

Principle of Operation



HP300 Series – Relieving Piston

The Conoflow HP300 High Pressure Regulator is designed to accurately control supply pressures up to 10,000 PSIG (69 MPa). This piston sensing, self-relieving regulator allows pressure setting reduction in a closed system by relieving downstream pressure through the regulator.

For hazardous media applications a non-relieving piston is offered. Where noncorrosive media are present, the HP300 Regulator is offered in brass. Each unit is supplied with 1/4" inlet, outlet and two gauge ports. CGA cylinder connections are also available.

The HP300 Regulator provides excellent sensitivity through six control setting ranges: 8-500, 9-800, 10-1500, 15-2500, 25-4000, and 30-6000 PSIG (0.06-3.45, 0.062-5.52, 0.069-10.35, 0.104-17.25, 0.173-27.60, and 0.207-41.40 MPa). All of these regulated pressure ranges can be obtained from one regulator simply by interchanging range/sensor kits. Adjustment within each range is made by a large handwheel (standard) or by an optional "T" bar handle.

Designed for reliability with minimum maintenance, this unit is commonly used for instrument calibration, for corrosive gases, airline charging systems, cylinder gas regulation, process sampling systems, cylinder filling stations and other applications where rugged construction and accurate control of high pressure is required.

Turning the control knob clockwise will increase the force on the range spring and, in turn, the outlet set pressure. Conversely, turning the control knob counter-clockwise will decrease the force on the range spring and decrease the outlet set pressure. In equilibrium, the force exerted by the range spring is balanced by the outlet pressure.

An unbalance between the outlet pressure and the set pressure causes a corresponding reaction on the sensor and valve. If the outlet pressure rises above the set pressure, the piston sensor with lift allowing the main valve to seat. This action causes the relief valve to open relieving the excess pressure to atmosphere until equilibrium is reached.

If the outlet pressure falls below the set pressure, the range spring will push the sensor down and unseat the main valve. This allows supply pressure to flow through the main valve to the downstream port increasing the set pressure. At equilibrium, the valve plug assumes a position which supplies the required flow while maintaining the outlet pressure at the set pressure.

Specifications

Maximum Supply Pressure:

Brass: 6,000 PSIG (41.4 MPa)

Control Setting Ranges:

8-500 PSIG (0.060-3.45 MPa)
 9-800 PSIG (0.062-5.52 MPa)
 10-1500 PSIG (0.069-10.35 MPa)
 15-2500 PSIG (0.104-17.25 MPa)
 25-4000 PSIG (0.173-27.60 MPa)
 30-6000 PSIG (0.207-41.40 MPa)

Proof Pressure:

150% Maximum operating

Burst Pressure:

400% Maximum operating

Flow Capacity:

C_v 0.14 (See Flow Graph)
 Orifice Diameter: 0.110"

Supply Pressure Effect:

2.2 PSIG (0.015 MPa) increase for a 100 PSIG (0.690 MPa) supply decrease

Operating and Fluid Temperature Range:

-40°F to +165°F (-40°C to +74°C)

Leakage:

Bubble Tight (In Board and Main Valve)

Maximum Operating Torque:

55 in/lbs. (63.2 Kg-cm)

Ports:

1/4" NPTF supply, outlet and two gauge ports (60°)

Weight (Without Gauges):

4.6 lbs. (2.12 Kg)

Materials of Construction

Body: Brass

Bonnet: Brass

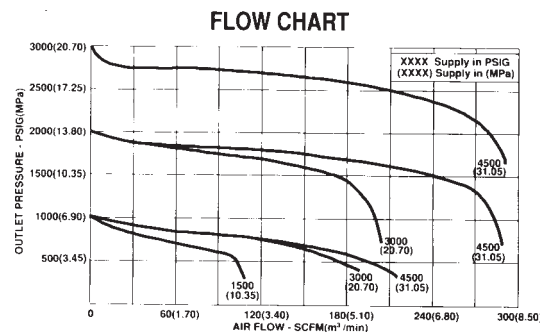
Main Valve Seat: Vespel (Kel-F optional)

Relief Valve Seat: Kel-F

Sensor and Trim: 300 Series Stainless Steel

Seals: Buna N/Teflon (Viton optional)

Filter: Bronze (20 micron)



Oxygen Service

Specification of materials in regulators used for oxygen service is the **user's responsibility**. Cleaning for oxygen service (**Per ES8A 01 297**) to 3500 PSIG (24.20 MPa) is supplied by Conoflow at no additional cost. Cleaning for service above 3500 PSIG (24.20 MPa) may be performed to the user's specifications at an additional cost through an outside source.

