# **CONOFLOW HIGH-PRESSURE REGULATOR - HP200**

Back Pressure - Diaphragm Type -**High Purity** 

The Conoflow HP200 is a self-contained, spring loaded back pressure regulator. This diaphragm sensing, high purity regulator is designed to provide accurate regulation of corrosive and non-corrosive fluids in applications such as compressors, controlling of pump pressures, gas and liquid sampling and petrochemical processing.

This regulator uses a soft-seated main valve for helium leak-tight shutoff and a 316 stainless steel diaphragm for accurate and sensitive control of supply pressure. Control setting ranges offered are 0-25, 0-50, 0-100 and 0-250 PSIG (0-0.173, 0-0.345, 0-0.690, and 0-1.73 MPa). Adjustments are made with a standard large handwheel. A wrench style knob with a locking device or a "T" bar handle are available as options.

When controlling corrosive media, the HP200 Series stainless steel model can be utilized. For non-corrosive applications the brass model is offered. N.A.C.E. configurations are also available. These units are rated for a 500 PSIG (3.45 MPa) maximum supply pressure. A captured bonnet is standard on this regulator.

In the standard configuration, this unit is supplied with 1/4" NPT inlet and outlet connections. 1/4" NPT gauge ports are optional. Vacuseal, VCR, Ultra Seal welded fittings and High Purity Internal Connections are available upon request.

This regulator is designed for reliability with an absolute minimum of maintenance. The characteristics are a result of Conoflow's high standards of manufacturing and years of experience as a leading producer of pneumatic instrumentation.

#### FEATURE SUMMARY

Metal-to-metal sealed diaphragm Vacuseal, VCR, and Ultra Seal welded fittings - optional High purity internal connections - optional Leak rate less than 2 x 10<sup>-8</sup> atm cc/sec helium Line and rear mounting - standard Panel mounting available Electronic grade cleaning available Regulator cleaned to ITT Conoflow Specification (ES8A 01 294)

#### **OPTIONS:**

#### MOUNTING:

Line - All variations (Supplied with plain bonnet) Panel - (2 panel mounting nuts) - Optional Rear Mounting - Standard

ADJUSTMENTS:

Handwheel (Large) - Standard

Knob (Wrench style - with locking device) - Optional

"T" bar handle - Optional

**GAUGES:** 

2" and 2-1/2" diameters

Brass, steel and stainless steel construction

#### HP200 CONTROL KIT:

83200-11, 12, 13 & 14 For control setting range 0-25 PSIG (0-0.173 MPa) 83201-11, 12, 13 & 14 For control setting range 0-50 PSIG (0-0.345 MPa) 83202-11, 12, 13 & 14 For control setting range 0-100 PSIG (0-.690 MPa) 83203-11, 12, 13 & 14 For control setting range 0-250 PSIG (0-1.73 MPa)

**HP200 MAINTENANCE KIT:** 

80200-11, 12, 13 & 14 For all control setting ranges

#### HP200 OVERHAUL KIT:

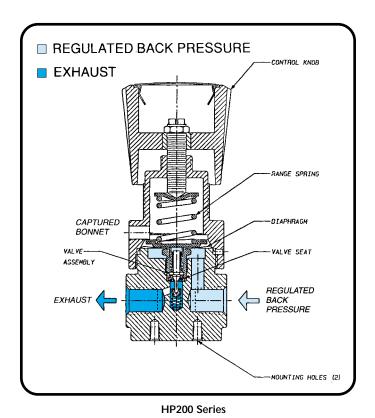
81200-11, 12, 13 & 14 For control setting ranges 0-25 & 0-50 PSIG (0-0.173 & 0-0.345 MPa)

81201-11, 12, 13 & 14 For control setting ranges 0-100 & 0-250 PSIG (0-0.690 & 0.1.73 MPa)

# **DIMENSIONAL DATA -**ADVERTISING DRAWINGS:

HP200 - C1: Standard unit HP200 - C2: "T" bar handle

HP200 - C3: Wrench knob with locking device



# PRINCIPLE OF OPERATION

Turning the control knob clockwise will increase the force on the range spring and, in turn, the inlet set pressure. Conversely, turning the control knob counterclockwise will decrease the force on the range spring and decrease the inlet set pressure. In equilibrium, the force exerted by the range spring is balanced by the inlet pressure acting on the diaphragm.

