Spence™ A Series Air-Adjusted Pilot

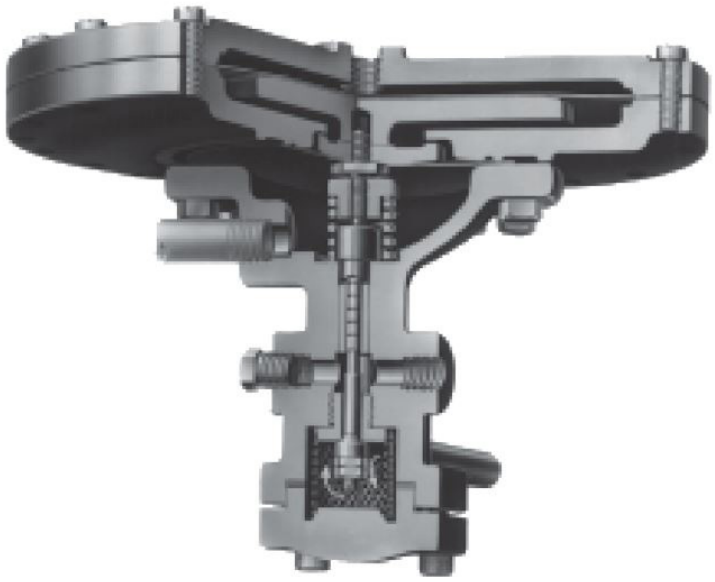


Figure 1. *A Series Air-Adjusted Pilot*

Features

- Remote Control and Spring Operated
- Packless Construction
- Economic Use of Air
- Ease of Adjustment
- Accurate to ±1 psi / 0.07 bar
- Delivery to Loading Air Pressure ratios from 5/8 to 1 up to 6-2/3 to 1 psi / 0.04 to 0.07 up to 0.46 to 0.07 bar
- Fluid, Gas and Vapor Applications
- Accurate Regulation Unaffected by Service Conditions
- Easy In-line Maintenance

Introduction

Spence™ Pressure Regulator is a combination of A Series pilot and a Type E main valve. This regulator reduces a steady or varying initial pressure to a constant, adjustable delivery pressure.

The A Series air-adjusted pilots, when combined with a Main Valve, control a steady or varying inlet pressure to a constant delivery pressure. The pilots control either pressure or temperature.

Pilot Types

- Type A for pressure control at low pressures. Delivery to loading pressure is 1 to 1 psi / 0.07 to 0.07 bar.
- Type A35 for pressure control at very low delivery pressures as in some heating system control. Delivery to loading pressure is 1/2 to 1 psi / 0.03 to 0.07 bar.

Specifications

The Specifications section gives some general specifications for the A Series air-adjusted pilots. The nameplates give detailed information for a specific pilot as built in the factory.

Available Configurations

Type A35: Very Low Pressure
Type A: Low Pressure
Type A53: Medium Pressure
Types A43 and A54: Medium to High Pressure
Types A70 and A73: High Pressure
Type A82: Vacuum Pressure Control
Type A83: Vacuum Temperature Control

Maximum Inlet Pressure(1)

Cast Iron: 250 psig / 17.2 bar
Cast Steel: 600 psig / 41.4 bar

Maximum Temperature(1)

Cast Iron: 450°F / 232°C
Cast Steel: 600°F / 316°C

Construction Materials

Body: Cast Iron, Cast Steel
Stem, Disk, Seat and Diaphragm: Stainless Steel
Gasket: Graphite
Spring: Inconel®

Option

Integral Mount
Air Filter Gauges
Panel Board

Applications

Pressure Regulating for Remote Locations
Pneumatic Pressure Control
Pneumatic Temperature Control
Process Control where Controller is Far from Pilot

Approximate Weights

6 to 19 lbs / 2.7 to 8.6 kg

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.

