

General

The Flanders-AirSeal PowerClean is a new generation electrostatic precipitator, used to control unwanted airborne contaminants generated by industrial manufacturing processes. PowerClean is a reliable solution for both indoor air quality problems and contaminated exhaust air. It's available in side or front access units for use with central air handlers or as a stand alone fan powered unit.

Dependable high frequency electronics, safe/no-short charging system, rugged ionizer electrodes and improved automatic cleaning are just a few of the innovations developed to make PowerClean the most reliable ESP ever. High efficiency particle collection is delivered instantly and continuously. The extremely low resistance to airflow means less fan horsepower is needed, compared to conventional media filtration, and since resistance to airflow is constant, the system air volume is always maintained. Optional TechSorb™ High Mass Zero Dust bonded activated carbon can be added for molecular contamination control, making PowerClean the IDEAL SOLUTION for ventilation or exhaust air quality problems.

Reliability, high performance and low operating cost make PowerClean an excellent choice for industrial/indoor air cleaning or exhaust air pollution control.

Key Features

- New Generation ESP designed for dependable operation
- Reliable high frequency electronics do not use fragile ionizing wires or insulators
- Specified efficiency is instant and constant
- Resistance to airflow is a low 0.25" w.g., resulting in reduced fan horsepower
- Constant resistance to airflow prevents fluctuations in system air volume
- Permanent aluminum collector cells never need replacing
- Built-in automatic cleaning and PLC controls
- Optional TechSorb bonded carbon for gas/odor control
- Available in side or front access

Applications

PowerClean delivers dependable, continuous duty operation, controlling a broad range of process generated airborne contaminants.

Below is a partial listing of PowerClean applications:

- Machine tool coolant mist
- Forging lubricant effluent
- Heat treating smoke
- Cold heading smoke
- Welding and soldering fume
- Vinyl extrusion plasticizers
- Rubber curing and molding smoke
- Textile finishing exhaust
- Commercial cooking kitchen exhaust

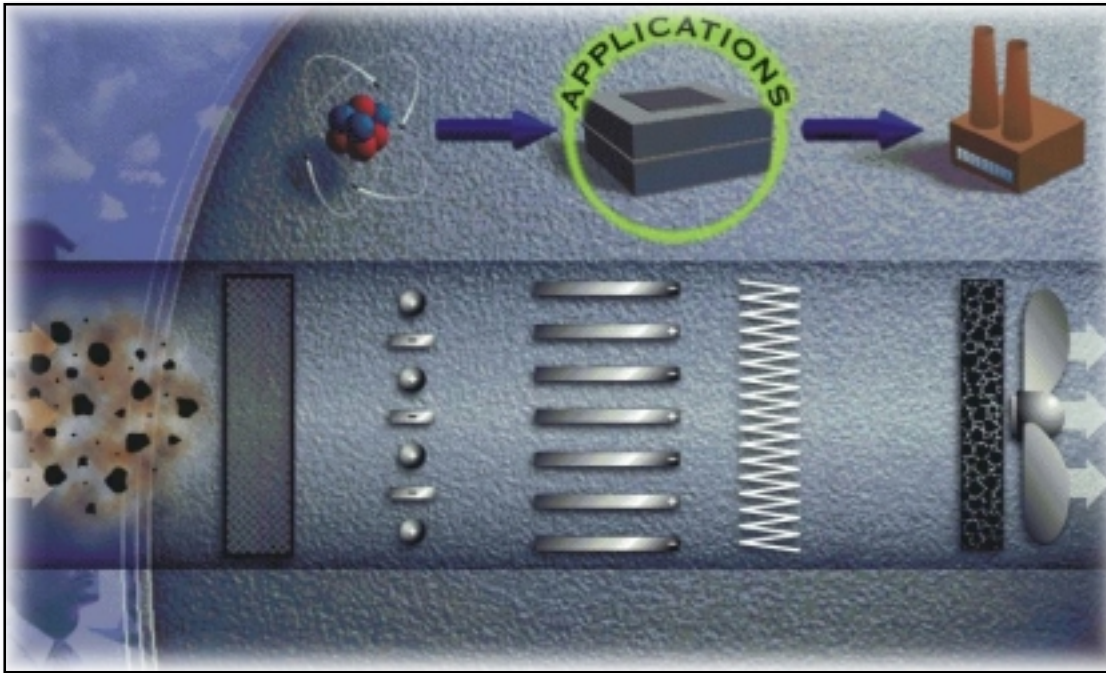


PowerClean Model SA Side Access



PowerClean Model FA Front Access

PowerClean...Industrial Air Quality Solution



Industrial Air Quality Problems

Manufacturing processes release a wide range of airborne pollutants that create health, safety, and environmental problems and adversely affect manufacturing efficiency. Today's operating standards offer two solutions for air quality problems: clean and reuse indoor conditioned air; or clean the exhaust and conditioned makeup air. The choice depends on the nature of the contaminant and the complexity of the process.

