



PB 20 Series Air Conditioners with Air Pressurization / Filtration for Hazardous or Dusty Locations



APPLICATIONS

- Control Rooms
- Analyzer Buildings
- Compressor Stations
- Motor Control Centers
- Offshore Oil and Gas Platforms
- Grain Elevators
- Steel Mills

FEATURES

- Provides Pressurization, Air Conditioning, Heating and Air Filtration in one Pre-assembled Module
- Pressure is Adjustable from 0.025" to 0.50" w.c.
- Fully Automatic; Speed Modulated Blower Maintains Preset Pressure
- Eliminates Problems Associated with Damper Controlled Systems
- Minimizes Heating and Cooling Losses
- Explosion Proof Class I, Groups B, C or D and Class II, Groups F and G in Div. 1 or 2 (*)
- Cooling Capacities from 2 to 50 tons
- Skid Mounted, Pretested System for Quick Installation and Trouble-Free Start-Up
- Filters for Dust, Odor (*) and Corrosion (*) Control
- Control Panel has Pressure and Temperature Controls and Display, Pressure Loss Alarm Contacts and Purge (*) Controls
- Smoke, Hydrocarbon or Specific Gas Detectors with Alarm and Automatic Shutdown (*)
- Full Redundancy with Automatic Switchover (*)
- Blower Maintenance without Pressure Loss (*)
- Corrosion Resistant Coatings and Coil Finish (*)

DESCRIPTION

Industrial Control Rooms, Analyzer Buildings, Motor Control Centers and other installations in or near hazardous or dusty locations require both air conditioning and pressurization. NFPA, API and related industrial codes mandate both the building pressure and the air flow across door or other openings that must be maintained. Pre-assembled and pretested PB(X) 20 systems provide these functions automatically. The control panel includes all controls for setting and monitoring room temperature, pressure and pressure loss alarm. Models specified as "Explosion Proof" comply with Articles 500-503 of the National Electric Code (NEC) for Class I, Groups C and D or Class II, Groups F and G, Divisions 1 and/or 2.

A low noise, Vari-Speed blower automatically maintains the desired building pressure. The supply air can be limited to the amount required to offset air loss from the pressurized structure and from door openings. The results are lower heating and cooling requirements, substantial energy conservation and lower operating costs. Gone are sluggish response and the repeated need for adjustment and maintenance of damper controlled designs.

Maximum makeup air flow can be specified in the range of 1300 to 6000 cu-ft per minute. The matched air-conditioning system operates in a recirculating mode. Ample external static pressures allow for any required distribution ducts. Cooling capacities range from 2 to 50 tons. The built-in housing will accept a wide variety of air filters for particulate or gas-phase corrosion and odor control media. Additional options are an audible pressure loss alarm, timer controlled air purge, and gas detectors.

