



The World Leader in Engine Exhaust
Removal Systems for the Fire & EMS
Industry.



Air Vacuum Corporation

6 Faraday Drive, Dover, New Hampshire 03820
ph: 800-540-7264 fax: 603-743-3111 www.airvac911.com

GO GREEN, GO AIRVAC 911®



BREATHE THE CLEAN AIR



AIRVAC 911[®] Engine Exhaust Removal System

NO HOSES HANDS FREE

Celebrating 25 Years



Protecting First Responders



Contract Holder
Contract GS-07F-0437M



For a free proposal or more info,
contact Air Vacuum Corporation.



800-540-7264

airvac911.com/FreeProposal

THE #1 SYSTEM PREFERRED BY FIRE CHIEFS



PROTECT YOUR FIRST RESPONDERS

Breathe Clean Air with AIRVAC 911®

For a quarter century Air Vacuum Corporation's dedicated team has been protecting first responders worldwide by automatically removing diesel carcinogens from fire stations and EMS facilities with its custom designed engine exhaust removal system, AIRVAC 911®.

AIRVAC 911® is the most effective and efficient exhaust removal system available. No building modifications, no hoses and no vehicle attachments. That means no interference with your daily operations or emergency response time. A sophisticated UL certified "Smart Timer" control panel automatically activates the AIRVAC 911® system so that particulate and gases are constantly removed 24 hours a day, 7 days a week, 365 days a year. It's no wonder our system is preferred by stations worldwide.

FACT: According to OSHA, prolonged, uncontrolled exposure to diesel exhaust and diesel particulate matter can increase the risk of lung cancer and cardiovascular, cardiopulmonary and respiratory disease*.

Control the spread of hazardous contaminants in your station with AIRVAC 911®.

Benefits for Fire Departments:

- Protects 100% of the bay area(s)
- Eliminates Hot Zones within your station
- Removes off-gassing of turnout gear, hoses and parked vehicles
- No hoses, hook-ups or vehicle connections
- No building modifications, no ducting and no outside exhausting
- 100% automatic
- Only system to remove engine exhaust that re-enters the building
- Half the cost of hose systems
- Virtually zero maintenance
- Energy efficient LEED/green design
- Most comprehensive warranty in the industry



Benefits for EMS Facilities:

The same benefits as fire departments, plus:

- Maintains building temperature to protect sensitive medical equipment
- Provides a clean, safe environment for workers and patients
- Eliminates particulate residue or contaminants on medical equipment
- Flexible – vehicles may park in any bay
- Installs easily in low and high ceiling areas



Manufactured and distributed by Air Vacuum Corporation.
Installed by factory technicians or local contractors.

*OSHA, 2013 "Hazard Alert for Diesel Exhaust / Diesel Particulate Matter."

AND FIRST RESPONDERS WORLDWIDE

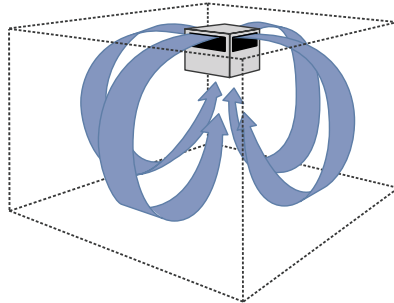


“ In my opinion, these are the best by far for safety concerns about the air in the fire hall bays. ”

– City of Chattanooga
Fire Department, TN

MAXIMIZE PARTICULATE AND GAS REMOVAL FROM THE BREATHING ZONE

Only Hoseless System with a Multi-Directional Airflow Design



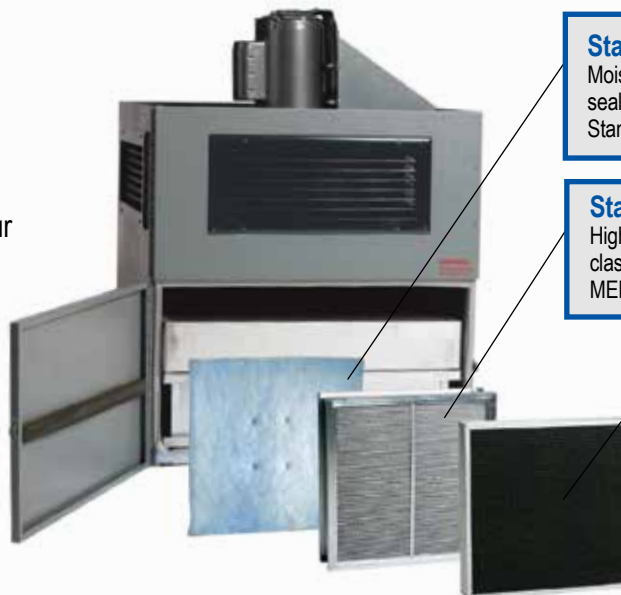
Continuously filter the air and eliminate dead spots of exhaust. The AIRVAC 911® system is built on our proprietary “Coanda Design” which allows for 360-degree vertical and horizontal air movement throughout the entire bay area. In head-to-head comparisons with unidirectional air cleaners, AIRVAC 911® cleans more air at a faster and more efficient rate.

Eliminates “Engine Exhaust Backwash” and Hot Zones

AIRVAC 911® removes engine exhaust that re-enters the station when vehicles depart and return. It also addresses the entire apparatus area and contaminant Hot Zones regardless of parking configuration, vehicle quantity and the type of vehicle.

Four-Stage Filter Pack with Virtually Zero Maintenance

The AIRVAC 911® Engine Exhaust Removal System also features four fully adjustable, clean air return vents that provide maximum airflow for high-performance protection.



Stage 1: Three-Ply Pre-Filter

Moisture-resistant, 3-ply polyester media. Self-sealing continuous link design. Class 2 filter, UL Standard 900 and CAN 4-S111.

Stage 2: HEPA MAX 3000

High-efficiency particulate air filter. UL/ULC classified; Class 2 filter ASHRAE 52.2 tested to MERV 16 (>98% efficiency).

Stage 3 and 4:

MULTISORB 3000

Consists of a 50/50 blend of high performance and enhanced porosity carbons: Impregnated Activated Alumina and Coconut Shell Activated Carbon. Certified UL CLASS-1.

For a free proposal with specifications, call 800-540-7264, go to airvac911.com/FreeProposal or email us at sales@airvacuumcorporation.com



Celebrating 25 Years



Protecting First Responders



Air Vacuum Corporation
P.O. Box 517
Dover, New Hampshire 03821

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EMAIL: sales@airvacuumcorporation.com



Contract Holder
Contract GS-07F-0437M

AIRVAC 911® Meets NFPA 1500, OSHA, IBOCA, EPA, GSA Standards



Manufactured and distributed by Air Vacuum Corporation.
Installed by factory technicians or local contractors.

“one of the biggest benefits is that the AIRVAC 911® Engine Exhaust Removal System addresses the blast of exhaust received when the apparatus leaves the apron. Hose systems disconnect as the unit leaves the bay and do not capture the ‘second’ dump of fumes.”

—Ripon Fire District, Ripon, CA

“As an ambulance service, we value having clean equipment and vehicles for our patients as well. The air in our vehicle bay actually feels better and smells better!”

—Bethel, VT



800-540-7264

airvac911.com/FreeProposal

LEED Accepted
Energy Efficient



PRODUCT FEATURES

Standard: 3/4 HP, 110/208-230 Volt, single phase motor. UL Approved (3 phase available)

Four Pre-drilled mounting holes for chain mounting or for threaded rod brackets (provided with unit)

8 foot 14-3 pre-molded electrical cord.

UNIT WEIGHT: 190 Pounds with filtration, 135 Pounds without.

Automated filter gauge indicates when it is time to replace filters.

16 Gauge steel construction. Industrial baked "Gray" Powder Coat Finish.



UNIQUE
Four-Sided adjustable air flow grills create an "Umbrella Like" clean air pattern.

Feature allows for a customized air flow pattern within any size/shape building.

2000 CFM - Clean Air Delivery Rate

FULLY AUTOMATIC - NO HOOK UPS, VEHICLE ATTACHMENTS or HANDS ON NEEDED!

Unique 4-stage filter pack. Removes both the gasses and particulate generated via diesel or gas vehicles. Creates a healthier work environment.

NO BUILDING MODIFICATIONS or HEATING LOSS.

HIGHLY AFFORDABLE = 1/3 TO 1/2 THE COST OF HOSE SYSTEMS

ZERO INTERFERENCE WITH VEHICLE OPERATIONS.

MADE IN THE USA

MEETS NFPA/OSHA/EPA/FEMA



The World Leader In Engine Exhaust Removal
Systems for the Fire and EMS Industry



Certified Safe Feature! Filter cabinet door opens right to left and **NOT** down onto person changing filters.

AIRVAC 911® Engine Exhaust Removal System

The most effective solution to the removal of hazardous engine exhaust.

Compact, Quiet and Affordable.

Filter replacements under ½ the cost of the competition!

Highest efficiency within the industry!

Filter replacements easily slide in and out.

AIRVAC 911® “4-STAGE” FILTER PACK

(STAGE 1) PRE-FILTER: 24" X 24" X 1". 3-PLY POLYESTER CONSTRUCTION. TWO LAYERS OF 16/40 DUAL DENIER POLY FIBERS WITH A FINAL DUST CATCHING ADHESIVE LAYER. SELF-SEALING FILTER WITH PRE-INSTALLED INTERNAL HEAVY GAGE WIRE FRAME. PERFORMANCE BASED ON A.S.H.R.A.E. 52.1-1992 TEST METHOD. CLASSIFIED AS A UL CLASS 2 FILTER, ACCORDING TO UL STANDARD 900 AND CAN 4-S111.

(STAGE 2) MAIN MEDIA FILTER: 24" X 24" X 6". “HEPA MAX 3000” HIGH EFFICIENCY PARTICULATE AIR FILTER. DOP TESTED WITH 0.3 MICROMETER SIZED PARTICLES TO HAVE A MINIMUM EFFICIENCY OF 95% UP TO 99.97% AND EXCEEDS THE MAXIMUM EFFICIENCY OF 98% ASHRAE 52.1 TESTED FILTERS. CONSISTS OF A PLEATED MEDIA PACK ENCLOSED WITHIN A GALVANIZED STEEL FRAME ASSEMBLY. ULTRA-FINE FIBERGLASS MEDIA FORMED IN A SERIES OF PLEATS SEPERATED BY CORRUGATED ALUMINUM DIVIDERS TO MAINTAIN UNIFORM SPACING BETWEEN EACH PLEAT FOR OPTIMAL AIRFLOW. CLASSIFIED CLASS 2 ACCORDING TO U.L. STANDARD 900 AND IS CLASSIFIED MERV 16 IN ACCORDANCE WITH ASHRAE STANDARD 52.2. FOR INSTALLATION SAFETY, TOTAL WEIGHT NOT TO EXCEED 16 LBS.

