

500 West Big Beaver Troy, MI 48084 troymi.gov

CITY COUNCIL AGENDA ITEM

0

Date: July 31, 2024

To: Robert J. Bruner, Acting City Manager

- From: Megan Schubert, Assistant City Manager Robert Maleszyk, Chief Financial Officer Dee Ann Irby, Controller Peter Hullinger, Fire Chief Shawn Hugg, Deputy Fire Chief Kurt Bovensiep, Public Works Director Dennis Trantham, Deputy Public Works Director Emily Frontera, Purchasing Manager
- Subject: Bid Waiver and Standard Purchasing Resolution 4: AirVac 911 Exhaust System and Installation at Fire Stations 1, 2, 3, 5, 6 and Budget Amendments (Introduced by: Peter Hullinger, Fire Chief)

<u>History</u>

The NFPA, (National Fire Protection Association), and OSHA have identified that the exhaust carcinogens and particulates from diesel truck exhaust was harming fire fighters in the fire stations. 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. Currently, all 6 fire stations in Troy utilize a vehicle exhaust removal system for every apparatus to limit the exposure to the fire fighters from diesel exhaust. The current systems installed in 5 of our 6 fire stations are in excess of 25 years old, and are essentially at the end of their useful life, requiring a significant number of repairs and annual maintenance to keep them operational. Current exhaust removal systems also require the manual attachment of hoses to each individual exhaust pipe, every time an apparatus pulls into the fire station. If the system is not connected, or connected correctly, it does not provide proper exhaust removal. To facilitate system operation, and hold the hoses to remain attached to the apparatus, suction from a separate air compressor is required. In the event of a compressor malfunction or an air leak within the system and/or piping, the exhaust removal will lose suction and be rendered inoperable.

The AirVac 911 system meets NFPA 1500, OSHA and NIOSH standards, and is differentiated from the legacy installations by not requiring physical attachment to the apparatus, thus removing the firefighter interface and requirement to provide exhaust removal. AirVac 911 utilizes removal and filtration units that hang from the ceiling that will not be attached to any trucks. When the trucks ignition is activated, or the apparatus bay doors open, the units automatically activate and continually filter the air in the bay for a designated time period. Additionally, and unlike the legacy system, as the AirVac 911 system does not require physical attachment to a vehicle for exhaust removal, it provides a total apparatus bay coverage, with further protection against the emissions of regular vehicles and small engine tools which are often operated in the bays.



500 West Big Beaver Troy, MI 48084 troymi.gov

CITY COUNCIL AGENDA ITEM

When Fire Station #4 was designed and built in 2017, significant research was conducted regarding options for exhaust removal, with the primary focus on ease of operation, effectiveness and long-term ownership cost. Research led us to identify and install the AirVac 911 system, which has proven extremely efficient and reliable for the previous 7 years, and is the chosen replacement system to be installed in the remaining five fire stations.

Purchasing

Pricing for the purchase of the AirVac 911 system for Fire Stations 1, 2, 3, 5, 6 has been secured from *AirVac, Air Vacuum Corporation of Dover, NH*, as detailed in quotation package received June 12, 2024 for a total equipment purchase cost of \$152,281. The bid process for the procurement of the AirVac 911 system equipment is waived as *AirVac, Air Vacuum Corporation of Dover, NH* is the sole manufacturer and distributor for this vertical airflow system.

Pricing for the installation of the equipment as well as the associated electrical requirements has been secured from *Shaw Systems of Southfield, MI* through the Oakland County Cooperative Purchasing Program Contract #010460, as detailed in the attached proposals dated July 16, 2024 for an estimated total of \$115,891.

City Council authorized participation in the Cooperative Purchasing Programs on February 5, 2024 (Resolution #2024-02-031-J-5).

<u>Financial</u>

Funds for this project are budgeted and available in the amount of \$250,000 (\$50,000 per Fire Station 1, 2, 3, 5, 6) in the Capital Projects Fund for the Fire Department – Fire Halls Buildings and Improvements Funds for the 2025 fiscal year. The estimated total cost for this project is \$294,989.20, which includes a 10% contingency amount of \$26,817.20 as detailed below.

Fire			10%	Project	Budget		
Station	AirVac	Shaw	Contingency	Total	Amount	Project No	Account
1	\$30,903	\$24,500	\$5,540.30	\$60,943.30	\$50,000	2025C0013	401.336.344.975.055
2	\$24,801	\$18,980	\$4,378.10	\$48,159.10	\$50,000	2025C0014	401.336.344.975.060
3	\$47,373	\$31,251	\$7,862.40	\$86,486.40	\$50,000	2025C0015	401.336.344.975.065
5	\$24,801	\$20,580	\$4,538.10	\$49,919.10	\$50,000	2025C0016	401.336.344.975.075
6	\$24,403	\$20,580	\$4,498.30	\$49,481.30	\$50,000	2025C0017	401.336.344.975.080
Grand Total	\$152.281	\$115.891	\$26.817.20	\$294.989.20	\$250.000.00		

The proposed equipment purchase and installation will require a total budget amendment in the amount of \$45,000 to the Fire Department Buildings and Improvements Capital Fund for the 2025 fiscal year for Project Numbers 2025C0013 and 2025C0015.



500 West Big Beaver Troy, MI 48084 troymi.gov

CITY COUNCIL AGENDA ITEM

Recommendation

City Management recommends that, in the best interest of the City, the bid process be waived and a contract be awarded to *AirVac, Air Vacuum Corporation of Dover, NH*, for the procurement of the AirVac 911 system for the City of Troy Fire Stations for an estimated cost of \$152,281, as detailed in the attached proposal.

City Management recommends that a contract be awarded to *Shaw Systems of Southfield, MI* for the installation of the AirVac 911 equipment and associated electrical requirements for an estimated cost of \$115,891 with a 10% contingency amount of \$26,817, for a total estimated cost of \$142,708 as detailed in the attached proposals and as per the Oakland County Cooperative Purchasing Contract #010460; not to exceed budgetary limitations.

It is also recommended that City Council approve budget amendments to the Fire Department Buildings and Improvements Capital Fund in the amount of \$45,000.



Friday, July 26, 2024

Shawn Hugg Deputy Chief Troy Fire Department 500 W. Big Beaver Rd. Troy, Michigan 48084

Dear Troy,

This letter is to confirm our conversation regarding the availability of the AIRVAC 911® exhaust removal system for Fire & EMS Facilities.

The multi-directional airflow (vertical & horizontal) AIRVAC 911® System is manufactured and distributed solely by the Air Vacuum Corporation of Dover, New Hampshire. To the best of our knowledge there are no other manufacturers within the industry selling or distributing this type of exhaust removal system.

Thank you again for your interest, and please feel free to contact us if you have any additional questions.

Sincerely,

Tom Vitko Regional Sales Manager 800-540-7264 Email: sales@airvacuumcorporation.com



MEETS NFPA 1500 9-1.6, OSHA, NIOSH, FEMA & MORE



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

PROPOSAL – AIRVAC 911® Multi-Directional (Horizontal & Vertical) Air Flow Exhaust Removal System THE SALE OF AIRVAC 911®, ENGINE EXHAUST AIR FILTRATION SYSTEM, BY AIR VACUUM CORPORATION OF DOVER N.H., FOR REMOVAL OF HAZARDOUS EMISSIONS FROM FIRE, RESCUE, TRUCKING, AND OTHER HEAVY EQUIPMENT FLOOR AREAS.

THIS QUOTATION HAS BEEN PREPARED FOR:



7/8/2024

Deputy Chief, Shawn Hugg Troy Fire Department 1,2,3,5&6 4693 Rochester Road Troy, MI 48084

SPECIFICATIONS

MODEL: AIRVAC 911®, VERTICAL AIR FLOW DESIGN, CEILING HUNG, RE-CIRCULATING AIR FILTRATION SYSTEM. MANUFACTURED BY: AIR VACUUM CORPORATION, 32 NADEAU DRIVE, ROCHESTER NH 03867.

FILTRATION: "4-STAGE" FILTER PACK. ALL FILTERS ARE INDUSTRY STANDARD SIZED, UL TESTED & CERTIFIED.

PRE-FILTER (STAGE 1): 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. MERV 8. 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.

MAIN MEDIA FILTER (STAGE 2): 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 UP TO 95% 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. CLASSIFFIED 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.

GAS-PHASE EXTRACTOR (STAGES 3&4): 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*). FILTER IS CONSTRUCTED WITHIN A 24ga METAL FRAME WITH INTERNAL "HONEYCOMB" CONTAINMENT STRUCTURE. 50/50 BLEND EQUATES TO 28+/- LBS OF CARBON. FOR INSTALLATION SAFETY, TOTAL WEIGHT NOT TO EXCEED 30 LBS.

CABINET CONSTRUCTION: 18 & 16 GAUGE, ALL WELDED STEEL CONSTRUCTION. 25" X 26" X 28" CUSTOM GRAY POWDER COAT PAINT FINISH. <u>TWO HINGED ACCESS PANELS</u>: ONE, TO THE FILTER BANK AND THE OTHER TO THE MOTOR/BLOWER UNIT. A "DWYER" MAGNEHELIC STATIC PRESSURE GAGE, ALLOWS USER TO VISUALLY CHECK ON THE STATUS OF THE FILTER BANK. FOUR HORIZONTAL & ADJUSTABLE AIRFLOW GRILLS. "QUICK LATCH" FILTER COMPARTMENT WHICH IS CAPABLE OF HOLDING UP TO 15" OF FILTRATION!

ELECTRICAL: 3/4 H.P., 1725 RPM, 115 VOLT SINGLE PHASE ELECTRIC MOTOR, 13.6 F.L. AMP., RESILIENT MOUNT, AUTOMATIC THERMAL PROTECTION. ELECTRIC MOTOR, RESILIENT MOUNT. ALL MOTORS ARE UL APPROVED. <u>OPTIONS</u>: UNITS AVAILABLE @ 230 VOLT, SINGLE PHASE, 6.8 F.L. AMP, ADD \$75 EA. UNIT, SINGLE PHASE MOTOR USABLE @ 208-230 VOLT. 7.0 F.L. AMP. ADD \$115 EA UNIT, THREE PHASE 1 HP-@ 208-230/460 Volt, 3.4 -3.6/1.8 F.L. AMPS, ADD \$255 EA. UNIT; TO BASE QUOTE.

BLOWER: CONTINENTAL CENTRIFUGAL IMPELLER AND FUNNEL CONE. NON-METAL & CHEMICALLY RESISTANT.

AVEC CONTROL PANEL: UL 508 CERTIFIED CUSTOM "AUTOMATIC VEHICLE EXHAUST CONTROL", MULTI-CIRCUIT AUTOMATIC RESET TIMER CONTROL. TWO CIRCUIT CONFIGURATIONS RATED AT 20 AMPS PER. TIMING RANGE OF .1 TO 120 MIN. ENCLOSED WITHIN A NEMA-4 RATED ENCLOSURE, NECESSARY FOR APPLICATIONS WHERE WATER IS PRESENT (WASHING OF VEHICLES). MANUAL THREE POSITION SWITCH FOR: AUTO MODE, SYSTEM OFF & SYSTEM RUN OVERRIDE. LED "OPERATING" LIGHT.

AUTOMATIC ACTIVATION SWITCHES: (SEE ENCLOSURES) PHOTO ELECTRIC EYES ACTIVATE SYSTEM UPON VEHICLE MOVEMENT (OUTDOOR RANGES OF UP TO 200') VEHICLE IGNITION TRANSMITTER/RECEIVER AND MAGNETIC DOOR SWITCHES (ONE PER OVERHEAD DOOR).



PRICE QUOTATION – STATION #1 V2

Deputy Chief Shawn Hugg	DATE: 7/8/2024
Troy Fire Department 1,2,3,5&6	PHONE: 248-524-3422
4693 Rochester Road,	FAX: 248-524-1770
Troy, MI 48084	Shawn.Hugg@Troymi.Gov

DESCRIPTION	QUANTITY	UNIT COST	TOTALS
AIRVAC 911® EXHAUST REMOVAL SYSTEM - Single Ph. 115V	5	\$4,450.00	\$22,250.00
AIRVAC 911® FILTER PACK (4-Stage Filter Pack, "Main Filters")	5	\$490.00	\$2,450.00
AIRVAC 911® FILTER GAUGE (Min. one per building section)	1	\$149.00	\$149.00
UL 508A CERTIFIED CONTROL PANEL - AVEC-6C/T2	1	\$1,598.00	\$1,598.00
N505AUTM/STX01 TRACK MOUNTED DOOR SWITCH	6	\$56.00	\$336.00
Kussmaul Radio Frequency Transmitter #091-133-T	5	\$286.00	\$1,430.00
Kussmaul Radio Frequency Receiver #091-133-R	1	\$464.00	\$464.00
PREFILTERS (12 Per Box/Change date est. indicated below)	1	\$126.00	\$126.00
*ESTIMATED SHIPPING AND HANDLING	5	\$325.00	\$1,625.00
*"Non-Schedule Item"			\$30,428.00

OPTIONAL

AGSCOiS-PSA - 24V AC/DC Carbon Monoxide Detector 1 \$475.00

\$475.00

MADE IN THE USA

• FREIGHT: FOB Origin, • TERMS: 1/2 Payment with the order & final payment prior to release. • Lead-Time 10 to 16 weeks.

