

## PLCs, Diagnostic Controllers & HMI for Dust Collectors

**Maintenance Savings**  
**Improved Performance**  
**EPA Compliance**

The B-PAC series of Baghouse PLCs and Diagnostic Controllers with built-in, user-friendly HMI are turn-key, pre-engineered solutions for dust collector control and automation. FilterSense pioneered Baghouse PLCs and Diagnostic Controllers with integrated control and sensing to lower project engineering costs, improve efficiency, lower energy use, meet EPA compliance and dramatically lower maintenance costs.

Integration of control and sensing enables reliable, maintenance reduction features such as the ability to instantly detect and locate filter leaks, failed solenoids and failed pulse-jet valves. Integrated control and sensing also makes possible innovative filter cleaning methods that extend filter life, reduce compressed air consumption and lower electricity use.

With integrated Leak Detectors or Particulate CEMS, B-PACs are ideally suited for compliance including EPA MACT, Title V, CAM and PM CEMS regulations. Optional FilterWare PC Software provides further automation of EPA requirements, record keeping, maintenance planning and process control.

A wide range of models from basic diagnostic controllers for small cartridge dust collectors to large baghouse PLCs with HMI are available. B-PACs are easy-to-use, high quality, heavy duty products designed for long-life and a fast return on investment.

### Features & Benefits

- Instantly Detect and Locate Problems
- Reduce Maintenance and Installation Costs
- Increase Air Flow and Keep Constant
- Ensure Maximum Product Recovery
- Lower Energy and Compressed Air Use
- Lower Particulate Emissions
- Reduce EPA Compliance costs
- Extend Filter Life and Minimize Replacements



With a worldwide distribution network, FilterSense provides solutions to virtually every industry and application.

### Industries and Applications

- **Air Pollution Control Systems**  
*Cement - Power - Smelting - Aluminum - Steel*
- **Spray Dryers and Fluid Bed Filters**  
*Pharmaceutical - Food - Dairy - Powders*
- **Powder Recovery Baghouses**  
*Chemicals - Plastics - Toner - Minerals*
- **Industrial Ventilation Dust Collectors**  
*Automotive - Woodworking - Lead Battery Plants*

### World Leader in Process Filter Monitoring & Automation

*FilterSense is the world leader in process filter monitoring and automation. FilterSense manufactures a range of instrumentation, controls and software. Products include: Fabric Filter Leak Detectors, Liquid Mist Monitors, Particulate CEMs, Baghouse PLCs & HMI solutions, Pressure Sensors, Air Flow Monitors, SCADA and EPA Reporting Software.*

*FilterSense is also the leader in automation engineering and systems integration services including EPA compliance integration. Engineering and management projects range in size from a single power plant baghouse to a plant-wide network of dust collectors, mist eliminators, RTOs, scrubbers and stacks.*

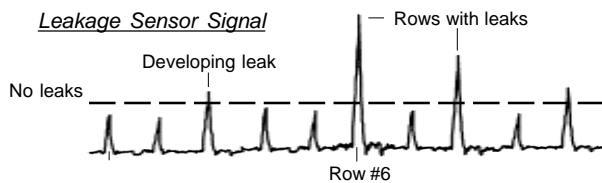
## Instant Diagnostics

Instant Diagnostics are one of several features that provide a quick return on investment.

### Instant Leak Locating

Instant leak locating optimizes product recovery, ensures low emissions and dramatically reduces maintenance costs. This instant, repeatable and proven technology is made possible by proprietary analysis of pressure and particulate measurements combined with intelligent control of the cleaning system.

Each time a row or cell of filters is cleaned, emissions “spike”. This is due to the removal of the filter cake and stretching of the fabrics. When filters begin to wear, the peak and width of the spike will increase above normal levels.



Peaks are very short in time (often less than 1 sec). The difference between peaks and the baseline can be a factor of 1000 or more. B-PAC leak locating is so precise and user-friendly, it is capable of detecting the difference between a 2mm and 4mm hole in one filter.

- Instantly pinpoint rows with leaks and degree of leakage
- Change only the leaking filters, saving time and money
- Reduce employee exposure to dusts and confined spaces
- Minimize downtime and prevent unexpected shutdowns
- No need for costly, contaminating fluorescent leak powders
- No tuning or adjustments, ready for repeatable operation
- True integration, never confused by varying cleaning cycle

### Failed Solenoid and Diaphragm Detection

B-PACs also instantly detect and locate failed solenoids and ruptured or frozen diaphragms. Undetected failed solenoids prevent filters from being cleaned properly causing filters to blind and air flow to drop. Failed pulse valve diaphragms can allow huge amounts of compressed air to continuously and wastefully blow into the filters. Like leak locating, instant solenoid and diaphragm diagnostics are made possible by true integration of control and sensing, combined with FilterSense's proprietary techniques which have been refined over years of field experience.

