Product Bulletin
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Fisher™ 4680

Pilot Controller

FISHER™

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The Fisher 4680 Pilot Controller is a pneumatic pilot controller that regulates downstream pressure for control valves. The 4680 compares a sensed-process pressure with an operator-adjusted setpoint sending a pneumatic signal to a connected control element that maintains the process pressure at the set point value. The 4680 does this without the constant bleed to atmosphere of a traditional, continuous-bleed process controller.

The 4680 is available in direct and reverse-acting configurations for service in pressures from 3 to 225 psig.

Figure 1. 4680 Pilot Controller

Features

- **Accuracy of Control**—Within the 4680's controllable range of 3 to 225 psig, multiple color-coded setpoint springs and large diaphragm area allows for optimal setpoint accuracy.
- **Meets Requirements for OOOO Subparts b and c**—The 4680 is considered an "intermittent vent" device by United States Environmental Protection Agency (EPA) definitions. This means when the actuator is not moving, no process gas is being vented from the device. When mounted to an Emergency Shutdown Device, such as a monitor valve in a worker-monitor setup, it will be capable of complying with OOOO requirements
- **Simplified, Cost-Effective Maintenance**—Product is designed for intuitive servicing and simple setpoint spring swaps. Spare parts kits contain only the necessary soft goods for replacement and three O-rings for efficient servicing.
- **Rugged and Reliable Design**—Anodized aluminum for corrosion resistance.
- **Modular Construction**—Allows for direct or reverse-acting configurations.
- **Simple and Accurate Setpoint**—Adjustment screw with protective cover.
- **Color-Coded Control Springs**—7 color-coded springs for various pressure ranges.
- **Dead Band Adjustment Drum**—Helps balance responsiveness and emissions control.

Table 1. Specifications

Available Configurations	Controller Performance
Direct or Reverse-acting	See Table 2
Input Signal (Process)	**Ambient Operation Temperature Limits**
Type: Gauge pressure of gas, see Table 2 for Input Ranges Maximum input pressure: See Table 2	-29 to 71°C / -20 to 160°F
Output Signal	**Mounting**
Pneumatic pressure as required by the actuator up to full supply pressure. Action: Control action is reversible between direct (increased sensed-process pressure increases output pressure) or reverse (increased sensed-process pressure decreases output pressure)	The controller can be mounted on a panel, wall or pipestand
Supply Pressure Requirements(1)	**Hazardous Area Classification**
Maximum: 10.3 bar / 150 psig or maximum pressure rating of the actuator, whichever is lower	Complies with the requirements of ATEX Group II Category 2 Gas and Dust CE Ex II 2 G D Ex h IIC Tx Gb Ex h IIIC Tx Db Maximum surface temperature (Tx) depends on operating conditions Gas: T6 Dust: T71
Supply Pressure Medium	**Approximate Weight**
Air or Natural Gas Supply medium must be clean, dry and non-corrosive **Per ISA Standard 7.0.01** A maximum 40 micrometer particle size in the air system is acceptable. Further filtration down to 5 micrometer particle size is recommended. Lubricant content is not to exceed 1 ppm weight (w/w) or volume (v/v) basis. Condensation in the air supply should be minimized. Pressure Dew Point: At least 10°C less than the lowest ambient temperature expected. **Per ISO 8573-1** Maximum particle density size: Class 7 Oil content: Class 3 Pressure Dew Point: Class 3	Aluminum: 20 lbs
Input, Supply and Output Connections	**Approximate Dimensions**
1/4 NPT Internal	445 mm x 356 mm x 172 mm / 17.5 in. x 14 in. x 6.75 in. See instruction manual for details

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

Table 2. Controller Pressure Range and Accuracy

CONSTRUCTION	MAXIMUM ALLOWABLE WORKING PRESSURE	SETPOINT SPRING	INPUT PRESSURE RANGE		SETPOINT ACCURACY
			bar	psig	±psi
Low Pressure	225 psig	Red	0.2 to 2	3 to 29	0.4
		Orange	0.6 to 4.3	8 to 62	0.5
		Yellow	0.9 to 6.6	13 to 95	0.6
		Green	1.2 to 8.9	17 to 129	0.7
		Blue	1.7 to 11.2	25 to 162	0.8
		Purple	2.4 to 13.4	35 to 195	1.0
		Black	2.8 to 15.5	40 to 225	1.1