Whether recirculating or exhausting, local control of the contaminants is a first consideration. This may be accomplished by using a captive hood or enclosure to entrain and convey the contaminant to a collector. This prevents escape into the surrounding environment and reduces the volume of air to be treated. If local control is not feasible, contaminated air can be cleaned as it is processed through an ambient or general ventilation system. Polluted air may require cleaning and reconditioning in order to be reused. In this case, many times it is more economical to clean and exhaust the polluted airstream and replace with make up air.

The PowerClean Solution

The type of particle collector best suited for an application depends on the nature of the contaminant and its concentration in the airstream. PowerClean is used to collect a broad range of dry and liquid airborne particulate and can be sized to meet varying concentrations.

Smoke, fumes, mist and light dust are collected with the high efficiency delivered by electrostatic precipitation.

PowerClean's new design also delivers unequalled reliability. High frequency electronics, Flanders new HCC collectors, and an effective, self-cleaning system make PowerClean the most dependable ESP (electrostatic precipitator) ever. And, it's designed for heavy, industrial use applications.



PowerClean can be used in conjunction with existing exhaust or ventilation systems, or as a stand alone system with its own blower. Optional TechSorb™ activated carbon can be furnished for complete particulate and gas/odor control.

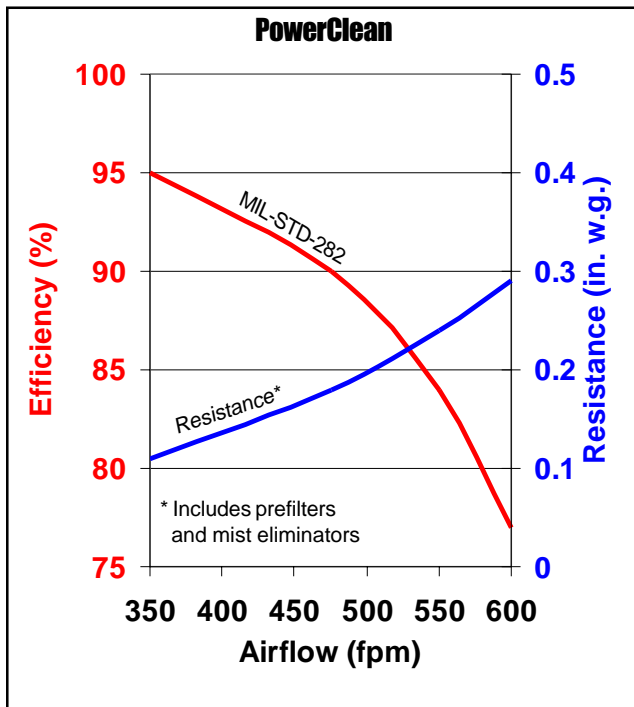
PowerClean Delivers...

Performance

PowerClean uses a 2-stage electronic collector for particulate control. A high-density, low power first stage charges each particle. The charged particles then travel downstream into the second stage where they are repelled from the air stream, captured, and retained on collector plates.

The electronic collector uses an airfoil design that eliminates air-bypass, so all of the system air and airborne particulate pass directly through the charging and collecting stages. This assures that all contaminated air is treated.

PowerClean delivers the rated efficiency instantly and continuously. The high-density charging and collecting zones produce an immediate and constant removal rate regardless of particle size.



Reliability

PowerClean uses a programmable logic controller (PLC) for system control and monitoring, in conjunction with high frequency electronics, to deliver optimum performance and assure the highest degree of reliability.

The versatile control system can be easily integrated with existing process systems, adding another degree of reliability in the overall system operation.

The durable, all aluminum 2-stage electronic collectors feature unitary construction and are designed to last the lifetime of the system. The integrated automatic wash system assures optimum performance and maximum system reliability.