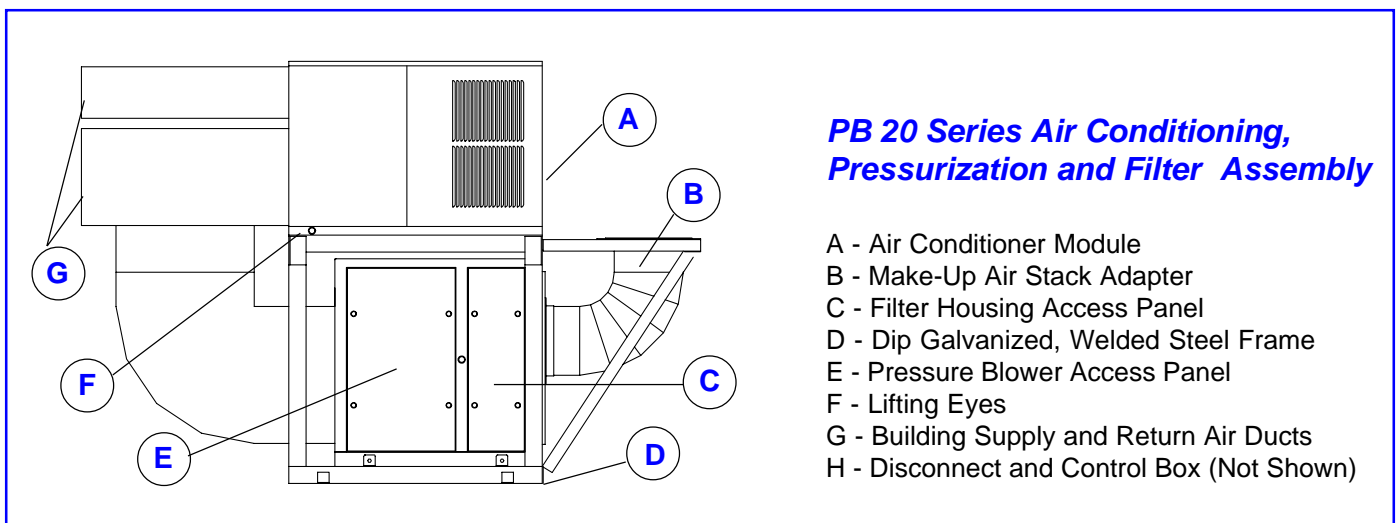
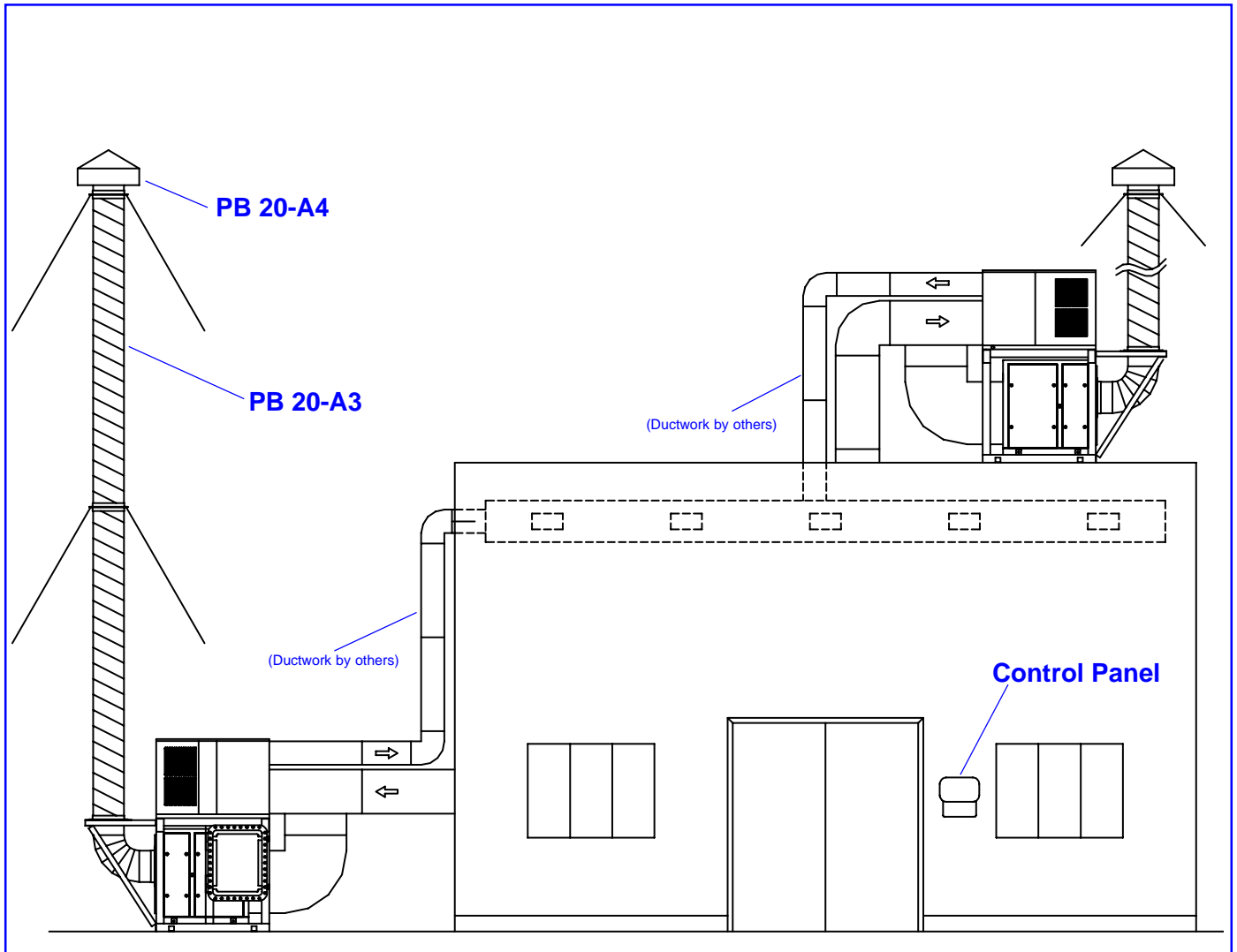
(*) = Optional Feature