- Instantly pinpoint solenoid and diaphragm problems
- Save time and money, stop searching for problems
- Prevent compressed air from wastefully blowing into filters
- Prevent catastrophic bag filter or cartridge failures

Leakage, 15pA OK  
Diaphragm, Fail  
Solenoid, OK



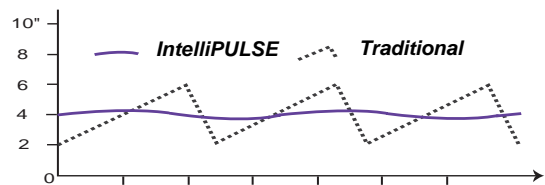
From the basic B-PAC 100 (shown) to the modular and expandable B-PAC 1000PLC, there is a B-PAC for every size dust collector and budget.

## Simple, Yet Innovative Filter Cleaning Methods

- **IntelliPULSE Technology**  
*Reduces Compressed Air Use - Maximizes Air Flow*
- **Off-Line Cleaning**  
*Lowers Emissions - Helps To Meet Compliance*
- **Indexing**  
*Reduces Energy Use - Maintains Constant Air Flow*
- **Recipes**  
*Multiple Row Pulsing - Gentle Low Emissions Cleaning*

B-PACs feature innovative cleaning methods to maximize filtration efficiency, reduce compressed air consumption, lower emissions, control air flow and reduce energy use.

IntelliPULSE automatically adjusts the off-time between pulses and pulse duration to maintain constant pressure drop across the filters while using the least possible amount of compressed air. It also extends filter life and lowers emissions.



OFF-LINE cleaning for multi-compartment dust collectors reduces emissions by isolating cleaning to a closed cell or compartment preventing re-entrainment.

INDEXING for systems with variable frequency drives automatically increases the differential pressure set-point gradually as the filters are seasoned. This is to take advantage of the lower pressure drop of new filters. It enables a reduction in blower speed and thus electricity use. In some processes seasoning can take months providing large energy savings.

RECIPES allow users to select multiple row pulsing and pulsing sequences. Additional recipes such as gentle low emissions cleaning and cycle down cleaning are possible.

## PLC Models for Automation & Networking

All B-PAC models seamlessly integrate intelligent filter cleaning, pressure and particulate sensing, and other measurements such as air flow and fan amps. All models also feature built-in, user-friendly HMI. "PLC" models add traditional PLC features such as PID loops for damper and VFD control, ladder logic programming, networking and various field-bus communications such as Modbus, DeviceNet and Ethernet.

PLC models are modular so analog and digital I/O can be added and sensors can be easily calibrated. Networking ports and remote I/O modules are offered for distributing controls.



*B-PAC PLC models feature modular HMI/Controller & I/O*

B-PAC PLCs are application-specific providing many features and capabilities that are not possible with off-the-shelf PLCs.

Feature/Capability	B-PAC PLC	Standard PLC
True Integration of Sensing	Yes	No
Turn-Key/Pre-Programmed	Yes	No
Integrated/User-Friendly HMI	Yes	No
Instant Diagnostics & EPA Features	Yes	No
High Power, AC Synchronized Triacs	Yes	No
Designed for Harsh, Hot & Dusty	Yes	No
Ladder Logic Programming	Yes	Yes
Modbus, DeviceNet, Ethernet, Profibus	Yes	Yes
Function as Remote I/O or Slave to Standard PLC (i.e. Allen-Bradley)	Yes	Yes

## Integrated Motor Controls

FilterSense has high quality in-house control panel design and fabrication capabilities for integrating other controls such as motor starters, manual switches and indicator lights into the same enclosure as the B-PAC controls. This reduces engineering and procurement costs and provides better overall control system layout and functionality.

- Motor Starters & VFDs
- Manual Switches & Lights

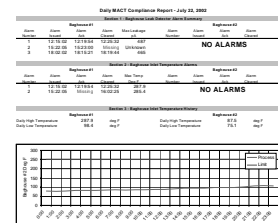


## SCADA & EPA Reporting Software

Optional FilterWare control and reporting software provides SCADA (supervisory control and data acquisition) and reporting capabilities for B-PAC PLC models using the standard serial communications.