Table 3. Process Pressure Gauge Ranges

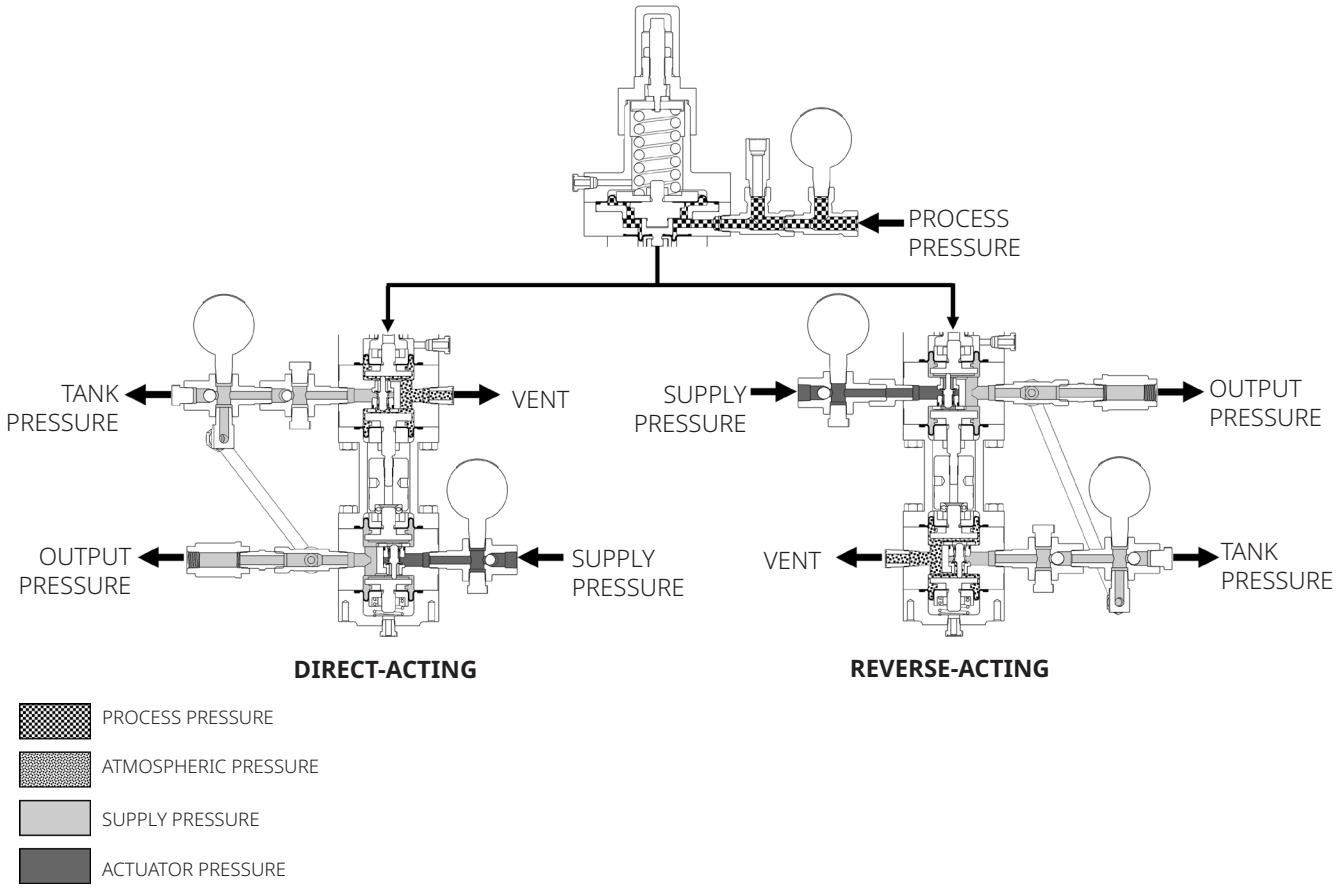
Gauge Scale	Range
Triple	0 to 15 psig / 0.1 MPa / 1 bar
	0 to 30 psig / 0.2 MPa / 2 bar
	0 to 60 psig / 0.4 MPa / 4 bar
	0 to 100 psig / 0.7 MPa / 7 bar
	0 to 160 psig / 1.4 MPa / 14 bar
	0 to 200 psig / 1.1 MPa / 11 bar
	0 to 300 psig / 2 MPa / 20 bar
	0 to 500 psig / 3.4 MPa / 34 bar
	0 to 800 psig / 5.5 MPa / 55 bar
	0 to 1000 psig / 6.9 MPa / 69 bar
	0 to 1500 psig / 10.3 MPa / 103 bar

Table 4. Supply and Output Pressure Gauge Ranges

Gauge Scale	Range
Triple	0 to 15 psig / 0.1 MPa / 1 bar
	0 to 30 psig / 0.2 MPa / 2 bar
	0 to 60 psig / 0.4 MPa / 4 bar
	0 to 100 psig / 0.7 MPa / 7 bar
	0 to 160 psig / 1.1 MPa / 11 bar

Principle of Operation

Figure 2. Fisher 4680 Direct-Acting and Reverse-Acting Operation



Configurations

The 4680 is available in a direct or reverse-acting configuration. The direct-acting configurations provide an increase in output pressure to the actuator when the process pressure increases. The reverse-acting configuration decreases output pressure for the actuator when the process pressure increases. Figures 3 and 4 show each configuration. The difference between each configuration is the orientation of the fittings and the location of the pressure connections. The main body of the 4680 is the same between each configuration.

