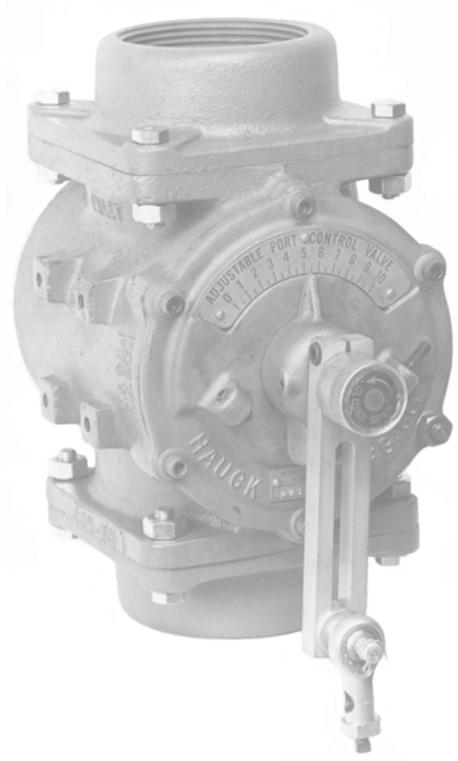


**ADJUSTABLE PORT VALVES**



**WARNING**

These instructions are intended for use only by experienced, qualified combustion start-up personnel.

Adjustment of this equipment and its components, by unqualified personnel, can result in fire, explosion, severe personal injury, or even death.

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These instructions are intended to serve as guidelines covering the installation, operation, and maintenance of Hauck equipment. While every attempt has been made to ensure completeness, unforeseen or unspecified applications, details, and variations may preclude covering every possible contingency. **WARNING: TO PREVENT THE POSSIBILITY OF SERIOUS BODILY INJURY, DO NOT USE OR OPERATE ANY EQUIPMENT OR COMPONENT WITH ANY PARTS REMOVED OR ANY PARTS NOT APPROVED BY THE MANUFACTURER.** Should further information be required or desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, contact Hauck Mfg. Co.



**WARNING**

This equipment is potentially dangerous with the possibility of serious personal injury and property damage. Hauck Manufacturing Company recommends the use of flame supervisory equipment and fuel safety shutoff valves. Furthermore, Hauck urges rigid adherence to National Fire Protection Association (NFPA) standards and insurance underwriter's requirements. Operation and regular preventative maintenance of this equipment should be performed only by properly trained and qualified personnel. Annual review and upgrading of safety equipment is recommended.

**A. GENERAL INFORMATION**

The Hauck Adjustable Air and Gas Port Valves are a dependable, accurate means of controlling the flow of air or gas to any variable pressure type of burner or system. Flow control may be either manual or automatic. These valves are easily adjustable and designed to hold the desired setting in either mode of operation. Each side of the valve is equipped with four drilled and tapped mounting pads. This facilitates the installation of multiple valve units or an automatic control system. These units are designed to be used as efficient control systems, not as shutoff valves.

**B. RECEIVING AND INSPECTION**

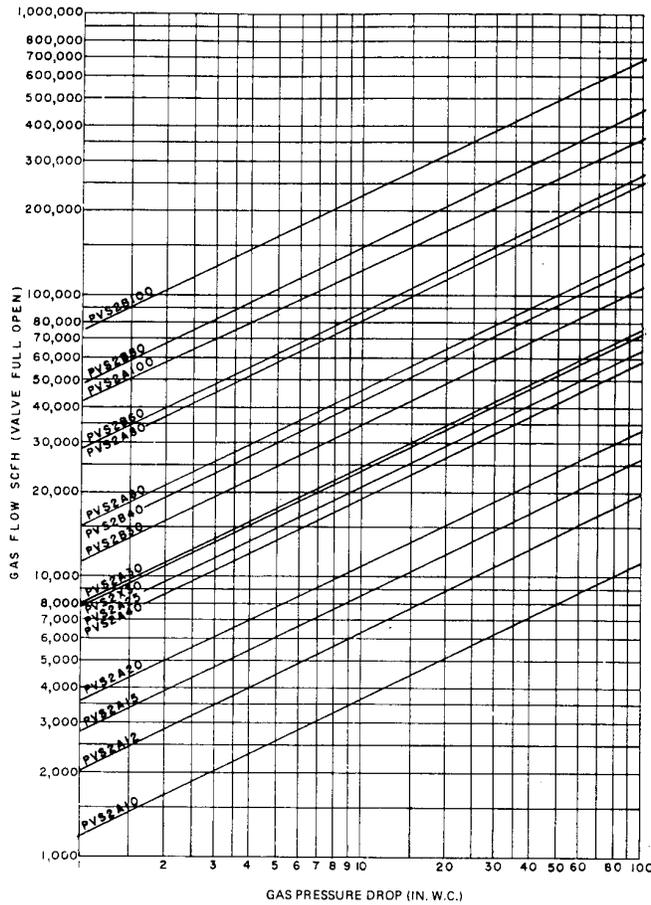
Upon receipt, check each item on the bill of lading and/or invoice to determine that all equipment has been received. A careful examination of all parts should be made to ascertain if there has been any damage in shipment.