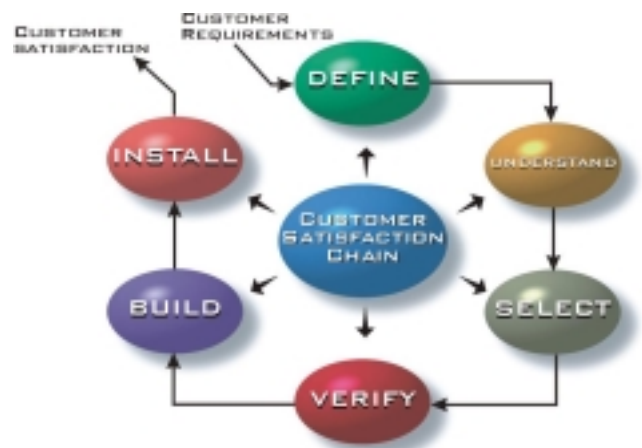


Value

PowerClean's design features increased collector surface area in a smaller package compared to conventional systems, resulting in higher dirt holding capacities and reduced system footprint. This translates into extra available floor space, up to 30% in some instances.

PurePac's low resistance to airflow results in reduced fan horsepower and fan energy cost. Over time, this reduction amounts to significant energy savings. Since PowerClean uses wash-in-place electronic collectors, replacement filter cost, disposal cost and labor cost are eliminated.

When it comes to value, PowerClean delivers. High performance and reliability in a compact design, and low operating cost make PowerClean the ideal choice for today's industrial air quality problems. Call us, and we'll help evaluate your application.



PowerClean Front Access Electrostatic Precipitator



PLC Control
automatic or manual operation



30 Gallon Detergent Dispenser
liquid level sensor and flow control valve



System Accessories
solenoid valve, backflow preventer, Y-strainer and ball valve



Model FA-0604
(metal mesh prefilters removed)

System Description

PowerClean Front Access Model (FA) is packaged as a complete system, including the electrostatic precipitator (ESP), system control, detergent dispenser and system accessories. Components are furnished factory assembled, except for the ESP, which is shipped knocked-down for field installation inside the air handler or ventilation duct.

PowerClean Model FA uses Flanders type HCC electronic collectors and modular design, arranged in multiple tiers and varying widths to attain the specified capacities and efficiency. The versatile design and modular construction can accommodate all sizes of ventilation systems by installing multiple units side-by-side.

Options

PowerClean is available with TechSorb HMZD bonded, activated carbon panels for molecular contaminant, gas phase/odor control. Since the granules are "locked together", TechSorb eliminates settling, dusting, and air by-pass, which are typical in loose granular carbon filters.

TechSorb is furnished in disposable panels, eliminating the messy chore of emptying and refilling loose carbon holding frames.

System Accessories

Each PowerClean Model FA is furnished with the following standard accessories.

Wash water strainer.....	1 each
Ball valve.....	1 each
Backflow preventer.....	1 each
Solenoid valve.....	1 each
Access door electrical interlock & pilot light.....	2 each
Detergent.....	55 gal

Utilities

Electrical

Standard: 120 Vac, 1 ph, 60 Hz

Optional: 208-230, 460 Vac, 1 ph, 50/60 Hz

Wash Water:(See Selection Table) gpm @ 40 psig

System Drain: Sized according to applicable codes to handle water and detergent volume shown in Size Selection Table.

PowerClean Front Access Electrostatic Precipitator

Model Number Development



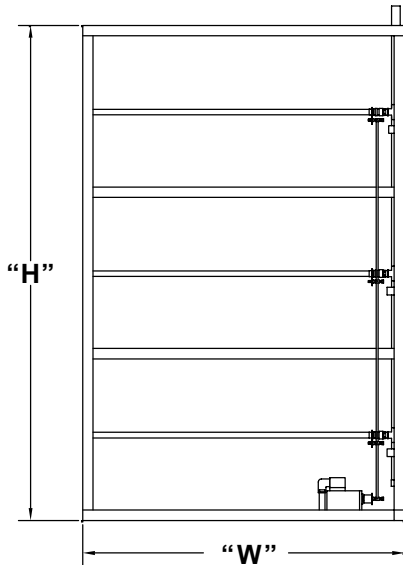
Front Access Nominal Height Nominal Width

Represents a PowerClean Front Access unit, Model FA-0606, nominally 6 ft. high x 6 ft. wide.