For special cleaning requirements, the customer must supply specifications for desired level of cleanliness. Cost will be advised prior to performing the cleaning operation.

Control Engineering Data

Control Engineering Data is intended to provide a single source from which one can determine, in detail, the full scope of the product line. In addition to materials of construction and diaphragm selection, it also provides all necessary data, regarding adjustment options and range selections. Control Engineering Data also provides a means of communicating, by way of a code number, which is fully descriptive of the product selection.

Note: I. Catalog numbers as received must contain fifteen (15) characters.

1-5
Model HP300 = Pressure Regulator – Piston Type

6
Materials of Construction **Body/Bonnet/Trim**
B = Brass/Brass

	Main Valve Seat(s)	Vent Valve Seat	Backup	O-Rings	Notes
7-8 Elastomers	11 = Vespel	Kel-F	Buna-N/Teflon	Buna-N	(Standard)
	12 = Kel-F	Kel-F	Buna-N/Teflon	Buna-N	2
	13 = Vespel	Kel-F	Viton/Teflon	Viton	—
	14 = Kel-F	Kel-F	Viton/Teflon	Viton	2
	15 = Vespel	—	Buna-N/Teflon	Buna-N	1
	16 = Kel-F	—	Buna-N/Teflon	Buna-N	1 and 2
	17 = Vespel	—	Viton/Teflon	Viton	1
	18 = Kel-F	—	Viton/Teflon	Viton	1 and 2

Notes: 1. These options are offered for non-relieving units.
2. These options cannot be used for 10,000 PSIG (69.00 MPa) applications. Use Vespel main valve seats for applications above 6000 PSIG (41.40 MPa).