An unbalance between the inlet pressure and the set pressure causes a corresponding reaction in the diaphragm and valve. If the inlet pressure rises above the set pressure, the diaphragm will rise allowing the plug to unseat. As the inlet pressure decreases, the diaphragm and valve will move toward the closed position. When the inlet pressure is reduced to the set pressure, the valve will seat and shut off the relieving flow.

If the supply pressure is below the set pressure, the valve will remain closed.

### **SPECIFICATIONS**

 Maximum Supply Pressure: 500 PSIG (3.45 MPa)

 Control Setting Ranges:
 0-25 PSIG (0.173 MPa)

 0-50 PSIG (0.345 MPa)
 0-100 PSIG (0.690 MPa)

 0-250 PSIG (1.73 MPa)

Proof Pressure: 150% maximum operating Burst Pressure: 400% maximum operating Flow Capacity: C. - 0.19 (See Flow Graphs)

Orifice Diameter: 0.110"

Operating and Fluid Temperature Range:

 $-40^{\circ}$ F to  $+165^{\circ}$ F ( $-40^{\circ}$ C to  $+74^{\circ}$ C)

Leakage: 2 x 108 atm cc/sec Helium (In Board and Main Valve)

Maximum Operating Torque: 25 in/lbs. (29 Kg-cm)

Ports: 1/4" NPTF supply and outlet

1/4" NPTF gauge ports optional (80°). Other porting sizes and

configurations available.

Weights (Without gauges): 2.0 lbs. (0.91 Kg)

#### MATERIALS OF CONSTRUCTION

**Body:** Brass/316 SS/N.A.C.E. 316SS **Bonnet:** Brass/Plated Brass

Diaphragm and Trim: 316 Stainless Steel (Elgiloy - N.A.C.E.)

Main Valve Seat: Kel-F (Teflon - Optional)

### **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 ITT Conoflow at no additional cost. Special cleaning may be performed to user's specifications at an additional cost through an outside service.

#### HIGH PURITY INTERNAL CONNECTIONS

Available at additional cost. ITT Conoflow High Purity Internal Connections are machined into the regulator body to accommodate 1/4" Vacuseal, VCR, Ultra Seal or equivalent male vacuum fittings (fittings supplied by the customer).

#### **WELDED FITTINGS**

Available at additional cost. Straight tubing, 90° elbows, Vacuseal, VCR, Ultra Seal or equivalent compatible fittings are available butt welded in the regulator body (ITT Conoflow to provide fitting).

### **ELECTRONIC GRADE CLEANING**

Available at additional cost. ITT Conoflow will perform electronic grade cleaning to customer supplied specifications. Cost will be advised prior to performing cleaning.

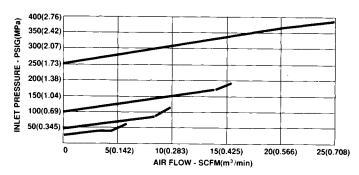
#### **LEAK RATE CERTIFICATION (ES8A 01 295)**

Available at additional cost. ITT Conoflow will certify a leak rate to  $2 \times 10^8$  atm cc/sec of Helium.

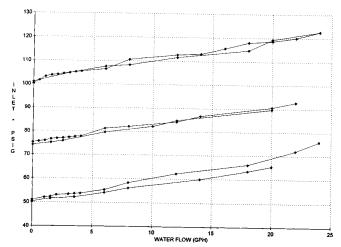
#### **INTERNAL SURFACE FINISH**

Available at additional cost. ITT Conoflow can provide an internal surface finish, on wetted components, of 15 Ra microinch. Other surface finishes available, consult the factory.

