AIR BOSS® ATS

Air Purification System

UL LISTED
EXHAUST FILTRATION SYSTEM

Qualified to UL Specification
YYXS-YYXS7
Hood and Duct Accessories

UL File #MH27669
New York City, Department of Buildings
MEA 288-01-E and 88-99-E

TRION®
air purification systems

ENGINEERED SOLUTIONS FOR CLEAN AIR

There are certain things you expect from an air purification system.

A perfect fit for your specific application…effectiveness… availability. For even more value, add a variety of applications and simplicity of operation. Back all these features up with substantial product and application expertise, superb technical services and unconditional support anywhere, anytime, and you've got the first name in air purification systems: Trion.

Since 1947, Trion has combined the leading-edge technology you expect with the value-added services you want to provide unique, effective air purification solutions for numerous applications in industrial and commercial markets.

Numerous applications. One solution.

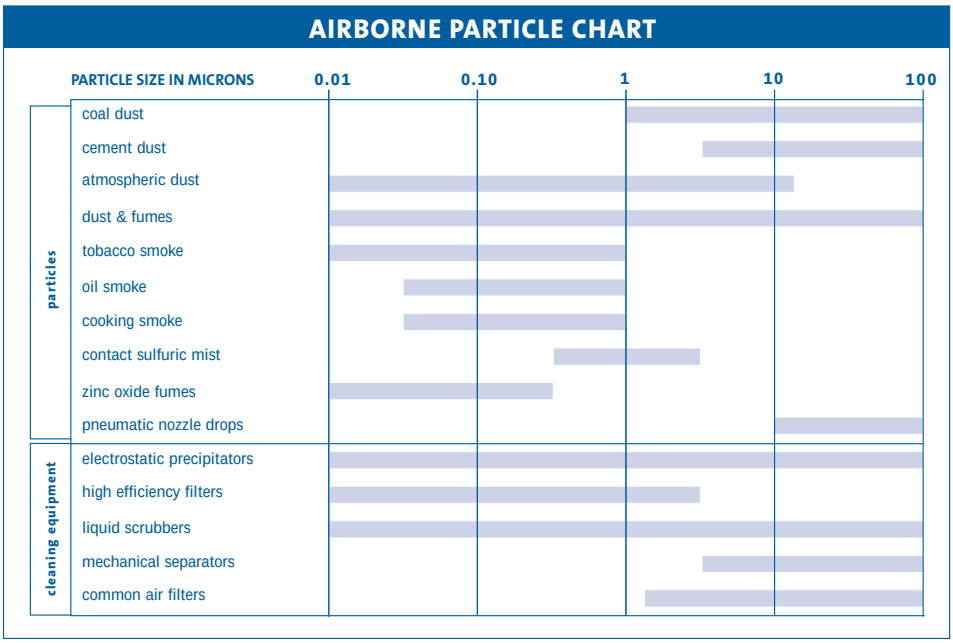
When you need one system for cleaning numerous applications, such as kitchen grease and smoke, oil mist, and contaminants from other industrial processes, Trion has the kitchen exhaust, commercial and large industrial solutions just for you.

Atmospheric contaminants may be either liquids or solids, in the form of oil, water, grease, smoke, fumes, dusts or similar particulate including gaseous and vaporous odors. The ATS units readily adapt to the various air collection methods utilized to recover contaminant for collection. Air inlet and outlet flanges on the modules include predrilled holes to connect adjoining duct work. Module support rails are included for multiple mounting methods.

With your unique needs in mind, the Trion ATS design utilizes five individual sections, each with specific air treatment tasks that are preselected, then factory assembled to form a compact, inline, drop-in unit. The modules and their basic functions include:

MODULE NAME	NORMAL FUNCTION
Prefilter/Impinger	Mist Eliminator/Grease Extraction
ESP-Electrostatic Precipitator	High-efficiency Primary Filtering Device
Media	Secondary or Backup Filter
Adsorber	Odor Control and Removal of Gases
Blower	System Air Mover

Characteristics of Particles and Particle Dispersoids



Air Boss® ATS features factory assembled, inline, compact construction.

AIR BOSS® ATS Features

Feature/Benefits

- Customized for specific applications
- Effective on airborne solids, liquids and odors
- Available in various capacity ranges
- Factory assembled, built-up construction
- Integral automatic cleaning system
- Optional fire suppression system
- ETL listed
- Designed for: simplified installation, ease in service, NFPA 96 standards

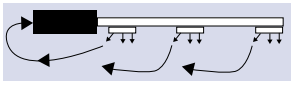
ATS Applications

Oil Mist:	Smoke:	Kitchen Exhaust:	HVAC:
Machine Shops	Welding	Grease	Clean Rooms
Cold Heading	Presses/Forging	Smoke	Return Air
Screw Machines	Curing	Odors	Outside/Makeup Air
Foundry	Rubber Manufacturing	Wood-fired Cookers	Lounges
Presses	Plasticisers		Bars
Machining Centers	Heat Treating		Smoking Rooms
Heat Treating			Casinos
Tenter Frames			Indoor Gun Ranges

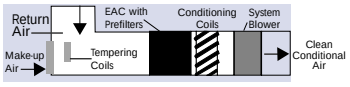
- **Trion Quality** — The same high quality that Trion provides on ALL of the US Navy submarine fleet since 1947 as a sole supplier of air cleaning equipment to the world's navies.
- **NFPA Qualified** — Designed to NFPA 96 standards for kitchen exhaust.
- **ETL Listed** — ETL approved to UL standard 867.
- **Sectional Design** — Built-up design allows units to be tailored to your exact requirements.
- **Smoke and Odor Control** — Components effectively remove both liquid and solid particulate, as well as gas and odor.
- **Complete System Design** — One central system to effectively treat virtually any application for kitchen or industrial exhaust air.
- **High Efficiency Cleaning** — Up to 99% efficient, per DOP or ASHRAE test methods.
- **Spiked Ionizer Design** — Eliminates common wire breakage and replacement, as seen in wire and other ionizer cell designs.
- **Heavy Duty Cell Design** — The most durable and efficient cell design on the market insures long term performance and reliability.
- **Automatic Cleaning** — Programmable Logic Controller (PLC) automates the cleaning process, which reduces maintenance costs and insures efficient air cleaning at all times.
- **Simple to Service** — Designed for easy serviceability from either side of cabinet, as specified.
- **Optional Fire Suppression** — Available on all systems to meet your specific requirements.
- **Ease of Installation** — System design makes installation simple and requires no field assembly. Just attach your ductwork, electrical connection and plumbing, and it's done.

Typical System Arrangements

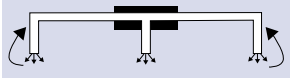
The ATS units readily adapt to the various air collection methods.

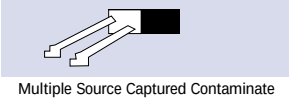

Fugitive Contaminate - Multiple Overhead Discharge through Cental Trunk Line

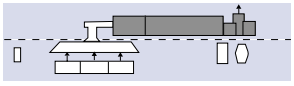

Multiple Source Captured Contaminate Hooded to Main Trunk Line



Central System


Fugitive Contaminate - Low Column Ducted Discharge


Multiple Source Captured Contaminate Hooded to Common Mixing Plenum


Kitchen Exhaust (Weatherproof)

DESIGN EFFICIENCIES AND OPERATIONAL RELIABILITY

Revolutionary Technology for the New Millennium

During operation, the contaminated air to be cleaned passes across Trion's unique spiked ionizer blades which are supported between flat grounded electrodes. Revolutionary to the industry, the blades are made of stainless steel that will not rust or break, thus eliminating costly maintenance time and replacement costs.

The DC voltage supplied to the blades creates a high intensity field where the particulate matter in the air becomes electrically charged. The charged particles then pass into a collector plate section made up of a series of equally spaced parallel plates. Each alternate plate is charged with the same polarity as the particles, which repel, while the interleaving plates are grounded, which attract and collect.

Periodically, depending on the type and amount, the contaminant is washed into the cabinet drain basin by an automatic activated integral washing system that is located on both the upstream and downstream sides of the ionizing-collecting cell(s). "U" shaped slide rails are positioned on the air entrance and exit sides of the module housing. These rails will hold two-inch metal mesh filter panels or a 40% open perforated plate. The selection depends on the nature of the contaminant and the other modules used in the air treatment system.

A programmable logic controller (PLC) and dual voltage solid-state Pulse Width Modulated (PWM) high voltage DC power supply are housed in a remote-mounted NEMA 12 enclosure. The PLC controls the system functions of wash, fire suppression, and fan on/off. A 7-day clock is standard. The PWM power supply, which energizes the ionizing-collecting cells, comes standard with LED indicator lights. Optional door-mounted meters, which aid in determining cell operating status, are also available.

In applications requiring extremely high collection efficiency and low resistance to air flow, two or three electrostatic sections may be placed inline to create a double or triple pass unit.

Durable, compact cabinetry

When you invest in a Trion ATS, you want it not only to fit your unique needs, but your individual space as well. And you want it to last. Trion ATS housings are constructed using 16-gauge zinc-coated steel. Then all welds and the finished area of welds are treated with a corrosion- and rust-inhibiting coating to assure long life. Cabinet finish is completed with a durable industrial-grade semi-gloss baked-on enamel no less than 3 mil thick. All doors are gasketed to prevent air and water leakage. Finally, the housing is furnished completely assembled for easy shipment and installation.

The Impinger Module

The impinger module is an optional part of the ATS system design. A 2" rail is positioned upstream of the impinger panel to accommodate a standard 40% free area perforated panel for heavy, fluid or semi-fluid particulate matter or a metal mesh prefilter for light oil mist. It also allows for even, dry air distribution through the filtering sections. The particulate matter may range in viscosity from that of water to relatively heavy greases. In heavy loading applications, the liquid particles strike the impinger, coalesce into droplets and then flow to the drain pan below, thus eliminating problems with evaporation. If the particles are of a high viscosity nature that do not readily flow into the drain pan, they are periodically flushed down the drain with the integral wash system nozzles located upstream and downstream of the impinger panel.

The Electrostatic Air Cleaner Module

Electrostatic Air Cleaner Section enables extremely small particulate matter, "The Fines," to be removed from an air stream with relatively no resistance to air flow. This is due to the open area of the collecting elements. The low resistance is maintained from the start to the completion of the collection cycle. The unit operates in the higher efficiency collection range, upward of 95% DOP Method, on particles ranging in size from 10 Microns down to 0.01 Microns in size.

Media Module (optional)

The flexibility of the media module provides an efficient means for high efficiency filtration, as a prefilter or afterfilter, depending on your requirement. This section is designed to house a variety of mechanical filters that may be required in your application. The housing allows for various filter combinations that are tailored to your specific needs, such as HEPAs, 95% bags, mini-pleated cartridges or other media. The heavy-gauge access housings are supplied with industrial-grade hardware.

Adsorber Module (optional)

Unlike particulate filters, odors in the form of undesirable gases and vapors are most commonly removed from the air stream by the process of adsorption that is enhanced by multi-faceted porous surfaces of certain materials. Filter trays of activated carbon or optional potassium permanganate pellets effectively facilitate the adsorption of these odors and gaseous contaminants.

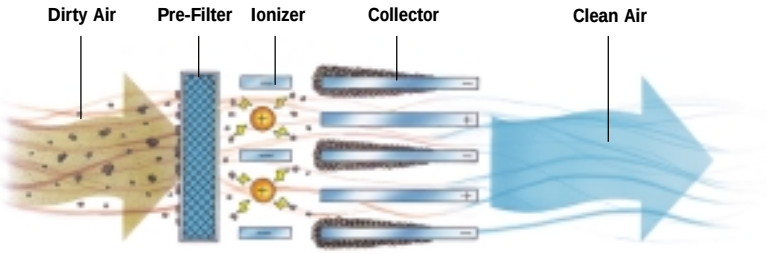
Standard Blower Module Package

The energy-efficient, backward-inclined blower, powered by a TEFC motor, is designed for horizontal air flow and mates with the air purification system to provide a uniform distribution of air. The bolted rear panel provides service access. Air discharge screen and rain guard are available as options. The blower wheel is steel, backward-inclined, all-welded construction.

Optional UpBlast Blower

The NFPA 96 UpBlast fan is designed to mate with the air purification system and provide uniform air distribution. It is a centrifugal upblast exhaust fan, with drain, in compliance with UL 762 for kitchen exhaust applications containing grease-laden air. The blower wheel is steel, backward inclined, all welded construction.

Principle of Operation



Electronic Air Cleaning

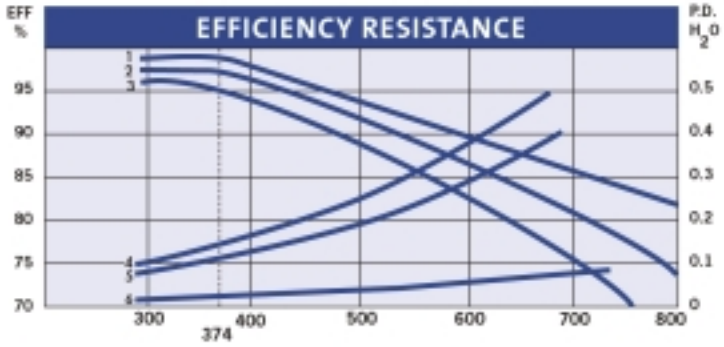
AIR VELOCITY FEET PER MINUTE

Efficiency-Curves 1, 2 and 3

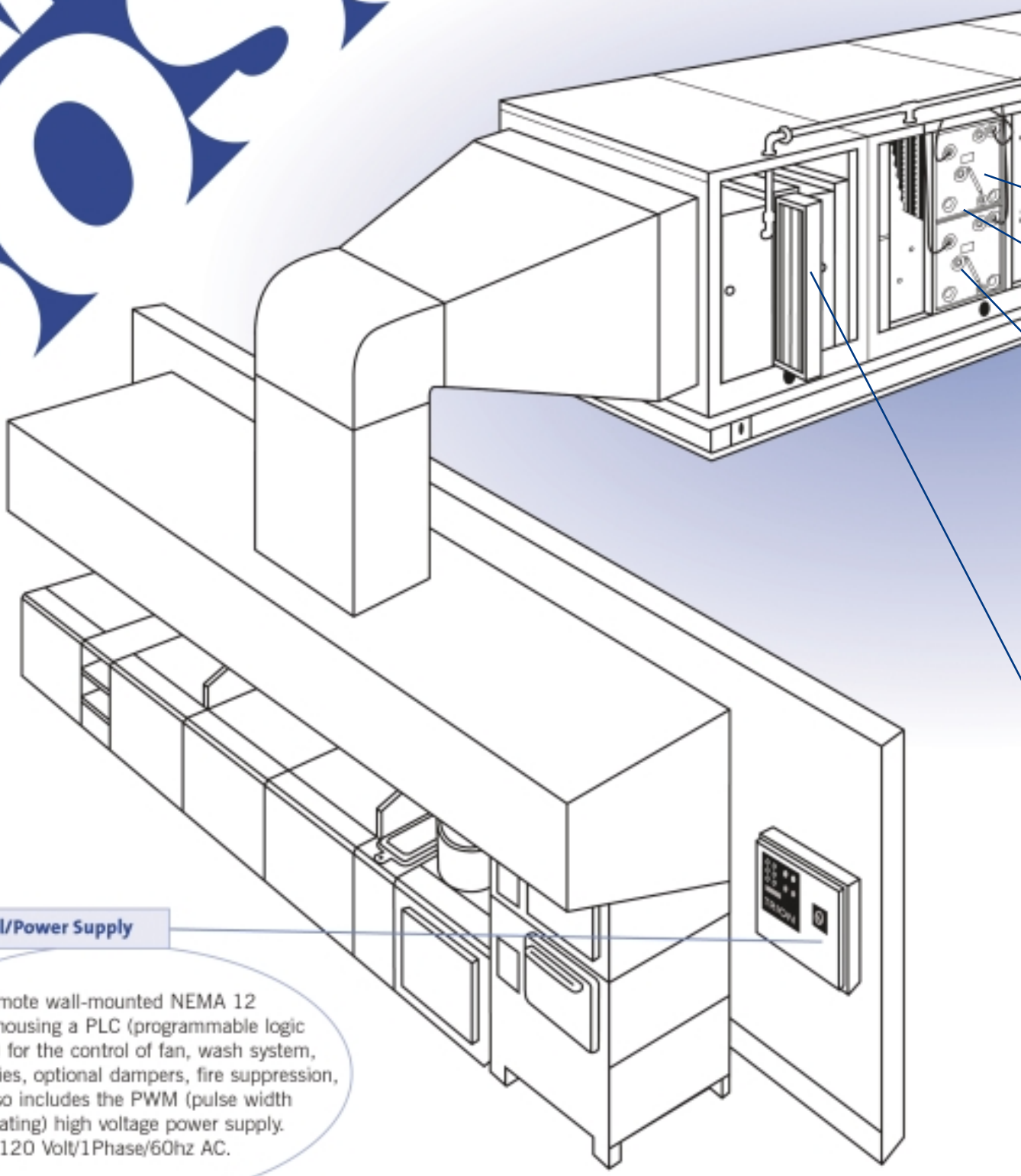
1. Overall DOP (Dioctylphthalate) efficiency using 10 Stage Cascade Impactor
2. ASHRAE Standard 52 Dust Spot Test Method Atmospheric Air
3. 0.3 Micron DOP efficiency using 10 Stage Cascade Impactor

Pressure Drop Across Unit-Curves 4, 5 and 6

4. Cell with 40% open perforated plate, front and rear
5. Cell with 1” metal mesh filter, front and rear
6. Cell only



AIR BOSS®



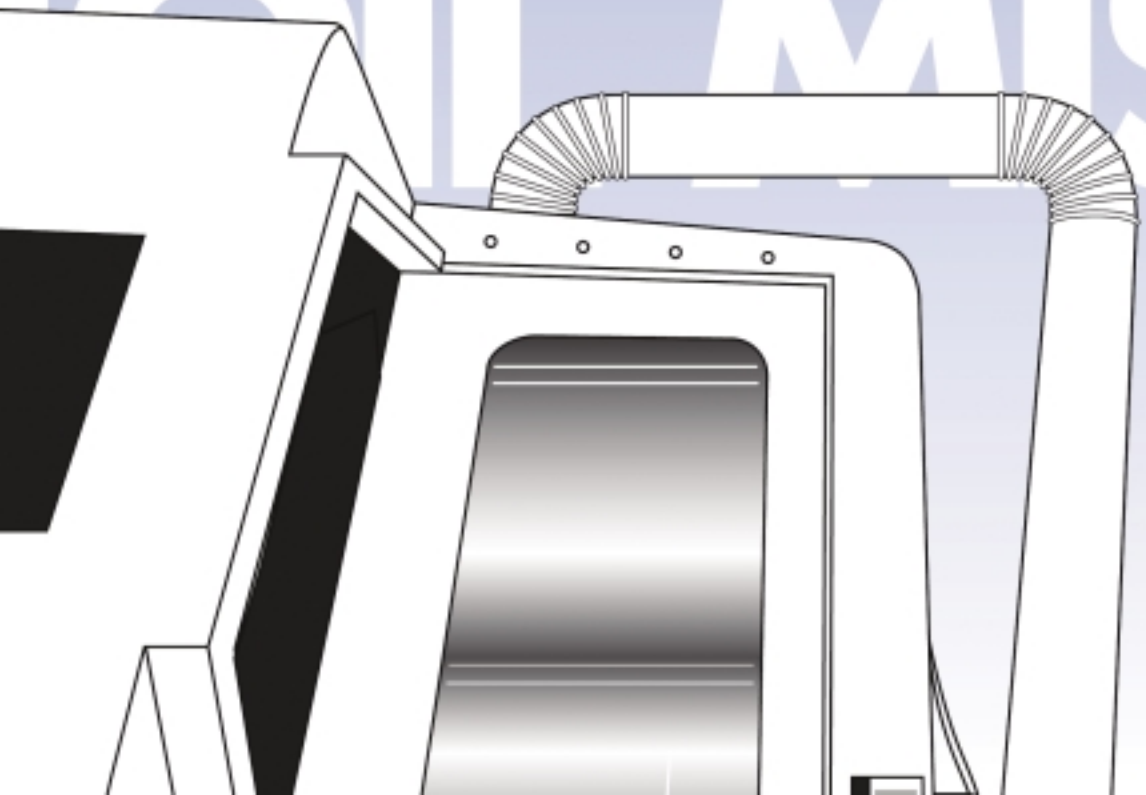
Control/Power Supply

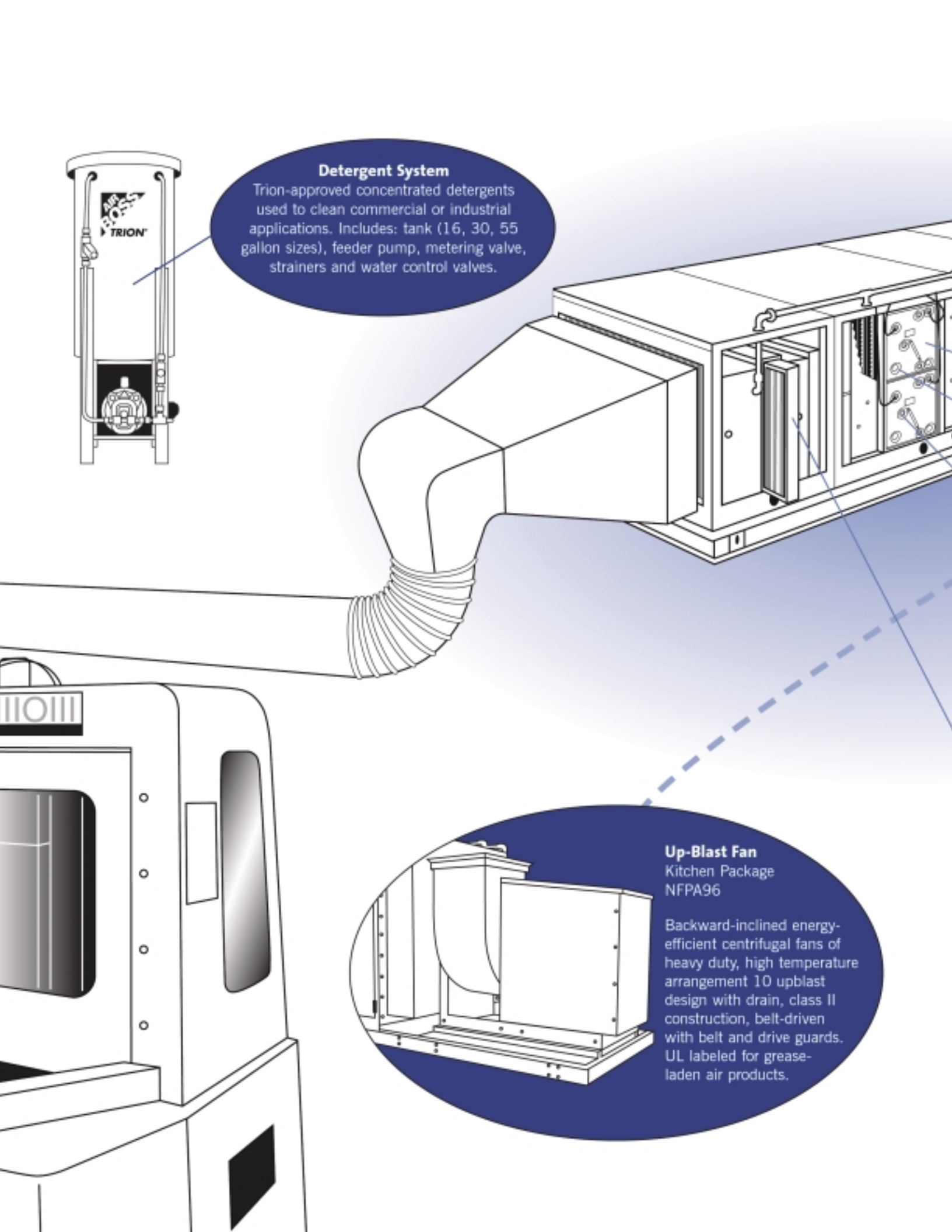
Remote wall-mounted NEMA 12 cabinet housing a PLC (programmable logic controller) for the control of fan, wash system, power supplies, optional dampers, fire suppression, etc. Also includes the PWM (pulse width modulating) high voltage power supply. 120 Volt/1Phase/60hz AC.

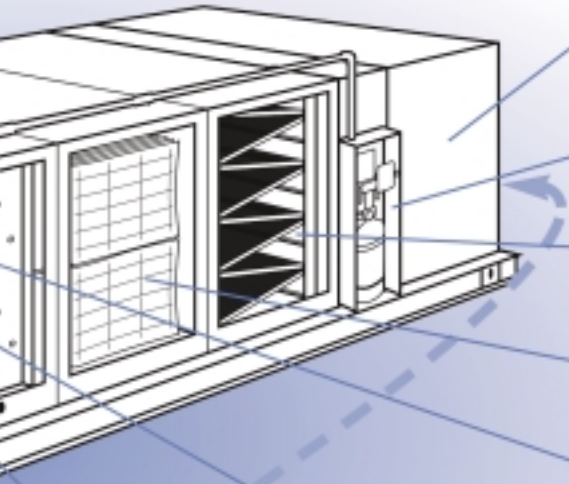
Kitchen Hood Exhaust (Smoke, Grease, Odors)

DUST
SMOKE
OIL MIST

AIR BOSS®




TRION
Detergent System
Trion-approved concentrated detergents used to clean commercial or industrial applications. Includes: tank (16, 30, 55 gallon sizes), feeder pump, metering valve, strainers and water control valves.
Up-Blast Fan
Kitchen Package
NFPA96
Backward-inclined energy-efficient centrifugal fans of heavy duty, high temperature arrangement 10 upblast design with drain, class II construction, belt-driven with belt and drive guards. UL labeled for grease-laden air products.



Fan Package-Standard

Backward-inclined, energy-efficient centrifugal fans of heavy duty AMCA arrangement 9 inline or arrangement 10 upblast design, class II construction, belt-driven with belt and drive guards.

Fire Suppression Option

Weather-tight enclosure includes ADP-S nozzles for the impinger section and electronic air cleaner section.

Adsorber Module

Activated carbon or optional potassium permanganate pellets for gaseous odor adsorption.

Media Module

Designed to house a variety of mechanical filters as required for a specific application or to insure extended life of the adsorption media.

Spiked Ionizer Blade

Revolutionary technology made of stainless steel blades, not wires. Reliable, unbreakable blades eliminate costly maintenance replacement and downtime.

Ionizing-Collecting Cell

High efficiency multi-stage collection cell, designed to maintain high efficiency under heavy loads.

High-Voltage Stand-Off Insulators

Made of self-glazing ceramic, insulates electrical current; helps to prevent and virtually eliminate arcing; prolongs power supply, life span; and aids in maintaining high efficiency. Prevents tracking, retards contaminant build-up and provides easy cleaning.

Prefilter/Impinger Module

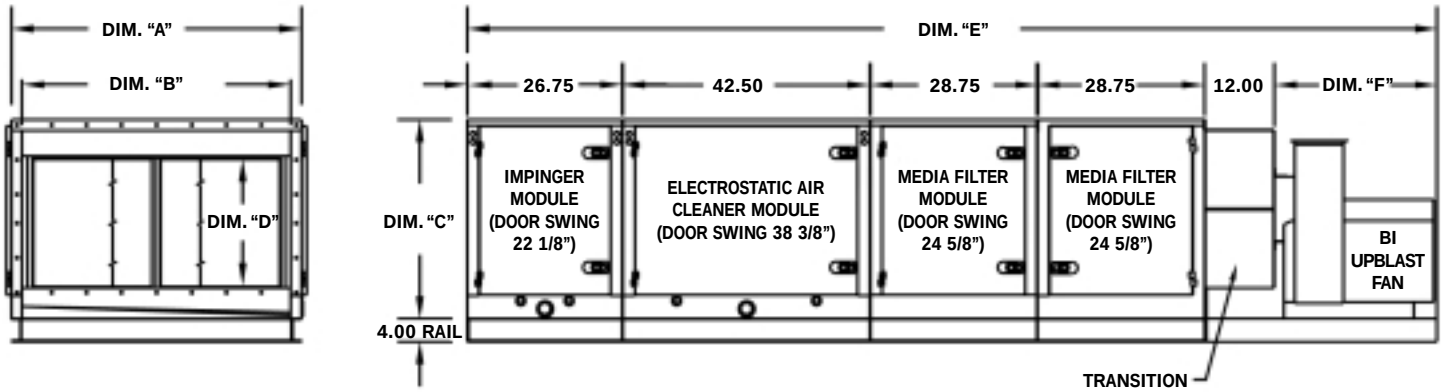
Metal mesh or perforated plate prefilter for safety and capture of oversize objects and agglomerated mists. Impinger may be used to knock down heavy mists and kitchen grease.

ATS

AIR PURIFICATION SYSTEMS

ATS Series for Industrial Applications and Kitchen Hood Exhaust Systems

ATS DIMENSIONAL DATA



SYSTEM (CFM)	MODULE DESIGNATION	MODULE SP @ RATED CFM	MODULE WIDTH DIM. "A"	INSIDE FLANGE ID DIM. "B"	UNIT HEIGHT DIM. "C"	INSIDE FLANGE ID DIM "D"	SYSTEM DEPTH DIM "E"	BLOWER DEPTH DIM "F"	MODULE WEIGHT (LBS)	SYSTEM WEIGHT (LBS)	AVG. WATER REQUIRED CPM/WASH @50 PSI	CELL FACE AREA (FT2)	DETERGENT PER CYCLE (GAL)
ATS-2 1,375 TO 2,000	IMPINGER ELECTROSTATIC MEDIA ADSORBER BLOWER	1.33" 0.39" 0.44" 0.25" -- (TOTAL SP 2.41")	27.96	24.25	34.25	27.19	174.25	35.00	175 320 115 315 270	1330	4.0 4.0 -- -- --	3.68	.20
ATS-4 2,750 TO 4,000	IMPINGER ELECTROSTATIC MEDIA ADSORBER BLOWER	1.33" 0.39" 0.44" 0.25" -- (TOTAL SP 2.41")	50.00	46.38	34.25	27.19	176.25 TO 183.25	37.00 TO 44.00	235 480 150 550 420	2050	9.3 9.3 -- -- --	7.37	.40
ATS-6 4,125 TO 6,000	IMPINGER ELECTROSTATIC MEDIA ADSORBER BLOWER	1.33" 0.39" 0.44" 0.25" -- (TOTAL SP 2.41")	72.38	68.75	34.25	27.19	179.25 TO 186.75	40.00 TO 47.50	295 640 185 785 535	2700	14.6 14.6 -- -- --	11.06	.63
ATS-8 5,500 TO 8,000	IMPINGER ELECTROSTATIC MEDIA ADSORBER BLOWER	1.33" 0.39" 0.44" 0.25" -- (TOTAL SP 2.41")	50.00	46.38	58.63	51.56	186.75 TO 190.25	47.50 TO 51.00	390 780 270 1070 675	3400	18.6 18.6 -- -- --	14.74	.91
ATS-10 6,890 TO 10,000	IMPINGER ELECTROSTATIC MEDIA ADSORBER BLOWER	1.33" 0.39" 0.44" 0.25" -- (TOTAL SP 2.41")	61.18	57.56	58.63	51.56	190.25 TO 193.25	51.00 TO 54.00	460 893 305 1297 770	3900	24.0 24.0 -- -- --	18.45	1.20
ATS-12 8,250 TO 12,000	IMPINGER ELECTROSTATIC MEDIA ADSORBER BLOWER	1.33" 0.39" 0.44" 0.25" -- (TOTAL SP 2.41")	72.38	68.75	58.63	51.56	190.75 TO 198.25	51.50 TO 59.00	520 1010 345 1545 870	4450	29.3 29.3 -- -- --	22.12	1.40

(1) DIMENSIONS SHOWN IN INCHES

(2) SYSTEM DEPTH AS SHOWN TO THE SUM OF ALL MODULE, TRANSITION & FAN DEPTHS AND 1/8" GASKET ALLOWANCE BETWEEN EACH MODULE.

(3) SYSTEM WEIGHT EQUAL TO THE SUM OF ALL MODULE WEIGHTS AND MOUNTING RAIL.

(4) IMPINGER MODULE AND ELECTROSTATIC MODULE SUPPLIED WITH (2) 1" WASH WATER SUPPLY COUPINGS AND (1) 2" DRAIN COUPLING.

(5) MODULE ACCESS DOORS LOCATED ON ONE SIDE. (LIFT-OFF HINGES) SPECIFY ACCESS REQUIRED.

Size Capacity Data

EFFICIENCY	DOP CFM CAPACITY		ASHRAE CFM CAPACITY	
	95%	**90%**	**95%**	**90%**
ATS-2	1,375	1,500	1,600	2,000
ATS-4	2,750	3,000	3,200	4,000
ATS-6	4,125	4,500	4,800	6,000
ATS-8	5,500	6,000	6,400	8,000
ATS-10	6,890	7,500	8,000	10,000
ATS-12	8,250	9,000	9,600	12,000
Face Velocity	374 fpm	406 fpm	433 fpm	540 fpm

Static Pressure Drops

TRION EQUIPMENT LOSSES INCHES H_20	
ESP Section	0.14”
40% open perforated prefilter or after filter	0.15”
Metal mesh prefilter or after filter	0.10”
2” impinger	1.25”
Media Section	0.11”
	Initial Final
4” pleated prefilter, 40% efficient	0.17” - 1.00”
10 pocket bag, 95% efficient	0.40” - 1.20”
HEPA, 99.97% efficient	1.00” - 1.50”
Adsorber Section	0.28”
1” trays	0.26”
2” trays	0.28”
4” modules	0.36”
Fan Transition	0.11”

The ESP section must have both an internal prefilter and after filter, select and add for each.

External losses for ductwork, exhaust hoods, manufacturing equipment with associated entry losses, kitchen hoods, etc., must be added with the above Trion internal equipment losses to calculate total fan static pressure required.

TRION HISTORY

Providing Clean, Comfortable & Safe IAQ Solutions for More Than Half a Century

Since 1947, Trion has manufactured quality products for the commercial, industrial, residential, and military markets. All Trion products are engineered specifically to provide a clean, safe and comfortable indoor air environment. Trion's success has been driven by the dependable performance and superior quality of our products, as well as by our excellent customer service.

Trion's technical expertise allows us to create innovative products and cost-effective, environmentally sound solutions that solve the air cleaning problems of our worldwide customer base. Our products can be found in homes, offices, factories, clubs, hospitals and sea vessels.

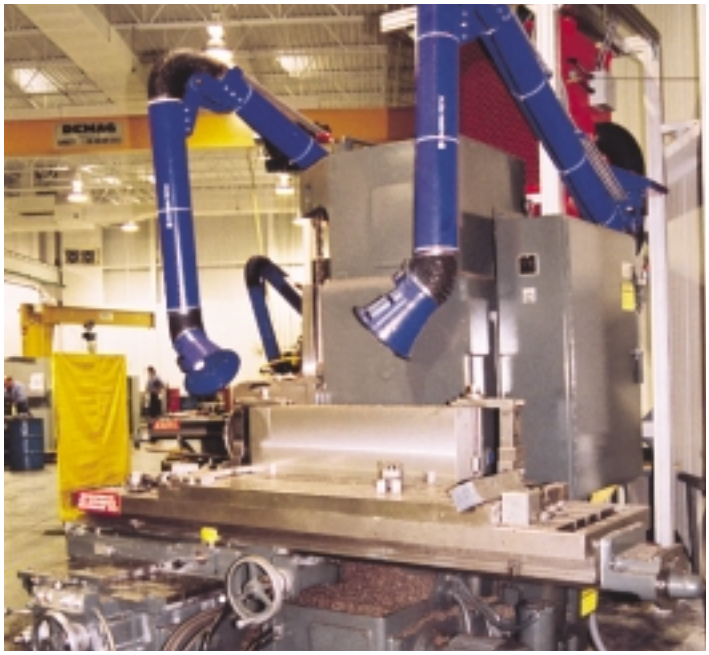
Headquartered in Sanford, North Carolina, Trion manufactures products in a dedicated 263,000 square-foot plant. Trion UK's European, Middle East and Far East operations are based in Andover, Hampshire in the United Kingdom.

Trion Deutschland GmbH, formed in 1984, is responsible for serving markets in Central and Eastern Europe.

In 1996, Trion purchased Herrmidifier, a well-known manufacturer of humidification products for use in a variety of commercial, residential and industrial settings.

Trion is part of Fedders Indoor Air Quality, which opened its first Asian manufacturing facility in Suzhou, China, in August 2002.

Today, and in the future, Trion will continue to develop innovative air cleaning solutions that meet the demands of our customers throughout the world .



Notes

Corporate headquarters in Sanford, North Carolina

Creating the Right Climate for You to Do Business

Trion products have provided solutions to indoor air quality problems for more than 50 years. Products marketed under the Trion brand are part of Fedders Indoor Air Quality division of Fedders Corporation (NYSE:FJC), a leading global manufacturer and marketer of air treatment products. Trion is a registered trademark of Trion, Inc.

TRION
air purification systems

FEDDERS INDOOR AIR QUALITY SOLUTIONS

Form No. 02-0390

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Phone: 800-884-0002 · **Fax:** 800-458-2379 · **www**.trioninc.com · **email:** sales@trioninc.com

TRION AIR BOSS Air Treatment System (ATS) - *Price Data - Effective May 1, 2006*

Unit Size and Module Data

Components	ATS 2		ATS 4		ATS 6		ATS 8		ATS 10		ATS 12	
	Price	Weight-lbs	Price	Weight-lbs	Price	Weight-lbs	Price	Weight-lbs	Price	Weight-lbs	Price	Weight-lbs
ESP Section	$12,845	320	$14,388	480	$15,959	640	$17,864	780	$19,993	893	$20,158	1010
Media Section	$3,538	115	$3,458	150	$4,388	185	$4,323	270	$5,133	305	$5,190	345
Adsorber Section	$6,393	215	$7,699	365	$10,634	515	$11,736	540	$16,990	675	$16,818	835
UL762-NFPA Blower 4.5" Tot.S.P.	$4,388	270	5,221	420	$5,597	535	$6,881	675	$7,513	770	$8,222	870
FAN HP	2 HP		5 HP		7.5 HP		7.5 HP		10 HP		10 HP	
ATS Controller	$5,405	107	$5,405	107	6,220	111	$6,221	111	$6,221	111	$7,037	115
System Accessories	$3,401	359	$3,401	359	3,401	359	$3,489	359	$3,489	359	$3,489	359
Complete Unit Price	$ 35,970	1386	$39,572	1881	$46,199	2345	$50,515	2735	$59,339	3113	$60,914	3534

Options and Accesssories - Add to Base Price Above

Fire Suppression	$7,932	75	$7,932	75	$7,932	75	$8,167	100	$8,167	100	$8,167	100
ANSUL Pre-piped Only	$6,492	10	$6,492	10	$6,492	10	$6,492	10	$6,492	10	$6,492	10
Air Boss Controller Adder	$2,652	113	$2,652	113	$2,652	117	$2,652	117	$2,652	117	$2,652	121

CFM Efficiencies - Specifications

See Note 1	95% DOP	90% DOP	95% DOP	90% DOP	95% DOP	90% DOP	95% DOP	90% DOP	95% DOP	90% DOP	95% DOP	90% DOP
CFM Capacity at efficiency shown	1075	1400	2150	2800	3500	4600	4300	5600	5650	7400	7000	9200
Sq.Ft. Cell Face Area	2.94 sq.ft.		5.88 sq.ft.		9.58 sq.ft.		11.76 sq.ft.		15.46 sq.ft.		19.16 sq.ft.	
Dimensions-(inches) Width x Height x Length	27.88 x 38.25 x 162.25		50.00 x 38.25 x 167.25		72.38 x 38.25 x 172.25		50.00 x 62.63 x 181.25		61.19 x 62.63 x 183.25		72.38 x 62.63 x 185.25	
Weight / Ship Weight	1386	1736	1881	2331	2345	2745	2735	3135	3113	3513	3534	3984

Note 1. UL762 Upblast fans are standard OEM finish. Contact factory for special painting.

Note 2. Contact factory for special fans other than UL762 specified.

Note 3. The standard ATS Control is supplied with a RED LED light, PLC, 7-Day clock and PWM power supplies. The optional Air Boss Control is supplied with automated digital meter display panel, PLC, 7-Day clock and PWM power supplies.

Note 4. The Fire Suppression components include enclosure assembly with electrical control head and chemical tank, ADP nozzles, detect-a-fire thermostats, and all pre-plumbed piping. All fire suppression systems must be connected and certified by an authorized fire suppression factory technician.

Note 5. Standard system accessories include 30 gallon detergent tank with initial 16 gallon of detergent, and 1 each 1" Y Strainer. The solenoid valves are pre-installed inside the cabinet of the ATS ESP and Impinger Modules.

TRION Air Boss Series - Replacement Parts - Effective May 1, 2006

Part Number	Item Description	Module Used On	Price EACH	Quantity Per Unit Size					
				ATS 2	ATS 4	ATS 6	ATS 8	ATS 10	ATS 12
346941-001	Sealed Lever Latch	ALL	$69.21	2 Per Door on each module					
346942-005	Nylon Lift Off Hinge	ALL	$10.81	2 Per Door on each module					
252956-001	Nitrile Gasket, per foot	ALL	$1.08	26'	26'	26'	34'	34'	34'
246901-008	Impinger, 2 ft	Impinger, ESP	$50.83	1	2	--	4	2	--
246901-010	Impinger, 3 ft	Impinger, ESP	$123.29	--	--	2	--	2	4
155041-001	Filter Clip (ESP Module)	Impinger, ESP, Media	$43.26	4	4	4	8	8	8
240550-005	Aluminum Mesh Filter 2 x 22 x 23.5	Impinger, ESP	$148.94	2	4	--	8	4	--
240550-007	Aluminum Mesh Filter 2 x 33.2 x 23.5	Impinger, ESP	$160.38	--	--	4	--	4	8
344601-102	Perforated Metal Baffle, 1.8 x 22.0 x 23.5	Impinger, ESP	$115.42	2	4	--	8	4	--
344601-103	Perforated Metal Baffle, 1.8 x 33.2 x 23.5	Impinger, ESP	$164.89	--	--	4	--	4	8
250487-001	High Voltage Wire Assy. Red (50 ft)	ESP	$56.19	50 ft Shipped Standard with each ESP section					
250487-002	High Voltage Wire Assy. Red/Black (50 ft)	ESP	$53.63	50 ft Shipped Standard with each ESP section					
156311-001	Multi-conductor Cable, 16ga., 8 wire	Impinger, ESP	$344.07	50 ft Shipped Standard with each ESP section					
346615-004	Bag Filter, 65%, 24 x 24 x 22 nom.	Media	$111.17	1	2	3	4	4	6
346615-005	Bag Filter, 65%, 24 x 12 x 22 nom.	Media	$79.43	--	--	--	--	2	--
346615-003	Bag Filter, 95%, 24 x 24 x 22 nom.	Media	$124.64	1	2	3	4	4	6
138093-001	Adsorber Panel 24 x 12 x 3/4 nom	Odor	$110.64	--	--	--	--	24	--
138093-002	Adsorber Panel 24 x 24 x 3/4 nom	Odor	$98.31	12	24	36	48	48	72
155680-001	Adsorber Panel 24 x 12 x 2" nom	Odor (option)	$187.37					16	
155680-002	Adsorber Panel 24 x 24 x 2" nom	Odor (option)	$69.48	8	16	24	32	32	48
450656-502	Nozzle, ADP	Impinger, ESP	$680.61	2	2	2	4	4	4
450656-101	Cylinder, 5 Quart (Fire Suppression)	Fire Suppression	$849.56	1	1	1	--	--	--
450656-102	Cylinder, 2-1/2 Gallon (Fire Suppression)	Fire Suppression	$1,831.75	--	--	--	1	1	1
448740-001	PWM Power Supply	Control	$3,202.32	1	1	2	2	2	4
422733-514N	Ionizing-Collecting Cell 2 ft	ESP	$4,185.40	1	2	--	4	2	--
422733-515N	Ionizing-Collecting Cell 3 ft	ESP	$184.82	--	--	2	--	2	4
155093-002	Proximity Sensor (Normally Open)	Impinger, ESP	$394.04	1 required for each ESP and Impinger Modules					
221095-004	Solenoid Valve - 1" NPT	Impinger, ESP	$394.04	2 required for each ESP and Impinger Modules					
248977-001	Manifold Gear Motor, 1/20HP, 120V/60Hz	Impinger, ESP	$559.39	2 required for each ESP and Impinger Modules					

AIR BOSS® MODEL 75 & ATS SERIES

Maintenance Quick Checks

Weekly

- Ensure detergent level is above fill line in wash tank; never allow detergent level to get below the Low Level Line. Use only concentrated detergent, TRIDEX ESP1000 - DO NOT DILUTE.
- Visually check power supply LED operation on control panel. *Continuous flickering lights indicate arcing in cells and troubleshooting/ service may be required.*
- Check to ensure unit is washing at specified time on the 7-day clock.

Monthly

- Ensure water pressure is 40-60 psi at full flow when unit is washing.
- Manually check complete wash cycle operation with control schematics.

Semi-Annually

- Remove and manually clean pre- and after-filters, ionizing/collecting cells and spiked ionizer tips. Cells must be completely dry before installing.
- Inspect wash nozzle spray pattern for clogged or missing nozzles.
- Inspect manifold drive motor, linkage and drain for proper operation.
- Inspect and replace carbon trays as required.
- Inspect and replace media/bag filters (if provided).
- Lubricate blower bearings (if provided).
- Remove and clean water line strainer.
- Inspect fire suppression system (if provided).

Annually

- Fire suppression system to be inspected and certified by responsible agency.

*NOTE: Refer to the **Operations & Service Manual** for detailed maintenance instructions and operating tips.*

TRION air purification systems
FEDDERS ENGINEERED PRODUCTS
101 McNeill Road · Sanford, NC 27330
Phone: 800-884-0002 · **Fax:** 800-458-2379 · **www.**trioninc.com · **email:** sales@trioninc.com

AIR BOSS® KES SERIES

Kitchen Exhaust Filtration System

TRION®
air purification systems

ENGINEERED SOLUTIONS FOR CLEAN AIR

Air Boss® KES Series, the Right Solution

Kitchen exhaust contains grease, smoke and odors, which can be filtered properly to help meet EPA, state and local air quality standards. With the Trion KES system, you'll be on good terms with both city inspectors and your commercial and residential neighbors.

The KES is a multi-stage, self-contained filtration unit that ensures maximum effectiveness through the use of:

1. An electrostatic precipitator

2. A 95% DOP media filter

3. Carbon modules for odor control

Applications

The KES is perfect for commercial and institutional kitchens in:

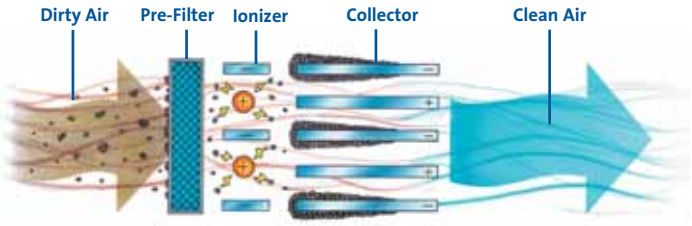
- **Restaurants**
- **Food Courts**
- **Hospitals**
- **Schools**
- **Sport & Entertainment Complexes**

Air Boss® KES Series Can Help You Achieve:

- High-efficiency at low, constant pressure drop
- Compliance with EPA, state and local air quality laws and regulations
- Cleaner, fresher kitchen exhaust that fosters "goodwill" with commercial and residential neighbors and with federal, state and local government agencies.

How Electrostatic Precipitators Work

As air enters the filter, the particles pass through a high intensity electrical field that imparts an electrical charge to the particles, which range in size from 0.01 micron to 10 microns. The charged particles pass through a series of alternately charged collector plates. Particles are repelled by plates with the same polarity and attracted to plates with opposite polarity — similar to how a powerful magnet works.



AIR BOSS® KES SERIES

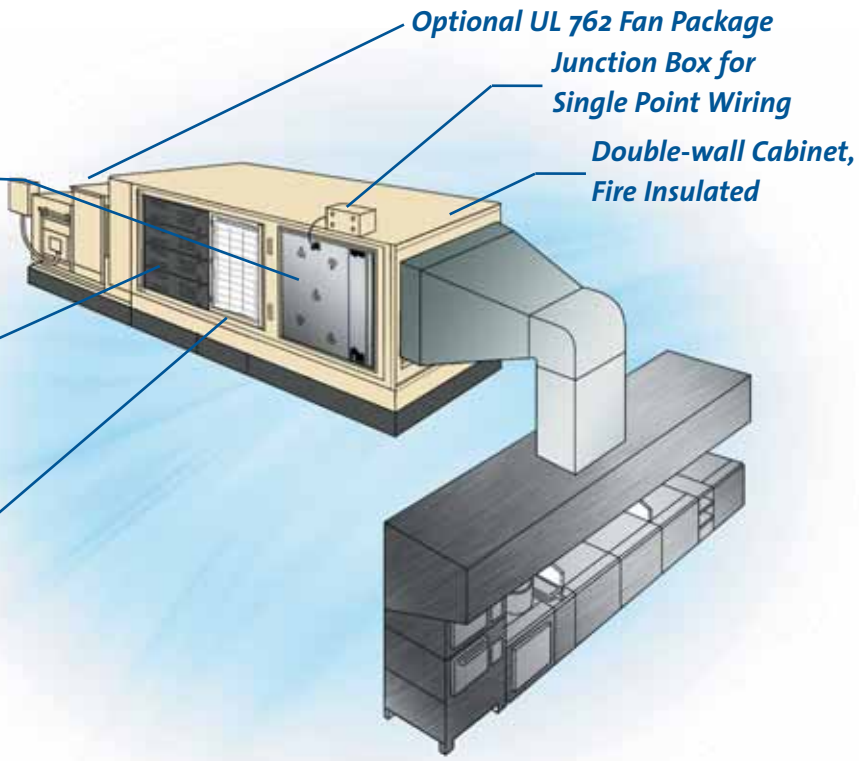
Trion: The First Name in Air Purification Systems

More than 50 years ago, Trion created the first air cleaner for the U.S. Navy submarine fleet. Since then, commercial and industrial businesses have depended on Trion's trusted and proven technologies. Trion is a division of Fedders Corporation (NYSE: FJC), a leading global manufacturer and marketer of air treatment products.

