How to Use Proportional Technology to Control Pressure in High Flow Applications

Application

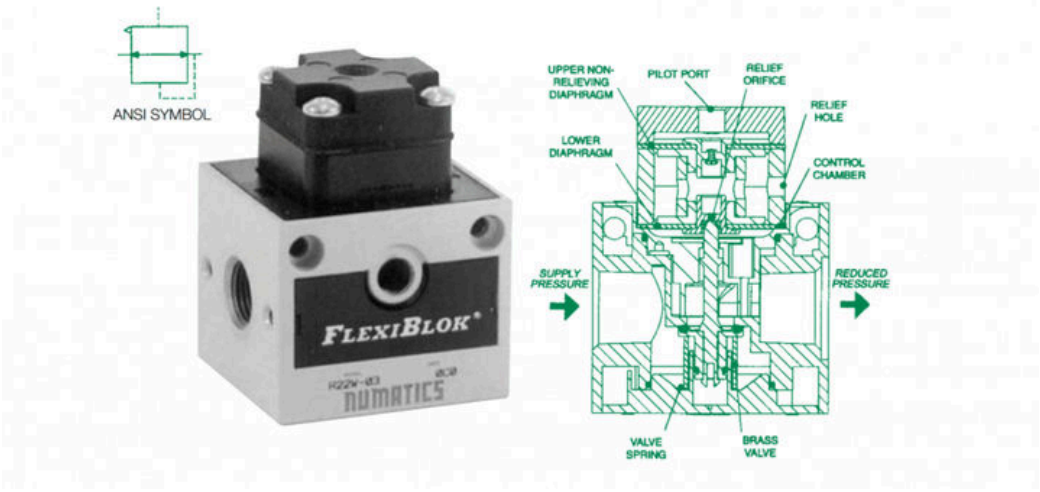
For this particular application, a direct-acting proportional control valve was chosen due to its pressure control resolution, short overshoot settling time, and ability to quickly control the pressure with an analog input. In direct-acting proportional control valves, a direct-acting proportional coil solenoid is used, which acts directly on a piston or spool to adjust valve open or closed positions, based on varying voltage across the coil. This product is ideal for this type of dynamic pressure control application.



However, these devices, especially direct acting proportional control valves, are typically used for relatively low flow rates. This particular customer needed this dynamic control but with varying flow rates exceeding the capabilities of these valves (about 46 SCFM). Fortunately, we were able to accomplish this using the direct acting proportional valve to control a pilot operated regulator. Using this solution, we could use one type of proportional valve for a variety of flow rates while keeping the cost down.

Options are available for proportional valves with high flow rates, but they tend to be much more expensive. This solution sacrifices some resolution, but for the customer's application, this was not an issue. This series of pilot operated regulators have nominal flow rates from 60 SCFM to 325 SCFM and port sizes from ¼" NPT to 1" NPT.

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Using this solution, we were able to control the pressure with an analog signal using the Sentronic D proportional valve. This solution is very robust because the Sentronic D has a simple construction with minimal moving parts. This solution is also very easy to implement using the Data Acquisition Software (DaS) for the Sentronic D valve.

By connecting the SentronicD to a PC with an RS232 interface, the DaS can be used to optimally adjust the valve's control parameters to a specific application. This solution is also very cost effective as the Sentronic D valve is reasonably priced and includes the free DaS tuning software. In addition, we are able to use the same Sentronic D proportional valve with different pilot operated regulators for different flow requirements, especially the high flow applications required. Due to our technical expertise and extensive product lines, we were able to provide this solution to meet all of the customer's requirements.