Buyer is responsible for obtaining all permits, permit fees, State/local licensing fees and applicable taxes related to the purchase of product, shipping and installation or must provide all necessary tax-exempt certificates; state, local and/or county to Air Vacuum Corporation.
 Please contact your sales rep for installation information and pricing.
 Governmental Purchases please consult your sales rep for GSA price list.

The AIRVAC 911[™] System is Provided With a FIVE YEAR WARRANTY On ALL Components (excluding consumable filters)

SEE DIAGRAM FOR RECOMMENDED AIRVAC 911 UNIT LOCATIONS

Approximate Filter Life Expectancy

Prefilters 2-4 months, Main filters 12 to 24 months.



PRICE QUOTATION – STATION #2 V2

Deputy Chief Shawn Hugg	DATE: 7/8/2024
Troy Fire Department 1,2,3,5&6	PHONE: 248-524-3422
4693 Rochester Road,	FAX: 248-524-1770
Troy, MI 48084	Shawn.Hugg@Troymi.Gov

DESCRIPTION	QUANTITY	UNIT COST	TOTALS
AIRVAC 911® EXHAUST REMOVAL SYSTEM - Single Ph. 115V	4	\$4,450.00	\$17,800.00
AIRVAC 911® FILTER PACK (4-Stage Filter Pack, "Main Filters")	4	\$490.00	\$1,960.00
AIRVAC 911® FILTER GAUGE (Min. one per building section)	1	\$149.00	\$149.00
UL 508A CERTIFIED CONTROL PANEL - AVEC-4C	1	\$1,333.00	\$1,333.00
N505AUTM/STX01 TRACK MOUNTED DOOR SWITCH	6	\$56.00	\$336.00
Kussmaul Radio Frequency Transmitter #091-133-T	3	\$286.00	\$858.00
Kussmaul Radio Frequency Receiver #091-133-R	1	\$464.00	\$464.00
PREFILTERS (12 Per Box/Change date est. indicated below)	1	\$126.00	\$126.00
*ESTIMATED SHIPPING AND HANDLING	4	\$325.00	\$1,300.00
*"Non-Schedule Item"			\$24,326.00

MADE IN THE USA

OPTIONAL			
AGSCOiS-PSA - 24V AC/DC Carbon Monoxide Detector	1	\$475.00	\$475.00

◆ *FREIGHT: FOB Origin*, ◆ **TERMS:** 1/2 Payment with the order & final payment prior to release. ◆ *Lead-Time 10 to 16 weeks*.

Buyer is responsible for obtaining all permits, permit fees, State/local licensing fees and applicable taxes related to the purchase of product, shipping and installation or must provide all necessary tax-exempt certificates; state, local and/or county to Air Vacuum Corporation.
 Please contact your sales rep for installation information and pricing.
 Governmental Purchases please consult your sales rep for GSA price list.

The AIRVAC 911[™] System is Provided With a FIVE YEAR WARRANTY On ALL Components (excluding consumable filters)

SEE DIAGRAM FOR RECOMMENDED AIRVAC 911 UNIT LOCATIONS

Approximate Filter Life Expectancy

Prefilters 2-4 months, Main filters 12 to 24 months.



PRICE QUOTATION – STATION #3 V2

Deputy Chief Shawn Hugg	DATE: 7/8/2024
Troy Fire Department 1,2,3,5&6	PHONE: 248-524-3422
4693 Rochester Road,	FAX: 248-524-1770
Troy, MI 48084	Shawn.Hugg@Troymi.Gov

DESCRIPTION	QUANTITY	UNIT COST	TOTALS
AIRVAC 911® EXHAUST REMOVAL SYSTEM - Single Ph. 115V	8	\$4,450.00	\$35,600.00
AIRVAC 911® FILTER PACK (4-Stage Filter Pack, "Main Filters")	8	\$490.00	\$3,920.00
AIRVAC 911® FILTER GAUGE (Min. one per building section)	1	\$149.00	\$149.00
UL 508A CERTIFIED CONTROL PANEL - AVEC-8C/T3	1	\$1,875.00	\$1,875.00
N505AUTM/STX01 TRACK MOUNTED DOOR SWITCH	8	\$56.00	\$448.00
Kussmaul Radio Frequency Transmitter #091-133-T	6	\$286.00	\$1,716.00
Kussmaul Radio Frequency Receiver #091-133-R	1	\$464.00	\$464.00
PREFILTERS (12 Per Box/Change date est. indicated below)	1	\$126.00	\$126.00
*ESTIMATED SHIPPING AND HANDLING	8	\$325.00	\$2,600.00
*"Non-Schedule Item"			\$46,898.00

MADE IN THE USA

OPTIONAL				
AGSCOiS-PSA - 24V AC/DC Carbon Monox	cide Detector	1	\$475.00	\$475.00

FREIGHT: FOB Origin, • TERMS: 1/2 Payment with the order & final payment prior to release. • Lead-Time 10 to 16 weeks.
 Buyer is responsible for obtaining all permits, permit fees, State/local licensing fees and applicable taxes related to the purchase of product,

shipping and installation or must provide all necessary tax-exempt certificates; state, local and/or county to Air Vacuum Corporation.

Please contact your sales rep for installation information and pricing.

Governmental Purchases please consult your sales rep for GSA price list.

The AIRVAC 911[™] System is Provided With a FIVE YEAR WARRANTY On ALL Components (excluding consumable filters)

SEE DIAGRAM FOR RECOMMENDED AIRVAC 911 UNIT LOCATIONS

Approximate Filter Life Expectancy

Prefilters 2-4 months, Main filters 12 to 24 months.



PRICE QUOTATION – STATION #5 V2

Deputy Chief Shawn Hugg	DATE: 7/8/2024
Troy Fire Department 1,2,3,5&6	PHONE: 248-524-3422
4693 Rochester Road,	FAX: 248-524-1770
Troy, MI 48084	Shawn.Hugg@Troymi.Gov

DESCRIPTION	QUANTITY	UNIT COST	TOTALS
AIRVAC 911® EXHAUST REMOVAL SYSTEM - Single Ph. 115V	4	\$4,450.00	\$17,800.00
AIRVAC 911® FILTER PACK (4-Stage Filter Pack, "Main Filters")	4	\$490.00	\$1,960.00
AIRVAC 911® FILTER GAUGE (Min. one per building section)	1	\$149.00	\$149.00
UL 508A CERTIFIED CONTROL PANEL - AVEC-4C	1	\$1,333.00	\$1,333.00
N505AUTM/STX01 TRACK MOUNTED DOOR SWITCH	6	\$56.00	\$336.00
Kussmaul Radio Frequency Transmitter #091-133-T	3	\$286.00	\$858.00
Kussmaul Radio Frequency Receiver #091-133-R	1	\$464.00	\$464.00
PREFILTERS (12 Per Box/Change date est. indicated below)	1	\$126.00	\$126.00
*ESTIMATED SHIPPING AND HANDLING	4	\$325.00	\$1,300.00
*"Non-Schedule Item"			\$24,326.00

MADE IN THE USA

OPTIONAL			
AGSCOiS-PSA - 24V AC/DC Carbon Monoxide Detector	1	\$475.00	\$475.00

◆ *FREIGHT: FOB Origin,* ◆ **TERMS:** 1/2 Payment with the order & final payment prior to release. ◆ *Lead-Time 10 to 16 weeks.*

Buyer is responsible for obtaining all permits, permit fees, State/local licensing fees and applicable taxes related to the purchase of product, shipping and installation or must provide all necessary tax-exempt certificates; state, local and/or county to Air Vacuum Corporation.
 Please contact your sales rep for installation information and pricing.
 Governmental Purchases please consult your sales rep for GSA price list.

The AIRVAC 911[™] System is Provided With a FIVE YEAR WARRANTY On ALL Components (excluding consumable filters)

SEE DIAGRAM FOR RECOMMENDED AIRVAC 911 UNIT LOCATIONS

Approximate Filter Life Expectancy

Prefilters 2-4 months, Main filters 12 to 24 months.



OPTIONAL

PRICE QUOTATION – STATION #6 V2

Deputy Chief Shawn Hugg Troy Fire Department 1 2 3 5 & 6	DATE: 7/8/2024 PHONE: 248-524-3422
4693 Rochester Road,	FAX: 248-524-1770
Troy, MI 48084	Shawn.Hugg@Troymi.Gov

DESCRIPTION	QUANTITY	UNIT COST	TOTALS
AIRVAC 911® EXHAUST REMOVAL SYSTEM - Single Ph. 115V	4	\$4,450.00	\$17,800.00
AIRVAC 911® FILTER PACK (4-Stage Filter Pack, "Main Filters")	4	\$490.00	\$1,960.00
AIRVAC 911® FILTER GAUGE (Min. one per building section)	1	\$149.00	\$149.00
UL 508A CERTIFIED CONTROL PANEL - AVEC-4C	1	\$1,333.00	\$1,333.00
N505AUTM/STX01 TRACK MOUNTED DOOR SWITCH	4	\$56.00	\$224.00
Kussmaul Radio Frequency Transmitter #091-133-T	2	\$286.00	\$572.00
Kussmaul Radio Frequency Receiver #091-133-R	1	\$464.00	\$464.00
PREFILTERS (12 Per Box/Change date est. indicated below)	1	\$126.00	\$126.00
*ESTIMATED SHIPPING AND HANDLING	4	\$325.00	\$1,300.00
*"Non-Schedule Item"			\$23,928.00

MADE IN THE USA

GSCOiS-PSA - 24V AC/DC Carbon Monoxide Detector	1	\$475.00	\$475.00

◆ FREIGHT: FOB Origin, ◆ TERMS: 1/2 Payment with the order & final payment prior to release. ◆ Lead-Time 10 to 16 weeks.

Buyer is responsible for obtaining all permits, permit fees, State/local licensing fees and applicable taxes related to the purchase of product, shipping and installation or must provide all necessary tax-exempt certificates; state, local and/or county to Air Vacuum Corporation.
 Please contact your sales rep for installation information and pricing.
 Governmental Purchases please consult your sales rep for GSA price list.

The AIRVAC 911[™] System is Provided With a FIVE YEAR WARRANTY On ALL Components (excluding consumable filters)

SEE DIAGRAM FOR RECOMMENDED AIRVAC 911 UNIT LOCATIONS

Approximate Filter Life Expectancy

Prefilters 2-4 months, Main filters 12 to 24 months.



Proposal & Scope of Work

Date: 7/16/2024

TO: Shawn Hugg City of Troy 4695 Rochester Road Troy, MI 48085 Proposal ID: SCOT240716002

FROM: Eric J Peterson PROJECT: COT FS1 AIRVAC Installation

Shaw Service and Maintenance Contacts

Eric Peterson, Service Engineer | Direct (248) 228-2080 | (248)534-7602 | epeterson@shawsi.com

Direct (248) 228-2080 | service@shawsi.com

After Hours Emergency Number

Dispatch

(877) 370-7076

Service Email service@shawsi.com

Included	Excluded		Included	Excluded	
\boxtimes		Sales & Use Tax		\boxtimes	Payment & Performance Bonds
	\boxtimes	Electrical Permit Costs & Fees		\boxtimes	Overtime Costs
	\boxtimes	Fire Division Inspection Fees		\boxtimes	Temperature Controls
	\boxtimes	Building Permit Fees		\boxtimes	Patching &/or repair of holes in walls or floors

This Proposal is based upon Shaw Service & Maintenance's Standard Terms and Conditions (see Page 2) unless otherwise indicated below.

SCOPE OF WORK:

Furnish and install Mounting hardware for (5) Airvac Units

Suspend and install (5) new Airvac Units (provided by other) near locations marked on provided print and agreed upon by COT

Furnish and install conduit and wire to (2) locations as agreed upon for gas monitors (monitors provided by other)

Furnish and install conduit, wire and MC for (5) 20a circuits terminating at duplex receptacles for new Airvac Units

SHAW will rework existing electrical panels to provide a total of (6) 20a circuits on this project

Provide conduit and wire for (1) dedicated 20a circuit for Airvac control unit

Demo existing Plymovent control cabinet on wall, return to COT staff for disposal

Mount new Airvac control cabinet on wall at agreed upon location

Terminate electrical in new control cabinet (control cabinet and necessary electrical/control boards by other)

Furnish and install new conduit, MC and control cabling to rear bay doors Install door contact on rear doors, terminate furnished control cabling to contacts and control boards within control cabinet

Install and terminate provided RF Receiver within control cabinet (RF Transmitter and Receiver provided by other)

SHAW will complete terminations within control cabinet per documented instructions

 Equipment:
 \$909.00

 Material:
 \$4,459.00

 Labor:
 \$19,132.00

 Total Offering Price:
 \$24,500.00

EXCLUSIONS & ASSUMPTIONS:

All work to be performed during normal working hours Monday through Friday.

