

SF10V CONTROL VALVE

OPERATIONS

Principles of Operation:

A. General:

When loading pressure in the charge chamber is equal to the inlet pressure the sleeve will remain closed. As the inlet pressure increases and exceeds the loading pressure the sleeve begins expanding, exposing the cone ports (Cracking Pressure, and Pressure to 100% Open is dictated by the internal sleeve material and strength chosen during original sizing; please refer to the sleeve specification for specific minimum pressures). The different functions of the valve are determined by the type of controllers, such as expansion bottles, pilots, or regulators used in conjunction with the valve.

CAUTION: On startup, pressure must be equally applied to charge chamber and flow line until desired control pressure is reached. On back pressure applications pressurize expansion bottle prior to charging line. Failure to comply will result in sleeve damage.

CAUTION: must be taken to ensure the charge chamber pressure does not exceed recommended differential charge pressure at prescribed operating temperature or damage may occur to the sleeve assembly.

B. SF10V with Expansion Bottle for Back Pressure or Pressure Relief Applications

Simply pre-charge the charge chamber of the expansion bottle with a gas compatible with the process and then close the charge valve. To adjust the pressure setting, simply change the pressure in the charge chamber. It is recommended to keep at least 2lbs above the inlet pressure until the desired control pressure setting is reached.

***Please note that approximately 3% per year may be lost from the control charge pressure, which may require periodic re-charging. Temperature changes may also cause the valve's setting to fluctuate slightly.*

C. SF10V with Pilot/Regulator for Controlling or Pressure Reducing Applications

Pilots/Regulators sense the downstream pressure that is being controlled. As the downstream pressure increases the pilot/regulator will close thus allowing pressure to build in the charge chamber closing the valve ports off. As the process is reversed the downstream pressure is in the demand mode. The pilot/regulator then opens and allows pressure to bleed off the charge chamber thus allowing the valve ports to open allowing more flow through the valve. This happens when the restrictor (reset) orifice (fixed or adjustable) is smaller than the pilot/regulator orifice. This allows more gas to bleed through the pilot/regulator to the downstream side of the valve than can flow through the restrictor orifice.

***Please note that pilots/regulators may also be used in back pressure or pressure relief applications.*



Installation Procedures:

1. Inspect the valve and pipe to ensure they are free of all foreign material. This will ensure the flow will not be affected upon installation. The SF10V can be installed in either a vertical or horizontal position. The valve is also bi-directional with no effect on its performance. Although it is bi-directional, when using a controller care must be taken to ensure it is installed properly.
2. When installing the valve with flanges, drop the appropriate flange gasket next to each flange. Install the valve between the flanges (as per asme/ansi requirements) centering the studs on the outside of the valve depending on the flange series being used. Then tightening the bolts, use a diagonal pattern and tighten evenly.
3. **CAUTION: On startup, pressure must be equally applied to charge chamber and flow line until desired control pressure is reached. On back pressure applications pressurize expansion bottle prior to charging line. Failure to comply will result in sleeve damage.**
4. The SF10V is designed to operate up to 3705 psig; however, the flange configuration used in conjunction with the valve must be considered in the design pressure.

Valve Maintenance:

Maintenance usually consists of an inspection and/or replacement of the sleeve or cone assembly as well as a general cleaning of the cone parts. An inspection should be made at least once a year to ensure top performance.

To properly inspect the valve, it must be removed from the line as follows:

1. Close the upstream mainline block valve followed by the downstream mainline block valve.
2. Bleed off the downstream section to fully relieve pressure in the outlet section of the valve.
3. Bleed off the upstream section to fully relieve pressure in the inlet section.
4. Bleed off the charge chamber.

**** Note: DO NOT loosen flange bolts while the valve is still under pressure!**

Troubleshooting:

Problem: Charge chamber will not maintain charge pressure.

Solution: Check fittings for leaks, check sleeve for proper installation.

Problem: System pressure and charge chamber pressure equalize.

Solution: Check sleeve for rupture. (To check sleeve, bleed pressure off the charge chamber while system is still charged. If the sleeve is not ruptured, the gas will stop bleeding within a few seconds. *Caution: Velocity will increase through valve and may affect the system.*)

Problem: System will not maintain set pressure.

Solution: Check sleeve for rupture, check valve for plugging, check valve to ensure sleeve is not being held open, check to ensure proper sizing. Note, if gas pressure is not sufficient to maintain system pressure, other measures may be required, i.e. make up gas. Also note, in fluid applications, if inlet line is not full of fluid damage may occur to the sleeve.