**IMPORTANT**

If the installation is delayed and the equipment is stored outside, provide adequate protection as dictated by climate and period of exposure. Special care should be given to all motors and bearings, if applicable, to protect them from rain or excessive moisture.

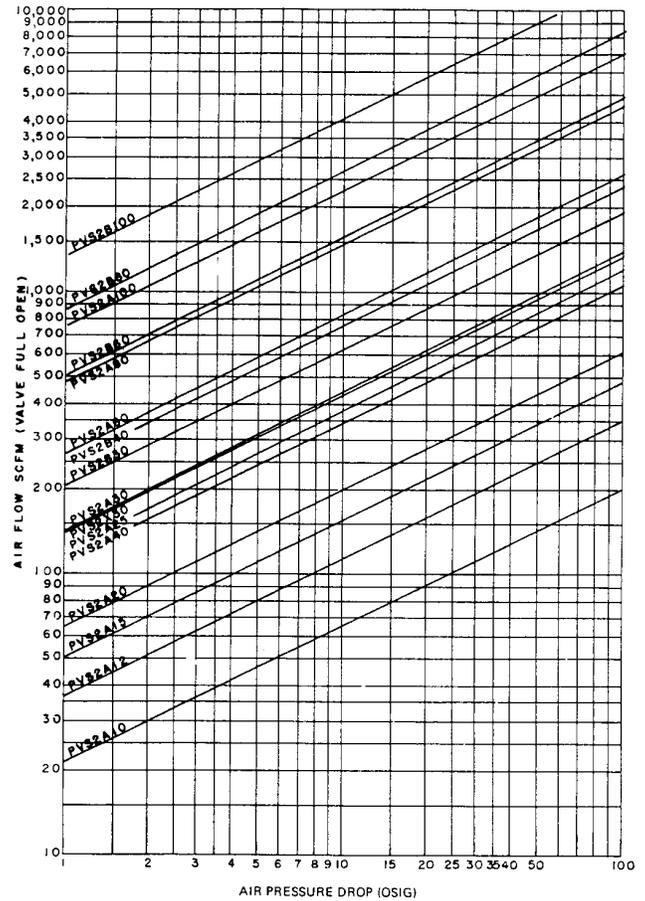
**C. CAPACITIES**

**NATURAL GAS**



Q137

**AIR**



Q140

**NOTES:**

1. Capacities based on gas @ 0.60 s.g., air @ 1.0 s.g., and 68°F temperature.
2. Static pressure drop measured across full open valve, i.e., pointer at position 10 and adjusting screw turned in fully.
3. Maximum inlet pressure is **15 psig** up to 4" valve size and **5 psig** for 6" and larger valve size.
4. Maximum temperature is **200°F**.