(STAGES 3&4) GAS-PHASE EXTRACTOR: ONE 24" X 24" X 4", “MULTISORB 3000” BLENDED GAS PHASE EXTRACTOR. 50/50 RESPIRATOR GRADE ACTIVATED CARBON GRANUALS EFFECT FOR REMOVAL OF HIGH WEIGHT MOLECULAR GASES WITHIN DIESEL EXHAUST (VOC'S, HYDROCARBONS, BENZENE, OCTANE, METHANOL AND MORE) AND POTASSIUM PERMANGANATE FOR REMOVAL OF LIGHT WEIGHT MOLECULAR GASES (SULFUR DIOXIDE, NITROGEN DIOXIDE, FORMALDEHYDE AND MORE). EACH FILTER IS CONSTRUCTED WITHIN A 24ga METAL FRAME WITH INTERNAL "HONEYCOMB" CONTAINMENT STRUCTURE. 50/50 BLEND EQUATES TO 14 LBS EACH. FOR INSTALLATION SAFETY, TOTAL WEIGHT NOT TO EXCEED 28 LBS.

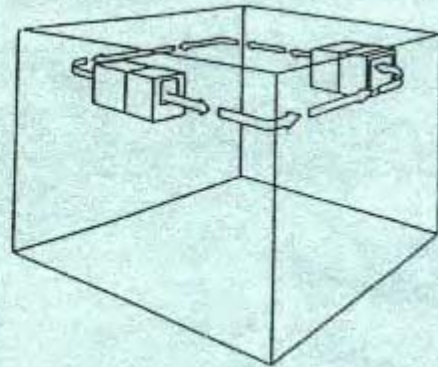
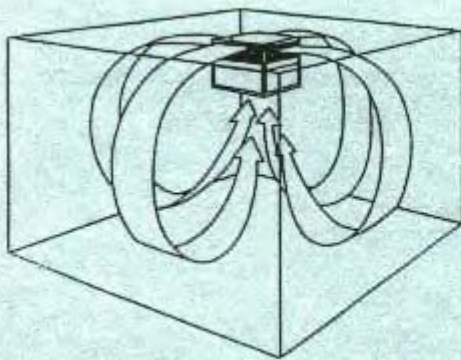
AIRVAC 911®

Engine Exhaust Removal System

800-540-7264

www.airvac911.com

AIRVAC 911's Coanda (umbrella like)
(Vertical & Horizontal) Air Pattern



Old-fashion pass thru method

Air Vacuum Corporation is the industries innovator and leader in "Hoseless" & 100% Vertical Airflow Engine Exhaust Removal. See below for how the AIRVAC 911® Filtration System offers the industries most effective and efficient technology.

- o The AIRVAC 911® System utilizes the natural upward movement of air through its unique "coanda" airflow pattern. This System eliminates the pockets of stagnant air that horizontal units may create.
- o This advanced "Coanda" (vertical airflow) design is much more effective than older horizontal units which tend to corral exhaust at the ceiling level.
- o The AIRVAC 911® System creates a uniform ceiling to floor movement of air.
- o Our Multi unit installation approach is similar to that of a sprinkler fire suppression system by addressing the WHOLE apparatus area.
- o There are NO heavy Uni-Directional drafts as with the "horizontal" units.
- o In many applications, one AIRVAC 911® unit will perform more effectively than two old fashion type horizontal units.



The World Leader In Engine Exhaust Removal
Systems for the Fire and EMS Industry

AIRVAC 911® Automatic Vehicle Exhaust Control System

Installation Information for Catalog Number(s) AVC-2C, -4C, -6C, -8C, 10C

GENERAL: Each standard AVC Panel (AVC-2C, -4C, -6C, -8C, -10C) controls multiple AIRVAC 911® units (2, 4, 6, 8, 10 units respectively). All standard AVC Panel are essentially identical, except for how many AIRVAC 911® units they control. Each standard AVC Panel comes with a panel layout and electrical schematic drawing with information for all field connections. Refer to AVC Panel drawings for detailed wiring information.

120V AIR-VAC 911 POWER WIRING: 120V power wiring (through the standard AVC Panel) to individual AIRVAC 911® units must be protected by overcurrent devices per NEC requirements. Refer to AVC Panel drawings for detailed wiring information.

120V CONTROL POWER WIRING: 120V control power wiring to each standard AVC Panel should come from a dedicated 120V power circuit. If a dedicated circuit is not available for this purpose, 120V control power can come from line side wiring of an AIRVAC 911® unit. Refer to AVC Panel drawings for detailed wiring information.

OPERATOR CONTROLS: Each standard AVC Panel comes with an ON-OFF-AUTO Selector and an Illuminated Pushbutton.

- In the ON position, the AVEC startup sequence is initiated and AVEC Units will remain energized.
- In the OFF position, all AVEC Units will be de-energized.
- In the AUTO Position, the AVEC startup sequence is initiated (by an external contact closure or by pressing the Illuminated Pushbutton) and all AVEC Units will remain ON for 15 Minutes (Factory Setting) or desired time.
- The Illuminated Pushbutton will illuminate when AVEC units are ON.

STARTUP SEQUENCE: Upon initiation, two AIRVAC 911® units will energize. Remaining AIRVAC 911® units will energize in groups of two (after 15 second delays) until all AIRVAC 911® units are energized.

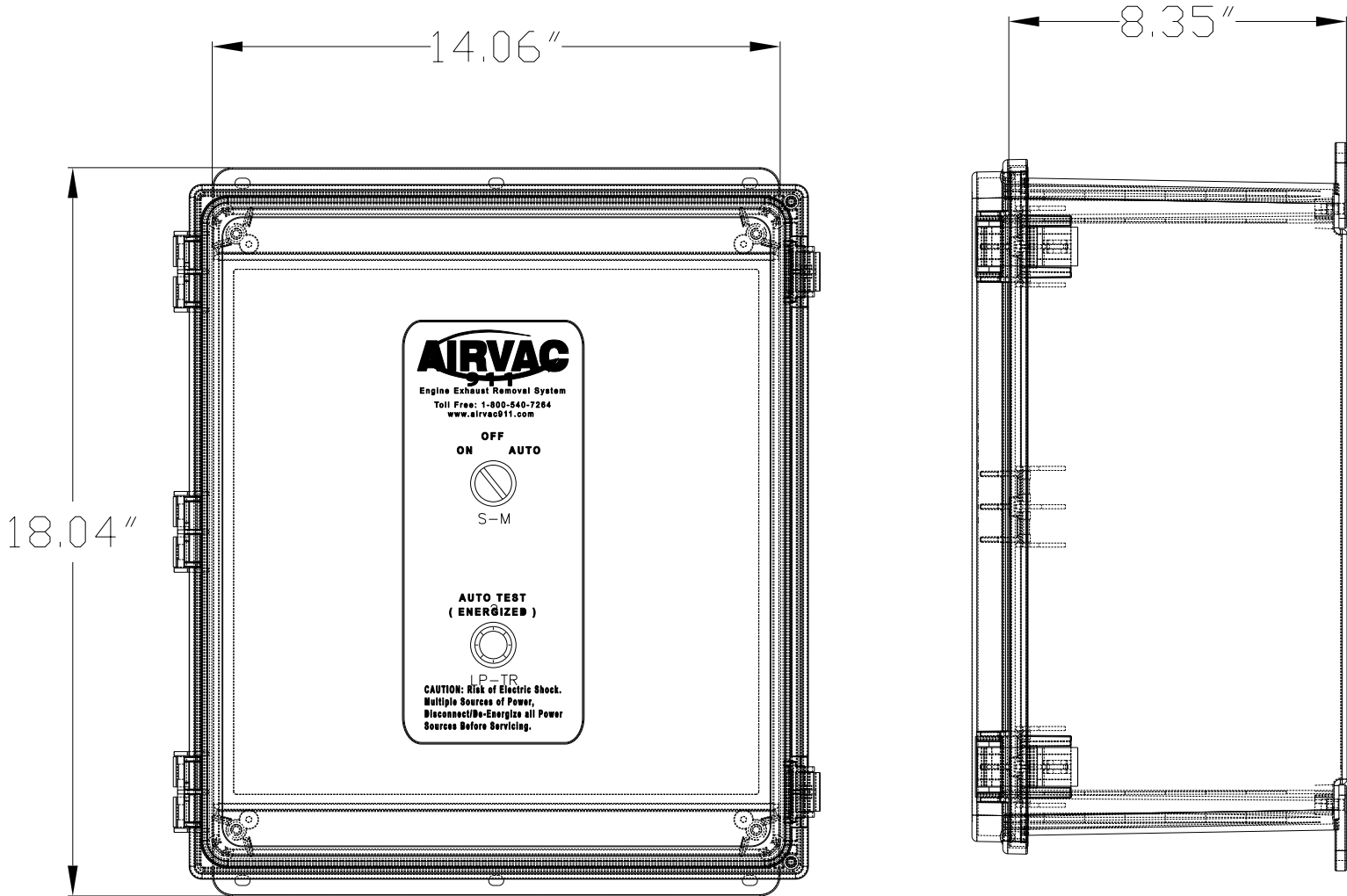
24V EXTERNAL SENSOR POWER: Each standard AVC Panel comes with a 40W 120V to 24V transformer to power specific field devices available from Air Vac (i.e Aleph or Takex photo eyes, Macurco/Honeywell E3 CO/NO2 Gas detection switches, etc.). It is recommended that the installer use a 2 pair, shielded and color coded cable for low voltage wiring. Refer to the appropriate standard AVC Panel for detailed wiring information.

120V EXTERNAL (SEQUENCE INITIATE IN AUTO) CONTACT WIRING: Each standard AVC Panel allows the AVEC startup sequence to be initiated by an external contact closure in the AUTO Position. Refer to AVC Panel drawings for detailed wiring information.

