



PFE 4-in-1 Pressure Controller

The Atlas Air & Water PFE 4-in-1 Pressure Controller is:

- Forward Pressure Controller (FPC)
- Back Pressure Priority Controller (BPC)
- Combination Forward and Back Pressure Controller (C/FC/BPC)
- Air Net Charging Valve



Fluctuating compressed air demand is something that occurs in most compressed air systems. These fluctuations can cause unstable system air pressure and in some cases cause compressors to cycle on and off.

Unstable compressed air systems respond with overcompensation with regard to compressor supply and system pressure. This can cause compressors to run longer at higher pressures which results in increased operating and maintenance costs and reduced system reliability.

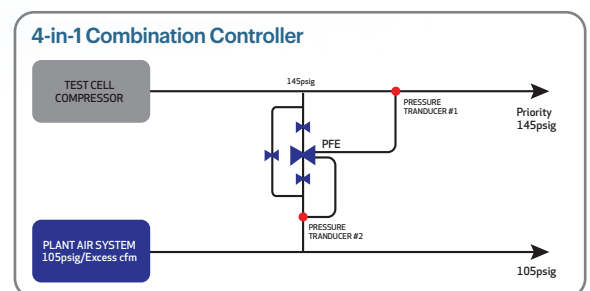
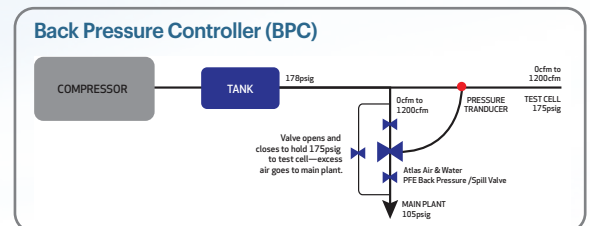
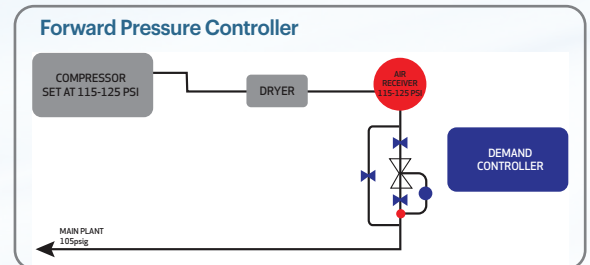
Balancing Pressure Supply and Demand

Pressure instability, even a one-time pressure drop, frequently causes operators to elevate plant air pressure. But this fixed elevated air pressure also increases the air consumption of all poorly regulated processes...including the leak rate! For example, in a nominal 100 psig air system, a 15 psig increase in pressure will use approximately 10-12% more compressed air, PLUS use an additional 7.5% more energy. Installing an AAW PFE 4-in-1 Controller, combined with proper storage, will provide a capacitance (stored energy) for changing system air demands, eliminating the energy and maintenance costs associated with elevating the pressure or starting an additional air compressor while adding profit to the bottom line!

The **AAW PFE 4-in-1 Forward Pressure Controller (FPC)** constantly monitors the demand of air pressure and dynamically adjusts to utilize storage, increase volume flow and stabilize air pressure.

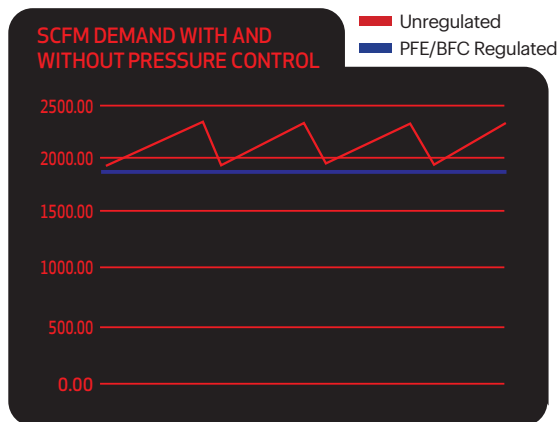
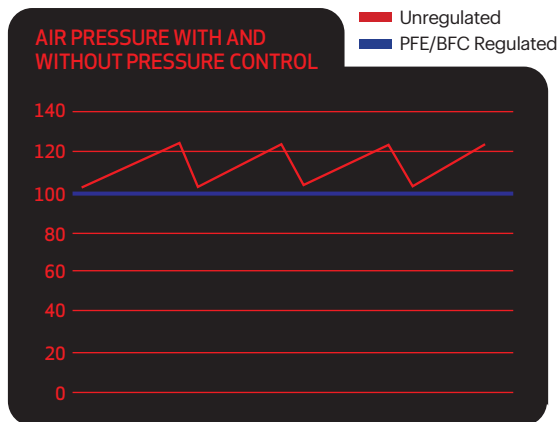
The **AAW PFE 4-in-1 Back Pressure Control (BPC)** allows excess compressed air capacity from one air system to spill over to another compressed air system. This is very helpful with centrifugals, keeping centrifugal loaded not blowing off.