9
Relieving Options N = Non-Relieving (Optional)
V = Relieve to atmosphere

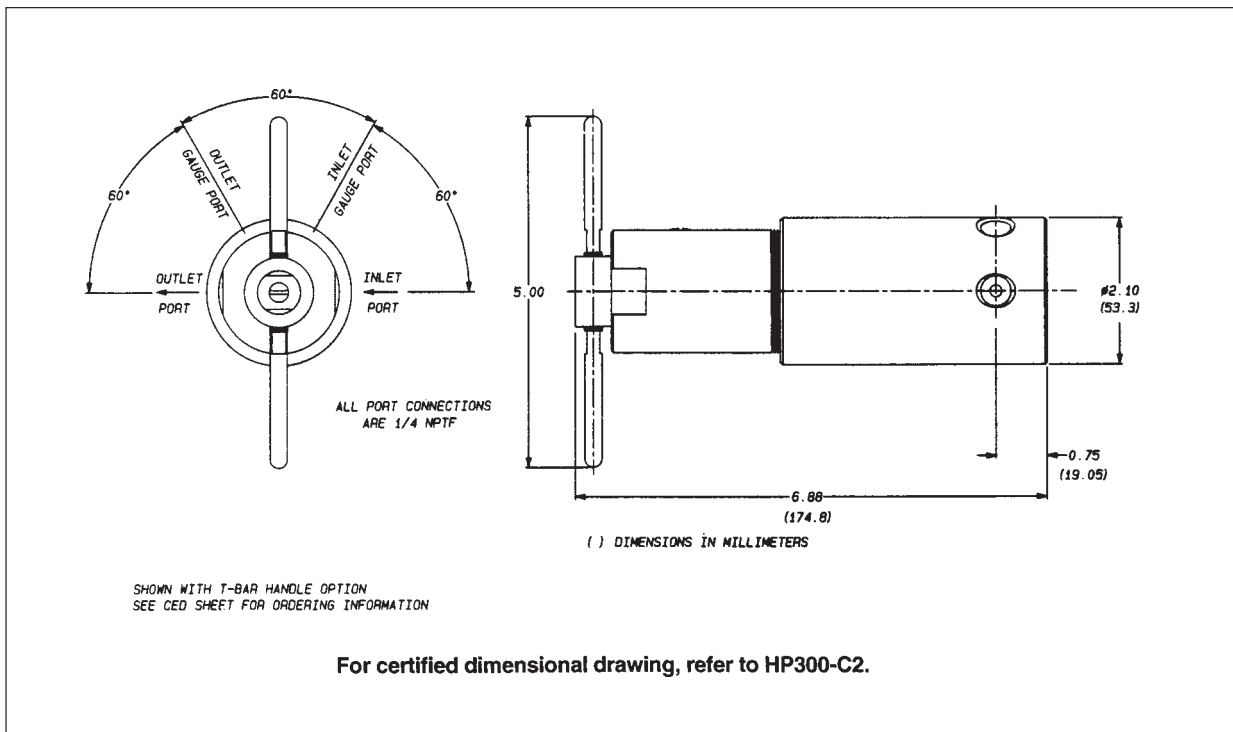
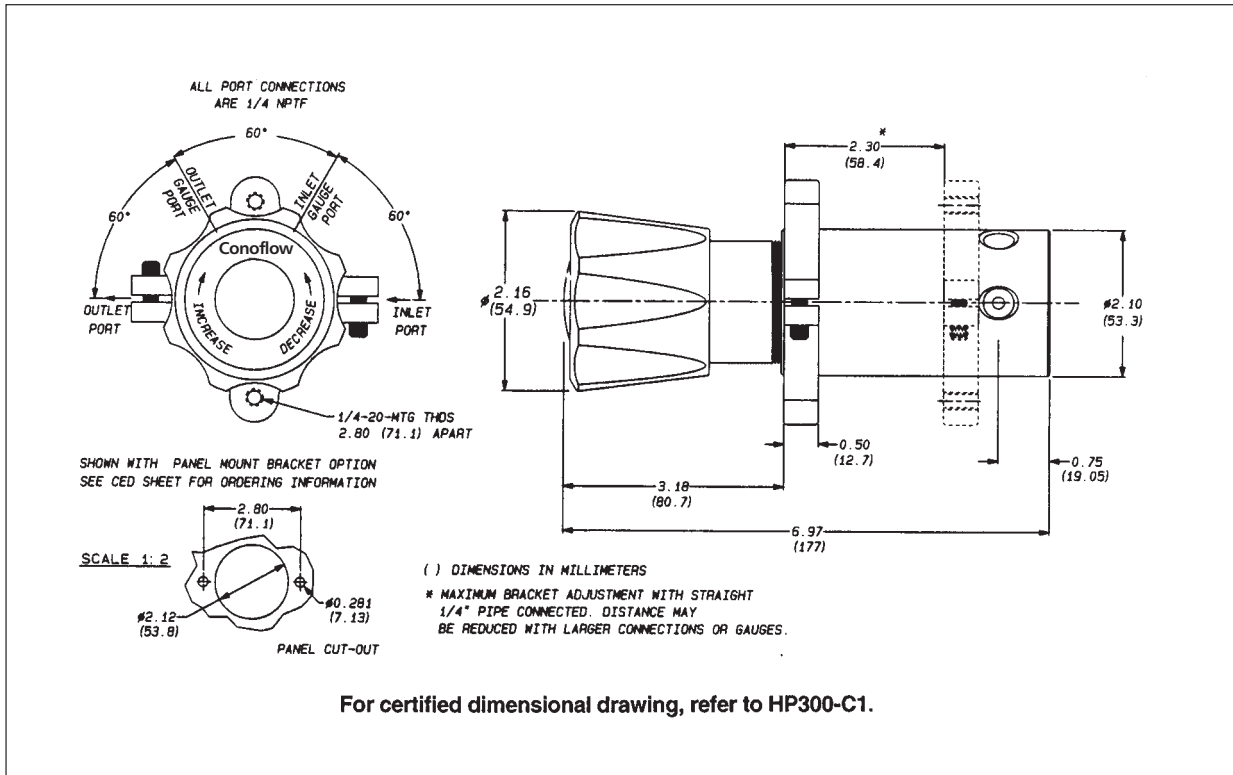
10-11
Inlet/Outlet **Inlet/Outlet/2-Gauge Ports (60°) Gauge Port Configuration – Inlet (Low) Outlet (High)**
NPT Connections
61 = 1/4"

12
Mounting Options P = Bracket Mount
S = Port Pipe Mounting (Standard)

13
Cleaning Options A = Regulator is cleaned to ITT Conoflow Specification ES8A 01 294
B = **Oxygen Cleaning** - Specification of material in regulators used for cleaning for oxygen service is the **user's responsibility**. Cleaning for oxygen service (**Per ES8A 01 297**) to 3500 PSIG (24.20 MPa) is supplied by ITT Conoflow at no additional cost.
C = **Customer Specified Cleaning** - Customer to specify the desired level of cleanliness. ITT Conoflow will advise cost prior to performing cleaning operation. Specification of materials is the **user's responsibility**.