AIR CONDITIONING with PRESSURIZATION

Ground Level or Roof Top Installation

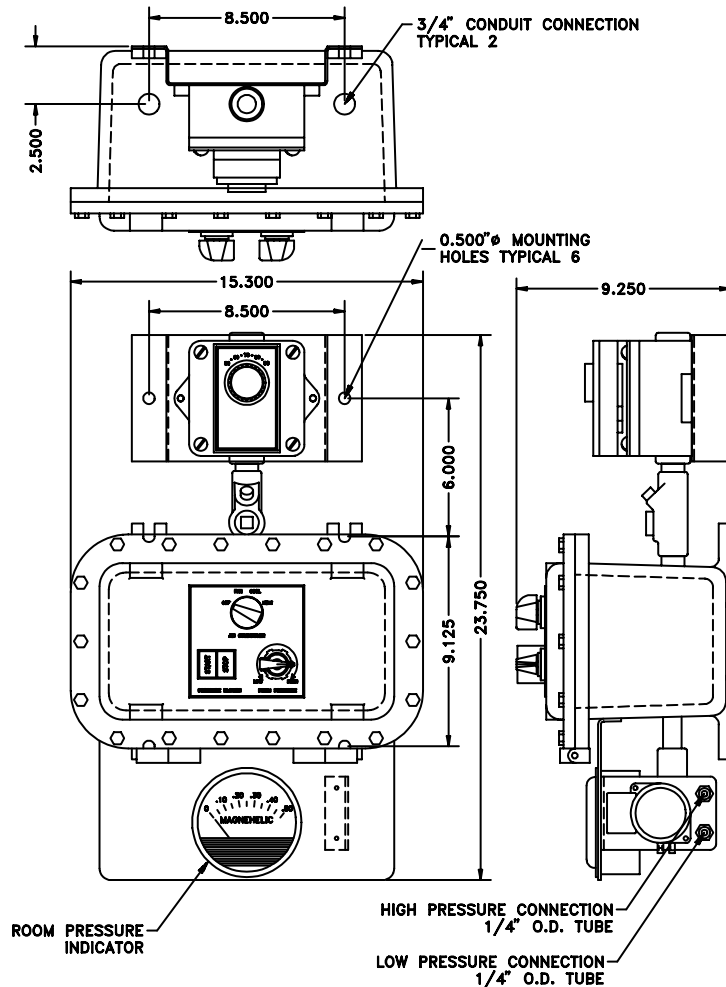




Control System: Preassembled and Pretested

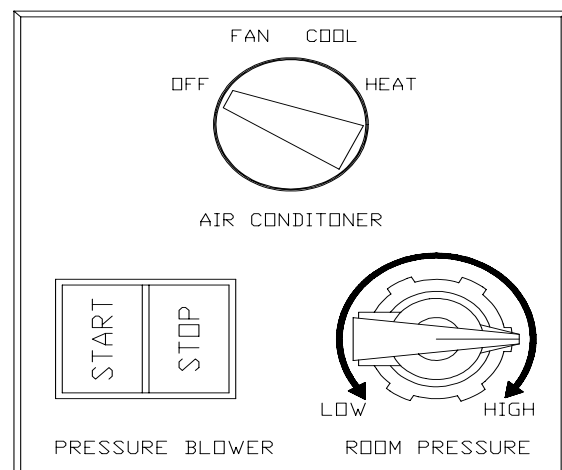
Automatic Pressure and Temperature Controls