Airvac Units, Filters, Controller Housing, Control boards, Gas Monitors and all other components of the system to be provided by COT. Shaw will supply conduit, wire, MC, support hardware and other electrical materials to provide a complete installation Startup services and programming by other

Painting of Conduit by other

RF Transmitter installation in vehicles by other

Eric J Peterson



Proposal & Scope of Work

Shaw Service & Maintenance

Standard Terms & Conditions

- 1. Payment terms are monthly progress payments net 30 days due.
- 2. The offering price is valid for 30 days. Shaw Service & Maintenance reserves the right to extend this term without notice.
- 3. Subcontract terms and conditions are subject to review and approval prior to award of a subcontract to Shaw Service & Maintenance.
- 4. Terms are pending approval by Shaw Service & Maintenance credit manager.
- 5. This Proposal is based on the schedule and time durations presented at time of bid. A change in schedule shall constitute a change in scope of work.
- 6. All equipment furnished is F.O.B. shipping points with freight allowed to jobsite.
- 7. The price includes a warranty as specified in the Bid Documents. No other warranty is expressed or implied.

22100 TELEGRAPH RD		RD SOUTHFI	ELD MICHIG	AN 48033
PHONE: 248-228-2000		000	FAX	: 248-228-2080
		www.shaweled	<u>stric.com</u>	
	402FR003S	Version B	03/22/2014	Page 2 of 2

22100 Telegraph Southfield, MI 48033 Phone: (248) 228-2000 Fax: (248) 228-2080

CITY OF TROY BULLETIN BREAKDOWN THROUGH JUNE 30TH, 2026

PROJECT:	CITY OF TROY			SHAW PROJECT #:	SCOT240716002
OUOTE FOR:	SHAWN HUGG			SHAW MMS RFC #:	00012101212
DATED:	7/16/2024			SHAW REVISION #:	0
				SHAW QUOTE DATE:	6/12/2023
DESCRIPTION:	PER PROVIDED SCOPE- FS1 AIRVAC INS	STALLATION			
DI ANG TESHEDI	~!>				
SPECS ISSUED:	11/a "				
SKETCHES ISSUED:	"				
QTY ELEC/TECH DWGS	ISSUED:	0			
MATERIAL	MISC			\$225	
	Conduit, MC, Wire, hardware (Estim	nated)	0	\$2,880	
	Support Hardware (for Airvac Units))	0	\$485	
				\$0	
	MARKUP(INCLUDING USE TAX)	15%		\$539	
	ESCALATION(CONTINGENCY)	8%		\$330	¢4.450
DIRECT INSTALLATION					ַ כּנדּ,דּק
DIRECTINGTALLATION	HOURS @ Straight			\$0	
	16 HOURS @ "	\$ 99.00	FLECTRICIAN	\$1,584	
	132 HOURS @ "	\$ 122.00	SERVICE ELECTRICIAN	\$16,104	
	0 HOURS @ Time & 1/2	<u> </u>		<u> </u> \$0	
	0 HOURS @ "	\$ 129.00	ELECTRICIAN	\$0	
	0 HOURS @ "	\$ 153.00	SERVICE ELECTRICIAN	\$0	
	0 HOURS @ Double	_		\$0	
	0 HOURS @ "	\$ 162.00	ELECTRICIAN	\$0	
	0 HOURS @ "	\$ 189.00	SERVICE ELECTRICIAN	\$0	
SUPERVISION - 8% OF	DIRECT LABOR HOURS (DETAILING, LOG	ISTICS) or PER	RATTACHED SHEETS AS DIRECT LABOR	¢1 444	
		\$ 122.00		\$1, 111	
				\$0	
				90 \$0	
	0 HOURS @ Double			\$0	
	0 HOURS @ "			\$0	
		0%	INCREASE RATES FOR NON DAY SHIFT/FUTURE RATES	\$0	
	LABOR TOTAL				\$19,132
DJE EQUIPMENT - LARG	E OR SPECIAL TOOLING				
	EXCAVATOR/TRENCHING EQUIPME	ENT		\$0 + 150	
	RIGGING / HOISTING / LULL / FOR	RELIFT		\$450	
				\$U ¢75	
	CODING			د بو \$0	
	POWER LOGGER			*~ \$0	
	PERMIT			\$0	
	• •			\$0	
ENGINEERING / DOCUM	IENT MAINTENANCE				
	4 HOURS	\$ 96.00	SERVICE ENGINEER/FIELD DETAIL/SURVEY	\$384	
	0 HOURS	\$ 80.00	BIM COORDINATOR/PLOTS/DWGS	\$0	
	0 HOURS	\$ 65.00	ADMINISTRATIVE ASSISTANT	\$0	
DIRECT JOB EXPENSES	/ SMALL TOOLS / SAFETY / CONSUMMAB	ILES / FIRST A	۱D		
	AS PERCENT @	0.0%	OF LABOR ABOVE TOTAL	\$0	
	OF AS ITEMIZED ON THE DJE CHECKLIS	ST SHEET (Page	e 2 of 2)	\$U	¢000
	DIRECT JUB EXPENSES TOTAL				<u>پەرى</u> ¢24 500
		0%			30-ر-24 \$0
SUBCONTRACTORS					
				\$0	
	x			\$0	
	x			\$0	
	x			\$0	
	SUBCONTRACTOR TOTAL				\$0
DIM DOND / INCUDANC	FEE ON SUBS @	5%			\$0
PLM BUND / INSURANC	ECOSIS				\$U
TOTAL PRICE FOR T	HIS QUOTATION				\$24,500



Proposal & Scope of Work

Date: 7/16/2024

TO: Shawn Hugg City of Troy 4695 Rochester Road Troy, MI 48085 Proposal ID: SCOT240716002-1

FROM: Eric J Peterson PROJECT: COT FS2 AIRVAC Installation

Shaw Service and Maintenance Contacts

Eric Peterson, Service Engineer | Direct (248) 228-2080 | (248)534-7602 | epeterson@shawsi.com

Direct (248) 228-2080 | service@shawsi.com

After Hours Emergency Number

Dispatch

(877) 370-7076

Service Email service@shawsi.com

Included	Excluded		Included	Excluded	
\boxtimes		Sales & Use Tax		\boxtimes	Payment & Performance Bonds
	\boxtimes	Electrical Permit Costs & Fees		\boxtimes	Overtime Costs
	\boxtimes	Fire Division Inspection Fees		\boxtimes	Temperature Controls
	\boxtimes	Building Permit Fees		\boxtimes	Patching &/or repair of holes in walls or floors

This Proposal is based upon Shaw Service & Maintenance's Standard Terms and Conditions (see Page 2) unless otherwise indicated below.

SCOPE OF WORK:

Furnish and install Mounting hardware for (4) Airvac Units

Suspend and install (4) new Airvac Units (provided by other) near locations marked on provided print and agreed upon by COT

Furnish and install conduit and wire to (2) locations as agreed upon for gas monitors (monitors provided by other)

Furnish and install conduit, wire and MC for (4) 20a circuits terminating at duplex receptacles for new Airvac Units

SHAW will rework existing electrical panels to provide a total of (5) 20a circuits on this project

Provide conduit and wire for (1) dedicated 20a circuit for Airvac control unit

Demo existing Plymovent control cabinet on wall, return to COT staff for disposal

Mount new Airvac control cabinet on wall at agreed upon location

Terminate electrical in new control cabinet (control cabinet and necessary electrical/control boards by other)

Furnish and install new conduit, MC and control cabling to rear bay doors Install door contact on rear doors, terminate furnished control cabling to contacts and control boards within control cabinet

Install and terminate provided RF Receiver within control cabinet (RF Transmitter and Receiver provided by other)

SHAW will complete terminations within control cabinet per documented instructions

Equipment: \$909.00 Material: \$3,155.00 Labor: \$14,916.00 **Total Offering Price: \$18,980.00**

EXCLUSIONS & ASSUMPTIONS:

All work to be performed during normal working hours Monday through Friday.

Airvac Units, Filters, Controller Housing, Control boards, Gas Monitors and all other components of the system to be provided by COT. Shaw will supply conduit, wire, MC, support hardware and other electrical materials to provide a complete installation Startup services and programming by other

Painting of Conduit by other

RF Transmitter installation in vehicles by other

Eric J Peterson

Shaw Service & Maintenance

402FR003S	Version B	03/22/2014	Page 1 of 2
		,	· • 5 •



Proposal & Scope of Work

Standard Terms & Conditions

- 1. Payment terms are monthly progress payments net 30 days due.
- 2. The offering price is valid for 30 days. Shaw Service & Maintenance reserves the right to extend this term without notice.
- 3. Subcontract terms and conditions are subject to review and approval prior to award of a subcontract to Shaw Service & Maintenance.
- 4. Terms are pending approval by Shaw Service & Maintenance credit manager.
- 5. This Proposal is based on the schedule and time durations presented at time of bid. A change in schedule shall constitute a change in scope of work.
- 6. All equipment furnished is F.O.B. shipping points with freight allowed to jobsite.
- 7. The price includes a warranty as specified in the Bid Documents. No other warranty is expressed or implied.

22100 TELEGRAPH RD		RD SOUTHFI	ELD MICHIG	GAN 48033
PHONE: 248-228-2000		000	FAX	: 248-228-2080
		www.shawele	<u>ctric.com</u>	
	402FR003S	Version B	03/22/2014	Page 2 of 2

22100 Telegraph Southfield, MI 48033 Phone: (248) 228-2000 Fax: (248) 228-2080

CITY OF TROY BULLETIN BREAKDOWN THROUGH JUNE 30TH, 2026

PROJECT: QUOTE FOR: DATED:	CITY OF TROY SHAWN HUGG 7/16/2024	SHAW PROJECT #: SHAW MMS RFC #: SHAW REVISION #:	SCOT240716002-1
DESCRIPTION:	PER PROVIDED SCOPE- FS2 AIRVAC INSTALLATION	SHAW QUOTE DATE:	6/12/2023
PLANS ISSUED:	n/a		
SPECS. ISSUED:	"		
SKETCHES ISSUED:	n		
QTY ELEC/TECH DWGS	3 ISSUED: 0	¢335	
MATERIAL	MISC Conduite MC Wite Instalues (Estimated)	\$220 ¢1.050	
	Conduit, MC, wire, naruware (csumateu) 0 Support Hardware /for Airvac Units) 0	موريد في \$365	
		\$0	
	MARKUP(INCLUDING USE TAX) 15%	\$381	
	ESCALATION(CONTINGENCY) 8%	\$234	
	MATERIAL TOTAL		\$3,155
DIRECT INSTALLATION	LABOR COST - PER ATTACHED SHEETS		
	0 HOURS @ Straight	\$0	
	16 HOURS @ " \$ 99.00 ELECTRICIAN	\$1,584	
	100 HOURS @ " \$ 122.00 SERVICE ELECTRICIAN		
		\$U ¢0	
		οφ Φ	
		\$0	
	0 HOURS @ " \$ 162.00 ELECTRICIAN	\$0	
	0 HOURS @ " \$ 189.00 SERVICE ELECTRICIAN	\$0	
SUPERVISION - 8% OF	DIRECT LABOR HOURS (DETAILING, LOGISTICS) or PER ATTACHED SHEETS AS DIRECT LABOR		
	9.3 HOURS @ Straight \$ 122.00	\$1,132	
	0 HOURS @ "	\$0	
	0 HOURS @ Time & 1/2	\$0	
	0 HOURS @ "	\$0	
	0 HOURS @ Double	\$0	
	0 HOURS @ "	\$0	
	U% INCREASE RATES FOR NON DAY SHIFT/FUTURE RATES	۶U	\$14,916
DJE EQUIPMENT - LARG	GE OR SPECIAL TOOLING		· · ·
	EXCAVATOR/TRENCHING EQUIPMENT	\$0	
	RIGGING / HOISTING / LULL / FORKLIFT	\$450	
	FLUKE CABLE TESTER	\$0	
	CIRCUIT TRACER	\$75	
	CORING	\$0	
	POWER LOGGER	\$0	
	PERMIT	\$0 ¢0	
		şυ	
ENGINEERING / DOCOR		\$384	
	A HOURS SOUTHER SOUTH SERVICE ENGINEER/FILLD DEFAIL SOUTH	بەرد \$0	
	0 HOURS \$ 65.00 ADMINISTRATIVE ASSISTANT	+~ \$0	
DIRECT JOB EXPENSES	5 / SMALL TOOLS / SAFETY / CONSUMMABLES / FIRST AID	τ =	
	AS PERCENT @ 0.0% OF LABOR ABOVE TOTAL	\$0	
	or AS ITEMIZED ON THE DJE CHECKLIST SHEET (Page 2 of 2)	\$0	
	DIRECT JOB EXPENSES TOTAL		\$909
			\$18,980
	0%		\$0
SUBCONTRACTORS		*0	
	v.	\$U ¢0	
	X	\$U ¢0	
	X	ን ቀበ	
		φυ	\$
	FFF ON SURS @ 5%		\$
PLM BOND / INSURANC			\$(
TOTAL PRICE FOR T			\$18.980
			+==/===



Proposal & Scope of Work

Date: 7/16/2024

TO: Shawn Hugg City of Troy 4695 Rochester Road Troy, MI 48085 Proposal ID: SCOT240716002-2

FROM: Eric J Peterson PROJECT: COT FS3 AIRVAC Installation

Shaw Service and Maintenance Contacts

Eric Peterson, Service Engineer | Direct (248) 228-2080 | (248)534-7602 | epeterson@shawsi.com

Direct (248) 228-2080 | service@shawsi.com

After Hours Emergency Number

Dispatch

(877) 370-7076

Service Email service@shawsi.com

Included	Excluded		Included	Excluded	
\boxtimes		Sales & Use Tax		\boxtimes	Payment & Performance Bonds
	\boxtimes	Electrical Permit Costs & Fees		\boxtimes	Overtime Costs
	\boxtimes	Fire Division Inspection Fees		\boxtimes	Temperature Controls
	\boxtimes	Building Permit Fees		\boxtimes	Patching &/or repair of holes in walls or floors

This Proposal is based upon Shaw Service & Maintenance's Standard Terms and Conditions (see Page 2) unless otherwise indicated below.