**SPECIFIC GRAVITY (GAS Correction Factor C<sub>3</sub>)**

Gas	Coke Oven	Natural Gas		Blast Furnace	Propane	Butane
Specific Gravity	.40	.59	.60	1.02	1.52	2.01
Multiplier	1.224	1.007	1.000	.992	.767	.628

**CORRECTION FACTORS**

**PRESSURE (GAS OR AIR Correction Factor C<sub>1</sub>)**

Pressure Drop (psig)	Inlet Pressure (psig)		
	5	10	15
1	1.15	1.29	1.42
2	1.63	1.80	1.95
3	1.95	2.25	2.45
4	2.20	2.50	2.85
5	2.45	2.75	3.00
10		3.70	4.05
15			4.70

**TEMPERATURE (GAS OR AIR Correction Factor C<sub>2</sub>)**

Temperature (°F)	68	100	150	20
Multiplier	1.00	1.03	1.07	1.1

**EXAMPLE:**

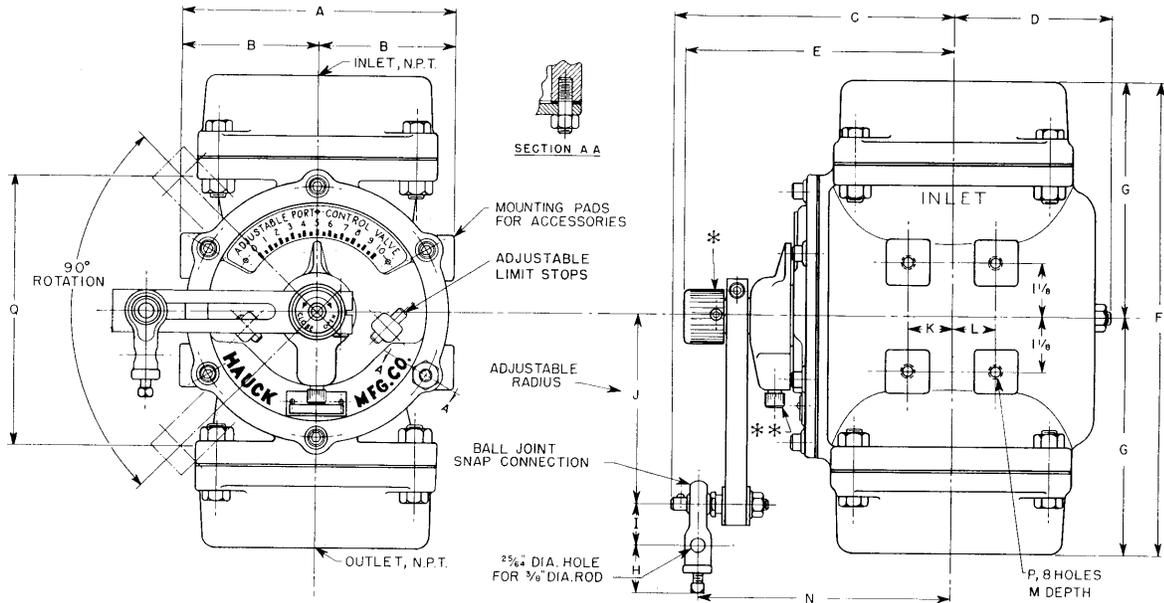
Determine the corrected volumetric flow rate in standard cubic feet per hour for a PVS2A20 (2") adjustable port valve for propane gas at 100°F having an inlet pressure of 15 psig and a pressure drop of 5 psig.

Using the equation:  $Q^{(corrected)} = C_1 \times C_2 \times C_3 \times Q^{(rated)}$

1. From the standard flow curve for Natural Gas (Q137) at 27.7 "w.c. pressure drop, determine the rated flow:  $Q^{(rated)} = 14,000$  scfh.
2. From the Pressure correction factor table, determine the pressure correction factor:  $C_1 = 3.00$
3. From the Temperature correction factor table, determine the temperature correction factor:  $C_2 = 1.03$
4. From the Specific Gravity correction factor table, determine the specific gravity correction factor for Propane:  $C_3 = 0.628$   
Then,  $Q^{(corrected)} = (3.00) \times (1.03) \times (0.628) \times (14,000)$   
 $= 27,170$  scfh of propane gas