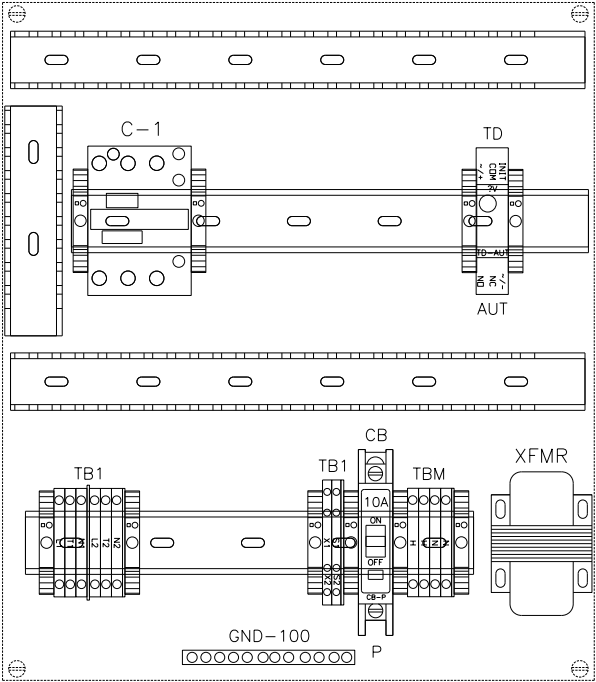
Section D

Drawings

**Enclosure Physical Layout
Electrical Schematics
Field Connections**



TYPE 4X ENCLOSURE



PANEL TO BE UL LISTED (usUL, cUL)
INDUSTRIAL CONTROL PANEL
UL508A FILE NO E109698

Consult your sales rep for
other model controls

REV	DATE	PURPOSE:	BY	CHKD	DESIGNED	DATE	FOR:	PANEL LAYOUT	SHEET:
1	02/2016	AUTO (ON) MINIMUM RUN TIMER RESETS (CLEARS) WHEN ON-OFF-AUTO SELECTOR IN OFF POSITION	BL	DR	BL	09/2011	AIRVAC	AVC 2C 2 FAN	1 OF 3
					DRAWN	DATE			
					DCR	09/2011			
					CHECKED	DATE			

AIRVAC
9-1-1
Engine Exhaust Removal System
Toll Free: 1-800-540-7264, www.airvac911.com

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DRAWING SET:
20XX-XXX-2C

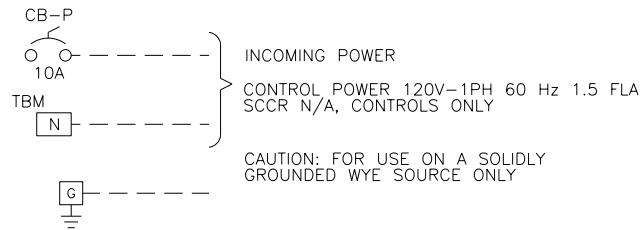


AIRVAC
911
Engine Exhaust Removal System
Toll Free: 1-800-540-7264, www.airvac911.com

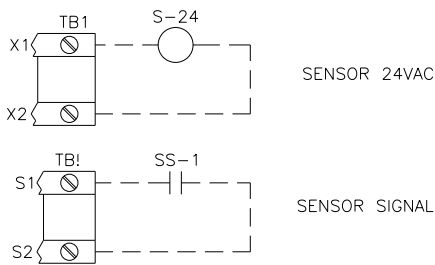
CONTROL SCHEMATIC AVC 2C 2 FAN	
DRAWING SET: 20XX-XXX-2C	SHEET: 2 OF 3

FIELD CONNECTIONS

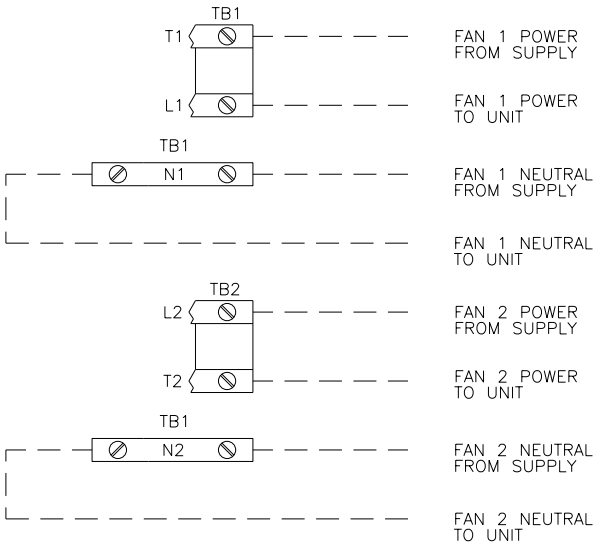
INCOMING POWER CONNECTIONS



SENSOR CONNECTIONS



FAN MOTOR CONNECTIONS
SEE NOTES 1,2,3



NOTES:
1) EACH FAN MOTOR 120VAC 1 PH 60 Hz
0.75 HP 13.8 FLA, SCR = 5KA RMS
SYMMETRICAL @ 120V MAX.
2) CAUTION FOR USE ON A GROUNDED
SOURCE ONLY
3) MOTOR OVERLOAD AND SHORT CIRCUIT
PROTECTION PROVIDED BY OTHERS
4) THIS PANEL CONTAINS CLASS 2
CIRCUITS

REV	DATE	PURPOSE:	BY	CHKD	DESIGNED	DATE	FOR:	FIELD CONNECTIONS
1	02/2016	AUTO (ON) MINIMUM RUN TIMER RESETS (CLEARS) WHEN ON-OFF-AUTO SELECTOR IN OFF POSITION	BL	DR	BL	09/2011	AIRVAC	AVC 2C
					DRAWN	DATE		2 FAN
					DCR	09/2011		
					CHECKED	DATE		
					THIS DRAWING, AND ALL REPRESENTED DATA, ARE THE PROPERTY OF THE NAMED COMPANY IN THE TITLE BLOCK. THIS DRAWING SHALL NOT BE REPRODUCED, COPIED, OR DISCLOSED EXCEPT FOR MAINTENANCE PURPOSES BY THE USING CUSTOMER.			DRAWING SET:
								20XX-XXX-2C
								SHEET:
								3 OF 3



ACTIVATION DEVICES

Some items are options: N505ATM/ST
Magnetic Door Switch & Takex PB030TK
Photo Electric Eye Switches are standard
equipment.

OTHER OPTIONS:

- Tone Activation
- Vehicle ignition transmitters
- Manual Push Buttons
- CO/NO₂ gas detection



Manufacturer of Air Filtration Equipment

(603-743-4332)

TAKEX

PB-30TK (60)

Outdoor Infrared Double Beam Sensor



The **PB-30TK (60) Takex** Outdoor Infrared Double Beam sensor is the ideal photo beam to use in conjunction with the Air Vac 911 Air Cleaner and the Air Vac AVEC UL control panel.

The **Takex** Beam sensor has been field tested in numerous applications over the past several years and accepted by many for its ease of installation and operation. Its range is 100 (200) feet outdoors and will cover a much larger range indoors.

Air Vacuum Corporation will be pleased to supply you with the PB-30TK (60) Photo Beam along with the AIR VAC-911 air cleaner and AVEC control.

MODEL	PB-30TK	PB-60TK
Detection System	Simultaneous breaking of two (2) beams	
Infrared Beam	LED pulsed beam, Double modulation	
Protection Distance	Outdoor 100' (30m) or less Indoor 200' (60m) or less	Outdoor 200' (60m) or less Indoor 400' (120m) or less
Maximum Beam Range (Approximation)	Outdoor 1000' (300m) Indoor 1000' (300m)	Outdoor 2000' (600m) Indoor 2000' (600m)
Response Time	50msec. To 700msec. (Variable at pot.)	
Supply Voltage	10V to 30VDC (Non-polarity) usable at "24Vac"	
Current Consumption	53mA or less	80mA or less
Alarm Output	Dry contact relay form C Contact action: Interruption time plus delay time (1 to 30 seconds) Contact capacity: 30V AC/DC, 0.5A or less	
Tamper Output	Dry contact relay N/C Action: Activated when cover is detached Contact capacity: 30V AC/DC, 0.5A or less	
Alarm LED	Red LED (Receiver) On: when beam is activated	
Attenuation LED	Red LED (Receiver) On: when beam is attenuated	
Functions	Monitor jack output, AGC circuit, Frost proof cover	
Ambient Temperature Range	-13 F to +140 F (-25 C to +60 C)	
Mounting Position	Indoor / Outdoor	
Wiring	Screw Terminals	
Weight	Transmitter: 13.3oz (380g) / Receiver: 14.0oz (400g)	
Appearance	PC resin (Black)	

Catalog Number PB-30TK (60)

“Takex 100 (200) Foot Outdoor Photo Beam”

Interface Information

The PB-30TK comes complete with installation instructions and it is important that you read them completely before installation. Place Beam at sufficient height so as to avoid tripping by people and animals.

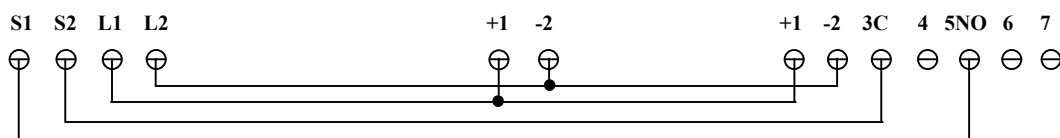
Both the Transmitter and Receiver operate on 24Vac. 24Vac is available from terminals *L1 and L2 of the AVEC control. Although the Takex installation instructions show the connections on their unit as DC, plus (+) and minus (-), there is no polarity and will accept AC. The connections are listed as plus and minus 10 to 30V.

In order to activate the AVEC control, a momentary short must be placed across terminals S1 & S2 of the AVEC control. When the PB-30TK is activated, the control will activate. When the PB-30TK deactivates, timing as set on the time delay relay in the control will begin. As long as the PB-30TK is activated, the unit will run continuously. The wires to connect to on the PB-30TK will be the common (C) and normally open (NO), no polarity.**

AVEC Control

Takex Trans.

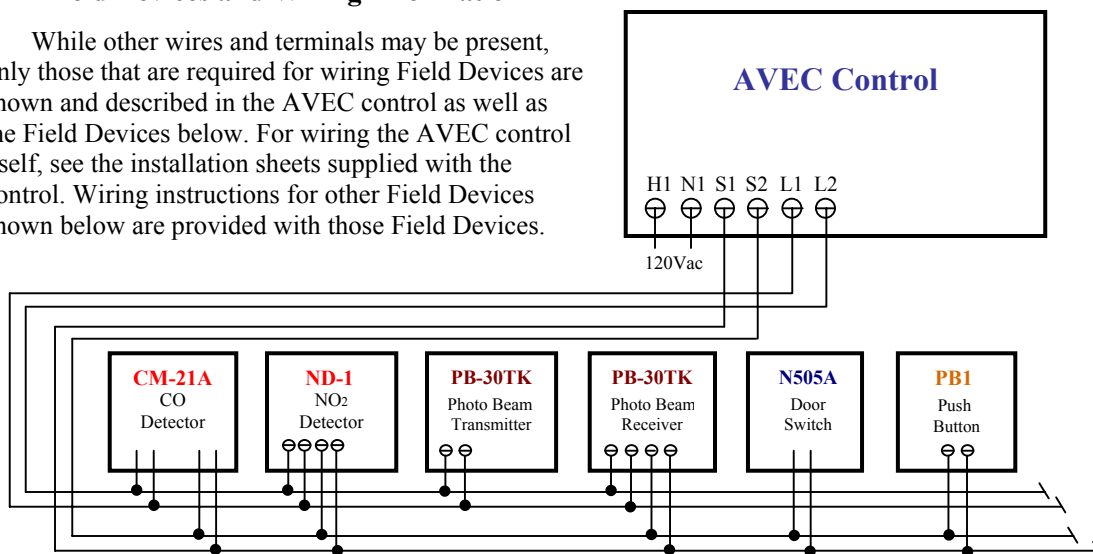
Takex Receiver



Typical Multiple Connections to AVEC Control

Field Devices and Wiring Information

While other wires and terminals may be present, only those that are required for wiring Field Devices are shown and described in the AVEC control as well as the Field Devices below. For wiring the AVEC control itself, see the installation sheets supplied with the control. Wiring instructions for other Field Devices shown below are provided with those Field Devices.