UL LISTED
EXHAUST FILTRATION SYSTEM
86 LF

Qualified to UL Specification YYXS-YYXS7
Hood and Duct Accessories

Air Boss® KES Series System Components



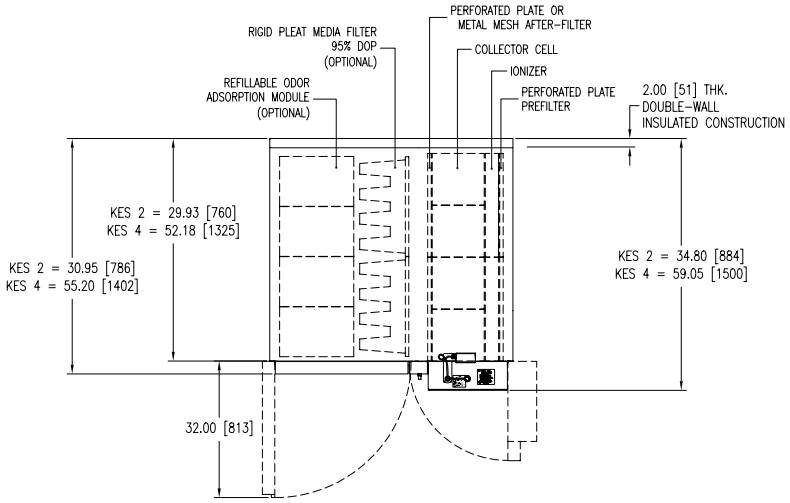
Electrostatic Section (1st Stage)
High efficiency two-stage collection components

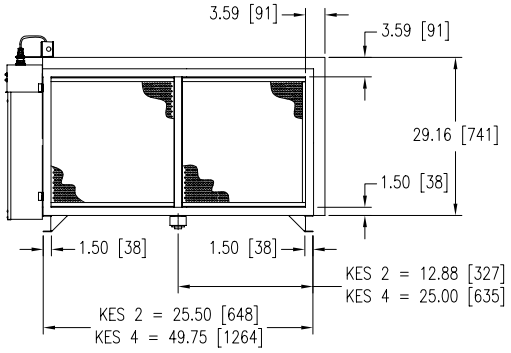
Optional
Adsorber Section (3rd Stage)
Activated carbon modules for gaseous odor adsorption

Optional
Media Section (2nd Stage)
95% DOP filter to help extend the life of the adsorption media

Optional
Fire Suppression System
(Not Shown)

AIR BOSS® KES Specifications



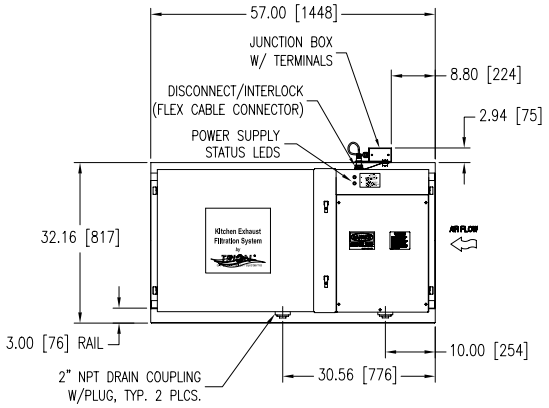


AIR BOSS® KES SERIES SPECIFICATIONS

INPUT VOLTAGE: 120/220VAC, 50/60HZ
CURRENT: 1.5 AMP MAX
OUTPUT VOLTAGE: 12.5 – 13.0 kVDC IONIZER
6.0 – 6.5 kVDC COLLECTOR
POWER SUPPLY: (1) PMW WITH STATUS LED FOR KES 2
(2) PMW WITH STATUS LED FOR KES 4
POWER SUPPLY STATUS LIGHT: LED, 5 AMP MAX
WEIGHT OF STANDARD UNIT W/ IONIZER, COLLECTOR,
PRE & AFTER FILTERS: 480 LBS. [218 KG] KES 2
650 LBS. [296 KG] KES 4

FILTER COUNT & WEIGHTS FOR KES 2:
(1) PRE FILTERS – PERFORATED PLATE, 2 LBS. [0.9 kg]
(1) AFTER-FILTER – PERFORATED PLATE OR METAL MESH, 2 LBS. [0.9 kg]
(1) IONIZER, 5 LBS. [2.3 kg]
(2) COLLECTOR, 60 LBS. [27.3 kg] TOTAL
(1) RIGID PLEAT MEDIA 95% DOP (OPTIONAL), 17 LBS. [7.7 kg}
(8) REFILLABLE ODOR ABSORPTION MODULE (OPTIONAL), 120 LBS. [54.6 kg] TOTAL

FILTER COUNT AND WEIGHTS FOR KES 4:
(2) PRE FILTERS – PERFORATED PLATE, 4 LBS. [1.8 KG] TOTAL
(2) AFTER-FILTER – PERFORATED PLATE OR METAL MESH, 4 LBS. [1.8 KG] TOTAL
(3) IONIZER, 10 LBS. [4.6 KG] TOTAL
(4) COLLECTORS, 120 LBS. [54.6 KG] TOTAL
(2) RIGID PLEAT MEDIA 95% DOP (OPTIONAL), 34 LBS. [15.5 KG} TOTAL
(16) REFILLABLE ODOR ABSORPTION MODULE (OPTIONAL), 240 LBS. [109 KG] TOTAL



ELECTROSTATIC EFFICIENCY/CAPACITY DATA

	DOP CFM CAPACITIES				
	95%	94%	93%	92%	90%
KES2	1200	1400	1750	2000	2550
KES4	2400	2800	3500	4000	5100
Face Velocity (fpm)	372	434	542	620	790

PRESSURE DROP DATA (Inches H_2O)

KES2 CFM KES4 CFM	1200 2400	1400 2800	1750 3500	2000 4000	2550 5100
ESP*	0.09	0.14	0.20	0.27	0.42
Media**	0.13	0.15	0.23	0.25	0.41
Carbon	0.08	0.10	0.15	0.21	0.30
TOTAL**	**0.30**	**0.39**	**0.58**	**0.73**	**1.13**

** Includes perforated plate pre- and post filters.*
*** With clean media filters. Allow up to 1" additional pressure drop for filter loading.*

TRION® air purification systems

FEDDERS ENGINEERED PRODUCTS

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email: infochina@fedders.com

Form No. 06-0445

AIR BOSS® KES SERIES

Kitchen Exhaust Filtration Systems

UL LISTED
EXHAUST FILTRATION SYSTEM
86 LF

- INSTALLATION
- OPERATION
- SERVICE

Electrostatic Precipitator for Commercial Kitchens

TRION®
air purification systems

101 McNeill Road • Sanford, NC 27330
(919) 775-2201 • Fax: (919) 777-6399 • (800) 884-0002
www.trioninc.com
MANUAL PART NO. 257045-001 – April 2004

TABLE OF CONTENTS

SECTION I – DESIGN

FOR THE SYSTEM DESIGN ENGINEER

1. General Description
The standard major components supplied with each KES Kitchen Exhaust Filtration Systems are as follows:

- Electronic air cleaner/media absorber cabinet
- Power supply(s) and status LED(s)
- Junction Box

The electronic air cleaner cabinet contains split ionizer and collecting cells (collecting elements), perforated plate pre-filters and metal mesh after-filters. Perforated plates, in lieu of the metal after-filters, are optional when specified.

The standard electronic air cleaner cabinet is equipped with a Media Section for housing an optional 95% DOP – rigid pleat filter and/or an odor adsorption module.

Gasketed access doors located on one end of the cabinet, 90 degrees to the direction of the airflow, provide entry for removal of the cells and filters.

All KES cabinets are 2" [51mm] double wall insulated on the top and two sides and are welded to a 3" [76mm] unitary mounting rail.

The Pulse Width Modulated (PWM) power supply(s), providing the necessary high voltage for the air cleaner and power supply status LED(s), are furnished in an enclosure on the ionizer/cell access door.

The junction box is located on top of the cabinet and above the ionizer and collector cell access door. The junction box contains terminals for a single point wiring connection.

Other options available with the KES are as follows:

- Remote mounted control box containing an On/Off switch, power supply status light, relay for connection to an exhaust system, fan starter and power supply shut-down relay for a fire condition
- UL 762 fan for restaurant exhaust, suitable for outdoor installation
- Fire suppression pre-piping

2. System Design and Layout
The arrangement of the supplied components and the general layout of the system will vary according to application, adjoining equipment and available space. However, there are several basic factors pertaining to all installations that must be considered:

To maintain the selected cleaning efficiency, it is important to assure that the total air volume (capacity in CFM) is uniformly distributed across the entire face area of the unit. The perforated plate and metal mesh filters provide some resistance to effect even air distribution. However, since most air ducts are designed to handle air velocities greater than the rated velocity of the air cleaner, it is necessary to properly transition any attached ducting. If possible, a contraction ratio of 1 in 3 (approximately 20°) should be maintained.

If space prohibits, turning vanes, air baffles or other means may be utilized. Ducting, where attached to the cabinet collars, should be liquid-tight and in compliance with NFPA 96 and any other local code requirements.

Contaminants to be collected, such as oils in vaporous state, must be condensed into particulate form prior to entering the ionizer and collecting cells in order to maintain the anticipated efficiency. Gases, vapors or odors cannot be precipitated and will therefore pass through the air cleaner. Any condensing that takes place downstream from the air cleaner defeats the purpose. By the same token, heavy concentrations of water vapor, or other matter that becomes highly conductive when condensed, must be prevented from entering and/or condensing in the collecting elements to prevent electrical arc-over and shorting.

WARNING!
RISK OF ELECTRICAL SHOCK
Factory designed access to all electrically charged high voltage components contain electrical interlocks for the safety of operating personnel. These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

Each KES system is supplied with two, 2" NPT cabinet drain couplings (see Figures 1 & 2). Each coupling is plugged at the factory. During installation, clearance to access these clean-out drain couplings must be considered. It is recommended that the drain couplings be piped off to an acceptable catch basin. Drain pipe lines from the cabinet drain should be trapped or otherwise sealed against the system pressure (in accordance with local codes). For ease in maintenance and component removal, adequate space, **32" [813mm] Minimum required**, must be provided in front of all access doors. Special consideration should be given in this respect for installations where the unit is suspended overhead. Catwalks or platforms should be provided.

CAUTION
In addition to the above space requirement, installation of the KES in NFPA applications shall have a clearance of at least 18" [457mm] to a combustible material, 3" [76mm] to limited combustible material, and 0" [0mm] to noncombustible material. Any reduction in clearance or exceptions must be in compliance with NFPA and acceptable to the AUTHORITY HAVING JURISDICTION.

WARNING!
FIRE SUPPRESSION SYSTEMS
Extreme caution should be exercised when this unit is installed in applications that are collecting volatile or potentially flammable contaminates such as cooking grease and petroleum based oils. TRION STRONGLY RECOMMENDS A FIRE SUPPRESSION SYSTEM BE INSTALLED IN THE DUCTWORK AND ON THE KES IN CASES WHERE THESE CONTAMINATES ARE COLLECTED ON THE CELL PLATES AND COLLECT ON THE ATTACHED DUCTWORK. Contact the factory for questions or concerns regarding a fire suppression system.

3. Outdoor Installations
The KES system is suitable for outdoor installation. Requirements for outdoor protection vary in accordance to climate and equipment component arrangement for the particular job. The installing contractor should treat the equipment as required to meet the specific needs. Detailed discussions of the KES components are as follows, using a rooftop installation as an example (refer to Figure 2):

Adjoining Duct Work (not supplied by Trion)
The ductwork located on the air entering side of the cabinet, between the point where it enters the roof and the cabinet, must be liquid-tight and installed in accordance with NFPA and any other local code requirements. It must also be adequately insulated or other means must be taken to prevent the formation of condensation through temperature change. Condensation will short out the ionizer and collecting cells. Insulation must be of the outdoor variety.

Trion KES Cabinet
The access doors on the KES cabinet are gasketed and the unit is sealed against air leakage. The paint finish (enamel) is for interior and exterior use. The cabinet is double-wall, weather-tight construction with 2"[51mm] thick– 8 lb/ft^3 [128 kg/m^3] density mineral wool insulation on the top and two sides.

Drain Line
The drain line, when piped from the cabinet drain coupling, should be trapped or otherwise sealed against the system pressure and sloped to allow for maximum drainage. The drain line should be trapped to seal off the cabinet from the drain against the system pressure and should be located in the heated interior. Failure to provide sufficient slope on drain lines will result in poor drainage, pooling of liquid in the cabinet and possible system failure. Drain line pipe runs should be piped with as short a run as possible to the heated interior of the building, preferably straight down from the drain pan supply through the floor. If not installed in this manner, heat wrap or other means should be employed to prevent freezing. It is recommended that clean-outs be installed in all drain lines.

SECTION II – INSTALLATION

FOR THE INSTALLING CONTRACTOR

1. Unpack and Inspect
Upon receipt of the equipment, all shipping containers and their contents should be examined for damage. Any damage occurring in shipment must be immediately reported to the carrier, an inspection report completed and a claim filed at the receiving point.

The unit cabinet is shipped completely assembled with perforated plate pre-filter, ionizer, collector cell and metal mesh after-filter factory installed. Media (95% DOP rigid pleat) filter(s) and odor adsorption modules are shipped separately to prevent premature particulate loading and protect against damage during shipment. Optional fan package can be either factory installed with KES cabinet assembly or shipped separately.

2. Position Air Cleaner Cabinet
To reduce weight for ease in handling, remove the pre-filters, after-filters, ionizer(s) and collecting cells from the cabinet, and place them safely aside. Position the cabinet in the designated location giving consideration to the following points:

A. Provide sufficient clearance in front of the access doors for ionizing-collecting cell and mechanical filter removal**. A minimum of 32 inches [813mm] is required. (see figure 2)**

B. Level the cabinet to assure proper drainage from the drain pan.

C. Direction of airflow through the cabinet is from **right-to-left** when looking at the access doors. After the cabinet has been properly located, it may be secured into place by bolting or welding.

3. Connect Adjoining Duct Work
When adjoining ducting is to be installed, the duct securement to the KES collars should be made liquid-tight and in compliance with NFPA requirements and any other local codes that apply.

When a blower (other than factory installed) is installed downstream from the KES cabinet, the ducting between the cabinet and the blower will be under negative pressure and should be made air-tight to prevent infiltration of contaminated air.

After the ductwork has been installed, clear remaining material or debris from inside ducts and bottom of cabinet, and then re-install the mechanical filters, ionizer(s) and collector cells.

IMPORTANT NOTE: Ionizer and collector cells are designed with a keyed slot permitting one directional installation into cabinet. When properly installed, the brass contact plungers on the ionizer and cell should be pointed toward the access door. Installation of the perforated plate pre-filter and either a perforated plate after-filter or metal mesh after-filter is required for all installations. After installation of the pre/after filters, ionizer and collector cells, the filter clip should be installed.

4. Connect Drain
Connect a drain line to the cabinet drain couplings provided in the cabinet drain basin in accordance with the governing plumbing codes. The drain line must be sealed with a trap or other means to prevent air bypass. If a trap is used, it should hold sufficient water column to overcome the system air pressure and to assure that loss of liquid from evaporation between cleaning periods will not break the seal. The drain line should not be smaller than the drainpipe coupling.

5. Remote Mounted Control Box (customer supplied or optional Trion component)
The remote mounted control box should be mounted at eye level and located in an accessible place for operator, maintenance and service personnel.

6. Complete Wiring
A. *Primary Wiring*
The junction box located on top of the KES is the main distribution point for primary wiring. A terminal block inside the junction is provided for single point wiring to the various electrical components. Main power disconnect and safety interlocking is achieved through a sealed, flex cable connector attached to the junction box. To prevent access to charged high voltage, this cable connector must be unscrewed (breaking the connection) from a mating, flange mounted connector on top of the ionizer and collector cell access door. Refer to Figure 3 on page 14 for Field Wiring Diagram.

B. *Grounding*
An earth ground must be provided to the KES cabinet and optional remote mounted control box. All ground connections must be in contact with bare metal and securely affixed. Ground conductor size and connection means will be in accordance with all applicable electrical code standards.

7. Check Out for System Start-up
When the installation has been completed, assure that the equipment is ready for start-up by checking the following:

A. All construction debris is removed from the KES cabinet, ionizer(s), collecting cells and adjoining ductwork.

B. The drain line from the KES drain couplings is clear and completely connected to its point of termination.

C. Supply line power is available and electrical wiring is completed to the following components:

- KES junction box
- Remote mounted control box
- System fan and starter
- Fire suppression panel

SECTION III - OPERATION & SERVICE

WARNING!
RISK OF ELECTRIC SHOCK
These service instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

FOR THE MAINTENANCE ENGINEER

1. Introduction and Principle of Operation
The electronic air cleaner is technically known as an electrostatic precipitator. In this type of equipment, all airborne particles, even of microscopic size, are electrically charged (positively) as they pass through a high voltage ionizer. These charged particles are then attracted and adhere to a series of parallel collecting plates, which form the negative elements of an electrostatic field.

The ionizer consists of charged Tungsten wire spaced between grounded electrodes. The collecting section consists of parallel plates arranged so that each alternate plate is charged while the intermediate plates are electrically grounded.

Periodically, depending on the type and concentration of contamination in the air, contaminate is washed from the plates by manually removing the cells and cleaning them (pages 7 & 8, Item 4, A & B, Routine Maintenance).

Two major functional components comprise the air cleaner:

(1) Ionizer and collecting cells to ionize and collect airborne particulate matter
(2) Power supply(s) to supply high voltage direct current to the ionizing-collecting cells

Normally, systems are designed for collection efficiencies in the range of 90 percent or more. Collecting a contaminate at these efficiencies, especially when there are high concentrations, can result in large accumulations in a relatively short period. Therefore, maintenance must encompass two areas: the operation of the equipment for efficient collection, and the systematic removal of the collected contaminate.

2. General Description
The ionizer(s) & collecting cells (contaminant collecting elements) are housed in the cabinet on slide rails. They can be removed from the cabinet as required, through the access door, by sliding them out like drawers.
Ionizer-to-ionizer and collector cell-to-collector cell electrical connections are automatically made through spring plunger connectors. Power supply(s) on the ionizer/collector cell access door make contact with ionizer and collector cell spring plungers through an insulted high voltage contact.

IMPORTANT NOTE: Ionizer and collector cells are designed with a keyed slot permitting one directional installation into the cabinet. When properly installed, the brass contact plungers on the ionizer and cell should be pointed toward the access door.

Installation of the perforated plate pre-filter and either a perforated plate after-filter or metal mesh after-filter is required for all installations. These items act as trash screens and provide resistance for even air distribution. After installation of the pre/after filters, ionizer and collector cells, the filter clip should be installed.

The power supply(s) convert the 120/220-volt, 50/60HZ, single phase AC supply to the high voltage DC needed to power the ionizing-collecting cells. Potential of 12.5 –13.0 kVDC are required for the ionizer sections and 6.0 - 6.5 kVDC for the collector sections of the cells.

3. Initial Start-up

A. Inspect the inside of the adjoining ductwork and KES cabinet to be sure it is clean and free of any debris or construction materials. Ensure the openings in the drain basin are free of any restrictions. The ducting, where secured to the cabinet collars, should be sealed liquid tight in accordance with NFPA.

B. Inspect the ionizer and collecting cells to see that all of the ionizing wires are intact, no large pieces of foreign material are lodged between the plates, high voltage insulators are not cracked, and the ionizer and collecting cells are properly installed in the cabinet.

C. Check the primary wiring to see that it is connected to the proper terminal in both the KES junction box and the remote mounted control box. (Refer to Figures 3 and 6, pages 14 and 17).

D. Be sure the drain lines from the KES cabinet drain coupling are completely connected and properly terminated. A trap or seal should be incorporated in the line to prevent air bypass.

E. Be sure that electrical power is available, the wiring is completed, and the system blower is ready to energize.

F. Be sure the flex cable connector (main power disconnect/safety interlock) is aligned, pushed down and screwed securely into the mating flange mount connector on the access door. To help with alignment, marks have been placed on the flex cable connector body and the flange mount connector.

G. Close the system electrical supply switches, making power available to the remote mounted control box and the system fan.

H. Turn the control box selector switch to the "ON" position. The exhaust fan should run (if installed) and the power supply(s) should be energized. Electrical arcing within the collecting cells may occur. It is a normal occurrence caused by accumulation of dusts from construction or other sources in the cell(s) and should subside quickly. If the arcing is continuous and does not subside, recheck the cell for trash, damaged plates or cracked insulators.

IMPORTANT NOTE: Kitchen exhaust fan control and operation will vary with each installation. The optional Trion remote mounted control box contains a 120/220VAC relay for connection to the exhaust fan starter coil. When the control box selector switch is placed in the "ON" position, the relay will energize the fan starter coil.

For safe and proper Kitchen Exhaust operations, adhere to the following instructions and procedures:

1. Exhaust systems shall be operated during all periods of cooking in restaurant applications.
2. Filter-equipped exhaust systems shall not be operated with filters removed.
3. The posted instructions for manually operating the fire extinguishing system shall be kept conspicuously posted in the kitchen and reviewed periodically with employees by the management.
4. Listed exhaust hoods shall be operated in accordance with the terms of their listings and the manufacturer instructions.
5. Cooking equipment shall not be operated while its fire-extinguishing system or exhaust system is not operating or otherwise impaired.

4. Routine Maintenance

A. *Washing Frequency*

The frequency the collected dirt must be manually washed from the unit depends upon the type and amount of dirt in the air to be cleaned. Dirt, which is greasy in nature, tends to harden after collection and should be washed away often. Likewise, units operating under extremely heavy dirt loads should be washed more often as a large build-up of collected material will have a tendency to "blow-off" if permitted to remain on the collecting elements for long periods of time. Trion recommends starting with a manual washing frequency of at least once a week. This schedule may then be altered as needed after visual examinations of the collected material contained on the ionizing-collecting cells. ***Daily manual washing is not unusual for units operating on heavy kitchen exhaust hoods or similar contaminants.***

Manual washing to clean the perforated plate pre-filter, ionizer(s), collecting cells, and metal mesh or perforated plate after-filters can be performed in a soak tank, commercial car wash, or with a pressure hose or pressure cleaner using a low pressure setting. Particular care should be taken in cleaning each of the insulators.

WARNING!
DO NOT USE HIGH PRESSURE STEAM CLEANING EQUIPMENT TO CLEAN CELLS. THE EXCESSIVE HEAT AND PRESSURE WILL CAUSE THE PLATES TO WARP AND IN TURN POSSIBLY CAUSE EXCESSIVE ARCING.

WARNING!
FLAMMABLE SOLVENTS OR OTHER FLAMMABLE CLEANING AIDS SHALL NOT BE USED.

When a cleaning service is used, a certificate showing dates of inspection and/or cleaning shall be maintained on the premises.

B. *Detergent*
Effective washing is dependent upon detergent. The detergent, as supplied by Trion, Inc., is formulated specifically for electronic air cleaners. If substitutes are used, Trion must approve them in order not to void the warranty. Please contact Trion for this approval. Alternate detergents should be safe for use in ventilation systems and non-caustic, as 95% of the ionizer and collecting cells are constructed of aluminum and special high voltage insulation and gasket seals.

C. *Media filter and odor adsorption module replacement* ***(IF INSTALLED) – Every 3 to 6 Months***
Units equipped with this option may experience different loading conditions and scheduled replacement may then be altered as needed after visual examination.

D. *Electrical Operation*
The KES and optional remote mounted control box both have LED indicating lights to show power to the PWM power supply(s) and output voltage present (12.5 – 13.0 kVDC ionizer and 6.0 – 6.5 kVDC collector). Flickering or failed LEDs indicate electrical arcing, electrical short and/or power failure.

5. Periodic Maintenance
A. *Fire Suppression System* ***(IF INSTALLED) – Every 6 Months***
Properly trained and qualified personnel shall complete inspection, cleaning and servicing of the fire suppression system.

All actuation components, including remote manual pull stations, mechanical or electrical devices, detectors, fire-actuated dampers, etc., shall be checked for proper operation in accordance with the instructions in this manual. In addition to these requirements, the specific inspection requirements of the applicable NFPA standard shall also be followed. If required, certificates of inspection and maintenance shall be forwarded to the authority having jurisdiction.

B. *KES Power Supply Enclosure* - ***Every 12 Months***
The KES power supply enclosure located on the ionizer/collector cell access door should be examined for accumulated dirt and dust. If required, the components should be cleaned using a good electrical contact cleaner. All terminal connections should be checked for securement and tightened or reworked as required.

WARNING!
Risk of Electrical Shock
To reduce the risk of electric shock, do not perform any servicing unless all electrical power to the system has been turned off.

At the start of the cleaning process, electrical switches that could be accidentally activated shall be locked out. Components of the fire suppression system (if installed) shall not be rendered inoperable during the cleaning process.

CAUTION
Care should be taken not to apply cleaning chemicals on any fusible links or other detection devices of the automatic extinguishing system.

6. Troubleshooting

WARNING!
EXERCISE THE USUAL PRECAUTIONS WHEN WORKING WITH HIGH VOLTAGE. THE MAXIMUM OPERATING OUTPUT FROM THE POWER SUPPLY IS 15,000 VDC AND 5.5 MA. to 11.0 MA. WHEN IN PARALLEL.

IF SAFETY SWITCHES ARE CLOSED AND CIRCUIT IS ENERGIZED, DO NOT TOUCH HIGH VOLTAGE. WHEN THE CIRCUIT IS DE-ENERGIZED, ALWAYS BLEED OFF REMAINING STATIC CHARGE WITH AN INSULATED HANDLED SCREW DRIVER BY SHORTING TOGROUND THE POINTS OF HIGH VOLTAGE DC POTENTIAL.

WARNING!
Risk of Electrical Shock
The servicing Instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the service instructions unless you are qualified to do so.

A. *Introduction*
This section on troubleshooting provides a description of potential malfunctions, their cause, location and correction. A Troubleshooting Reference Chart listing the most probable causes and corrections follows the general text.

IMPORTANT NOTE: All repairs to the fire suppression system (If Supplied) must be completed by the authorized fire control contractor.

The electronic air cleaner is the unit within the system that has the highest efficiency collection rating. When a malfunction occurs, the outage is usually found in the electrical secondary circuit in the ionizing/collecting cell(s).

Indicating lights (LEDs) are installed in the face of the power supply enclosure on the KES ionizer/collector cell access door and provided with the Trion optional remote mounted control box. These lights monitor the electrical operation of each power supply and the ionizer(s) and collecting cell(s) they energize. The KES-2 requires (1) power supply to energize (1) ionizer and (2) collector cells. The 4000 CFM KES-4 requires (2) power supplies to energize (2) ionizers and (4) collector cells.

Other than the basic hand tools, it is advantageous to have a volt meter with a 20 KVDC high voltage probe.

B. *Secondary Short Circuit*
The most common outage is a short in the secondary circuit, and is best located through the process of elimination. Symptoms are a flickering indicating light accompanied by an arcing noise in the ionizer(s) and collecting cell(s), or an indicating light that is not glowing. A flickering light with an arcing noise is an indication of a high resistance short circuit and a light that is not glowing is an indication of a dead short. (A light that is not glowing can also be an indication of an open circuit in the primary circuit. Refer to the paragraph on open circuits page 10.) The short may be in the power supply, insulated high voltage contact on the access door, ionizer(s), or collecting cell(s). To isolate the short to any one of these three components, proceed as follows:

WARNING!
When safety interlock devices are closed, do not come in contact with high voltage components. The operating output from the high voltage power supply(s) is 13,000 VDC and 6 mA to 11.0 mA.

When the power supply(s) is de-energized there is a 20 second delay for the voltage to decay. Always short from ground to a point of high voltage with a well insulated jumper wire or an insulated handled screwdriver to bleed off any remaining residual charge.

IMPORTANT NOTE: To perform this troubleshooting step, it will be necessary to close the ionizer/collector cell access door and re-connect the flex cable connector to the flange-mounted connector on the access door. This will re-energize the power supply(s). The panel on the ionizer/collector cell access door enclosure will also need to be removed.

1. Disconnect both high voltage leads from their respective terminals in the power supply and support them away from any point of contact.
2. Energize the power supply:
    a. If the light still flickers or does not glow the trouble is indicated to be in the power supply. Replace the power supply in its entirety.
    b. If the light glows steady with the leads disconnected, the power supply is indicated to be normal.

3. Next reconnect both high voltage leads to their respective terminals inside the power supply and disconnect them at the insulated door contacts for the ionizer(s) and collecting cell(s). Support them away from any point of contact and energize the power supply.

    a. If either high voltage lead is defective the light will indicate the trouble. Each lead may then be checked separately by disconnecting them, one at a time, from their respective terminals at the power supply. When a lead is found to be defective, replace it in its entirety. Do not repair or splice.
    b. If the light glows steady with the leads disconnected from the insulated door contact for the ionizer(s) and collecting cell(s), the trouble is then indicated to be in the ionizer(s) or collecting cell(s). The trouble can then be isolated to the ionizer section or collector cell section and then to an individual ionizer or collector cell as follows:

4. First determine if the short is in the ionizer section or the collecting section by connecting each high voltage lead to its respective section, one at a time, and energizing the power pack. (The lead not connected must be supported away from any point of contact.) The short symptoms will still exist for the section in which the short is located.
5. When the short is isolated to either the ionizer or collector cell section, remove all the ionizers or collectors cells in that section and visually check each for the following:
    a. If the short is in the ionizer section look for a broken or defective insulator or a broken ionizer wire.
    b. If the short is in the collector section look for a large piece of foreign material bridging the collector plates or a defective insulator.

C. *Open Circuits*

Although open circuits can occur in the secondary they usually take place in the primary. If the unit contains only one power supply and the indicating light does not glow the outage is probably one of the following:

1. Supply line power to the power supply(s) disconnected. Reconnect.
2. Main disconnect/access door interlock on KES unscrewed. Close access door and insert flex cable connector from junction box into flange- mounted connector on access door. Screw connectors together.
3. Blown in-line fuse located on the power supply circuit board. Replace power supply.
4. Outage in the power supply. Look for charred or burned components or a loose wiring connection. Replace power supply or reconnect wiring.
5. Defective indicating light. Replace light.

7. Spare Parts

Recommended spare part quantities are usually based on the unit size and the amount of units per installation. For specific recommendations, consult the Trion factory or nearest Sales Office at 919-775-2201. Consideration however, should be given to stocking the following components:

DESCRIPTION	QTY.
PWM Power Supply	1
Ionizer	2
Collector cell	4
Cell Insulators	6
LED	1

Part Numbers are not listed as they are subject to change. Always state Unit Model and Serial Numbers when ordering parts.

Troubleshooting Reference Chart

PROBLEM/ SYMPTOM	PROBABLE CAUSE	LOCATION	REASON - CORRECTION
Indicating Light Not Glowing	Short Circuit	Ionizing Section	1. Dirty insulator(s) – Clean 2. Defective insulator(s) – Replace 3. Broken ionizer wire 4. Foreign Object Between Ionizing Bar and Ground electrode - Remove
		Collecting Section of Cell	1. Dirty insulator(s) - Clean 2. Defective insulator(s) – Replace 3. Foreign Material Bridging Plates - Remove 4. Bent Plates – Straighten or Replace
		High Voltage Leads	1. Disconnected High Voltage Lead Contacting Ground - Reconnect 2. Defective Lead/Insulation Breakdown – Replace Entire Lead
		Power Supply	Charred/Overheated Components – Replace Power Supply
Indicating Light Not Glowing	Open Circuit	Remote Mounted Control Box	1. Disconnected Supply Line Power – Reconnect 2. Faulty indicting Light - Replace
		Power Supply	1. Blown In-line Fuse – Replace Power Supply 2. Disconnected Wire – Replace 3. Charred/Over Heated Components – Replace Power Supply
		Electronic Air Cleaner Housing	1. Electrical Interlock Connector Not Closed – Close Access Door and screw connectors together 2. Junction Box wiring faulty – Check and correct 3. Faulty Electrical Interlock Connector - Replace
Indicating Light Flickering	High Resistance Short	High Voltage Circuit	1. Ionizer High Voltage Lead Connected to Collector Section and Collector Lead to Ionizer – Reconnect Leads 2. Loose or Disconnect high Voltage Lead-Tighten or Reconnect 3. Loose or Defective Intercell Connection (on Multicell Units) – Tighten or Replace 4. Foreign Object Adrift in Ionizer or Collector – Remove 5. Dirty Cells – Remove, clean and replace.

FIGURE – 1
KES Unit Outline

SPECIFICATIONS

INPUT VOLTAGE: 120/220VAC, 50/60HZ
CURRENT: 1.5 AMP MAX.
OUTPUT VOLTAGE: 12.5 – 13.0 kVDC IONIZER
6.0 – 6.5 kVDC COLLECTOR
POWER SUPPLY: (1) PWM WITH STATUS LED FOR KES 2
(2) PWM WITH STATUS LED FOR KES 4
POWER SUPPLY STATUS LIGHT– LED, 5 AMP MAX.
WEIGHT OF STANDARD UNIT W/IONIZER, COLLECTOR, PRE & AFTER FILTERS: 480 LBS.[218 kg] KES 2
650 LBS.[296 kg] KES 4

FILTER COUNT AND WEIGHTS FOR KES 2:
(1) PRE FILTERS – PERFORATED PLATE, 2 LBS.[0.9 kg]
(1) AFTER–FILTER – PERFORATED PLATE OR METAL MESH, 2 LBS.[0.9 kg]
(1) IONIZER, 5 LBS.[2.3 kg]
(2) COLLECTOR, 60 LBS.[27.3 kg] TOTAL
(1) RIGID PLEAT MEDIA 95% DOP (OPTIONAL), 17 LBS.[7.7 kg]
(8) REFILLABLE ODOR ADSORPTION MODULE (OPTIONAL), 120 LBS.[54.6 kg] TOTAL

FILTER COUNT AND WEIGHTS FOR KES 4:
(2) PRE FILTERS – PERFORATED PLATE, 4 LBS.[1.8 kg] TOTAL
(2) AFTER–FILTER – PERFORATED PLATE OR METAL MESH, 4 LBS.[1.8 kg]TOTAL
(2) IONIZER, 10 LBS.[4.6 kg] TOTAL
(4) COLLECTOR, 120 LBS.[54.6 kg] TOTAL
(2) RIGID PLEAT MEDIA 95% DOP (OPTIONAL), 34 LBS.[15.5 kg] TOTAL
(16) REFILLABLE ODOR ADSORPTION MODULE (OPTIONAL), 240 LBS.[109 kg] TOTAL

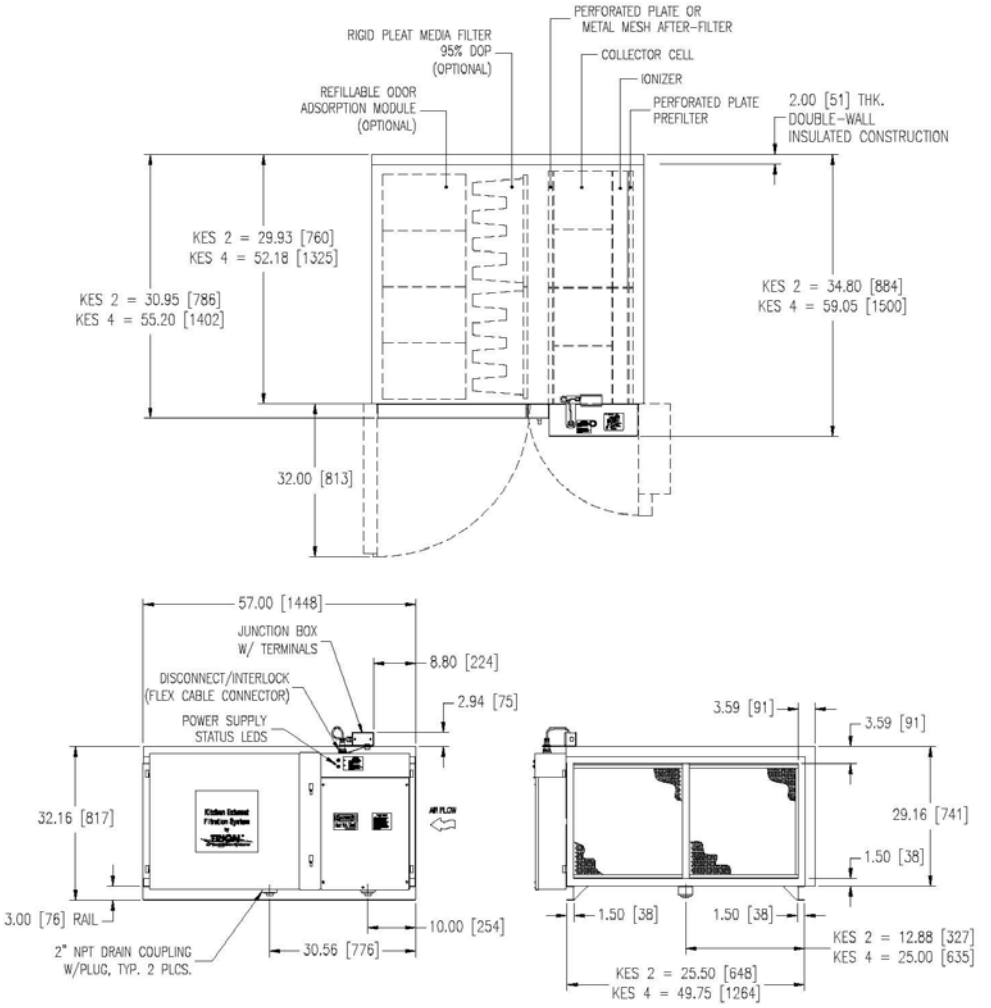


FIGURE – 2
Typical Outdoor Installation

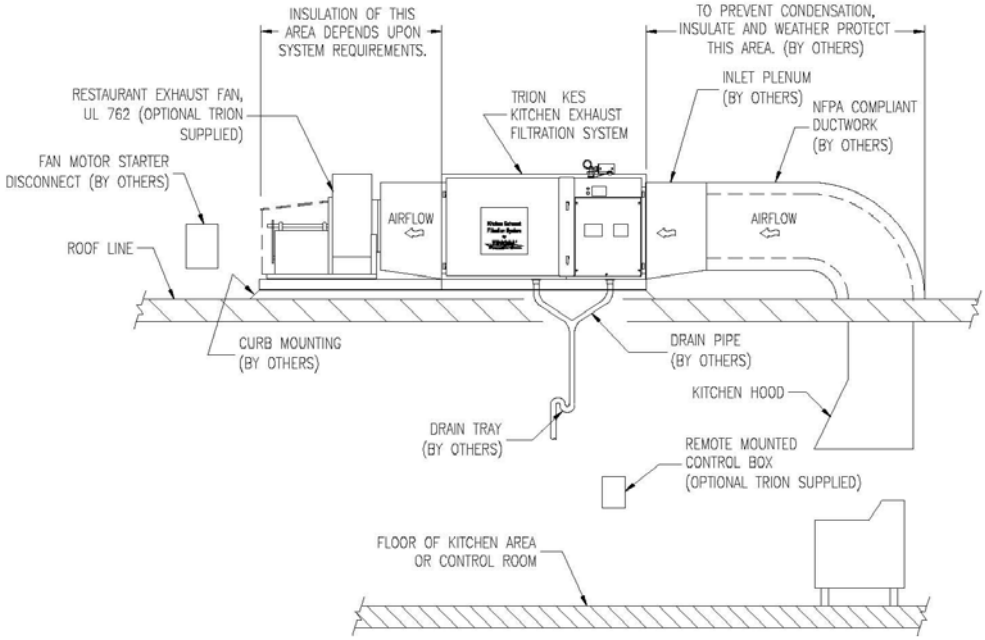


FIGURE – 3
Field Wiring-Junction Box

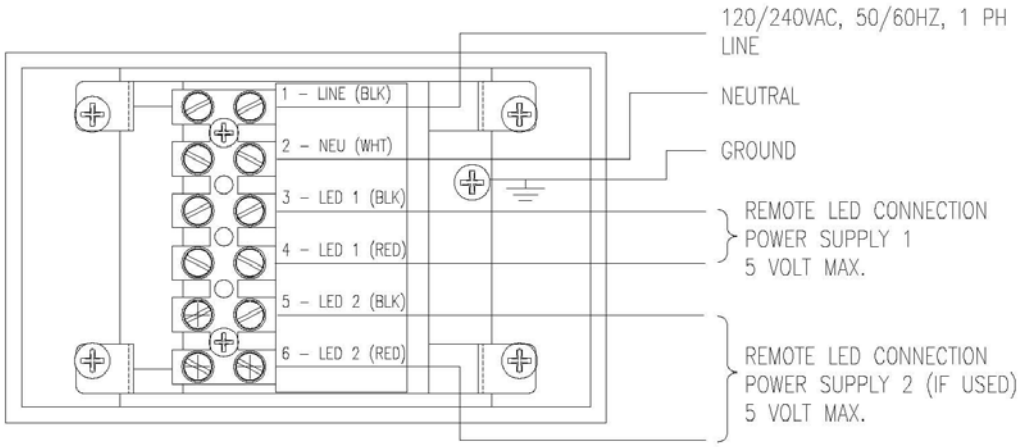
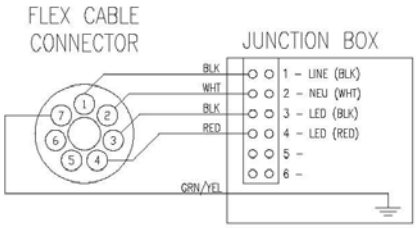


FIGURE – 4
Wiring Diagram
KES-2



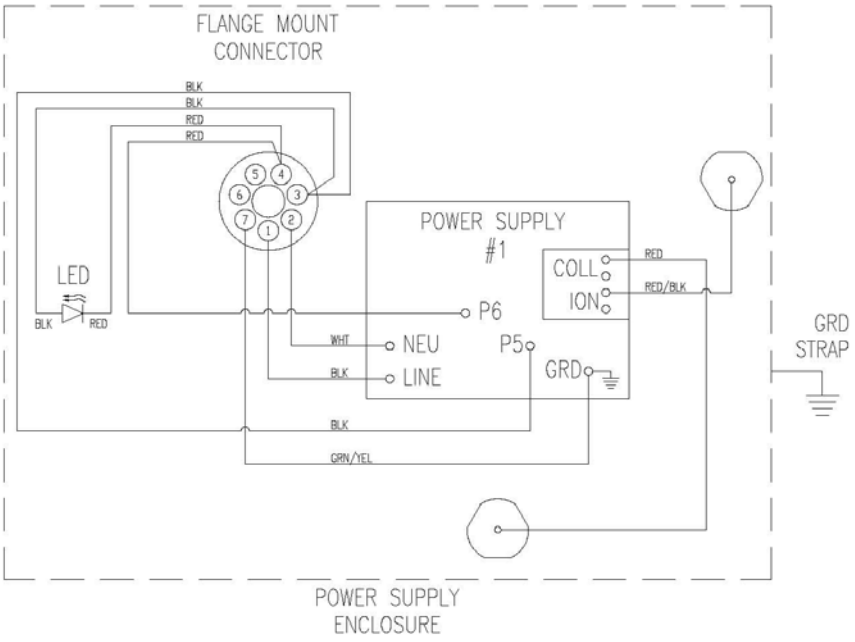


FIGURE – 5
Wiring Diagram
KES-4

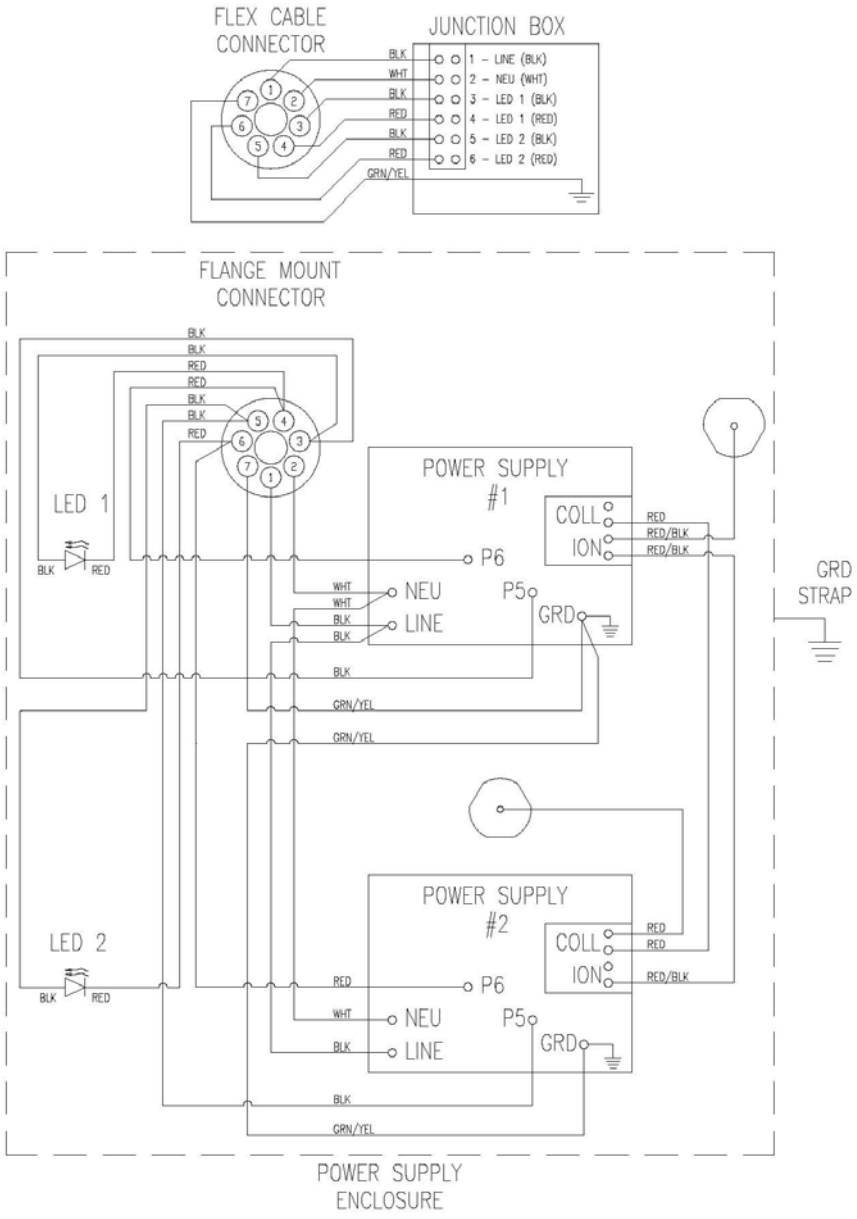
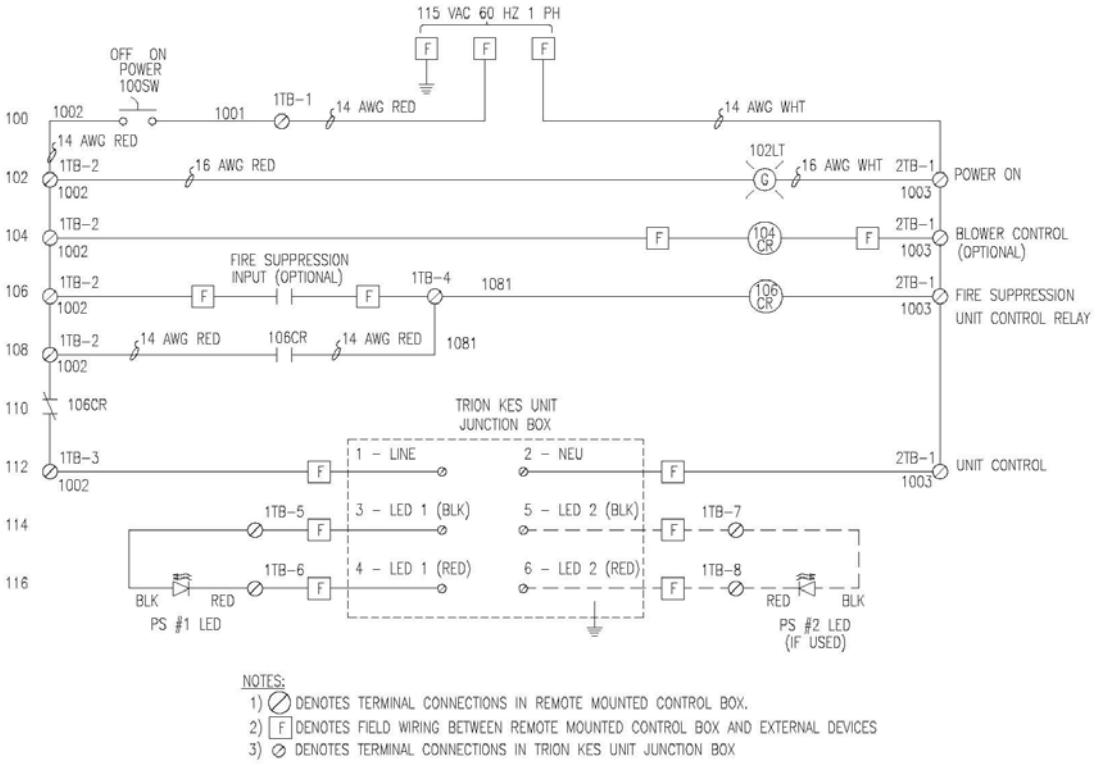