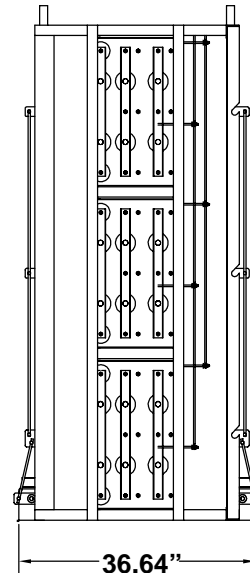
Unit Selection Guide

1. From the Size Selection Table below, select the Model FA with Air Volume and Dimensions that meet the required efficiency.
2. Multiple Model FA units of the same height may be grouped together to create larger, multi-section units.
3. Each Model FA is shipped complete with the System Accessories, as shown on Page 2.

Size Selection Table



Front Elevation



Side Elevation

Model	Face Area(ft ²)	Air Volume (cfm) (1,2)Efficiency		Dimensions Overall (in)		(3)Wash Cycle		(4)Wt. (lb)
		95%	90%	H	W	Water gpm	Detergent gal	
FA-0604	22.8	8,000	11,000	77 ³ / ₈	50 ³ / ₈	28.8	1.4	1,025
FA-0605	28.3	10,000	13,500	77 ³ / ₈	61 ³ / ₁₆	36.0	1.8	1,160
FA-0606	33.8	12,000	16,000	77 ³ / ₈	72	43.2	2.2	1,295
FA-0804	30.4	10,500	14,500	102 ⁵ / ₈	50 ³ / ₈	38.4	1.9	1,250
FA-0805	37.8	13,000	18,000	102 ⁵ / ₈	61 ³ / ₁₆	48.0	2.4	1,540
FA-0806	45.1	16,000	21,500	102 ⁵ / ₈	72	57.6	2.9	1,740
FA-1004	38.0	13,500	18,000	127 ⁷ / ₈	50 ³ / ₈	48.0	2.4	1,610
FA-1005	47.2	16,500	22,500	127 ⁷ / ₈	61 ³ / ₁₆	60.0	3.0	1,830
FA-1006	56.4	19,500	27,000	127 ⁷ / ₈	72	72.0	3.6	2,055
FA-1204	45.6	16,000	21,500	153 ¹ / ₈	50 ³ / ₈	57.6	2.9	1,900
FA-1205	56.6	20,000	27,000	153 ¹ / ₈	61 ³ / ₁₆	72.0	3.6	2,165
FA-1206	67.7	23,500	32,000	153 ¹ / ₈	72	86.4	4.3	2,430

(1) MIL-STD-282, DOP Smoke Penetration Test Method
 (2) Capacities may be rounded to the nearest 500 cfm

(3) Based on 40psi water pressure. Typical wash cycle is 4 min.

(4) Total system net weight

PowerClean Side Access Electrostatic Precipitator



PLC Control
automatic or manual operation



30 Gallon Detergent Dispenser
liquid level sensor and flow control valve



System Accessories
solenoid valve, backflow preventer, Y-strainer and ball valve



Conforms to ANSI/UL
STD 867 for Electro-
static Air Cleaners



Model SA-0604
metal mesh prefilters removed

System Description

PowerClean Side Access Model (SA) is a factory packaged system including side access housing with upstream and downstream flanges, integral wash system, pre and post mist eliminators, electronic collectors, system control, detergent dispenser, and accessories. The factory assembled system is designed for mating to air handlers and ventilation systems or as a stand alone unit with matching blower.

Options

Odor/Gas Phase Control - TechSorb HMZD, bonded, activated carbon panels for molecular contamination control. The TechSorb is contained in a separate housing which bolts to the exhaust side of the Model SA. The panels are arranged in a V Bank configuration using fully gasketed extruded aluminum tracks to eliminate air by-pass.

Blower - matching motor/blower combinations are available in a variety of styles to meet system air volume and static pressure requirements (consult factory).

System Accessories

Each PowerClean Model SA is furnished with the following standard accessories.

Wash water strainer.....	1 each
Ball valve.....	1 each
Backflow preventer.....	1 each
Solenoid valve.....	1 each
Detergent.....	55 gal

Utilities

Electrical

Standard: 120 Vac, 1 Ph, 60 Hz
Optional: 208-230, 460 Vac, 1 Ph, 50/60 Hz

Wash Water: (See Selection Table) gpm @ 40 psig

System Drain: Integral 3" FNPT

Agency Approval

Each PowerClean Side Access system is ETL listed, conforming to ANSI/UL 867 Standard for Electrostatic Air Cleaners.