The **AAW PFE 4-in-1 Forward and Backward Pressure Control** automatically switches control between forward system control (FFC) and back pressure priority control (BPC) based on user defined set points.



Regulating Plant Flow/CFM

- Red line is plant air pressure and plant flow CFM unregulated with no PFE or BFC flow control valve.
- Blue line is plant air pressure and plant flow CFM regulated with PFE or BFC flow control valve.



Operating Cost Reduction

- With compressed air pressure set at 100 PSI the compressed air demand is held constant at 1915 SCFM. This represents a compressed air demand reduction of 363 SCFM from the previous average compressed air demand of 2278 SCFM
- Compressor, delivering compressed air at 25 cents per 1000 cubic feet, with a demand reduction of 363 SCFM equals $363 \times 60 \times 8760/1000 \times .25 = \$47,698.20$ per annum.

Load Shifting Capacity

- Effective stored compressed air 1723.5 cubic feet above 90 psig
- Facilitates Compressed Air Demand Spikes (up to $2372 + 1723.5 = 4095.5$ CF) for up to sixty seconds, without need for additional support Compressors
- Air Pressure is maintained @ 90 PSI

Optimize Air Storage

- Ideal Operating Pressure > 90 PSI
- Compressor Operating Pressure Range 105-125 PSI
- Ideal Receiver Capacity 4 gal/SCFM or $1915 \times 4 = 7660$ gallons (7500)
- Usable storage 1723.5 cubic feet above 90 psig

Stored Air for Load Shaping

Example: A 400 Gallon storage tank with 25 PSID has 90 CF of stored air at usable pressure. Stored air allows for any compressor to be base loaded, or to be the trim compressor. Enables easy installation of an additional air compressor. Allows plant to have unlimited air pressure set point without degradation of air dryer, air filters performance, or negative impact to maintenance of life of air dryers or air filters.

Compressor Controls

- PFE and BFC Pressure Controllers provide air storage for multiple compressor installation with workable operating pressure dead-band.
- Demand expansion systems/flow control valves provide stable operating pressure for base loaded and trim air compressors.

Fixed Speed with PFE & BFC Flow Control Valve and Proper Storage

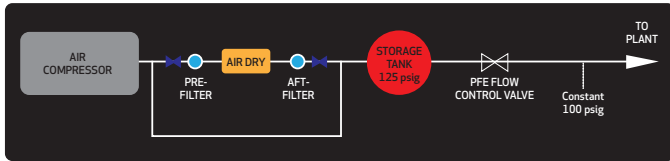
- PFE/BFC provide lowest first cost w/fixed speed, and proper storage
- Highly durable, dust resistant, and withstands higher operating temperatures
- Allows use of any compressor for base load or trim
- Creates usable storage for load shaping
- Discharge air pressure can be set to any pressure without need to over size clean up equipment and offsets potential problems for HOC dryers
- Easy to add additional compressor(s) to system

VSD Air Compressors Concerns

- Higher Initial Cost
- Heat Sensitive and dust sensitive
- Inverter is a wearing part typically needs replacement in 5 years at significant cost.s
- Operating at lower air pressure may increase oil carry over and oil foaming of lubricated rotary screw compressors.
- Must operate at 95 PSIG or higher to maintain clean-up/dryer/filtration equipment performance/integrity as well as proper regeneration temperature for Energy Free Heat of Compression air dryers.

The AA&W PFE is an intelligent 4-in-1 Pressure Controller and Air Net Charging Valve

Air Pressure When It's Needed



Storage tank, filters and dryer must maintain design pressure for proper performance. Compressor remains “alive” ready to come on line and provide compressed air when the PFE pressure returns to P1 set point.

Atlas Air & Water’s PFE day/time clock feature with second pressure set point helps clients maximize compressed air energy conservation and compressed air clean up equipment performance.

Example:

- The facility does not operate a 2nd or 3rd shift or no weekend shift.
- Enter the times and days the plant is not in production in PFE controller.
- Enter 2nd set pressure point to 0 psig* in PFE controller for these non-work periods.