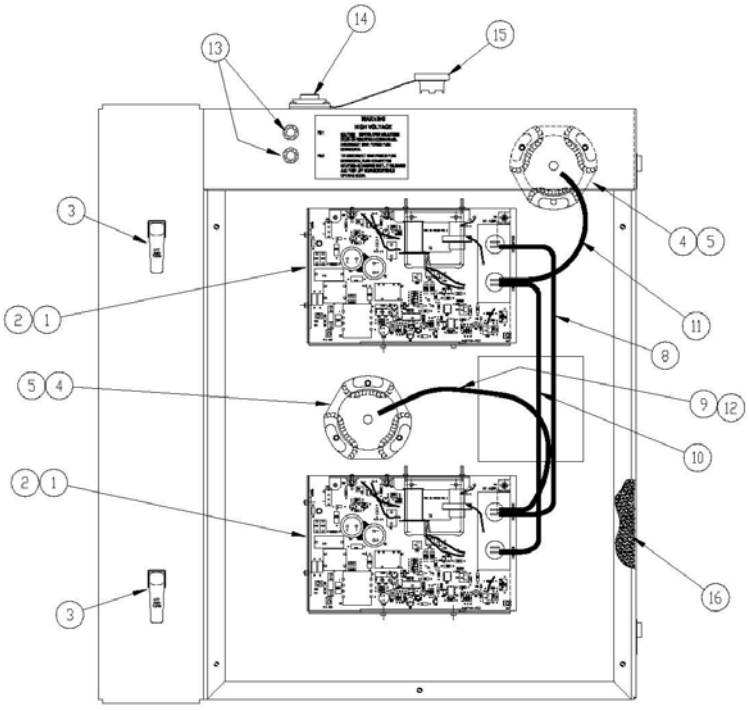
FIGURE – 6
Remote Mounted Control Box
Schematic



NOTES:
1) ⊘ DENOTES TERMINAL CONNECTIONS IN REMOTE MOUNTED CONTROL BOX.
2) [F] DENOTES FIELD WIRING BETWEEN REMOTE MOUNTED CONTROL BOX AND EXTERNAL DEVICES
3) ⊘ DENOTES TERMINAL CONNECTIONS IN TRION KES UNIT JUNCTION BOX

FIGURE – 7
Parts List
Access Door Enclosure Components

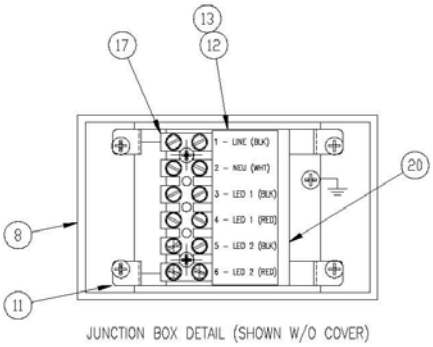
REF. NO.	DESCRIPTION	TRION PART NO.
1	HV CIRCUIT BOARD ASSEMBLY	448740-001
2	CIRCUIT BOARD GUIDE	123480-001
3	DRAW LATCH	334562-005
4	STAND-OFF INSULATOR, MODIFIED	353228-001
5	FIRESTOP CAULKING	150694-001
6	WIRING DIAGRAM (2000 CFM – SEE FIG. 4)	257178-001
7	WIRING DIAGRAM (4000 CFM – SEE FIG. 5)	257175-001
8	HV WIRE ASS'Y. (COLL. JUMPER 4000 CFM)	257046-101
9	HV WIRE ASS'Y. (COLL. – P/S 2, 4000 CFM)	257046-102
10	HV WIRE ASS'Y (ION. JUMPER 4000 CFM)	257046-103
11	HV WIRE ASS'Y. (ION. – P/S 1, 2000/4000 CFM)	257046-104
12	HV WIRE ASS'Y (COLL. – P/S 2, 4000 CFM)	257046-105
13	NEMA 12 LED	257177-001
14	FLANGE MTG. CONNECTOR	257037-003
15	SEALING CAP ASSEMBLY TOOL	257037-004
16	GASKET	224779-015



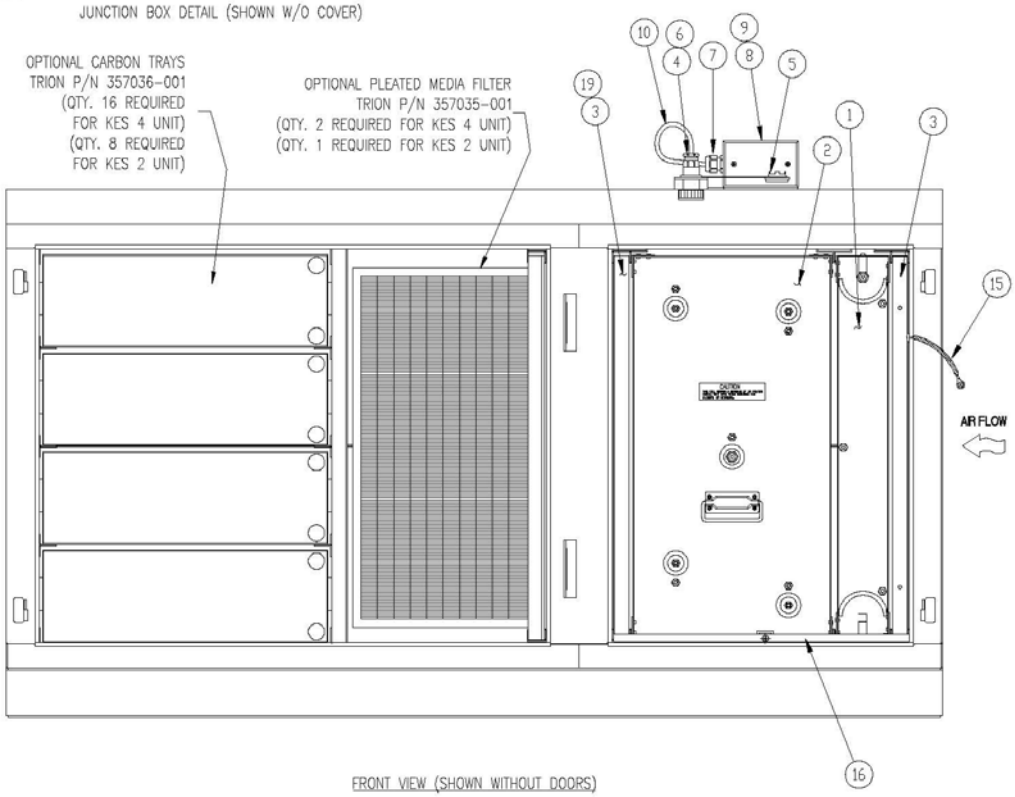
OUTSIDE DOOR VIEW (W/OUT COVER)

FIGURE – 8
Parts List
KES Cabinet Components

REF. NO.	DESCRIPTION	TRION PART NO.
1	IONIZER CELL	457200-001
2	COLLECTOR CELL	457300-001
3	PERFORATED BAFFLE	344601-004
4	FLEX CABLE CONNECTOR	257037-001
5	SEALING CAP/ASSEMBLY TOOL	257037-002
6	CABLE GLAND	257037-005
7	NYLON, LIQUID TIGHT CONNECTOR	128077-003
8	JUNCTION BOX	60000-0008-01
9	JUNCTION BOX COVER	60000-0008-02
10	POWER CORD	145797-002
11	TERMINAL BLOCK MTG. BRACKET	257048-001
12	TERMINAL BLOCK LABEL	257185-001
13	TERMINAL BLOCK LABEL	257185-002
14	IOS MANUAL (NOT SHOWN)	257045-001
15	GROUND STRAP ASSEMBLY	257184-001
16	SAFETY – FILTER CLIP	257182-001
17	TERMINAL BLOCK	EST-1124
18	DOOR GASKET (NOT SHOWN)	224779-015
19	ALUMINUM MESH AIR FILTER	224451-025
20	INSULATOR, NOMEX	157180-001



JUNCTION BOX DETAIL (SHOWN W/O COVER)



FRONT VIEW (SHOWN WITHOUT DOORS)

Contact Information

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TRION®
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TRION AIR BOSS KES Kitchen Exhaust Filtration System

Standard Unit:	**Suggested List Price:**
KES-2 - Standard Base Unit Consists of (1) Perforated Plate Pre-Filter, (1) Ionizer Assembly, (2) Collector Cells, (1) Metal Mesh After-Filter, 3" Supporting Rail, Internally Pre-Wired to Top Mounted Junction Box, 120V/60Hz/1Ph, Left Hand Access Doors, Double-Wall Cabinet. ***(Media and Carbon Filters **NOT** Included in Base Unit). Unit Part Number: **457000-001** Shipping Weight: 425 lbs.	**$ 7,390.00**
KES-2 OPTION ADDERS (When Ordered with Unit @ Same Discount)	
KES-2, Mechanical Filter Media - One (1) 95% DOP 24"x24"x12" nom. Mini-Pleat Filter. Part Number: 357035-001	**$ 240.00**
KES-2, Activated Carbon Tray Adsorber Media, (8) each, **Refillable** Carbon Modules, 7 lbs per tray. Part Number: 357036-001 X 8 each.	**$ 864.00**
KES-2, ANSUL Pre-piped fire suppression components. (Chemical tank, Control Head, external piping connections are not provided). Part Number: 257260-001	**$ 1,173.00**
KES-2, Fan Package, 15-BISW-21 UL762, CL-1, 3-HP, 460/60/3 Sized up to 2,550 CFM @ 3.5" Total S.P., with rail, transition. Specify Discharge Direction. Part Number: 257259-001 Shipping weight: 325 lbs.	**$ 5,289.00**
Combination Remote mounted Motor/Starter Disconnect - 460/60/3, 3 HP Part Number: 450695-013 (Shipped Loose)	**$ 1,305.00**
Remote Mounted Control Box Assembly - On/Off Switch and Power Supply Indicator LED Lights. Allows interconnection between the Fire Suppression Controls and the KES unit and fan. Part Number 357238-001	**$ 473.00**
KES-2, Maintenance and Service Pac - Includes complete set of cells (1-Ionizer, 2-Collectors), 6-ionizing wires, 1-mesh filter, 8-cell insulators, 1-door LED and 1 each 5-gallon pail of Tridex ESP1000. Part Number 257255-001	**$ 1,300.00**

KES-4 - Standard Base Unit Consists of (2) Perforated Plate Pre-Filters, (2) Ionizer Assemblies, (4) Collector Cells, (2) Metal Mesh After-Filters, 3" Supporting Rail, Internally Pre-Wired to Top Mounted Junction Box, 120V/60Hz/1Ph, Left Hand Access Doors, Double-Wall Cabinet. ***(Media and Carbon Filters **NOT** Included in Base Unit). Unit Part: **457000-002** Shipping Weight: 570 lbs.	**$ 10,141.00**
KES-4 OPTION ADDERS (When Ordered with Unit @ Same Discount)	
KES-4, Mechanical Filter Media - Two (2) 95% DOP 24"x24"x12" nom. Mini-Pleat Filters. Part Number 357035-001 X 2 each	**$ 480.00**
KES-4, Activated Carbon Tray Adsorber Media, (16) each, **Refillable** Carbon Modules, 7 lbs per tray. Part Number: 357036-001 x 16 each	**$ 1,727.00**
KES-4, ANSUL Pre-piped fire suppression components. (Chemical tank, Control Head, external piping connections are not provided) Part Number: 257260-002	**$ 1,173.00**
KES-4, Fan Package, 18-BISW-21 UL762, CL-1, 5-HP, 460/60/3 Sized up to 5,100 CFM @ 3.5" Total S.P., with rail, transition. Specify Discharge Direction. Part Number: 257259-002 Shipping weight: 455 lbs.	**$ 6,240.00**
Combination Remote mounted Motor/Starter Disconnect - 460/60/3, 5 HP. Part Number: 450695-014 (Shipped Loose)	**$ 1,305.00**
Remote Mounted Control Box Assembly - On/Off Switch and Power Supply Indicator LED Lights. Allows interconnection between the Fire Suppression Controls and the KES unit and fan. Part Number 357238-002	**$ 515.00**
KES-4, Maintenance and Service Pac - Includes complete set of cells (2-Ionizer, 4-Collectors), 12-ionizing wires, 2-mesh filters, 16-cell insulators, 1-door LED, 1-Cell and Media Extraction Tool, and 1 each 5-gallon pail of Tridex ESP1000. Part Number 257255-002	**$ 2,571.00**

Construction: 16ga. Galvanized steel cabinet; textured reverse hammer pearl white paint; single-side access ionizer/collector cell door; power supply mounted out of air stream; liquid drain connection in cabinet; safety interlock switch; and operating light. Fused disconnect not included.

KES UNITS REPLACEMENT PARTS - APPLIED

PART NUMBER	DESCRIPTION	Quantity Required KES-2	KES-4	LIST PRICE Ea.
457200-001	Ionizer Assembly	1	2	
220112-027	Ionizing Wire	12	24	
457300-001	Collector Cell	2	4	
344601-004	Perforated Baffle Pre-Filter	1	2	
224451-025	Aluminum Metal Mesh After-Filter	1	2	
357035-001	95% DOP Mini-Pleat Filter Cartridge, 24"x24"x12" Nominal	1	2	
357036-001	Refillable Carbon Module, Filled, 7 lbs.	8	16	**REFER TO**
357036-002	Refillable 50/50 Blend Module, Carbon/Potassium, 9.5 lbs.	8	16	**PARTS PRICE**
145797-002	Junction Box Power Cord	1	1	**LIST FOR**
224779-015	Gasket, 1/4" x 1" x 9.25 ft	1	1	**PRICING**
221441-044	Ionizer Insulator, (6) per ionizer	6	12	
250938-001	Collector Insulator, (10) per cell	20	40	
448740-001	PWM HV Circuit Board Assembly	1	2	
334562-005	Access Door Lift & Turn Draw Latch	2	2	
353228-001	Access Door Stand-Off Insulator	2	2	
257177-001	NEMA 12 Door LED	1	2	
257037-003	Flange Mounting Connector	1	1	
257264-001	Cell and Media Extraction Tool		1	

TERMS AND CONDITIONS OF SALE

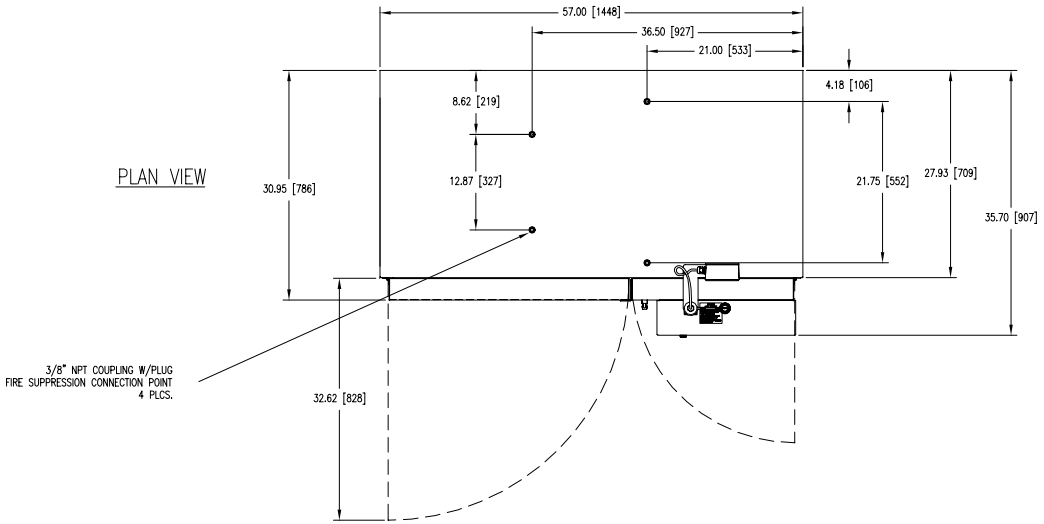
Terms: Net 30 days, subject to credit approval. Freight: FOB Trion Factory, Sanford, NC Freight Collect

Corporate Office: 101 McNeill Road · Sanford, NC 27330

Phone: 800-884-0002 ● Fax: 800-458-2379 ● www.trioninc.com ● email: sales@trioninc.com

Form No. 03-0703 ● 2006, Trion, Inc. ● Effective 5/2006 ● Prices subject to change without notice

REVISIONS

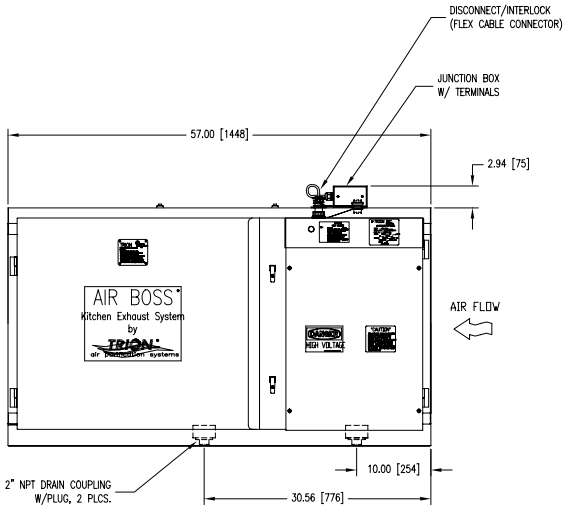


PLAN VIEW

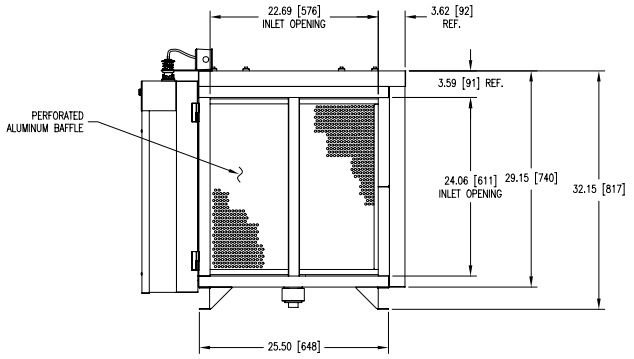
NOTES:

1) SYSTEM WEIGHT (ESTIMATE) WITH MEDIA FILTER AND ABSORPTION MODULES: 480 LBS.
2) THIS SYSTEM REQUIRES ONE ELECTRICAL CIRCUIT: KES UNIT – 120VAC/60HZ/1PH @ 1.5 AMP. MAX.

- UL LISTED YYXS & YYXS7 (CANADA) "HOOD AND DUCT ACCESSORIES"
- FANS FOR KITCHEN EXHAUST SYSTEMS UL LISTED UL762 " POWER ROOF VENTILATORS FOR RESTAURANT EXHAUST APPLIANCES"
- DESIGNED IN ACCORDANCE WITH THE RECOMMENDED PRACTICES OF NFPA 96 STANDARD FOR VENTILATION CONTROL AND FIRE PROTECTION OF COMMERCIAL COOKING OPERATIONS.



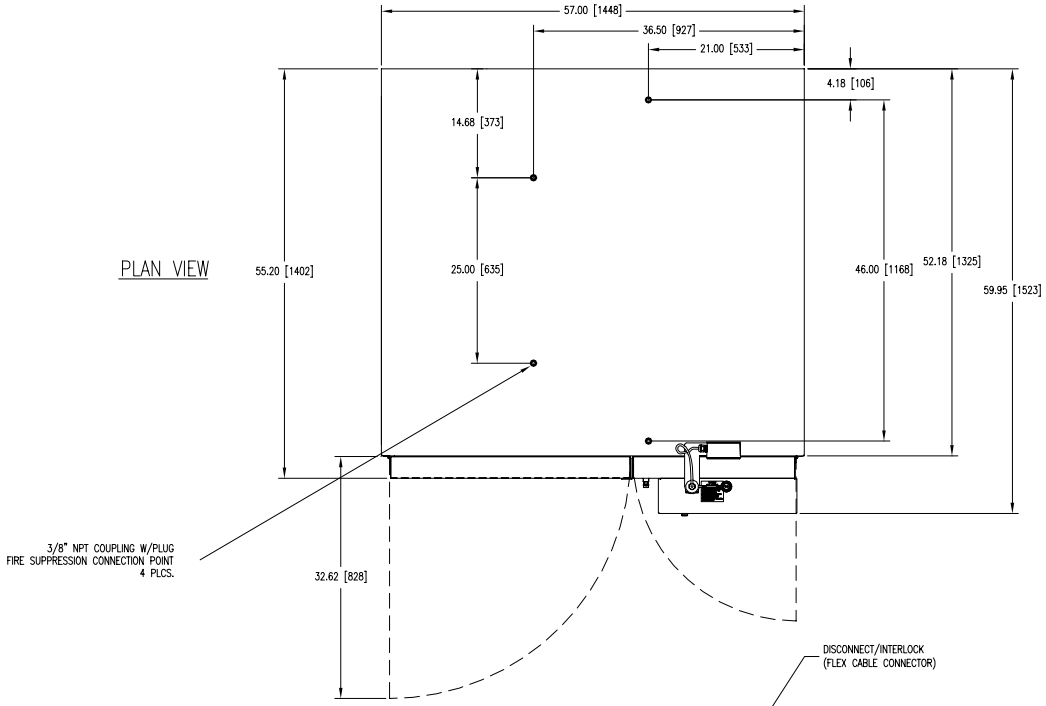
ELEVATION VIEW

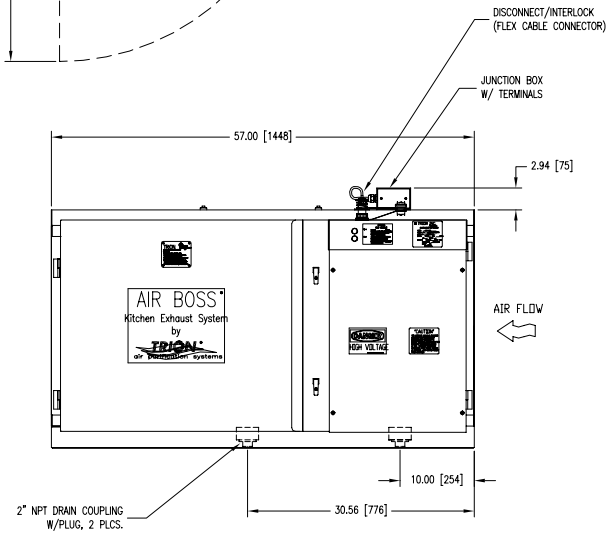


INLET VIEW

CO– 16756-01

		UNLESS OTHERWISE SPECIFIED USE				KES 2 SYSTEM OUTLINE		REV
		SCALE 1/8=1	2 DEC. PLACE ± .03	3 DEC. PLACE ± .015	ANGLES ± 1/2°			–
NEXT ASSY	USED ON	DR. DAR	CHKD. DAR	APP. CAR		TRION®	DWG 458087	SHT 1/1
APPLICATION		DATE 4-29-05	DATE 4-29-05	DATE 4-29-05			PROPERTY OF TRION, Inc. Sanford, NC 27330	



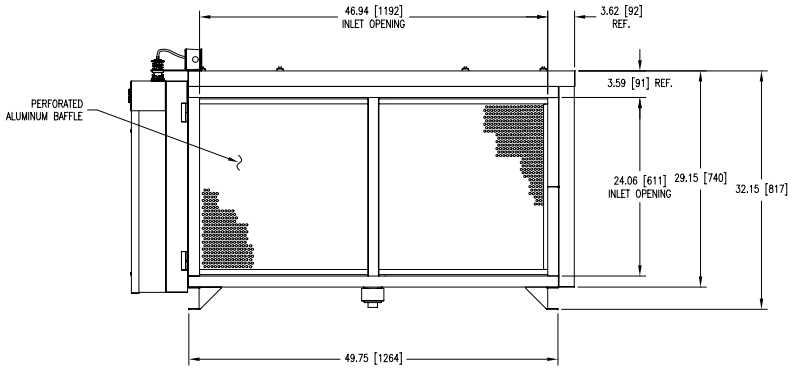


ELEVATION VIEW

NOTES:

1) SYSTEM WEIGHT (ESTIMATE) WITH MEDIA FILTER AND ABSORPTION MODULES: 650 LBS.
2) THIS SYSTEM REQUIRES ONE ELECTRICAL CIRCUIT: KES UNIT – 120VAC/60HZ/1PH @ 1.5 AMP. MAX.

- UL LISTED YYXS & YYXS7 (CANADA) "HOOD AND DUCT ACCESSORIES"
- FANS FOR KITCHEN EXHAUST SYSTEMS UL LISTED UL762 " POWER ROOF VENTILATORS FOR RESTAURANT EXHAUST APPLIANCES"
- DESIGNED IN ACCORDANCE WITH THE RECOMMENDED PRACTICES OF NFPA 96 STANDARD FOR VENTILATION CONTROL AND FIRE PROTECTION OF COMMERCIAL COOKING OPERATIONS.



INLET VIEW

REVISIONS

CO– 16756-01

		UNLESS OTHERWISE SPECIFIED USE				KES 4 SYSTEM OUTLINE		REV
		SCALE 1/8=1	2 DEC. PLACE ± .03	3 DEC. PLACE ± .015	ANGLES ± 1/2°			–
NEXT ASSY	USED ON	DR. DAR	CHKD. DAR	APP. CAR		TRION®	DWG 458086	SHT 1/1
APPLICATION		DATE 4-29-05	DATE 4-29-05	DATE 4-29-05			PROPERTY OF TRION, Inc. Sanford, NC 27330	

AIR BOSS® MODEL 75 & ATS SERIES

Maintenance Quick Checks

Weekly

- Ensure detergent level is above fill line in wash tank; never allow detergent level to get below the Low Level Line. Use only concentrated detergent, TRIDEX ESP1000 - DO NOT DILUTE.
- Visually check power supply LED operation on control panel. *Continuous flickering lights indicate arcing in cells and troubleshooting/ service may be required.*
- Check to ensure unit is washing at specified time on the 7-day clock.

Monthly

- Ensure water pressure is 40-60 psi at full flow when unit is washing.
- Manually check complete wash cycle operation with control schematics.

Semi-Annually

- Remove and manually clean pre- and after-filters, ionizing/collecting cells and spiked ionizer tips. Cells must be completely dry before installing.
- Inspect wash nozzle spray pattern for clogged or missing nozzles.
- Inspect manifold drive motor, linkage and drain for proper operation.
- Inspect and replace carbon trays as required.
- Inspect and replace media/bag filters (if provided).
- Lubricate blower bearings (if provided).
- Remove and clean water line strainer.
- Inspect fire suppression system (if provided).

Annually

- Fire suppression system to be inspected and certified by responsible agency.

*NOTE: Refer to the **Operations & Service Manual** for detailed maintenance instructions and operating tips.*

TRION air purification systems
FEDDERS ENGINEERED PRODUCTS
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Phone: 800-884-0002 · **Fax:** 800-458-2379 · **www.**trioninc.com · **email:** sales@trioninc.com

CUSTOM PACKAGED ELECTRONIC AIR CLEANER

Model 75 Series Units
WITHOUT
Wash System

- INSTALLATION
- OPERATION
- SERVICE

For Model Numbers
75- _____-01 & -03

Electrostatic Precipitators for Commercial & Industrial Applications

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EXHAUST FILTRATION SYSTEM
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MEA 288-01-E and 88-99-E

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www.trioninc.com
MANUAL PART NO. 154024-002• July 2002

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SECTION I DESIGN

FOR THE SYSTEM DESIGN ENGINEER

1. General Description

The standard major components supplied with each unit for installation are as follows:

electronic air cleaner
controller / power supplies

The electronic air cleaner contains the ionizing-collecting cells (collecting elements) and metal mesh pre-filters and after-filters. Perforated plate or impingement type mist suppressors, in lieu of the metal pre-filters, are options when specified.

Gasketed access doors located on one end of the cabinet, 90 degrees to the direction of the airflow, provide entry for removal of the cells and filters. The location of the access doors may be specified as “right” or “left” handed. The hand designation is determined by standing in the ductwork on the air entering side of the unit so the airflow strikes your back.

The Pulse Width Modulated (PWM) power supplies, providing the necessary high voltage for the air cleaner and the controls are furnished in a NEMA 12 enclosure designed for remote mounting. The distance between the controller and unit must be determined as the interconnecting high voltage leads are furnished to the specified length. Consult factory for distances greater than 50 ft. Cables are not to be spliced at any point along their length. In addition, the enclosure is a central junction for the primary wiring.

Note: Trion Tridex Detergent is specially formulated for use with Trion electronic air cleaners. Use of other cleaners and detergents, not specifically approved by Trion, can cause possible failures in the unit and will void any and all warranties on our equipment.

2. System Design and Layout

The arrangement of the supplied components and the general layout of the system will vary according to application, adjoining equipment and available space. However, there are several basic factors pertaining to all installations that must be considered:

To maintain the selected cleaning efficiency, it is important to assure that the total air volume (capacity in CFM) is uniformly distributed across the entire face area of the unit. The metal mesh filters, perforated plate or mist suppressors; provide some resistance to effect even air distribution. However, since most air ducts are designed to handle air velocities greater than the rated velocity of the air cleaner, it is necessary to properly transition any attached ducting. If possible, a contraction ratio of 1 in 3 (approximately 20°) should be maintained. If space prohibits, turning vanes, air baffles or other means may be utilized. Ducting – where attached to the cabinet collars – should be gasketed, caulked or otherwise made watertight.

When there is a danger of rain, snow or debris being drawn into the system with outside air, the make-up air intake should be protected with rain louvers, hooding and hardware cloth to prevent the rain, snow or debris from entering the electronic air cleaner.

Contaminants to be collected – such as oils in vaporous state – must be condensed into particulate form prior to entering the ionizing-collecting cells in order to maintain the anticipated efficiency. Gases, vapors or any non-particulate cannot be precipitated and will therefore pass through the air cleaner. Any condensing that takes place downstream from the air cleaner defeats the purpose. By the same token, heavy concentrations of water vapor, or other matter that becomes highly conductive when condensed, must be prevented from entering and/or condensing in the collecting elements to prevent electrical arc over and shorting.

SAFETY NOTE:
Factory designed access to all electrically charged high voltage components contain electrical interlocks for the safety of operating personnel. Any additional access that may be provided in the system, where there is access to high voltage, must be equipped with such interlocks. Interlocks are readily available from the factory.

Drain lines from the cabinet drain basin should be trapped or otherwise sealed against the system pressure (in accordance with local codes). Each installation varies according to needs, but normally the controller is located near the air cleaner. Ideal mounting height is at eye level for ease in reading the instrumentation, and to facilitate service.

For ease in maintenance and component removal, adequate space, **39” Minimum Required**, must be provided in front of all access doors, motors, pump and accessory equipment. Special consideration should be given in this respect for installations where the unit is suspended overhead. Catwalks or platforms should be provided.

CAUTION
In addition to the above space requirement, installation of the Model 75 in NFPA applications shall have a clearance of at least 18""to a combustible material, 3" to limited combustible material, and 0” to noncombustible material. Any reduction in clearance or exceptions must be in compliance with NFPA and acceptable to the Authority Having Jurisdiction.

******WARNING******

Fire Suppression Systems

Extreme caution should be exercised when this unit is installed in applications that are collecting volatile or potentially flammable contaminates such as cooking grease and petroleum based oils.

Trion strongly recommends a fire suppression system be installed in the ductwork and on the Model 75 in cases where these contaminates are collected on the cell plates and collect on the attached ductwork.

Contact the factory for questions or concerns regarding a fire suppression system.

3. Outdoor Installations

Requirements for outdoor protection vary in accordance to climate and equipment component arrangement for the particular job. The best approach, for equipment protection, is the construction of a heated shed or building over the installation. As an alternative, the installing contractor should treat the equipment as required to meet the specific needs. Detailed discussions of the Model 75 components are as follows, using a rooftop installation as an example (refer to Figure 3):

Adjoining Duct Work (not supplied by Trion)

The ductwork located on the air entering side of the cabinet, between the point where it enters the roof and the cabinet, must be air tight to prevent the entrance of moisture, especially if it is under negative pressure. It must also be adequately insulated or other means taken to prevent the formation of condensation through temperature change. Condensation will short out the ionizing-collecting cells. Insulation must be of the outdoor variety.

Trion Model 75 Cabinet

The access doors on the Model 75 cabinet are gasketed and the unit is basically sealed against air leakage. The paint finish (epoxy) is for interior and exterior use. Like the air-entering duct, the cabinet must be insulated or other means taken to prevent condensation from taking place, which results in electrical shorting of the ionizing-collecting cells. Insulation, when employed must be suitable for outdoor applications and when applied, consideration given to all access door openings and electrical interlock box covers.

Controller/PWM Power Supplies

As the controller/power supplies are designed for remote mounting, they can be, in many cases, located indoors and still be reasonably close to the main cabinet. If located outdoors with the cabinet, it must be weather protected.

Drain Line

The drain line, located under the ionizing/collecting cell access door at the lowest point of the Trion cabinet drain pan, should be piped with as short a run as possible to the heated interior of the building. Preferably, straight down from the drain pan supply through the floor. The normally recommended drain line trap, to seal off the cabinet from the drain against the system pressure, should be located in the heated interior. If not installed in this manner, heat wrap or other means should be employed to prevent freezing. Clean-outs are recommended to be installed in all drain lines.

SECTION II INSTALLATION

FOR THE INSTALLING CONTRACTOR

1. Unpack and Inspect

At the time the unit is received, all shipping containers and their contents should be examined for damage. Any damage occurring in shipment must be immediately reported to the carrier, an inspection report completed and a claim filed at the receiving point.

The unit cabinet is shipped completely assembled and, where size permits, the ionizing-collecting cells are shipped inside the cabinet. On large units, the upper tier of cells may be shipped in separate containers. The controller, and other separate accessories are shipped in the containers as noted on the packing list.

2. Position Air Cleaner Cabinet

To reduce weight for ease in handling, remove the pre-filters, after-filters and the ionizing-collecting cells from the cabinet, and place them safely aside. Position the cabinet in the designated location giving consideration to the following points:

(a) Provide sufficient clearance in front of the access doors for ionizing-collecting cell and mechanical filter removal. **A minimum of 39 inches is required. (see figure 5)**

(b) Level the cabinet to assure proper drainage from the drain pan.

(c) Unless specific design features have been prearranged, the direction of airflow through the cabinet may be either from the right or the left. When the ionizing-collecting cells are reinstalled, the directional arrows on the cell end plates must concur with airflow through the cabinet. If mist suppressors have been specified, they are to be installed on the air entering side of the unit.

After the cabinet has been properly located, it may be secured into place at the predrilled factory mounting pads either by bolting or welding.

3. Connect Adjoining Duct Work

Depending on the application, the installation plan may or may not call for adjoining ductwork on the air entering and/or air leaving sides of the cabinet.

When adjoining ducting is to be installed, the bottom of the horizontal duct runs should be relatively flat and

sloped toward the cabinet drain pan for an 18-inch length.

Duct securement to the collar may be completed using the predrilled flange. The seam should be made air and watertight by caulking or gasketing.

When a blower is installed downstream from the Trion cabinet, the ducting between the cabinet and the blower will be under negative pressure and should be made air tight to prevent infiltration of contaminated air.

After the ductwork has been installed, clear remaining material or debris from inside ducts and bottom of cabinet, and then re-install both the mechanical filters and the ionizing-collecting cells.

NOTE: Follow the directional arrows located on the cell end plates. The side of each cell containing the spiked ionizer blades must be located on the air entering side of the cabinet. The brass contact plungers on the cell should be inserted toward the back of cabinet. Also, mist suppressors when specified must be located on the air entering side of the cabinet.

4. Connect Drain

Connect a drain line to the pipe coupling provided in the cabinet drain basin in accordance with the governing plumbing codes. The drain line must be sealed with a trap or other means to prevent air by pass. If a trap is used, it should hold sufficient water column to overcome the system air pressure and to assure that loss of liquid from evaporation between cleaning periods will not break the seal. The drain line should not be smaller than the drainpipe coupling.

5. Mount Controller

The Controller should be mounted at eye level and located as close to the air cleaner as practical. It must be mounted indoors out of the weather unless supplied with a weatherproof cabinet. Allow sufficient space in front of the access door(s) for service. Refer to appropriate Control/Remote PWM Box Outline Drawing for mounting hole layout and dimensions.

6. Complete Wiring

(a). *High Voltage Wiring*

WARNING:
EXERCISE ALL THE NORMAL PRECAUTIONS WHEN WORKING WITH HIGH VOLTAGE AND COMPLY WITH NEC AND ALL APPROPRIATE LOCAL CODES.

The high voltage wiring entails interconnecting the power supply(s) to the ionizing-collecting cell(s) through the factory-installed junction box on top of the cabinet. All the wiring in the cabinet has been completed at the factory.

Refer to the Field Wiring Diagram. Two high voltage leads, Red/Black Tracer for the ionizer and one Red for the collector, are factory furnished. Each lead is to be run in separate conduit and must be of continuous run (do not splice) between the controller and the ionizing-collecting cell terminal connection in the junction box.

(b). *Primary Wiring*

The Controller is the main distribution point for all primary wiring. The various electrical components involved are connected to and powered from the controller. These interlocks are safety switches that prevent access to the charged high voltage components without first turning “OFF” the high voltage by interrupting the 24 VDC input to the PLC. Refer to the appropriate Field Wiring Diagram.

(c). *Grounding*

An earth ground must be provided to the Model 75 cabinet and control. All ground connections must be in contact with bare metal and securely affixed. Ground conductor size and connection means will be in accordance with all applicable electrical code standards.

7. Check Out for System Start-up

When the installation has been completed, assure that the equipment is ready for start-up by checking the following:

A. All construction debris is removed from the ionizing-collecting cells, drain basin and ductwork.
B. The drain line from the Trion drain basin is clear and completely connected to its point of termination.
C. Supply line power is available and electrical wiring is completed to the following components:

1. Controller
2. Electrical Interlocks
3. Ionizing-Collecting Cells
4. The System Fan

SECTION III OPERATION & SERVICE

WARNING
RISK OF ELECTRIC SHOCK
These serving instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

FOR THE MAINTENANCE ENGINEER

1. Introduction and Principle of Operation

The Trion® electronic air cleaner is technically known as an electrostatic precipitator. In this type of equipment, all airborne particles, even of microscopic

size, are electrically charged (positively) as they pass through a high voltage ionizer. These charged particles are then attracted and adhere to a series of parallel collecting plates, which form the negative elements of an electrostatic field.

The ionizer consists of charged stainless steel spiked blades spaced between grounded electrodes. The collecting section consists of parallel plates arranged so that each alternate plate is charged while the intermediate plates are electrically grounded.

Periodically, depending on the type and concentration of contamination in the air, contaminate is washed from the plates by manually removing the cells and washing with a pressure washer.

Two major functional components comprise the air cleaner:

(1) Ionizing-collecting cells to ionize and collect airborne particulate matter.
(2) Power supply(s) to supply high voltage direct current to the ionizing-collecting cells.

Normally, systems are designed for collection efficiencies in the range of 90 percent or more. Collecting a contaminate at these efficiencies, especially when there are high concentrations can result in large accumulations in a relatively short period. Therefore, maintenance must encompass two areas; the operation of the equipment for efficient collection and the systematic removal of the collected contaminate.

2. General Description

The ionizing-collecting cells (contaminate collecting elements) are housed in the cabinet on slide rails. They can be removed from the cabinet as required, through the end access door, by sliding them out like drawers. On multi-cell units, all of the electrical connections between cells in a given tier are automatically made through spring plunger connectors. On the access end, the high voltage cables from the power supplies are connected to the junction box on top of the cabinet. The high voltage cables from the junction box to the individual tiers are factory wired. When installing cells into the cabinet, observe the directional arrows on the cell end plates. The side of the cell containing the spiked ionizer blades always must be located on the air entering side. The spring plunger connectors, located on one end of each cell, will always face toward the back of the Model 75 Cabinet.

Both the air entering and air leaving side of the cabinet contain either metal mesh filters or perforated plate, whichever was specified. These items act as trash screens, and provide resistance for even air distribution.

The Power Supply(s) convert the 115 volt, 60HZ, single phase AC supply to the high voltage DC needed to power the ionizing-collecting cells. Potential of 13 KVDC are required for the ionizer sections and 6.5 KVDC for the collector sections of the cells.

3. Initial Start-up

A. Inspect the inside of the adjoining ductwork and Trion cabinet to be sure it is clean and free of any debris or construction materials. Especially note the opening in the drain basin for any restrictions. The ducting, where secured to the cabinet collars, should be sealed water tight either with gasketing or caulking.

B. Inspect the ionizing-collecting cells to see that all of the ionizing blades are intact, that no large pieces of foreign material are lodged between the plates, and that the cells are properly installed in the cabinet with the spiked ionizing blades located on the air entering side.

C. Check the high voltage leads to see that they are connected to the proper terminal both at the ionizing-collecting cells, the junction box and inside the controller. (Refer to Figures 2 and 4).

D. Be sure that the drain lines from the Trion cabinet drain basin are completely connected and properly terminated. A trap or seal of some type should be incorporated in the line to prevent air bypass.

E. Be sure that electrical power is available, that the wiring is completed, and that the system blower is ready to energize.

F. Be sure that all access door interlocks are closed.

G. Close the system electrical supply switches, making power available to the Trion controller and the system fan.

H. Turn the controller selector switch to the “ON” position. The blower should run (if installed) and the power supply(s) should be energized. Electrical arcing within the ionizing-collecting cells may occur. It is a normal occurrence caused by accumulation of dusts from construction or other sources in the cell(s) and should subside quickly. If the arcing is continuous and does not subside, recheck the routing of the high voltage leads between the power supply(s) and the cell(s). Refer to the field wiring diagram. The ionizer lead must be connected to the ionizer and the collector lead to the collector.

<u>Kitchen Exhaust Applications</u>

I. For safe and proper operation adhere to the following instructions and procedures:

1. Exhaust systems shall be operated during all periods of cooking in restaurant applications.

2. Filter-equipped exhaust systems shall not be operated with filters removed.

3.The posted instructions for manually operating the fire extinguishing system shall be kept conspicuously posted in the kitchen and reviewed periodically with employees by the management.

4. Listed exhaust hoods shall be operated in accordance with the terms of their listings and the manufacture instructions.

5. Cooking equipment shall not be operated while its fire-extinguishing system or exhaust system is not operating or otherwise impaired.

4. Routine Maintenance

A. *Washing Frequency*

The frequency that the collected dirt is to be washed from the unit depends upon the type and amount of dirt in the air to be cleaned. Dirt which is greasy in nature tends to harden after collection and should be washed away often. Likewise, units operating under extremely heavy dirt loads should be washed more often as a large build-up of collected material will have a tendency to "blow-off" if permitted to remain on the collecting elements for long periods of time. In that the type and amount of dirt varies geographically (and from one location to another in any given area) it is recommended to start operation with a washing frequency of at least once a week. This schedule may then be altered as needed after visual examinations of the collected material contained on the ionizing-collecting cells. Daily washing is not unusual for units operating on heavy welding fume, kitchen exhaust hoods or similar contaminants.

B. *Detergent*

Effective washing is dependent upon detergent. The detergent, as supplied by Trion, Inc., is formulated specifically for electronic air cleaners. If substitutes are used, they must be approved by Trion, so as to not void the warranty and should be safe for use in ventilation systems and non-caustic, as 95% of the ionizing-collecting cells are constructed of aluminum and special high voltage insulation and gasket seals.

C. *Electrical Operation*

The Air Boss controller (Optional) contains a digital LED display for kilovolt and milliampere readings. The milliammeter should be observed on a routine basis to be sure that it is reading within the prescribed operating range as marked on the data plate. For those units containing a voltmeter, the ionizer readings should be between 12.5 and 13.5 KV.

The ATS controller and remote PWM box both have LED indicating lights to show power to the PWM power supplies. Flickering or failed LED's indicate electrical arcing and/or power failure.

5. Periodic Maintenance

A. *Fire Suppression System* ***(IF INSTALLED) – Every 6 Months***

Properly trained and qualified personnel shall complete inspection, cleaning and servicing of the fire suppression system.

All actuation components, including remote manual pull stations, mechanical or electrical devices, detectors, fire-actuated dampers, etc., shall be checked for proper operation in accordance with the manufacturers listed procedures. In addition to these requirements, the specific inspection requirements of the applicable NFPA standard shall also be followed. If required, certificates of inspection and maintenance shall be forwarded to the authority having jurisdiction.

B. *Controller -* ***Every 12 Months***

The inside of the controller cabinet should be examined for accumulated dirt and dust. If required, the components should be cleaned using a good brand of electrical contact cleaner. All terminal connections should be checked for securement and tightened or reworked as required.

C. *Ionizing-Collecting Cell –* ***Every 6 to 12 Months***

Remove and inspect the ionizing-collecting cells for excessive dirt accumulations. Manually clean as required in a soak tank, commercial car wash, or with a pressure hose or pressure cleaner using a low pressure setting. At this time, particular care should be taken in cleaning each of the insulators.

WARNING:

DO NOT USE HIGH PRESSURE STEAM CLEANING EQUIPMENT TO CLEAN CELLS. THE EXCESSIVE HEAT AND PRESSURE WILL CAUSE THE PLATES TO WARP AND IN TURN POSSIBLY CAUSE EXCESSIVE ARCING.

D. *Filter Devices –* ***Every 4 to 6 Months***

Hoods, impingers, metal mesh filters, ducts and other appurtenances shall be cleaned to bare metal at frequent intervals prior to surfaces becoming heavily contaminated with grease, oil or other contaminate. It may be advantageous to clean readily removable items, such as impingers, metal mesh filters or other permanent filter devices in a soak tank, with a pressure hose or pressure cleaner set low. After cleaning to bare metal, components shall not be coated with powder or other substance.

When a cleaning service is used, a certificate showing dates of inspection and/or cleaning shall be maintained on the premises.

WARNING
Flammable solvents or other flammable cleaning aids shall not be used.

At the start of the cleaning process, electrical switches that could be accidentally activated shall be locked out. Components of the fire suppression system (if installed) shall not be rendered inoperable during the cleaning process.

Care should be taken not to apply cleaning chemicals on any fusible links or other detection devices of the automatic extinguishing system.

6. Troubleshooting

WARNING:
EXERCISE THE USUAL PRECAUTIONS WHEN WORKING WITH HIGH VOLTAGE. THE MAXIMUM OPERATING OUTPUT FROM THE POWER SUPPLY IS 15,000 VDC AND 5.5 MA. to 11.0 MA. WHEN IN PARALLEL.

IF SAFETY SWITCHES ARE CLOSED AND CIRCUIT IS ENERGIZED, DO NOT TOUCH HIGH VOLTAGE. WHEN THE CIRCUIT IS DE-ENERGIZED, ALWAYS BLEED OFF REMAINING STATIC CHARGE WITH AN INSULATED HANDLED SCREW DRIVER BY SHORTING GROUND THE POINTS OF HIGH VOLTAGE DC POTENTIAL.

WARNING
Risk of Electrical Shock

The servicing Instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the service instructions unless you are qualified to do so.

A. Introduction

This section on trouble shooting provides a description of potential malfunctions, their cause, location and correction. A Trouble Reference Chart listing the most probable causes and corrections follows the general text.

NOTE: All repair to the fire suppression system (If Supplied) must be completed by the authorized fire control contractor.

The electronic air cleaner is the unit within the system that has the highest efficiency collection rating and is also the one with the highest potential for malfunction. When a malfunction does occur, the outage is usually found in the electrical secondary circuit in the ionizing-collecting cell(s).

Indicating lights are installed in the face panel of the control to monitor the electrical operation of each power supply and the ionizing-collecting cell(s) they energize. The quantity of power supplies per unit is dependent upon unit size with one or two power supplies for each ionizing-collecting cell tier in height. Other than the basic hand tools, it is advantageous to have a volt meter with a 20 KVDC high voltage probe. These instruments are standard catalog items by several manufactures.

B. Secondary Short Circuit

The most common outage is a short in the secondary circuit and is best located through the process of elimination. Symptoms are a flickering indicating light accompanied by an arcing noise in the ionizing-collecting cell(s) or an indicating light that is not glowing.

A flickering light with an arcing noise is an indication of a high resistance short circuit and a light that is not glowing is an indication of a dead short. (A light that is not glowing can also be an indication of an open circuit in the primary circuit. Refer to the paragraph on open circuits.) The short may be in the power supply, the high voltage cables or the ionizing-collecting cell(s). To isolate the short to any one of these three components, proceed as follows:

WARNING

When safety interlock switches are closed, do not come in contact with high voltage components. The operating output from the high voltage power supply(s) is 12,600 VDC and 6 MA. to 11.0 MA.

When the power supply(s) is de-energized there is a 20 second delay for the voltage to decay. Always short from ground to a point of high voltage with a well insulated jumper wire or an insulated handled screwdriver to bleed-off any remaining residual charge.

1. Disconnect both high voltage leads from their respective terminals in the power supply and support them away from any point of contact.

2. Energize the power supply:

   a. If the light still flickers or does not glow, the trouble is indicated to be in the power supply. Replace the power supply in its entirety.

   b. If the light glows steady with the leads disconnected the power supply is indicated to be normal.

NOTE: It will be necessary to close the access door electrical interlock switch operated by the access door and affix the junction box lid with hardware supplied to close the electrical interlock switch on the box, to complete the primary circuit to the power supply.

3. Next reconnect both high voltage leads to their respective terminals inside the power supply and disconnect them at the ionizing-collecting cell(s). Support

them away from any point of contact and energize the power supply.

a. If either high voltage lead is defective the light will indicate the trouble. Each lead may then be checked separately by disconnecting them, one at a time, from their respective terminals at the power supply. When a lead is found to be defective, replace it in its entirety. Do not repair or splice.

b. If the light glows steady with the leads disconnected at the ionizing-collecting cell(s) the trouble is then indicated to be in the ionizing-collecting cell(s).

The trouble can then be isolated to, a single cell, or the ionizing or collector section of a given cell as follows:

(1) First determine if the short is in the ionizing section or the collecting section by connecting each high voltage lead to its respective section, one at a time, and energizing the power pack. (The lead not connected must be supported away from any point of contact.) The short symptoms will still exist for the section in which the short is located. If the trouble causing the short is bridging both sections, then the short will be indicated in both sections when they are individually connected.

(2) When the short is isolated to a cell tier, remove all the cells within the tier and visually check the sections indicated to contain the short.
(a). If the short is in the ionizer section look for a broken or defective insulator.
(b). If the short is in the collector section look for a large piece of foreign material bridging the collector plates or a defective insulator.
(c) . If the short is indicated to be in both sections, it will probably be a foreign object bridging the air gap between the ionizer and the collector.

c. Open Circuits
Although open circuits can occur in the secondary they usually take place in the primary. If the unit contains only one power supply and the indicating light does not glow the outage is probably one of the following.
(1) Supply line power to the control disconnected. Reconnect.
(2) Open access door interlock in control of electronic air cleaner. Be sure all access doors are properly closed and secured.
(3)Blown in-line fuse located on the power supply circuit board. Replace power supply.
(4) Outage in the power supply. Look for charred or burned components or a loose wiring connection. Replace power supply or reconnect wiring.
(5) Defective indicating light. Replace light.

d. Malfunctions other than short or open circuits.
Refer to trouble reference chart in this section.