- Types A43 and A54 for pressure control at medium to high pressures. Delivery to loading pressure is 2-5/8 to 1 psi / 0.09 to 0.07 bar.
- Type A53 for pressure control at medium pressures. Delivery to loading pressure is 4 to 1 psi / 0.30 to 0.07 bar.
- Types A70 and A73 for pressure control at high delivery pressures when available loading air is at low pressure. Delivery to loading pressures are 15 and 6-2/3 (respectively) to 1 psi / 1.03 and 0.30 to 0.07 bar.
- Type A82 Vacuum for pressure control of very low pressure or systems varying between very low pressure and light vacuum. Delivery to loading pressure is 1 to 1 psi / 0.07 to 0.07 bar.
- Type A83 Vacuum for temperature control. Delivery to loading pressure is 1 to 1 psi / 0.07 to 0.07 bar.
- Type A84 Vacuum for temperature control at lower delivery pressure features more gradual response. Delivery to loading pressure is 2% to 1 psi / 0.07 bar.
- Type A85 Vacuum for temperature, pressure and vacuum control. Delivery to loading pressure is 3% to 1 psi / 0.07 bar.
- Type A86 for pressure control at low pressures. Delivery to loading pressure is 1% to 1 psi / 0.07 bar.
- Type A87 Vacuum for temperature, pressure and vacuum control. Delivery to loading pressure is 8% to 1 psi / 0.07 bar.

Panel Board

Air adjustment panels are available in two models as illustrated in Figures 2 and 3.

- Type A includes an air adjusting valve incorporating it's own bleed and two gages: one for the supply air, the other to indicate the adjusting air. It is complete and ready to be mounted directly on a control board or box.
- Type B is the same as Model A with the exception that it has in addition, a gage indicating the delivery pressure. The air filter regulator bleeds only on a lowering of the pressure set point.