*On three (3) phase controls, these terminals (L1 & L2) will be listed as X1 and X2.

**We recommend the use of 18 Awg shielded and/or twisted pair cable in lieu of a standard two-conductor cable. This should ensure no induced voltage across terminals S1 and S2.

Twin Photobeam Detectors

- E-960-D90Q** Outdoor Range: Up to 90ft (30m)
- E-960-D190Q** Outdoor Range: Up to 190ft (60m)
- E-960-D290Q** Outdoor Range: Up to 290ft (90m)
- E-964-D390Q*** Outdoor Range: Up to 390ft (120m)

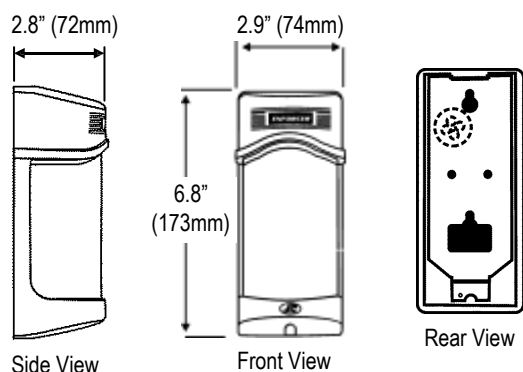
Features:

- Twin beams provide reliable perimeter security, minimizing false alarms for falling leaves, birds, etc.
- Lensed optics reinforce beam strength and provide excellent immunity to false alarms due to rain, snow, mist etc.
- Weatherproof, sunlight-filtering case
- Non-polarized power inputs
- Anti-frost system
- Automatic input power filtering with special noise rejection circuitry
- NC/NO Alarm output
- NC Tamper circuit included
- "U" Brackets included for pole mounting
- Quick, easy installation with built-in laser beam alignment system

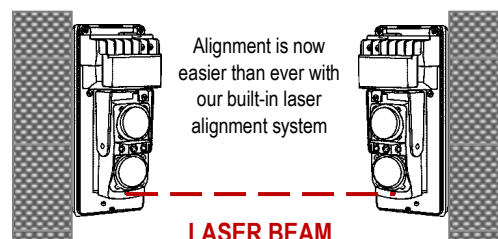
***E-964-D390Q also features:**

- Four selectable beam frequencies

Dimensions:



Laser Beam Alignment:



Specifications:

Model	E-960-D90Q	E-960-D190Q	E-960-D290Q	E-964-D390Q
Max. Range (outdoor)	90' (30m)	190' (60m)	290' (90m)	390' (120m)
Max. Range (indoor)	190' (60m)	390' (120m)	590' (180m)	790' (240m)
Current	53mA	62mA	63mA	64mA
Voltage output	1~4V			
Power	10~30 VAC/VDC (non-polarized)			
Interrupt speed	50msec~700msec (variable)			
Alarm output	NO/NC relay, 1A@120VAC, minimum 1sec			
Tamper output	N.C. switch, 1A@120VAC			
LEDs	Red	ON indicates transmitter and receiver not aligned or beam is broken		
	Yellow	ON indicates weak receiver signal or beam is broken		
	Green	ON indicates unit connected to power		
Laser wavelength	650nm			
Laser output power	<5mW			
Alignment angle	Horizontal: +90°, vertical: +5°			
Operating temperature	-13°F (-25°C)~131°F (55°C)			
Weight	2.5-lb (1.1kg)			

SECO-LARM® U.S.A., Inc.

16842 Millikan Avenue, Irvine, CA 92606

Phone: (949) 261-2999 | (800) 662-0800 Fax: (949) 261-7326

Website: www.seco-larm.com Email: sales@seco-larm.com

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SECO-LARM® ENFORCER® CRIMEBUSTER® CBA SLI®

piE-96x-Dx90Q.docx

DISTRIBUTED BY:
AIR VACUUM CORP.
P.O. BOX 517
DOVER, NH 03821
800.540.7264

Industrial Track Mount Switch

N-505ATM for 2inch rails. / N-505ATMC for 3 ¼ inch rails.



Save Time on Installation (Installs in 60 Seconds)

NOTE:

Install these contacts in a normally open momentary position. The magnet will make contact only as it passes by the track mounted switch.
(Do not mount as an alarm type as shown in photograph)

DESCRIPTION:

Fastest installing Overhead Door Contact
Widest Gap in the Security Industry
Anodized Bar Stock Aluminum Housing for Durability
2 foot Stainless Steel Cable Standard
Eliminate Service Calls (Doesn't knock off Rail)
Black Satin Finish

***wire low voltage
switches in "parallel" to
the AVEC control**

SPECIFICATIONS:

	Closed Loop	Open Loop	SPDT	DPDT
Switching Voltage:	100 Volts	30 Volts	30 Volts	30 Volts
Switching Current:	.5 Amps	.25 Amps	.25 Amps	.25 Amps
Watts (Max)(Volt x Amps):	7.5 Watts	3 Watts	3 Watts	3 Watts

Closed Loop = When a magnet is in close proximity to the switch the switch is closed.

Open Loop = When a magnet is in close proximity to the switch, the switch is open.

SPDT = This switch has a common, closed & open side.

DPDT = This switch has two SPDT reeds in the same switch housing, each having it's own common, closed, and open side.

Dual Single Pole Single Throw = Two closed loop reeds in one switch housing.

Nascom only specifies the most sensitive reeds, which will provide for it's customer the most Gap distance between the switch and magnet, without modification.

PART NO:

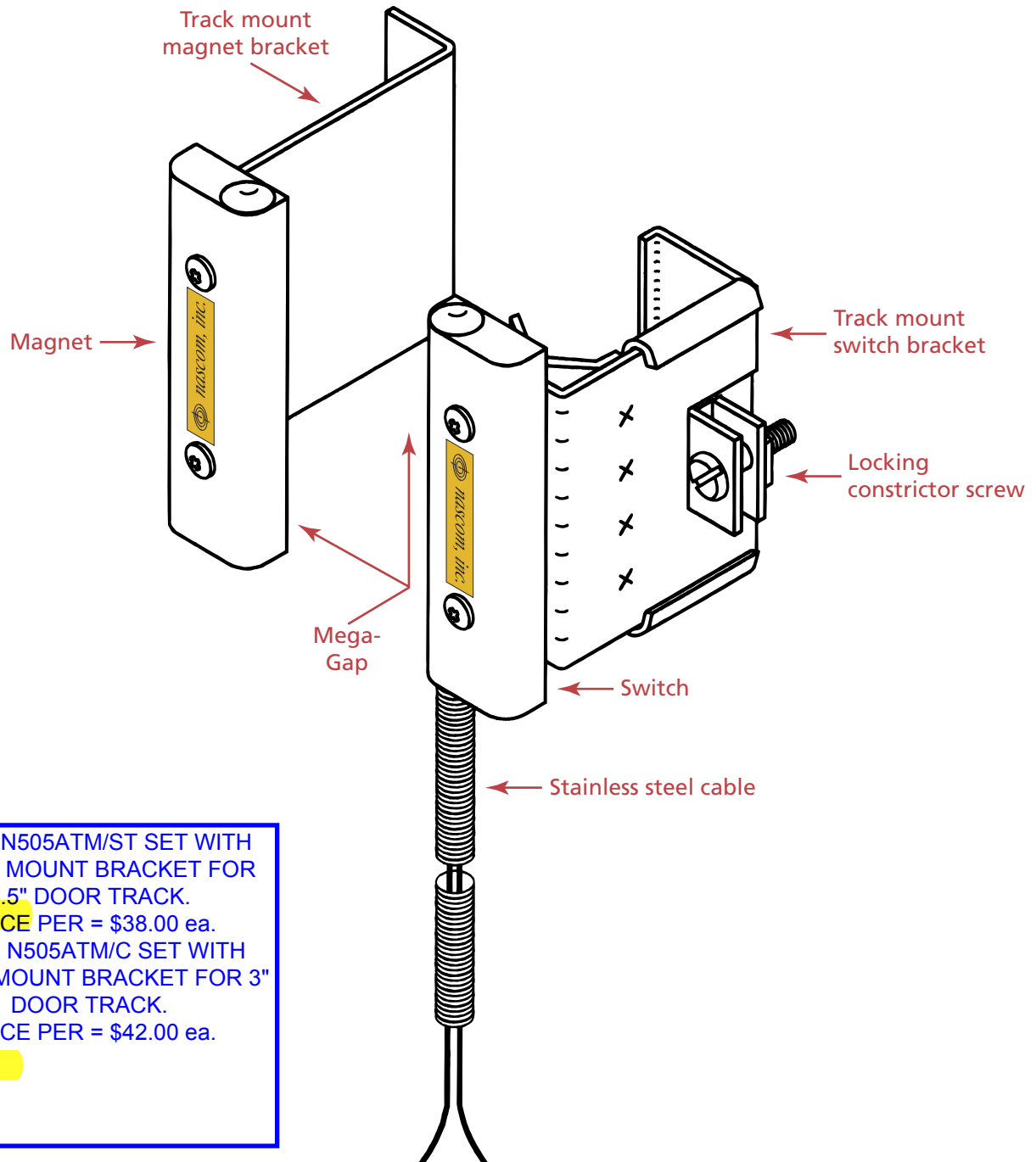
N505ATM/ST 2 inch rails.

N505ATMC/ST 3 ¼ inch rails.

Tested under UL Standard 634

Connector & Switches

Nascom's N505ATM/ST Track mount switch for overhead doors



Mega-Gap installs in 60 seconds.

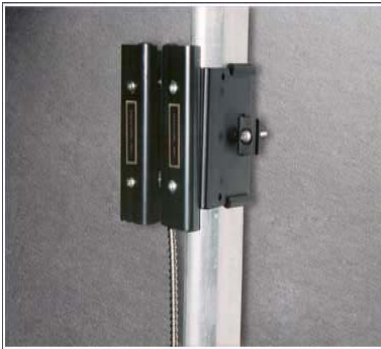
"World's finest switch"

Catalog Number N505ATMC/ST

***nascom, inc.* Door Switch**

Installation Information

The N505ATMC/ST [normally open] comes pre-wired with a heavy-duty armored cable connected to an industrial housing. The other end is striped and ready for connection within an approved box using acceptable wiring methods. While you may go from door switch to door switch, the circuit is wired in parallel. No polarity is observed.