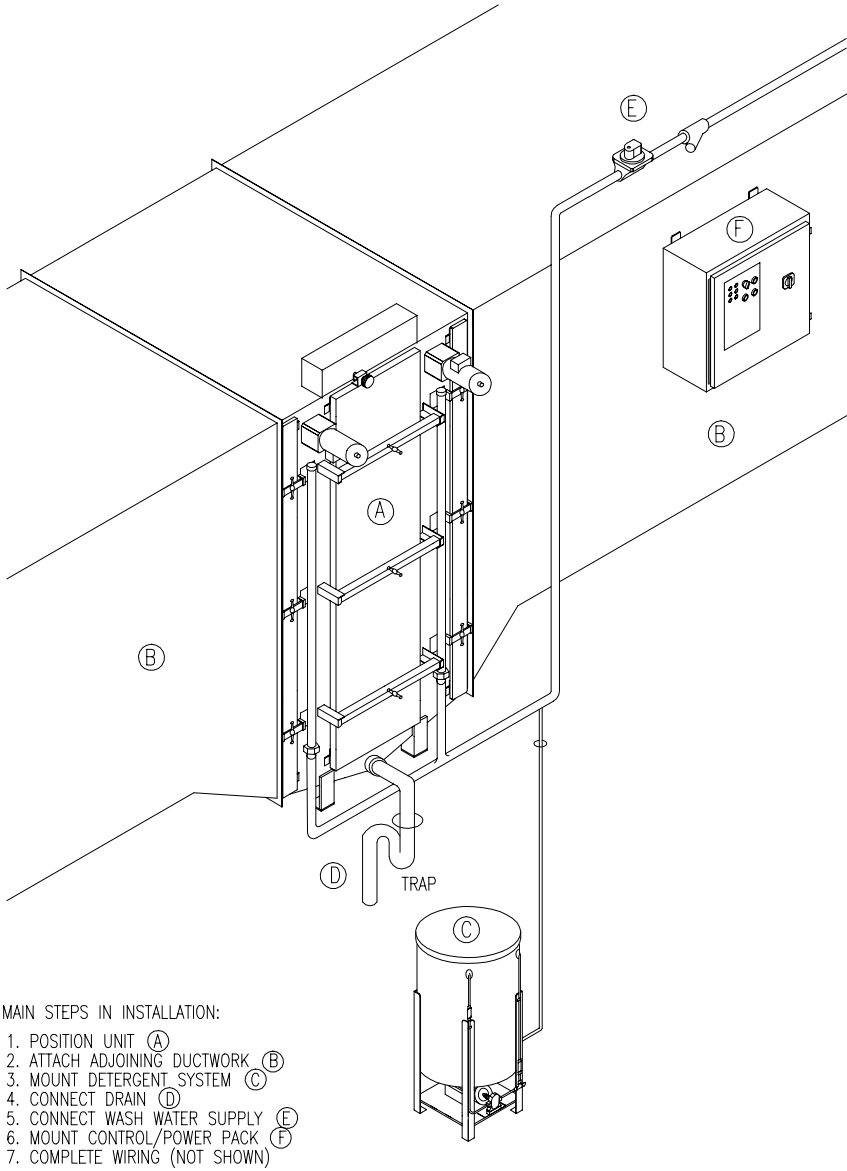
7. Spare Parts
Recommended spare part quantities are usually based on the unit size and the amount of units per installation. For specific recommendations, consult the Trion factory or nearest Sales Office. Consideration, however, should be given to stocking the following components;

DESCRIPTION	QTY.
PWM Power Supply	2
Junction Box Stand Off Insulators	2
Cell Insulators	6
LED	2

Part Numbers are not listed as they are subject to change. Always state Unit Model and Serial Numbers when ordering parts.

Troubleshooting Reference Chart

PROBLEM/ SYMPTOM	PROBABLE CAUSE	LOCATION	REASON - CORRECTION
Indicating Light Not Glowing	Short Circuit	Ionizing Section of Cell	1. Dirty insulator(s) – Clean 2. Defective insulator(s) – Replace 3. Foreign Object Between Ionizing Bar and Ground electrode - Remove
		Collecting Section of Cell	1. Dirty insulator(s) - Clean 2. Defective insulator(s) – Replace 3. Foreign Material Bridging Plates - Remove 4. Bent Plates – Straighten or Replace
		High Voltage Leads	1. Disconnected High Voltage Lead Contacting Ground - Reconnect 2. Defective Lead/Insulation Breakdown – Replace Entire Lead
		Power Supply	Charred/Over Heated Components – Replace Power Supply
Indicating Light Not Glowing	Open Circuit	Control	1. Disconnected Supply Line Power – Reconnect 2. Faulty indicting Light - Replace
		Power Supply	1. Blown In-line Fuse – Replace Power Supply 2. Disconnected Wire – Replace 3. Charred/Over Heated Components – Replace Power Supply
		Electronic Air Cleaner Housing	1. Electrical Interlock Switch Not Closed – Close Access Door 2. Junction Box interlock switch not closed – Secure Cover 3. Faulty Electrical Interlock Switch - Replace
Indicating Light Flickering	High Resistance Short	High Voltage Circuit	1. Ionizer High Voltage Lead Connected to Plate Section and Plate Lead to Ionizer – Reconnect Leads 2. Loose or Disconnect high Voltage Lead-Tighten or Reconnect 3. Loose or Defective Intercell Connection (on Multicell Units) – Tighten or Replace 4. Foreign Object Adrift in Ionizer or Plate Section of Cell – Remove 5. Dirty Cells – Remove, clean and replace.

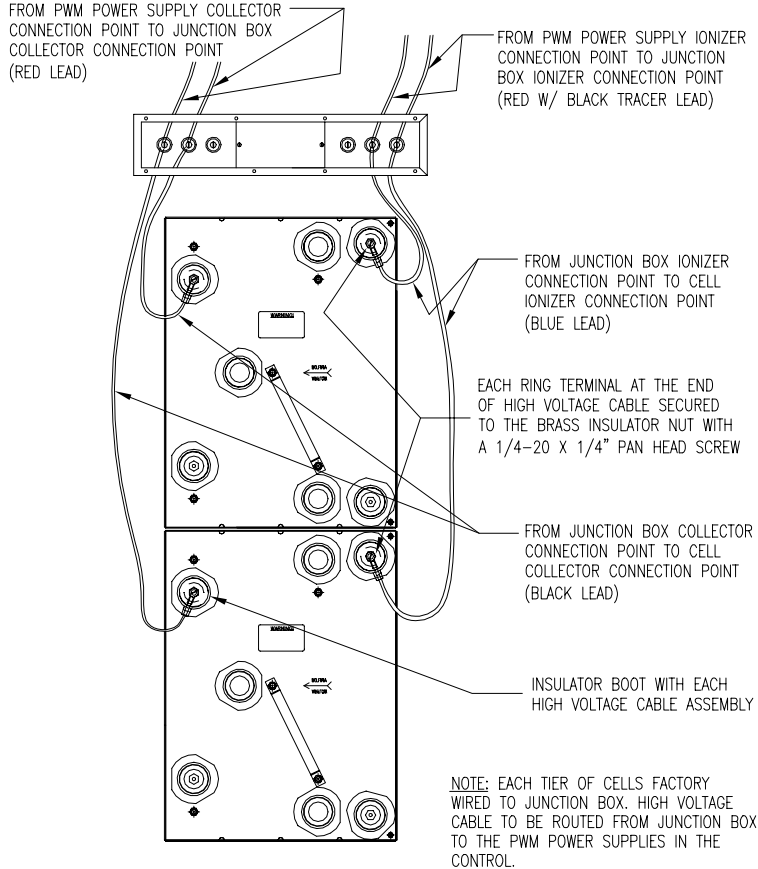


MAIN STEPS IN INSTALLATION:

1. POSITION UNIT (A)
2. ATTACH ADJOINING DUCTWORK (B)
3. MOUNT DETERGENT SYSTEM (C)
4. CONNECT DRAIN (D)
5. CONNECT WASH WATER SUPPLY (E)
6. MOUNT CONTROL/POWER PACK (F)
7. COMPLETE WIRING (NOT SHOWN)

GENERAL COMPONENT ARRANGEMENT

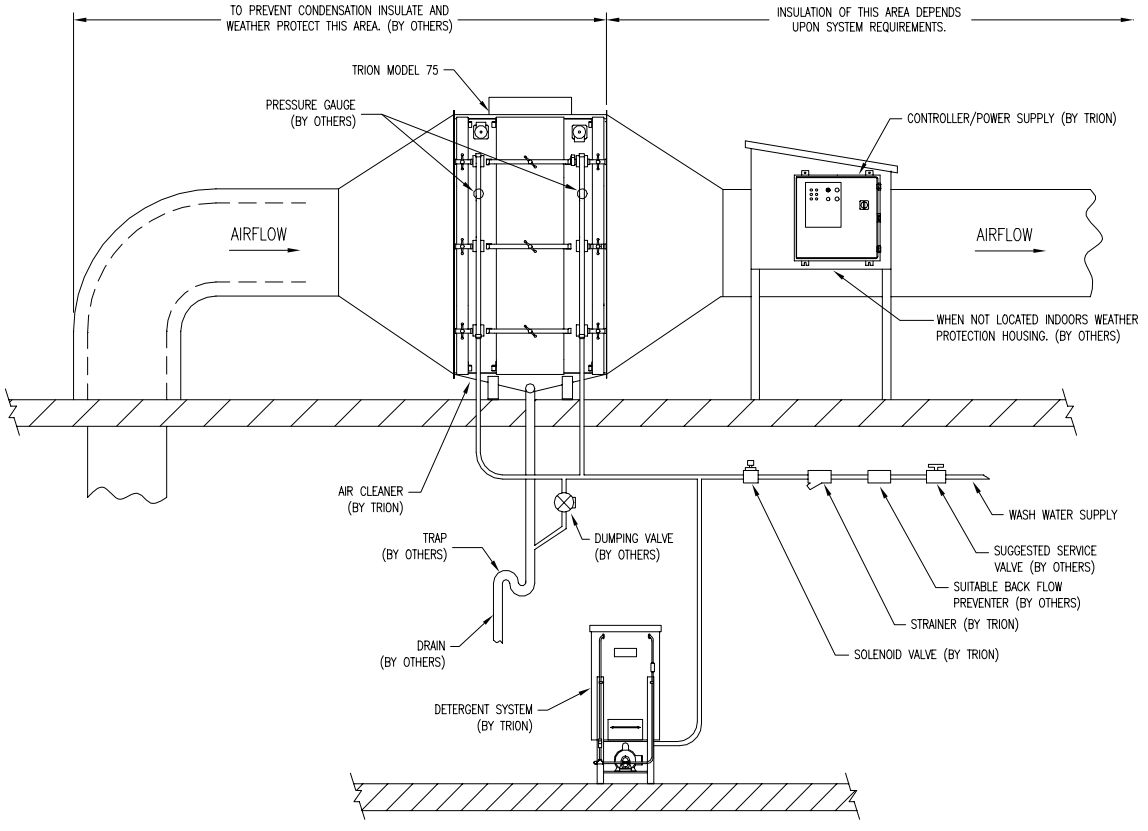
FIGURE 1



HIGH VOLTAGE LEAD CONNECTING TERMINALS

FIGURE 2

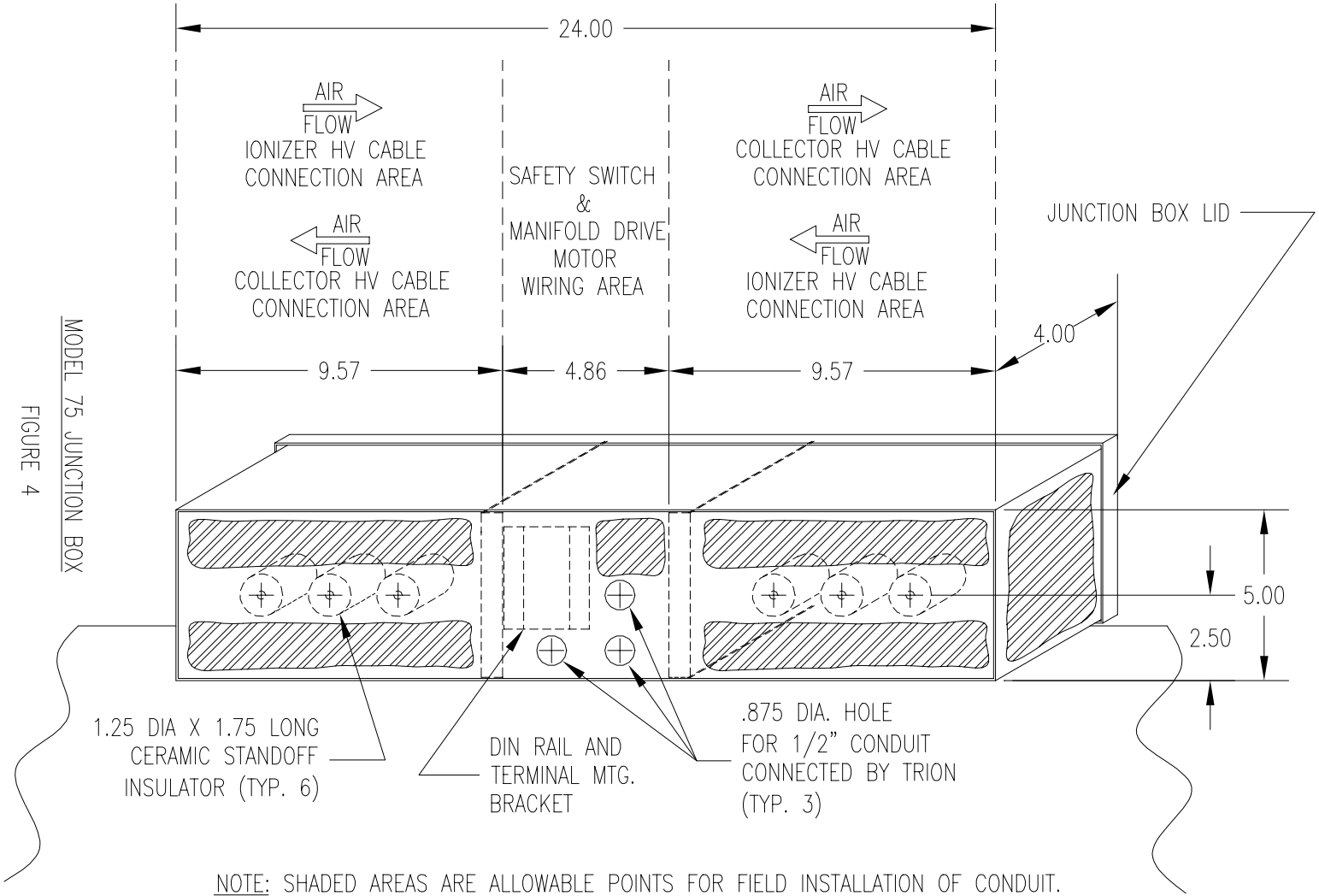
M75FIG2.DWG



TYPICAL OUTDOOR INSTALLATIONS

FIGURE 3
14

M75FIG3.DWG



NOTE: SHADED AREAS ARE ALLOWABLE POINTS FOR FIELD INSTALLATION OF CONDUIT.

MODEL 75 JUNCTION BOX

FIGURE 4

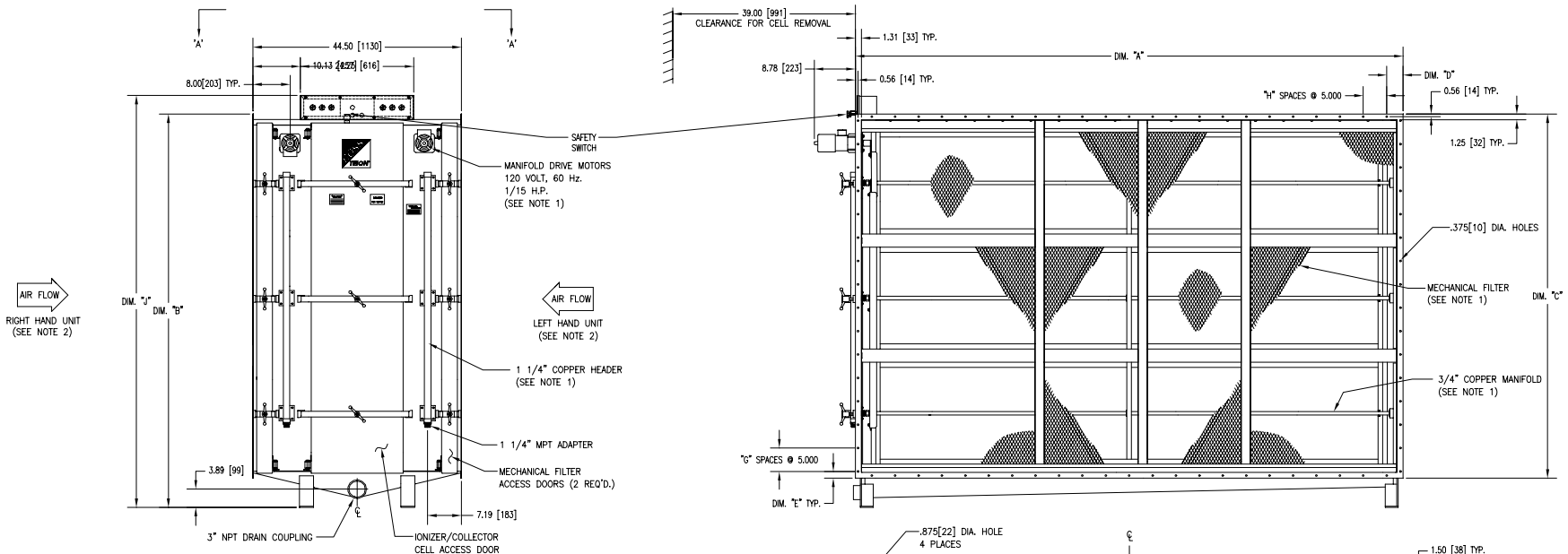
M75FIG4.DWG

UNIT SIZE	DIM."A"	DIM."B"	DIM."C"	DIM."D"	DIM."E"	DIM."F"	"G" SPACES	"H" SPACES	DIM. "J"	UNIT WEIGHT APPROX.
MODEL 75-102	28.31 [719]	34.87 [886]	28.62 [727]	1.65 [42]	1.81 [46]	23.37 [594]	5	5	38.87 [987]	370 LBS.[168.2 kg]
MODEL 75-103	39.50 [1003]			2.25 [57]		34.56 [878]		7		450 LBS.[204.5 kg]
MODEL 75-104	50.44 [1281]			2.72 [69]		45.50 [1156]		9		540 LBS.[245.5 kg]
MODEL 75-105	61.63 [1565]			3.31 [84]		56.69 [1440]		11		620 LBS.[281.8 kg]
MODEL 75-106	72.81 [1850]			3.90 [99]		67.87 [1724]		13		705 LBS.[320.5 kg]
MODEL 75-107	83.75 [2127]			1.87 [48]		78.81 [2002]		16		800 LBS.[363.6 kg]
MODEL 75-108	94.97 [2412]			2.48 [63]		90.03 [2287]		18		880 LBS.[400.0 kg]
MODEL 75-109	106.16 [2696]			3.08 [78]		101.22 [2571]		20		960 LBS.[436.4 kg]
MODEL 75-110	117.00 [2972]			3.50 [89]		112.06 [2846]		22		1050 LBS.[477.3 kg]
MODEL 75-203	39.50 [1003]	59.50 [1511]	53.24 [1352]	2.25 [57]	1.62 [41]	34.56 [878]	10	7	63.50 [1613]	740 LBS.[336.4 kg]
MODEL 75-204	50.44 [1281]			2.72 [69]		45.50 [1156]		9		905 LBS.[411.4 kg]
MODEL 75-205	61.63 [1565]			3.31 [84]		56.69 [1440]		11		1050 LBS.[477.3 kg]
MODEL 75-206	72.81 [1850]			3.90 [99]		67.87 [1724]		13		1190 LBS.[540.9 kg]
MODEL 75-207	83.75 [2127]			1.87 [48]		78.81 [2002]		16		1360 LBS.[618.2 kg]
MODEL 75-208	94.97 [2412]			2.48 [63]		90.03 [2287]		18		1500 LBS.[681.8 kg]
MODEL 75-209	106.16 [2696]			3.08 [78]		101.22 [2571]		20		1640 LBS.[745.5 kg]
MODEL 75-210	117.00 [2972]			3.50 [89]		112.06 [2846]		22		1805 LBS.[820.5 kg]

UNIT SIZE	DIM."A"	DIM."B"	DIM."C"	DIM."D"	DIM."E"	DIM."F"	"G" SPACES	"H" SPACES	DIM. "J"	UNIT WEIGHT APPROX.
MODEL 75-303	39.50 [1003]	84.12 [2137]	77.87 [1978]	2.25 [57]	1.43 [36]	34.56 [878]	15	7	88.12 [2238]	1050 LBS.[477.3 kg]
MODEL 75-304	50.44 [1281]			2.72 [69]		45.50 [1156]		9		1275 LBS.[579.5 kg]
MODEL 75-305	61.63 [1565]			3.31 [84]		56.69 [1440]		11		1480 LBS.[672.7 kg]
MODEL 75-306	72.81 [1850]			3.90 [99]		67.87 [1724]		13		1680 LBS.[763.6 kg]
MODEL 75-307	83.75 [2127]			1.87 [48]		78.81 [2002]		16		1920 LBS.[872.7 kg]
MODEL 75-308	94.97 [2412]			2.48 [63]		90.03 [2287]		18		2120 LBS.[963.6 kg]
MODEL 75-309	106.16 [2696]			3.08 [78]		101.22 [2571]		20		2325 LBS.[1056.8 kg]
MODEL 75-310	117.00 [2972]			3.50 [89]		112.06 [2846]		22		2552 LBS.[1159.1 kg]

NOTES:

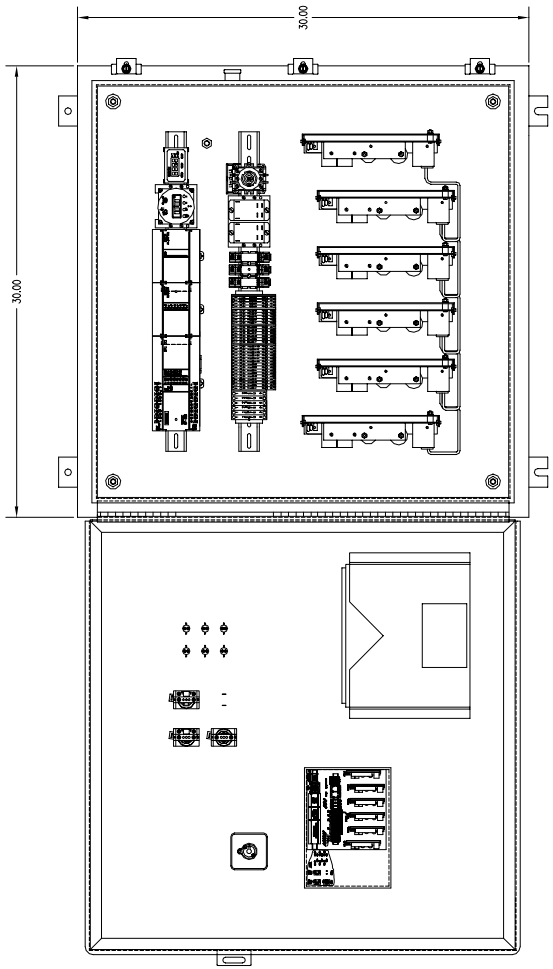
1.) UNIT SHOWN WITH WASH AND METAL MESH FILTERS. DESIGNATE BY ORDER DESCRIPTION, THE LOCATION & PART NUMBER OF WASH ASSEMBLY AND MECHANICAL FILTER TYPE.
2.) SPECIFY DIRECTION OF AIR FLOW THROUGH UNIT ON ORDER DESCRIPTION.

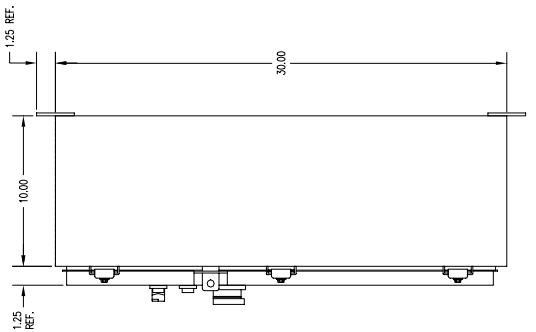


MODEL 75 UNIT OUTLINE

FIGURE 5

ATS CONTROL
(STANDARD)





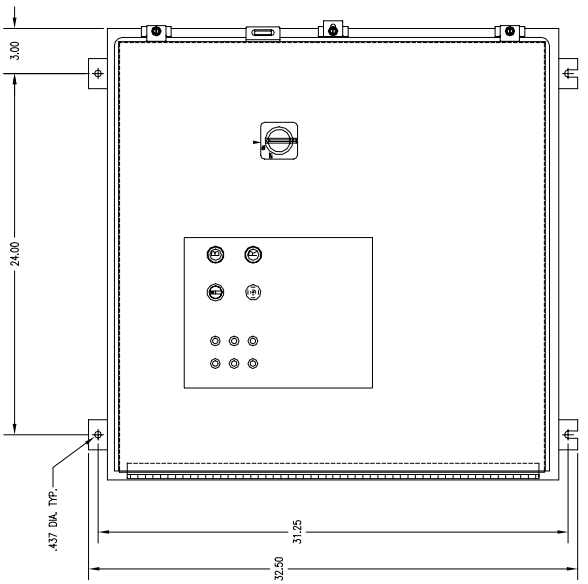
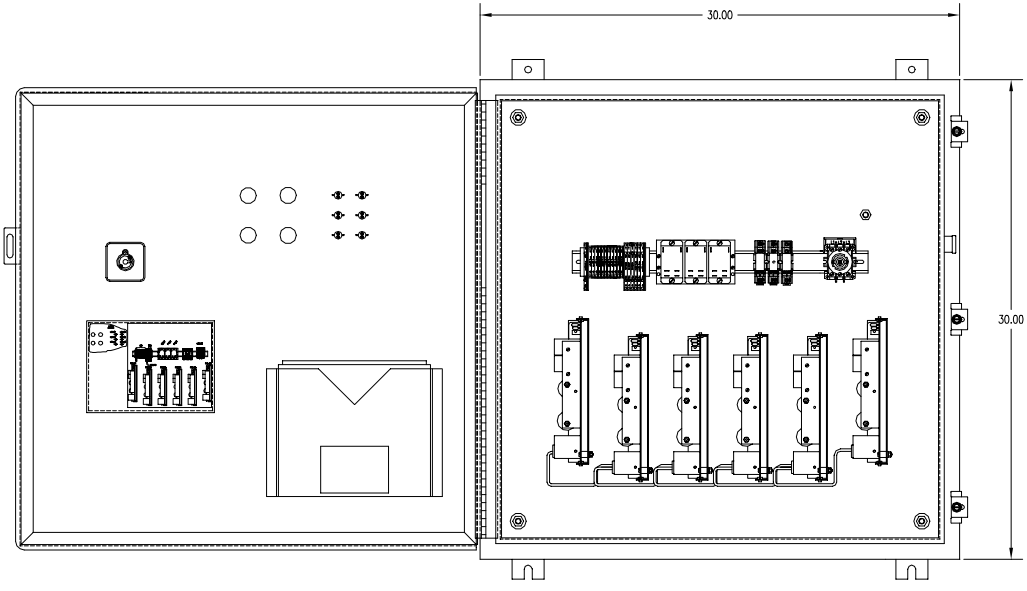
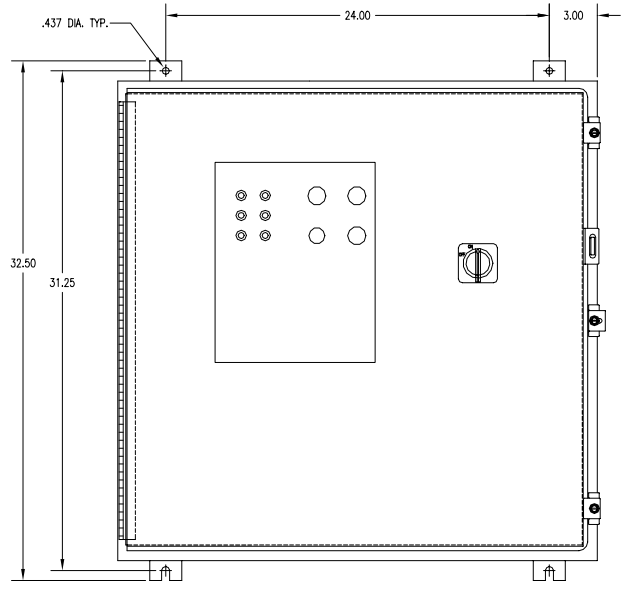


FIGURE 6

M75FIG6.DWG



REMOTE PWM ASSEMBLY
(OPTIONAL)



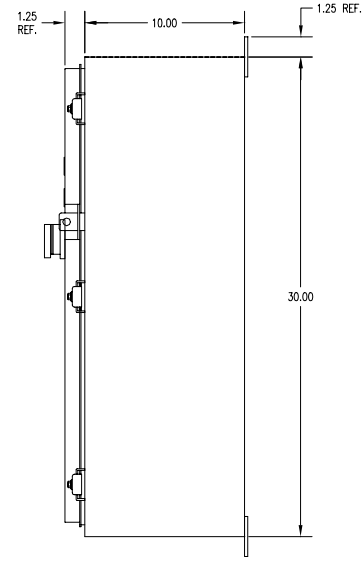
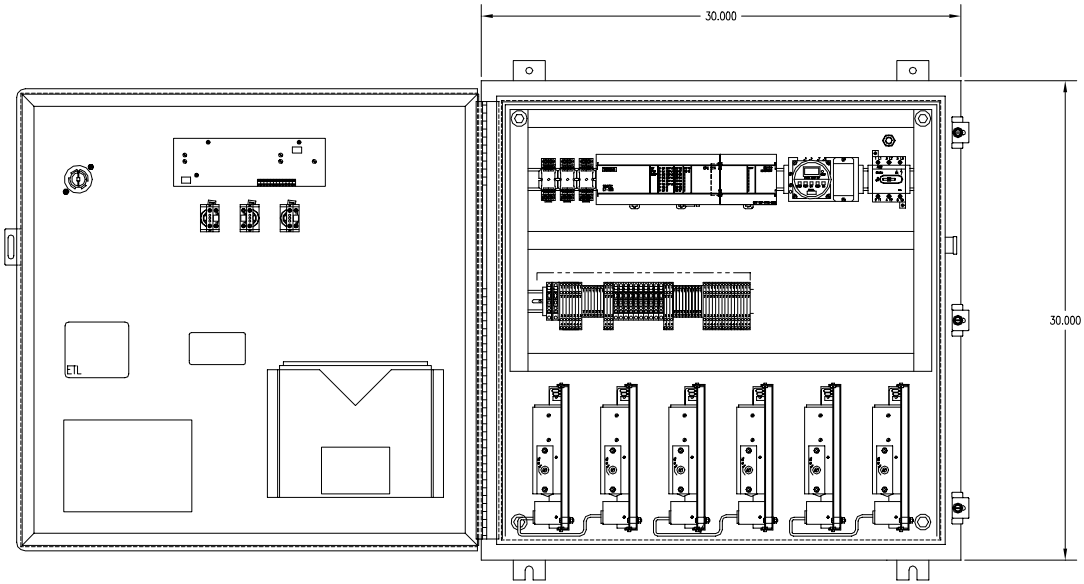
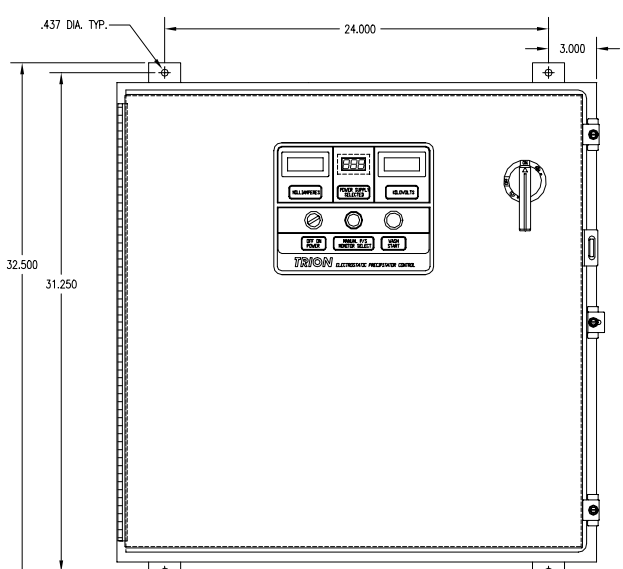


FIGURE 7

M75FIG7.DWG



AIR BOSS CONTROL
(OPTIONAL)



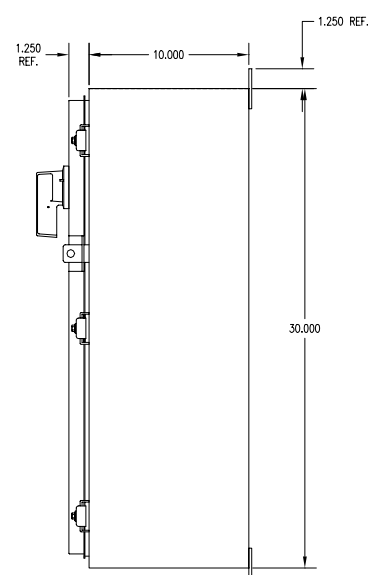
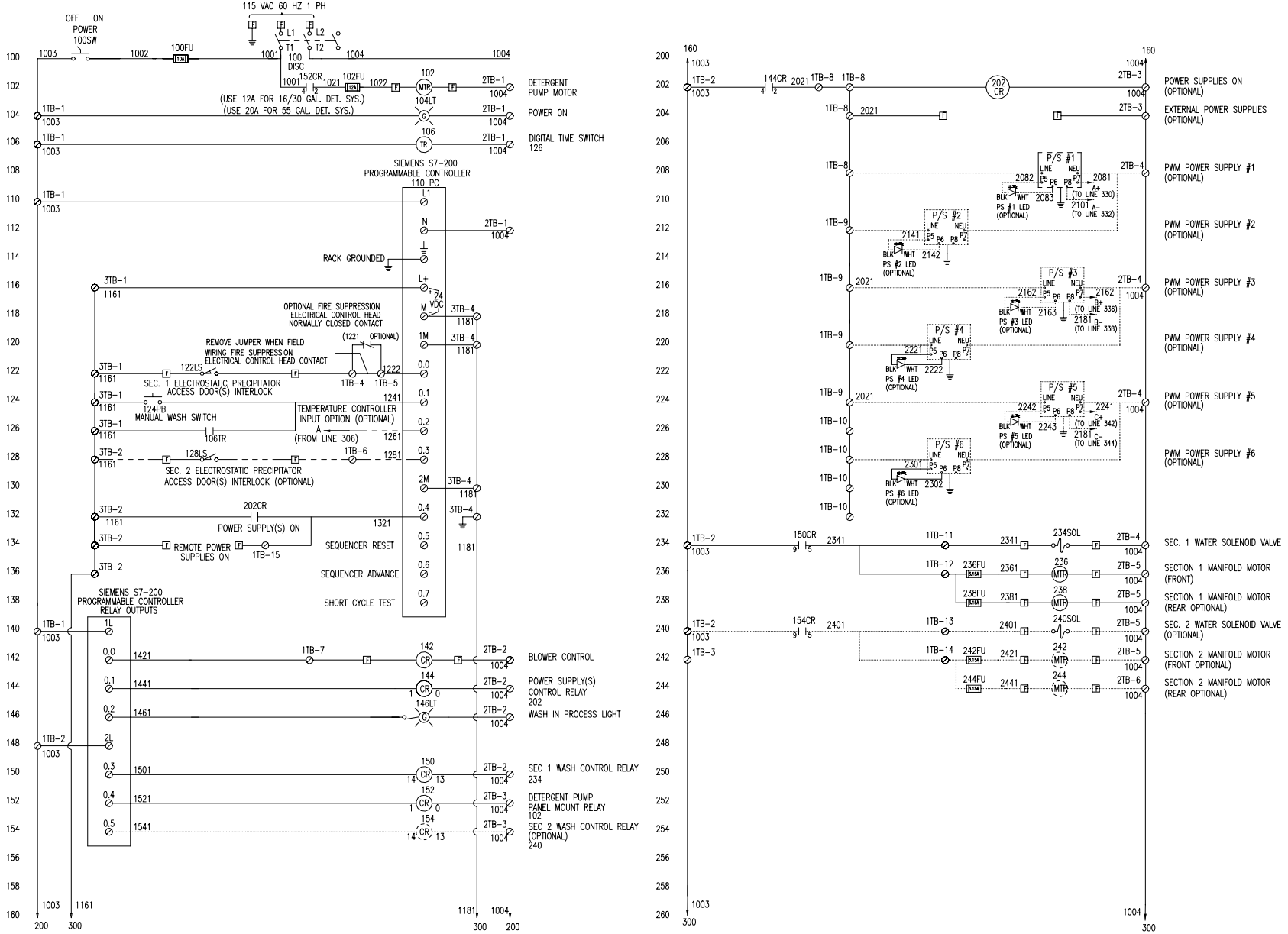


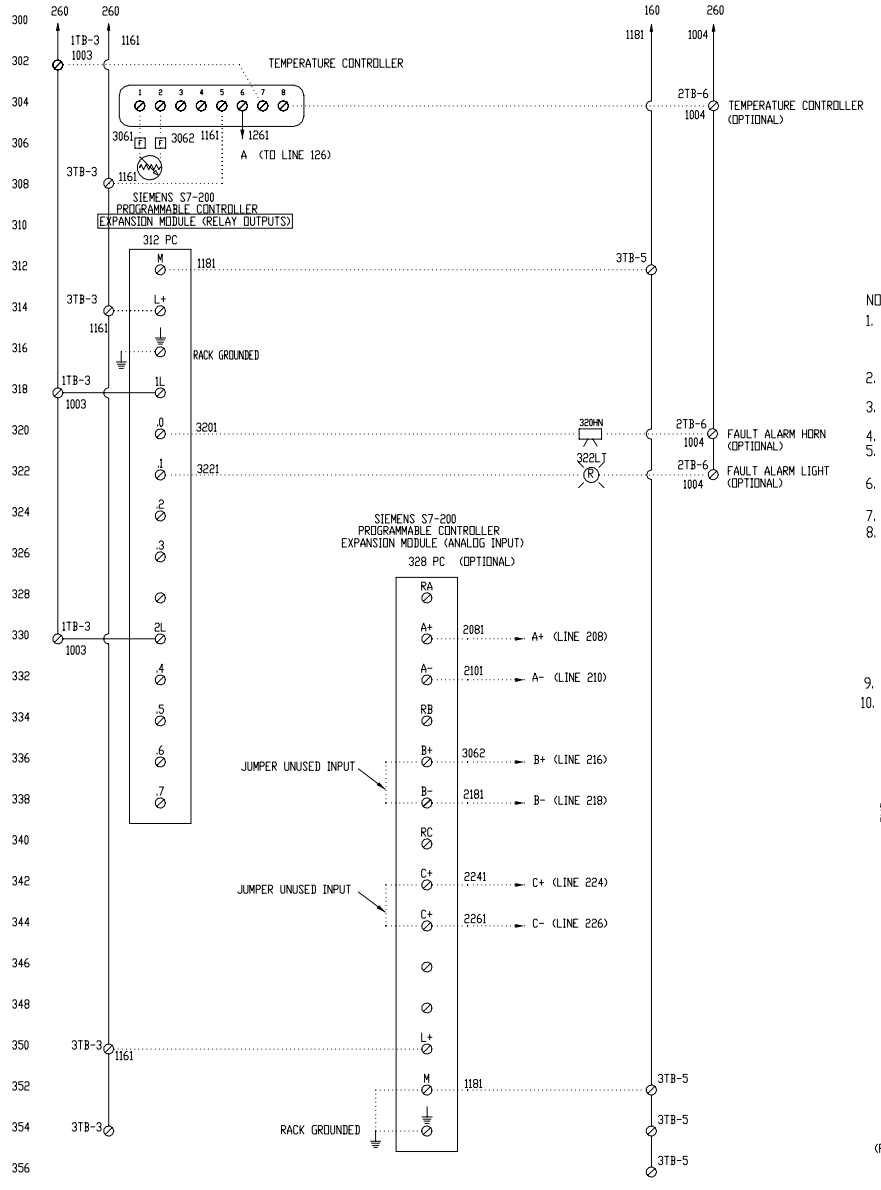
FIGURE 8
19

M75FIG8.DWG



ATS CONTROL SCHEMATIC

FIGURE 11



ATS CONTROL SCHEMATIC

SEQUENCE and TIMING OPERATIONS

(SINGLE SECTION SHOWN)

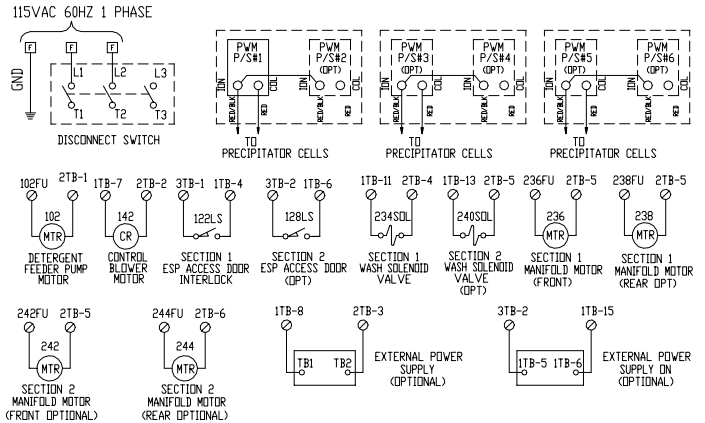
SYSTEMS OPERATIONS		P.C. TIMERS / DEVICES TO ADVANCE TO NEXT STEP	SEQUENCER STEP NO.	OUTPUTS ACTIVATED - X					
				1st RO 0.0 1421	1st RO 0.1 1441	1st RO 0.2 1461	1st RO 0.3 1501	1st RO 0.4 1521	1st RO 0.5 1541
AIR CLEANER ALL SECTIONS		I0.1	0	X	X				
SYSTEM AIR SHUTDOWN	1 min.	T37	1			X			
SEC 1 PRE WASH	30 SEC.	T42	2			X	X		
SEC 1 WASH	1 min.	T38	3			X	X	X	
SEC 1 SOAK	2 min.	T39	4			X			
SEC 1 RINSE	2 min.	T40	5			X	X		
DRIP DRY	4 min.	T41	6			X			
FORCE DRY	60 min.	C1	7	X		X			
RETURN TO STEP 0		M0.3	8						
				BLOWER CONTROL RELAY	POWER PACKS CONTROL RELAY	WASH IN PROCESS LIGHT	SECTION 1 WASH CONTROL RELAY	DETERGENT PUMP RELAY	SECTION 2 WASH CONTROL RELAY (OPTIONAL)

NOTES:

1. HIGH VOLTAGE LEADS BY TRION. STANDARD LENGTH 50 FT. IONIZER RED/BLACK, COLLECTOR RED. RUN LEADS IN SPERATE CONDUITS BETWEEN POWER PACKS AND AIR CLEANER. DO NOT SPLICE LEADS. ISOLATE HIGH VOLTAGE CABLE AWAY FROM CONTROL WIRING.
2. CONTROL ENCLOSURES AND AIR CLEANER MUST BE GROUNDED TO STRUCTURAL STEEL AND EARTH GROUND.
3. ALL PRIMARY INTERCONNECTION WIRING BY CUSTOMER MUST MEET APPLICABLE CODE REQUIREMENTS.
4. EACH MANIFOLD MOTOR REQUIRES 1.7 AMPS AT 115 VAC 60HZ.
5. SOLENOID VALVES REQUIRE 6.0 - 15.4 WATTS AT 115 VAC 60 HZ (SEE SPECIFIC VALVE FOR RATING).
6. 16/30 GALLON DETERGENT PUMP MOTOR REQUIRES 10 AMPS @ 115 VAC/60HZ/1PH 55 GALLON DETERGENT PUMP MOTOR REQUIRES 12 AMPS @ 115 VAC/60HZ/1PH
7. CONTROL POWER REQUIREMENTS 30 AMPS AT 115 VAC 60 HZ.
8. LISTED BELOW IS THE POWER PACK SCHEDULE FOR THE MODEL 70 SERIES UNITS

MODEL 70 SERIES UNIT	NO. PWM POWER SUPPLIES REQ'D.
-102 THRU -105	1
-106 THRU -110 -203 THRU -205	2
-303 THRU -305	3
-206 THRU -210	4
-306 THRU -310	6

9. ⊘ DENOTES TERMINAL CONNECTION IN CONTROL ENCLOSURE.
10. [F] ALL FIELD WIRING PROVIDED BY CUSTOMER.