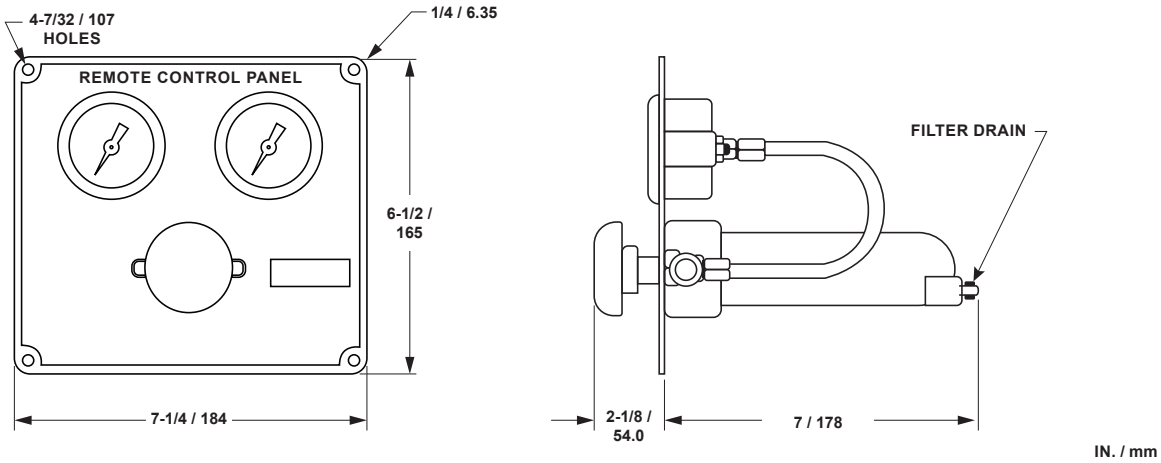


Figure 2. *Type A Panel (cut out 5-1/4 in. high by 6 in. wide)*

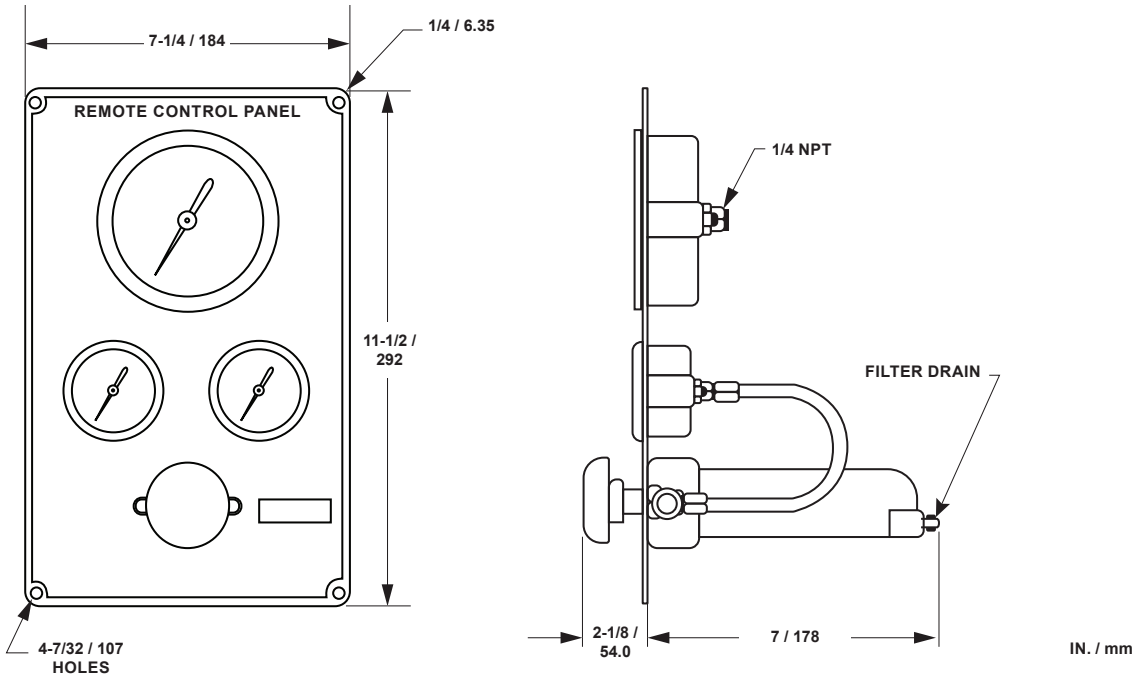


Figure 3. *Type B Panel (cut out 10-1/4 in. high by 6 in. wide)*

Principle of Operation

The regulator is operated by initial steam or fluid pressure. It is normally closed, being held so by initial pressure on the disk and by an internal main spring. When the pilot is opened, initial pressure flows through the pilot to the 8B tee. Bleedport 4A restricts the flow and pressure builds under the diaphragm and opens the main valve. The 5A restriction elbow steadies the operation of the regulator.

Delivery pressure feeds back through the control pipe to the pilot diaphragm. As this pressure approaches a balance with the air loading signal, the pilot throttles the loading pressure. In turn, the main valve takes a position established by the loading pressure where just enough steam flows to maintain the set deliver pressure. For temperature control, refer to temperature pilot Instruction Manual (VCIMD-14980).