**Figure 1. Capacities**

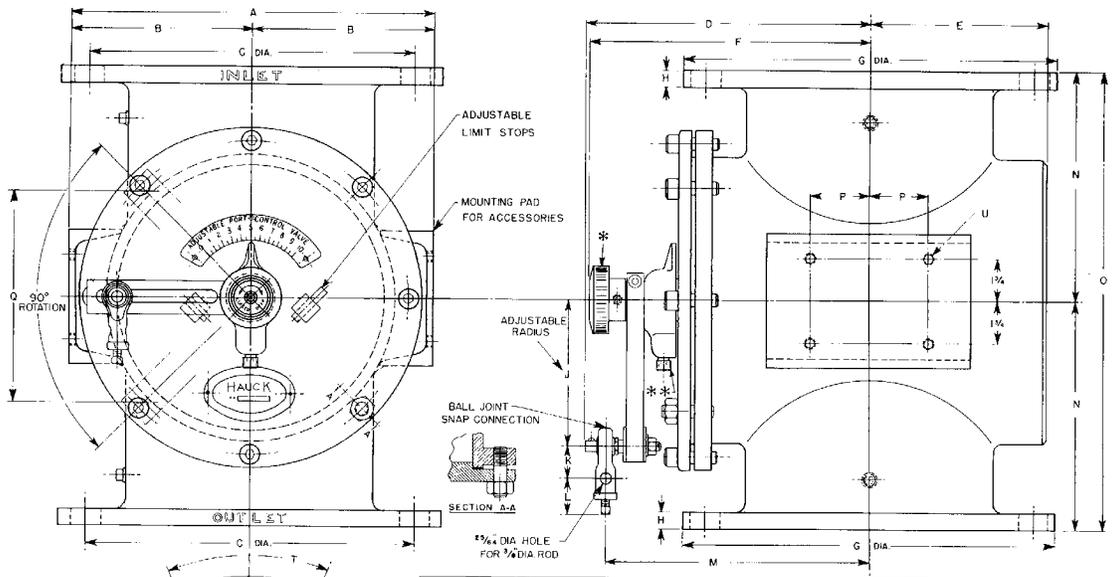
**D. DIMENSIONS**



\* PORT HEIGHT ADJUSTING KNOB WITH LOCKING SCREW  
 \*\* LOCKING SCREW FOR MANUAL SETTINGS

VALVE NO.	VALVE SIZE N.P.T.	DIMENSIONS																	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	P THD.	Q		
PVS 2A10	1"										2 5/8	4 3/8	7/8	1 1/8	3/16	4 5/16	1/16	6 3/16	
PVS 2A12	1 1/4"	3 3/8	1 5/8	4 3/8	2 3/8	4 3/8	6 3/8	3 3/8	1 1/8	1	2 5/8	4 3/8	7/8	1 1/8	3/16	4 5/16	1/16	6 3/16	
PVS 2A15	1 1/2"										2 5/8	4 3/8	1 1/8	7/8	3/16	4 5/16	1/16	6 3/16	
PVS 2A20	2"	4 1/8	2 1/2	5 1/4	2 3/8	5 1/8	7 1/4	3 3/8	1 1/8	1	2 5/8	4 3/8	1 1/8	7/8	3/16	4 5/16	1/16	6 3/16	
PVS 2A30	3"										2 5/8	4 3/8	1	1	1/2	5 5/16	3/16	6 3/16	
PVS 2A40	4"	6 1/4	3 3/8	6 3/8	3 3/4	6 3/4	10 3/8	5 3/8	1 1/8	1	2 5/8	4 3/8	1	1	1/2	5 5/16	3/16	6 3/16	
PVS 2A25	2 1/2"										2 5/8	4 3/8	1	1	3/16	5 5/16	3/16	6 3/16	
PVS 2X30	3"	5	2 1/2	5 3/8	3 3/8	5 3/8	9 3/8	4 3/8	1 1/8	1	2 5/8	4 3/8	1	1	3/16	5 5/16	3/16	6 3/16	

GY231  
(NOT TO SCALE)