PowerClean Side Access Electrostatic Precipitator

Model Number Development



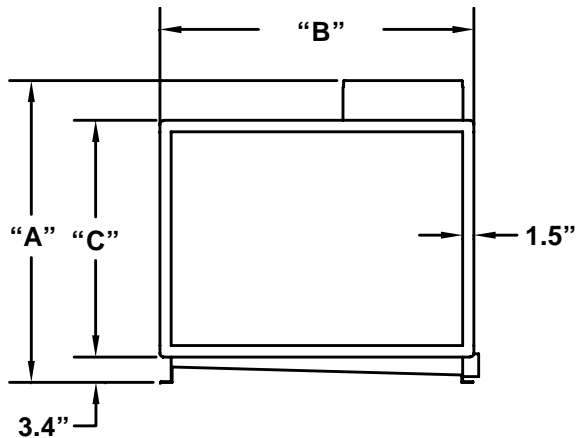
Side Access Nominal Height Nominal Width

Represents a PowerClean Side Access, Model SA-0203, nominally 2 ft. high x 3 ft. wide.

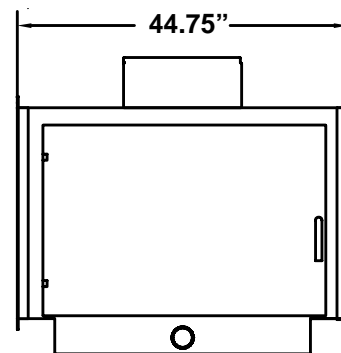
Unit Selection Guide

1. From the Size Selection Table below, select the Model SA with Air Volume and Dimensions that meet the required efficiency.
2. Two Model SA units of the same height may be arranged side-by-side to create a larger, multi-section unit. Specify one unit with left hand and one unit with right hand access doors.
3. Each Model SA is shipped complete with the System Accessories, as shown on Page 4.

Size Selection Table



Inlet Elevation



Access Side Elevation

Model	Face Area(ft ²)	Air Volume (cfm) (1,2)Efficiency		Dimensions (in)			(3)Wash Cycle		(4)Wt (lb)
		95%	90%	Overall A	Inlet/Outlet B	C	Water gpm	Detergent gal	
SA-0203	5.6	2,000	2,500	40 1/4	41 7/8	31 1/2	7.2	0.4	510
SA-0204	7.6	2,500	3,500	40 1/4	54 3/8	31 1/2	9.6	0.5	570
SA-0205	9.4	3,500	4,500	40 1/4	65 1/8	31 1/2	12.0	0.6	650
SA-0206	11.3	4,000	5,500	40 1/4	76	31 1/2	14.4	0.7	785
SA-0403	11.3	4,000	5,500	64 1/8	41 7/8	55 3/8	14.4	0.7	710
SA-0404	15.2	5,500	7,000	64 1/8	54 3/8	55 3/8	19.2	1.0	810
SA-0405	18.9	6,500	9,000	64 1/8	65 1/8	55 3/8	24.0	1.2	930
SA-0406	22.6	8,000	10,500	64 1/8	76	55 3/8	28.8	1.4	1,110
SA-0407	26.4	9,000	12,500	64 1/8	88 5/8	55 3/8	33.6	1.7	1,225
SA-0408	30.0	10,500	14,500	64 1/8	99 3/8	55 3/8	38.4	1.9	1,335
SA-0409	33.8	12,000	16,000	64 1/8	110 1/8	55 3/8	43.2	2.2	1,445
SA-0603	16.9	6,000	8,000	88	41 7/8	79 1/4	21.6	1.1	860
SA-0604	22.8	8,000	11,000	88	54 3/8	79 1/4	28.8	1.4	1,100
SA-0605	28.3	10,000	13,500	88	65 1/8	79 1/4	36.0	1.8	1,180
SA-0606	33.8	12,000	16,000	88	76	79 1/4	43.2	2.2	1,315
SA-0607	39.6	14,000	19,000	88	88 5/8	79 1/4	50.4	2.5	1,500
SA-0608	45.0	16,000	21,500	88	99 3/8	79 1/4	57.6	2.9	1,685
SA-0609	50.8	18,000	24,000	88	110 1/8	79 1/4	64.8	3.2	1,860

(1) MIL-STD-282, DOP Smoke Penetration Test Method

(2) Capacities may be rounded to nearest 500 cfm

(3) Based on 40psi water pressure. Typical wash cycle is 4 mins.