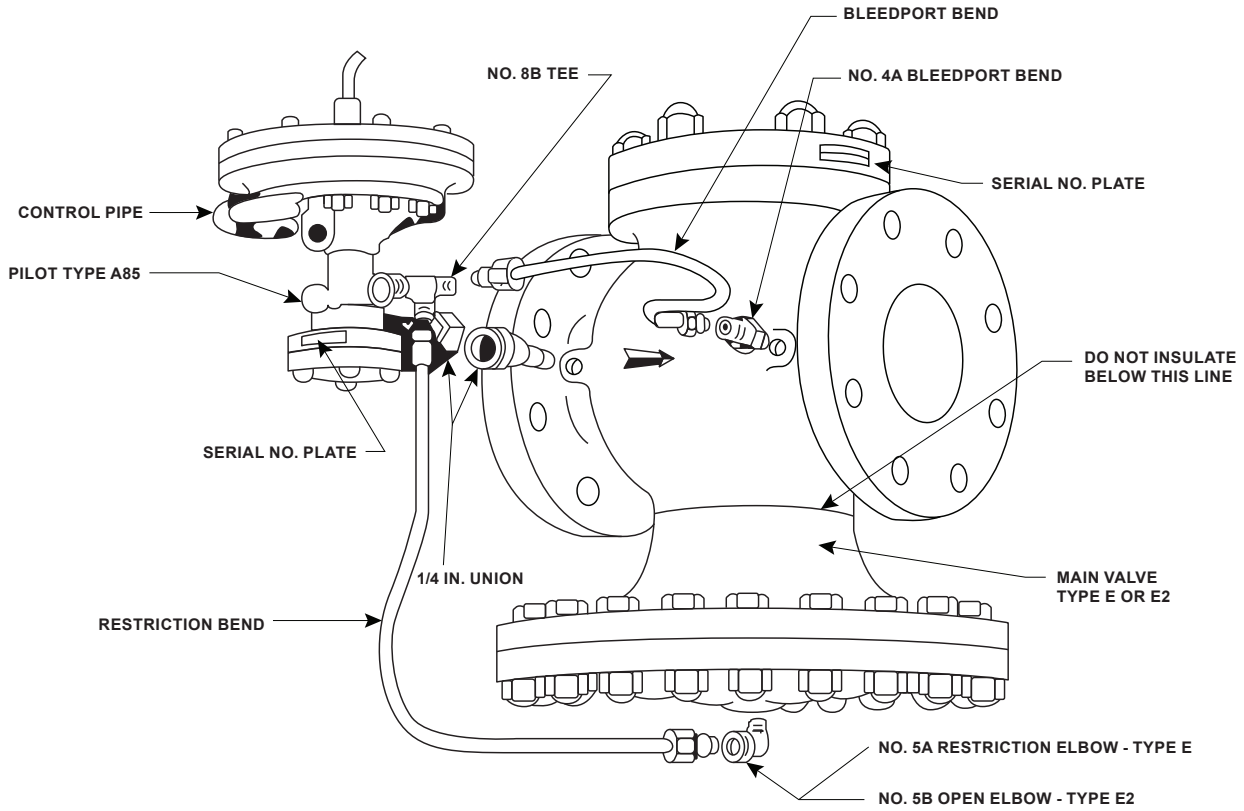


Figure 4. *A Series Air-Adjusted Pilot Tubing Bend Connections*

Installation

1. Mount the pilot on either side of the main valve by means of a 1/4 in. / 6.35 mm nipple and union provided Make this connection to the 1/4 in. / 6.35 mm pipe tap on the inlet of the main valve.
2. Screw 4A bleedport fitting into 1/8 in. / 3.18 mm pipe tap on the outlet of the main valve body.

Note

Bleed orifice in this fitting is vital to operation of regulator.

3. Screw 8B tee into 1/8 in. / 3.18 mm pipe tap in pilot. Select tap facing downstream.
4. Screw 5A elbow containing restriction orifice into 1/8 in. / 3.18 mm pipe tap on underside of main valve diaphragm chamber. If initial pressure or pressure drop is less than 15 psi / 1.03 bar, a 5B open elbow without orifice is used.
5. Connect tubing bends as illustrated in Figure 2.

