-7/8	5-3/8	1/4	1-1/4	9 1/2	65	381	124	137	7	32	242	30
	31JC13	600#		15	4-7/8	5-3/8	1/4	1-1/4	9 1/2	65	381	124	137	7	32	242	30
	31JC14	900#	300#	16-1/8	6-3/4	6-9/16	1/4	1-7/8	9 3/4	102	410	172	167	7	48	248	47
	31JC15	1500#		16-1/8	6-3/4	6-9/16	1/4	1-7/8	9 3/4	102	410	172	167	7	48	248	47
	31JC16	2500#		16-3/4	6-3/4	7	1/4	2-3/8	9 3/4	130	426	172	178	7	61	248	59
2 x 3	31KC10N	150#	150#	15	4-7/8	5-3/8	1/16	1-1/4	9 1/2	65	381	124	137	2	32	242	30
	31KC12N	300#		15	4-7/8	5-3/8	1/4	1-1/4	9 1/2	65	381	124	137	7	32	242	30
	31KC13N	600#		15	4-7/8	5-3/8	1/4	1-1/4	9 1/2	65	381	124	137	7	32	242	30
	31KC14N	900#	300#	16-1/8	6-3/4	6-9/16	1/4	1-7/8	9 3/4	102	410	172	167	7	48	248	47
	31KC15N	1500#		16-1/8	6-3/4	6-9/16	1/4	1-7/8	9 3/4	102	410	172	167	7	48	248	47
	31KC16N	2500#		16-3/4	6-3/4	7	1/4	2-3/8	9 3/4	130	426	172	178	7	61	248	59
3 x 4	31JC10X	150#	150#	17-5/8	6-3/8	6-1/8	1/16	1-1/4	10 3/4	135	448	162	156	2	32	274	62
	31JC12X	300#		17-5/8	6-3/8	6-1/8	1/16	1-1/4	10 3/4	140	448	162	156	2	32	274	64
	31JC13X	600#		17-7/8	6-3/8	6-3/8	1/4	1-1/2	10 3/4	140	455	162	162	7	39	274	64
	31JC14X	900#	300#	19-1/8	7-1/8	7-1/2	1/4	2-1/4	11 1/2	195	486	181	191	7	58	293	89
	31JC15X	1500#		19-1/8	7-1/8	7-1/2	1/4	2-1/4	11 1/2	204	486	181	191	7	58	293	93
3 x 4	31 (K, L) C10	150#	150#	17-5/8	6-3/8	6-1/8	1/16	1-1/4	10 3/4	135	448	162	156	2	32	274	62
	31 (K, L) C12	300#		17-5/8	6-3/8	6-1/8	1/16	1-1/4	10 3/4	140	448	162	156	2	32	274	64
	31 (K, L) C13	600#		17-7/8	6-3/8	6-3/8	1/4	1-1/2	10 3/4	140	455	162	162	7	39	274	64
	31 (K, L) C14	900#	300#	19-1/8	7-1/8	7-1/2	1/4	2-1/4	11 1/2	195	486	181	191	7	58	293	89
	31 (K, L) C15	1500#		19-1/8	7-1/8	7-1/2	1/4	2-1/4	11 1/2	204	486	181	191	7	58	293	93
3 x 4	31 (M, N) C10N	150#	150#	17-5/8	6-3/8	6-1/8	1/16	1-1/4	10 3/4	135	448	162	156	2	32	274	62
	31 (M, N) C12N	300#		17-5/8	6-3/8	6-1/8	1/16	1-1/4	10 3/4	140	448	162	156	2	32	274	64
	31 (M, N) C13N	600#		17-7/8	6-3/8	6-3/8	1/4	1-1/2	10 3/4	140	455	162	162	7	39	274	64
	31 (M, N) C14N	900#	300#	19-1/8	7-1/8	7-1/2	1/4	2-1/4	11 1/2	195	486	181	191	7	58	293	89
	31 (M, N) C15N	1500#		19-1/8	7-1/8	7-1/2	1/4	2-1/4	11 1/2	204	486	181	191	7	58	293	93
4 x 6	31LC10X	150#	150#	20-1/4	8-1/4	7-3/4	1/16	1-3/4	11	212	515	210	197	2	45	280	97
	31LC12X	300#		20-1/4	8-1/4	7-3/4	1/16	1-3/4	11	218	515	210	197	2	45	280	99
	31LC13X	600#		20-1/4	8-1/4	7-3/4	1/4	1-3/4	11	220	515	210	197	7	45	280	100
	31LC14X	900#	300#	22	9-3/16	9-13/16	1/4	2-1/2	12	320	559	234	250	7	64	305	146
	31LC15X	1500#		22	9-3/16	9-13/16	1/4	2-1/2	12	325	559	234	250	7	64	305	148
4 x 6	31 (M, N, P) C10	150#	150#	20-1/4	8-1/4	7-3/4	1/16	1-3/4	11	212	515	210	197	2	45	280	97
	31 (M, N, P) C12	300#		20-1/4	8-1/4	7-3/4	1/16	1-3/4	11	218	515	210	197	2	45	280	99
	31 (M, N, P) C13	600#		20-1/4	8-1/4	7-3/4	1/4	1-3/4	11	220	515	210	197	7	45	280	100
	31 (M, N, P) C14	900#	300#	22	9-3/16	9-13/16	1/4	2-1/2	12	320	559	234	250	7	64	305	146
	31 (M, N, P) C15	1500#		22	9-3/16	9-13/16	1/4	2-1/2	12	325	559	234	250	7	64	305	148
6 x 8	31 (Q, R) C10	150#	150#	24-5/8	9-1/2	9-7/16	1/16	1-7/8	12 3/4	465	626	242	240	2	48	324	211
	31 (Q, R) C12	300#		24-5/8	9-1/2	9-7/16	1/16	1-7/8	12 3/4	480	626	242	240	2	48	324	218
	31 (Q, R) C13	600#		24-7/8	9-1/2	9-11/16	1/4	2-1/8	12 3/4	500	632	242	247	7	54	324	227
6 x 8 x 8	31 (Q, R) C10D	150#	150#	24-5/8	9-1/2	9-7/16	1/16	1-7/8	12 3/4	504	626	242	240	2	48	324	229
	31 (Q, R) C12D	300#		24-5/8	9-1/2	9-7/16	1/16	1-7/8	12 3/4	519	626	242	240	2	48	324	236
	31 (Q, R) C13D	600#		24-7/8	9-1/2	9-11/16	1/4	2-1/8	12 3/4	539	632	242	247	7	54	324	245
8 x 10	31TC10	150#	150#	29	11	10-7/8	1/16	1-5/8	14 1/4	830	737	280	277	2	42	362	377
	31TC12	300#		29	11	10-7/8	1/16	1-5/8	14 1/4	835	737	280	277	2	42	362	379
	31TC13	600#		29-7/8	11	11-11/16	1/4	2-7/16	14 1/4	925	759	280	297	7	62	362	420
8 x 10 x 10	31TC10D	150#	150#	29	11	10-7/8	1/16	1-5/8	14 1/4	885	737	280	277	2	42	362	402
	31TC12D	300#		29	11	10-7/8	1/16	1-5/8	14 1/4	890	737	280	277	2	42	362	404
	31TC13D	600#		29-7/8	11	11-11/16	1/4	2-7/16	14 1/4	980	759	280	297	7	62	362	445