FIELD WIRING

FIGURE 12

154629-2
REV.-E

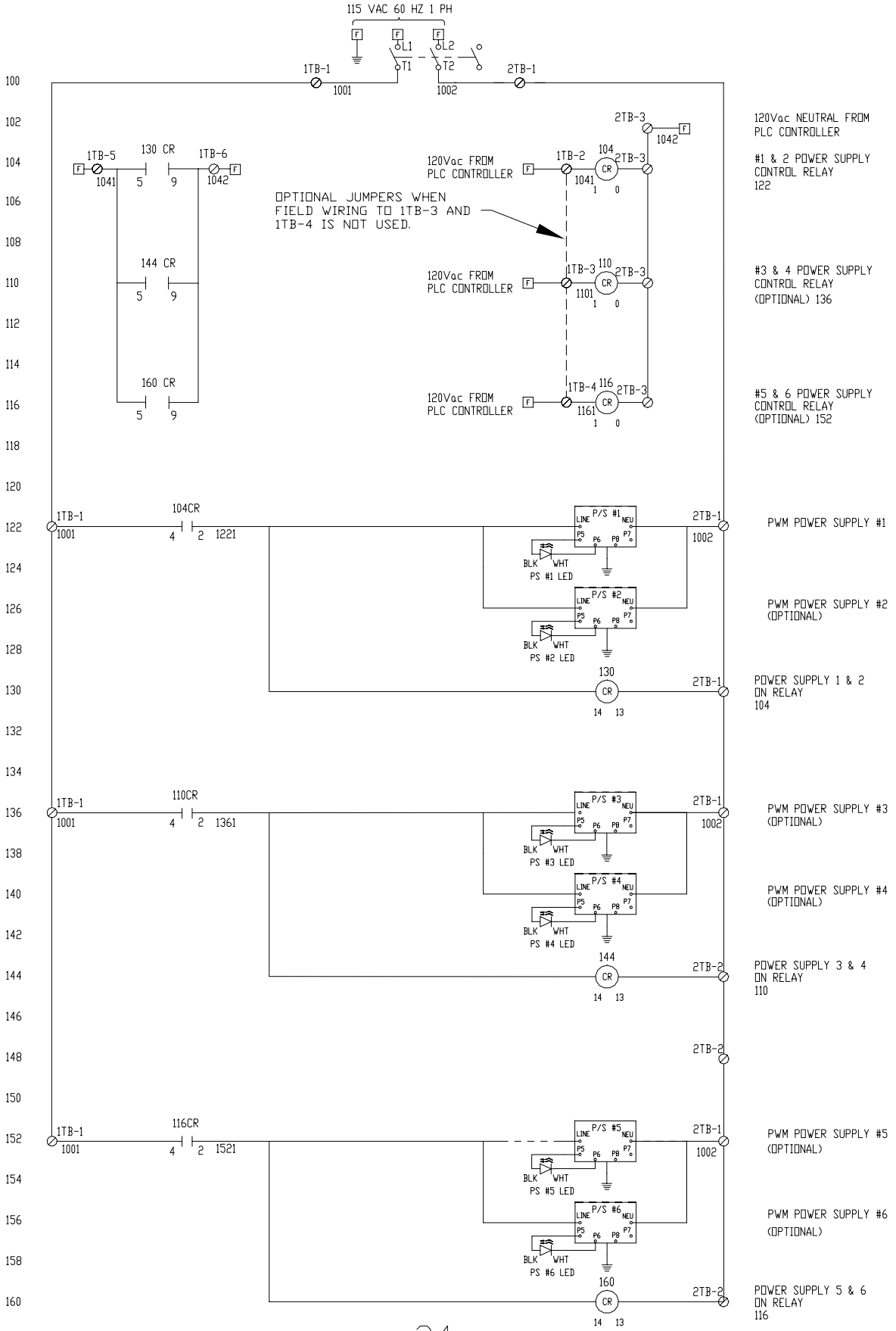
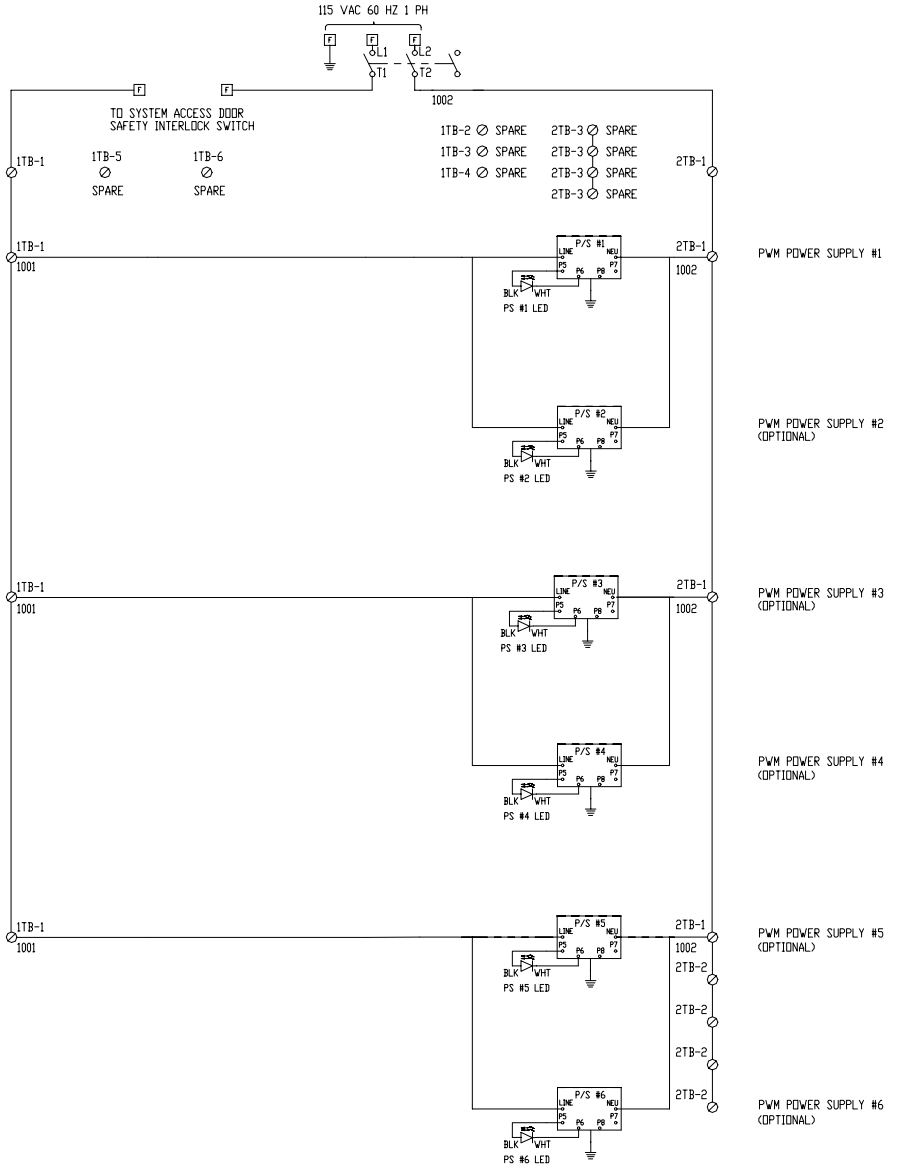
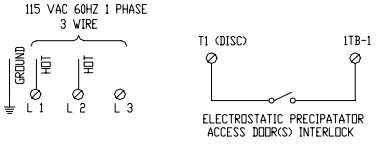
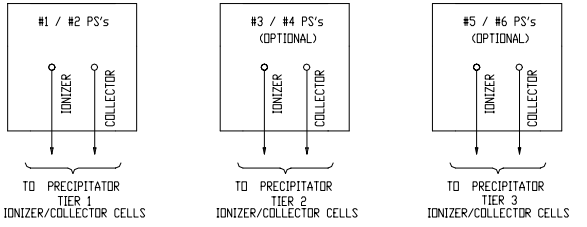


FIGURE 13

ATS REMOTE POWER SUPPLY SCHEMATIC





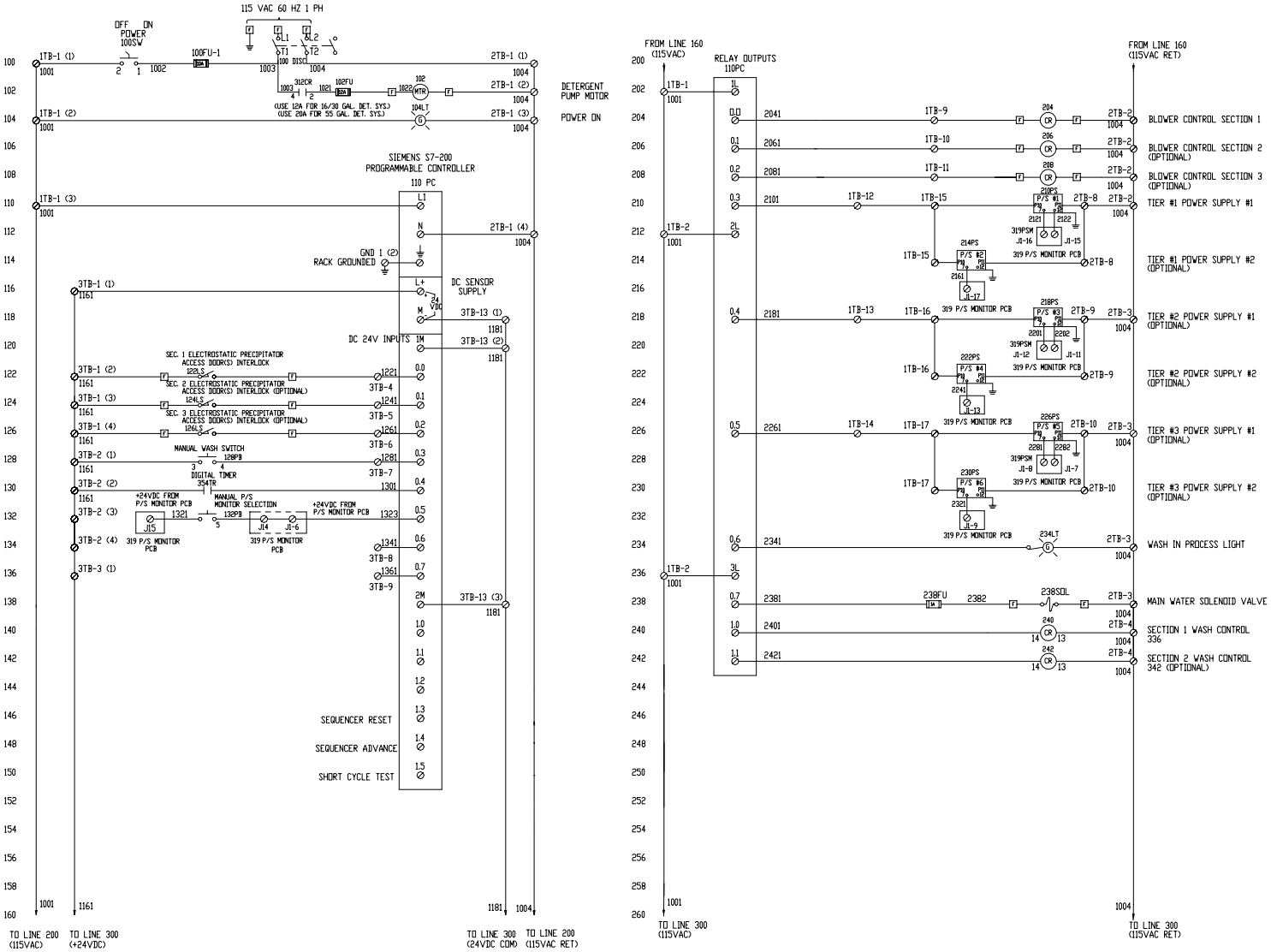


NOTES:
1. HIGH VOLTAGE LEADS BY TRION. STANDARD LENGTH 50 FT. IONIZER RED/BLACK TRACER LEAD, COLLECTOR-RED LEAD. RUN LEADS IN SEPARATE CONDUITS BETWEEN POWER PACKS AND AIR CLEANER. DO NOT SPLICE LEADS.
2. CONTROL ENCLOSURE AND AIR CLEANER MUST BE GROUNDED TO STRUCTURAL STEEL AND EARTH GROUND.
3. ALL PRIMARY INTERCONNECTION WIRING BY CUSTOMER MUST MEET APPLICABLE CODE REQUIREMENTS.
4. CONTROL POWER REQUIREMENTS IS 15 AMPS MINIMUM.
5. ⊘ DENOTES TERMINAL CONNECTION IN REMOTE POWER SUPPLY ENCLOSURE.

ATS REMOTE POWER SUPPLY SCHEMATIC

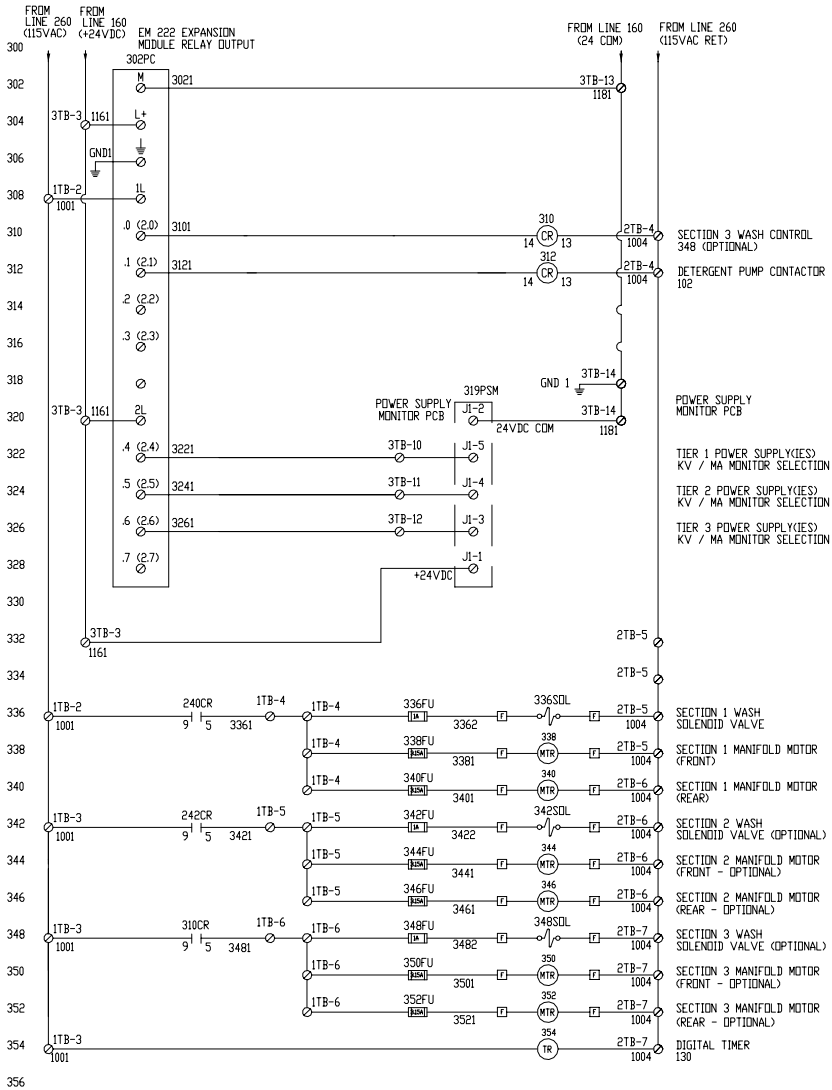
FIELD WIRING

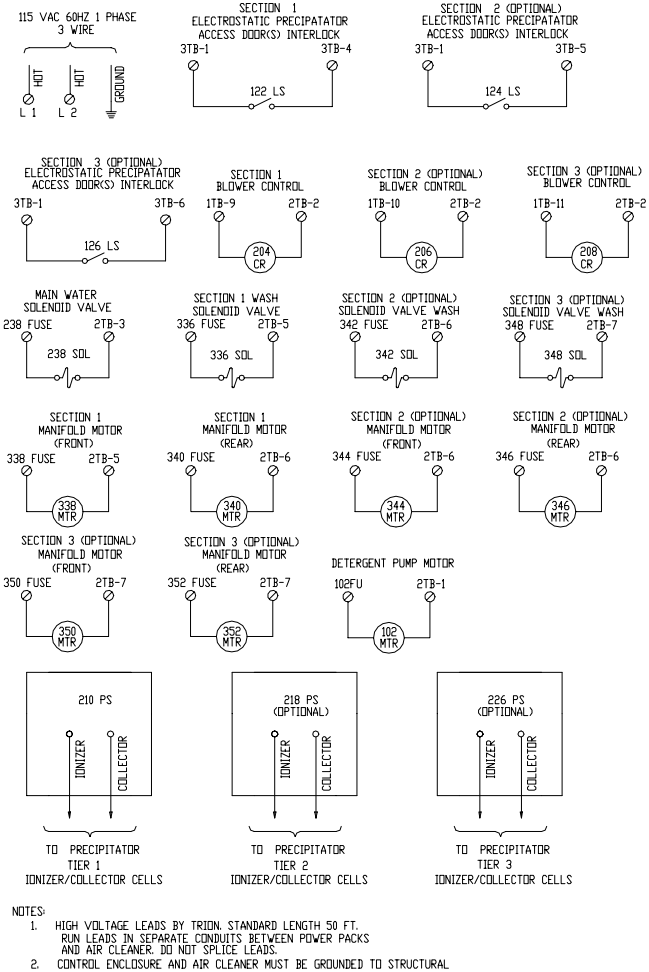
FIGURE 14



AIR BOSS WASH CONTROL SCHEMATIC FIGURE 15

154636-1
REV.-B





NOTES:

1. HIGH VOLTAGE LEADS BY TRION. STANDARD LENGTH 50 FT. RUN LEADS IN SEPARATE CONDUITS BETWEEN POWER PACKS AND AIR CLEANER. DO NOT SPLICE LEADS.
2. CONTROL ENCLOSURE AND AIR CLEANER MUST BE GROUNDED TO STRUCTURAL STEEL AND EARTH GROUND.
3. ALL PRIMARY INTERCONNECTION WIRING BY CUSTOMER MUST MEET APPLICABLE CODE REQUIREMENTS.
4. EACH MANIFOLD MOTOR REQUIRES 1.7 AMPS AT 115 VAC 60HZ.
5. MAIN WATER AND SECTION SOLENOID VALVES REQUIRES 6 to 15.4 WATTS AT 115 VAC 60HZ. (SEE SPECIFIC VALVE FOR RATING)
6. 16/30 GALLON DETERGENT PUMP MOTOR REQUIRES 12 AMPS AT 115VAC, 60HZ, 1PH. 55 GALLON DETERGENT PUMP MOTOR REQUIRES 20 AMPS AT 115VAC, 60HZ, 1PH.
7. CONTROL POWER REQUIREMENTS IS 30 AMPS MINIMUM.
8. ⊘ DENOTES TERMINAL CONNECTION (1TB,2TB & 3TB) IN WASH CONTROL ENCLOSURE.

AIR BOSS WASH CONTROL SCHEMATIC

FIELD WIRING FIGURE 16

154636-2
REV.-B

STANDARD SINGLE SECTION SEQUENCE AND TIMING OPERATIONS

SYSTEMS OPERATIONS		P.C. TIMERS / DEVICES TO ADVANCE TO NEXT STEP	SEQUENCER STEP NO.	OUTPUTS ACTIVATED - X																	
				1st RO 0.0 2041	1st RO 0.1 2061	1st RO 0.2 2081	1st RO 0.3 2101	1st RO 0.4 2181	1st RO 0.5 2261	1st RO 0.6 2341	1st RO 0.7 2381	1st RO 1.0 2401	1st RO 1.1 2421	2nd RO 2.0 3101	2nd RO 2.1 3121	3rd RO 2.2	4th RO 2.3	5th RO 2.4 3221	6th RO 2.1 3241	7th RO 2.1 3261	7th RO 2.1 3261
AIR CLEANER ALL SECTIONS		I0.1	0	X			X														
SYSTEM AIR SHUTDOWN	1 min.	T37	1							X											
SEC 1 PRE WASH	30 sec.	T42	2							X	X	X									
SEC 1 WASH	1 min.	T38	3							X	X	X			X						
SEC 1 SOAK	2 min.	T39	4							X											
SEC 1 RINSE	2 min.	T40	5							X	X	X									
DRIP DRY	4 min.	T41	6							X											
FORCE DRY	60 min.	C1	7	X						X											
RETURN TO STEP 0		M0.3	8																		
				SECTION 1 BLOWER CONTROL RELAY	SECTION 2 BLOWER CONTROL RELAY	SECTION 3 BLOWER CONTROL RELAY	SECTION 1 POWER PACKS CONTROL RELAY	SECTION 2 POWER PACKS CONTROL RELAY	SECTION 3 POWER PACKS CONTROL RELAY	WASH IN PROCESS LIGHT	MAIN WATER SOLENOID VALVE	SECTION 1 WASH CONTROL RELAY	SECTION 2 WASH CONTROL RELAY	SECTION 3 WASH CONTROL RELAY	DETERGENT PUMP RELAY	UNIT RUNNING	UNIT IN WASH	TIER 1 POWER SUPPLIES MONITOR SEL.	TIER 1 POWER SUPPLIES MONITOR SEL.	TIER 1 POWER SUPPLIES MONITOR SEL.	UNIT OUT OF WASH

FIGURE 17

154636-3
REV.-B

CUSTOM PACKAGED ELECTRONIC AIR CLEANER

Model 75 Series Units
with
Integral Washing System

- INSTALLATION
- OPERATION
- SERVICE

For Model Numbers
75- _____-02 & -04

Electrostatic Precipitators for Commercial & Industrial Applications

UL LISTED
EXHAUST FILTRATION SYSTEM
86LF

Accepted For Use
City of New York
Department of Buildings
MEA 288-01-E and 88-99-E

TRION air purification systems
A FEDDERS ENGINEERED PRODUCTS COMPANY

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MANUAL PART NO. 154024-001• December 2002

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SECTION I DESIGN

FOR THE SYSTEM DESIGN ENGINEER

1. General Description

The standard major components supplied with each unit for installation are as follows:

electronic air cleaner
controller / power supplies
the detergent system
wash water line strainer and solenoid valve

The electronic air cleaner contains the ionizing-collecting cells (collecting elements), wash manifolds—located to the front and rear of each tier of cells—and metal mesh pre-filters and after-filters. Perforated plate or impingement type mist suppressors, in lieu of the metal pre-filters, are options when specified.

Gasketed access doors located on one end of the cabinet, 90 degrees to the direction of the airflow, provide entry for removal of the cells and filters. The location of the access doors, wash manifold drive motors and manifold header pipes may be specified as "right" or "left" handed. The hand designation is determined by standing in the ductwork on the air entering side of the unit so the airflow strikes your back.

The Pulse Width Modulated (PWM) power supplies, providing the necessary high voltage for the air cleaner and the controls initiating and sequencing the wash cycle are furnished in a NEMA 12 enclosure designed for remote mounting. The distance between the controller and unit must be determined as the interconnecting high voltage leads are furnished to the specified length. Consult factory for distances greater than 50 ft. Cables are not to be spliced at any point along their length. In addition, the enclosure is a central junction for the primary wiring.

The detergent system is furnished as a completely assembled unit to be piped directly to the wash water supply, into the wash manifold headers.

Note: 30 or 55-gallon detergent tanks are available as an option.

Note: Trion Tridex Detergent is specially formulated for use with Trion electronic air cleaners. Use of other cleaners and detergents, not specifically approved by Trion, can cause possible failures in the unit and will void any and all warranties on our equipment.

The strainer and solenoid valves are to be installed in the wash water supply lines. A back flow preventer and/or check valves should be installed according to local code requirements. These items are not provided as part of the system accessories. The Model 75 has a ¼" Female NPT fitting for installation of a pressure gage (Not supplied by Trion). This gage is used to ensure adequate water pressure during the wash cycle, (see attached piping diagram for specific locations).

2. System Design and Layout

The arrangement of the supplied components and the general layout of the system will vary according to application, adjoining equipment and available space. However, there are several basic factors pertaining to all installations that must be considered:

To maintain the selected cleaning efficiency, it is important to assure that the total air volume (capacity in CFM) is uniformly distributed across the entire face area of the unit. The metal mesh filters, perforated plate or mist suppressors provide some resistance to effect even air distribution. However, since most air ducts are designed to handle air velocities greater than the rated velocity of the air cleaner, it is necessary to properly transition any attached ducting. If possible, a contraction ratio of 1 in 3 (approximately 20°) should be maintained. If space prohibits, turning vanes, air baffles or other means may be utilized. Ducting – where attached to the cabinet collars – should be gasketed, caulked or otherwise made watertight.

When there is a danger of rain, snow or debris being drawn into the system with outside air, the make-up air intake should be protected with rain louvers, hooding and hardware cloth to prevent the rain, snow or debris from entering the electronic air cleaner.

Contaminants to be collected – such as oils in vaporous state – must be condensed into particulate form prior to entering the ionizing-collecting cells in order to maintain the anticipated efficiency. Gases, vapors or any non-particulate cannot be precipitated and will therefore pass through the air cleaner. Any condensing that takes place downstream from the air cleaner defeats the purpose. By the same token, heavy concentrations of water vapor, or other matter that becomes highly conductive when condensed, must be prevented from entering and/or condensing in the collecting elements to prevent electrical arc over and shorting.

SAFETY NOTE:
Factory designed access to all electrically charged high voltage components contain electrical interlocks for the safety of operating personnel. Any additional access that may be provided in the system, where there is access to high voltage, must be equipped with such interlocks. Interlocks are readily available from the factory.

Waterwash drain lines from the cabinet drain basin should be trapped or otherwise sealed against the system pressure (in accordance with local codes). Wash water to the unit must meet the volume required for the specific unit involved and must be between 40 PSIG Min. – 60 PSIG Max. at full flow to provide proper spray patterns from the wash nozzles. The wash water MUST be Hot water (140^0F recommended) and installed as close as possible to the unit and detergent system.

NOTE: THE HOT WATER TANK IS NOT PROVIDED BY TRION.

Each installation varies according to needs, but normally the controller is located near the air cleaner. Ideal mounting height is at eye level for ease in reading the instrumentation and to facilitate service.

For ease in maintenance and component removal, adequate space, **39" Minimum Required**, must be provided in front of all access doors, motors, pump and accessory equipment. Special consideration should be given in this respect for installations where the unit is suspended overhead. Catwalks or platforms should be provided.

CAUTION

In addition to the above space requirement, installation of the Model 75 in NFPA applications shall have a clearance of at least 18 inches to a combustible material, 3 inches to limited combustible material, and 0 inches to noncombustible material. Any reduction in clearance or exceptions must be in compliance with NFPA and acceptable to the Authority Having Jurisdiction.

******WARNING******

Fire Suppression Systems

Extreme caution should be exercised when this unit is installed in applications that are collecting volatile or potentially flammable contaminants such as cooking grease and petroleum based oils.

Trion strongly recommends a fire suppression system be installed in the ductwork and on the Model 75 in cases where these contaminants are collected on the cell plates and collect on the attached ductwork.

Contact the factory for questions or concerns regarding a fire suppression system.

3. Outdoor Installations

Requirements for outdoor protection vary in accordance to climate and equipment component arrangement for the particular job. The best approach for equipment protection is the construction of a heated shed or building over the installation. As an alternative, the installing contractor should treat the equipment as required to meet the specific needs. Detailed discussions of the Model 75 components are as follows, using a rooftop installation as an example (refer to Figure 3):

Adjoining Ductwork (not supplied by Trion)

The ductwork located on the air entering side of the cabinet, between the point where it enters the roof and the cabinet, must be air tight to prevent the entrance of moisture, especially if it is under negative pressure. It must also be adequately insulated or other means taken to prevent the formation of condensation through temperature change. Condensation will short out the ionizing-collecting cells. Insulation must be of the outdoor variety.

Trion Model 75 Cabinet

The access doors on the Model 75 cabinet are gasketed and the unit is basically sealed against air leakage. The paint finish (epoxy) is for interior and exterior use. Like the air-entering duct, the cabinet must be insulated or other means taken to prevent condensation from taking place, which results in electrical shorting of the ionizing-collecting cells. Insulation, when employed, must be suitable for outdoor applications and when applied, consideration given to all access door openings and electrical interlock box covers. Trion will, upon request, install manifold drive motor covers for a cost adder.

Controller/PWM Power Supplies

As the controller/power supplies are designed for remote mounting, they can be, in many cases, located indoors and still be reasonably close to the main cabinet. If located outdoors with the cabinet, it must be weather protected. The enclosure is NEMA 12 rated and is not waterproof.

Drain Line

The drain line, located under the ionizing/collecting cell access door at the lowest point of the Trion cabinet drain pan, should be piped with as short a run as possible to the heated interior of the building. Preferably, straight down from the drain pan supply through the floor. The normally recommended drain line trap, to seal off the cabinet from the drain against the system pressure, should be located in the heated interior. If not installed in this manner, heat wrap or other means should be employed to prevent freezing. Clean-outs are recommended to be installed in all drain lines.

Wash Water Supply Line

Naturally, the length of the run between the Trion cabinet and the heated building should be kept to a minimum. Preferably the line would go through the roof directly below each of the two manifold headers. The strainer, solenoid valve and back flow preventer should be kept indoors. Installed in this manner, a dumping valve can be included in the supply line to drain the remaining water and prevent freezing. The normally open dumping valve should be energized to close when the water wash solenoid valve is energized to open. The strainer and solenoid valve are supplied by Trion. The dumping valve and back flow preventer or check valve are to be supplied by others.

If the above method is not employed, the supply line and manifold headers must be kept from freezing with heat wrap or other means.

Detergent System

The detergent system, designed for remote mounting, should be installed indoors and piped to the water

supply line within the heated interior. Detergent feed line should be piped with as short a run as possible and inject into the wash water supply line as close as possible and upstream from the Model 75 header connection points. (Refer to Figure 3).
Contact the local Trion Sales Office or the factory if questions arise, or any additional information is required.

SECTION II INSTALLATION

FOR THE INSTALLING CONTRACTOR

1. Unpack and Inspect
At the time the unit is received, all shipping containers and their contents should be examined for damage. Any damage occurring in shipment must be immediately reported to the carrier, an inspection report completed and a claim filed at the receiving point.

The unit cabinet is shipped completely assembled and, where size permits, the ionizing-collecting cells are shipped inside the cabinet. On large units, the upper tier of cells may be shipped in separate containers. The controller, detergent feeder and other separate accessories are shipped in the containers as noted on the packing list.

2. Position Air Cleaner Cabinet
To reduce weight for ease in handling, remove the pre-filters, after-filters and the ionizing-collecting cells from the cabinet, and place them safely aside. Position the cabinet in the designated location giving consideration to the following points:

(a) Provide sufficient clearance in front of the access doors for ionizing-collecting cell and mechanical filter removal. **A minimum of 39 inches is required. (see figure 5)**
(b) Level the cabinet to assure proper drainage from the drain pan.
(c) Unless specific design features have been prearranged, the direction of airflow through the cabinet may be either from the right or the left. When the ionizing-collecting cells are reinstalled, the directional arrows on the cell end plates must concur with airflow through the cabinet. If mist suppressors have been specified, they are to be installed on the air entering side of the unit.

After the cabinet has been properly located, it may be secured into place at the predrilled factory mounting pads either by bolting or welding.

3. Connect Adjoining Ductwork
Depending on the application, the installation plan may or may not call for adjoining ductwork on the air entering and/or air leaving sides of the cabinet.

When adjoining ducting is to be installed, the bottom of the horizontal duct runs should be relatively flat and sloped toward the cabinet drain pan for an 18-inch length. As a result, any wash water splash back occurring during the washing operation will run back into the drain pan.

Duct securement to the collar may be completed using the predrilled flange. The seam should be made air and watertight by caulking or gasketing.

When a blower is installed downstream from the Trion cabinet, the ducting between the cabinet and the blower will be under negative pressure and should be made air tight to prevent infiltration of contaminated air.

After the ductwork has been installed, clear remaining material or debris from inside ducts and bottom of cabinet, then re-install both the mechanical filters and the ionizing-collecting cells.

NOTE: Follow the directional arrows located on the cell end plates. The side of each cell containing the spiked ionizer blades must be located on the air entering side of the cabinet. The brass contact plungers on the cell should be inserted toward the back of cabinet. Also, mist suppressors, when specified, must be located on the air entering side of the cabinet.

4. Mount Detergent System
Refer to Detergent Outline Drawing (Figure 9). The detergent system should be located as close to the unit as practical, but should not exceed 20 feet in elevation difference. Service space must be provided for periodic manual filling of the detergent tank and to gain access to the pump and motor assembly. When positioned, the assembly may be secured in place at the predrilled factory mounting pads, either by bolting or welding.

5. Connect Drain
Connect a drain line to the pipe coupling provided in the cabinet drain basin in accordance with the governing plumbing codes. The drain line must be sealed with a trap or other means to prevent air by pass. If a trap is used, it should hold sufficient water column to overcome the system air pressure and to assure that loss of liquid from evaporation between cleaning periods will not break the seal. The drain line should not be smaller than the drainpipe coupling, or it will otherwise restrict the flow of water. Elevation of the equipment may be required to allow adequate draining.

6. Connect Water Wash Supply
The items furnished to be included in the wash water supply are a strainer, an electrically operated solenoid valve, and a detergent system. Refer to the Piping Schematic (Figure 10).

Unless otherwise specified, the water wash supply should be hot **(140^{0}F recommended-WATER HEATER NOT SUPPLIED BY TRION**) at the volume specified for the given unit, and at a full flow pressure between 40 and 60 PSIG.

WARNING: Adequate precautions should be taken in the event the water supply, detergent system and drains are subjected to freezing temperatures.

Although not required, a pressure gage and a manual service valve are recommended as shown in the diagram. The components should be located within the system to provide for service access.

7. Mount Controller

The Controller should be mounted at eye level and located as close to the air cleaner as practical. It must be mounted indoors out of the weather unless supplied with a weatherproof cabinet. Allow sufficient space in front of the access door(s) for service. Refer to appropriate Control/Remote PWM Box Outline Drawing for mounting hole layout and dimensions.

8. Complete Wiring

(a). *High Voltage Wiring*

WARNING:
EXERCISE ALL THE NORMAL PRECAUTIONS WHEN WORKING WITH HIGH VOLTAGE AND COMPLY WITH NEC AND ALL APPROPRIATE LOCAL CODES.

The high voltage wiring entails interconnecting the power supply(s) to the ionizing-collecting cell(s) through the factory-installed junction box on top of the cabinet. All the wiring in the cabinet has been completed at the factory.

Refer to the Field Wiring Diagram. Two high voltage leads, Red/Black Tracer for the ionizer and one Red for the collector, are factory furnished. Each lead is to be run in separate conduit and must be of continuous run (do not splice) between the controller and the ionizing-collecting cell terminal connection in the junction box.

(b). *Primary Wiring*

The Wash Controller is the main distribution point for all primary wiring. The various electrical components involved are connected to and powered from the controller. These interlocks are safety switches that prevent access to the charged high voltage components without first turning "OFF" the high voltage by interrupting the 24 VDC input to the PLC. Refer to the appropriate Field Wiring Diagram.

(c). *Grounding*

An earth ground must be provided to the Model 75 cabinet and control. All ground connections must be in contact with bare metal and securely affixed. Ground conductor size and connection means will be in accordance with all applicable electrical code standards.

9. Check Out for System Start-up

When the installation has been completed, assure that the equipment is ready for start-up by checking the following:

A. All construction debris is removed from the ionizing-collecting cells, drain basin and ductwork.
B. The inside of the controller and detergent tank are clear of any foreign materials.
C. The drain line from the Trion drain basin is clear and completely connected to its point of termination.
D. All piping is completed to the manifold headers and wash water is available.
E. Supply line power is available and electrical wiring is completed to the following components:

1. Controller
2. Solenoid Valve
3. Detergent Pump Motors
4. Manifold Drive Motors
5. Electrical Interlocks
6. Ionizing-Collecting Cells
7. The System Fan

NOTE: Do not put the initial supply of detergent into the detergent tank. This is to be done after volume settings are made at start-up.

SECTION III OPERATION & SERVICE

WARNING
RISK OF ELECTRIC SHOCK
These serving instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

FOR THE MAINTENANCE ENGINEER

1. Introduction and Principle of Operation

The Trion® electronic air cleaner is technically known as an electrostatic precipitator. In this type of equipment, all airborne particles, even of microscopic size, are electrically charged (positively) as they pass through a high voltage ionizer. These charged particles are then attracted and adhere to a series of parallel collecting plates, which form the negative elements of an electrostatic field.

The ionizer consists of charged stainless steel spiked blades spaced between grounded electrodes. The collecting section consists of parallel plates arranged so that each alternate plate is charged while the intermediate plates are electrically grounded.

Periodically, depending on the type and concentration of contamination in the air, the contaminant is washed from the plates by the integrally constructed water wash system.

Three major functional components comprise the air cleaner:

(1) Ionizing-collecting cells to ionize and collect airborne particulate matter.
(2) Power supply(s) to supply high voltage direct current to the ionizing-collecting cells.
(3) Control operated washer to automatically wash away the collected contaminant.

Normally, systems are designed for collection efficiencies in the range of 90 percent or more. Collecting a contaminant at these efficiencies, especially when there are high concentrations can result in large accumulations in a relatively short period. Therefore, maintenance must encompass two areas; the operation of the equipment for efficient collection and the systematic removal of the collected contaminant.

2. General Description

The ionizing-collecting cells (contaminant collecting elements) are housed in the cabinet on slide rails. They can be removed from the cabinet as required, through the end access door, by sliding them out like drawers. On multi-cell units, all of the electrical connections between cells in a given tier are automatically made through spring plunger connectors. On the access end, the high voltage cables from the power supplies are connected to the junction box on top of the cabinet. The high voltage cables from the junction box to the individual tiers are factory wired. When installing cells into the cabinet, observe the directional arrows on the cell end plates. The side of the cell containing the spiked ionizer blades must always be located on the air entering side. The spring plunger connectors, located on one end of each cell, will always face toward the back of the Model 75 Cabinet.

Both the air entering and air leaving side of the cabinet contain either metal mesh filters or perforated plate, whichever was specified. These items act as trash screens, provide resistance for even air distribution, and help contain splash back from the integral water wash system.

The Power Supply(s) convert the 115 volt, 60HZ, single phase AC supply to the high voltage DC needed to power the ionizing-collecting cells. Potential of 13 KVDC are required for the ionizer sections and 6.5 KVDC for the collector sections of the cells.

The integral wash system consists of a series of spray nozzles soldered into oscillating water wash manifolds. The manifolds are located in the front and rear of each cell tier. They are oscillated through straight drive linkage powered by fractional HP motors. A detergent system is also incorporated into the wash system. The amount of detergent used for washing is readily adjustable, and that amount is dependent upon the type and amount of collected contaminant.

The washing operation is cycled periodically, and again the frequency is dependent on the type and amount of contaminant collected. The events in a wash cycle are:

A. Power Supply(s) and System Fan “OFF”
B. Washer and Detergent “ON”
C. Washer and Detergent “OFF”
D. Pause for Detergent to react
E. Washer “ON” (without detergent for rinse)
F. Washer “OFF”
G. Pause for Drip Dry
H. Blower “ON” for forced dry
I. Power Supply(s) “ON”

The time span for all of the events is factory set when the equipment is initially ordered.

3. Initial Start-up

A. Inspect the inside of the adjoining ductwork and Trion cabinet to be sure it is clean and free of any debris or construction materials. Especially note the opening in the drain basin for any restrictions. The ducting, where secured to the cabinet collars, should be sealed water tight either with gasketing or caulking.

B. Inspect the ionizing-collecting cells to see that all of the ionizing blades are intact, that no large pieces of foreign material are lodged between the plates, and that the cells are properly installed in the cabinet with the spiked ionizing blades located on the air entering side.

C. Check the high voltage leads to see that they are connected to the proper terminal both at the ionizing-collecting cells, the junction box and inside the controller. (Refer to Figures 2 and 4).

D. Be sure that the drain lines from the Trion cabinet drain basin are completely connected and properly terminated. A trap or seal of some type should be incorporated in the line to prevent air bypass.

E. Check the water supply line to be sure water is available and that the strainer, solenoid valve, and detergent system are properly installed and connected. (Refer to Figure 10).

F. Be sure that electrical power is available, that the wiring is completed, and that the system blower is ready to energize.

G. Be sure that all access door interlocks are closed.

H. Close the system electrical supply switches, making power available to the Trion controller and the system fan.

I. Turn the controller selector switch to the “ON” position. The blower should run (if installed) and the power supply(s) should be energized. Electrical arcing within the ionizing-collecting cells may occur. It is a normal occurrence caused by accumulation of dusts from construction or other sources in the cell(s) and should subside quickly. If the arcing is continuous and does not subside, recheck the routing of the high voltage leads between the power supply(s) and the cell(s). Refer to the field wiring diagram. The ionizer lead must be connected to the ionizer and the collector lead to the collector.

J. Ensure the detergent tank is clean, then fill the tank 1/8 full with clean water. **Do not fill with the detergent until start-up adjustments have been completed.**

K. (Review this paragraph in its entirety before initiating the wash start button.)

Next, set the detergent volume setting per wash at the detergent feeder. Manually initiate the wash cycle by pushing the "Wash Start" button on the control. The wash control duration is **70** minutes and by means of a factory preset programmable logic controller (PLC) will sequence the washing events as previously outlined. When the detergent pump is energized, note the amount that is used by observing the reduction in the liquid level in the tank. The usage should be approximately 1 part of detergent to 20 parts of water. The water and detergent requirements for each unit model are listed on the Piping Schematic, Figure 10. To adjust the volume output from the pump, refer to the Detergent System Outline, Figure 9. The pump is a constant displacement type and the amount of detergent forced into the water supply to wash the unit is dependent upon the setting of the control valve in the bypass return line to the reservoir. The side of the translucent reservoir is marked with volume markers. Adjust the control valve to obtain the correct usage for the given unit model, then secure the setting with the Allen head set screw located in the valve adjustment knob. When the correct adjustment has been made, remove the remaining water from the reservoir and fill the tank with initial supply of detergent furnished.

L. When the wash control has cycled out, manually set the programmable timer relay (TR), or initiator clock, located in the control for automatic initiation of the washing operation. This setting can be tailored to the washing frequency best suited for the specific application and may be best explained by example.

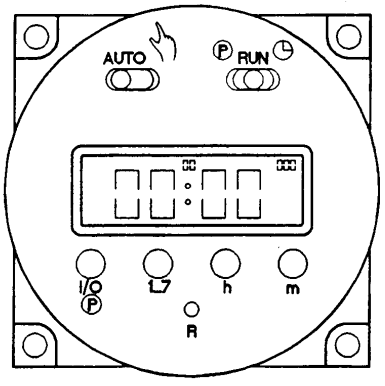
Suppose the application of the equipment is to clean restaurant kitchen exhaust air. The collected contaminant to be washed away is of greasy nature, containing particulate such as smoke and fume from the grill, mist and vapors from the French fryer, flour dust and other various matter that is created by normal kitchen operation.

In our example, the restaurant operates Monday through Saturday (closed Sunday) and opens daily at 6:00 a.m. and closes daily at 11:30 p.m. This busy schedule presents a relatively heavy dirt loading and being of greasy nature should be washed away daily. The best time being shortly after closing when the atmosphere has settled but before the greasy contaminant collected has had a chance to harden and setup.

From the above, a wash schedule of every day except Sunday at 1:00 a.m. can be established. As the duration of events preset at the factory is approximately 70 minutes, the cycle will end at approximately 2:20 a.m.

Prior to setting the initiator clock it will be necessary to charge the battery located inside the clock. This is accomplished by turning the selector switch on the front of the control to the "ON" position. A light inside the switch will glow. If it does not glow, check to be sure there is supply line power to the control. DO NOT PUSH THE WASH BUTTON. Allow the control to remain in the "ON" position for 24 to 36 hours while the battery is charging.

Initiator clock setting:



Initiator Clock (Programmable Timer Relay)

To set the initiator clock, it is first necessary to set the existing time, then the program times that are to be initiated.

To set existing time:

1. Depress the reset (R) button to cancel out any previous settings.

2. Slide the P-Run switch to the clock position . Monday (MO) will be indicated.

3. Push the (1 ... 7) button until the present day of the week is indicated.

4. Push the hour (h) button to the present hour of the day.

5. Push the minute (m) button to the minutes past the hour of the day.

6. Slide the P-Run switch to the run position. The colon will blink indicating the clock has been set.

To set the programs (wash times) according to the times in the example outlined above.

1.Slide the auto-manual switch to the auto position.

2. Slide the P-Run switch to the program (P) position. The word "ON" and the number 1 will appear on the display. This indicates the time the first program is to be turned "ON."

3. Push the day (1 ... 7) button until only the day Monday (MO) appears on the display.

4. Push the hour (h) button until the designate hour (01:00) appears on the display.

5. It is not necessary to set the minute (m) as 1:00 o'clock on the hour was the selected wash initiation "ON" time. The "ON" time has now been set.

6. Next, set the program "OFF" time. This will be 1 minute after the "ON" time. A 1-minute duration is adequate program time as the initiation signal is sent to the wash control logic timer instantaneously.

Push the I/0 (P) button. The word "OFF" and the number 1 will appear on the display. This indicates the set time the first program is to be turned "OFF."

7. Push the day (1 ... 7) button until only the day Monday (MO) appears on the display.

8. Push the hour (h) button until the hour 01:00 appears on the display.

9. Push the minute (m) button until the time 01:01 appears on the display. Program 1, wash time "ON" and "OFF," for Monday has now been set.

10. Next set the second program which will be the Tuesday (TU) washing. Push the program I/0 (P) button. The word "ON" and the number "2" will appear on the display.

11. Repeat the setting process for TU as outlined above in steps 3 through 9 for MO "ON" - "OFF" time.

12. After the wash program has been set for TU, repeat the same setting procedure for WE, TH, FR and SA. Omit SU.

13. Slide the P-Run switch to the run position. The existing time of day will show on the display. The six selected wash days established in the example have been set.

NOTE: Using the above procedures, different washing days and "ON - OFF" times may be established and set into the initiator clock to best serve a specific application.

NOTICE: Once the reset key (R) is pressed, the previous time and program will be cleared to the initial state.

Kitchen Exhaust Applications

M. For safe and proper operation adhere to the following instructions and procedures:

1. Exhaust systems shall be operated during all periods of cooking in restaurant applications.

2. Filter-equipped exhaust systems shall not be operated with filters removed.

3.The posted instructions for manually operating the fire extinguishing system shall be kept conspicuously posted in the kitchen and reviewed periodically with employees by the management.

4. Listed exhaust hoods shall be operated in accordance with the terms of their listings and the manufacturers instructions.

5. Cooking equipment shall not be operated while its fire-extinguishing system or exhaust system is not operating or otherwise impaired.

4. Wash Control and Detergent System Settings

Some dirt's being more tenacious than others are more difficult to remove and require a stronger detergent solution. Average settings have been factory set. Best possible settings for any given installation, however, are determined through experience. Determination can be made by visually examining the collecting elements after the first few washings.

To adjust the volume of detergent used within the given time setting, loosen the knurled knob with an Allen wrench on the control valve located in the by-pass line. Refer to the Detergent System Outline. Turning the knob clockwise increases the volume and counter clockwise decreases the volume. When adjustment has been made, be sure to retighten the setscrew.

5. Routine Maintenance

A. *Washing Frequency*

The frequency that the collected dirt is to be washed from the unit depends upon the type and amount of dirt in the air to be cleaned. Dirt which is greasy in nature tends to harden after collection and should be washed away often. Likewise, units operating under extremely heavy dirt loads should be washed more often as a large build-up of collected material will have a tendency to "blow-off" if permitted to remain on the collecting elements for long periods of time. In that the type and amount of dirt varies geographically (and from one location to another in any given area) it is recommended to start operation with a washing frequency of at least once a week. This schedule may then be altered as needed after visual examinations of the collected material contained on the ionizing-collecting cells. Daily washing is not unusual for units operating on heavy welding fume, kitchen exhaust hoods or similar applications.

B. *Detergent*

Effective washing is dependent upon detergent. The detergent reservoir should be examined on a routine basis, a minimum tank level established and never permitted to empty. An empty tank not only means poor washing, but can also be detrimental to the pump. The inside of the tank should be kept clean, free from dirt and foreign objects. The detergent, as supplied by Trion, Inc., is formulated specifically for electronic air cleaners. If substitutes are used, they must be approved by Trion, so as to not void the warranty. They should be safe for use in ventilation systems and non-caustic, as 95% of the ionizing-collecting cells are constructed of aluminum, special high voltage insulation and gasket seals.

C. *Electrical Operation*

The Air Boss controller (Optional) contains a digital LED display for kilovolt and milliampere readings. The milliammeter should be observed on a routine basis to be sure that it is reading within the prescribed operating range as marked on the data plate. For those units containing a voltmeter, the collector voltage should be between 6 and 7 KV, and the ionizer between 12.5 and 13.5 KV.

The ATS controller and remote PWM box both have LED indicating lights to show power to the PWM power supplies. Flickering or failed LED's indicate electrical arcing and/or power failure.

6. Periodic Maintenance

A. *Water Wash System –* ***Every 6 Months***

The water wash spray pattern should be checked on each nozzle to be sure that a full spray pattern is developed. Distorted patterns are usually caused by dirt in the nozzle orifice, which can be cleaned by inserting a small gage, soft copper wire into the orifice. If any one manifold contains several nozzles that are restricted, the drain plug at the idler end of the manifold should be removed, after the nozzles have been cleaned, and the manifold flushed with clean water. The main supply line strainer and the strainer in the detergent system should be checked and cleaned. Check the wash manifold drive linkage connections and tighten or adjust as required.

B. *Fire Suppression System* ***(IF INSTALLED) – Every 6 Months***

Properly trained and qualified personnel shall complete inspection, cleaning and servicing of the fire suppression system.

All actuation components, including remote manual pull stations, mechanical or electrical devices, detectors, fire-actuated dampers, etc., shall be checked for proper operation in accordance with the manufacturers listed procedures. In addition to these requirements, the specific inspection requirements of the applicable NFPA standard shall also be followed. If required, certificates of inspection and maintenance shall be forwarded to the authority having jurisdiction.

C. *Controller -* ***Every 12 Months***

The inside of the controller cabinet should be examined for accumulated dirt and dust. If required, the components should be cleaned using a good brand of electrical contact cleaner. All terminal connections should be checked for securement and tightened or reworked as required.

D. *Ionizing-Collecting Cell –* ***Every 6 to 12 Months***
Remove and inspect the ionizing-collecting cells for excessive dirt accumulations not removed by the integral washing system. Manually clean as required in a soak tank, commercial car wash, or with a pressure hose or pressure cleaner using a low pressure setting. At this time, particular care should be taken in cleaning each of the insulators.

WARNING:
DO NOT USE HIGH PRESSURE STEAM CLEANING EQUIPMENT TO CLEAN CELLS. THE EXCESSIVE HEAT AND PRESSURE WILL CAUSE THE PLATES TO WARP AND IN TURN POSSIBLY CAUSE EXCESSIVE ARCING.

E. *Motors –* ***Every 24 Months***
As the operation of detergent pump motor is limited, frequent oiling is not required. Lubricate with several drops of SAE 10 motor oil every two years. DO NOT OVER OIL. The manifold drive motors are factory lubricated for life and do not require oiling.

F. *Filter Devices –* ***Every 4 to 6 Months***
Hoods, impingers, metal mesh filters, ducts and other appurtenances shall be cleaned to bare metal at frequent intervals prior to surfaces becoming heavily contaminated with grease, oil or other contaminant. It may be advantageous to clean readily removable items, such as impingers, metal mesh filters or other permanent filter devices in a soak tank, with a pressure hose or pressure cleaner low setting. After cleaning to bare metal, components shall not be coated with powder or other substance.

When a cleaning service is used, a certificate showing dates of inspection and/or cleaning shall be maintained on the premises.

WARNING
Flammable solvents or other flammable cleaning aids shall not be used.

At the start of the cleaning process, electrical switches that could be accidentally activated shall be locked out. Components of the fire suppression system (if installed) shall not be rendered inoperable during the cleaning process.

Care should be taken not to apply cleaning chemicals on any fusible links or other detection devices of the automatic extinguishing system.

7. Troubleshooting

WARNING:
EXERCISE THE USUAL PRECAUTIONS WHEN WORKING WITH HIGH VOLTAGE. THE MAXIMUM OPERATING OUTPUT FROM THE POWER SUPPLY IS 15,000 VDC AND 5.5 MA. to 11.0 MA. WHEN IN PARALLEL.

IF SAFETY SWITCHES ARE CLOSED AND CIRCUIT IS ENERGIZED, DO NOT TOUCH HIGH VOLTAGE. WHEN THE CIRCUIT IS DE-ENERGIZED, ALWAYS BLEED OFF REMAINING STATIC CHARGE WITH AN INSULATED HANDLED SCREW DRIVER BY SHORTING TO GROUND THE POINTS OF HIGH VOLTAGE DC POTENTIAL.

WARNING
Risk of Electrical Shock

The servicing Instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the service instructions unless you are qualified to do so.

A. Introduction
This section on troubleshooting provides a description of potential malfunctions, their cause, location and correction. A Troubleshooting Reference Chart listing the most probable causes and corrections follows the general text.

NOTE: All repair to the fire suppression system (If Supplied) must be completed by the authorized fire control contractor.

The electronic air cleaner is the unit within the system that has the highest efficiency collection rating and is also the one with the highest potential for malfunction. When a malfunction does occur, the outage is usually found in the electrical secondary circuit in the ionizing-collecting cell(s).

Indicating lights are installed in the face panel of the control to monitor the electrical operation of each power supply and the ionizing-collecting cell(s) they energize. The quantity of power supplies per unit is dependent upon unit size with one or two power supplies for each ionizing-collecting cell tier in height. Other than the basic hand tools, it is advantageous to have a volt/ohm/milliammeter with a 20 KVDC high voltage probe. These instruments are standard catalog items by several manufacturers.

B. Secondary Short Circuit
The most common outage is a short in the secondary circuit and is best located through the process of elimination. Symptoms are a flickering indicating light accompanied by an arcing noise in the ionizing-collecting cell(s) or an indicating light that is not glowing.

A flickering light with an arcing noise is an indication of a high resistance short circuit and a light that is not glowing is an indication of a dead short. (A light that is not glowing can also be an indication of an open circuit in the primary circuit. Refer to the paragraph on open

circuits.) The short may be in the power supply, the high voltage cables or the ionizing-collecting cell(s). To isolate the short to any one of these three components, proceed as follows:

WARNING

When safety interlock switches are closed, do not come in contact with high voltage components. The operating output from the high voltage power supply(s) is 12,600 VDC and 6 MA. to 11.0 MA.

When the power supply(s) is de-energized there Is a 20 second delay for the voltage to decay. Always short from ground to a point of high voltage with a well Insulated jumper wire or an insulated handled screwdriver to bleed-off any remaining residual charge.

1. Disconnect both high voltage leads from their respective terminals in the power supply and support them away from any point of contact.

2. Energize the power supply:

   a. If the light still flickers or does not glow, the trouble is indicated to be in the power supply. First, check the inline fuse mounted on the circuit board and replace if it is blown. Second, replace the power supply in its entirety.

   b. If the light glows steady with the leads disconnected, the power supply is indicated to be normal.