The pre-assembled and pretested control panel is located inside the pressurized space. NEMA 7 (hazardous location) control housings are standard for explosion proof models. This design allows safe purging of the conditioned space prior to initial room pressurization. A NEMA 2 (drip proof) housing is standard for non-explosion proof models and optional for explosion proof units. Controls include a thermostat, pressure set, pressure readout, and start/stop controls for the blower. Pressure loss alarm contacts with adjustable alarm delay are standard as are contacts for computer control and monitoring. An optional automatic switch-over controller provides full control redundancy for room pressurization or for both, pressurization and air conditioning.



Convenient Controls

Located inside the pressurized and conditioned space, temperature and pressure can be adjusted or monitored as required. A separate selector switch allows a choice of "Heating", "Cooling" or "Fan Only" operation. Additional control options include humidity control, smoke and gas detectors, time controlled automatic purge, and audible alarms.





AIR CONDITIONING with PRESSURIZATION

PB 20 Series

Preassembled and Pretested Pressurization / Air Conditioning / Filter Systems

General

The Pressurization / Air Conditioning / Air Filtration system shall be Scientific Systems Corporation Model _____

This equipment shall be specifically designed for pressurizing and air conditioning industrial buildings. The equipment must conform with the code requirements of NFPA 70, NFPA 496, API, ISA, and AMCA. Equipment specified for use in hazardous locations shall also comply with Article 500 of the U. S. National Electric Code under NEC Class _____, Group _____, Division _____. Entire system including air conditioner, pressurizing and recirculating blowers, and air filter(s) shall be installed on a structural steel skid and be fully assembled and pretested. The skid shall consist of a frame of rectangular steel tubing with all joints continuously welded. The frame shall have lifting tabs, be dip galvanized after fabrication and designed for lifting by forklift or crane. All interconnecting ducts shall be 20 Ga. galvanized (Optional: Type 316 stainless steel). Equipment housings shall be carbon steel (Optional: Type 316 stainless steel) with baked enamel or urethane finish (Optional: Epoxy finish). All electrical components on the skid shall be in housings rated NEMA 4. Explosion proof housing must additional be rated NEMA 7(1) and include automatic condensate drains. Covers larger than 96 square inches on explosion proof boxes shall be hinged.

Indoor Controls

A separate control housing for installation inside the controlled building environment shall be supplied. This housing shall be rated NEMA 7 (Optional: NEMA 2, NEMA 12). The control panel shall be Pre-assembled, pre-wired and pretested with a room pressure sensor, pressure setting control, Magneheli pressure indicator, Start/Stop Controls for the blower system and suitable thermostat. The pressure control system shall be adjustable over the range of 0.025 to 0.5" w.c. A separate selector switch shall allow the selection of "Cooling" or "Fan Only" (Optional: ...or "Heating") operation.

Wiring

All wiring shall conform to the National Electric Code. Wire terminations shall have shrink type, machine imprinted wire markers. Identifying numbers and letters shall correspond with identification on wiring diagrams. All wiring shall be brought to terminal boards. Terminations shall have spade type connectors.

Blowers

The pressure blower shall be centrifugal type, belt-driven, with variable pitch pulley. Blower housing(s) shall be spark proof aluminum⁽²⁾ housings.. Housings shall be continuously heli-arc welded with suitable corrosion protection. Blower(s) shall provide no less than 2600 CFM @ 0.3" w.c. (Optional: _____CFM @ _____" w.c.) external static pressure. A spare fan belt shall be provided. Blower speed shall be continuously modulated as a function of room pressure. The makeup air inlet side



AIR CONDITIONING with PRESSURIZATION

of the blower shall have a nominal 30" x 30" opening. (Optional: A 90° adapter elbow for connecting to a 12" O.D. (Optional: 18" O.D.) makeup air duct shall be provided. Adapter shall be structurally braced and suitable for supporting a minimum of 20' of supply duct. A separate recirculating air blower shall provide a minimum of 1.0" w.c. external static pressure (Optional: _____" w.c.) .