SCOPE OF WORK:

Furnish and install Mounting hardware for (8) Airvac Units

Suspend and install (8) new Airvac Units (provided by other) near locations marked on provided print and agreed upon by COT

Furnish and install conduit and wire to (2) locations as agreed upon for gas monitors (monitors provided by other)

Furnish and install conduit, wire and MC for (8) 20a circuits terminating at duplex receptacles for new Airvac Units

SHAW will rework existing electrical panels to provide a total of (9) 20a circuits on this project

Provide conduit and wire for (1) dedicated 20a circuit for Airvac control unit

Demo existing Plymovent control cabinet on wall, return to COT staff for disposal

Mount new Airvac control cabinet on wall at agreed upon location

Terminate electrical in new control cabinet (control cabinet and necessary electrical/control boards by other)

Furnish and install new conduit, MC and control cabling to rear bay doors Install door contact on rear doors, terminate furnished control cabling to contacts and control boards within control cabinet

Install and terminate provided RF Receiver within control cabinet (RF Transmitter and Receiver provided by other)

SHAW will complete terminations within control cabinet per documented instructions

Equipment: \$909.00 Material: \$5,780.00 Labor: \$24,562.00 Total Offering Price: \$31,251.00

EXCLUSIONS & ASSUMPTIONS:

All work to be performed during normal working hours Monday through Friday.

Airvac Units, Filters, Controller Housing, Control boards, Gas Monitors and all other components of the system to be provided by COT. Shaw will supply conduit, wire, MC, support hardware and other electrical materials to provide a complete installation Startup services and programming by other

Painting of Conduit by other

RF Transmitter installation in vehicles by other

Eric J Peterson

Shaw Service & Maintenance

402FR003S	Version B	03/22/2014	Page 1 of 2
10211100000		00) ==, =0 = 1	



Proposal & Scope of Work

Standard Terms & Conditions

- 1. Payment terms are monthly progress payments net 30 days due.
- 2. The offering price is valid for 30 days. Shaw Service & Maintenance reserves the right to extend this term without notice.
- 3. Subcontract terms and conditions are subject to review and approval prior to award of a subcontract to Shaw Service & Maintenance.
- 4. Terms are pending approval by Shaw Service & Maintenance credit manager.
- 5. This Proposal is based on the schedule and time durations presented at time of bid. A change in schedule shall constitute a change in scope of work.
- 6. All equipment furnished is F.O.B. shipping points with freight allowed to jobsite.
- 7. The price includes a warranty as specified in the Bid Documents. No other warranty is expressed or implied.

22100 TELEGRAPH RD		RD SOUTHFI	ELD MICHIG	GAN 48033
PHONE: 248-228-2000		000	FAX	: 248-228-2080
		www.shawele	<u>ctric.com</u>	
	402FR003S	Version B	03/22/2014	Page 2 of 2



22100 Telegraph Southfield, MI 48033 Phone: (248) 228-2000 Fax: (248) 228-2080

CITY OF TROY BULLETIN BREAKDOWN THROUGH JUNE 30TH, 2026

PROJECT:		SHAW PROJECT #:	SCOT240716002
DATED:	7/16/2024	SHAW MMS RFC #:	C
		SHAW QUOTE DATE:	6/12/2023
DESCRIPTION:	PER PROVIDED SCOPE- FS1 AIRVAC INSTALLATION		
	FS3		
PLANS ISSUED:	n/a		
SPECS. ISSUED:	11		
SKETCHES ISSUED:			
MATERIAL	MISC	\$350	
	Conduit, MC, Wire, hardware (Estimated) 0	\$3,340	
	Support Hardware (for Airvac Units) 0	\$964	
		\$0	
	MARKUP(INCLUDING USE TAX) 15%	\$698	
	ESCALATION(CONTINGENCY) 8%	\$428	¢5 780
DIRECT INSTALLATIO	N LABOR COST - PER ATTACHED SHEETS		43,700
	0 HOURS @ Straight	\$0	
	32 HOURS @ " \$ 99.00 ELECTRICIAN	\$3,168	
	160 HOURS @ " \$ 122.00 SERVICE ELECTRICIAN	\$19,520	
	0 HOURS @ Time & 1/2	\$0 \$0	
	0 HOURS @ \$ 123.00 ELECTRICIAN	\$0 \$0	
	0 HOURS @ Double	\$0	
	0 HOURS @ " \$ 162.00 ELECTRICIAN	\$0	
	0 HOURS @ " \$ 189.00 SERVICE ELECTRICIAN	\$0	
SUPERVISION - 8% O	F DIRECT LABOR HOURS (DETAILING, LOGISTICS) or PER ATTACHED SHEETS AS DIRECT LABOR	1.074	
	15.4 HOURS @ Straight \$ 122.00	\$1,8/4	
	0 HOURS @ Time & 1/2	- \$0	
	0 HOURS @ "	\$0	
	0 HOURS @ Double	- \$0	
	0 HOURS @ "	\$0	
	0% INCREASE RATES FOR NON DAY SHIFT/FUTURE RATES	\$0	¢74 567
DJE EOUIPMENT - LAR	RGE OR SPECIAL TOOLING		<i>ψ2 1,502</i>
	EXCAVATOR/TRENCHING EQUIPMENT	\$0	
	RIGGING / HOISTING / LULL / FORKLIFT	\$450	
	FLUKE CABLE TESTER	\$0	
	CIRCUIT TRACER	\$75	
		\$U \$0	
	PERMIT	\$0	
		\$0	
ENGINEERING / DOCU	JMENT MAINTENANCE		
	4 HOURS \$ 96.00 SERVICE ENGINEER/FIELD DETAIL/SURVEY	\$384	
	U HOURS \$ 80.00 BIM COORDINATOR/PLOTS/DWGS	\$U ¢0	
DIRECT JOB EXPENSE	S / SMALL TOOLS / SAFETY / CONSUMMABLES / FIRST AID	şυ	
	AS PERCENT @ 0.0% OF LABOR ABOVE TOTAL	\$0	
	or AS ITEMIZED ON THE DJE CHECKLIST SHEET (Page 2 of 2)	\$0	
	DIRECT JOB EXPENSES TOTAL		\$909
	00/-		\$31,251
SUBCONTRACTORS	070		\$0
		\$0	
	X	\$0	
	x	\$0	
		\$0	
			\$0 ¢0
PLM BOND / INSURAN	NCE COSTS		\$0 \$0
			+04 0=4
I UTAL PRICE FOR	I I I I I I I I I I I I I I I I I I I		\$31,251



Proposal & Scope of Work

Date: 7/16/2024

TO: Shawn Hugg City of Troy 4695 Rochester Road Troy, MI 48085 Proposal ID: SCOT240716002-3

FROM: Eric J Peterson PROJECT: COT FS5 AIRVAC Installation

Shaw Service and Maintenance Contacts

Eric Peterson, Service Engineer | Direct (248) 228-2080 | (248)534-7602 | epeterson@shawsi.com

Direct (248) 228-2080 | service@shawsi.com

After Hours Emergency Number

Dispatch

(877) 370-7076

Service Email service@shawsi.com

Included	Excluded		Included	Excluded	
\boxtimes		Sales & Use Tax		\boxtimes	Payment & Performance Bonds
	\boxtimes	Electrical Permit Costs & Fees		\boxtimes	Overtime Costs
	\boxtimes	Fire Division Inspection Fees		\boxtimes	Temperature Controls
	\boxtimes	Building Permit Fees		\boxtimes	Patching &/or repair of holes in walls or floors

This Proposal is based upon Shaw Service & Maintenance's Standard Terms and Conditions (see Page 2) unless otherwise indicated below.

SCOPE OF WORK:

Furnish and install Mounting hardware for (4) Airvac Units

Suspend and install (4) new Airvac Units (provided by other) near locations marked on provided print and agreed upon by COT

Furnish and install conduit and wire to (2) locations as agreed upon for gas monitors (monitors provided by other)

Furnish and install conduit, wire and MC for (4) 20a circuits terminating at duplex receptacles for new Airvac Units

SHAW will rework existing electrical panels to provide a total of (5) 20a circuits on this project

Provide conduit and wire for (1) dedicated 20a circuit for Airvac control unit

Demo existing Plymovent control cabinet on wall, return to COT staff for disposal

Mount new Airvac control cabinet on wall at agreed upon location

Terminate electrical in new control cabinet (control cabinet and necessary electrical/control boards by other)

Furnish and install new conduit, MC and control cabling to rear bay doors Install door contact on rear doors, terminate furnished control cabling to contacts and control boards within control cabinet

Install and terminate provided RF Receiver within control cabinet (RF Transmitter and Receiver provided by other)

SHAW will complete terminations within control cabinet per documented instructions

 Equipment:
 \$909.00

 Material:
 \$3,701.00

 Labor:
 \$15,970.00

 Total Offering Price:
 \$20,580.00

EXCLUSIONS & ASSUMPTIONS:

All work to be performed during normal working hours Monday through Friday.

Airvac Units, Filters, Controller Housing, Control boards, Gas Monitors and all other components of the system to be provided by COT. Shaw will supply conduit, wire, MC, support hardware and other electrical materials to provide a complete installation Startup services and programming by other

Painting of Conduit by other

RF Transmitter installation in vehicles by other

Eric J Peterson

Shaw Service & Maintenance

402FR003S	Version B	03/22/2014	Page 1 of 2
		,	· • 5 •



Proposal & Scope of Work

Standard Terms & Conditions

- 1. Payment terms are monthly progress payments net 30 days due.
- 2. The offering price is valid for 30 days. Shaw Service & Maintenance reserves the right to extend this term without notice.
- 3. Subcontract terms and conditions are subject to review and approval prior to award of a subcontract to Shaw Service & Maintenance.
- 4. Terms are pending approval by Shaw Service & Maintenance credit manager.
- 5. This Proposal is based on the schedule and time durations presented at time of bid. A change in schedule shall constitute a change in scope of work.
- 6. All equipment furnished is F.O.B. shipping points with freight allowed to jobsite.
- 7. The price includes a warranty as specified in the Bid Documents. No other warranty is expressed or implied.