NOTE: It will be necessary to close the access door electrical interlock switch operated by the access door and affix the junction box lid with hardware supplied to close the electrical interlock switch on the box, to complete the primary circuit to the power supply.

3. Next, reconnect both high voltage leads to their respective terminals inside the power supply and disconnect them at the ionizing-collecting cell(s). Support them away from any point of contact and energize the power supply.

a. If either high voltage lead is defective the light will indicate the trouble. Each lead may then be checked separately by disconnecting them, one at a time, from their respective terminals at the power supply. When a lead is found to be defective, replace it in its entirety. Do not repair or splice.

b. If the light glows steady with the leads disconnected at the ionizing-collecting cell(s) the trouble is then indicated to be in the ionizing-collecting cell(s).

The trouble can then be isolated to, a single cell, or the ionizing or collector section of a given cell as follows:

(1) First determine if the short is in the ionizing section or the collecting section by connecting each high voltage lead to its respective section, one at a time, and energizing the power pack. (The lead not connected must be supported away from any point of contact.) The short symptoms will still exist for the section in which the short is located. If the trouble causing the short is bridging both sections, then the short will be indicated in both sections when they are individually connected.

(2) When the short is isolated to a cell tier, remove all the cells within the tier and visually check the sections indicated to contain the short.
   (a). If the short is in the ionizer section, look for a broken or defective insulator.
   (b). If the short is in the collector section, look for a large piece of foreign material bridging the collector plates or a defective insulator.
   (c) . If the short is indicated to be in both sections, it will probably be a foreign object bridging the air gap between the ionizer and the collector.

c. Open Circuits

Although open circuits can occur in the secondary they usually take place in the primary. If the unit contains only one power supply and the indicating light does not glow the outage is probably one of the following.
(1)Supply line power to the control disconnected. Reconnect.
(2)Open access door interlock in control of electronic air cleaner. Be sure all access doors are properly closed and secured.
(3)Blown in-line fuse located on the power supply circuit board. Replace Power Supply.
(4)Outage in the power supply. Look for charred or burned components or a loose wiring connection. Replace power supply or reconnect wiring.
(5)Defective indicating light. Replace light.

d. Malfunctions other than short or open circuits. Refer to trouble reference chart in this section.

8. Spare Parts

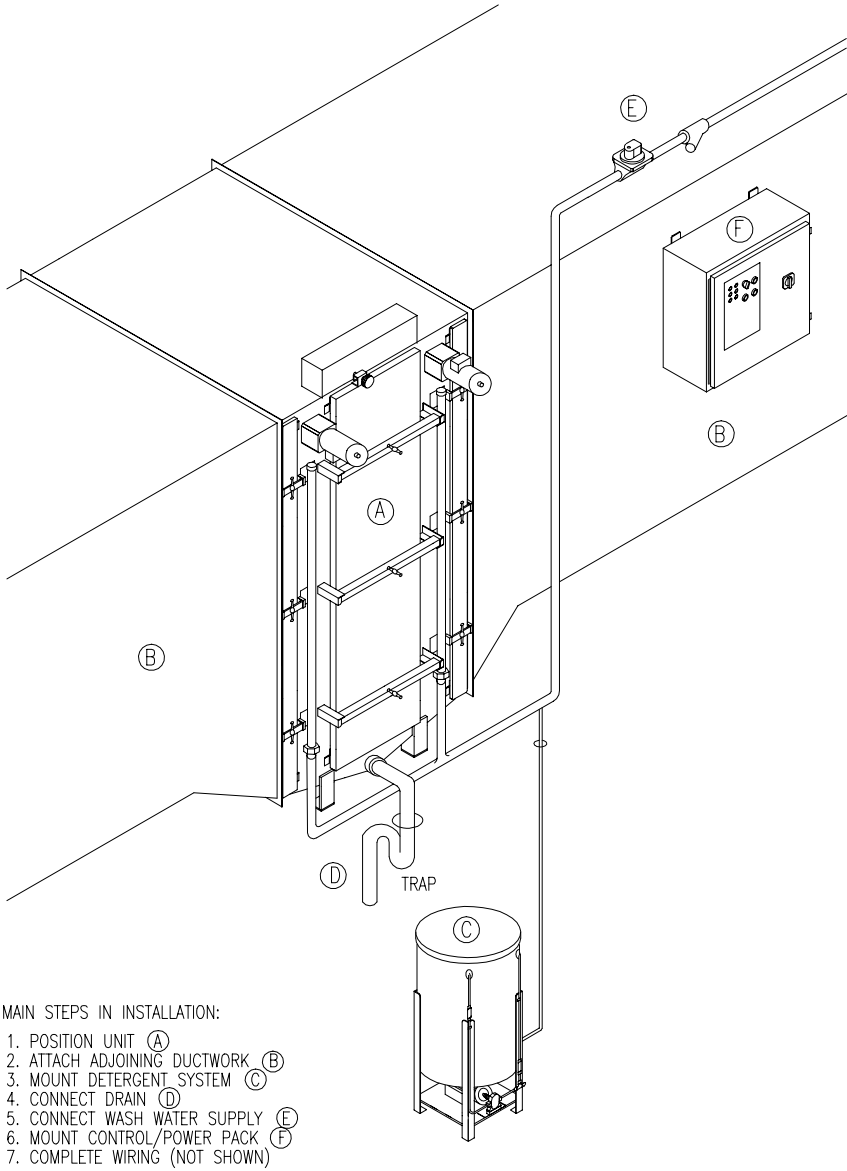
Recommended spare part quantities are usually based on the unit size and the amount of units per installation. For specific recommendations, consult the Trion factory or nearest Sales Office. Consideration, however, should be given to stocking the following components;

DESCRIPTION	QTY.
PWM Power Supply	2
Junction Box Stand Off Insulators	2
Cell Insulators	6
LED	2

Part Numbers are not listed as they are subject to change. Always state Unit Model and Serial Numbers when ordering parts.

Troubleshooting Reference Chart

PROBLEM/ SYMPTOM	PROBABLE CAUSE	LOCATION	REASON - CORRECTION
Indicating Light Not Glowing	Short Circuit	Ionizing Section of Cell	1. Dirty insulator(s) – Clean 2. Defective insulator(s) – Replace 3. Foreign Object Between Ionizing Bar and Ground electrode - Remove
		Collecting Section of Cell	1. Dirty insulator(s) - Clean 2. Defective insulator(s) – Replace 3. Foreign Material Bridging Plates - Remove 4. Bent Plates – Straighten or Replace
		High Voltage Leads	1. Disconnected High Voltage Lead Contacting Ground - Reconnect 2. Defective Lead/Insulation Breakdown – Replace Entire Lead
		Power Supply	Charred/Over Heated Components – Replace Power Supply
Indicating Light Not Glowing	Open Circuit	Control	1. Disconnected Supply Line Power – Reconnect 2. Faulty indicting Light - Replace
		Power Supply	1. Blown Fuse – Replace Power Supply. 2. Disconnected Wire – Replace 3. Charred/Over Heated Components – Replace Power Supply
		Electronic Air Cleaner Housing	1. Electrical Interlock Switch Not Closed – Close Access Door 2. Junction Box interlock switch not closed – Secure Cover 3. Faulty Electrical Interlock Switch - Replace
Indicating Light Flickering	High Resistance Short	High Voltage Circuit	1. Ionizer High Voltage Lead Connected to Plate Section and Plate Lead to Ionizer – Reconnect Leads 2. Loose or Disconnect high Voltage Lead-Tighten or Reconnect 3. Loose or Defective Intercell Connection (on Multicell Units) – Tighten or Replace 4. Foreign Object Adrift in Ionizer or Plate Section of Cell - Remove

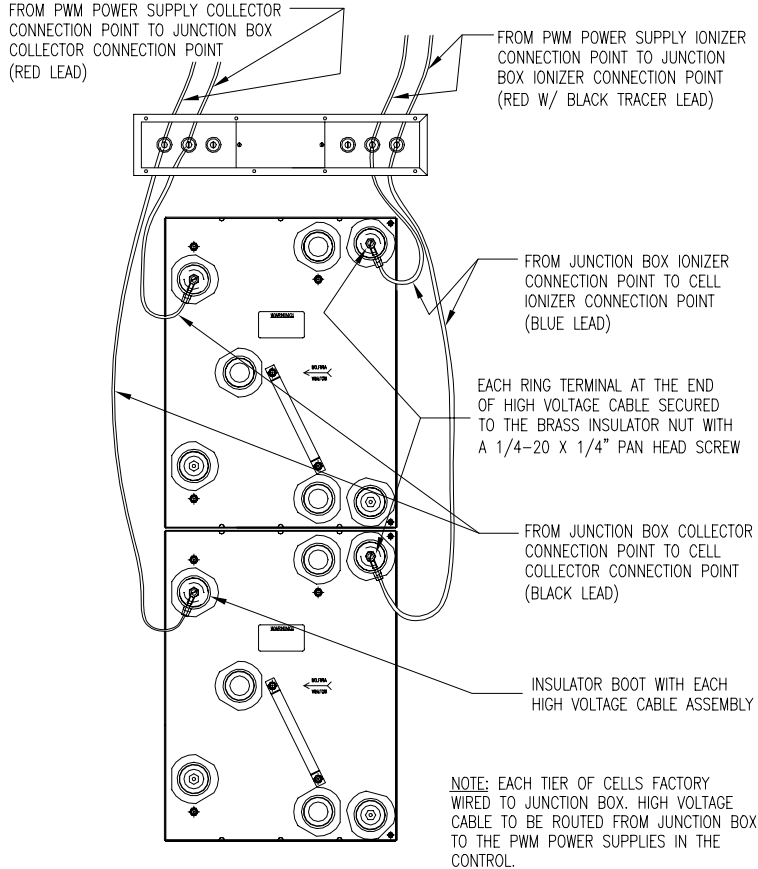


MAIN STEPS IN INSTALLATION:

1. POSITION UNIT (A)
2. ATTACH ADJOINING DUCTWORK (B)
3. MOUNT DETERGENT SYSTEM (C)
4. CONNECT DRAIN (D)
5. CONNECT WASH WATER SUPPLY (E)
6. MOUNT CONTROL/POWER PACK (F)
7. COMPLETE WIRING (NOT SHOWN)

GENERAL COMPONENT ARRANGEMENT

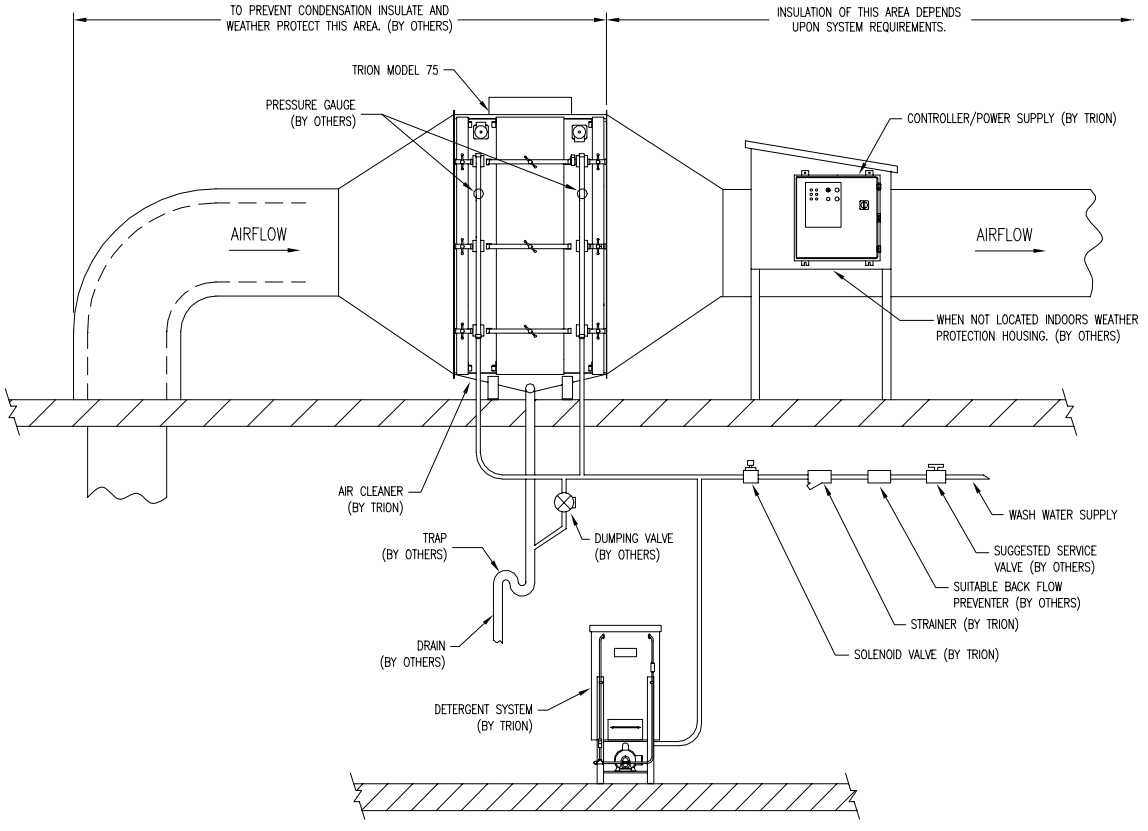
FIGURE 1



HIGH VOLTAGE LEAD CONNECTING TERMINALS

FIGURE 2

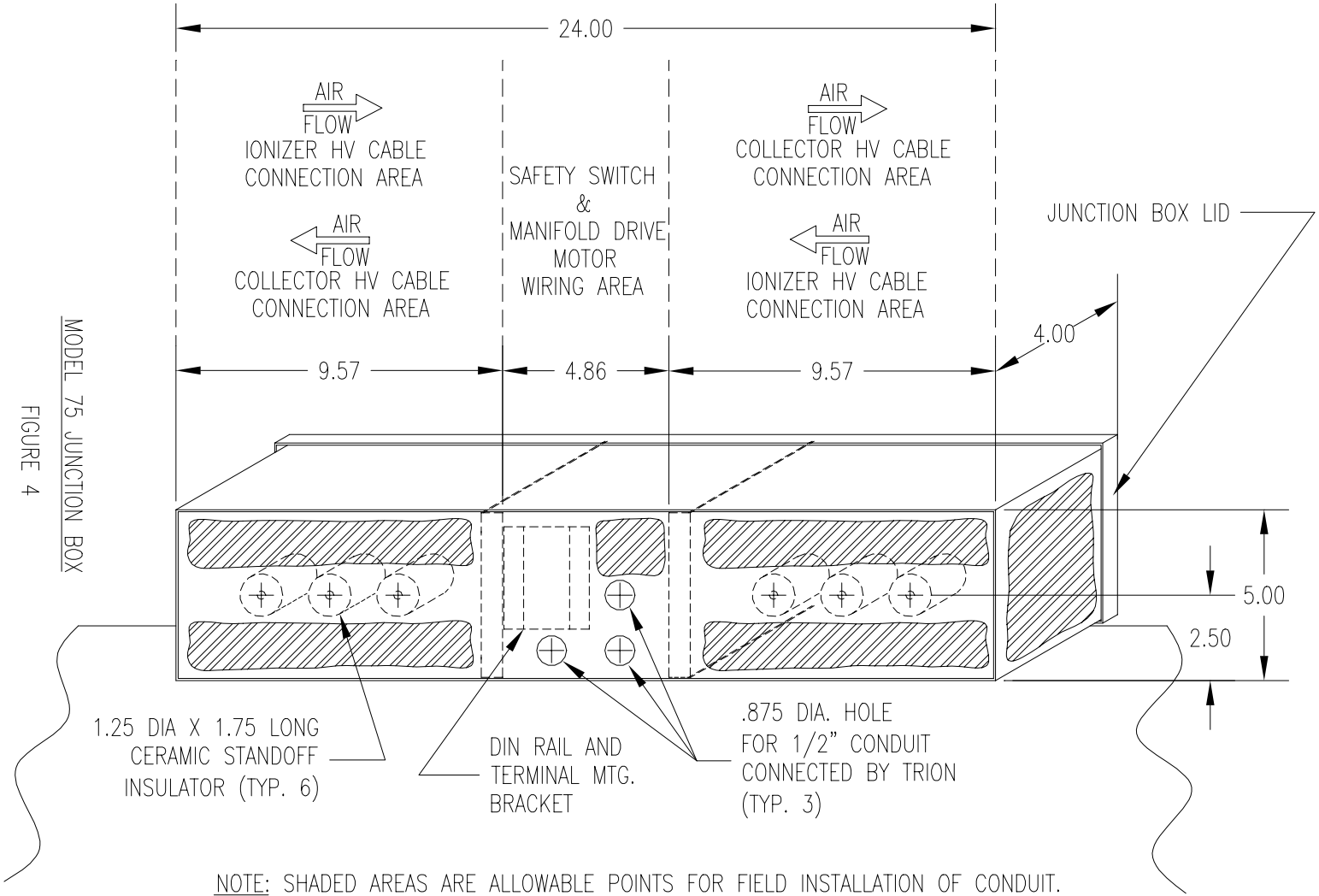
M75FIG2.DWG



TYPICAL OUTDOOR INSTALLATIONS

FIGURE 3
14

M75FIG3.DWG



NOTE: SHADED AREAS ARE ALLOWABLE POINTS FOR FIELD INSTALLATION OF CONDUIT.

MODEL 75 JUNCTION BOX

FIGURE 4

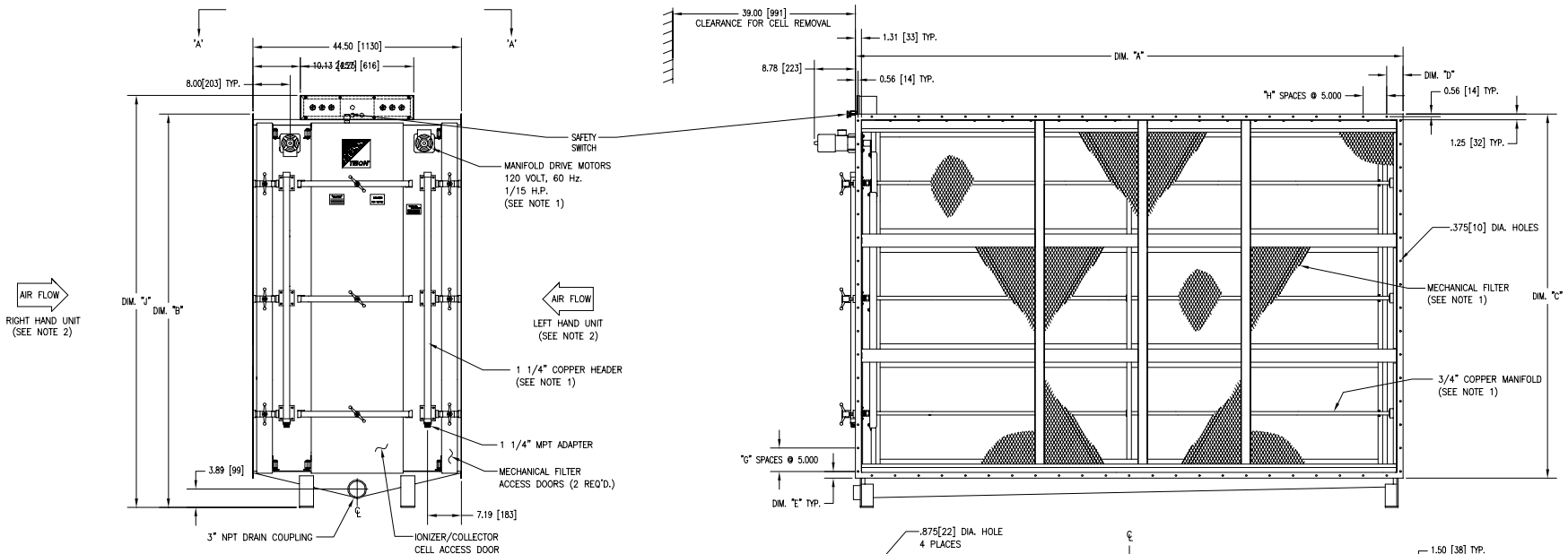
M75FIG4.DWG

UNIT SIZE	DIM."A"	DIM."B"	DIM."C"	DIM."D"	DIM."E"	DIM."F"	"G" SPACES	"H" SPACES	DIM. "J"	UNIT WEIGHT APPROX.
MODEL 75-102	28.31 [719]	34.87 [886]	28.62 [727]	1.65 [42]	1.81 [46]	23.37 [594]	5	5	38.87 [987]	370 LBS.[168.2 kg]
MODEL 75-103	39.50 [1003]			2.25 [57]		34.56 [878]		7		450 LBS.[204.5 kg]
MODEL 75-104	50.44 [1281]			2.72 [69]		45.50 [1156]		9		540 LBS.[245.5 kg]
MODEL 75-105	61.63 [1565]			3.31 [84]		56.69 [1440]		11		620 LBS.[281.8 kg]
MODEL 75-106	72.81 [1850]			3.90 [99]		67.87 [1724]		13		705 LBS.[320.5 kg]
MODEL 75-107	83.75 [2127]			1.87 [48]		78.81 [2002]		16		800 LBS.[363.6 kg]
MODEL 75-108	94.97 [2412]			2.48 [63]		90.03 [2287]		18		880 LBS.[400.0 kg]
MODEL 75-109	106.16 [2696]			3.08 [78]		101.22 [2571]		20		960 LBS.[436.4 kg]
MODEL 75-110	117.00 [2972]			3.50 [89]		112.06 [2846]		22		1050 LBS.[477.3 kg]
MODEL 75-203	39.50 [1003]	59.50 [1511]	53.24 [1352]	2.25 [57]	1.62 [41]	34.56 [878]	10	7	63.50 [1613]	740 LBS.[336.4 kg]
MODEL 75-204	50.44 [1281]			2.72 [69]		45.50 [1156]		9		905 LBS.[411.4 kg]
MODEL 75-205	61.63 [1565]			3.31 [84]		56.69 [1440]		11		1050 LBS.[477.3 kg]
MODEL 75-206	72.81 [1850]			3.90 [99]		67.87 [1724]		13		1190 LBS.[540.9 kg]
MODEL 75-207	83.75 [2127]			1.87 [48]		78.81 [2002]		16		1360 LBS.[618.2 kg]
MODEL 75-208	94.97 [2412]			2.48 [63]		90.03 [2287]		18		1500 LBS.[681.8 kg]
MODEL 75-209	106.16 [2696]			3.08 [78]		101.22 [2571]		20		1640 LBS.[745.5 kg]
MODEL 75-210	117.00 [2972]			3.50 [89]		112.06 [2846]		22		1805 LBS.[820.5 kg]

UNIT SIZE	DIM."A"	DIM."B"	DIM."C"	DIM."D"	DIM."E"	DIM."F"	"G" SPACES	"H" SPACES	DIM. "J"	UNIT WEIGHT APPROX.
MODEL 75-303	39.50 [1003]	84.12 [2137]	77.87 [1978]	2.25 [57]	1.43 [36]	34.56 [878]	15	7	88.12 [2238]	1050 LBS.[477.3 kg]
MODEL 75-304	50.44 [1281]			2.72 [69]		45.50 [1156]		9		1275 LBS.[579.5 kg]
MODEL 75-305	61.63 [1565]			3.31 [84]		56.69 [1440]		11		1480 LBS.[672.7 kg]
MODEL 75-306	72.81 [1850]			3.90 [99]		67.87 [1724]		13		1680 LBS.[763.6 kg]
MODEL 75-307	83.75 [2127]			1.87 [48]		78.81 [2002]		16		1920 LBS.[872.7 kg]
MODEL 75-308	94.97 [2412]			2.48 [63]		90.03 [2287]		18		2120 LBS.[963.6 kg]
MODEL 75-309	106.16 [2696]			3.08 [78]		101.22 [2571]		20		2325 LBS.[1056.8 kg]
MODEL 75-310	117.00 [2972]			3.50 [89]		112.06 [2846]		22		2552 LBS.[1159.1 kg]

NOTES:

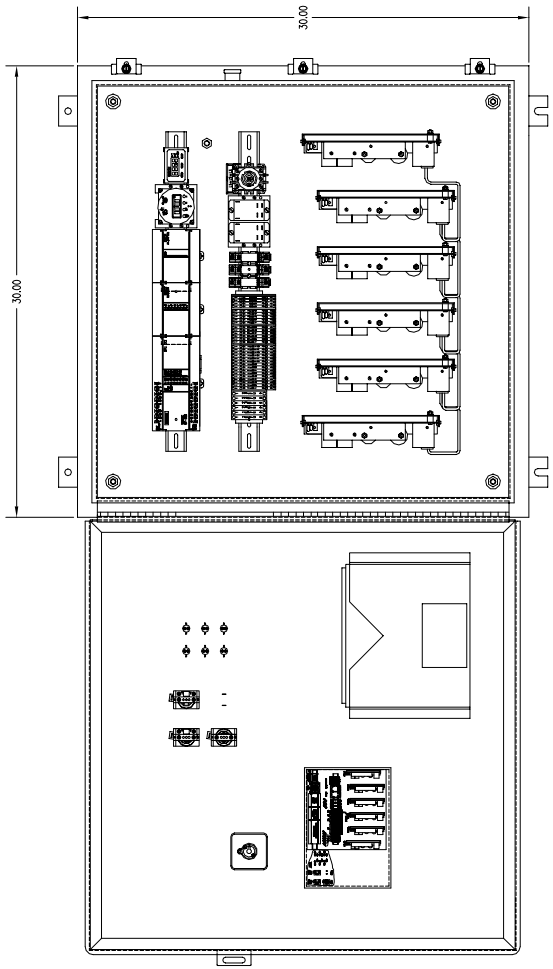
1.) UNIT SHOWN WITH WASH AND METAL MESH FILTERS. DESIGNATE BY ORDER DESCRIPTION, THE LOCATION & PART NUMBER OF WASH ASSEMBLY AND MECHANICAL FILTER TYPE.
2.) SPECIFY DIRECTION OF AIR FLOW THROUGH UNIT ON ORDER DESCRIPTION.

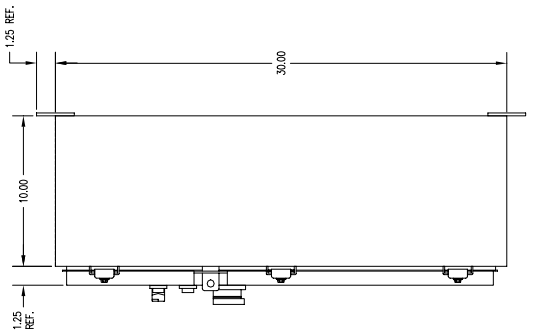


MODEL 75 UNIT OUTLINE

FIGURE 5

ATS CONTROL
(STANDARD)





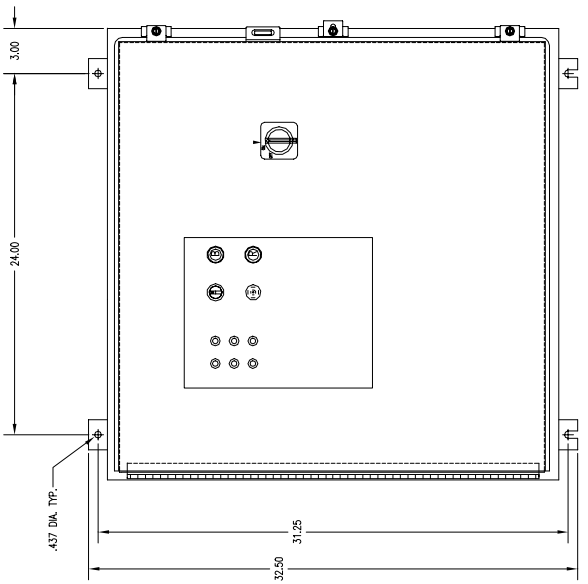
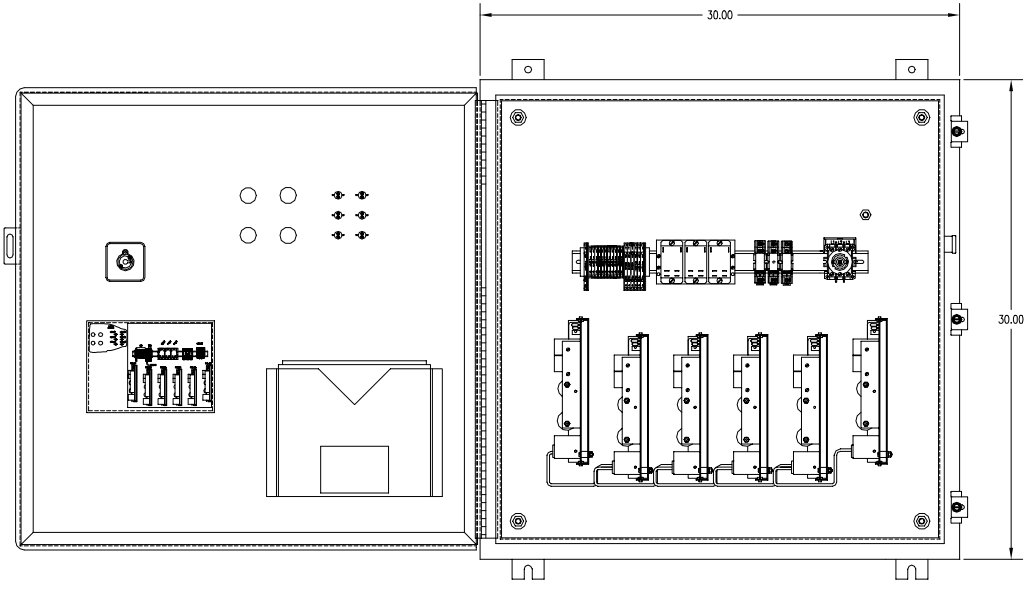
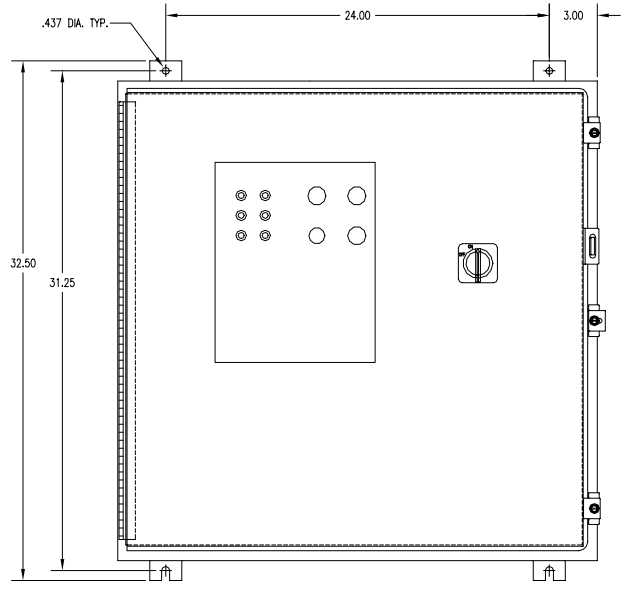


FIGURE 6

M75FIG6.DWG



REMOTE PWM ASSEMBLY
(OPTIONAL)



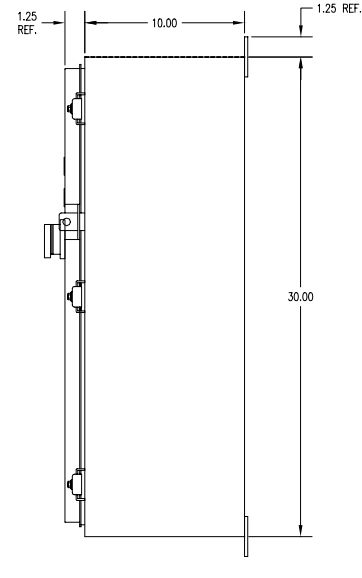
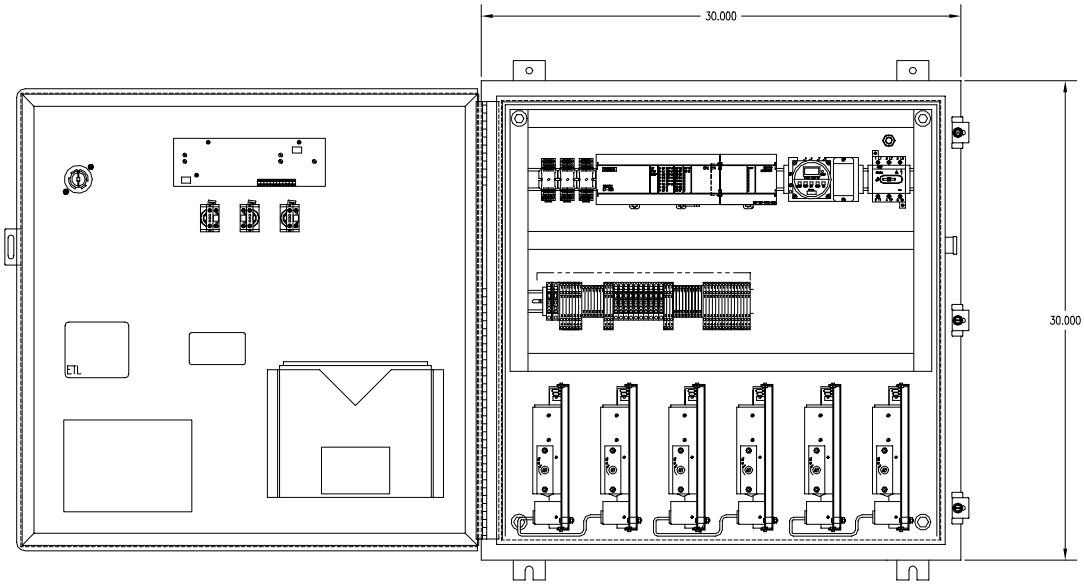
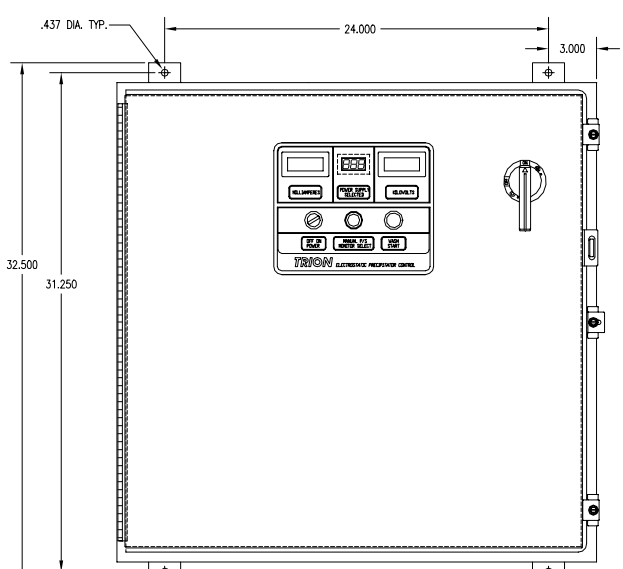


FIGURE 7

M75FIG7.DWG



AIR BOSS CONTROL
(OPTIONAL)



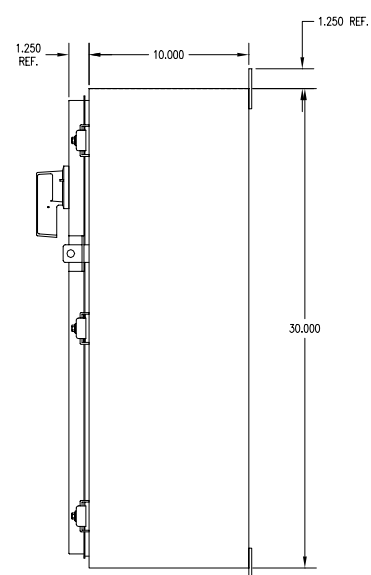
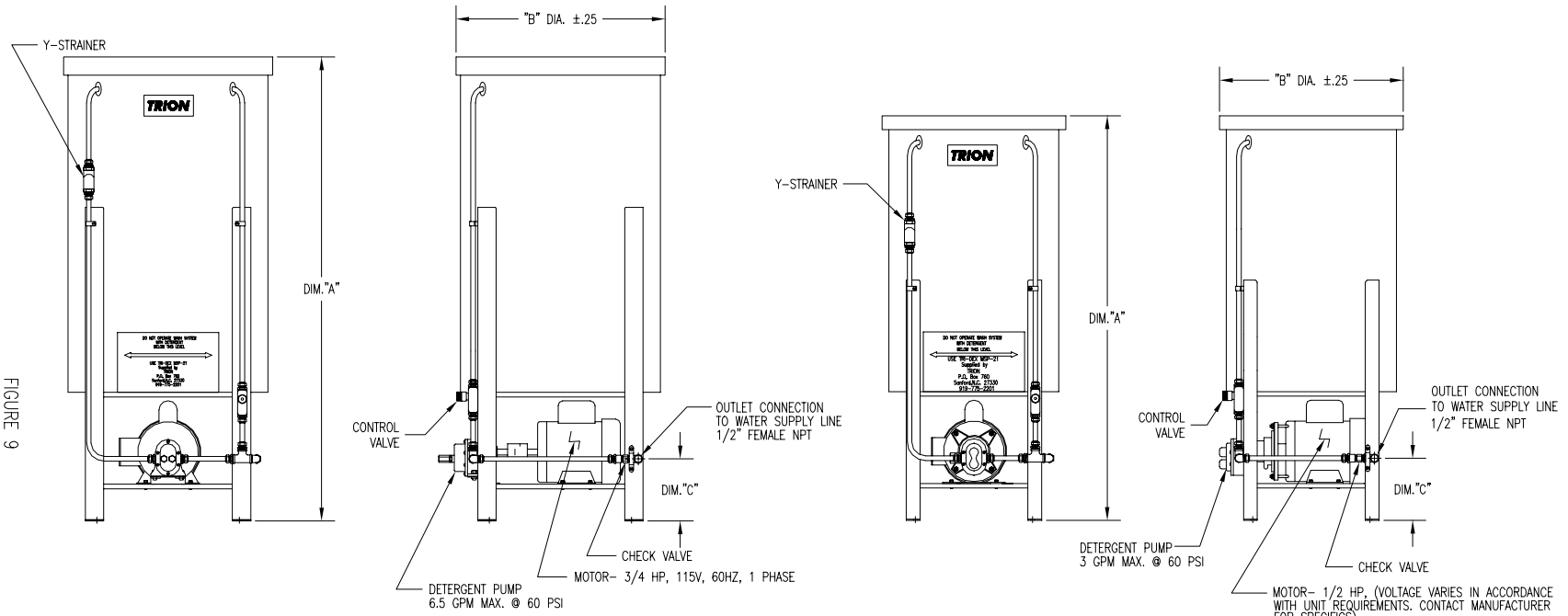


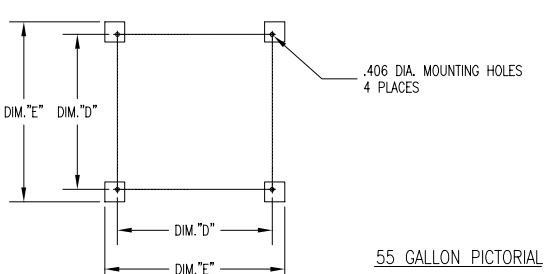
FIGURE 8
19

M75FIG8.DWG

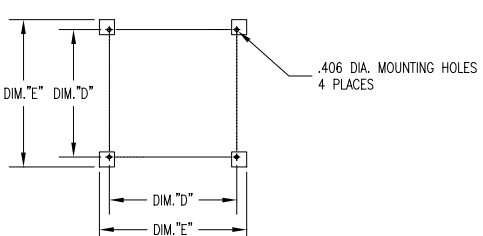
DETERGENT TANK	DIM."A"	"B" DIA.	DIM."C"	DIM."D"	DIM."E"	WEIGHT-EMPTY	WEIGHT-FULL
16 GALLON	42.00	15.50	6.31*	9.50	11.49	50 LBS.	200 LBS.
30 GALLON	44.00	20.00	6.31*	12.75	14.74	65 LBS.	330 LBS.
55 GALLON	50.50	23.00	6.75	15.50	17.86	115 LBS.	585 LBS.

* ADD .50 TO THIS DIMENSION FOR 56 FRAME PUMP MOTOR.





55 GALLON PICTORIAL



16 & 30 GALLON PICTORIAL

DETERGENT FEEDER OUTLINE

FIGURE 9
20

M75FI09.DWG

MODEL	WATER REQ'D @ 50 PSI	WATER REQ'D PER CYCLE	DETERGENT REQUIRED PER CYCLE	PIPING COMPONENT SIZE
73/75-102	5.3 GPM	18.6 GALS.	0.3 GALS.	2.00
73/75-103	8.0 GPM	28.0 GALS.	0.4 GALS.	2.00
73/75-104	10.6 GPM	37.1 GALS.	0.5 GALS.	2.00
73/75-105	13.3 GPM	46.6 GALS.	0.7 GALS.	2.00
73/75-106	16.0 GPM	56.0 GALS.	0.8 GALS.	2.00
73/75-107	18.6 GPM	65.1 GALS.	0.9 GALS.	2.00
73/75-108	21.3 GPM	74.6 GALS.	1.1 GALS.	2.00
73/75-109	23.9 GPM	83.7 GALS.	1.2 GALS.	2.00
73/75-110	26.6 GPM	93.1 GALS.	1.3 GALS.	2.00
73/75-203	16.0 GPM	56.0 GALS.	0.8 GALS.	2.00
73/75-204	21.3 GPM	74.6 GALS.	1.1 GALS.	2.00
73/75-205	26.6 GPM	93.1 GALS.	1.3 GALS.	2.00
73/75-206	31.9 GPM	111.7 GALS.	1.6 GALS.	2.00
73/75-207	37.2 GPM	130.2 GALS.	1.9 GALS.	2.00
73/75-208	42.6 GPM	149.1 GALS.	2.1 GALS.	2.00
73/75-209	47.9 GPM	167.7 GALS.	2.4 GALS.	2.00
73/75-210	53.2 GPM	186.2 GALS.	2.7 GALS.	2.00
73/75-303	23.9 GPM	83.7 GALS.	1.2 GALS.	2.00
73/75-304	31.9 GPM	111.7 GALS.	1.6 GALS.	2.00
73/75-305	39.9 GPM	139.7 GALS.	2.0 GALS.	2.00
73/75-306	47.9 GPM	167.7 GALS.	2.4 GALS.	2.00
73/75-307	55.9 GPM	195.7 GALS.	2.8 GALS.	2.00
73/75-308	63.8 GPM	223.3 GALS.	3.2 GALS.	2.00
73/75-309	71.8 GPM	251.3 GALS.	3.6 GALS.	2.00
73/75-310	79.8 GPM	279.3 GALS.	4.0 GALS.	2.00

16 & 30 GAL. SYSTEM PUMP CHARACTERISTICS	
WATER SUPPLY LINE (PSI)	MAXIMUM (FT) VERTICAL HEAD
45	34
50	23
55	11
60*	*
PUMP CAPACITY @ MAXIMUM VERTICAL HEAD IS 3.0 GPM	

55 GAL. SYSTEM PUMP CHARACTERISTICS	
WATER SUPPLY LINE (PSI)	MAXIMUM (FT) VERTICAL HEAD
45	34
50	23
55	11
60*	*
PUMP CAPACITY @ MAXIMUM VERTICAL HEAD IS 6.5 GPM	

* CONTACT FACTORY FOR WATER PRESSURE'S 60 PSI AND HIGHER FOR MAXIMUM VERTICAL HEAD.

NOTES:

1) THE BACKFLOW PREVENTER MUST BE LOCATED UPSTREAM FROM THE DETERGENT FEEDER LINE CONNECTION AND "Y" STRAINER. THIS DEVICE SHOULD BE CONTINUOUS PRESSURE TYPE, AND INSTALLED IN ACCORDANCE WITH ALL APPLICABLE PLUMBING CODE REQUIREMENTS.
2) SOLENOID VALVE COIL MUST BE MOUNTED UPRIGHT.
3) WATER CONSUMPTION PER CYCLE BASED ON 1 MINUTE WASH AND 2 MINUTE RINSE (FACTORY SET) WASH CYCLE. TO DETERMINE WATER CONSUMPTION FOR OTHER WASH CYCLES MULTIPLY FLOW RATE (GPM) BY TOTAL OF WASH AND RINSE CYCLE TIME (MINUTES).
4) IT IS RECOMMENDED THAT HOT WATER (MIN. 120°F) BE USED FOR A MORE EFFICIENT WASH CYCLE. HOT WATER TANKS SHOULD BE LOCATED AS CLOSE AS POSSIBLE TO THE UNIT BEING WASHED AND SUFFICIENT PIPING MUST BE PROVIDED SO THE WATER FLOW IS NOT RESTRICTED NOR WATER PRESSURE APPRECIABLY REDUCED.
5) DETERGENT QUANTITY ADJUSTABLE.
6) WATER MAIN SUPPLY LINE PRESSURE:
   45 PSI MINIMUM
   75 PSI MAXIMUM
7) DRAIN LINE TRAP MUST PROVIDE SUFFICIENT WATER COLUMN TO OVERCOME THE INTERNAL STATIC PRESSURE OF THE AIR HANDLING SYSTEM IN WHICH THE MODEL 73/75 IS INSTALLED.
8) ALL PIPE COMPONENTS (VALVES, PRESSURE GAUGE, BACKFLOW PREVENTER) SHOWN ON THIS DRAWING ARE TO BE LOCATED IN PROXIMITY TO MODEL 73/75 UNIT.
9) SIZE WATER SUPPLY LINE PIPE FOR FLOW AND PRESSURE REQUIREMENT SHOWN IN TABLE AND NOTE 5. PIPING BETWEEN COMPONENTS TO MATCH PIPE COMPONENT SIZE IN TABLE.
10) ALL DRAIN PIPE SHOULD ALLOW FOR MAXIMUM AVAILABLE SLOPE (1/4" PER FOOT MINIMUM).
11) HEADERS ARE NOT REQUIRED ON MODEL 73/75-102 THRU MODEL 73/75-110. TWO 3/4" MPT CONNECTIONS ARE PROVIDED FOR THE WASH WATER SUPPLY LINE IN LIEU OF HEADERS.
12) EACH HEADER IS SUPPLIED WITH A CONNECTION POINT FOR A PRESSURE GAUGE.
13) INJECT DETERGENT LINE INTO MAIN WATER LINE AS CLOSE AS POSSIBLE AND UPSTREAM FROM THE MODEL 73/75.
14) PROTECT ALL WASH WATER AND PLUMBING COMPONENTS THAT ARE SUBJECT TO FREEZING.