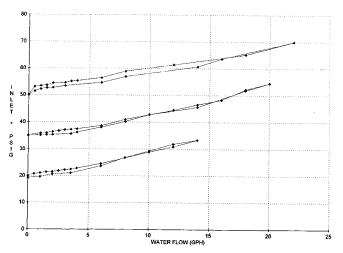




# HP200F11RN1RABC WATER FLOW CURVES



# HP200F11RN1RABB WATER FLOW CURVES

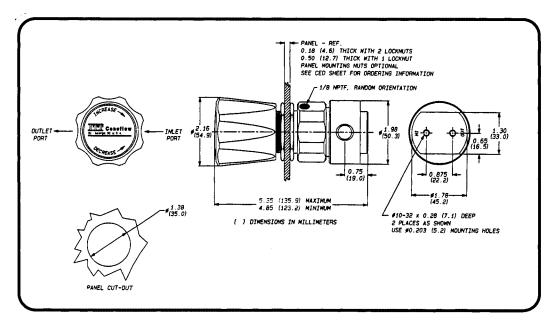


# **CONTROL ENGINEERING DATA**

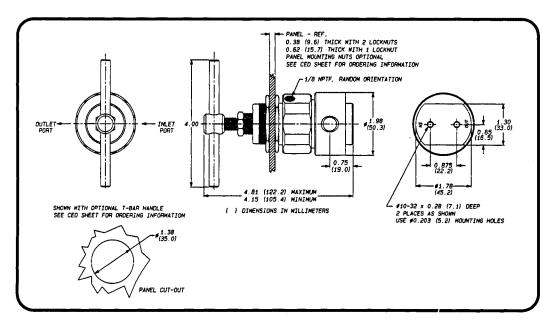
Control Engineering Data is intended to provide a single source from which one can determine, in detail, the full scope of the product line. In addition to materials of construction and diaphragm selection, it also provides all necessary data, regarding adjustment options and range selections. Control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

NOTE: 1. Catalog numbers as received must contain fifteen (15) characters.