22100 TELEGRAPH RD		RD SOUTHFI	ELD MICHIG	GAN 48033
PHONE: 248-228-2000		000	FAX	: 248-228-2080
		www.shawele	<u>ctric.com</u>	
	402FR003S	Version B	03/22/2014	Page 2 of 2

22100 Telegraph Southfield, MI 48033 Phone: (248) 228-2000 Fax: (248) 228-2080

CITY OF TROY BULLETIN BREAKDOWN THROUGH JUNE 30TH, 2026

PROJECT: QUOTE FOR: DATED:	CITY OF TROY SHAWN HUGG 7/16/2024	SHAW PROJECT #: SHAW MMS RFC #: SHAW REVISION #:	SCOT240716002-1
DAILD.	7/10/2024	SHAW QUOTE DATE:	6/12/2023
DESCRIPTION:	PER PROVIDED SCOPE- FS5 AIRVAC INSTALLATION		
PLANS ISSUED:	n/a		
SPECS. ISSUED:	" "		
SKETCHES ISSUED:	n		
QTY ELEC/TECH DWGS	3 ISSUED: 0	¢775	
MAIEKIAL	MISU Conduit MC Wire hardware (Estimated)	ع کر \$2.340	
	Support Hardware (for Airvac Units) 0	\$415	
		\$0	
	MARKUP(INCLUDING USE TAX) 15%	\$447	
	ESCALATION(CONTINGENCY) 8%	\$274	¢2 701
DIRECT INSTALLATION	ILABOR COST - PER ATTACHED SHEETS		₽J,/U1
	0 HOURS @ Straight	\$0	
	16 HOURS @ " \$ 99.00 ELECTRICIAN	\$1,584	
	108 HOURS @ \$ 122.00 SERVICE ELECTRICIAN	\$13,176	
	0 HOURS @ Time & 1/2	\$0 ¢0	
	0 HOURS @ " \$ 129.00 ELECTRICIAN 0 HOURS @ " \$ 153.00 SERVICE ELECTRICIAN	ֆՍ \$Ո	
	0 HOURS @ Double	\$0	
	0 HOURS @ " \$ 162.00 ELECTRICIAN	\$0	
	0 HOURS @ " \$ 189.00 SERVICE ELECTRICIAN	\$0	
SUPERVISION - 8% OF	DIRECT LABOR HOURS (DETAILING, LOGISTICS) or PER ATTACHED SHEETS AS DIRECT LABOR	¢1 010	
	9.9 HOURS @ Straight \$ 122.00	\$1,210 \$0	
	0 HOURS @ Time & 1/2	- ⁺⁰ \$0	
	0 HOURS @ "	\$0	
	0 HOURS @ Double	\$0	
	0 HOURS @ "	\$0	
	U% INCREASE RATES FOR NON DAY SHIFT/FUTURE RATES LABOR TOTAL	\$U	\$15,970
DJE EQUIPMENT - LARG	JE OR SPECIAL TOOLING		
	EXCAVATOR/TRENCHING EQUIPMENT	\$0	
	RIGGING / HOISTING / LULL / FORKLIFT	\$450	
	FLUKE CABLE TESTER	\$0 ¢75	
		ېرې \$0	
	POWER LOGGER	\$0	
	PERMIT	\$0	
		\$0	
ENGINEERING / DOCU		¢204	
	4 HOURS \$ 96.00 SERVICE ENGINEER/FIELD DETAIL/SURVET	\$38 4 \$በ	
	0 HOURS \$ 65.00 ADMINISTRATIVE ASSISTANT	↓~ \$0	
DIRECT JOB EXPENSES	/ SMALL TOOLS / SAFETY / CONSUMMABLES / FIRST AID		
	AS PERCENT @ 0.0% OF LABOR ABOVE TOTAL	\$0	
	or AS ITEMIZED ON THE DJE CHECKLIST SHEET (Page 2 of 2)	\$0	+000
	DIRECT JOB EXPENSES TOTAL		\$909 \$20,580
	0%		+ - -, \$0
SUBCONTRACTORS			
		\$0	
	X	\$0	
	X	\$U \$0	
	X SUBCONTRACTOR TOTAL	φυ	\$0
	FEE ON SUBS @ 5%		 \$0
PLM BOND / INSURANC	CE COSTS		\$0
TOTAL PRICE FOR 1	THIS QUOTATION		\$20,580



Proposal & Scope of Work

Date: 7/16/2024

TO: Shawn Hugg City of Troy 4695 Rochester Road Troy, MI 48085 Proposal ID: SCOT240716002-4

FROM: Eric J Peterson PROJECT: COT FS6 AIRVAC Installation

Shaw Service and Maintenance Contacts

Eric Peterson, Service Engineer | Direct (248) 228-2080 | (248)534-7602 | epeterson@shawsi.com

Direct (248) 228-2080 | service@shawsi.com

After Hours Emergency Number

Dispatch

(877) 370-7076

Service Email service@shawsi.com

Included	Excluded		Included	Excluded	
\boxtimes		Sales & Use Tax		\boxtimes	Payment & Performance Bonds
	\boxtimes	Electrical Permit Costs & Fees		\boxtimes	Overtime Costs
	\boxtimes	Fire Division Inspection Fees		\boxtimes	Temperature Controls
	\boxtimes	Building Permit Fees		\boxtimes	Patching &/or repair of holes in walls or floors

This Proposal is based upon Shaw Service & Maintenance's Standard Terms and Conditions (see Page 2) unless otherwise indicated below.

SCOPE OF WORK:

Furnish and install Mounting hardware for (4) Airvac Units

Suspend and install (4) new Airvac Units (provided by other) near locations marked on provided print and agreed upon by COT

Furnish and install conduit and wire to (2) locations as agreed upon for gas monitors (monitors provided by other)

Furnish and install conduit, wire and MC for (4) 20a circuits terminating at duplex receptacles for new Airvac Units

SHAW will rework existing electrical panels to provide a total of (5) 20a circuits on this project

Provide conduit and wire for (1) dedicated 20a circuit for Airvac control unit

Demo existing Plymovent control cabinet on wall, return to COT staff for disposal

Mount new Airvac control cabinet on wall at agreed upon location

Terminate electrical in new control cabinet (control cabinet and necessary electrical/control boards by other)

Furnish and install new conduit, MC and control cabling to rear bay doors Install door contact on rear doors, terminate furnished control cabling to contacts and control boards within control cabinet

Install and terminate provided RF Receiver within control cabinet (RF Transmitter and Receiver provided by other)

SHAW will complete terminations within control cabinet per documented instructions

 Equipment:
 \$909.00

 Material:
 \$3,701.00

 Labor:
 \$15,970.00

 Total Offering Price:
 \$20,580.00

EXCLUSIONS & ASSUMPTIONS:

All work to be performed during normal working hours Monday through Friday.

Airvac Units, Filters, Controller Housing, Control boards, Gas Monitors and all other components of the system to be provided by COT. Shaw will supply conduit, wire, MC, support hardware and other electrical materials to provide a complete installation Startup services and programming by other

Painting of Conduit by other

RF Transmitter installation in vehicles by other

Eric J Peterson

Shaw Service & Maintenance

402FR003S	Version B	03/22/2014	Page 1 of 2
		,	· J · ·



Proposal & Scope of Work

Standard Terms & Conditions

- 1. Payment terms are monthly progress payments net 30 days due.
- 2. The offering price is valid for 30 days. Shaw Service & Maintenance reserves the right to extend this term without notice.
- 3. Subcontract terms and conditions are subject to review and approval prior to award of a subcontract to Shaw Service & Maintenance.
- 4. Terms are pending approval by Shaw Service & Maintenance credit manager.
- 5. This Proposal is based on the schedule and time durations presented at time of bid. A change in schedule shall constitute a change in scope of work.
- 6. All equipment furnished is F.O.B. shipping points with freight allowed to jobsite.
- 7. The price includes a warranty as specified in the Bid Documents. No other warranty is expressed or implied.

22100 TELEGRAPH RD		RD SOUTHFI	ELD MICHIG	GAN 48033
PHONE: 248-228-2000		000	FAX	: 248-228-2080
		www.shawelee	<u>ctric.com</u>	
	402FR003S	Version B	03/22/2014	Page 2 of 2

SHAW	22100 Telegraph Southfield, MI 48033 Phone: (248) 228-2000			CITY OF TROY BULLETIN	BREAKDOWN THROU 2026	GH JUNE 30TH,
	Fax: (248) 228-2080					
PROJECT:	CITY OF TROY				SHAW PROJECT #:	SCOT240716002-1
QUOTE FOR:	SHAWN HUGG				SHAW MMS RFC #:	00012107100021
DATED:	7/16/2024				SHAW REVISION #:	C
					SHAW QUOTE DATE:	6/12/2023
DESCRIPTION:	PER PROVIDED SCOPE- FS6 AIRVAC IN	STALLATION				
PLANS ISSUED:	n/a					
SPECS. ISSUED:	"					
SKETCHES ISSUED:	"					
QTY ELEC/TECH DWGS	S ISSUED:	0				
MATERIAL	MISC				\$225	
	Conduit, MC, Wire, hardware (Estin	nated)		0	\$2,340	
	Support Hardware (for Airvac Units	5)		0	\$415	
		1 504			\$U #447	
	ESCALATION(CONTINGENCY)	15%			۵۹۹ / ¢274	
	MATERIAL TOTAL	0.70				\$3,701
DIRECT INSTALLATION	LABOR COST - PER ATTACHED SHEETS					1-7.01
	0 HOURS @ Straight				\$0	
	16 HOURS @ "	\$ 99.00	ELECTRICIAN		\$1,584	
	108 HOURS @ "	\$ 122.00	SERVICE ELEC	TRICIAN	\$13,176	
	0 HOURS @ Time & 1/2	+ 120.00	EL FOTRIOTAN		\$0 \$0	
		\$ 129.00 ¢ 152.00		TRICIAN	\$U ¢0	
		\$ 155.00	SERVICE ELEC	TRICIAN	\$0\$0	
	0 HOURS @ "	\$ 162.00	ELECTRICIAN		\$0 \$0	
	0 HOURS @ "	\$ 189.00	SERVICE ELEC	TRICIAN	\$0	
SUPERVISION - 8% OF	DIRECT LABOR HOURS (DETAILING, LO	GISTICS) or PE	R ATTACHED SHEE	TS AS DIRECT LABOR		
	9.9 HOURS @ Straight	\$ 122.00			\$1,210	
	0 HOURS @ "				\$0	
	0 HOURS @ Time & 1/2				\$0	
					\$0\$0	
	0 HOURS @ "				\$0	
	· · · · · · ·	0%	INCREASE RATE	S FOR NON DAY SHIFT/FUTURE RATES	\$0	
	LABOR TOTAL					\$15,970
DJE EQUIPMENT - LARG	GE OR SPECIAL TOOLING					
	EXCAVATOR/TRENCHING EQUIPM	ENT			\$0	
		RKLIFT			\$450	
	CIRCUIT TRACER				\$∪ ¢75	
	CORING				\$0	
	POWER LOGGER				\$0	
	PERMIT				\$0	
					\$0	
ENGINEERING / DOCUM	MENT MAINTENANCE					
	4 HOURS	\$ 96.00	SERVICE ENGI	NEER/FIELD DETAIL/SURVEY	\$384	
		\$ 80.00 \$ 65.00		ATUR/PLUIS/DWGS TVF ASSISTANT	\$U ¢0	
DIRECT JOB EXPENSES	/ SMALL TOOLS / SAFETY / CONSUMMA	a 05.00 BLES / FIRST ∆	ID	TTE 43313 (AIT)	şυ	
	AS PERCENT @	0.0%	OF LABOR ABO	OVE TOTAL	\$0	
	or AS ITEMIZED ON THE DJE CHECKL	IST SHEET (Pag	je 2 of 2)		\$0	
	DIRECT JOB EXPENSES TOTAL					\$909
						\$20,580
		0%				\$0
SUBCONTRACTORS					¢0	
	x				ېن ∩¢	
	x				\$0	
	x				\$0	
	SUBCONTRACTOR TOTAL				· · · · · · · · · · · · · · · · · · ·	\$0
	FEE ON SUBS @	5%				\$0
PLM BOND / INSURANC	CE CUSTS					\$0
TOTAL PRICE FOR T	THIS QUOTATION					\$20,580

Specification packs available upon request. Please email or call us at sales@airvacuumcorporation.com TOLL FREE 800-540-7264



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 CLEAN AIR



Celebrating 25 Years



GSA Contract Holder

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

AIRVAC 911[®] Engine Exhaust Removal System





Protecting First Responders

f 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.



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 airflow for high-performance protection.

Stage 1: Three-Ply Pre-Filter Moisture-resistant, 3-ply polyester media. Selfsealing 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



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

airvac911.com TOLL FREE: 800-540-7264 FAX: 603-743-3111 EMAIL: sales@airvacuumcorporation.com



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



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

Protecting First Responders

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!

airvac911.com/FreeProposal

Engine Exhaust Removal System

LEED design? 3 phase available

PRODUCT FEATURES





Certified Safe Feature! Filter cabinet

door opens right to left and NOT down

onto person changing filters.

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

> AIRVAC 911[®] Engine Exhaust Removal System The most effective solution to the removal of hazardous engine exhaust.

Compact, Quiet and Affordable.

Filter replacements under $\frac{1}{2}$ 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 ALUMINUN DIVIDERS TO MAINTAIN UNIFORM SPACING BETWEEN EACH PLEAT FOR OPTIMAL AIRFLOW. CLASSIFFIED 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.

