



PFE PressureFlowEnergy FLOW CONTROLLER WITH VSD AIR COMPRESSOR

Why install a PFE Flow Control Valve with a VSD Air Compressor?

- Additional air compressor KW/energy savings! 24% KW savings in this case study with PFE Flow Control Valve.
- Reduced VSD inverter work. As illustrated in this case study the PFE flow control valve with storage will flattened out motor RPM.
- With the PFE flow control valve and proper storage the VSD ran at a reduced and near constant RPM vs rapid increase/decrease RPM with out PFE Flow Control Valve.
- Create usable storage with PFE Flow control valve. Usable storage allows for load shaping without air compressor loading.
- Usable storage allows for additional compressor to be brought on line from dead stop without loss of plant air pressure. Typical motor acceleration time is 14 seconds, plus time for other permissives.
- Reduced air compressor operating temperature as VSD operates at greatly reduced RPM. Lower operating temperature of rotating equipment typically means longer running equipment, longer oil life, less oil varnish, long air oil separator life.
- Properly sized storage with a PFE flow control valve results in prolonged compressor load and unload cycles minimizing mechanical wear of intake and blow down valves as well as improving heat of compression dryer performance by insuring dryer load cycle time is met.
- PFE Flow Controllers are not tied to only one compressor. Multiple fixed speed compressors can provide load shaping as well as being used as base load machines. VSD compressors are typically dedicated trim compressors.

Energy Savings by Design

As shown by the actual field data below, there is additional energy savings derived from the installation of a properly sized receiver tank and flow control valve in addition to a VSD compressor. Scenario's 'A' & 'B' are periods when the VSD compressor was set to "keep the tank filled" at 105 psig. The PFE Flow Controller performed the modulation and demand event control. A 10 psig reduction in plant pressure yielded a 13 kW savings in energy consumption. Scenario 'C' was recorded with the flow controller bypassed and the VFD PID set point set to maintain a plant pressure of 90 psig. The 34 kW difference between scenario's 'A' and 'C' is a clear indication of how, even with a variable speed compressor installed, the buffering and averaging effect of a tank and flow control valve can still provide substantial benefits.

Scenario A (with PFE Flow Control Valve)

Tank Pressure = 105 psig VFD Set point= 105 psig
Plant Pressure = 90 psig (Flow Controller Set point)

Average Power Usage= 108 kW

Scenario B (with PFE Flow Control Valve)

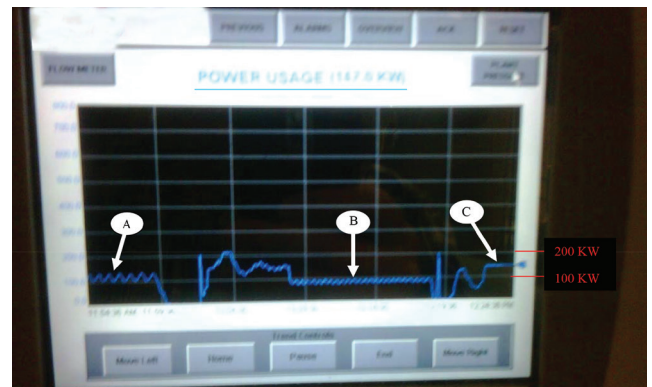
Tank Pressure = 105 psig VFD Set point= 105 psig
Plant Pressure= 80 psig (Flow Controller Set point)

Average Power Usage= 95 kW

Scenario C (no PFE Flow Control Valve)

Tank Pressure = 90 psig VFD Set point= 90 psig
Plant Pressure = 90 psig

Average Power Usage= 142 kW



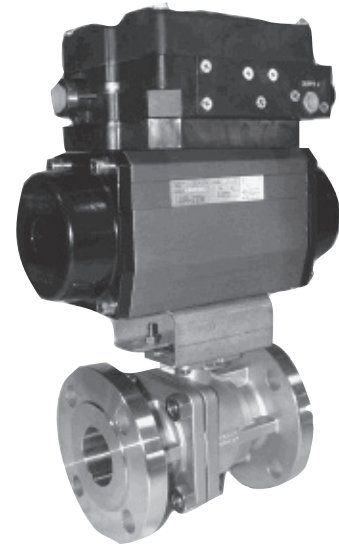
With the PFE Flow Control Valve, power is reduced by 34 kW for an additional 24% energy savings!

The combination of supply and demand side benefits typically result in energy savings of 20% - 40%!

The PFE Controller meets your plant's goals of maintaining the plant air at the lowest possible pressure, satisfying intermittent demand events with stored air, and prolonging the need to re-pressurize the storage tank. This control strategy results in the lowest possible energy consumption and maximum pressure control.

Standard Flow Control Valve

- Rotary V-ball control valve
- Standard valve controller
- 4-20 mA input/output
- Pressure transducer
- Programming
- 150# RF, 4-20 mA input positioner
- 25' of two wire signal wire
- 508 UL panel
- 3 meters of transducer cable
- Loss of pressure or loss of power result in fail open valve position



Diameter	Part	Flow CFM
2 inch	PFE 2.0	1,000 scfm
3 inch	PFE 3.0	2,500 scfm
4 inch	PFE 4.0	4,500 scfm
6 inch	PFE 6.0	9,000 scfm
8 inch	PFE 8.0	15,000 scfm

Optional Deluxe Controller

Single loop controller 4-20 mA and output, 4 relays in a UL 508 NEMA 4 enclosure. PFE records up to 12 inputs (4 I/O's standard) every minute with rolling memory. Example: PFE Deluxe panel will record air pressure, CFM flow with flow meter (added optional) and dewpoint with dewpoint meter (added optional) every minute for 30 plus days of rolling memory!

The recorded data can be illustrated graphically on PFE panel, out put to thumb drive or exported via ethernet. The Deluxe panel is programmable allowing for different discharge pressure settings by day of week or time of day. Thus if plant shuts down for week end or night shift and the air compressors remain active, the discharge air pressure for this non-production time frame will automatically change to much lower air pressure resulting in greatly reduced air consumption in the plant air net.

Reduced air consumption means reduced compressor KW. Plant air pressure is automatically increased/restored to desired plant operating pressure at desired time and day.



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