N505ATMC/ST

AVEC Control

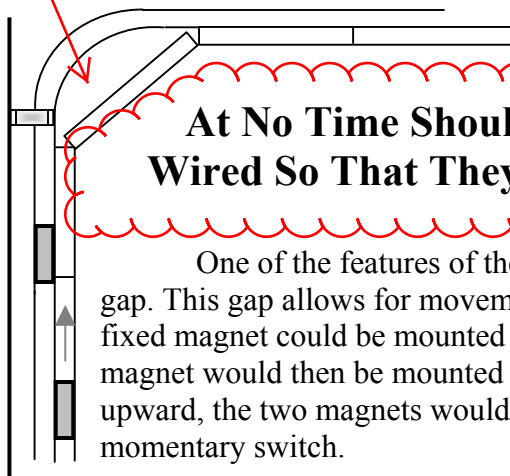


Typical Layout

.3 Amp Max Current @ 100 Volts AC/DC

Contacts Mounted In A Normally Open Momentary Position.

Note: Magnet Makes Contact Only As It Passes By The Fixed Magnet Acting As A Momentary Switch.



At No Time Should The Magnet Be Wired So That They Maintain Contact.

One of the features of the N505ATM magnet is its four (4) inch working gap. This gap allows for movement in the track. As an example only, the fixed magnet could be mounted six feet above the floor while the moveable magnet would then be mounted five feet above the floor. As the door travels upward, the two magnets would come together and then pass by acting as a momentary switch.

N505ATM & N505ATMC INSTALLATION

“WARNING”

“WARNING”

Most Commercial & Residential garage doors are very sloppy and out of alignment.

Before installing Nascom's N505ATM or N505ATMC track mount bracket, mark a heavy mark on the track where the bracket is to be installed.

At the bottom edge of most overhead doors you will notice a metal plate. There may be a cable attached to this plate. Operate the Overhead Door completely up and down two to three times watching the location of this plate's edge in relation to your rail mark. If the metal plate shifts close to your mark, move the mark to a different location on the rail. Roll the door up again to test your location. NOTE: The best location is when the edge of the door is the farthest away from your rail mark.

“WARNING” If this metal plate shifts to close too the rail it may hit the edge of the track mount bracket.

Once you insure your mark is in the proper location then mount your bracket on the rail using a screw gun. This will insure that the bracket is as tight as possible.

“WARNING” The Screw is designed so that the vibration of the door movement will not loosen the screw. Do not back off or loosen the screw that clamps the brackets together. This will cause the screw to strip. You will not be able to re-tighten the screw.

Mount the magnet bracket with self tapers or nuts and bolts depending on your application. The magnet must be within $\frac{3}{4}$ of an inch from the switch edge to avoid any dead spots and make sure the black plastic end caps at each end of the magnet are closest to the switch.

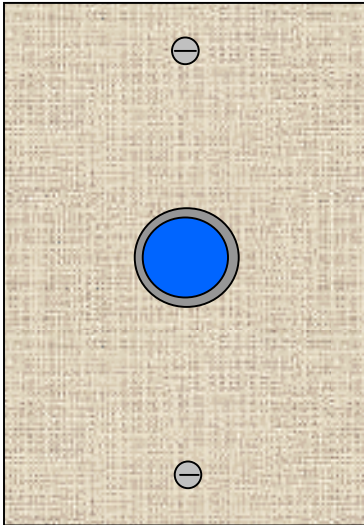


Manufacturer of Air Filtration Equipment

(603-743-4332)

Air Vacuum Corp. MULPB1

Pre-Assembled 22mm Wall Station



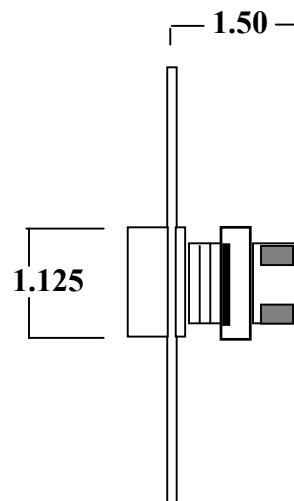
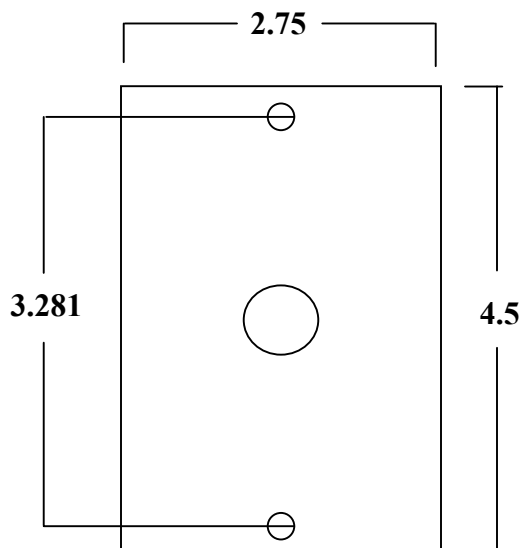
The MULPB1 is an ideal way to activate The Air Vac 911 Air Cleaner along with the AVEC control at the push of a button.

The unit comes complete with a 22mm black trim, "Double Insulated" blue plastic push button with mounting base and one normally open contact block. All mounted on a single gang gray lexan wall plate.

The NEMA type 1 push button is UL listed, CSA certified and meets IEC standards.

The gray lexan plate is virtually unbreakable. It comes ready for recessed wall box mtg. Or can be surfaced mounted on any standard bell box.

MOMENTARY PUSH BUTTON STATION



Catalog Number TOR-A506H

TORK Spring Wound Interval Timer

Installation Information

The TOR-A506H comes complete with installation instructions and it is important that you read them completely before installation.

For the application in which this timer is being used, the contacts are rated at 20 Amps 120 Volts Inductive and Resistive.

Six (6) Hour Maximum

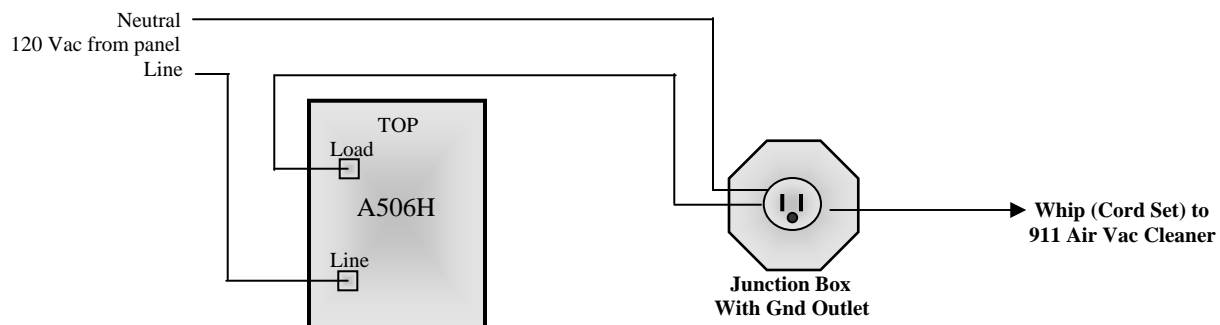


We recommend that the installation be made by a licensed electrician.

Disconnect power at main panel prior to installing or servicing this time switch or the equipment connected to it.

Warning: The timer is not to be used in precision timing applications where inaccurate timing could have dangerous consequences.

Typical Layout



E³Point SPECIFICATIONS

Toxic and Combustible Gas Detector Standalone Platform (Single or Dual-Gas Monitoring)



General Specifications

Uses	Wall or duct-mounted gas detector for monitoring carbon monoxide (CO), nitrogen dioxide (NO ₂), oxygen (O ₂), methane (CH ₄), hydrogen (H ₂), hydrogen sulphide (H ₂ S), and propane (C ₃ H ₈), installed as a standalone device with single-gas or dual-gas monitoring. (Note: E³Point standalone version replaces Vulcain models VA201T, VA201M and VA301M)
Size	20.56 x 14.90 x 6.72cm (8.09 x 5.87 x 2.65") (H x W x D); Remote Sensor: 3.5 x 4.5 x 6.5 cm (1.36 x 1.75 x 2.56")
Power Requirement	24 Vac nominal (17-27Vac), 50/60 Hz, 0.4A; 24Vdc nominal (20-38Vdc); with remote sensor: 7 W max.
Optional Main AC Input	120Vac nominal, +/- 10% (with on-board transformer)
Relay Output	2 DPDT relays, 5A @ 250Vac; 5A @ 30Vdc
Communications	4-20mA
Operating Environment	Commercial, Indoor, Extreme Temperature Environments
Operating Temperature	H ₂ S, NO ₂ , O ₂ , CH ₄ , H ₂ , C ₃ H ₈ : -40 to 50°C (-40 to 122°F) CO: -20 to 50°C (-4 to 122°F); future available CO version: -40 to 50°C (-40 to 122°F)
Sensor Type	Electrochemical cell (CO, NO ₂ , H ₂ S, O ₂); catalytic (CH ₄ , H ₂ , C ₃ H ₈)
Display	8 character, 2 line backlit LCD
Visual Indicators	Green LED: Power Amber LED 1: Alarm/Fault Amber LED 2: Alarm/Fault
Audible Alarm	85 dBA at 3 m (10 ft)
Accuracy	+/- 3% of full scale @ 25 C

Detection Ranges and Alarm Levels

Gas	Resolution	Range	Alarm A	Alarm B	Alarm C
CO (Carbon monoxide)	1 ppm	0-250 ppm	25 ppm	200 ppm	225 ppm
H₂S (Hydrogen sulfide)	0.1 ppm	0-50 ppm	10 ppm	15 ppm	20 ppm
NO₂ (Nitrogen dioxide)	0.1 ppm	0-16 ppm	0.7 ppm	2 ppm	9 ppm
O₂ (Oxygen)	0.1% vol.	0-25% vol.	19.5% vol.	22% vol.	22.5% vol.
H₂ (Hydrogen)	0.5% LEL	0-100% LEL	25% LEL	50% LEL	90% LEL
CH₄ (Methane)	0.5% LEL	0-100% LEL	25% LEL	50% LEL	90% LEL
C₃H₈ (Propane)	0.5% LEL	0-100% LEL	25% LEL	50% LEL	90% LEL

Enclosure

Polycarbonate

Certification

 CSA C22.2 No. 61010-1,
  UL 61010-1; FCC part 15; ICES-003 issue 4

ORDERING INFORMATION

Single-Gas Configuration: Base Unit, Surface-Mount

*** Base unit and sensor cartridge sold together ** Base unit only; sensor cartridge sold separately**

Part Number	Description
E3SASCO*	E ³ Point, CO sensor cartridge, Surface-mount, 24Vac/dc, -20 to 50°C (-4 to 122°F)
E3SA**	E ³ Point, Surface-mount, 4-20mA, 24Vac/dc, -40 to 50°C (-40 to 122°F)
E3SAHSCO*	E ³ Point, CO sensor cartridge, Surface-mount, 120Vac, -20 to 50°C (-4 to 122°F)
E3SAH**	E ³ Point, Surface-mount, 4-20mA, 120Vac, -40 to 50°C (-40 to 122°F)