P.O. Box 517 • Dover, NH 03821-0517 • Toll Free 800-540-7264 • Tel 603-743-4332 • Fax 603-743-3111 • www.airvac911.com



GENERAL INSTALLATION DESCRIPTION

(Please consult your local code requirements)

EACH UNIT SHALL BE HUNG USING THREADED ROD OR 500 LB. CHAIN (minimum) TO EACH CORNER OF THE AIRVAC-911 UNIT. ROD WIDTHS SHOULD MEET OR EXCEED THE FOLLOWING: 3/8" UP TO 30", 1/2" FOR 30"- 72", 5/8" FOR 72"-120". THE INSTALLER SHALL PROVIDE A SAFE AND STURDY MOUNT FROM THE CEILING SUPPORTS VIA, PRE-DRILLED UNISTRUT, BOLTING DIRECTLY TO EXISTING CEILING JOIST/TRUSS OR OTHER ACCEPTABLE MEANS. THE INSTALLATION SHALL PROVIDE A SAFE AND RUGGED MOUNT FOR EACH INDIVIDUAL UNIT. PRE-DRILLED MOUNTING BRACKETS & HOLES FOR "S" HOOKS, SHALL BE PROVIDED BY THE MANUFACTURER AT THE PROPER LOCATIONS FOR EACH UNIT (TOP EACH CORNER). EACH "AIRVAC-911" UNIT WEIGHS APPROXIMATELY 130 POUNDS WITHOUT FILTRATION, AND UP TO 190 POUNDS, WITH FILTERS. OPTIMUM HEIGHT OF THE AIRVAC-911 UNIT IS 10' TO 15' (BOTTOM OF UNIT OFF FINISHED FLOOR).

1. AVEC CONTROLLER: ADJUSTABLE LOW VOLTAGE TIMER (6 TO 60 MINUTES) FOR "AUTO OFF" AFTER ACTIVATION. NORMAL USAGE REQUIRES A RUN TIME OF APPROXIMATELY 15-20 MINUTES. WITH INSTALLATIONS OF OVER 4 UNITS THE CONTROL PANEL MAY "CASCADE/SEQUENTIAL ACTIVATE" THE UNITS IN SETS OF TWO WITH A DELAY TO DECREASE THE SURGE OF POWER NEEDED TO ACTIVATE THE SYSTEM. **2.** FRONT PANEL, LED LIGHT, TO INDICATE SYSTEM "ON/OFF."

3. MANUAL THREE POSITION TOGGLE SWITCH PROVIDED FOR THE FOLLOWING FUNCTIONS: "ON" (CONTINUOUS RUN) AND "OFF" (OVERRIDE SHUT DOWN), AND "AUTOMATIC MODE". ALSO PROVIDED, ONE MANUAL "TEST SYSTEM" TOGGLE SWITCH, TO RUN FOR ONE TIMED CYCLE.

4. THE CONTROL BOX WILL BE CONSTRUCTED USING A NEMA 4 FIBERGLASS ENCLOSURE. 5. FOR PHOTO ELECTRIC ACTIVATION & OTHER DEVICES REQUIRING 24 VOLT POWER - THE AVEC CONTROLLER SHALL BE DESIGNED WITH A 24VAC-2 AMP POWER SUPPLY SO AS TO POWER REMOTE PHOTO ELECTRIC EYE SWITCHES, THESE TYPE SWITCHES ARE RECOMMENDED WITH AN INDOOR RANGE OF UP TO 200'. THESE PHOTO BEAMS & BEAMS OF HIGHER RANGE ARE AVAILABLE THROUGH AIR VACUUM CORP. OTHER DEVICES SUCH AS CO & NO2 GAS SENSORS ARE AVAILABLE.

SEQUENCE OF OPERATION:

RECOMMENDED LOCATIONS FOR EACH UNIT AND OTHER SYSTEM INFORMATION IS SHOWN ON THE ENCLOSED DRAWINGS OF THE APPARATUS AREA. RECOMMENDATIONS ARE BASED ON OPTIMUM "ZONE CAPTURE" OF EXHAUST EMISSIONS, AS GENERATED, IN THE VICINITY OF ENGINE EXHAUST PIPES; AS WELL AS "AIR CHANGES PER HOUR" (ACH) OF RE-CIRCULATION CAPACITY ON THE FLOOR, BASED ON THE CUBIC FOOTAGE OF THE CONTROLLED AREA AND THE ACTIVITY LEVEL OF THE DEPARTMENT (# OF RUNS). "AUTO ON" ACTIVATION OF ALL UNITS SHOULD BE ACCOMPLISHED WITH LOW VOLTAGE, "MOMENTARY CONTACT", SWITCHES WIRED AS NORMALLY OPEN (PHOTO EYES, DOOR SWITCHES, VEHICLE

TRANSMITTER/RECEIVERS, CO/NO2 DETECTORS AND MORE). PHOTO EYES HAVE A RANGE OF 200' AND MAY TRANSMIT THE WIDTH OF THE APPARATUS AREA ARE RECOMMENDED TO BE INSTALLED 7+' OR HIGHER (TO AVOID UNECESSARY ACTIVATION VIA PERSONNEL WALKING INTO THE BEAM). ONCE ACTIVATED THE "AVEC" CONTROLER SHALL RUN FOR ITS PRE-SET TIME. GENERALLY, 18 TO 20 MINUTES. HOWEVER, TIMER SETTINGS ARE FULLY ADJUSTABLE FROM 0.1 SECONDS TO 100 HOURS. "MANUAL ON" ACTIVATION MAY ALSO BE ACCOMPLISHED VIA A THREE POSITION TOGGLE SWITCH ON THE AVEC CONTROL (ON-OFF-AUTO) AND VIA WIRING CONTROL CIRCUIT (MUSHROOM TYPE BUTTONS) TO CONVENIENT LOCATIONS THROUGHOUT THE STATION (I.E.- FLOOR AREA, DISPATCH OFFICES, ETC.)

STANDARD 120 VOLT INSTALLATION -

- Provide a dedicated 120 Volt 20 amp circuit to feed the AVEC Controller
- Provide a dedicated 120 volt 20 amp circuit for each AIRVAC 911 unit being installed from the electric panel to the "AVEC" Control terminating at contactors C1,C2, ect... on terminals L1,L2 or L3. This is the line side.
- 3 pole contactors are used as standard components within the AVEC Control as units are typically wired 2 per contactor. The number of units allowed per contactor are labeled on schematic or panel cover.
- Run the load side wiring from T1,T2.or T3 to unit locations terminating to a 120V 20A receptacle. Units are supplied with an 8-foot cord.
- All wiring shall comply with NEC and local codes.

LOW VOLTAGE CONTROL WIRING -



air vacuum corporation

- Control wiring originates from "AVEC" Control panel: Terminals X1 and X2 for 24V power supply and S1,S2 for signal. Photo eyes are mounted on the walls to shoot across multiple overhead doors without any obstructions to see one another clearly. Mount each eye approximately 7+ feet high so vehicle breaks the beam while passing through.
- From the AVEC Control, both Transmitter & Receiver requires 24v wiring on terminals 1 and 2 from terminals X1 & X2 of the AVEC control. The Receiver also requires signal wiring from AVEC S1,S2 on terminals 3 and 5 which is common and normally open.
- The Door switches mount to overhead door rails with a magnet mounted to the overhead door itself at a minimum 6 inches below the rail mounted switch. When door any opens it passes by momentarily and activates ALL of the AIRVAC 911 units installed.
- Door switches are wired to S1 and S2 of the AVEC Controller only & can be run in parallel.
- Control wiring can be 18/4 shielded cable and can terminate at first device. There is no need to run separate cables back to control panel unless desired.
- If the fire station is a drive through bay, repeat this process for rear set of devices.



INSTALLATION DESCRIPTION (Cont.)

PLEASE CONSULT YOUR SALES REP FOR INSTALLATION INSTRUCTIONS AND DIAGRAMS FOR MOTOR VOLTAGES OF 208 VOLT (SINGLE PHASE) & THREE PHASE INSTALLATIONS.

HANGING HARDWARE



(*INSTALLER TO COMPLY WITH ALL LOCAL, STATE AND NATIONAL CODE FOR HANGING OF EQUIPMENT @ AIRVAC 911 WEIGHT)

Hanging Height: The bottom of each unit should be mounted between 9' to 11' from the floor to provide optimal performance of the "AIR VAC-911" system.



www.airvac911.com

New AVEC Standard Panels

Prepared for:

Air Vacuum Corporation P.O. Box 517 Dover NH 03821-0517



PANEL TO BE UL LISTED (usul, cul) INDUSTRIAL CONTROL PANEL UL508A FILE NO E109698

ΕV	DATE	PURPESE:	BY CHKD		DESIGNED				PANEL LAYOUT		
				AIRVAC	BL	DATE ALKY	AL		AVEC 2C		
						08/2018 THIS D	RAWING.AND ALL RE	PRESENTED DATA. ARE THE PROPERT	Y 2 CONTACTOR - (24)1 PH FANS / (26)3	3 PH FANS
				Engine Exhaust Removal System	CHECKED	DATE OF THE	NAMEÓ COMPANY IN	N THE TITLE BLOCK, THIS DRAWING	DRAWING SET:		SHEET:
				Toll Free: 1-800-540-7264, www.airvac911.com		MAINTE	NANCE PURPOSES BY	Y THE USING CUSTOMER.	' 2019-189-AVE		I LF 3
/EC	20	2 CONTACTOR							(- Old Mod	a1 # AVEC AC)	
										$e_1 \pi \Lambda v EC-4C)$	



REV	DATE	PURPESE:	BY (СНКД		DESIGNED		CONTROL SCHEMATIC	
							DATE	AVEC 2C	
						DCR	08/2018 THIS DRAWING, AND ALL REPRESENTED DATA, ARE THE PROPERTY	2 LUNIALIUR - (04) I PH FANS / (06)	3 PH FANS
					Engine Exhaust Removal System	CHECKED	DATE OF THE NAMED COMPANY IN THE TITLE BLOCK. THIS DRAWING	DRAWING SET:	SHEET:
					Toll Free: 1-800-540-7264, www.airvac911.com		MAINTENANCE PURPOSES BY THE USING CUSTOMER.	2019-189-AVEC-2C	

(= Old Model # AVEC-4C)



V	DATE	PURPOSE:	ΒY	СН	IKD	DESIGNED		
						BL	00/2010 DATE	AIRVAL
							08/2018	THIS DRAWING.AND ALL REPRESENTED D
					Engine Exhaust Removal System	CHECKED	DATE	OF THE NAMED COMPANY IN THE TITLE
					Toll Free: 1-800-540-7264, www.airvac911.com			MAINTENANCE PURPOSES BY THE USING

(= Old Model # AVEC-4C)

BLOCK. THIS DRAWING DRAWING SET: DISCLOSED EXCEPT FOR 2019-189-AVEC-2C 3 DF 3 CUSTOMER.	DATA, ARE THE PROPERTY BLOCK. THIS DRAWING DISCLOSED EXCEPT FOR CUSTOMER.	2 CONTACTOR - (04)1 PH FANS / (06)	3 PH	FANS	ò
	BLOCK. THIS DRAWING DISCLOSED EXCEPT FOR CUSTOMER.	drawing set: 2019-189-AVEC-2C	SHEET: 3	٥F	3

FIELD CONNECTIONS

NDTES: 1) FAN POWER CIRCUIT PROTECTION PROVIDED BY OTHERS 2) FAN MOTORS IN CLUDE INTERNAL MOTOR OVERLOAD PROTECTION





AIRVAC 911® Automatic Vehicle Exhaust Control System Installation Information for Catalog Number(s) AVEC-2C, -4C, -6C, -8C, 10C

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

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

120V CONTROL POWER WIRING: 120V control power wiring to each standard AVEC 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 AVEC Panel drawings for detailed wiring information.

OPERATOR CONTROLS: Each standard AVEC 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 20 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 AVEC Panel comes with a 40W 120V to 24V transformer to power specific field devices available from Air Vac (i.e SecoLarm 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 AVEC Panel for detailed wiring information.

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

AIRVAC 911[®] SEQUENCE OF OPERATIONS

AIRVAC 911[®] Units are ceiling hung and do not interfere with vehicle operations. The AIRVAC 911[®] system is 100% self-contained and do not require any manual vehicle/manual connections nor do they require any building modifications, duct work or exhaust to the outdoor environment.

The quantity of AIRVAC 911[®] units for an apparatus area is determined by the cubic footage of air space within the apparatus area, number of vehicles and the level of runs per year from the bay area.

Once the quantity of AIRVAC 911[®] units is determined they are spaced evenly throughout the apparatus area to create an even air flow within the space. When applicable, units are generally mounted in between vehicle bays and the bottom of each unit is mounted higher than the tallest vehicle. Ideally the closer to the source of exhaust the better and it is recommended, if possible, to mount the bottom of the units at 10'-13'.