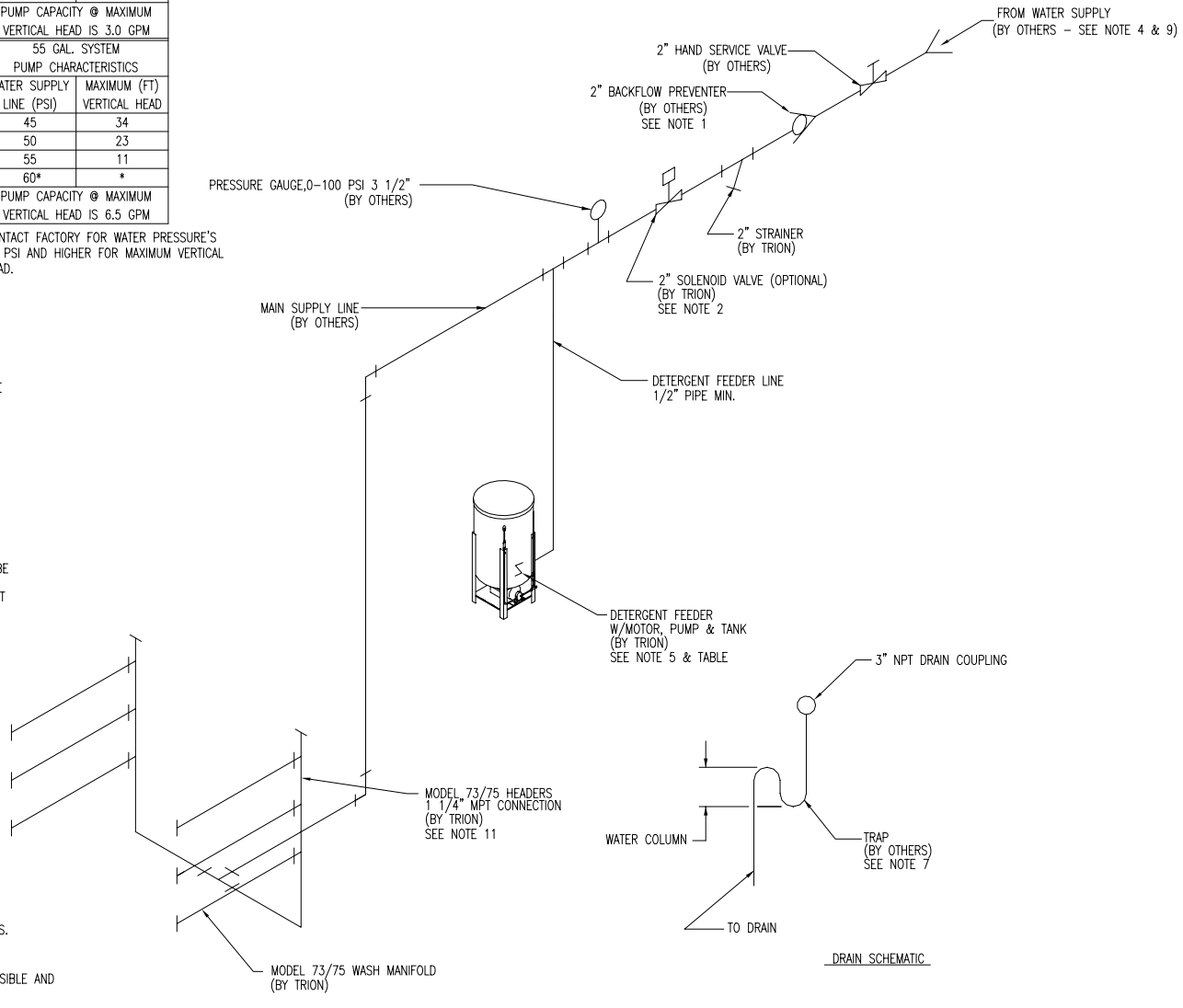
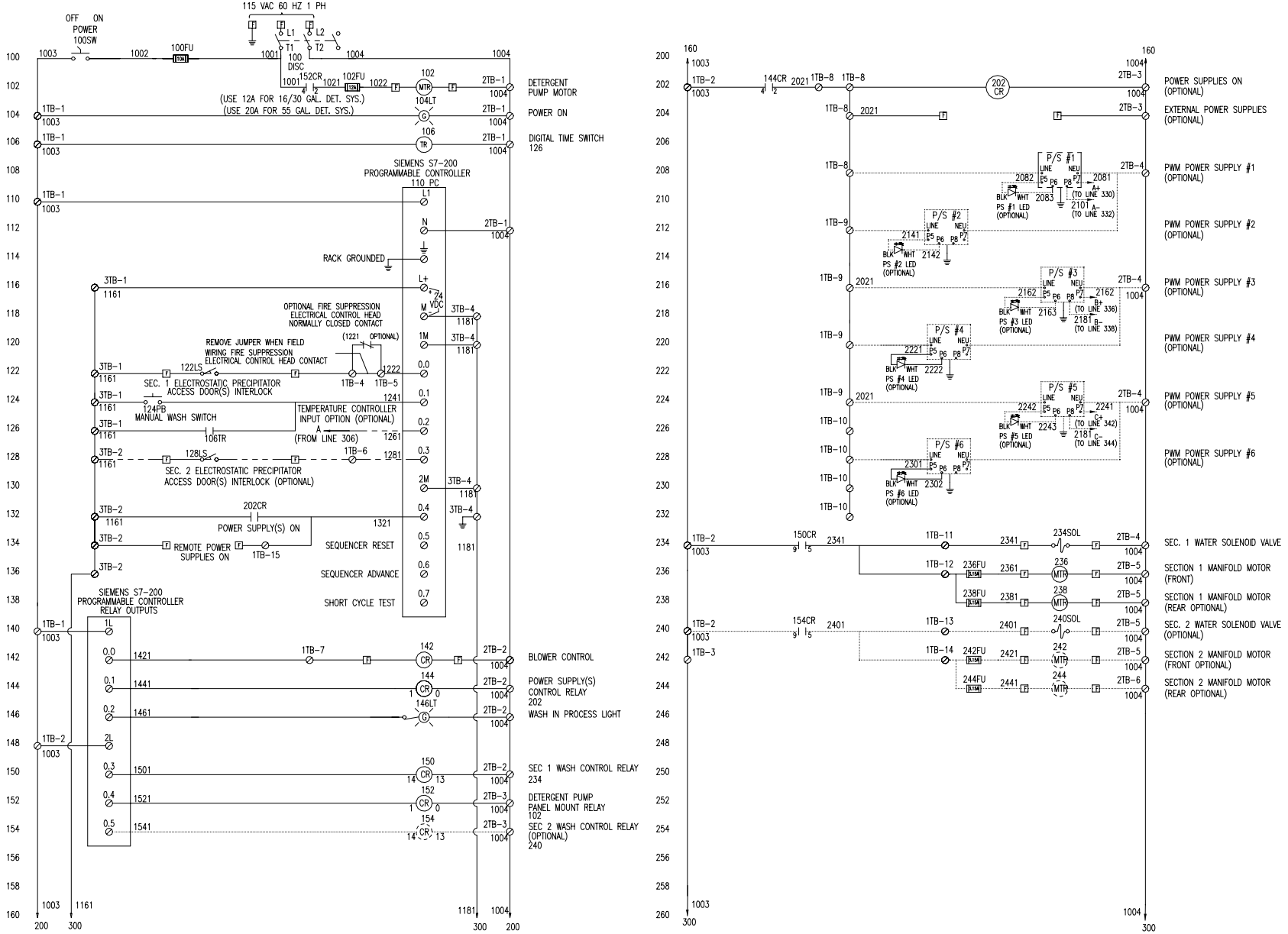
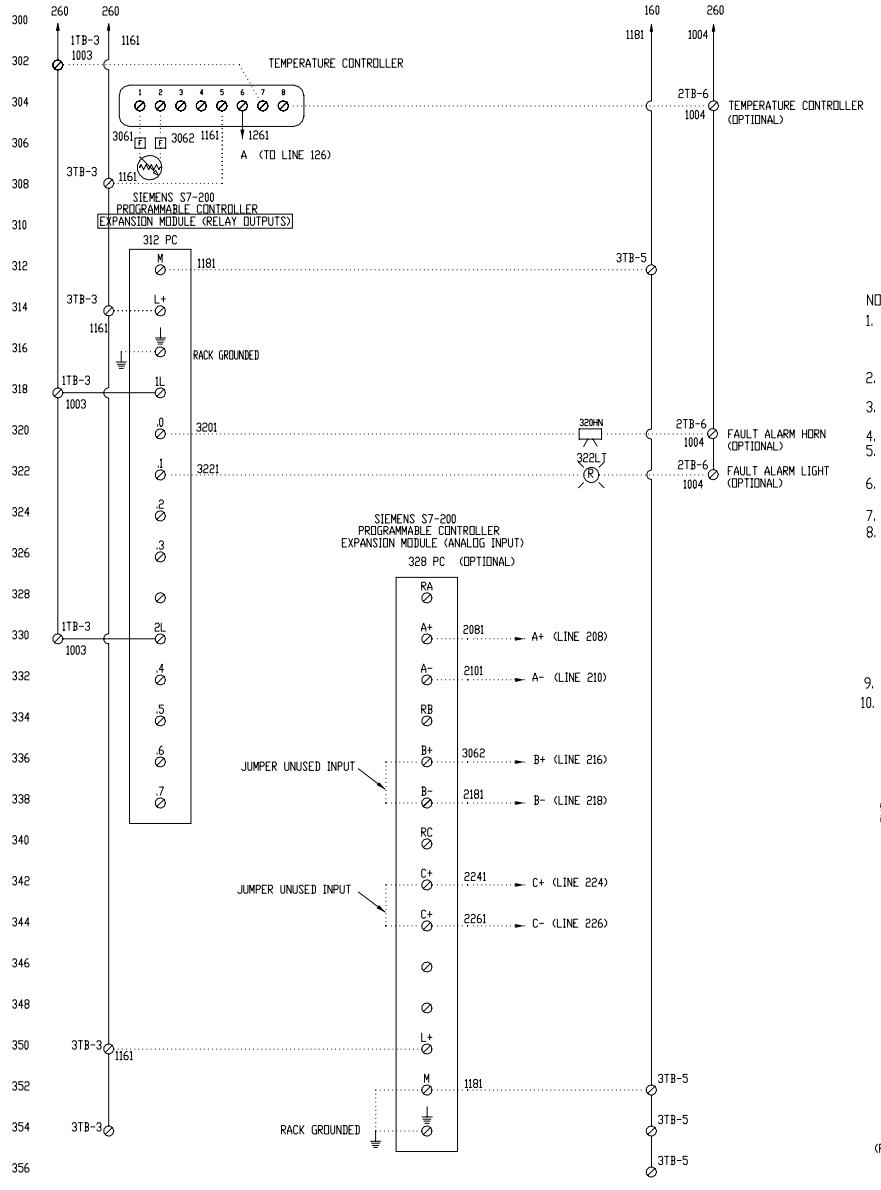


FIGURE 10



ATS CONTROL SCHEMATIC

FIGURE 11



ATS CONTROL SCHEMATIC

SEQUENCE and TIMING OPERATIONS

(SINGLE SECTION SHOWN)

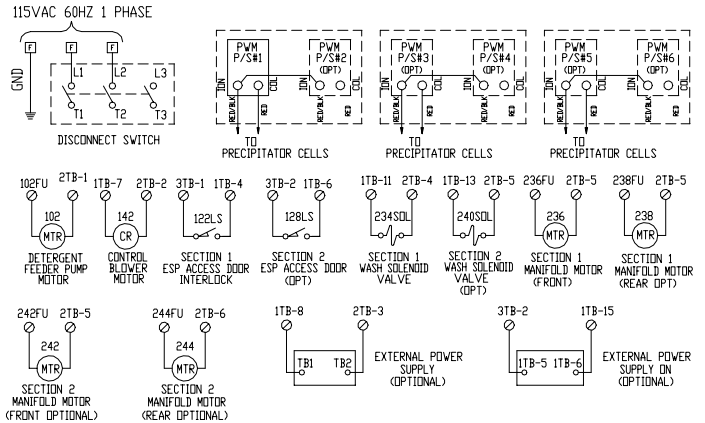
SYSTEMS OPERATIONS		P.C. TIMERS / DEVICES TO ADVANCE TO NEXT STEP	SEQUENCER STEP NO.	OUTPUTS ACTIVATED - X					
				1st RO 0.0 1421	1st RO 0.1 1441	1st RO 0.2 1461	1st RO 0.3 1501	1st RO 0.4 1521	1st RO 0.5 1541
AIR CLEANER ALL SECTIONS		I0.1	0	X	X				
SYSTEM AIR SHUTDOWN	1 min.	T37	1			X			
SEC 1 PRE WASH	30 SEC.	T42	2			X	X		
SEC 1 WASH	1 min.	T38	3			X	X	X	
SEC 1 SOAK	2 min.	T39	4			X			
SEC 1 RINSE	2 min.	T40	5			X	X		
DRIP DRY	4 min.	T41	6			X			
FORCE DRY	60 min.	C1	7	X		X			
RETURN TO STEP 0		M0.3	8						
				BLOWER CONTROL RELAY	POWER PACKS CONTROL RELAY	WASH IN PROCESS LIGHT	SECTION 1 WASH CONTROL RELAY	DETERGENT PUMP RELAY	SECTION 2 WASH CONTROL RELAY (OPTIONAL)

NOTES:

1. HIGH VOLTAGE LEADS BY TRION. STANDARD LENGTH 50 FT. IONIZER RED/BLACK, COLLECTOR RED. RUN LEADS IN SPERATE CONDUITS BETWEEN POWER PACKS AND AIR CLEANER. DO NOT SPLICE LEADS. ISOLATE HIGH VOLTAGE CABLE AWAY FROM CONTROL WIRING.
2. CONTROL ENCLOSURES AND AIR CLEANER MUST BE GROUNDED TO STRUCTURAL STEEL AND EARTH GROUND.
3. ALL PRIMARY INTERCONNECTION WIRING BY CUSTOMER MUST MEET APPLICABLE CODE REQUIREMENTS.
4. EACH MANIFOLD MOTOR REQUIRES 1.7 AMPS AT 115 VAC 60HZ.
5. SOLENOID VALVES REQUIRE 6.0 - 15.4 WATTS AT 115 VAC 60 HZ (SEE SPECIFIC VALVE FOR RATING).
6. 16/30 GALLON DETERGENT PUMP MOTOR REQUIRES 10 AMPS @ 115 VAC/60HZ/1PH 55 GALLON DETERGENT PUMP MOTOR REQUIRES 12 AMPS @ 115 VAC/60HZ/1PH
7. CONTROL POWER REQUIREMENTS 30 AMPS AT 115 VAC 60 HZ.
8. LISTED BELOW IS THE POWER PACK SCHEDULE FOR THE MODEL 70 SERIES UNITS

MODEL 70 SERIES UNIT	NO. PWM POWER SUPPLIES REQ'D.
-102 THRU -105	1
-106 THRU -110 -203 THRU -205	2
-303 THRU -305	3
-206 THRU -210	4
-306 THRU -310	6

9. ⊘ DENOTES TERMINAL CONNECTION IN CONTROL ENCLOSURE.
10. [F] ALL FIELD WIRING PROVIDED BY CUSTOMER.



FIELD WIRING

FIGURE 12

154629-2
REV.-E

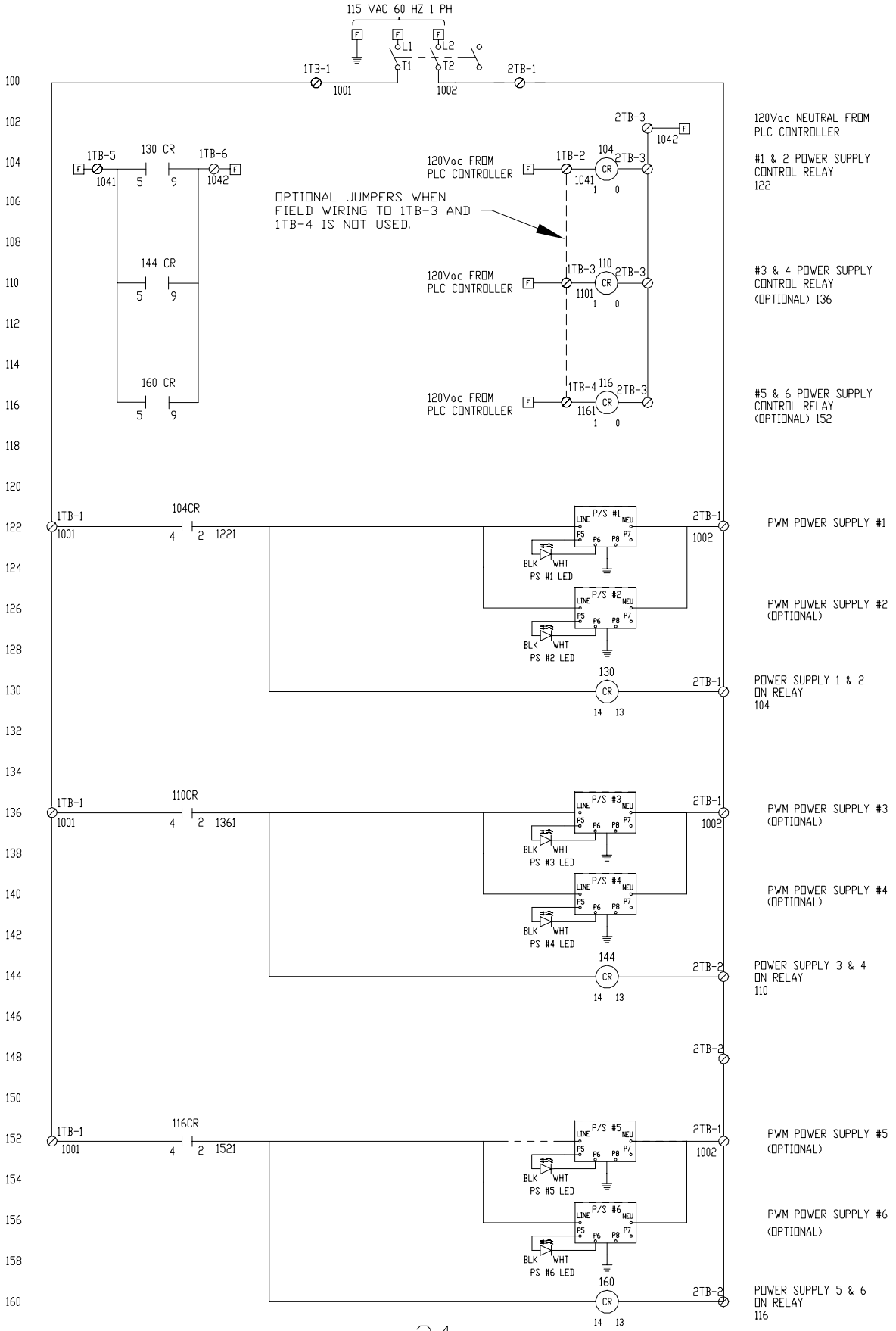
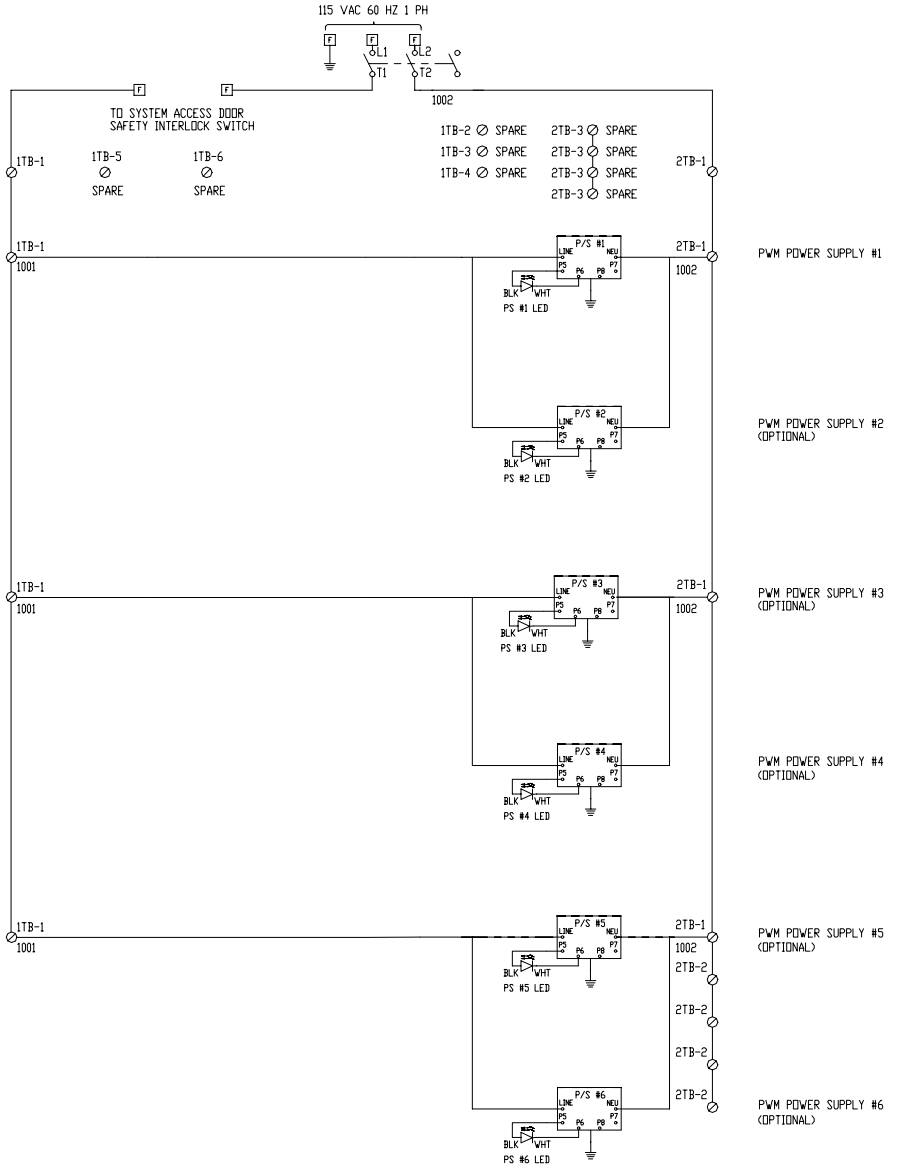
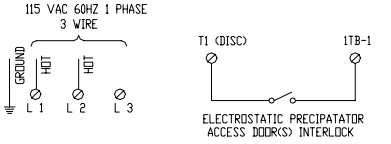
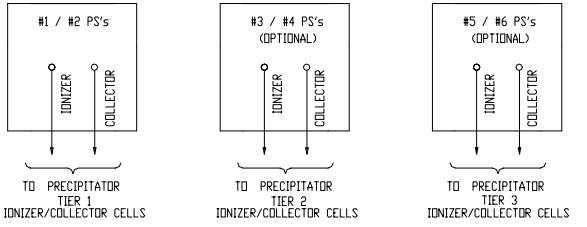


FIGURE 13

ATS REMOTE POWER SUPPLY SCHEMATIC





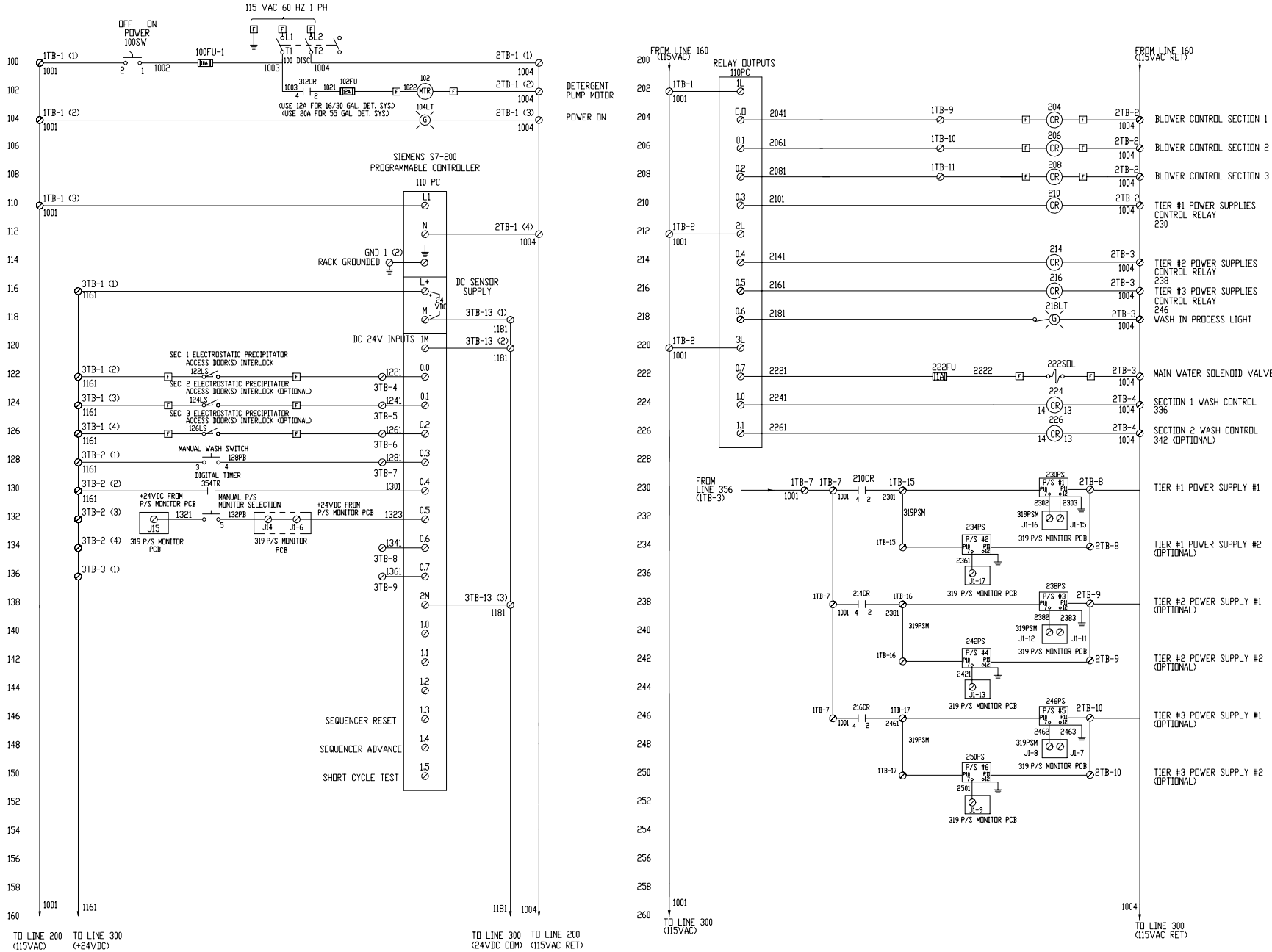


NOTES:
1. HIGH VOLTAGE LEADS BY TRION. STANDARD LENGTH 50 FT. IONIZER RED/BLACK TRACER LEAD, COLLECTOR-RED LEAD. RUN LEADS IN SEPARATE CONDUITS BETWEEN POWER PACKS AND AIR CLEANER. DO NOT SPLICE LEADS.
2. CONTROL ENCLOSURE AND AIR CLEANER MUST BE GROUNDED TO STRUCTURAL STEEL AND EARTH GROUND.
3. ALL PRIMARY INTERCONNECTION WIRING BY CUSTOMER MUST MEET APPLICABLE CODE REQUIREMENTS.
4. CONTROL POWER REQUIREMENTS IS 15 AMPS MINIMUM.
5. ⊘ DENOTES TERMINAL CONNECTION IN REMOTE POWER SUPPLY ENCLOSURE.

ATS REMOTE POWER SUPPLY SCHEMATIC

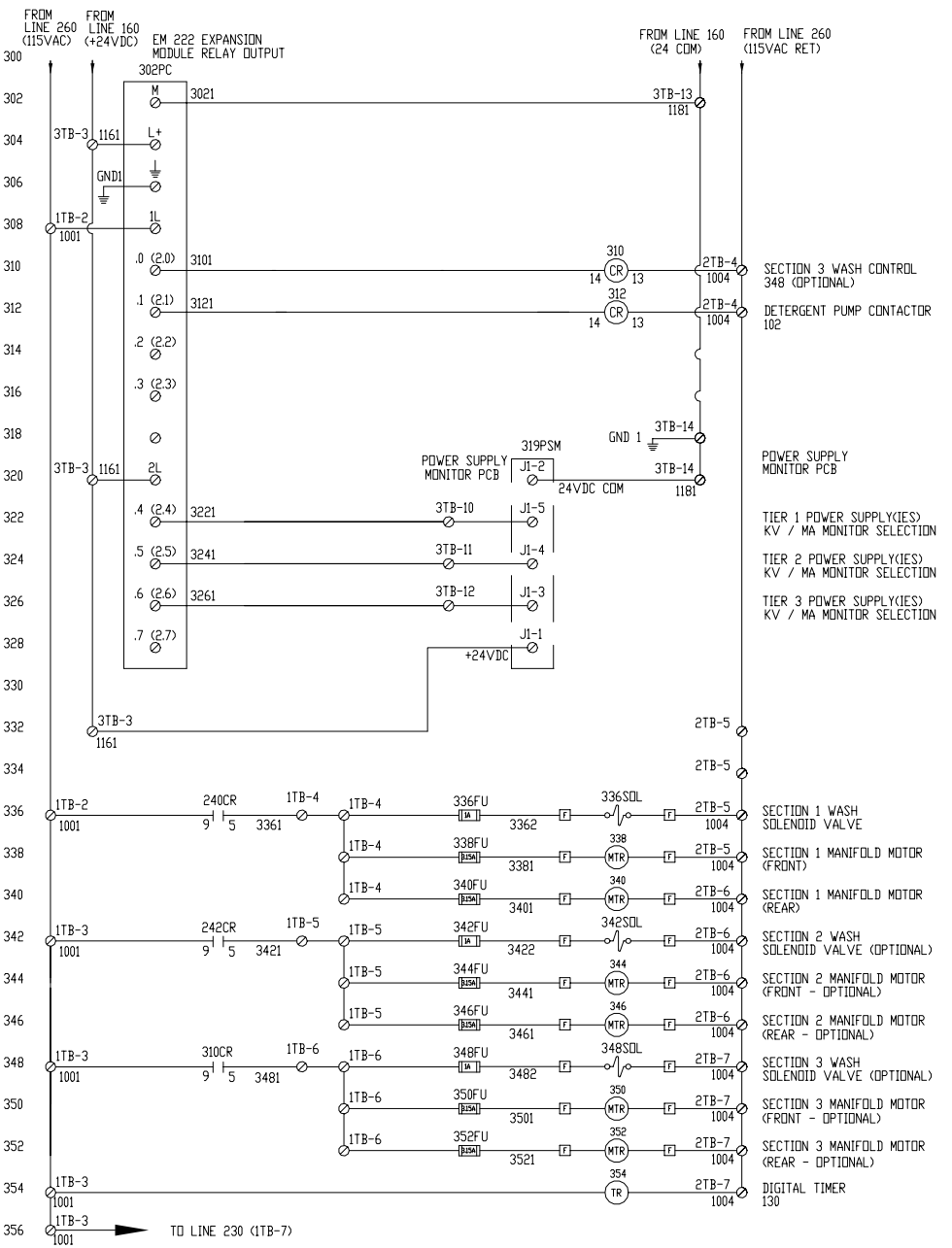
FIELD WIRING

FIGURE 14

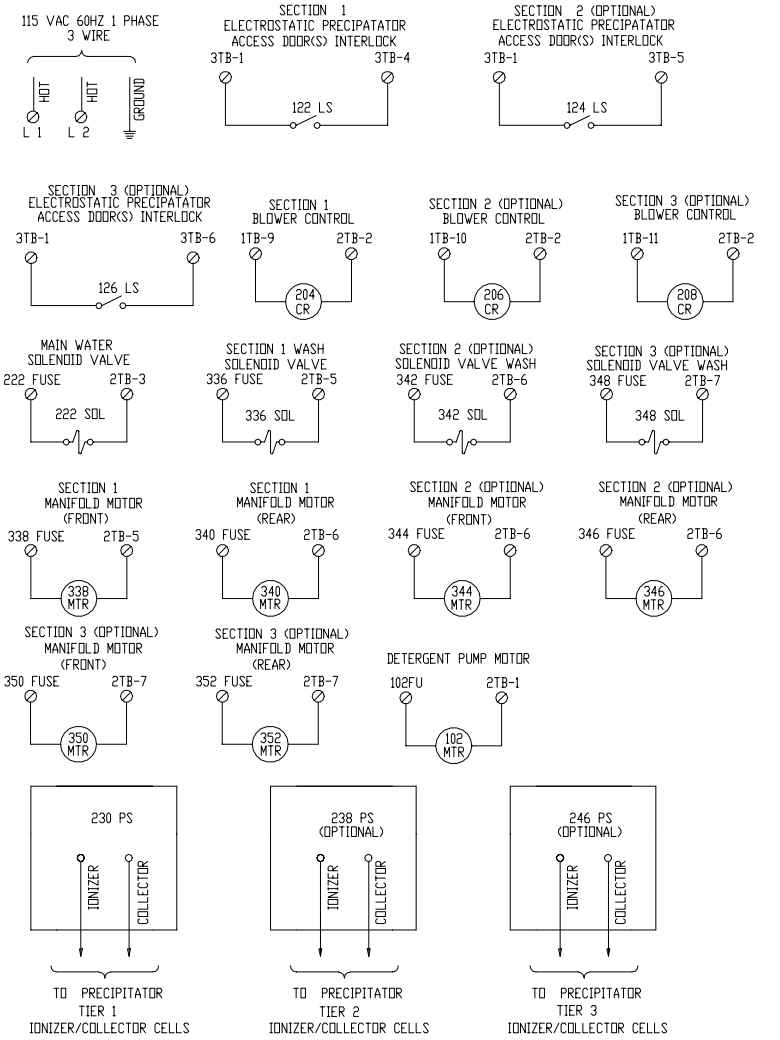


AIR BOSS WASH CONTROL SCHEMATIC FIGURE 15

154636-1
REV.-B



AIR BOSS WASH CONTROL SCHEMATIC



NOTES:

1. HIGH VOLTAGE LEADS BY TRION. STANDARD LENGTH 50 FT. RUN LEADS IN SEPARATE CONDUITS BETWEEN POWER PACKS AND AIR CLEANER. DO NOT SPLICE LEADS.
2. CONTROL ENCLOSURE AND AIR CLEANER MUST BE GROUNDED TO STRUCTURAL STEEL AND EARTH GROUND.
3. ALL PRIMARY INTERCONNECTION WIRING BY CUSTOMER MUST MEET APPLICABLE CODE REQUIREMENTS.
4. EACH MANIFOLD MOTOR REQUIRES 1.7 AMPS AT 115 VAC 60HZ.
5. MAIN WATER AND SECTION SOLENOID VALVES REQUIRES 6 to 15.4 WATTS AT 115 VAC 60HZ. (SEE SPECIFIC VALVE FOR RATING)
6. 16/30 GALLON DETERGENT PUMP MOTOR REQUIRES 12 AMPS AT 115VAC, 60HZ, 1PH. 55 GALLON DETERGENT PUMP MOTOR REQUIRES 20 AMPS AT 115VAC, 60HZ, 1PH.
7. CONTROL POWER REQUIREMENTS IS 30 AMPS MINIMUM.
8. ⊘ DENOTES TERMINAL CONNECTION (1TB,2TB & 3TB) IN WASH CONTROL ENCLOSURE.

FIELD WIRING FIGURE 16

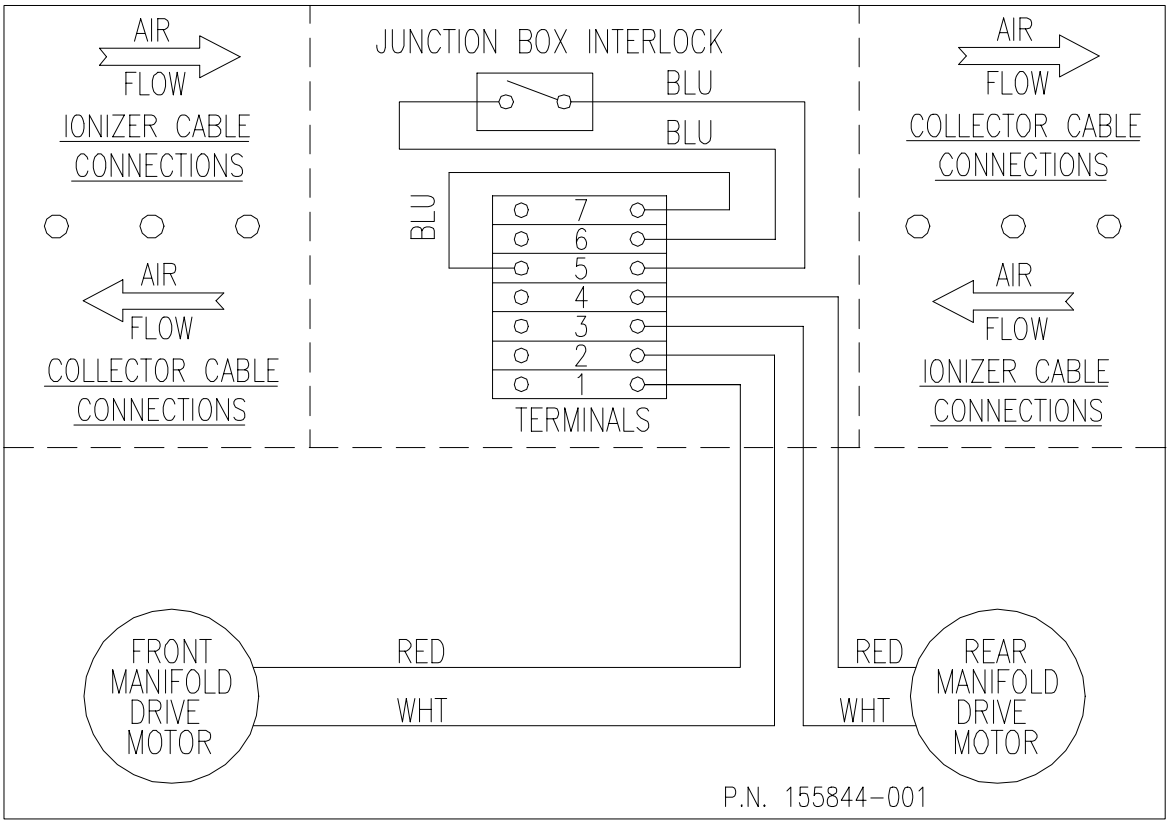
154636-2
REV.-B

STANDARD SINGLE SECTION SEQUENCE AND TIMING OPERATIONS

SYSTEMS OPERATIONS		P.C. TIMERS / DEVICES TO ADVANCE TO NEXT STEP	SEQUENCER STEP NO.	OUTPUTS ACTIVATED - X																	
				1st RO 0.0 2041	1st RO 0.1 2061	1st RO 0.2 2081	1st RO 0.3 2101	1st RO 0.4 2181	1st RO 0.5 2261	1st RO 0.6 2341	1st RO 0.7 2381	1st RO 1.0 2401	1st RO 1.1 2421	2nd RO 2.0 3101	2nd RO 2.1 3121	3rd RO 2.2	4th RO 2.3	5th RO 2.4 3221	6th RO 2.1 3241	7th RO 2.1 3261	7th RO 2.1 3261
AIR CLEANER ALL SECTIONS		I0.1	0	X			X														
SYSTEM AIR SHUTDOWN	1 min.	T37	1							X											
SEC 1 PREWASH	30 SEC.	T43	2							X	X	X						SCROLLING WHEN P/S's ON	SCROLLING WHEN P/S's ON	SCROLLING WHEN P/S's ON	
SEC 1 WASH	1 min.	T38	3							X	X	X			X						
SEC 1 SOAK	2 min.	T39	4							X											
SEC 1 RINSE	2 min.	T40	5							X	X	X									
DRIP DRY	4 min.	T41	6							X											
FORCE DRY	60 min.	C1	7	X						X											
RETURN TO STEP 0		M0.3	8																		
				SECTION 1 BLOWER CONTROL RELAY	SECTION 2 BLOWER CONTROL RELAY	SECTION 3 BLOWER CONTROL RELAY	SECTION 1 POWER PACKS CONTROL RELAY	SECTION 2 POWER PACKS CONTROL RELAY	SECTION 3 POWER PACKS CONTROL RELAY	WASH IN PROCESS LIGHT	MAIN WATER SOLENOID VALVE	SECTION 1 WASH CONTROL RELAY	SECTION 2 WASH CONTROL RELAY	SECTION 3 WASH CONTROL RELAY	DETERGENT PUMP RELAY	UNIT RUNNING	UNIT IN WASH	TIER 1 POWER SUPPLIES MONITOR SEL.	TIER 1 POWER SUPPLIES MONITOR SEL.	TIER 1 POWER SUPPLIES MONITOR SEL.	UNIT OUT OF WASH

FIGURE 17

154636-3
REV.-B



JUNCTION BOX WIRING
FIGURE 18

AIR BOSS® MODEL 75

Air Purification System

UL LISTED
EXHAUST FILTRATION SYSTEM

Qualified to UL Specification
YYXS-YYXS7
Hood and Duct Accessories

UL File #MH27669
New York City, Department of Buildings
MEA 288-01-E and 88-99-E

TRION®
air purification systems

ENGINEERED SOLUTIONS FOR CLEAN AIR

There are certain things you expect from an air purification system.

A perfect fit for your specific application…effectiveness… availability. For even more value, add a variety of applications and simplicity of operation. Back all these features up with substantial product and application expertise, superb technical services and unconditional support anywhere, anytime, and you've got the first name in air purification systems: Trion.

Since 1947, Trion has combined the leading-edge technology you expect with the value-added services you want to provide unique, effective air purification solutions for numerous applications in industrial and commercial markets.

Numerous applications. One solution.

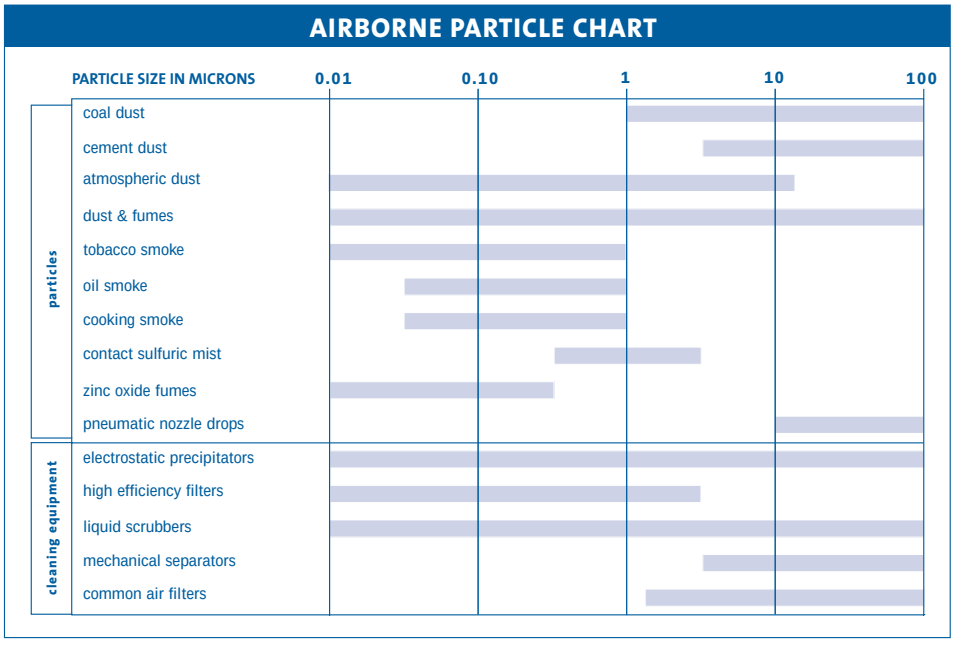
When you need one system for cleaning numerous applications, such as kitchen grease and smoke, oil mist, and contaminants from other industrial processes, Trion has the kitchen exhaust, commercial, and large industrial solutions just for you.

Atmospheric contaminants may be either liquids or solids, in the form of oil, water, grease, smoke, fumes, dusts or similar particulate including gaseous and vaporous odors. The Model 75 readily adapts to the various air collection methods utilized to recover contaminants for collection. Air inlet and outlet flanges on the modules include predrilled holes to connect adjoining duct work. Module support rails are optional for multiple mounting methods.

With your unique needs in mind, the Trion Model 75 utilizes five individual sections, each with specific air treatment tasks that are pre-selected, then factory assembled to form a compact, inline, drop-in unit. The modules and their basic functions include:

MODULE NAME	NORMAL FUNCTION
Prefilter/Impinger	Mist Eliminator/Grease Extraction
ESP-Electrostatic Precipitator	High-efficiency Primary or Secondary Filtering Device
Media	Primary, Secondary or Backup Filter
Adsorber	Odor Control and Removal
Blower	System Air Mover

Characteristics of Particles and Particle Disperoids



Model 75 Features

Feature/Benefits

- Customized for specific applications
- Effective on airborne solids, liquids and odors
- Available in various capacity ranges
- Factory assembled, built-up construction
- Integral automatic cleaning system
- Optional fire suppression system
- ETL and UL listed
- Designed for: simplified installation, ease in service, NFPA 96 standards

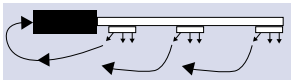
Model 75 Applications

Oil Mist:	Smoke:	Kitchen Exhaust:	HVAC:
Machine Shops	Welding	Grease	Clean Rooms
Cold Heading	Presses/Forging	Smoke	Return Air
Screw Machines	Curing	Odors	Outside/Makeup Air
Foundry	Rubber Manufacturing	Wood-fired Cookers	Lounges
Presses	Plasticisers		Bars
Machining Centers	Heat Treating		Smoking Rooms
Heat Treating			Casinos
Tenter Frames			Indoor Gun Ranges

• **Trion Quality**	The same high quality that Trion provides on ALL of the US Navy submarine fleet since 1947 as a sole supplier of air cleaning equipment to the world's navies.
• **NFPA Qualified**	Designed to NFPA 96 standards for kitchen exhaust.
• **ETL Listed**	ETL approved to UL standard 867.
• **Sectional Design**	Built-up design allows units to be tailored to your exact requirements.
• **Smoke and Odor Control**	Components effectively remove both liquid and solid particulate as well as gas and odor.
• **Complete System Design**	One central system to effectively treat virtually any application for kitchen or industrial exhaust air.
• **High Efficiency Cleaning**	Up to 99% efficient, per DOP or ASHRAE test methods.
• **Spiked Ionizer Design**	Eliminates common wire breakage and replacement, as seen in wire and other ionizer cell designs.
• **Heavy Duty Cell Design**	The most durable and efficient cell design on the market insures long term performance and reliability.
• **Automatic Cleaning**	Programmable Logic Controller (PLC) automates the cleaning process which reduces maintenance costs and insures efficient air cleaning at all times.
• **Simple to Service**	Designed for easy serviceability from either side of cabinet, as specified.
• **Optional Fire Suppression**	Available on all systems to meet your specific requirements.
• **Ease of Installation**	System design makes installation simple and requires no field assembly. Just attach your ductwork, electrical connection and plumbing, and it's done.

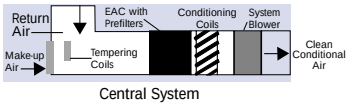
Typical System Arrangements

The Model 75 readily adapts to the various air collection methods.

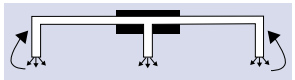


Fugitive Contaminate - Multiple Overhead Discharge through Cental Trunk Line

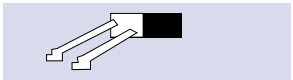
Multiple Source Captured Contaminate Hooded to Main Trunk Line



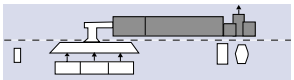
Central System



Fugitive Contaminate - Low Column Ducted Discharge



Multiple Source Captured Contaminate Hooded to Common Mixing Plenum



Kitchen Exhaust (Weatherproof)

DESIGN EFFICIENCIES AND OPERATIONAL RELIABILITY

Revolutionary Technology for the New Millennium

During operation, the contaminated air to be cleaned passes across Trion's unique spiked ionizer blades which are supported between flat grounded electrodes. Revolutionary to the industry, the blades are made of stainless steel that will not rust or break, thus eliminating costly maintenance time and replacement costs.

The DC voltage supplied to the blades creates a high intensity field where the particulate matter in the air becomes electrically charged. The charged particles then pass into a collector plate section made up of a series of equally spaced parallel plates. Each alternate plate is charged with the same polarity as the particles, which repel, while the interleaving plates are grounded, which attract and collect.

Periodically, depending on the type and amount, the contaminate is washed into the cabinet drain basin by an automatic activated integral washing system that is located on both the upstream and downstream sides of the ionizing-collecting cell(s).

A programmable logic controller (PLC) and dual solid-state Pulse Width Modulated (PWM) high voltage DC power supply are housed in a remote-mounted NEMA 12 enclosure. The PLC controls the system functions of wash, fire suppression, and fan on/off. A 7-day clock is standard. The PWM power supply, which energizes the ionizing-collecting cells, comes standard with LED indicator lights. Optional door-mounted meters, which aid in determining cell operating status, are also available.

In applications requiring extremely high collection efficiency and low resistance to air flow, two or three electrostatic sections may be placed inline to create a double or triple pass unit.

Durable, compact cabinetry

When you invest in a Trion Model 75 you want it not only to fit your unique needs, but your individual space as well.

And you want it to last. Trion housings are constructed using 16-gauge zinc-coated steel. Then all welds and the finished area of welds are treated with a corrosion and rust-inhibiting coating to assure long life. Cabinet finish is completed with a durable industrial grade semi-gloss, baked-on enamel no less than 3 mil thick. All doors are gasketed to prevent air and water leakage. Finally, the housing is furnished completely assembled for easy shipment and installation.

Prefilter/Impinger

The prefilter/impinger track is a standard integral part of the Model 75 ESP cabinet. A 2" rail is positioned upstream of the ESP collector cell to accommodate a standard 40% free area perforated panel for even air distribution, a metal mesh prefilter for light oil mist, or an impinger for more heavy, fluid or semi-fluid particulate matter. The particulate matter may range in viscosities from that of water to relatively heavy greases. In heavy loading applications, the liquid particles strike the impinger, coalesce into droplets and then flow to the drain pan below. If the particles are of a high viscosity nature that do not readily flow into the drain pan, they are periodically flushed down the drain with an optional bolt on collar containing an integral wash system located upstream of the impinger. A similar track, located downstream of the unit, is designed to house a perforated panel and functions as an air distribution device as well as a safety screen like its upstream counterpart.

The Electrostatic Air Cleaner Section

Electrostatic Air Cleaner Section enables extremely small particulate matter, "The Fines," to be removed from an air stream with relatively no resistance to air flow. This is due to the open area of the collecting elements. The low resistance is maintained from the start to the completion of the collection cycle. The unit operates in the higher efficiency collection range, upward of 95% DOP Method, on particles ranging in size from 10 Microns down to 0.01 Microns in size.

Standard Blower Package

The TEFC energy efficient blower is designed for horizontal air flow and mates with the air purification system to provide a uniform distribution of air. The blower wheel is steel, backward inclined, welded construction.

Optional UpBlast Blower

The NFPA 96 UpBlast fan is designed to mate with the air purification system and provide uniform air distribution. It is a centrifugal UpBlast exhaust fan, with drain, in compliance with UL 762 for kitchen exhaust applications containing grease-laden air. The blower wheel is steel, backward inclined, welded construction.

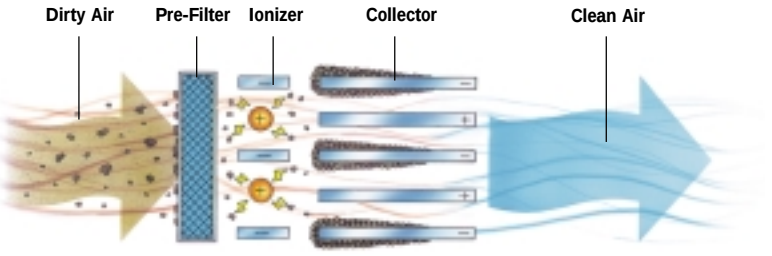
Side Access Filter Housing

The flexibility of the Media section provides an efficient means for high efficiency filtration, as a prefilter or after filter, depending on your requirement. This section is designed to house a variety of mechanical filters that may be required in your application. The housing allows for various filter combinations that are tailored to your specific needs, such as HEPAs, 95% bags, mini-pleated cartridges or other media. The heavy-guage dual-access housings are supplied with industrial-grade hardware.

Side Access/Final Filter Section

Unlike particulate filters, odors in the form of undesirable gases and vapors are most commonly removed from the air stream by the process of adsorption that is enhanced by multi-faceted porous surfaces of certain materials. Filter trays of activated carbon or optional potassium permanganate pellets effectively facilitate the adsorption of these odors and gaseous contaminates.