**SCADA HMI**



**EPA MACT Reports**

From a factory floor PC or intranet PC, FilterWare enables remote control of B-PACs, advanced data viewing and analysis, as well as large volume logging of process variables and diagnostics. Reports for process control, maintenance, spare parts and EPA compliance including EPA MACT can be customized. Internet functionality is available for remote services.

FilterWare is highly robust and user-friendly. For integration with existing plant software, FilterWare is available on industry standard platforms including Wonderware, Allen-Bradley RS-View and Intellution IFix.

## Reliable Integrated Sensors



Reliable sensing and accurate measurement are critical components to the overall performance and benefits of B-PACs. Every model is supplied with FilterSense's renowned particulate sensors for leakage detection and emission monitoring. Employing induction-sensing and protected-probe technologies, these sensors are rugged and highly reliable with an industry leading 3-year warranty. B-PACs also integrate other FilterSense application specific sensors such as FilterSense's non-clogging differential pressure sensor and non-clogging airflow monitors.

# Model Comparison Table

# B-PAC™ Baghouse Control Systems

Features & Capabilities		B-PAC 1000PLC	B-PAC 100PLC	B-PAC 1000	B-PAC 100
Instant Diagnostics (Detect & Locate)	Filter leaks by row Failed solenoids Failed diaphragms	Yes Yes Yes	Yes Yes Yes	Yes (opt) Yes (opt) Yes (opt)	Yes (opt) Yes (opt) Yes (opt)
Filter Cleaning Modes	IntelliPULSE Recipes & Indexing Off-Line/On-Line	Yes Yes Yes	Yes Yes Yes	Yes No No	Yes No No
Application Size & Range	Typical air volume (Approximate) Number of rows/solenoids Multi-compartment collectors	10-200KCFM or more 16-240 (by 8 or 16) Yes	5-25KCFM 8 or 16 (opt) No	10-50KFCM 10, 20, 40 (opt) No	3-10KCFM 10 or 6 (opt) No
Type of Filter	Pulse-Jet (bag or cartridge) Shaker Reverse Air	Yes Yes Yes	Yes Yes Yes	Yes Yes No	Yes Yes No
Programming & Control Capabilities	User adjustable setup Ladder logic programming PID Loops	Yes Yes Yes (up to 4)	Yes Yes Yes (up to 2)	Yes No No	Yes No No
Communications and Networking	RS-485/RS-232 Modbus Master/Slave DeviceNet Slave Ethernet, Profibus (Consult Factory)	Yes Yes Yes (opt) Yes (opt)	Yes Yes Yes (opt) Yes (opt)	No No No No	No No No No
PC Software (See FilterWare)	SCADA EPA Reports including MACT	Yes Yes	Yes Yes	No No	No No
Electronics, Sensors & I/O Packaging	Modular and Expandable Or Built-in	Modular	Modular	Built-in	Built-in
Warranty	Parts and Workmanship	1-3 Years	1-3 Years	1-3 Years	1-3 Years
Integrated Sensors and I/O		B-PAC 1000PLC	B-PAC 100PLC	B-PAC 1000	B-PAC 100
Sensor Capacity	Maximum number	32	6	4	3
Sensors	Differential Pressure Non-Clogging Differential Pressure Basic & EPA Leak Detectors Continuous Dust Emission Monitors Particulate (mg/m <sup>3</sup> ) and other CEMs Header Tank Static Pressure Air Flow (Std and Non-Clogging) Fan Amps Temperature Hopper Level Airlock speed, HEPA DP and more	<i>All sensors available with all models</i>			
I/O Modules	Combo Pulse-Jet module Triac/Solenoid module Analog modules Digital modules	0- 32 modules 0- 32 0-4 0-4	0-2 modules 0-2 0-1 0-1	1 built-in 1-3 No No	1 built-in No No No
Control Functions (in addition to cleaning cycle)		B-PAC 1000PLC	B-PAC 100PLC	B-PAC 1000	B-PAC 100
Motor Control	On/Off control	Yes	Yes	Yes (120V motor control only)	
Valves, Dampers & Other	On/off control Closed loop control (PID)	Yes Yes	Yes Yes	Yes No	Yes No
VFDs	Closed loop control (PID)	Yes	Yes	No	No

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