14
Adjustment Selections B = Handwheel (Standard)
T = "T" bar handle (Optional)

15 Control Setting Ranges	F = 8 - 500 PSIG (0.060 - 3.45 MPa)
	G = 9 - 800 PSIG (0.062 - 5.52 MPa)
	H = 10 - 1500 PSIG (0.069 - 10.35 MPa)
	J = 15 - 2500 PSIG (0.104 - 17.25 MPa)
	K = 25 - 4000 PSIG (0.173 - 27.60 MPa)
L = 30 - 6000 PSIG (0.207 - 41.40 MPa)	



HP400 Regulator

Pressure Reducing - Piston Type

Conoflow's HP400 is a piston-sensing, self-contained pressure reducing regulator. High inlet and outlet pressures allow use of this regulator in component testing, calibration systems, manufacturing processes and other applications that require an economical regulator having reliable and safe operating characteristics.

The brass constructed HP400 Regulator has a maximum supply pressure rating of 3500 PSIG (24.2 MPa). Control setting range for this unit is 20 to 2500 PSIG (0.138-17.25 MPa). Adjustments within the range are made with a large handwheel furnished with the standard unit. Optional adjustment devices include a wrench style knob with a locking device or a "T" bar handle.

This unit is supplied with 1/4" NPT inlet and outlet connections. Inlet and outlet gauge ports (1/4" NPT) are standard. The regulator is non-relieving with a captured bonnet.

Feature Summary

- High inlet pressure 3500 PSIG (24.2 MPa)
- 6000 PSIG (41.40 MPa) inlet pressure available
- High outlet pressure 2500 PSIG (17.25 MPa)
- Piston sensing for safe and reliable service life
- Economical brass construction
- Captured bonnet - standard
- Mounting nuts available for optional panel mounting
- Regulator cleaned to ITT Conoflow Specification (ES8A 01 294)
- CGA cylinder connections available

Options:

Mounting

Line – All variations (Supplied with plain bonnet)
Panel – (2 Panel mounting nuts) Optional

Adjustments

Handwheel (Large)
Knob (Wrench style - with locking device) – Optional
"T" bar handle – Optional

Cylinder Connections

CGA connections are available

HP400 Maintenance Kit

80400-11, 12, 13, 14, 15, 16, 17, 18 - For all control setting ranges

HP400 Overhaul Kit

81400-11, 12, 13, 14, 15, 16, 17, 18 For all control setting ranges

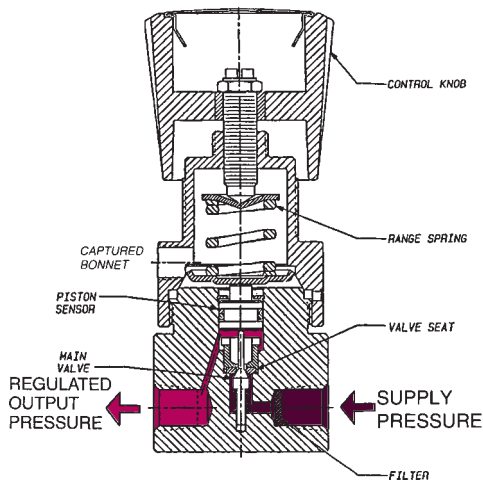


Dimensional Data – Advertising Drawings:

HP400-C1: Standard unit
HP400-C2: "T" bar handle
HP400-C3: Wrench Knob with locking device

Principle of Operation

- Supply Pressure
- Regulated Output Pressure



HP400 Series – Non-Relieving Piston

Turning the control knob clockwise will increase the force on the range spring and, in turn, the outlet set pressure. Conversely, turning the control knob counter-clockwise will decrease the force on the range spring and decrease the outlet set pressure. In equilibrium, the force exerted by the range spring is balanced by the outlet pressure.

An unbalance between the outlet pressure and the set pressure causes a corresponding reaction in the piston sensor and valve. If the outlet pressure rises above the set pressure, the piston sensor will lift allowing the main valve to seat. If the outlet pressure falls below the set pressure, the range spring will push the piston down and unseat the valve. At equilibrium, the valve plug assumes a position which supplies the required flow while maintaining the outlet pressure at the set pressure.