VALVE NO.	VALVE SIZE	DIMENSIONS																		NUMBER OF HOLES IN FLANGE				
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		S	T	U	
PVS 2A80C	6"	10 1/4	5 3/8	9 1/2	8 1/4	5 1/4	8 1/4	11	1 1/2	2 3/8	4 3/8	1	1 1/4	7 3/4	7 1/2	15	3	6 3/4	7/8	3/4	4 5"	1/2	13	8
PVS 2A80C	8"	13 1/4	6 3/4	11 3/4	9 3/4	7 3/4	9 3/4	13 1/4	1 1/2	2 3/8	4 3/8	1	1 1/4	8 3/4	8 1/2	17	3	6 3/4	7/8	3/4	4 5"	1/2	13	8
PVS 2A80C	10"	15 3/4	7 3/4	14 3/4	11 3/4	9 3/4	11 3/4	16	1 1/2	2 3/8	4 3/8	1	1 1/4	10 3/4	10	20	3	6 3/4	1	7/8	30"	1/2	13	12

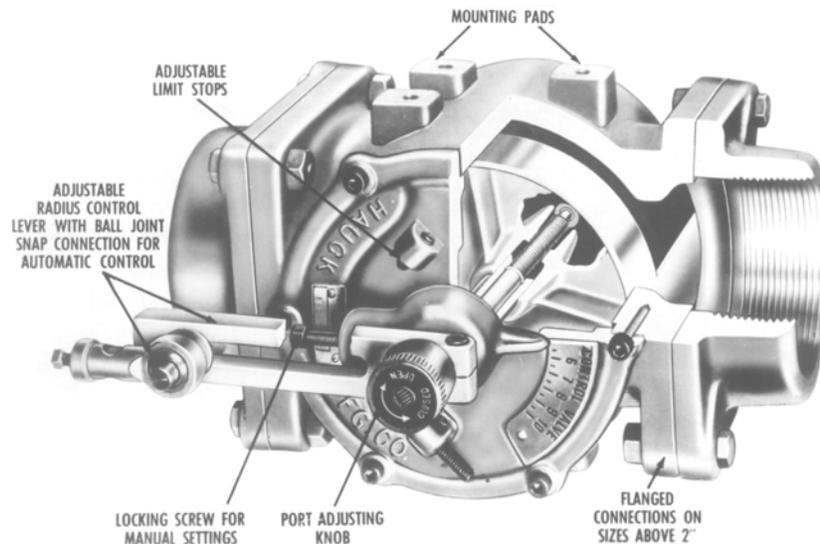
\* PORT HEIGHT ADJUSTING KNOB WITH LOCKING SCREW  
 \*\* LOCKING SCREW FOR MANUAL SETTINGS  
 \*\*\* 125 LB. AM. STD. FLANGE SIZE

GY229  
(NOT TO SCALE)

Figure 2. Dimensions

## **E. INSTALLATION**

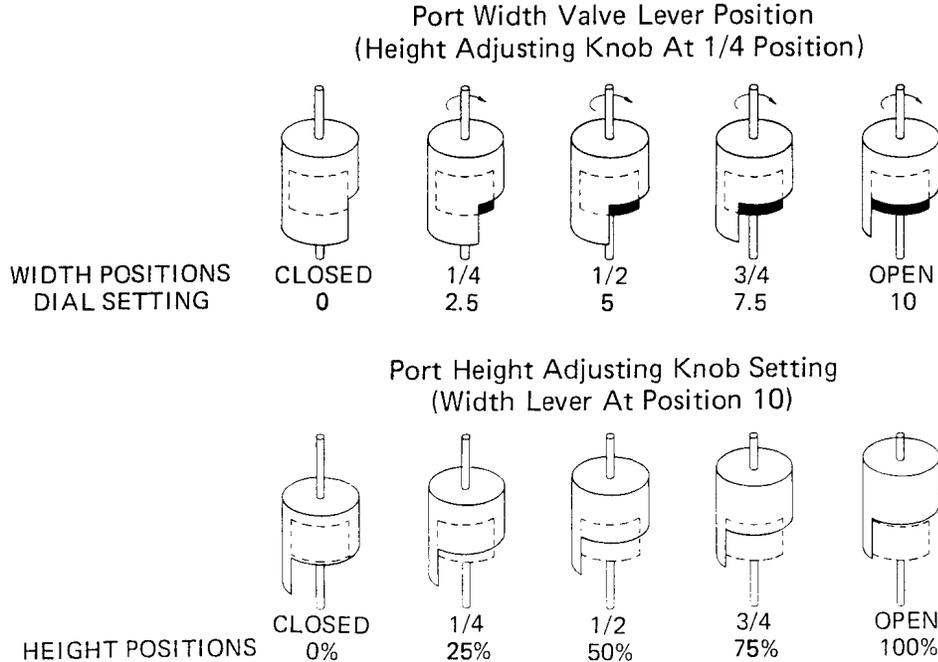
1. The port valve can be installed in any position, at any convenient location in the air or gas line. When installing this valve, provide a means for measuring the line pressure downstream of the valve. These valves are designed to operate with pressures up to **15 psig (103 kPa)** for 1" through 4" valve size, and **5 psig (34 kPa)** for 6" and larger valve size. The 1" to 4" valves are designed with female connections threaded for standard pipe. The 6" and larger valves have ANSI 125lb flange connections. These valves should not be used when the temperature exceeds 200°F (93°C). Ensure that all piping both to and from the valve is properly aligned and supported to prevent undue strain on the valve.