Principle of Operation



Electronic Air Cleaning

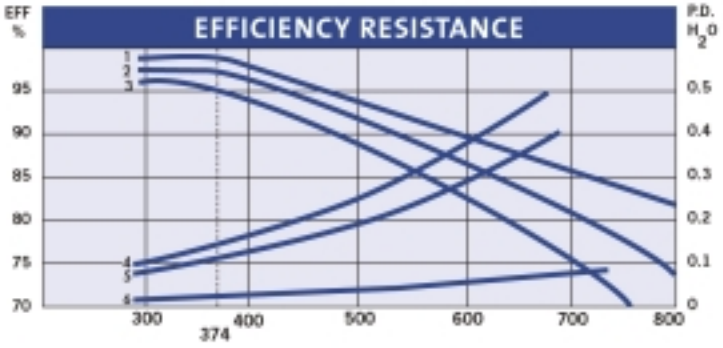
AIR VELOCITY FEET PER MINUTE

Efficiency-Curves 1, 2 and 3

1. Overall DOP (Dioctylphthalate) efficiency using 10 Stage Cascade Impactor
2. ASHRAE Standard 52 Dust Spot Test Method Atmospheric Air
3. 0.3 Micron DOP efficiency using 10 Stage Cascade Impactor

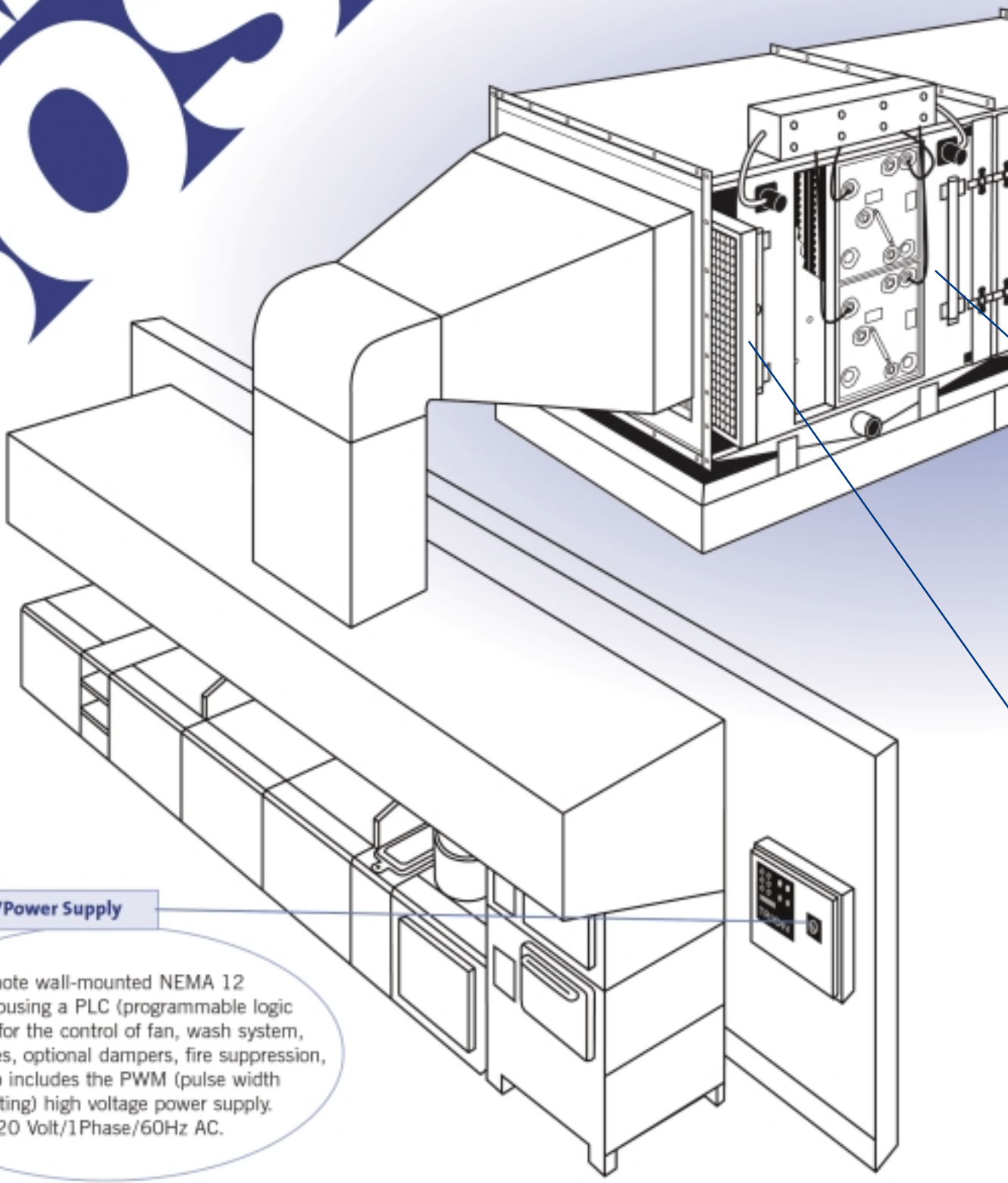
Pressure Drop Across Unit-Curves 4, 5 and 6

4. Cell with 40% open perforated plate front and rear
5. Cell with 1”metal mesh filter front and rear
6. Cell only



AIR VELOCITY FEET PER MINUTE

AIR BOSS®



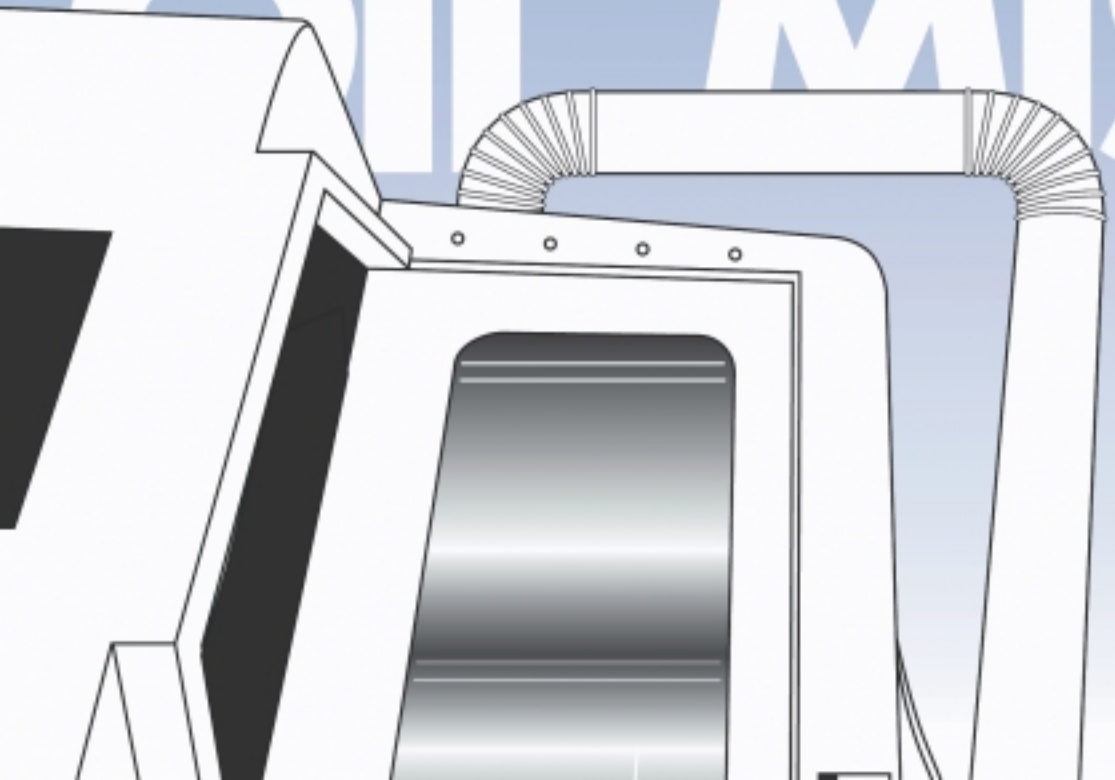
Control/Power Supply

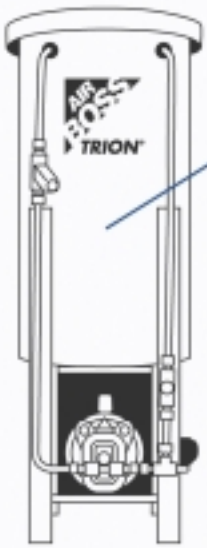
Remote wall-mounted NEMA 12 cabinet housing a PLC (programmable logic controller) for the control of fan, wash system, power supplies, optional dampers, fire suppression, etc. Also includes the PWM (pulse width modulating) high voltage power supply. 120 Volt/1Phase/60Hz AC.

Kitchen Hood Exhaust (Smoke, Grease, Odors)

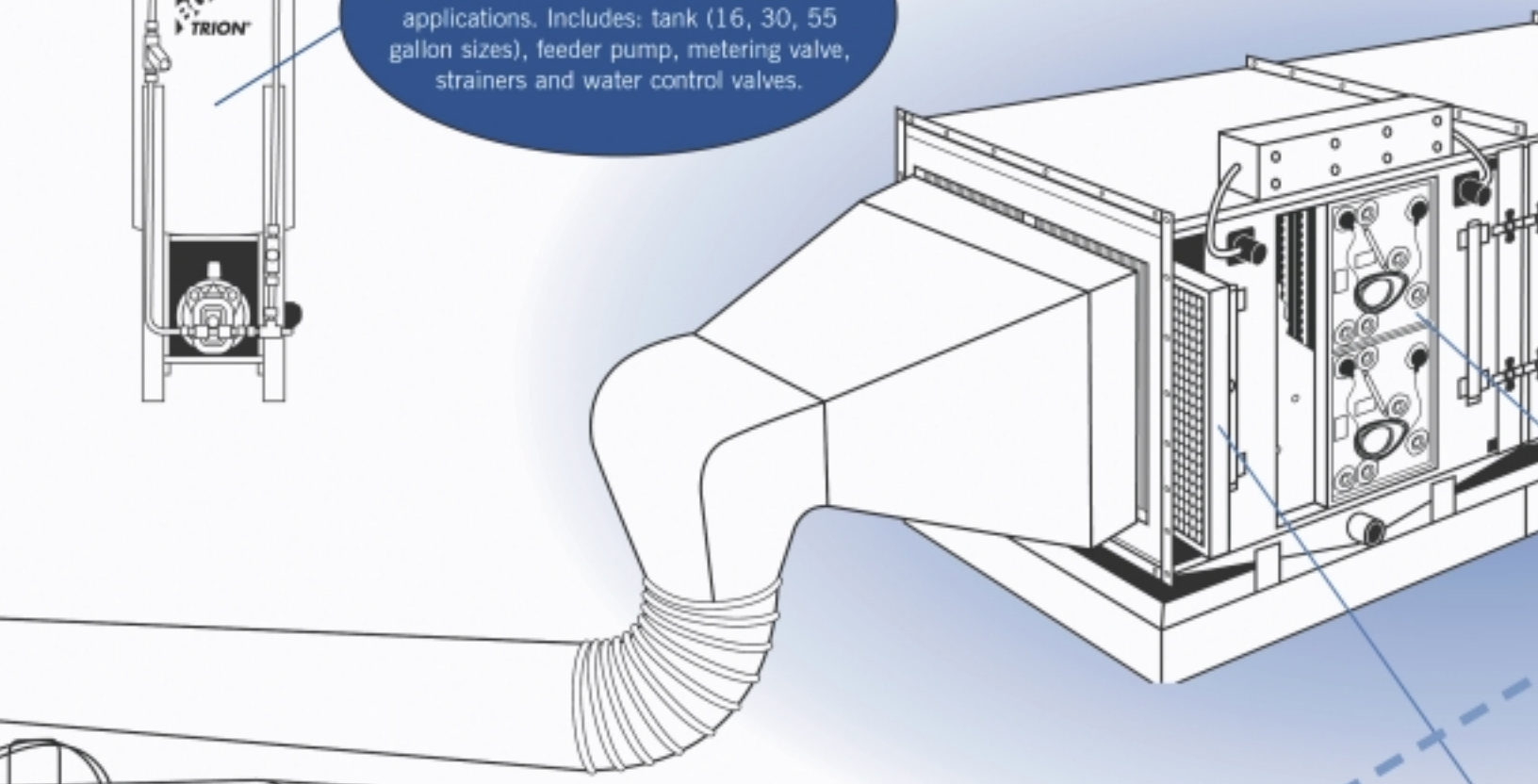
DUST
SMOKE
OIL MIST

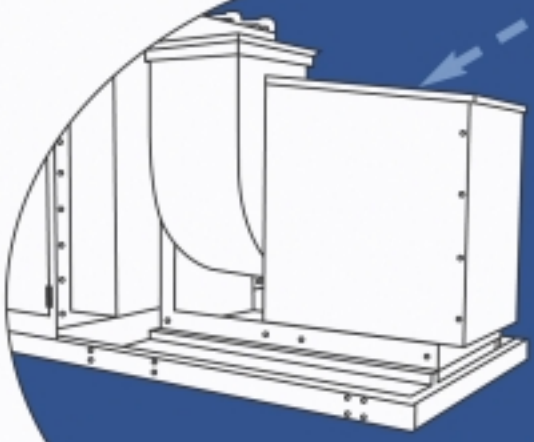
AIR BOSS®





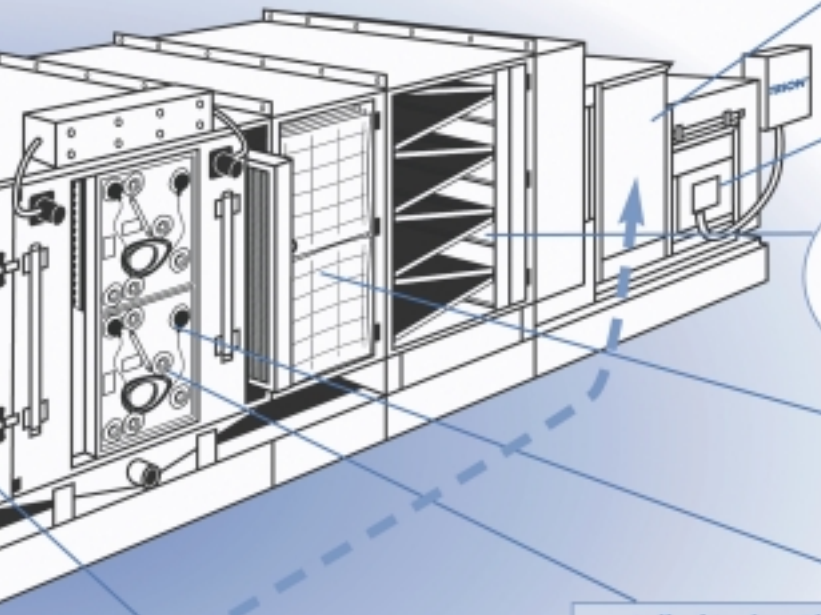
Detergent System
Trion approved concentrated detergents used to clean commercial or industrial applications. Includes: tank (16, 30, 55 gallon sizes), feeder pump, metering valve, strainers and water control valves.





Optional
UL 762:
Fan Package for Kitchen Exhaust

Backward inclined energy efficient centrifugal fans of heavy duty high temperature arrangement 10 upblast design with drain, class II construction, belt-driven with belt and drive guards. UL Labeled for grease laden air products.



Fan Package

Backward inclined energy efficient centrifugal fans of heavy duty AMCA arrangement 9 inline or arrangement 10 upblast design, class II construction, belt-driven with belt and drive guards.

Fire Suppression Option

Weather tight enclosure includes ADP-S nozzles for the impinger section and electronic air cleaner section.

Adsorber Section

Activated carbon or optional potassium permanganate pellets for gaseous odor adsorption.

Media Section

Designed to house a variety of mechanical filters as required for a specific application, or to insure extended life of the adsorption media.

Spiked Ionizer Blade

Revolutionary technology made of stainless steel blades, not wires. Reliable, unbreakable blades eliminate costly maintenance replacement and downtime.

High-Voltage Stand-Off Insulators

Made of self-glazing ceramic, insulates electrical current; helps to prevent and virtually eliminate arcing, prolong power supply, life span and aid in maintaining high efficiency. Prevents tracking, retards contaminate build-up and provides easy cleaning.

Ionizing-Collecting Cell

High efficiency multi-stage collection cell, rugged design, to maintain high efficiency under heavy loads.

Prefilter/Impinger Section

Metal mesh or perforated plate prefilter for safety and capture of oversize objects and agglomerated mists. Impinger may be used to knock down heavy mists and kitchen grease.

Model 75

AIR PURIFICATION SYSTEMS

Model 75 Series for Industrial Applications and Kitchen Hood Exhaust Systems

SIZE CAPACITY DATA

MODEL 75-XXX-XX WITH AND WITHOUT WASH

Model Number	ASHRAE CFM Capacities Efficiencies (1)		0.3 Micron DOP CFM Capacities Efficiencies (2)		Sq. Ft. Cell Face Area (3)	# PWM power supplies	Collar Dimensions Inside		Overall Dimensions		Weight Lbs. (4)	Water Required Per Cycle	Detergent Per Cycle	Water Req'd @ 40 psi
	95%	90%	95%	90%			HEIGHT A	WIDTH B	HEIGHT C	WIDTH D		GAL.		GPM
75-102-XX	1,250	1,600	1,075	1,400	2.94	1	26.12	25.69	38.90	37.09	370	14.4	0.18	4.8
75-103-XX	2,000	2,600	1,750	2,300	4.79	1	26.12	36.88	38.90	48.28	450	21.6	0.27	7.2
75-104-XX	2,500	3,200	2,150	2,800	5.88	1	26.12	47.82	38.90	59.22	540	28.8	0.36	9.6
75-105-XX	3,250	4,200	2,825	3,700	7.73	1	26.12	59.01	38.90	70.41	620	36.0	0.45	12.0
75-106-XX	4,000	5,200	3,500	4,600	9.58	2	26.12	70.19	38.90	81.59	705	43.2	0.54	14.4
75-107-XX	4,500	5,800	3,900	5,100	10.67	2	26.12	81.13	38.90	92.53	800	50.4	0.63	16.8
75-108-XX	5,250	6,800	4,575	6,000	12.52	2	26.12	92.35	38.90	103.75	880	57.6	0.72	19.2
75-109-XX	6,000	7,800	5,250	6,900	14.37	2	26.12	103.54	38.90	114.94	960	64.8	0.81	21.6
75-110-XX	6,500	8,400	5,650	7,400	15.46	2	26.12	114.38	38.90	125.78	1,050	72.0	0.90	24.0
75-203-XX	4,000	5,200	3,500	4,600	9.58	2	50.74	36.88	63.50	48.28	740	43.2	0.54	14.4
75-204-XX	5,000	6,400	4,300	5,600	11.76	2	50.74	47.82	63.50	59.22	905	57.6	0.72	19.2
75-205-XX	6,500	8,400	5,650	7,400	15.46	2	50.74	59.01	63.50	70.41	1,050	72.0	0.90	24.0
75-206-XX	8,000	10,400	7,000	9,200	19.16	4	50.74	70.19	63.50	81.59	1,190	86.4	1.08	28.8
75-207-XX	9,000	11,600	7,800	10,200	21.34	4	50.74	81.13	63.50	92.53	1,360	100.8	1.26	33.6
75-208-XX	10,500	13,600	9,150	12,000	25.04	4	50.74	92.35	63.50	103.75	1,500	115.2	1.44	38.4
75-209-XX	12,000	15,600	10,500	13,800	28.74	4	50.74	103.54	63.50	114.94	1,640	129.6	1.62	43.2
75-210-XX	13,000	16,800	11,300	14,800	30.92	4	50.74	114.38	63.50	125.78	1,805	144.0	1.80	48.0
75-303-XX	6,000	7,800	5,250	6,900	14.37	3	75.37	36.88	88.20	48.28	1,050	64.8	0.81	21.6
75-304-XX	7,500	9,600	6,450	8,400	17.64	3	75.37	47.82	88.20	59.22	1,275	86.4	1.08	28.8
75-305-XX	9,750	12,600	8,475	11,100	23.19	3	75.37	59.01	88.20	70.41	1,480	108.0	1.35	36.0
75-306-XX	12,000	15,600	10,500	13,800	28.74	6	75.37	70.19	88.20	81.59	1,680	129.6	1.62	43.2
75-307-XX	13,500	17,400	11,700	15,300	32.01	6	75.37	81.13	88.20	92.53	1,920	151.2	1.89	50.4
75-308-XX	15,750	20,400	13,725	18,000	37.56	6	75.37	92.35	88.20	103.75	2,120	172.8	2.16	57.6
75-309-XX	18,000	23,400	15,750	20,700	43.11	6	75.37	103.54	88.20	114.94	2,325	194.4	2.43	64.8
75-310-XX	19,500	25,200	16,950	22,200	46.38	6	75.37	114.38	88.20	125.78	2552	216.0	2.70	72.0

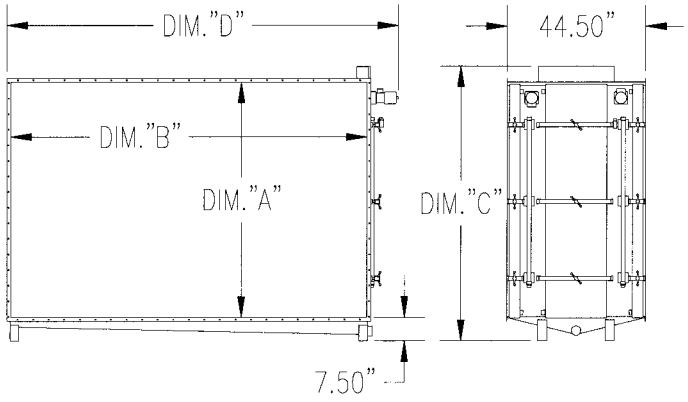
(1) ASHRAE Standard 52 Dust Spot Test Method. DUST
(2) DOP Efficiency based on use of Dioctylphthalate Aerosol. OIL MIST
(3) Total gross face area of ionizing-collecting cells in accordance with ASHRAE Standard 52, Mounting Flange is 1-1/2" wide.
(4) Total weight of unit with fan, transition, control,16 gal. Detergent system without liquid detergent.

Model Number Designation

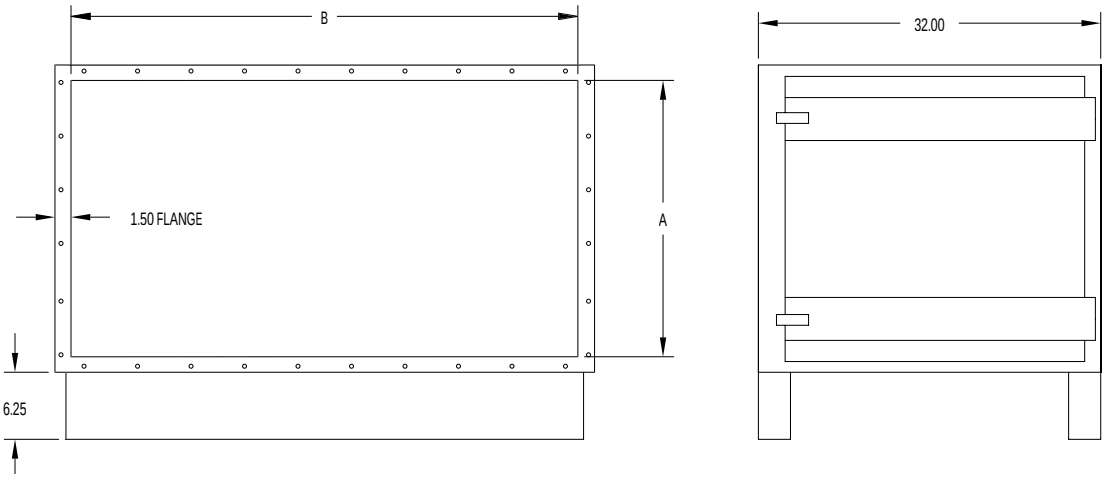
75 – X XX – XX

- 75 — Equipment Type (Custom Packaged Line)
- X — Number of Cells in Height
- XX — Nominal Cell Width in Feet
- XX — Specific Features

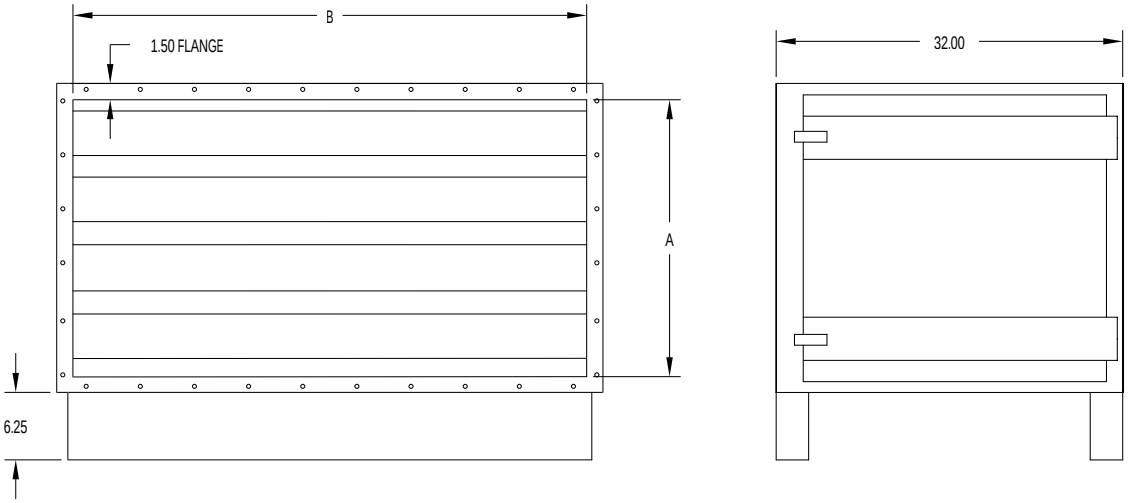
MODEL 75 SERIES



BAG HOUSING



CARBON HOUSING



STATIC PRESSURE DROPS

Trion Equipment Losses Inches H20

ESP Section	0.14”	
40% open perforated prefilter or after filter	0.15”	
Metal mesh prefilter or after filter	0.10”	
2” impinger	1.25”	
Media Section	0.11”	
	Initial	**Final**
4” pleated prefilter, 40% efficient	0.17”	1.00”
10 pocket bag, 65% efficient	0.40”	1.20”
HEPA, 99.97% efficient	1.00”	1.50”
Adsorber Section	0.28”	
1” trays	0.26”	
2” trays	0.28”	
4” modules	0.36”	
Fan Transition	0.11”	

The ESP section must have both an internal prefilter and an after filter, select and add for each.

External losses for ductwork, exhaust hoods, manufacturing equipment with associated entry losses, kitchen hoods, etc., must be added with the above Trion internal equipment losses to calculate total fan static pressure required.

Trion History

Providing Clean, Comfortable & Safe IAQ Solutions for More Than Half a Century

Since 1947, Trion has manufactured quality products for the commercial, industrial, residential, and military markets. All Trion products are engineered specifically to provide a clean, safe and comfortable indoor air environment. Trion's success has been driven by the dependable performance and superior quality of our products, as well as by our excellent customer service.

Trion's technical expertise allows us to create innovative products and cost-effective, environmentally sound solutions that solve the air cleaning problems of our worldwide customer base. Our products can be found in homes, offices, factories, clubs, hospitals and sea vessels.

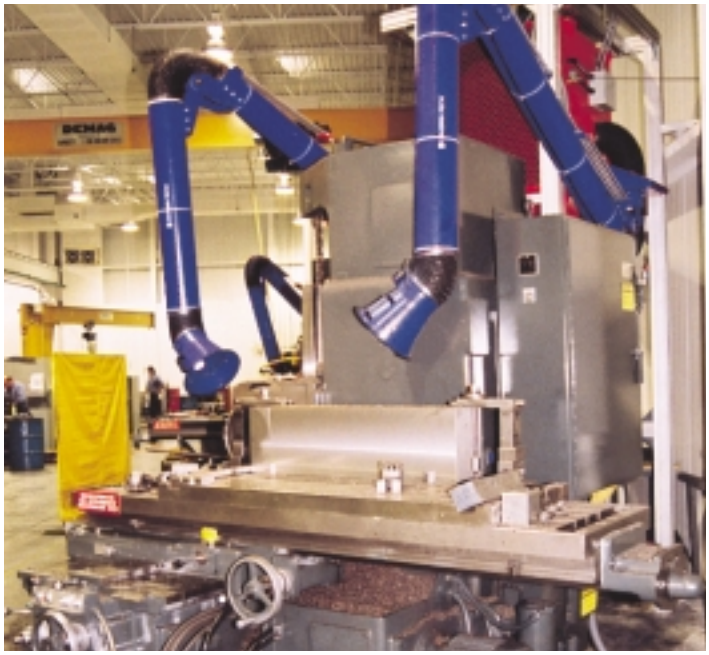
Headquartered in Sanford, North Carolina, Trion manufactures products in a dedicated 263,000 square-foot plant. Trion UK's European, Middle East and Far East operations are based in Andover, Hampshire in the United Kingdom.

Trion Deutschland GmbH, formed in 1984, is responsible for serving markets in Central and Eastern Europe.

In 1996, Trion purchased Herrmidifier, a well-known manufacturer of humidification products for use in a variety of commercial, residential and industrial settings.

Trion is part of Fedders Indoor Air Quality, which opened its first Asian manufacturing facility in Suzhou, China, in August 2002.

Today, and in the future, Trion will continue to develop innovative air cleaning solutions that meet the demands of our customers throughout the world .



Corporate headquarters in Sanford, North Carolina

Creating the Right Climate for You to Do Business

Trion products have provided solutions to indoor air quality problems for more than 50 years. Products marketed under the Trion brand are part of Fedders Indoor Air Quality division of Fedders Corporation (NYSE:FJC), a leading global manufacturer and marketer of air treatment products. Trion is a registered trademark of Trion, Inc.

TRION
air purification systems

FEDDERS INDOOR AIR QUALITY SOLUTIONS

Form No. 02-0391

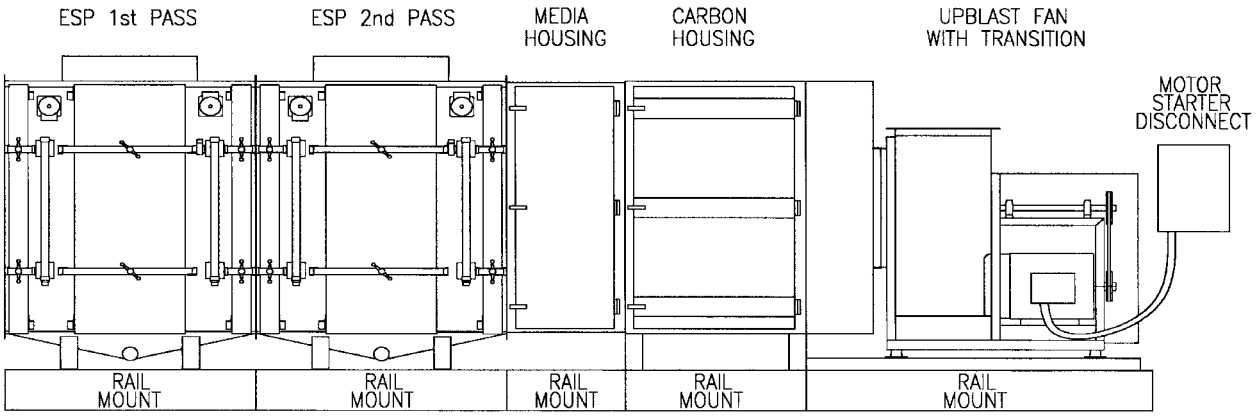
Corporate Office: 101 McNeill Road · Sanford, NC 27330
Phone: 800-884-0002 · **Fax:** 800-458-2379 · **www**.trioninc.com · **email:** sales@trioninc.com

TRION®
air purification systems

TRION Air Boss Model 75

Electronic Air Cleaners

LIST PRICE SHEET



TYPICAL COMPLETE UNIT CONFIGURATION

FEATURES

There are 25 different size units and 4 basic variations in this equipment series. In all cases the PWM power supplies are included. The variations are as follows:

1. 75-XXX-01 ⍾ Base unit without wash or fan. Includes pre and after filters of Metal Mesh, Perforated Plate or Impingers and ATS Control, with LED power indicators, and PWM Power Suppy(s).

2. 75-XXX-02 ⍾ Same as 75-XXX-01 with addition of water wash system. The wash system includes oscillating manifolds, 16-gallon detergent feeder, 6 gallon detergent, water strainer, solenoid valve, and ATS Wash Controller, with LED power indicators, 7-day clock and PWM power supplies housed in one Nema 12 enclosure.

3. 75-XXX-03 ⍾ Same as 75-XXX-01 with addition of fan section and transition, remote motor starter disconnect and ATS Controller, with LED power indicators, 7 day clock and PWM power supplies housed in one Nema 12 enclosure.

4. 75-XXX-04 ⍾ Same as 75-XXX-02 with addition of fan section and transition, remote motor starter disconnect, Fuses Not Included, and ATS Controller, with LED power

TRION Air Boss Series - Model 75 Price Data - Effective April 3, 2006

Standard Units

Model 75-Unit Number	Base Unit - NO Wash NO Fan (-01)		Base Unit-With Wash NO Fan (-02)		Base Unit-NO Wash With Fan & Starter (-03)		Base Unit-With Wash With Fan & Starter (-04)	
	Price	Weight	Price	Weight	Price	Weight	Price	Weight
102-	$13,525	451	$19,457	547	$24,621.86	675	$32,024	773
103-	$14,417	506	$20,356	624	$25,880.48	819	$33,435	939
104-	$15,309	561	$21,190	701	$27,310.35	944	$34,964	1086
105-	$16,202	638	$22,020	800	$28,390.36	1073	$36,137	1237
106-	$17,094	775	$22,855	959	$29,048.04	1296	$36,901	1482
107-	$17,986	830	$24,009	1010	$31,951.90	1473	$39,895	1654
108-	$18,878	880	$25,093	1053	$32,914.25	1646	$40,953	1821
109-	$19,772	935	$27,799	1130	$33,695.89	1713	$41,830	1911
110-	$20,670	985	$30,899	1207	$36,568.23	1785	$42,888	2002
203-	$18,015	775	$24,792	867	$30,384.40	1292	$37,403	1385
204-	$20,258	880	$27,231	992	$32,459.34	1635	$40,919	1749
205-	$21,422	940	$28,179	1135	$35,615.34	1845	$44,220	2042
206-	$22,931	1056	$29,970	1355	$37,212.25	1979	$45,966	2280
207-	$25,268	1265	$32,570	1515	$41,293.83	2382	$49,004	2654
208-	$26,076	1375	$33,575	1619	$42,781.48	2649	$51,594	2895
209-	$27,112	1485	$34,420	1762	$45,488.88	2922	$57,183	3201
210-	$29,596	1595	$37,762	1905	$51,080.17	3195	$59,773	3507
303-	$22,050	880	$29,504	1047	$34,968.17	1649	$42,810	1814
304-	$25,967	1045	$33,203	1344	$40,109.81	1996	$47,617	2297
305-	$26,904	1210	$34,348	1438	$43,083.00	2354	$50,862	2584
306-	$29,408	1375	$37,450	1603	$46,115.04	2807	$53,761	3037
307-	$33,594	1540	$40,909	1823	$51,845.01	3160	$60,124	3445
308-	$36,454	1705	$42,467	1988	$54,148.97	3349	$62,500	3624
309-	$39,316	1870	$45,324	2153	$60,111.13	4162	$68,538	4448
310-	$42,178	2035	$49,387	2318	$61,812.05	4975	$71,511	4734

Accessory Options

Model 75-Unit Number	Double Pass ESP Section With Wash		Rail Mounting Complete System Rail		Carbon Housing (See Note 2)		Side Access Housing 95% Bags (See Note 3)	
	Price	Weight	Price	Weight-note 1	Price	Weight	Price	Weight
102-	$11,698	547	$1,903	165	$2,994	220	$1,578	85
103-	$13,003	624	$1,946	190	$3,956	290	$1,872	100
104-	$14,101	701	$1,989	215	$4,747	380	$2,248	115
105-	$14,867	800	$2,032	235	$5,910	450	$2,762	130
106-	$15,754	959	$2,075	260	$6,510	530	$3,314	150
107-	$17,091	1010	$2,128	290	$7,412	595	$3,699	155
108-	$18,060	1053	$2,226	315	$8,178	690	$4,019	175
109-	$20,203	1130	$2,269	335	$9,218	765	$4,259	175
110-	$22,984	1207	$2,311	360	$10,098	850	$4,506	200
203-	$17,779	867	$1,946	190	$6,419	430	$2,982	135
204-	$20,240	992	$1,989	215	$8,539	575	$3,676	160
205-	$21,217	1135	$2,032	235	$10,152	720	$4,588	175
206-	$24,919	1355	$2,075	260	$11,798	845	$5,048	190
207-	$27,586	1515	$2,128	290	$14,101	1010	$5,655	205
208-	$28,626	1619	$2,226	315	$15,310	1135	$6,278	220
209-	$29,527	1762	$2,269	335	$17,391	1285	$7,027	245
210-	$32,829	1905	$2,311	360	$19,150	1589	$7,832	260
303-	$22,586	1047	$1,946	190	$9,445	745	$4,112	175
304-	$26,320	1344	$1,989	215	$12,106	985	$4,859	205
305-	$27,516	1438	$2,032	235	$14,890	1165	$5,956	225
306-	$32,486	1603	$2,075	260	$17,909	1380	$6,982	240
307-	$36,041	1823	$2,128	290	$20,523	1585	$8,123	255
308-	$37,603	1988	$2,226	315	$22,946	1795	$9,169	290
309-	$40,349	2153	$2,269	335	$26,157	1980	$10,335	305
310-	$44,469	2318	$2,311	360	$28,436	2210	$11,336	325

Unit Configuration Notes:

Air Boss Control, with digital LED meter display, adder is $2,625.00.00 for all unit sizes.

Adder for 30 or 55 gallon detergent system in lieu of standard 16 gallon is $316.00

Note 1: Calculate total number of sections required and multiply by the per section weight shown.

Note 2: Carbon housing consists of housing, double adapters and initial supply of carbon trays.

Note 3: Side access housing consists of housing, double adapters and initial supply of 95%, Class I Bags.

Form No. 03-0478 Effective 4/05

TERMS AND CONDITIONS:Terms: Net 30 days, subject to credit approval. Freight: FOB Trion Factory, Sanford, NC Freight Collect

Office:101 McNeill Road ·Sanford, NC 27330 Phone: 800-884-0002 ·Fax: 800-458-2379 · www.trioninc.com ·email:sales@trioninc.com

Trion Air Boss Model 75 - Size Capacity Data

Revision B - March 1, 2000

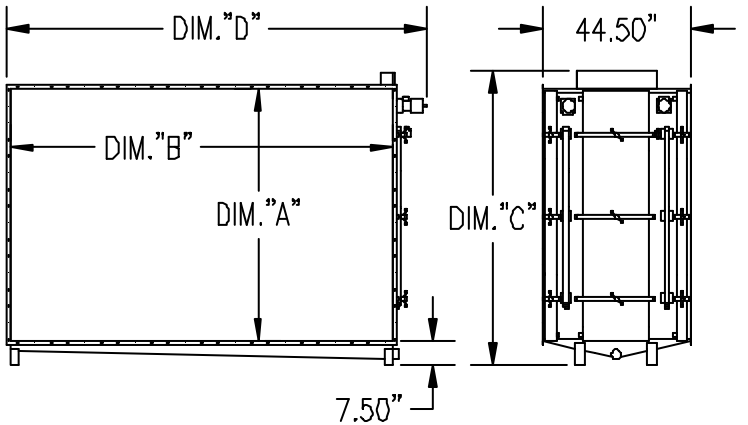
75-XXX-XX With and Without Wash											
MODEL NUMBER	*ASHRAE CFM CAPACITIES EFFICIENCIES (1)*		*0.3 MICRON DOP CFM CAPACITIES EFFICIENCIES (2)*		*SQ FT CELL FACE AREA (3)*	*# PWM Power Supplys*	*COLLAR DIMENSIONS - (INSIDE)*		*OVERALL DIMENSIONS*		*WEIGHT lbs. (4)*
	95%	90%	95%	90%			HEIGHT A	WIDTH B	HEIGHT C	WIDTH D	
75-102-XX	1,250	1,600	1,075	1,400	2.94	1	26.12	25.69	38.90	37.09	490
75-103-XX	2,000	2,600	1,750	2,300	4.79	1	26.12	36.88	38.90	48.28	560
75-104-XX	2,500	3,200	2,150	2,800	5.88	1	26.12	47.82	38.90	59.22	630
75-105-XX	3,250	4,200	2,825	3,700	7.73	1	26.12	59.01	38.90	70.41	720
75-106-XX	4,000	5,200	3,500	4,600	9.58	2	26.12	70.19	38.90	81.59	865
75-107-XX	4,500	5,800	3,900	5,100	10.67	2	26.12	81.13	38.90	92.53	910
75-108-XX	5,250	6,800	4,575	6,000	12.52	2	26.12	92.35	38.90	103.75	950
75-109-XX	6,000	7,800	5,250	6,900	14.37	2	26.12	103.54	38.90	114.94	1,020
75-110-XX	6,500	8,400	5,650	7,400	15.46	2	26.12	114.38	38.90	125.78	1,130
75-203-XX	4,000	5,200	3,500	4,600	9.58	2	50.74	36.88	63.50	48.28	780
75-204-XX	5,000	6,400	4,300	5,600	11.76	2	50.74	47.82	63.50	59.22	895
75-205-XX	6,500	8,400	5,650	7,400	15.46	2	50.74	59.01	63.50	70.41	1,025
75-206-XX	8,000	10,400	7,000	9,200	19.16	4	50.74	70.19	63.50	81.59	1,225
75-207-XX	9,000	11,600	7,800	10,200	21.34	4	50.74	81.13	63.50	92.53	1,370
75-208-XX	10,500	13,600	9,150	12,000	25.04	4	50.74	92.35	63.50	103.75	1,465
75-209-XX	12,000	15,600	10,500	13,800	28.74	4	50.74	103.54	63.50	114.94	1,595
75-210-XX	13,000	16,800	11,300	14,800	30.92	4	50.74	114.38	63.50	125.78	1,935
75-303-XX	6,000	7,800	5,250	6,900	14.37	3	75.37	36.88	88.20	48.28	1,050
75-304-XX	7,500	9,600	6,450	8,400	17.64	3	75.37	47.82	88.20	59.22	1,275
75-305-XX	9,750	12,600	8,475	11,100	23.19	3	75.37	59.01	88.20	70.41	1,480
75-306-XX	12,000	15,600	10,500	13,800	28.74	6	75.37	70.19	88.20	81.59	1,680
75-307-XX	13,500	17,400	11,700	15,300	32.01	6	75.37	81.13	88.20	92.53	1,920
75-308-XX	15,750	20,400	13,725	18,000	37.56	6	75.37	92.35	88.20	103.75	2,120
75-309-XX	18,000	23,400	15,750	20,700	43.11	6	75.37	103.54	88.20	114.94	2,325
75-310-XX	19,500	25,200	16,950	22,200	46.38	6	75.37	114.38	88.20	125.78	2552

Trion Model 75 Series Commercial and Industrial Air Treatment System

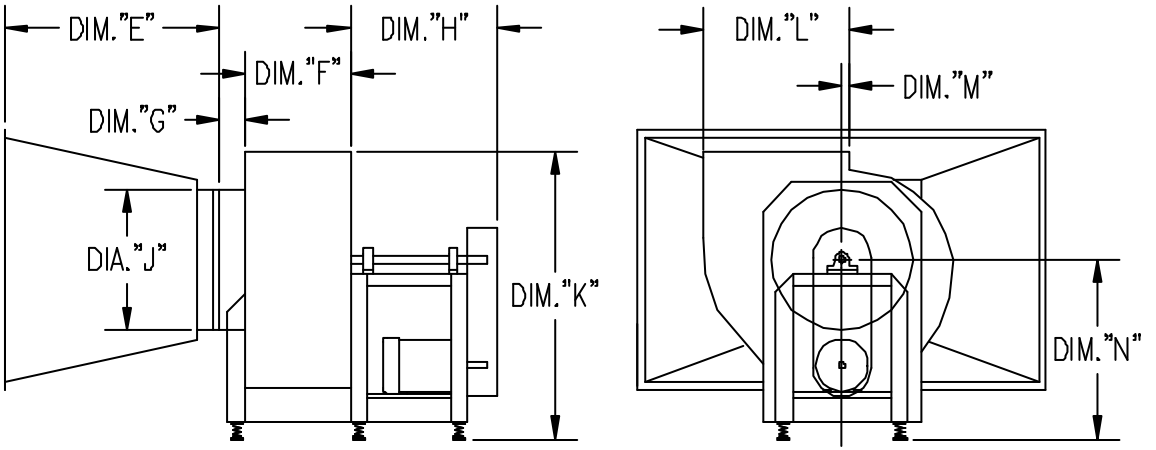
(1) ASHRAE Standard 52-76 Dust Spot Test Method. DUST
(2) DOP Efficiency based on use of Dioctylphthalate Aerosol. OIL MIST
(3) Total gross face area of ionizing-collecting cells in accordance with ASHRAE Standard 52-76.
(4) Total weight of unit with Fan, Transition, Control,16 gal. Detergent system without liquid detergent.

	Fan and Transition										***Side Access Filter Housing***			***Carbon Housing***		
Dimension	E	F	G	H	J	K	L	M	N	FAN #	Housing #	P	Q	Carbon #	R	S
75-102-XX	40.25	9.94	2.00	22.13	13.00	33.50	13.00	0.06	21.50	122	2X22/11	26.69	23.38	2LCB2	23.38	27.00
75-103-XX	40.25	12.13	2.00	27.88	15.88	38.50	15.88	0.06	25.75	150	3X22/11	26.69	34.88	3LCB2	34.88	27.00
75-104-XX	40.25	14.69	3.50	27.88	19.75	40.88	19.31	0.06	25.75	182	4X22/11	26.69	46.88	4LCB2	46.88	27.00
75-105-XX	40.25	14.69	3.50	27.88	19.75	40.88	19.31	0.06	25.75	182	5X22/11	26.69	58.38	5LCB2	58.38	27.00
75-106-XX	40.25	19.69	3.50	30.25	26.38	51.63	26.00	0.13	31.50	245	6X22/11	26.69	70.38	6LCB2	70.38	27.00
75-107-XX	40.25	19.69	3.50	30.25	26.38	51.63	26.00	0.13	31.50	245	7X22/11	26.69	81.88	7LCB2	81.88	27.00
75-108-XX	40.25	19.69	3.50	30.25	26.38	51.63	26.00	0.13	31.50	245	8X22/11	26.69	93.88	8LCB2	93.88	27.00
75-109-XX	40.25	19.69	3.50	30.25	26.38	51.63	26.00	0.13	31.50	245	9X22/11	26.69	105.38	9LCB2	105.38	27.00
75-110-XX	40.25	19.69	3.50	30.25	26.38	51.63	26.00	0.13	31.50	245	10X22/11	26.69	117.38	10LCB2	117.38	27.00
75-203-XX	46.25	19.69	3.50	30.25	26.38	51.63	26.00	0.13	31.50	245	3X42/11	50.38	34.88	3LCB4	34.88	51.00
75-204-XX	46.25	19.69	3.50	30.25	26.38	51.63	26.00	0.13	31.50	245	4X42/11	50.38	46.88	4LCB4	46.88	51.00
75-205-XX	46.25	19.69	3.50	30.25	26.38	51.63	26.00	0.13	31.50	245	5X42/11	50.38	58.38	5LCB4	58.38	51.00
75-206-XX	46.25	23.88	3.50	30.25	32.38	61.38	31.75	0.13	37.25	300	6X42/11	50.38	70.38	6LCB4	70.38	51.00
75-207-XX	46.25	26.44	3.50	34.88	34.63	70.63	34.81	0.06	44.25	330	7X42/11	50.38	81.88	7LCB4	81.88	51.00
75-208-XX	46.25	26.44	3.50	34.88	34.63	70.63	34.81	0.06	44.25	330	8X42/11	50.38	93.88	8LCB4	93.88	51.00
75-209-XX	46.25	26.44	3.50	34.88	34.63	70.63	34.81	0.06	44.25	330	9X42/11	50.38	105.38	9LCB4	105.38	51.00
75-210-XX	46.25	29.19	4.00	34.88	38.31	74.00	38.50	0.06	44.75	365	10X42/11	50.38	117.38	10LCB4	117.38	51.00
75-303-XX	52.25	19.69	3.50	30.25	26.38	51.63	26.00	0.13	31.50	245	3X62/11	74.06	34.88	3LCB6	34.88	75.00
75-304-XX	52.25	23.88	3.50	30.25	32.38	61.38	31.75	0.13	37.25	300	4X62/11	74.06	46.88	4LCB6	46.88	75.00
75-305-XX	52.25	26.44	3.50	34.88	34.63	70.63	34.81	0.06	44.25	330	5X62/11	74.06	58.38	5LCB6	58.38	75.00
75-306-XX	52.25	26.44	3.50	34.88	34.63	70.63	34.81	0.06	44.25	330	6X62/11	74.06	70.38	6LCB6	70.38	75.00
75-307-XX	52.25	29.19	4.00	34.88	38.31	74.00	38.50	0.06	44.75	365	7X62/11	74.06	81.88	7LCB6	81.88	75.00
75-308-XX	52.25	29.19	4.00	34.88	38.31	74.00	38.50	0.06	44.75	365	8X62/11	74.06	93.88	8LCB6	93.88	75.00
75-309-XX	52.25	29.19	4.00	34.88	38.31	74.00	38.50	0.06	44.75	365	9X62/11	74.06	105.38	9LCB6	105.38	75.00
75-310-XX	52.25	29.19	4.00	34.88	38.31	74.00	38.50	0.06	44.75	365	10X62/11	74.06	117.38	10LCB6	117.38	75.00

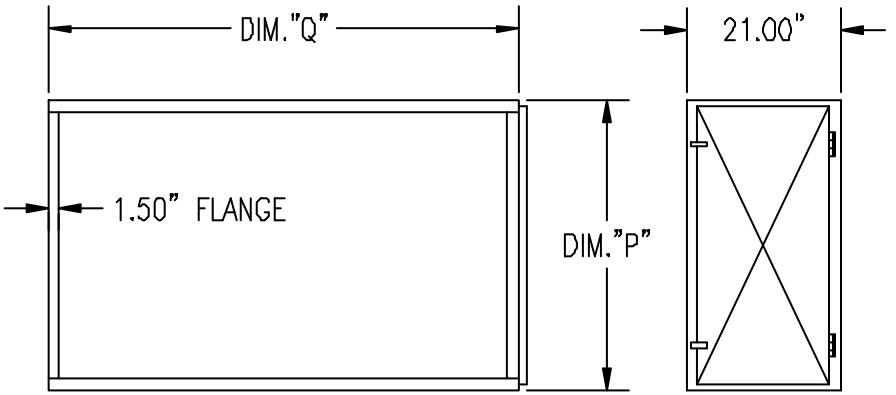
MODEL 75 SERIES



FAN & TRANSITION



SIDE ACCESS HOUSING



CARBON HOUSING