Accessories Reference Table ¹						
	Snap Acting Control		Modulating Control			
	SVN (2)	SLN (3)	MLN (4)	MLNS (5)	HMLN (6)	HMLN (7)
Test Gag (1)	✓	✓	✓	✓	✓	
Dual Pilots (2)	✓	✓	✓	✓	✓	
Auxillary Filter (3)	✓	✓	✓	✓	✓	✓
Manual Depressurizing ⁴ (4)	✓	✓	✓	✓	✓	✓
Remote Depressurizing ³ (8)	✓	✓	✓	✓	✓	✓
Field Test Connection (5)	✓	✓	✓ ²	✓ ²	✓ ²	✓ ²
Field Test Connection w/ Indicator (F)			✓ ²	✓ ²	✓ ²	✓ ²
Reverse Flow Preventer (6)	✓	✓	✓	✓	✓	✓
Pressure Spike Snubber (7)	✓	✓	✓		✓	
Remote Sensing (R)	✓	✓	✓	✓	✓	✓
Discharge to Outlet (V)			✓ ⁵	✓ ⁵	✓ ⁵	✓ ⁵
Valve Lift Indicator ⁶	✓	✓	✓	✓	✓	

- General Notes:
- Materials of construction for optional accessories will remain consistent with main and pilot valve constructions. Not all optional accessories may be available for valves specified with special trim material, based on commercial availability.
 - Option with indicator is recommended for modulating pilot control applications.
 - Customer will need to provide supplemental information to specify this option.
 - The effective CV of the manual depressurizing unit should be at least 0.41 (KV = 0.355) including any associated tubing or piping.
 - When liquid service is specified, this option is recommended.
 - Furnish complete details on type of signal output desired and power supply available.

- General Notes:
- For liquid service valves with standard size connections (L in the type number), use the standard type number dimensions, i.e. 31DC10-120. For liquid service valves with oversize connections (Y in the type number), use the oversize type number dimensions, i.e. 31DC10X-120.
 - Valves with ring joint inlet connections available. Consult the Factory for final dimensions.
 - For modulating valves, add 6-1/2" (160 mm) to the A dimension.
 - F dimension meets or exceeds ANSI thickness requirement.
 - A 1" x 2" valve with a "G" orifice is only available with a remote sensing option.
 - Weights listed are for valves with snap acting controls without any optional accessories. For valves with modulating controls maximum added weight is 15 lbs (6.8 Kg).