Specifications

Maximum Supply Pressure:

3500 PSIG (24.2 MPa), 6000 PSIG (41.40 MPa) available, refer to Control Engineering Data

Control Setting Range:

20-2500 PSIG (0.138-17.25 MPa)

Proof Pressure:

150% Maximum operating

Burst Pressure:

400% Maximum operating

Flow Capacity:

C_v 0.06 (See Flow Graph)
Orifice Diameter: 0.110"

Supply Pressure Effect:

3.6 PSIG (0.025 MPa) increase for a 100 PSIG (0.690 MPa) supply decrease

Operating and Fluid Temperature Range:

-15°F to +165°F (-26°C to +74°C)

Leakage:

Bubble Tight (In Board and Main Valve)

Maximum Operating Torque:

30 in/lbs. (34.5 Kg-cm)

Ports:

1/4" NPTF supply, outlet and two gauge ports (80°)

Weight (Without Gauges):

2.25 lbs. (1.02 Kg)

Materials of Construction

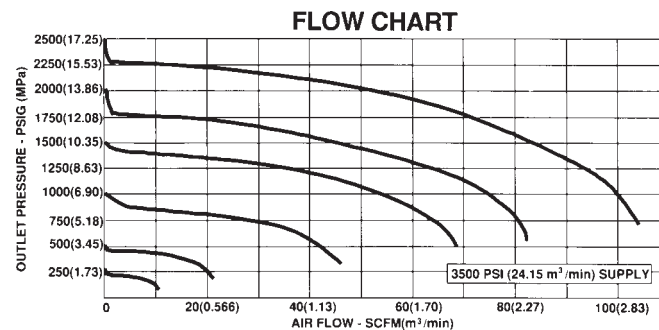
Body/Bonnet: Brass

Main Valve Seat: Kel-F (Vespel optional)

Sensor and Trim: 300 Series Stainless Steel

Seals: Teflon/Viton (Buna N optional)

Filter: 316 Stainless Steel Screen (120 Mesh)