Dual-Gas Configuration: Base Unit w/Remote Sensor Capability, Surface-Mount

Part Number	Description
E3SARSCO*	E ³ Point, CO sensor cartridge, Surface-mount, 24Vac/dc, Dual-mode, -20 to 50°C (-4 to 122°F)
E3SAR**	E ³ Point, Surface-mount, 4-20mA, 24Vac/dc, Dual-mode, -40 to 50°C (-40 to 122°F)
E3SARHSCO*	E ³ Point, CO sensor cartridge, Surface-mount, 120Vac, Dual-mode, -20 to 50°C (-4 to 122°F)
E3SARH**	E ³ Point, Surface-mount, 4-20mA, 120Vac, Dual-mode, -40 to 50°C (-40 to 122°F)

Remote Sensors (always sold with sensor cartridge included)

Part Number	Description
E3SRMCO	E ³ Point, Remote Sensor, -20 to 50°C (-4 to 122°F), Carbon Monoxide
E3SRMN02	E ³ Point, Remote Sensor, -20 to 50°C (-4 to 122°F), Nitrogen Dioxide
E3SRMH2S	E ³ Point, Remote Sensor, -20 to 50°C (-4 to 122°F), Hydrogen Sulfide
E3SRMH2	E ³ Point, Remote Sensor, -20 to 50°C (-4 to 122°F), Hydrogen
E3SRM02	E ³ Point, Remote Sensor, -20 to 50°C (-4 to 122°F), Oxygen
E3SRMM	E ³ Point, Remote Sensor, -20 to 50°C (-4 to 122°F), Methane
E3SRMP	E ³ Point, Remote Sensor, -20 to 50°C (-4 to 122°F), Propane

Stand-Alone Platform, Duct-Mount

Part Number	Description
E3DASCO*	E ³ Point, CO, Duct-mount, 24Vac/dc, -20 to 50°C (-4 to 122°F)
E3DA**	E ³ Point, Duct-mount, 4-20mA, 24Vac/dc, -40 to 50°C (-40 to 122°F)

Sensor Cartridges

Part Number	Description
E3SCO	CO Cartridge -20 to 50°C (-4 to 122°F), Carbon Monoxide
E3NO2	NO ₂ Cartridge -40 to 50°C (-40 to 122°F), Nitrogen Dioxide
E3H2S	H ₂ S Cartridge -40 to 50°C (-40 to 122°F), Hydrogen Sulfide
E3H2	H ₂ Cartridge -40 to 50°C (-40 to 122°F), Hydrogen
E3O2	O ₂ Cartridge -40 to 50°C (-40 to 122°F), Oxygen
E3M	CH ₄ Cartridge -40 to 50°C (-40 to 122°F), Methane
E3P	C ₃ H ₈ Cartridge -40 to 50°C (-40 to 122°F), Propane

EXAMPLES OF HOW TO ORDER

To order a stand-alone version, surface-mount, analog, CO detector, -20 to 50°C (-4 to 122°F): Order E3SASCO

To order a stand-alone version, surface-mount, analog, dual-gas CO + NO₂, -20 to 50°C (-4 to 122°F): Order E3SARSCO + E3SRMN02

To order a stand-alone version, duct-mount, analog, propane detector, -40 to 50°C (-40 to 122°F): Order E3DA + E3P

To order a stand-alone version, surface-mount, analog, dual-gas CO + C₃H₈, 120Vac, -20 to 50°C (-4 to 122°F): Order E3SARHSCO + E3SRMP

INSTRUCTION MANUAL

418 MHZ TRANSMITTER and RECEIVER

A Radio Frequency Control Link That Permits
Operating Electrical Devices In A Building From
A Transmitter In A Vehicle

MODEL# 091-133

CAUTION: ANY CHANGE MADE BY THE USER TO
THIS EQUIPMENT WITHOUT THE WRITTEN
APPROVAL OF KUSSMAUL ELECTRONICS CO INC
COULD VOID THE USERS AUTHORITY TO
OPERATE THIS EQUIPMENT

INPUT, RECEIVER: 120VOLTS, 50/60 Hz AC
TRANSMITTER: 12 VOLTS DC
OUTPUT: RELAY CONTACT CLOSURE. N.O., 2 AMPS

3 YEAR WARRANTY



KUSSMAUL ELECTRONICS COMPANY, INC.
170 CHERRY AVENUE, WEST SAYVILLE, NY 11796, TEL: 631-567-0314, 800-346-0857, FAX: 631-567-5826

INTRODUCTION

The Model 091-133 418 MHz Transmitter/Receiver is a remote control system between a vehicle and a building. It is intended to operate various electrical devices in the building when signaled to do so from the vehicle. The Transmitter is installed in the vehicle above the dash and near the windshield. The receiver is installed on a shelf or on a wall, away from large metallic surfaces. The transmitter and receiver have four proprietary channels; channels 6, 7, 8, & 9. Channel 9 is dedicated to automatically producing a 1 second closed contact at the receiver channel 9 output upon the ignition switch being turned on. This is intended to actuate the Fan Controller in the building. The other three channels could be used to open the door, close the door, or stop door movement. The other three channels are operated by a momentary push button switch mounted on the dashboard by the installer.

Each Transmitter and Receiver can be coded using a DIP switch mounted on each unit. In this way any number of proprietary channels can be implemented.

The Transmitter is of such low power that a license is not required to operate it, and it has a range of 150 feet to the receiver. For single receiver systems; each truck can have a transmitter which will communicate with the single receiver. For multiple Receiver systems each Receiver will be assigned a code. A given Transmitter will only communicate with a receiver if it has the code as that receiver. Dip switches on the Receiver and Transmitter code the Transmitter and Receiver. Thirty-two different codes are possible.

INSTALLATION & WIRING

Mount the transmitter on the top of the dash, facing the windshield with the antenna vertical.

Mount the receiver at a convenient location in the firehouse. It may be shelf mounted on its base or wall mounted using a bracket. The antenna shall be vertical. Be sure that there are not any metallic barriers between each transmitter and the receiver.

Make the connections shown in Figure 1.

Figure 2 shows the mounting dimensions for each unit.

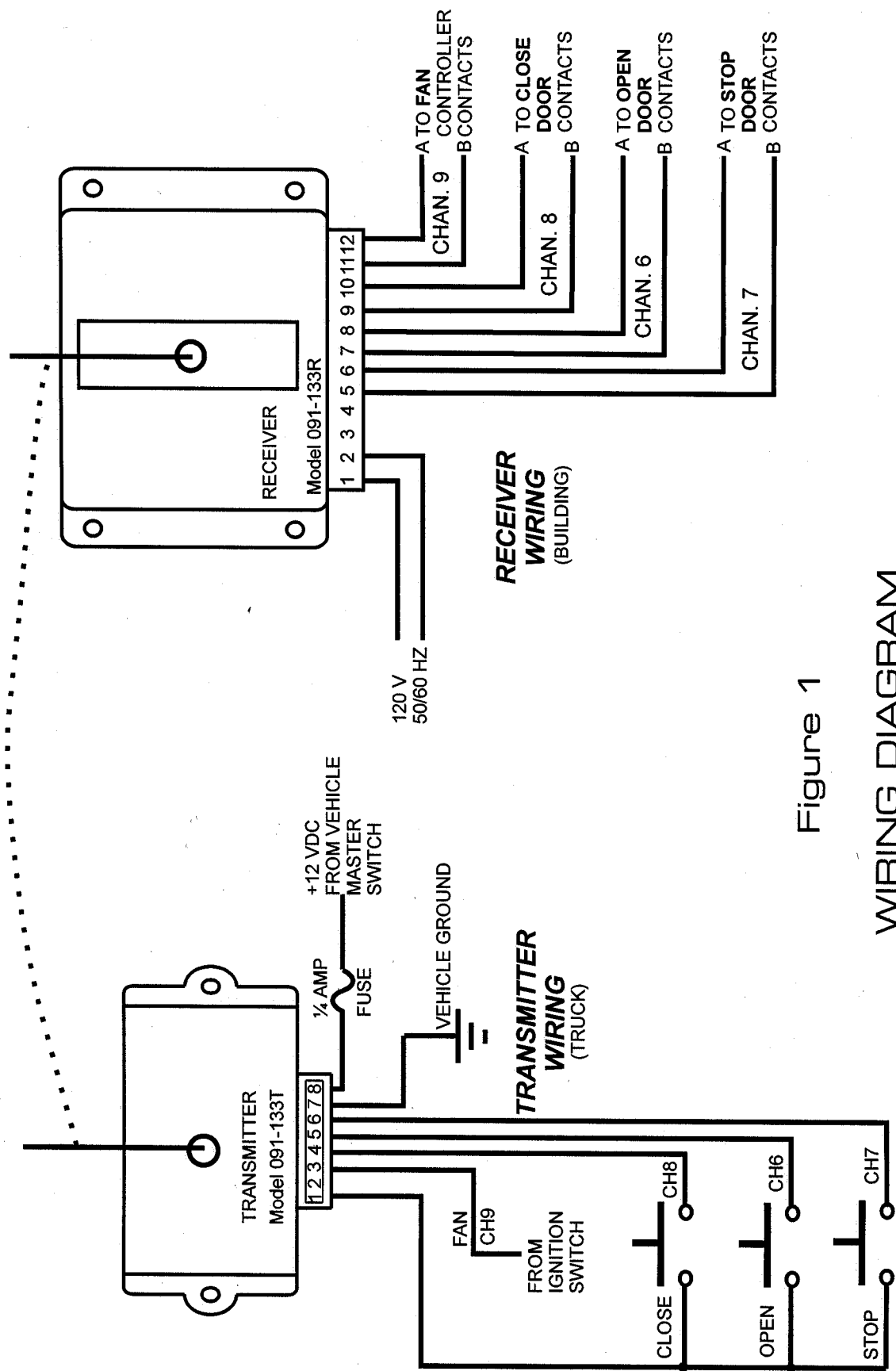


Figure 1
WIRING DIAGRAM

SPECIFICATION AND OUTLINE

Operating Frequency: 418 MHz

Transmitter Main Input Power: 12 volts D.C. battery.

Transmitter Current Draw: Less than 15 milliamperes D.C..

Number of Transmitter independent (or proprietary) Channels: 4

Number of possible Transmitter Codes: 32

Receiver Main Input Power: 115 volts, 60 Hertz

Receiver AC Current Draw: 15 milliamperes AC

Number of Receiver independent (or proprietary) Channels: 4

Number of Possible Receiver Codes: 32

Range of Transmission (between Transmitter & Receiver): 150 feet typical

Temperature Environment: 0 to 50 degrees C.