Air Filtration

Inlet side of pressure blower shall be equipped with 4" extended surface pleated panel filter rated UL Class I. All units with cooling capacities exceeding 3 tons shall have an additional 2" filter installed in the return air duct. (Optional: A multiple filter housing with side access door shall be attached on the downstream side of the blower module. The side access filter housing shall be equipped with quick opening compression latches. Filter service shall not require any tools. The following additional filters shall be installed in the filter housing: (Options: (A) 2" High Dust Loading with minimum 80% average efficiency; (B) 4" 90-95% Average Efficiency (C) Type _____ Activated Carbon Panel Filter with Particulate Post filter (D) Deep Bed 90 lbs. (Optional: _____lbs) Carbon or Chemical Media Filter with 30 and 90% final filters.

Cooling / Heating

The Air Conditioner shall be air () water () cooled with a minimum ARI cooling capacity of _____BTUH. Air-cooled condensers shall be copper tubing with aluminum fins. Water-cooled condensers shall be counterflow design with removable head and water regulating valve. (Optional: Air-cooled condenser shall be corrosion protected with SaveCoil 101 baked phenoxy coil coating). (Optional: An electric () steam () heater, suitably instrumented and interlocked with control system, shall be installed. Heater capacity shall be _____kw (_____BTUH).

Electrical

All outside equipment shall be rated for NEC Class ____, Group _____, Division _____. (Option: An explosion proof, fused circuit breaker / disconnect switch shall be factory installed and wired on the PBX module.) The control panel located inside the building shall be rated Class ____, Group _____, Division _____. Single point electrical service shall be _____Volts ___Phase _____Hertz. Wiring between control panel and PB 20 skid shall be by others.

Documentation

Vendor shall furnish detailed electrical, mechanical and dimensional CAD drawings. Wiring connections shall be numbered and cross referenced to wiring terminations. All components shall be clearly identified and cross referenced to a computerized parts list and include current pricing. A manual shall include all of the above documentation along with installation, operating and maintenance instructions. Vendor shall provide a "Certificate of Conformance" attesting to compliance with the specified electrical classification.

- (1) For Class II equipment rating is NEMA 9.
- (2) Models rated for non hazardous service have steel housings.