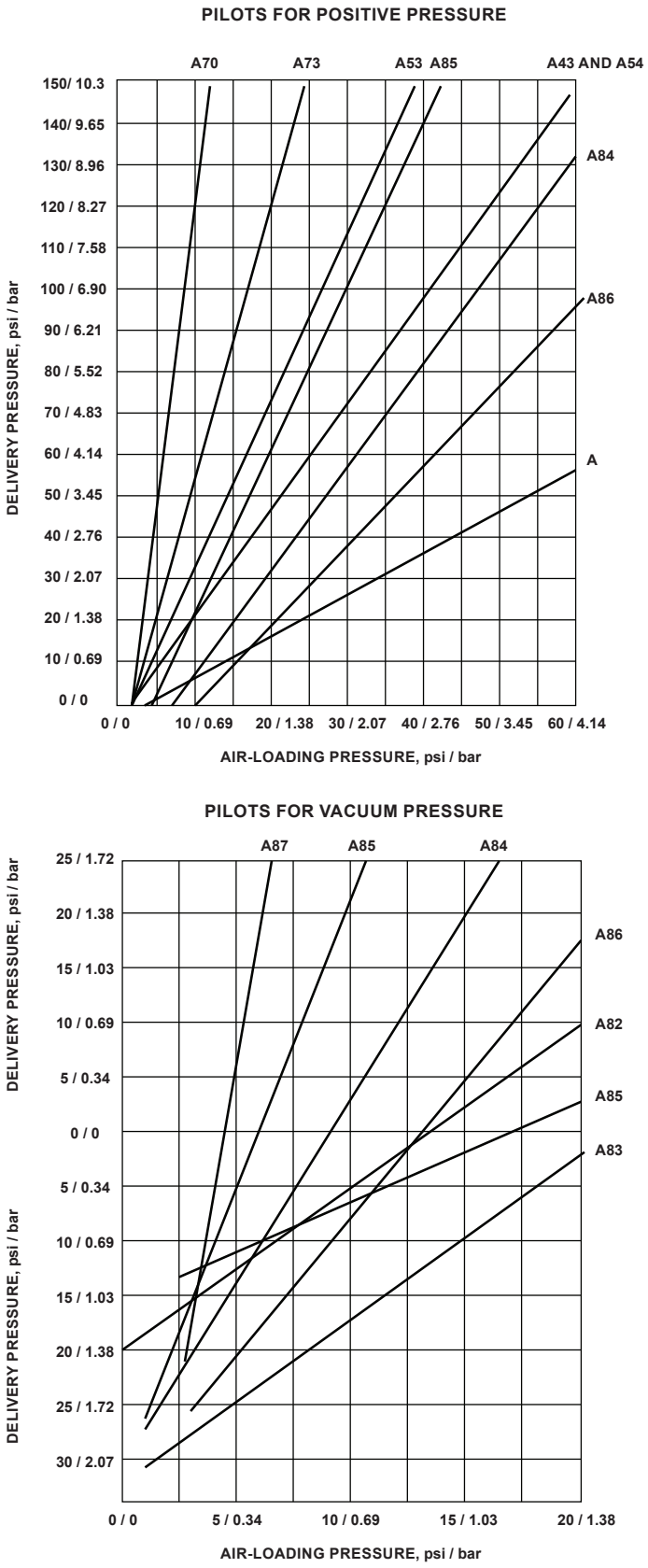
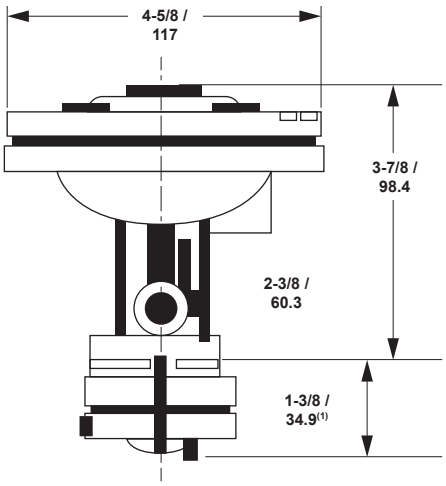
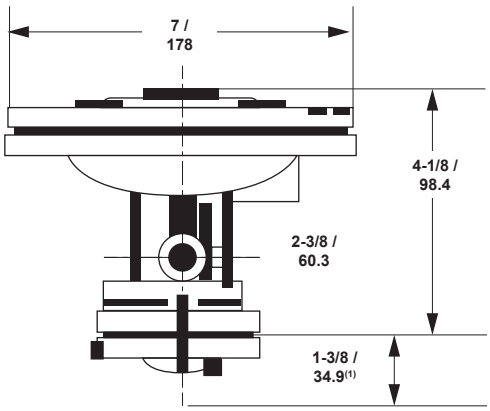


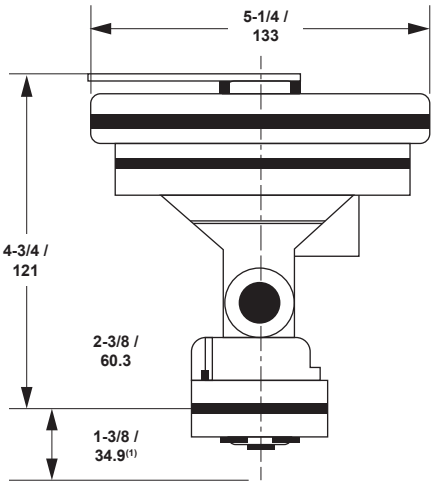
Figure 5. *A Series Air-Adjusted Pilot Air Loading and Delivery Pressure for Positive and Vacuum Pressure*