Outline Drawing: Refer to Figure 2



1. Product Name

AIRVAC 911® Engine Exhaust Removal System

2. Manufacturer

Air Vacuum Corporation
 6 Faraday Drive, Unit 2
 Dover, NH 03820
 Phone: 603-743-4332, 800-540-7264
 Fax: 603-743-3111
 Email: sales@airvacuumcorporation.com
 Web: www.airvac911.com

3. Product Description

Basic Use

AIRVAC 911® is a fully-automated, self-contained, hoseless system used to remove engine exhaust from indoor parking areas of public safety buildings. Manufactured and distributed directly since 1994 by Air Vacuum Corporation, the AIRVAC 911 system requires no hose connections, no structural modifications, and no exhausting to the outdoors. Ceiling hung, the system automatically removes harmful diesel or gasoline fumes and particulates, as well as hazardous backwash, without interference to daily operations.

The AIRVAC 911 system meets NFPA 1500, OSHA, IBOCA, EPA and GSA standards.

Composition and Materials

AIRVAC 911 is a self-contained unit enclosed in 16 or 18 gauge cold-rolled steel. The unit has four-sided adjustable discharge grills that maintain the 360-degree clean air output.

A standard AIRVAC 911 is equipped with a 3/4 HP, 60 Hz, 115/208-230 volt, single-phase motor. It includes a 4-stage filter pack:

- Stage 1 pre-filter: 3-ply polyester and heavy-gauge wire frame
- Stage 2 main media filter: HEPA Max 3000 filter and galvanized steel frame assembly
- Stage 3, 4 gas-phase extractor: Multisorb 3000 blended gas phase extractor and 24-gauge metal frame



Units are controlled through a UL® certified AVEC Smart Timer Panel (AVEC -2C, -4C, -6C, -8C, -10C), which controls multiple units (2, 4, 6, 8, 10 units, respectively).

Vehicle movement and overhead door movement triggers the standard photoelectric eye/door switch combination. Other triggering options are available. General run times are 15–20 minutes per cycle.

System and configuration options are available.

Size

See Table 1.

Color

Industrial, baked, gray powder coat finish

Benefits

- Provides a safe environment for workers and patients
- Eliminates “exhaust backwash” of fumes
- Multi-directional vertical and horizontal airflow cleans air in a uniform pattern
- Fully-adjustable air return vents maximize airflow
- Compact and quiet
- Easy to install and maintain
- Energy efficient — no heating or cooling loss
- Improved response time — nothing to disconnect
- Made in the USA

Table 1 Technical Data**AIRVAC 911**

Cabinet Dimensions	26" wide x 25" deep x 35" high		
Weight	190 lbs with filtration; 135 lbs without filtration		
Construction	18 and 16 gauge steel		
Filters	Stage 1	Stage 2	Stage 3, 4
Type	Pre-filter	Main media HEPA 3000	Gas-phase extractor, Multisorb 3000
Size	24" x 24" x 1"	24" x 24" x 6"	24" x 24" x 4"
Testing	--	UL/ULC classified; Class 2 filter ASHRAE 52.2 tested to MERV 16 (>98% efficiency)	--

Motor

Standard:	3/4 HP	115 Volt	1 Phase	60 Hz	13 FL amps	1.25 SF
Optional:	3/4 HP	208-230 volt	1 Phase	60 Hz	6.3-6.5 0 FL amps	1.25 SF
	3/4 HP	190 volt	3 Phase	50 Hz	3 FL amps	1.15 SF
	3/4 HP	380-415 volt	3 Phase	50 Hz	1.5-1.7 FL amps	1.25 SF
	1 HP	115/208-230 volt	1 Phase	60 Hz	14.7/7.2-7.4 FL amps	1.15 SF
	1 HP	208-230/460 volt	3 Phase	60 Hz	3.4-3.4/1.7 FL amps	1.15 SF

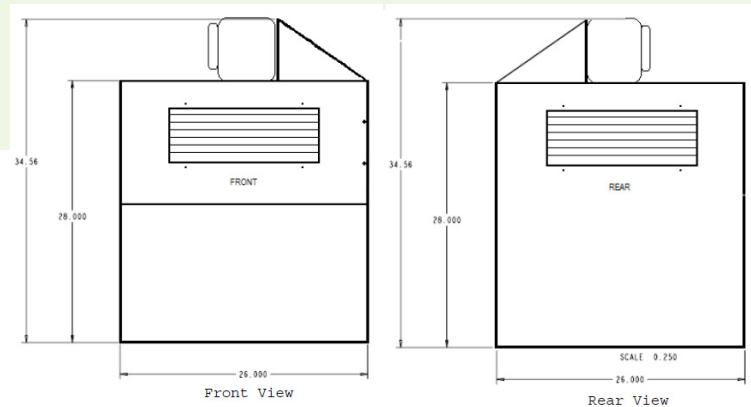
AVEC Smart Timer

Single zone:

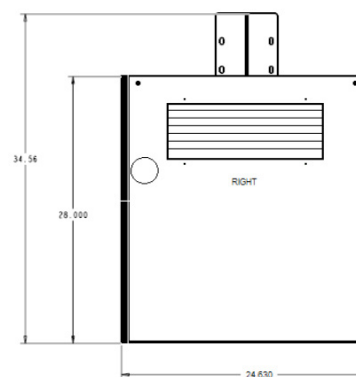
- AVEC-2C (operates 1-2 units)
- AVEC-4C (operates 2-4 units)
- AVEC-6C/T2 (operates 4-6 units with sequential start-up)
- AVEC-8C/T3 (operates 6-8 units with sequential start-up)
- AVEC-10C/T4 (operates 8-10 units with sequential start-up)

Zoned:

- AVEC-4C/Z (2 zone; operates 1-2 units per zone)
- AVEC-6C/Z (4C + 2C)
- AVEC-6C/Z2 (2C + 2C + 2C)
- AVEC-8C/Z (4C + 4C)
- AVEC-8C/T2/Z (6C/T2 + 2C)
- AVEC-8C/Z2 (4C, 2C, 2C)
- AVEC-10C/T2/Z (4C + 4C)
- AVEC-10C/T3/Z (8C/T3 + 2C)
- AVEC-10C/T2/Z2 (6C/T2, 2C, 2C)

**System Activation Devices**

Standard	Magnetic door switch (one per overhead door) Photoelectric eyes (detect vehicle movement)
Optional	Manual push button Spring wound timer Vehicle ignition wireless transmitter and receiver Standalone CO sensor 24V Standalone CO sensor 120V CO and NO ² combo sensor 24V CO and NO ² combo sensor 120V Tone alert activation



4. Technical Data

Applicable Standards

American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

- ASHRAE 52.2 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size

National Fire Protection Association (NFPA)

- NFPA 1500 Standard on Fire Department Occupational Safety and Health Program, 2013 Edition

Underwriters Laboratories, Inc. (UL)

- UL 508 Standard for Industrial Control Panels
- UL 900 Standard Method of Fire Tests for Air Filter Units

Underwriters Laboratories of Canada (ULC)

- ULC/CAN S111 Standard Method of Fire Tests for Air Filter Units

Approvals

Stage 2 filter

- UL Classified by Underwriters Laboratory, Inc.
- ULC Classified by Underwriters Laboratories of Canada

AVEC Smart Timer control panel

- UL 508 certified

Performance

Installed in accordance with the manufacturer's instructions, the AIRVAC 911 system meets NFPA 1500, OSHA, IBOCA, EPA and GSA standards.

AmerSeal filters are UL and CUL classified to UL Standard 900 and ULC/CAN S111.

Physical & Technical properties

See Table 1.

5. Installation

Preparatory Work

AIRVAC 911 does not require structural changes to the building or vehicle tailpipe, exhausting to outdoors or manual connections. Consult an AIRVAC 911 representative for preparatory electrical requirements on new building construction.

Methods

Installation is performed by an AIRVAC 911 technician or local licensed electrician. Units are ceiling hung via chain or threaded rod and mounted between bays to eliminate interference with vehicle movement. Power is supplied to each unit location from the building's main electrical panel through the AVEC Smart Timer. Low Voltage connections are necessary for the activation devices.

Building Codes

Installation must comply with the requirements of all applicable local, state and federal code jurisdictions.

Precautions

For installation safety, Stage 2 total weight should not exceed 16 lbs.; total unit weight should not exceed 190 lbs. Stage 3 and 4 filters should not exceed 28 lbs. Allow airflow to incorporate a vertical and horizontal airflow pattern.

6. Availability and Cost

AIRVAC 911 is distributed globally by Air Vacuum Corporation. Contact Air Vacuum Corporation for availability and cost information.

7. Warranty

The AIRVAC 911 Engine Exhaust Removal System comes with a five-year warranty on all unit components excluding consumable filters. Contact Air Vacuum Corporation for details.

8. Maintenance

Filter life expectancy is dependent upon station activity. Consult Air Vacuum Corporation for a detailed estimate. The filter gauge on the unit indicates filter load.

General life expectancy:

- Stage 1 prefilter: 1–6 months
- Main filters (Stages 2-4): 12–24+ months

9. Technical Services

Technical assistance, including detailed information, product literature, test results, project lists, assistance in preparing project specification or installation supervision is available by contacting Air Vacuum Corporation.

For questions about specifications, code regulations, product usage or product installation, visit Air Vacuum Corporation website: www.airvac911.com.

10. Filing Systems

- CMD
- Additional product information is available from Air Vacuum Corporation upon request

Air Vacuum Corporation



Air Vacuum Corporation
6 Faraday Dr.; Unit 2
Dover, NH 03820
Phone: 800-540-7264
Phone: 603-743-4332
Fax: 603-743-3111

Email: sales@airvacuumcorporation.com

Website: www.airvac911.com

This Manu-Spec® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat*™, *SectionFormat*™ and *PageFormat*™. A Manu-Spec is a manufacturer-specific product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate product model numbers, styles and types are used in Specifier Notes and in the specification text Article titled "Acceptable Material." Metric conversion, where used, is soft metric conversion.

This Manu-Spec specifies an engine exhaust removal system manufactured by Air Vacuum Corporation. Revise Manu-Spec section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

SECTION 23 35 16 ENGINE EXHAUST SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: This Section specifies an engine exhaust removal system.

Specifier Note: Revise Paragraph below to suit project requirements. Add section numbers and titles per CSI *MasterFormat* and specifiers practice.

- B. Related Requirements:

Specifier Note: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the Subparagraph below. Do not include Division 00 documents or Division 01 sections as it is assumed that all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution as referencing them may cause them to be considered part of the Contract.

1. Division 26 – Electrical for power wiring.
2. [].

1.02 REFERENCES

Specifier Note: Define terms that are unique to this Section and are not provided elsewhere in the contract documents. Include in this Article terms that are unique to the work result specified that may not be commonly known in the construction industry.