All units are wired through Air vacuum Corporations AVEC Control Panel and are triggered via any combination of low voltage activation devices. AIRVAC 911[®] Standard voltage is 115 Volt, single phase. Other voltages and 3-phase options are available.

The "standard" activation package consists of dry contact low voltage overhead door momentary magnetic switches (triggers via door movement) & photo electric eye motion sensors (triggers via vehicle movement). Photo electric eyes consist of a transmitter & receiver (24 V powered out of our AVEC Control) with an indoor range of 90'+ and mounted approximately 7'+ off the floor so personnel walking through the doors will not accidentally trigger the system. Generally, one set of photo eyes for all overhead doors at each end of the building.

Additional switches are available: CO, NO2, Tone Alert, Manual Push Buttons & Vehicle ignition radio transmitters.

General run time = 18-20 minutes and any installation with over 4 AIRVAC 911[®] units will sequentially activate units in blocks of two's every 10-15 seconds apart. The timing cycle will reset and start over upon every switch signal received by the AVEC Control timer. Units will then shut down automatically when time expires and wait for a new activation signal. To end a current run cycle the end user may turn the 0n-off-auto dial to off and then back to auto mode. This will clear the timing cycle for that run. The AIRVAC 911 System can be manually run for as long as the end user would like by turning the on-off-auto dial to on. The user may also push the "test" button while the dial is in auto mode and the system will run for its preset time 18-20 minutes.

Maintenance:

Periodic filter changes are the only maintenance required for the AIRVAC 911[®] System. Each unit consists of 3 physical filters (4-stage filter pack). Stage 1 prefilter requires replacement every 2-4 months. Stages 2 HEPA MAX, 3 & 4 MULTISORB CARBON (stages 3&4 are blended into one 4" filter panel) are replaced every 12-24 months.

Filter replacement video: <u>https://youtu.be/QUiCcHUOYXg</u>

System over view video: <u>https://youtu.be/TkQNb-bWdVc</u>



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

Also available from SECO-LARM:





- 4 Models available up to 660ft (200m) range
- Weatherproof
- 12~24 VAC/VDC
- Laser-beam alignment

Reflective Photobeam Sensor



- Available with 45ft (14m) or 35ft (11m) range
- Weatherproof
- Mounting hardware included
- Reflector included



- 2, 4, 6, 8 or 10 Beams available
- Up to 50ft (15m) range
- Weatherproof
- Slimline design
- Laser-beam alignment

Hooded Reflective Photobeam Sensor



- Available with 50ft (15m) or 33ft (10m) range
- Weatherproof
- Polarized version available
- Round reflector included



- 2, 4, 6, or 8 Beams available
- Up to 393ft (120m) range
- Weatherproof
- Multi-frequency
- Adjustable interruption time

Flush-Mount



- Available with reflective beam and 16ft (5m) range or through-beam and 33ft (10m) range
- Adjustable alignment angle
- Mounts to a single-gang box

WARRANTY: This SECO-LARM product is warranted against defects in material and workmanship while used in normal service for a period of one (1) year from the date of sale to the original consumer customer. SECO-LARM's obligation is limited to the repair or replacement of any defective part if the unit is returned, transportation prepaid, to SECO-LARM. This Warranty is void if damage is caused by or attributed to acts of God, physical or electrical misuse or abuse, neglect, repair, or alteration, improper or abnormal usage, or faulty installation, or if for any other reason SECO-LARM determines that such equipment is not operating properly as a result of causes other than defects in material and workmanship. The sole obligation of SECO-LARM, and the purchaser's exclusive remedy, shall be limited to replacement or repair only, at SECO-LARM's option. In no event shall SECO-LARM be liable for any special, collateral, incidental, or consequential personal or property damages of any kind to the purchaser or anyone else.

NOTICE: The information and specifications printed in this manual are current at the time of publication. However, the SECO-LARM policy is one of continual development and improvement. For this reason, SECO-LARM reserves the right to change specifications without notice. SECO-LARM is also not responsible for misprints or typographical errors. Copyright © 2014 SECO-LARM U.S.A., Inc. All rights reserved. This material may not be reproduced or copied, in whole or in part, without the written permission of SECO-LARM.



SECO-LARM[®] U.S.A., Inc.

16842 Millikan Avenue, Irvine, CA 92606 Tel: 800-662-0800 / 949-261-2999 Fax: 949-261-7326

Website: www.seco-larm.com E-mail: sales@seco-larm.com

ENFORCER®

Twin Photobeam Detectors

Manual



Model #	Outdoor Range	Indoor Range
E-964-D390Q*	390 ft. (120m)	790 ft. (240m)
E-960-D290Q	290 ft. (90m)	590 ft. (180m)
E-960-D190Q	190 ft. (60m)	390 ft. (120m)
E-960-D90Q	90 ft. (30m)	190 ft. (60m)

* Multi-frequency version

SECO-LARM® **SL/**®

TABLE OF CONTENTS

Important	2
Choosing a Location	3
Typical Installations	4
Running the Cable	4
Wiring the Transmitter – Wall Mount	4
Wiring the Transmitter – Pole Mount	5
Wiring	5
Examples of Ways To Connect Sensors	6
Selectable 4-channel Beam Frequency	7

Features:

- Four selectable beam frequencies (For E-964-D390Q model only).
- Twin beams provide reliable perimeter security, minimizing false alarms from 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 for indoor and outdoor use.
- Non-polarized power inputs.

Included:



IMPORTANT – Do not connect to power until the sensor is completely installed and the installation has been double-checked.

- Beam Frequency Selection Chart7(E-964-D390Q Model Only)Multiple Sensors Sample Applications7-8Adjusting the Alignment9Adjusting the Delay Time10Testing the Unit10Specifications10Dimensions11Troubleshooting11
- Automatically adjusts beam strength to compensate for different weather conditions
- Automatic input power filtering with special noise rejection circuitry.
- N.C./N.O. alarm output.
- N.C. tamper circuit included.
- Quick, easy installation with built-in laser beam alignment system.
- Interruption time adjustable for nearly all situations.

Fig. 12: Dimensions





Table 6: Troubleshooting

Situation	Possible Problem	Solution
Transmitter LED does not light.	Incorrectly wired and/or insufficient voltage	Ensure the power supply to the transmitter is 12 to 24 VAC/VDC.
Receiver LED never lights up when the beam is interrupted.	a. Insufficient voltage b. Beam reflected away from receiver c. Beams not simultaneously interrupted.	a. Double-check the voltage. b. Clean the cover. c. Check overall installation.
Beams interrupted and LED lights, but no alarm trigger.	Alarm trigger cable may be cut, or the relay contact stuck due to overloading.	Check the continuity of the wiring between the sensor and the alarm.
Alarm LED continuously lit.	a. Lenses out of alignment. b. Beams are blocked. c. Cover is foggy or dirty.	a. Realign the lenses. b. Remove any obstacles. c. Clean the cover.
Alarm trigger becomes erratic in bad weather.	Lenses out of alignment.	Check overall system installation. If still erratic, realign the lenses.
Frequent false triggers from leaves, birds, etc.	a. Too sensitive. b. Bad location.	a. Reduce the response time. b. Change the transmitter and/or location.

Adjusting the Delay Time

- 1. The delay time adjustment knob sets how long the beam can be interrupted before triggering the alarm (see fig. 11):
 - a. A short interrupt time (high sensitivity) is suitable for catching fast moving intruders, but more susceptible to false alarms.
 - b. A long interrupt time (low sensitivity) reduces false alarms, but fast moving intruders may not trigger the sensor.
- 2. Adjust the knob to the site's situation. You may need to make adjustments later after the walk-through test.

Testing the Unit

- 1. Power up the transmitter and receiver.
- 2. If the yellow or red LED remains steady ON even when the beam is not interrupted, re-adjust the alignment.

3. Walk between the transmitter and receiver to

interrupt the beams. Walk at various speeds, and

adjust the delay time adjustment knob as needed.

NOTE — The alarm will be triggered only if both the upper and lower beams are simultaneously interrupted.

Fig. 11:

Adjusting the

Delay Time

300ms

700ms

IMPORTANT – Test the detector periodically to ensure the alignment and delay time settings are suitable for the site.

Table 5: 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)			
Max. current (Tx & Rx)	64mA	70mA	74mA	88mA			
No. of beam channel	N/A	N/A	N/A	4			
Voltage output (+/-10%)	1~4V						
Power	10~30 VAC/V	DC (non-polarize	ed)				
Detection method	Simultaneous	breaking of 2 bea	ams				
Interrupt speed*	50msec~700	msec (variable)					
Alarm output	NO/NC relay, 1A @ 120VAC, min. 1 sec.						
Tamper output (Tx & Rx)	NC switch, 1A	@ 120VAC					
Alarm LED	Red LED - ON:	When transmitte	er and receiver a	ire not			
(receiver)	aligned or whe	n beam is broke	n.				
Signal LED	Yellow LED - O	N: When receive	r's signal is wea	k or when			
(receiver)	beam is broke	n.					
Power LED (Tx & Rx)	Green LED ON:	Indicates conne	ected to power				
Laser wavelength	650nm						
Laser output power	<u>≤</u> 5mW						
Alignment angle	Horizontal: $\pm 90^{\circ}$, Vertical: $\pm 5^{\circ}$						
Operating temperature	-13°F (-25°C) to +131°F (+55°C)						
Weight	2.5 lbs. (1.1kg)						
Case	PC Resin						

*This is the minimum time interval between breaking of both beams which will trigger the output. Setting the interval longer will reduce false alarms from birds or falling leaves, etc., while setting it shorter will detect faster moving objects.

Fig. 1: Identifying the Sensors



* For multi-frequency E-964-D390Q model only.

Choose a Location

To prevent erratic operation and/or false alarms:

- Wind will not directly cause false alarms, but could cause leaves or similar objects to fly or wave into the beams. Therefore, do not mount near trees, bushes, or other leafy vegetation.
- Do not mount where the transmitter or receiver could be splashed by water or mud.
- Do not mount where the unit could be suddenly exposed to a bright light, such as a floodlight or a passing automobile's headlight.
- Do not let sunlight or any direct beam of light enter the sensing spot of the transmitter. If needed, mount so the receiver, not the transmitter, faces the sun.
- Do not mount where animals could break the beams.







Typical Installations

The photoelectric beam lens can be adjusted horizontally $\pm 90^{\circ}$, and vertically $\pm 5^{\circ}$ (see fig. 2). This allows much flexibility in terms of how the transmitter and receiver can be mounted. See fig. 3. Install at a distance of 32" to 39" (80 to 100 cm) above the ground for most situations. See fig. 3.

Running the Cable

Run a cable from the alarm control panel to the photobeam sensor. If burying the cable is required, make sure to use electrical conduit. Shielded cable is strongly suggested. See Table 1 for maximum cable length.

Table 1: Cable Length

Model	E-960	-D90Q	E-960	-D190Q	E-960-D290Q		E-964	-D390Q
Wire Size	12V	24V	12V	24V	12V	24V	12V	24V
AWG22 0.33mm ² 0.0005in ²	320m 1,050 ft.	2,800m 18,000 ft.	280m 920 ft.	2,400m 7,870 ft.	200m 660 ft.	1,600m 5,250 ft.	110m 390 ft.	900m 2,950 ft.
AWG20 0.52mm ² 0.0008in ²	550m 1,800 ft.	4,800m 15,750 ft.	450m 1,480 ft.	4,200m 13,780 ft.	350m 1,150 ft.	3,000m 9,840 ft.	170m 560 ft.	1,400m 4,590 ft.
AWG18 0.83mm ² 0.0013in ²	800m 2,600 ft.	7,200m 23,620 ft.	700m 2,300 ft.	6,200m 20,340 ft.	500m 1,640 ft.	4,200m 13,780 ft.	250m 820 ft.	2,200m 7,220 ft.
AWG17 1.03mm ² 0.0016in ²	980m 3,190 ft.	8,800m 28,870 ft.	850m 2,790 ft.	7,600m 24,930 ft.	590m 1,940 ft.	5,200m 17,060 ft.	310m 1,020 ft.	2,600m 8,530 ft.

Note (1): Max. cable length when two or more sets are connected is the value shown in Table 1 divided by the number of sets.

Note (2): The power line can be wired to a distance of up to 3,300 ft. (1,000m) with AWG22 (0.33mm²) telephone wire.

Wiring the Transmitter – Wall Mount

- 1. Remove the cover. Remove the screw under the lens unit in order to detach the mounting plate. See fig. 4.
- 2. If the sensor wiring comes from inside the wall — Break a hole in the mounting plate's rubber grommet, and pull the cable through the grommet's hole. Then run the cable through the hole near the top of the sensor unit so it comes out the front. Using two of the included mounting screws, attach the mounting plate to the wall. Then reattach the sensor unit to the mounting plate, connect the wires, and snap on the cover. See fig. 5.