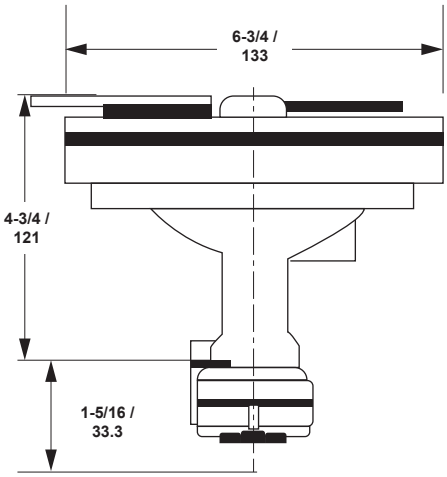
TYPE A OR A83, 6 LBS / 2.7 kgs



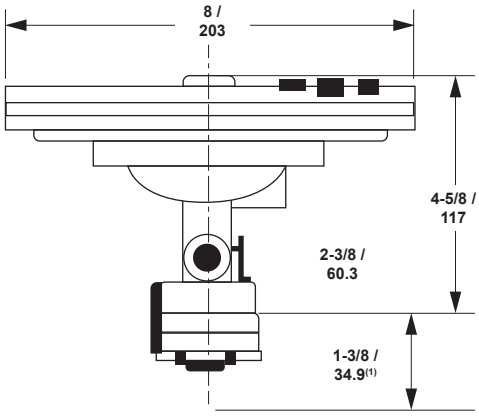
TYPE A83, 11 LBS / 5.0 kgs



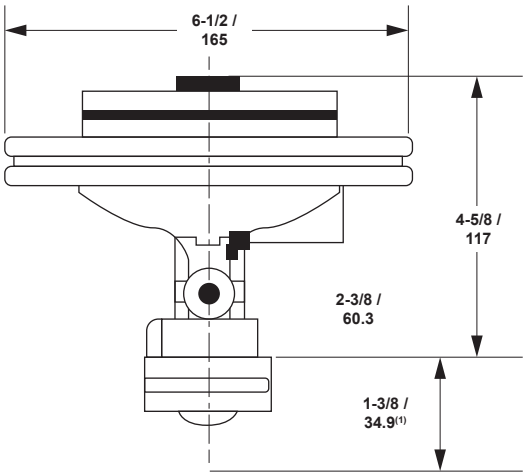
TYPE A43, 11 LBS / 5.0 kgs



TYPE A54, 19 LBS / 8.6 kgs



TYPE A73 OR A70, 15 LBS / 6.8 kgs

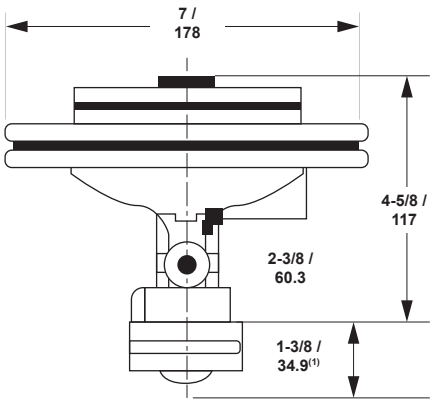


TYPE A53 OR A85, 12 LBS / 5.5 kgs

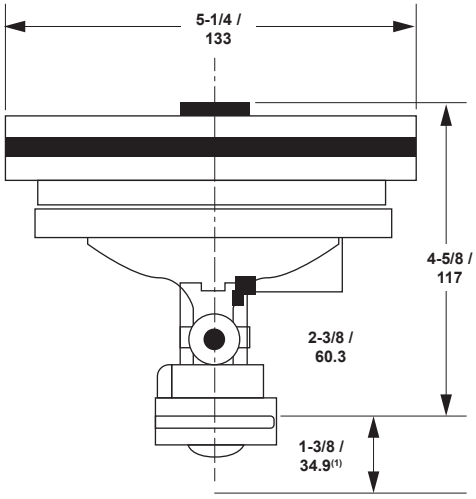
1. For Integral Mount Pilot, this dimension is 5/8 in. / 16 mm.

IN. / mm

Figure 6. *A Series Air-Adjusted Pilot Dimensions*



TYPE A35, 14 LBS / 6.4 kgs



TYPE A84 OR A86, 11 LBS / 5.0 kgs

IN. / mm

1. For Integral Mount Pilot, this dimension is 5/8 in. / 16 mm.

Figure 6. *A Series Air-Adjusted Pilot Dimensions (continued)*

Ordering Information

When ordering, complete the ordering guide on this page. Refer to the Specifications section. Review the description to the right of each specification and the information in each referenced table or figure. Specify your choice whenever a selection is offered.

Ordering Guide

Available Configurations (Select One)

- ☐ Type A35: Very Low Pressure
- ☐ Type A: Low Pressure
- ☐ Type A53: Medium Pressure
- ☐ Type A43: Medium to High Pressure
- ☐ Type A54: Medium to High Pressure
- ☐ Type A70: High Pressure
- ☐ Type A73: High Pressure
- ☐ Type A82: Vacuum Pressure Control
- ☐ Type A83: Vacuum Temperature Control

Body Material (Select One)

- ☐ Cast Iron
- ☐ Cast Steel

Options

- ☐ Intergal Mount
- ☐ Air Filter Gauges
- ☐ Panel Board

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