(4) Total system net weight

PowerClean Electrostatic Precipitator Engineering Specifications

A. General

The electrostatic precipitator (ESP) shall be the two stage, dual voltage, plate type, sized to clean the airflow capacities scheduled on the Contract Documents at an efficiency of (specify %) when tested per MIL-STD-282, DOP Smoke Penetration Method. ESP shall be furnished with built-in high pressure, low volume water/detergent washing system and programmable logic control for complete automatic operation.

B. Configuration (Select B.1 or B.2)

B.1 The ESP shall be furnished in a side access housing, fabricated from 16 gage galvanized steel, continuously welded, primed and painted. The housing shall be furnished with gasketed, hinged access door with safety electrical interlock, flanged inlet/outlet collars, built-in cleaning system and sloped bottom drain pan. The housing shall be tracked for and furnished with aluminum pre and post mist eliminators and ionizing-collecting cells.

B.2 The ESP shall be front/rear access, furnished using prefabricated, galvanized framework designed to contain ionizing-collecting cells and wash system. All frame sub-assemblies shall be match marked and prepared for bolted field assembly. Base support framework shall be stainless steel. All necessary fasteners and fittings shall be furnished. Framing shall be designed for cell removal either upstream or downstream and pre-punched air by-pass baffles shall be provided for the upstream side. The foundation supporting the framework, including drains and specified opening shall be prepared by the Contractor in accordance with the manufacturer's recommendation and written instructions.

C. Ionizer-Collector Cells

Ionizing-collecting cells shall be of industrial design integrity and single unit construction. The cells shall be all aluminum construction except the ionizing electrode shall be of the rigid stainless steel type. Repelling and collecting plates shall be positively retained in place using tie rod and tubular spacer design. High voltage insulators shall be molded from structural, self-glazing ceramic; shall contain no appurtenances; shall be of radial and bilateral symmetry; and shall contain no high voltage penetrations.

D. Built-in Cleaning System

Water/detergent washing system shall be high pressure, low volume type. Detergent, wash and rinse water shall be applied by oscillating copper manifolds containing

brass spray nozzles, located on both the air entering and air leaving side of each cell tier. Complete, effective washing of all ionizing-collector cell surfaces and all appurtenances shall be provided. Drive motors, used to oscillate the manifolds, shall be high torque, gear reduced, totally enclosed fan cooled type, and be permanently lubricated. Drive linkage shall be the rigid, positively fastened type without tracks or sprockets.

One detergent dispensing assembly shall be provided to serve each ESP. The detergent dispenser shall consist of a (specify 30 or 55) gallon anti-corrosive reservoir, positive displacement pump, motor, and flow volume control valve.

Solenoid valve, strainer, backflow preventer, ball valve, and an initial supply of detergent shall be furnished by the ESP manufacturer.

E. Control and High Voltage Power Supplies

The ESP shall use a single remote-mounted control and power supply, each contained in NEMA 12 enclosures. The unit shall operate on 120 Vac, 1Ph, 60 Hz.

The control shall be the programmable logic (PLC) type, furnished in a NEMA 12 enclosure, preprogrammed to sequence the ESP through wash cycles at a schedule to be determined with the Owner. Integral electronic time clock with manual override shall be provided.

High voltage power supply, furnished in a NEMA 12 enclosure, shall be the high frequency, solid state type, supplying a dual voltage and current output specified by the ESP manufacturer. Power supply shall have a regulated input and output for line fluctuations of 10% and shall have a current limiting shutdown and restart feature.

The face panel of the enclosures shall contain indicators for electronic air cleaner control status (run, wash, etc.), individual power supply, primary circuit indicating light, monitoring instrumentation, and on-off switch.

F. Electrical Interlocks

Furnish duct door electrical interlocks, disconnect switch, and pilot light assembly. All access to ESP and high voltage power packs shall contain electrical safety interlocks which de-energize the primary power circuit prior to accessing high voltage.

Flanders AirSeal

1112 Staffordshire Road
Stafford, TX 77477
Ph: (281) 499-9864
Fax: (281) 499-6060

Flanders AirSeal

201 Chatham Street
Sanford, NC 27330
Ph: (919) 718-5818
Fax: (919) 718-5819