In certain cases, Fisher will recommend the use of a volume tank. This volume tank allows users to tune the responsiveness of their valve to changes in output from the controller. The most common scenarios for the use of a volume tank with a 4680 include: small actuator volumes, close-coupled applications where short pipe runs after the valve or rapidly varying process conditions are present or feeding other instruments and accessories such as pneumatic positioners or volume boosters. Consult your Emerson sales office for proper use of a volume tank with the 4680.

Figure 3. Direct-Acting Configuration

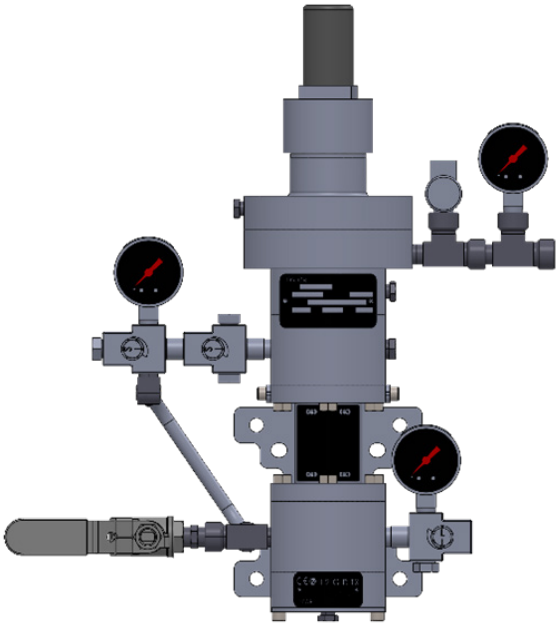


Figure 4. Reverse-Acting Configuration

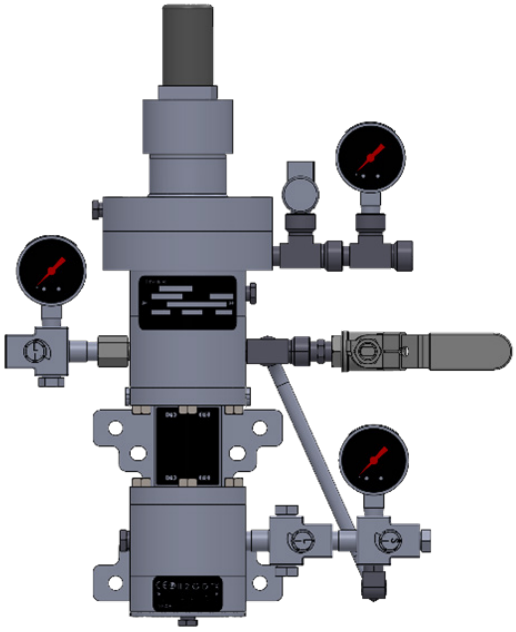


Table 5. Materials of Construction

Part	Material
External parts	Anodized Aluminum (Stainless steel fittings, gauges and tubing standard)
Diaphragms	Nylon reinforced Nitrile, Polyester reinforced Nitrile
O-rings	Nitrile
Control springs	Painted alloy steel
Covers	Nylon

Ordering Information

Application

When ordering, specify:

1. Description of installation site, such as PowerPlant Feed, Pipeline Interconnect, Gas Distribution, etc.
2. Downstream volume (pipe size and length)
3. Ambient Temperature
4. Setpoint Pressure (or a range, if it varies) and Maximum Allowable Operating Pressure (MAOP)
5. Type number, orientation and other applicable descriptions of control or indicating devices
6. For retrofits: specify type and size of valve and actuator including accessories

Construction

Refer to the Specifications and the Features sections. Review the description for each specification, construction feature and in the referenced tables. Specify the desired selection whenever there is a choice.

Always specify direct or reverse action, manual pneumatic overrides, supply pressure regulators and other desired equipment. Contact your Emerson sales office for all guidance in sizing / selection / service of your 4680 Pilot Controller.

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