**Figure 3. Adjustable Port Valve Cutaway Diagram**

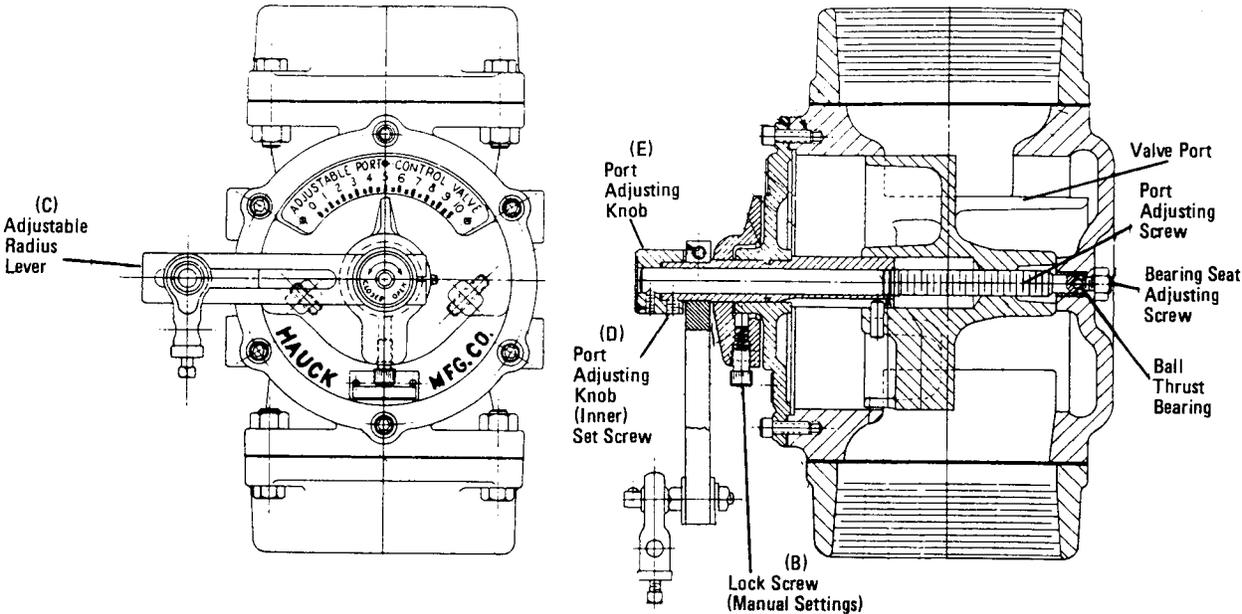
2. When an automatic operation is to be used, a control motor should be mounted to the valve or some other nearby rigid support. Recommended motor torque requirement for the 1" to 4" valves is 20 in-lbs (2.3Nm); 40 in-lbs (4.5Nm) for the 6" or larger valves. The valves operating arm moves in a clockwise direction to open the valve over an arc of about 90° at an adjustable radius from 2-5/8" to 4-3/8" (67 to 111mm).
  - A. Connect the valve lever to the control motor arm by a 3/8" (9.5mm) rod through the snap connection pin on the valve lever. A setscrew is provided on the snap pin to secure the rod at the proper point.
  - B. Loosen the locking screw located on the base of the dial indicator. This will allow easy movement of the valve pointer.
  - C. Adjust the two limit stops until they allow movement of the pointer over the entire range of dial positions.
  - D. Adjust the length of the control motor arm so that the valve pointer moves through the desired range on the valve dial. Be sure that the control motor does not move the valve lever beyond the stops on the dial as this can damage the valve if sufficient force is applied.