3. If the sensor wiring is run along the surface of the wall – There are two plastic knockouts on the back of the sensor unit, one on top and one on bottom. Break out the appropriate knockout, and pull the wiring through the knockout. Then run the wiring through the hole near the top of the sensor unit so it comes out the front. Using two of the included mounting screws, attach the mounting plate to the wall. Then reattach the sensor unit to the mounting plate, connect the wires, and snap on the cover. See fig. 6.

Adjusting the Alignment

The transmitter and receiver sensor units can be adjusted $\pm5^{\rm o}$ vertically and $\pm90^{\rm o}$ horizontally once the unit is mounted and power is connected (see fig. 2 on page 3).

There are two ways to adjust alignment:

- 1. Laser adjustment (see fig. 1 on page 3):
 - a. Remove the transmitter cover, then turn the laser on with the ON/OFF switch (see fig. 1 on page 3). A red dot will show where the photoelectric beams are aimed.
 - b. Adjust the transmitter's sensor unit vertically and horizontally until the red dot is centered on the receiver and both the receiver's LEDs turn off. See Table 3. It may be necessary to adjust the horizontal and vertical angles of the receiver's sensor unit as well.
 - c. Repeat steps a and b for the receiver.
 - d. Turn the lasers off, and then replace the covers.

WARNING: Do not look directly at the lasers.

- 2. Eyeball adjustment (see fig.10):
 - a. Remove the transmitter cover, and look into one of the alignment viewfinders (one of the four holes located between the two lenses) at a 45° angle.
 - b. Adjust the horizontal angle of the lens vertically and horizontally until the receiver is clearly seen in the viewfinder.
 - c. Repeat steps a and b for the receiver.
 - d. Replace the transmitter and receiver covers.

NOTE - If you cannot see the opposite unit in the viewfinder, put a sheet of white paper near the unit to be seen, move your eyes about 2" (5cm) away from the viewfinder, and try again.

Fine Tuning the Receiver

- 1. Once the sensor is mounted and aligned, the sensor can be fine tuned using the voltage output jack.
- a. Set the range of a volt-ohm meter (VOM) to $1{\sim}4\text{VDC}.$
- b. Insert the red (+) probe into the (+) terminal and the black (-) probe into the (-) terminal.
- c. Measure the voltage (see table 4).
- d. Adjust the horizontal angle by hand until the VOM indicates the highest voltage.
- e. Adjust the vertical angle by turning the vertical adjustment screw until the VOM indicates the highest voltage.

NOTE - Do not interrupt the beam while adjusting alignmen





Table 3: Receiver LED Indicators

Alarm	Signal (Yellow LED)	Signal
(Red LED)	Single frequency	Multi frequency	strength
OFF	OFF	OFF	Best
OFF (OFF	Flash	Good
OFF	ON	ON	Fair
ON	ON	ON	Re-adjust

1	lable 4:				
	Voltage	output	Alignment		Ĵ
	Single frequency	Multi frequency	quality		
	>2.8V	>2.8V	Best		
	1.7~2.7V	1.8~2.7V	Good		
	1.1~1.6V	$1.1 \sim 1.7 V$	Fair		
	<1.0V	<1.0V	Re-adjust		
) and	Note: 4VDC	is maximum	ı possible rea	ading.	

3. Two layer (double stacked) applications.



4. Perimeter security application.



5. Two layer (double stacked) perimeter security application.



Wiring the Transmitter – Pole Mount

(NOTE – Pole mounting bracket required.)

- 1. Remove the cover. Remove the screw under the lens unit in order to detach the mounting plate. See fig. 4.
- 2. Break a hole in the mounting plate's rubber grommet, and pull the cable through the grommet's hole. Then run the cable through the hole near the top of the sensor unit so it comes out the front. Use the included mounting bracket to mount to the pole. Then

Fig. 4: Remove the Transmitter cover



reattach the sensor unit to the mounting plate, connect the wires, and snap on the cover. See fig. 7.

Wiring (fig. 8)

- 1. Screw the wires tightly to avoid slipping off the terminals, but not so tight that they break.
- 2. Screws on terminals which are not used should be tightened.
- 3. Grounding may be necessary, depending on the location.











Fig. 9: Examples of Possible Ways To Connect One or More Sensors





Selectable 4-channel beam frequency (For E-964-D390Q model only)

The sensor beam frequency can be set at different levels on-site to avoid interference from other twin photobeam sensors nearby. Useful during multiple sensor applications as shown below. To select between four different beam frequencies, adjust the beam channel switch of the transmitter side and receiver side. See fig. 1 for switch location and table 2 for switch position.

Important – The transmitter and receiver sensor pair must be set with the same frequency.

Table 2: Beam Frequency Selection Chart (For E-964-D390Q model only)

Frequency channel	CH1 CH2		CH3	CH4	
Switch position	1 2	1 2	1 2	1 2	
	ON↓	ON↓	ON↓	ON↓	

Multiple sensor sample applications (For E-964-D390Q model only)

1. Single pair multiple layer application.



2. Long distance series application.





TAKEX

PB-30TK (60)



Manufacturer of Air Filtration Equipment

(603-743-4332)

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	РВ-60ТК			
Detection System	Simultaneous breaking of two (2) beams				
Infrared Beam	LED pulsed beam, Double modulation				
Protection	Outdoor 100' (30m) or less	Outdoor 200' (60m) or less			
Distance	Indoor 200' (60m) or less	Indoor 400' (120m) or less			
Maximum Beam Range	Outdoor 1000' (300m)	Outdoor 2000' (600m)			
(Approximation)	Indoor 1000' (300m)	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			
	Dry contact relay form C				
Alarm Output	Contact action: Interruption time plus delay time (1 to 30 seconds)				
	Contact capacity: 30V AC/DC, 0	0.5A or less			
	Dry contact relay N/C				
Tamper Output	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)				

Air Vacuum Corporation Tel: (603) 743-4332 Fax: (603) 743-3111

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 *X1 and X2 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				
S1 S2 X1 X2	+1 -2	+1 -2 3C 4 5NO 6 7				
φ φ φ φ	$\varphi \varphi$	မှ မှ မှ မှ မ မ မ				
	•					

Typical Multiple Connections to AVEC Control

Field Devices and Wiring Information



*In some controls, X1 & X2 may be listed as L1 & L2. See control installation information.

**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.

PB3060TK-Ins

Industrial Track Mount Switch

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



Save Time on Installation (Installs in 60 Seconds)

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

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)

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

SPECIFICATIONS:

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



Air Vacuum Corporation Tel: (603) 743-4332 Fax: (603) 743-3111

Catalog Number N505ATMC/ST *nascom, inc*. Door Switch <u>Installation Information</u>

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.



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 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.



Alternate method for mounting the switch and bracket set to the overhead door guide rail as I have outlined below. This should allow the door to open freely without coming into contact with the switch mounting bracket.

Alternate mounting method instructions:

• Remove the rear half of the mounting bracket by removing the clamping screw completely and separating the two halves of the bracket set.

• Position the front half of the bracket with the switch on the rail in the desired location. Using the mounting holes in the side of the bracket as your guide, drill through the rail using a 3/16 drill in two locations.

• To mount the bracket, use two Pan head machine screws. (Note: The screw heads must be on the inside of the rail to allow the door guide roller to pass). From the inside of the rail, insert the screws through the holes in the rail and through the mounting holes in the side of the bracket. Place a washer over the screw and use a Nylock type lock nut to secure the bracket to the rail. If Nylock type nuts are not available use thread locking compound on the mounting screw threads. This will prevent the mounting screws from loosening due to vibration from the door opening and closing.

• Open and close the door to make sure the door will operate freely without contacting the switch or mounting bracket.

• With the door closed, re-align the magnet actuator with the switch. Make sure there is sufficient clearance between the magnet and switch so the door can open and close freely.

• Connect an ohm meter to the switch leads and open and close the door to test the switch for correct operation.

Please refer to the video link below for a visual guide.

http://www.nascominc.com/video/video.htm

ENGINE EXHAUST SYSTEMS 23 35 16

SpecData



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



SpecData

Air Vacuum Corporation

Table 1 Technical Data									
AIRVAC 911									
Cabinet Dimensions	26" wide x 25" de	ep 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		
Туре	Pre-filter		Main media HEPA	3000	Gas-phase extractor, Multisorb 3000			ultisorb 3000	
Size	24" x 24" x 1"		24" x 24" x 6"			24" x 24" x	4"		
Testing			UL/ULC classified ASHRAE 52.2 test (>98% efficiency)	; Class 2 filter ed to MERV 16)					
Motor	-		-						
Standard: Optional:	3/4 HP 3/4 HP 3/4 HP 3/4 HP 1 HP 1 HP	115 Volt 208-230 volt 190 volt 380-415 volt 115/208-230 volt 208-230/460 volt	1 Phase 1 Phase 3 Phase 3 Phase 1 Phase 3 Phase	60 Hz 60 Hz 50 Hz 50 Hz 60 Hz 60 Hz	13 FL amps 6.3-6.5 0 FL amps 3 FL amps 1.5-1.7 FL amps 14.7/7.2-7.4 FL amps 3.4-3.4/1.7 FL amps	DS S	1.25 SF 1.25 SF 1.15 SF 1.25 SF 1.15 SF 1.15 SF 1.15 SF		
AVEC Smart Timer	-								
Single zone: Zoned:	AVEC-2C (operates 1-2 units) AVEC-4C (operates 2-4 units) AVEC-6C/T2 (operates 2-6 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) AVEC-4C/Z (2 zone; operates 1-2 units per zone) AVEC-6C/Z (2 zone; operates 1-2 units per zone)		34 56	FRONT		56 28.000	REA)	
	AVEC 8C/12/2 (60 AVEC 8C/22 (4C, AVEC 10C/T2/2 (4 AVEC 10C/T3/2 (4 AVEC 10C/T3/2 (4	26, 26) 26, 26) 16 + 46) 36 /73 + 26) (66/72, 26, 26)			- 26.000 Front View			s 28 Rear	CALE 0.250 .000 View
System Activation	Devices								
Standard	Magnetic door sw Photoelectric eyes	itch (one per overhead d s (detect vehicle moveme	oor) ent)	1	0 0				
Optional	Manual push buth Spring wound tim Vehicle ignition w Standalone CO se Standalone CO se CO and NO ² com CO and NO ² com Tone alert active	ton ier ireless transmitter and r insor 24V insor 120V bo sensor 24V bo sensor 24V bo sensor 120V ation	receiver	34, 56	RIGHT				Aurent Die



2

Air Vacuum Corporation

SpecData

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

PROTECT FIRST RESPONDERS FROM CANCER

Constantly Monitor and Remove Hazardous Contaminants from Your Station

The Only Hoseless System with a 360° Directional Airflow Design



PROBLEM: First responders have a greater risk for cancer and other diseases due to prolonged, uncontrolled exposure to diesel exhaust and particulate matter.

FACT: You can minimize their exposure and risk by automatically controlling the spread of hazardous contaminants in your station.





For a Free Proposal, Visit airvac911.com or Call 800-540-7264

NO HOSES HANDS FREE



FACT: Stations are full of toxic gases that hover in the air, unseen, causing damaging health effects. Only some toxic gases are captured by on-board filters and hose systems.

FACT: When vehicles leave the station they send a burst of engine exhaust back into the building, "Engine Exhaust Backwash". After a fire, when first responders return to the station, off-gassing of their turnout gear, hoses and parked vehicles pollutes the "Breathing Zone" again.

FACT: Diesel exhaust contains gases, particulate and potentially toxic compounds. Standard activated carbon filters and low efficiency media don't provide the level of removal necessary.

FACT: During a fire, cancer-causing chemicals contaminate exposed gear, vehicles and tools. When first responders return to the station with these items, the chemicals invade their "Breathing Zone".

SOLUTION: AIRVAC 911[®] is the only hoseless system with a 360° airflow design that is so powerful it pulls the air in from all directions to continuously eliminate exhaust dead spots and capture the toxins that are lurking in your station.

SOLUTION: AIRVAC 911[®] is the only system that addresses these issues by continuously monitoring and filtering 100% of the apparatus bay area Hot Zones. Our system also addresses emissions released from lawn equipment, chainsaws and generators.

SOLUTION: The AIRVAC 911[®] 4-stage filtration system features a unique combination of chemically treated carbon and activated carbon filters designed to remove these hazardous contaminants and create a clean "Breathing Zone".

SOLUTION: AIRVAC 911[®] automatically removes particulate and gases 24/7 with its technologically advanced control system and filter combination. No hoses or vehicle attachments, no ducting, no exhausting outside and no interference with daily operations.

The AIRVAC 911[®] systems removed the fumes inside our station better than the hose system because of the area they cover. This eliminates having to hook up apparatus. In my opinion, these systems are the best by far for safety concerns.

Celebrating 25 Years



GSA Contract Holder

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

— City of Chattanooga Fire Department, TN

Protecting First Responders