- A. Definitions:

1. Exhaust Backwash: Exhaust fumes that re-enter the building as vehicles leave and return.
2. High-Efficiency Particulate Arrestance (HEPA): Type of air filter that removes at least 99.97 percent of airborne particles down to 0.00012 inch (0.3 µm) in diameter at a pressure drop around 0.0435 psi (300 Pa) at normal air flow rate.
3. Minimum Efficiency Reporting Value (MERV): Rating system from 1 to 20 for the effectiveness of air filters, with 20 being the best.

Specifier Note: Paragraph below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References Paragraph when specifying products and installation by an industry reference standard. List retained standard(s) referenced in this section alphabetically. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Contract Conditions Section 01 42 00 - References may establish the edition date of standards. This Paragraph does not require compliance with standard(s). It is a listing of all references used in this section. Only include here standards referenced in the body of the specification in Parts 1, 2 and/or 3. Do not include references to building codes at any level.

B. Reference Standards:

1. American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE):
 - a. ANSI/ASHRAE Standard 52.2-2012 – Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size (ANSI Approved).
2. Underwriters Laboratories Inc. (UL):
 - a. UL 508A – Standard for Industrial Control Panels.
 - b. UL 900 – Standard for Air Filter Units.
3. Underwriters Laboratories of Canada. (ULC):
 - a. ULC/CAN S111 – Standard Method of Fire Tests for Air Filter Units.
4. National Fire Protection Association (NFPA)
 - a. NFPA 1500 – Standard on Fire Department Occupational Safety and Health Program, 2013
5. [].

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Contract Conditions and Section 01 33 00 - Submittal Procedures.

1.03 SUBMITTALS

A. Product Data: Manufacturer's standard specifications and descriptive literature, including:

1. Spec-Data product sheet.
2. Catalog cut-sheets.
3. Wiring diagrams.
4. Sample warranty.
5. [].

Specifier Note: Specify submittals intended to document manufacturer installation, storage and other instructions.

B. Manufacturer's written instructions, including:

1. Delivery, storage and handling.
2. Preparation and installation.
3. Maintenance.
4. [].

Specifier Note: Coordinate Article below with Contract Conditions and with Section 01 78 36 - Warranties.

C. Warranty: Fully executed, issued in [Owner's] name, and registered with manufacturer, including:

1. Manufacturer's [5 year] warranty, from date of substantial completion, covering defects in materials and workmanship, excluding consumable filters.
2. [].

1.04 QUALITY ASSURANCE

A. Installer: Acceptable to the manufacturer, experienced in performing work of this section and specialized in installation of work similar to that required for this project.

B. [].

1.05 DELIVERY, STORAGE & HANDLING

- A. Deliver materials in accordance with manufacturer's written instructions.
- B. Deliver materials in manufacturer's original packaging with identification labels intact.
- C. Store materials protected from exposure to harmful weather conditions and at temperature conditions in accordance with manufacturer's written instructions.

Specifier Note: USGBC's LEED® certification includes credits for the diversion of construction waste from landfill. Diversion can be tracked by either weight or volume, but must be consistent for all materials. Manufacturer may reclaim packaging and delivery materials for recycling.

- D. Remove packaging materials from site and dispose of at appropriate recycling facilities.
- E. ☐.

PART 2 PRODUCTS

Specifier Note: Retain Article below for proprietary method specification. Add product characteristics, performance data, material standards and descriptions as applicable. Use of such phrases "or equal," "approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 ENGINE EXHAUST REMOVAL SYSTEM

Specifier Note: Include in the following Paragraph manufacturer's name, address, phone number, fax number, email address and website URL.

- A. Manufacturer: Air Vacuum Corporation.
 - 1. Contact: P.O. Box 0517; Dover, NH 03821-0517; Phone: 800-540-7264; 603-743-4332; Fax: 603-743-3111; Email: sales@airvacuumcorporation.com; Website: www.airvac911.com.

Specifier Note: Substitution procedures must either be in the Contract Conditions or in Section 01 25 00 - Substitution Procedures. Do not include substitution procedures here.

- 2. Single Source Responsibility: Provide components and materials specified in this section from a single manufacturer.
- 3. Substitutions: No substitutions permitted.

Specifier Note: Include an overall description of the system, assembly, product or material. Include required properties or characteristics that do not obviously belong under other titles. Examples: Configuration, size and color.

- B. Air Vacuum Corporation, AIRVAC 911: Self-contained, fully automatic, recirculating, hoseless system with vertical intake and 360 degree horizontal clean air output; designed to remove hazardous gases and particulate from indoor vehicle parking bays and eliminate exhaust backwash in accordance with ANSI/ASHRAE 52.2, UL 508A, UL 900, ULC/CAN S111 and NFPA 1500.
 - 1. Description: [Single] [Multiple] zone system with total number of [2] [4] [6] [8] [10] ☐ units, [as shown on drawings] [as detailed] ☐.
 - 2. Components:
 - a. Cabinet body: Includes 4 pre-drilled mounting holes and 4 2 inch × 2 inch × 3/16 inch (51 mm × 51 mm × 4.8 mm) thick mounting angles for chain suspension or threaded-rod hangers; 8 feet (2438 mm) 3-prong, 14 gauge pre-molded electrical cord; 4 adjustable airflow grilles; 2 hinged access panels with 1 panel on top for access to motor blower unit and 1 panel on bottom for access to filter compartment; automated filter replacement gauge and electrical connection box.
 - 1) Material and finish: [16] [18] gauge steel with gray powder coat finish.
 - 2) Cabinet height: 28 inch (711 mm).
 - 3) Overall height: 34 9/16 inch (878 mm).
 - 4) Width: 26 inch (660 mm).

- 5) Depth: 24 5/8 inch (626 mm).
- 6) Weight: 190 lb (86 kg) with filter material; 135 lb (61 kg) without filter material.
- b. Filters:
 - 1) Pre-Filter: 24 inch × 24 inch × 1 inch (610 mm × 610 mm × 25 mm); 3 ply polyester construction; self-sealing; meeting requirements for Class 2 in accordance with UL 900 and ULC/CAN S111. Certified efficiency of 30 to 35 percent based on ASHRAE 52.2 test method.
 - 2) Main Media Filter: 24 inch × 24 inch × 6 inch (610 mm × 610 mm × 152 mm); HEPA MAX 3000 high efficiency particulate air filter, with ultra-fine pleated fiberglass media pack; constructed with 24 gauge galvanized metal frame and corrugated aluminum dividers between pleats; meeting requirements for Class 2 in accordance with UL 900 and MERV 16. Certified efficiency of 95 to 99.97 percent based on dioctyl phthalate (DOP) testing with 0.3 micrometer particles. Maximum filter media weight is 16 lb (7.3 kg) for main filter.
 - 3) Gas-Phase Extractor: 24 inch × 24 inch × 4 inch (610 mm × 610 mm × 102 mm) deep; 2-part gas phase extractor with activated carbon filter for removal of heavy weight gases and potassium permanganate filter for removal of light weight gases. Heavy and light weight filters are each constructed with 24 gauge galvanized metal frame and honeycomb containment structure. Maximum filter media weight is 28 lb (12.7 kg) for both gas-phase filters.
- c. Motor-Blower Unit: Dual voltage, ball bearing, resilient mounted, capacitor start, thermally protected, UL approved electric motor; with plastic chemical resistant, back curved, 14 inch × 7 33/64 inch (356 mm × 191 mm) centrifugal impeller and airflow funnel cone.

Specifier Note: Air Vacuum Corporation provides motors with standard and optional electrical characteristics. Select one of the following.

- 1) [Motor (standard): 3/4 HP, 115/208-230 V, 1 phase, 50-60 Hz, 13/6.3 to 6.5 FLA.] [Motor (optional): 1 HP, 115/208-230, 1 phase, 50-60 Hz, 14.7/7.2-7.4 FLA.] [Motor (optional): 1 HP, 208-230/460 V, 3 phase, 50-60 Hz, 3.2-3.4/1.7 FLA.]

Specifier Note: Specific AVEC model number indicates single or multiple zones and number of units in system. Coordinate with Paragraph 2.01B1.

- d. Automatic Vehicle Exhaust Control System (AVEC), Model []: NEMA 4, 120 V electrical controller designed to operate and sequentially activate exhaust removal units in groups of two, after 15 second delays, until all units are activated, including: adjustable low voltage time delay relay; LED "System Activated" indication light; ON-OFF-AUTO selector, "System Test" switch to activate system for a timed cycle; 120 V to 24 V, 2A low voltage transformer to power system activation devices; meeting UL 508 for industrial enclosed control panels.

Specifier Note: Air Vacuum Corporation offers standard and optional system activation devices. Select system activation devices and combinations of devices from the following.

- e. System Activation Devices:
 - 1) Standard magnetic door switches and photoelectric eye switches.
 - 2) [Manual push buttons].
 - 3) [Spring wound interval timers].
 - 4) [Radio frequency vehicle transmitter].
 - 5) [Standalone carbon monoxide detectors].
 - 6) [Standalone nitrogen dioxide detectors].
 - 7) [Tone activation switches].
- 3. Installation: Ceiling-hung with chain or threaded rod, between vehicle bays [as detailed] []. Power is required to each unit through the AVEC electrical controller. Low-voltage wiring and connections are necessary for activation devices.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that conditions of work previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to installation of engine exhaust removal system.

1. Notify [Architect] of unacceptable conditions upon discovery.
2. Proceed with installation only after unacceptable conditions have been corrected.

B. ☐.

Specifier Note: Specify actions required to prepare the surface, area or site for incorporation of the section's primary products. Describe requirements for exposure or removal of existing assemblies, components, products or materials.

3.02 PREPARATION

Specifier Note: Specify preparatory work required prior to installation/application/erection of primary products.

- A. Prepare work to receive engine exhaust removal system in accordance with manufacturer's written instructions and approved submittals.
- B. ☐.

3.03 INSTALLATION

- A. Install engine exhaust removal system in accordance with manufacturer's written instructions and approved submittals.
- B. Accurately fit, align, securely fasten and install free from distortion or defects.
- C. Test, adjust and balance for proper operation.
- D. Clean, lubricate and adjust moving parts.
- E. ☐.

3.04 CLEANING

- A. Perform daily progress cleaning.
- B. Upon completion, remove surplus materials, rubbish, tools and equipment.
- C. Collect recyclable waste and dispose of at appropriate recycling facilities.
- D. ☐.

Specifier Note: Specify protection methods completed after installation, but prior to acceptance by the owner. Protection of surrounding areas and surfaces during application or installation is included under Part 3, Preparation. Include only statements unique to this Section.

Specifier Note: Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

3.05 PROTECTION

- A. Protect installed product from damage during construction in accordance with manufacturer's written instructions.
- B. Repair or replace adjacent materials damaged by installation of engine exhaust removal system.
- C. ☐.

3.06 MAINTENANCE

- A. Maintain engine exhaust removal system in accordance with manufacturer's instructions [and terms of warranty].
- B. ☐.

END OF SECTION