**SCIENTIFIC
SYSTEMS
CORPORATION**



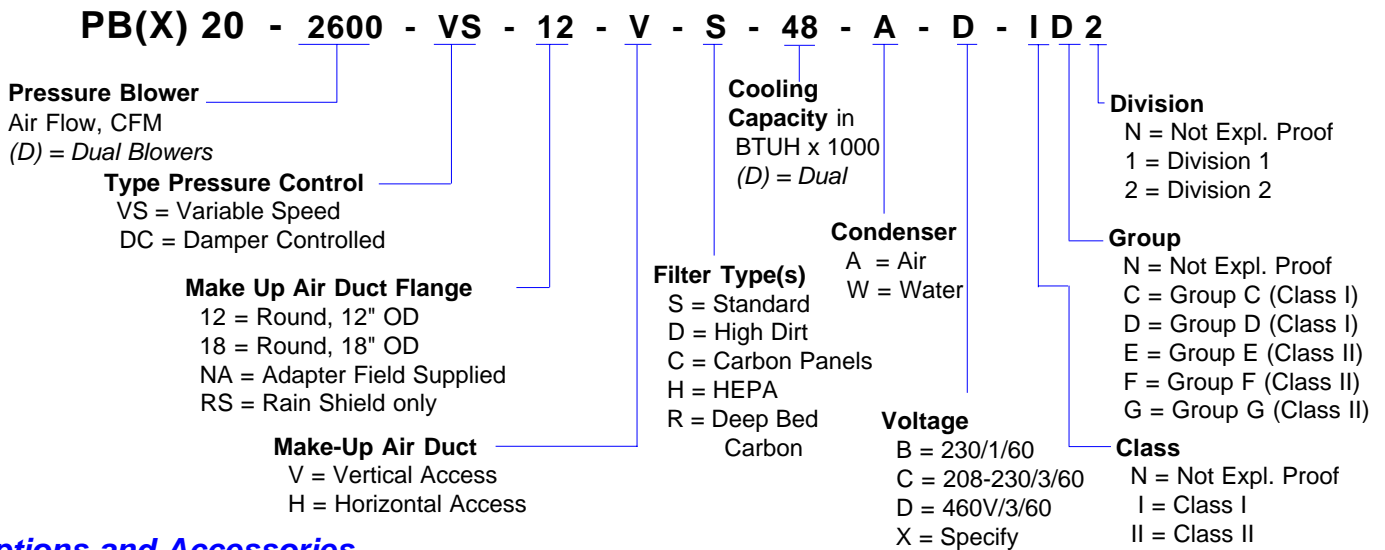
AIR CONDITIONING with PRESSURIZATION

PB(X) 20 Air Conditioning with Pressurization Blowers

How to Order

- 1.- Determine the **maximum** air flow required by the PB or PBX (explosion proof) pressure blower. NFPA 496 requires a **minimum of 60 feet per minute** across door and other room openings
- 2.- Determine cooling and (optional) heating capacity for the air conditioning module. For computer assisted load calculation contact factory and request Technical Support Bulletin HVLO1FRM.
- 3.- Determine hazard classification outside of the pressurized structure, e.g. NEC Class I, Group D, Division 2..
- 4.- Determine the model number following the description below.
- 5.- Select additional options and accessories that may be required. Order these items separately.
- 4.- For technical or pricing information contact your local representative or Sales Engineering at (800) 654-3857.

Model Number Description



Options and Accessories

| Model | Description |
|-----------------|--|
| PB EH(kw) | Auxiliary Electric Heat, (specify kw), with pressure interlock, available for Division 2 only |
| PB SH(BTUH) | Auxiliary Steam Heater, (specify BTUH), less trap or control solenoid (specify steam pressure) |
| PB 20-DCI | Disconnect Switch and Circuit Breaker, installed |
| PB 20-ASC-1 | Automatic Switchover, Dual Pressure Blowers only, w/disconnect and circuit breaker, installed |
| PB 20-ASC-2 | Automatic Switchover, Dual Pressure Blowers, Dual Air Conditioners, w/disconnect and circuit breaker |
| PB 20-A2 | Replacement Filters, 4" particulate, for Make-Up Air Filter Housing, Box of 3 |
| PB 20-A9 | Make-up Air Stack Adapter Elbow, 90°, for connecting PB 20-A3 to make-up air inlet..... |
| PB 20-A3(____") | Make-up Air Duct, 12" or 18" O.D. (specify), flanged 10 ft section, with flange bolts |
| PB 20-A4 | Rain cap Protective Air Inlet Cover, with bird screen and hardware, for connection to PB 20-A3..... |
| PB 20-A5 | Alarm Horn, connects to built-in alarm contacts to signal pressure loss |
| PB 20-A6 | Automatic Purge Control, timed purge provides adjustable delay period |
| PB 20-A7 | Barometric Control Damper, wall mount, for use with 'DC' pressure control option |
| PB 20-11 | Full Corrosion Protection: Sheet Metal Parts Protected with Epoxy Paint; coils w/SaveCoil..... |
| PB-20-98 | Smoke Detector, Explosion Proof, installed with system interlock |
| PB 20-99 | Gas Detector (specify gas and concentration), installed with system interlock |

Your Representative is:



**SCIENTIFIC
SYSTEMS
CORPORATION**

7924 Reco Avenue
Baton Rouge, Louisiana 70814 USA
Phone (225) 926-6950
Inside U.S. (800) 654-3857
FAX (225) 926-6973