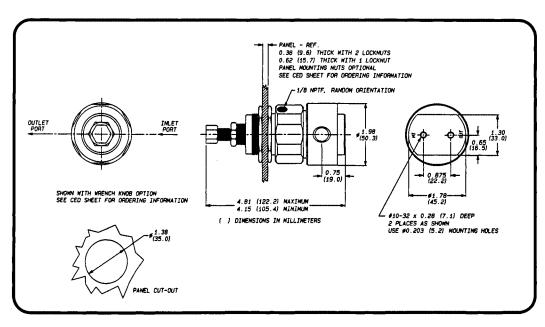
1-5	HP200 = Back Pressure Regulator - High Purity		Inlet/Outlet Ports 2-Gauge Ports (80 Degrees)
Model	Diaphragm Type- Low Pressure		Gauge Port Configuration = Inlet (High) Outlet
	Body/Bonnet/Trim  F = Brass/316 Stainless Steel H = 316 SS/Nickel Plated Brass/316SS 3 = 316 SS/Nickel Plated Brass/316SS-15Ra (See Note 2) R = N.A.C.E. 316SS/Nickel Plated Brass/316SS (See Note 1) L = 316L SS/Nickel Plated Brass/316 SS		NPT Connections  81 = 1/4"  82 = 316 Stainless Steel 1/4"x4" Tubing welded per port  83 = 316 Stainless Steel 1/4"x4" Tubing welded per port  84 = 316 Stainless Steel 1/4"x4" Tubing welded per port 15 Ra microinch finish
6 Materials of Construction	(See Note 3)  5 = 316 SS/Nickel Plated Brass/316 SS - 15Ra (See Notes 2 and 3)  J = N.A.C.E. 316L SS/Nickel Plated Brass/316SS (See Notes 1 and 3)  NOTES:	Field Welded Connections - See Note 1  84 = 1/4" Butt weld preparation  85 = 1/4" Socketweld preparation  High Purity Internal Connections - See Note 5	
	<ol> <li>National Association of Corrosion Engineers.</li> <li>These options are offered when a 15 Ra microinch finish is required. This finish will apply to the wetted surfaces only. Refer to price sheets for list price adder.</li> <li>316L Stainless Steel is required for welded connections. Refer to position 10-11</li> </ol>	10-11 Inlet/Outlet/ Gauge Ports (Cont'd. from previous column)	86 = 1/4" Vacuseal - Preparation 87 = 1/4" VCR - Preparation 88 = 1/4" Ultra Seal - Preparation  Butt Weld (Zero Clearance) - High Purity Connections - See Notes 2 and 6 89 = 1/4" Vacuseal 8A = 1/4" VCR
7-8	Seals & Diaphragm Main Valve Seat(s)  11 = 316 Stainless Steel Kel-F (Standard)  12 = 316 Stainless Steel Teflon (Optional)  13 = Elgiloy Kel-F - See Note 1		8F = 1/4" Ultra Seal  Butt Weld 90 Degree Elbow - See Note 3 8H = 1/4" Butt Weld 90 Degree Elbow
Elastomers	14 = Elgiloy Teflon - See Note 1		on = 1/4 Butt Weld 90 Degree Elbow
and Diaphragms	NOTE:  1. Elgiloy diaphragm required for N.A.C.E.		NOTES: 1. Weld preparation to standard tubing tolerance. 2. Fittings(s) supplied by ITT Conoflow. (Female Nuts)
9 Relieving	R = Non-Relieving, captured bonnet		3. Fittings are installed down away from control handle.
Option	Inlet/Outlet Ports (No Gauge Ports)  NPT Connections  Butt Welded  Tubing Connections  N1 = 1/4" (Standard)  B1 = 316L Stainless Steel  1/4"x4" Tubing	12 Mounting Options	<ul><li>4. All gauge connections are 1/4" NPT.</li><li>5. Customer to supply fittings.</li><li>6. Unless otherwise specified, female nuts will be provided.</li></ul>
	welded per port  B2 = 316L Stainless Steel  1/4"x4" Tubing		R = Rear Mounting (Standard) P = Panel Mounting (2-nut)
	welded per port 15Ra microinch finish		A = Regulator is cleaned to ITT Conoflow Specification ES8A 01 294. B = OXYGEN CLEANING. Specification of materials in regulators used for
10-11 Inlet/Outlet/	Field Welded Connections - See Note 1  W1 = 1/4" Butt Weld preparation  W2 = 1/4" Socketweld preparation	13 Cleaning	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
Gauge Ports (Cont'd. in next column)	High Purity Internal Connections - See Note 5 H1 = 1/4" Vacuseal - Preparation H2 = 1/4" VCR - Preparation H3 = 1/4" Ultra Seal - Preparation	Options	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.
	Butt Weld (Zero Clearance) -High Purity Connections - See Notes 2 and 6 Z1 = 1/4" Vacuseal Z2 = 1/4" VCR Z3 = 1/4" Ultra Seal	14 Adjustment Selections	B = Handwheel (Standard)  K = Wrench knob with locking device (Optional)  T = "T" bar handle (Optional)
	Butt Weld 90 Degree Elbow - See Note 3 91 = 1/4" Butt Weld 90 Degree Elbow	15 Control Setting Ranges	A = 0-25 PSI (0-0.173 MPa) B = 0-50 PSI (0-0.345 MPa) C = 0-100 PSI (0-0.690 MPa) E = 0-250 PSI (0-1.73 MPa)



For certified dimensional drawing, refer to HP200-C1.



For certified dimensional drawing, refer to HP200-C2.



For certified dimensional drawing, refer to HP200-C3.