

BLEED AIR SOLENOID VALVE

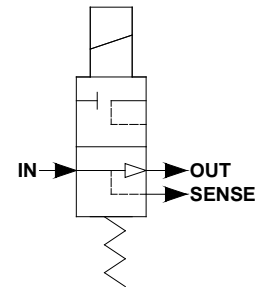
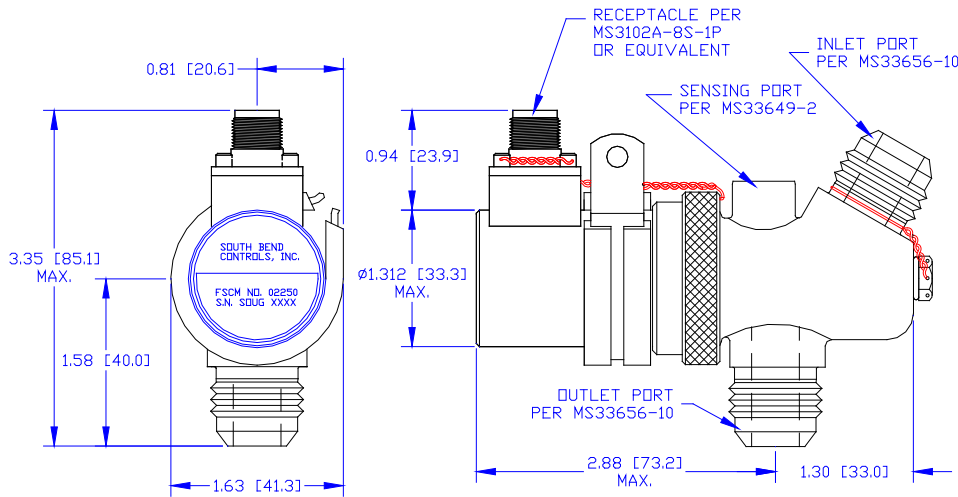
PILOT ASSISTED, HIGH TEMPERATURE SOLENOID VALVE FOR PNEUMATIC ANTI-ICE SYSTEMS

COMPONENT FEATURES

- Flight qualified in defense aircraft applications
- Normally-open / energize to close design insures anti-ice protection through power loss
- Two-Stage design with piloted operated spool for high flow
- Thermally isolated electrical elements for continuous duty operation
- Sensing port provides positive indication of valve position
- Constructed of high temperature corrosion resistant materials
- Specially engineered to meet the requirements of each system



BLEED AIR SOLENOID VALVE



FLOW SCHEMATIC

SPECIFICATIONS

1.0 Valve Type: Normally Open Solenoid Valve	6.0 Flow Rate: 2.45 lb/min
2.0 Configuration: Pilot Assisted	7.0 Seat Leakage: 0.5 lb/min (max)
3.0 Media: Turbine Engine Compressor Bleed Air	8.0 Electrical
4.0 Pressure	8.1 Voltage: 14 to 30 vdc @ 75°F
4.1 Operating: 8 to 190 psig [1.5 to 14 bar]	8.2 Current: 1.12 amp (max)
4.2 Proof: 350 psig [25.1 bar]	8.3 Duty Cycle: Continuous
5.0 Temperature	8.4 Insulation: $1 \times 10^8 \Omega$ (min)
5.1 Ambient: -65°F to +250°F [-54°C to 121°C]	9.0 Response: 50 msec (mechanical)
5.2 Media: -65°F to +800°F [-54°C to 426°C]	10.0 Useful Life: 20,000 cycles (min)
	11.0 Weight: 1.40 lbs. (0.64 kg)

TECH DATA

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BULLETIN SV-306

BLEED AIR SOLENOID VALVE TECHNOLOGY

WHAT IS IT?

- Solenoid-operated, normally open pneumatic valve, pilot-operated spool configuration.
- Continuous duty control of 800°F [426°C] engine bleed air in ambient temperatures up to 250°F [121°C].
- Precision assembly with primary components of high temperature stainless and chrome plated steels with specially engineered metallic sealing elements.
- An integral sensing port included as an indication of valve piston position.

HOW DOES IT WORK?

The basic elements include: Solenoid, Pilot Armature, Pilot Spring, Spool, and Main Spring. The Solenoid actuates the Pilot Armature which controls the flow of air to the chamber below the Spool. The Pilot Spring preloads the Pilot Armature in a closed position while the Main Spring preloads the Spool into the open position.

In the de-energized state, the Spool is preloaded to its travel stop (by the Main Spring) in the open position. The travel stop restricts the Pilot Armature in the open position and pressure on both sides of the spool is equalized. This balance maintains the spool in its open position where the sense port is exposed to the pressure and elevated temperature of the air stream. Installation of a temperature or pressure switch in this port can provide indication of valve position.

Energizing the solenoid incites an electromagnetic attraction between the Solenoid and Pilot Armature. This attractive force overcomes static friction and the Pilot Armature pulls closed against the spool. A pressure imbalance is applied to the spool which combines with the solenoid in shifting the Spool to the closed position, effectively shutting off flow. When de-energize, the Main Spring pushes the Spool back into the open configuration with the Pilot Armature open and venting pressure from behind the spool.

HOW IS IT USED?

This valve controls high temperature airflow bled off from the fourth stage of a turbine engine. This airflow can be routed to engine structures or flight surfaces to elevate their surface temperatures above the level where icing can occur. This specific configuration has significant history on helicopter platforms. Other mature anti-ice valve configurations are also available.

Related product: see Tech Data Bulletin SV-300 for additional Anti-ice Solenoid Valve information.



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