**F. OPERATION**



**Figure 4. Illustration of Valve Height and Width Adjustments**

Manual or automatic control is accomplished by moving the port adjusting knob and the radius control lever. The capacity of the air or gas flow is determined by the height and width of the valve port opening in relation to the valve outlet. The height of the port is controlled by the port adjusting knob. The width of the port is controlled by the radius control lever. Rotating this lever proportionally uncovers the rectangular port in the valve body.



**Figure 5. Adjustable Port Valve Diagram**

Once installed, adjustments of the port adjusting knob and the radius control lever are achieved by accomplishing the following:

- A. Disconnect the automatic linkage (if present).
- B. Loosen the dial pointer locking screw.
- C. Rotate the radius control lever to position 10.
- D. Loosen the setscrew which holds the port adjusting knob at the proper setting. Exercise care since two setscrews exist on the knob. The inner setscrew maintains the setting while the outer setscrew fastens the knob to the stem. Only the inner setscrew should be loosened.
- E. Turn the adjusting control knob counterclockwise until the FULLY CLOSED position is reached.
- F. Initiate the flow of air or gas through the line.
- G. Rotate the adjusting knob clockwise until the pressure gauge(s) indicates the maximum Pressure required. The pressure needed will vary depending on the burner, the piping, and the application. The table given below gives the approximate number of turns from FULL CLOSED TO FULL OPEN.

VALVE MODEL	APPROXIMATE NO. OF TURNS FROM FULL CLOSED TO FULL OPEN
PVS 2A10 & PVS 2A12	18
PVS 2A15 & PVS 2A20	22
PVS 2A30 & PVS 2B40	29
PVS 2A60 & PVS 2B60	43
PVS 2A 80 & PVS 2B80	48
PVS 2A100 & PVS 2B100	66

- H. Tighten the inner setscrew on the port adjusting knob.
- I. Connect the linkage for automatic control.

The vibration-proof locking screw, located at the base of the dial pointer, should be used to lock any manual setting of the valve pointer. When operating automatically, this locking screw must be loosened to facilitate the movement of the pointer.

Hauck adjustable port valves are designed for efficient flow control; they are not intended for use as complete shut-off valves.

### **G. MAINTENANCE**

All port valves are designed and constructed for maintenance free operation. Under normal usage no service should be necessary.

If should become necessary to clean the valve, the entire port assembly can be easily removed, in one piece, by accomplishing the following:

- A. Disconnect the automatic linkage (if present).
- B. Loosen and remove all of the screws, and the nut on the guide bolt, holding the dial plate cover to the valve body.
- C. Extract the entire port assembly.
- D. Wipe the port cylinder clean of any particles or residue. If scarring of the cylinder has occurred, use an emery cloth to restore a smooth surface.

**MAINTENANCE (Continued)**

- E. Lubricate the port cylinder with Molykote or some other suitable high temperature, non-gumming lubricant.
- F. Reinsert the port assembly. Use the location of the guide bolt to ensure proper alignment. Ensure that the stem is properly seated in the bushing at the back of the valve body.
- G. Replace and properly seat the dial plate cover gaskets.
- H. Replace and tighten all of the screws in the dial plate cover.
- I. Move the radius control lever through its full range of movement. If the movement is either binding or too free moving, adjust the bearing seat adjusting setscrew on the valve back by accomplishing the following:
  - a. Loosen the locknut which secures the setscrew.
  - b. Slowly tighten the setscrew (clockwise rotation) until there is resistance to the movement of the lever.
  - c. Rotate the setscrew 1/8 to 1/4 turn in a counterclockwise direction.
  - d. Tighten the lock nut.
- J. Reconnect the automatic linkage (if used).