There will not be any CFM flow/wasted compressor KW to the plant during the plant down time, non work periods.

The PFE protects clean up equipment performance by keeping filters/dryers/storage tank charged at design 100 psig (client adjustable) operating pressure at all times.

The PFE eliminates air compressor KW waste from leaks and solenoid valves etc. that are “stuck” in the on/open position by eliminating any compressed air flow (waste) to the plant.

At programmed plant production start time and date the PFE will automatically bring the plant air pressure back to the P1 operational pressure set point.

PFE Deluxe Control Panel Features

- PFE Deluxe Panel constantly monitors and displays; air pressure, SCFM flow rate*, and dew point*
- PFE Deluxe Panel records data on; air pressure, SCFM flow rate* and dew point* every few seconds with 30 plus days of rolling memory
- Low Air Pressure Alarm is adjustable
- Dual Air Pressure Set Points with calendar (for production and non-production periods)
- Touchpad Valve Control for manual settings of fully closed, 25% open, 50% open, 75% open and 100% open
- Two Pressure Transducers display tank pressure and line pressure for FFC and BPC
- **Ethernet Communication**
With PFE Deluxe Panel clients can send commands, pressure set points and read values, air pressure, dew point and SCFM flow via ModBus TCP/Transmission Control Protocol over Ethernet.
- **Available Add Ons**
Available add-ons include SCFM Flow Rate Meter and Digital Dew Point Meter with High Dew Point Alarm

*Requires purchase of flow meter and dew point meter.

BFC Pressure Control Valve

- Provides an excellent solution for smaller compressed air systems.
- **BFC-1000E** and **BFC-3000E** Flow Control Valve(s) with Electronic Control
- **BFC-1000E** 2” Electronic Flow Control Valve 300 psig, Max Flow 1,000 CFM
- **BFC-3000E** 3” Electronic Flow Control Valve 300 psig, Max Flow 3,000 CFM
- Atlas Air & Water PFE and BFC flow control systems are uniquely suited to:
 - Reduce compressed air and compressor energy demand
 - Stabilizing plant air pressure and creating usable storage for load shaping
- Air compressors with energy efficient on line/off-line controls provide the most efficient means of capacity control when fitted with our demand expansion flow control valve systems
 - Online/off-line controls use a preset pressure dead-band.



BFC Electronic Flow Control Valve



PFE Digital Dew Point Meter



PFE Digital Flow Meter

How Large is a Cubic Foot of Air?

Size of 1 ft³ of air

at 0 psig



■ at 100 psig

■ at 125 psig

As air pressure is increased, each cubic foot of compressed air is squeezed smaller and smaller. This results in more compressed air flowing through each air device and leak.

The air compressors have to make this additional CFM capacity, the plant does not need this extra CFM capacity to operate, thus the term artificial demand.

PFE/BFC flow control valve provides constant pressure for constant performance of all operated devices and significant energy savings by reduced kilowatt of compressors.

Typical ROI for installation of PressureFlowEnergy Controller is 18 months!

Fact: For every 1 psig reduction in operating air pressure there is a 1% reduction in flow/SCFM and 1/2% KW reduction.

ROI

Example: 1,000 SCFM demand

- 160KW = 1,000 SCFM compressor @ 110 psig
- 8,700 hours/year
- 8.9¢ KWh

With PFE or BFC Flow Control Valve
Possible energy savings w/30 PSIG reduction.

110 PSIG P1 vs. 80 PSIG P2

ROI

30 PSIG reduction unregulated users =
250 SCFM = 40 KW

40KW x 8700 Hrs/Yr x 8.9¢/KWh =
\$30,972.00/year

Possible Energy Savings plus
downtime reduction savings as
compressor is operating at lower
demand load.

PFE/BFC ROI is typically 18 months or less dependent on operational demand.



Atlas Air & Water (AAW), was founded in 1986 by John Ruprecht, an industry veteran, with an established reputation for innovation, honesty, and client satisfaction.

Mr. Ruprecht has personally been awarded several patents over his career and is recognized within the Industry for dependable and cost-efficient products.

This family-owned business was expanded in 2010 when Scott Ruprecht joined his father bringing with him extensive knowledge of the benchmark Parker Balston N2 operational processes as relates to ultra fine filtration applications.

For over three decades Atlas Air & Water has been predicated on 100% customer satisfaction and is solidly positioned to continue this tradition for the decades to come.

**Serving Industry
Since 1986**

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