Oxygen Service

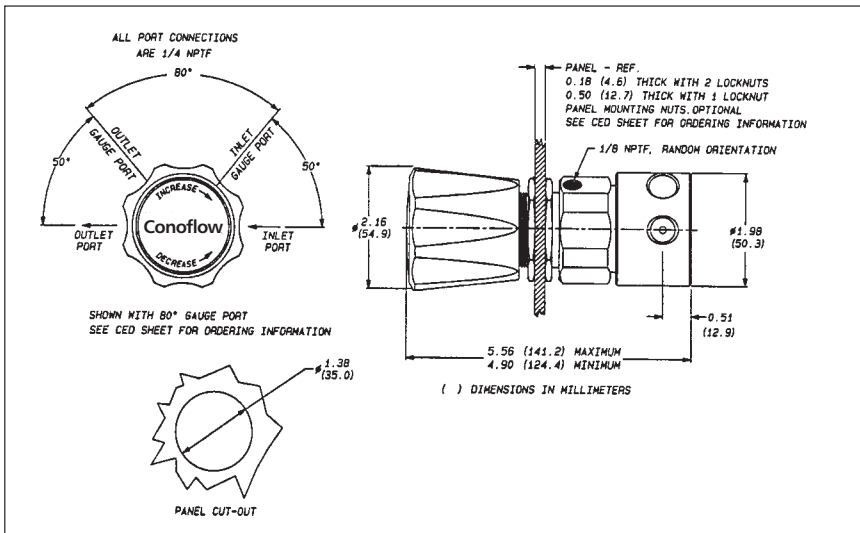
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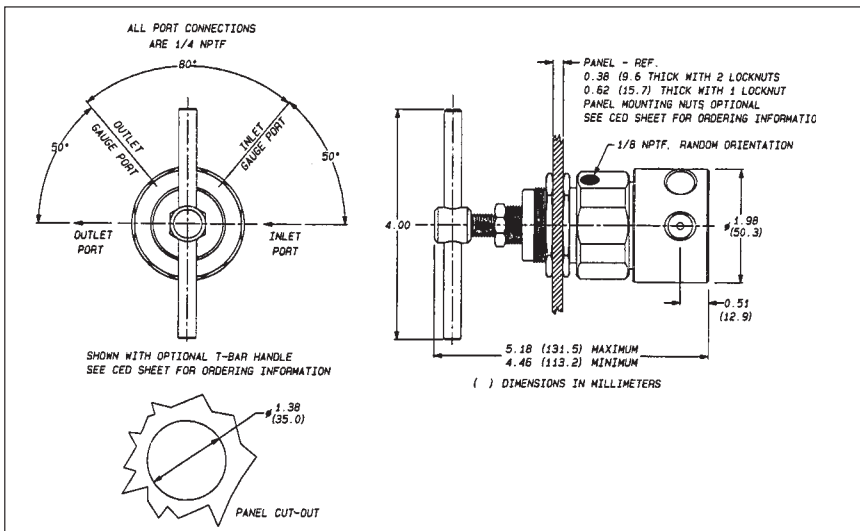
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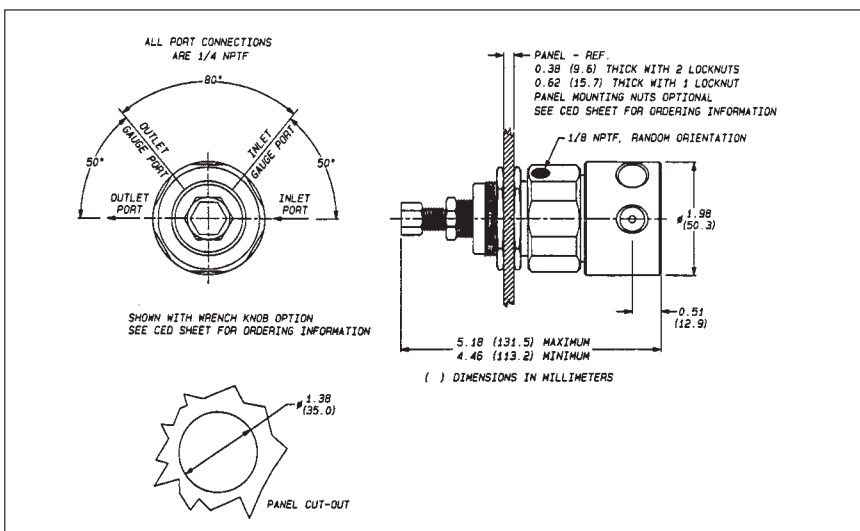
1-5 Model	HP400 = Pressure Reducing Regulator - Piston Type (Low Flow) Note: 1. For a maximum inlet pressure rating of 6000 PSIG (41.40 MPa), refer to positions (7-8) Elastomers.																												
6 Materials of Construction	Body/Bonnet/Trim B = Brass/Brass/300 Stainless Steel Note: 1. Maximum supply pressure must not exceed the maximum pressure rating of the supply connection and supply gauge connection.																												
7-8 Elastomers	<table border="1"> <thead> <tr> <th></th> <th>Main Valve Seat(s)</th> <th>Backup Rings</th> <th>O-Rings</th> </tr> </thead> <tbody> <tr> <td>11 =</td> <td>Kel-F/Teflon</td> <td>Buna-N</td> <td></td> </tr> <tr> <td>12 =</td> <td>Vespel</td> <td>Teflon</td> <td>Buna-N (See Note 1)</td> </tr> <tr> <td>13 =</td> <td>Kel-F/Buna-N</td> <td>Buna-N</td> <td></td> </tr> <tr> <td>14 =</td> <td>Vespel</td> <td>Buna-N</td> <td>Buna-N (See Note 1)</td> </tr> <tr> <td>17 =</td> <td>Vespel</td> <td>Teflon</td> <td>Viton (See Note 1)</td> </tr> <tr> <td>18 =</td> <td>Kel-F/Teflon</td> <td>Viton (Standard)</td> <td></td> </tr> </tbody> </table> <p>Note: 1. The use of a Vespel main valve seat increases the maximum inlet pressure rating to 6000 PSIG (41.40 MPa).</p>		Main Valve Seat(s)	Backup Rings	O-Rings	11 =	Kel-F/Teflon	Buna-N		12 =	Vespel	Teflon	Buna-N (See Note 1)	13 =	Kel-F/Buna-N	Buna-N		14 =	Vespel	Buna-N	Buna-N (See Note 1)	17 =	Vespel	Teflon	Viton (See Note 1)	18 =	Kel-F/Teflon	Viton (Standard)	
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10-11 Inlet/Outlet/Gauge Ports	Inlet/Outlet/2-Gauge Ports (80°) Gauge Port Configuration – Inlet (High) Outlet (Low) NPT Connections 81 = 1/4" Note: 1. All gauge port connections are 1/4" NPT.																												
12 Mounting Options	P = Panel Mounting (2-nut) (Optional) S = Plain bonnet (no threads) - Standard																												
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For certified dimensional drawing, refer to HP400-C1.



For certified dimensional drawing, refer to HP400-C2.



For certified dimensional drawing, refer to HP400-C3.