ARM-EVAC® 250

Central Filter Unit

MANUAL NO. 8881-0250

REV. B

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Use of this Manual

This manual will provide the user with the basic knowledge to properly operate and maintain the PACE Arm-Evac 250 Fume Extraction System. If you encounter any difficulty operating your system or have any questions, call your local authorized PACE dealer or contact PACE Applications Engineering directly at the United Kingdom Office at:

Tel. (44) 01908 277666, Fax (44) 01908 277777, or PACE Product Management at the U.S. Office at:
Tel: (301) 490-9860, Fax (301 604-8782

WARNING
Read the safety & set-up information sections in this manual thoroughly ***before*** installing and using your fume extraction system.

Introduction

Solder Fume removal when hand soldering is an often-overlooked work place hazard. Medical research has confirmed that there is an increase incidence of occupational asthma, chronic bronchitis, allergic reactions and other health related effects associated with exposure to solder/flux fumes in the electronics industry.

The PACE Arm-Evac 250 Central Filter Unit represents the latest technology in affordable fume extraction. It features a heavy-duty, maintenance-free brushless motor along with a filtration process which includes a pre-filter for course particle removal, and a High Efficiency Particulate Arrestor (HEPA)/Gas Filter cartridge. The HEPA/Gas Filter is ideal for applications where high efficiency particulate removal is required with the additional benefit of a gas media blend to neutralize and adsorb noxious gases. Optional filters are also available:

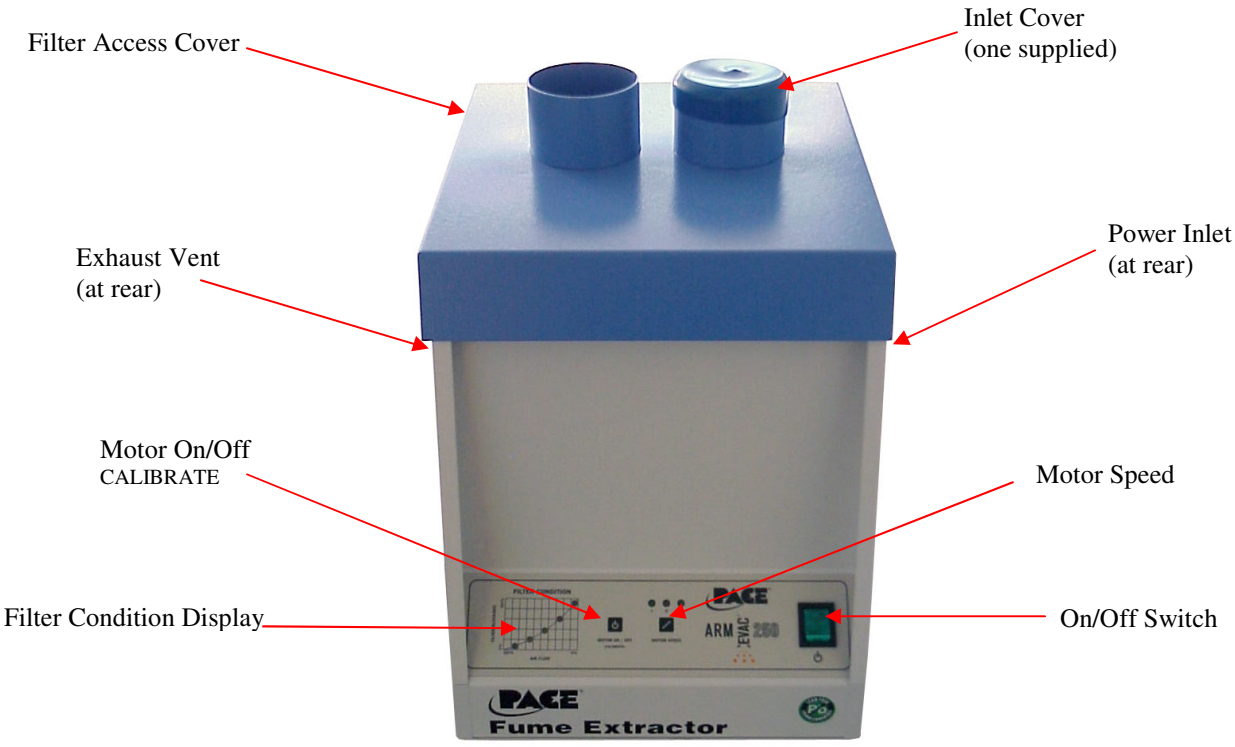
Environmental Specifications

Ambient operating temperature	0ºC to 50º (32ºF to 122ºF)
Storage temperature	-40ºC to 125ºC (-40ºF to 257ºF)
Ambient operating humidity	90% relative humidity max non-condensing
Storage humidity	90% relative humidity max non-condensing

Specifications

Arm-Evac 250 System Part Numbers	8889-0250 220/240V 50 Hz 8889-0255 110V, 60 Hz
Flow Rate with standard filter*	Single inlet: 288m³/h (170cfm) Dual Inlet: 170m³/h (100cfm) per inlet
Flow Rate with Optional Cleanroom Filter*	Single inlet: 255m³/h (150cfm) Dual inlet: 135m³/h (80cfm) per inlet
Noise Level*	58dbA at 2 meters
Weight	14Kg (31 lbs)
Size H x W x D	393 x 282 x 365mm (15.4" x 11.1" x 14.3")
Housing	18 gauge Steel (static safe)
Number of inlets	Two 75mm (3")
# of Collection accessories	Two 75mm (3") or four 45mm (1.75") or 50mm (2")
Maximum duct run	2.5m (8') per inlet
Standard Filter	General Purpose HEPA Filter
Filtration options	Cleanroom Filter Adhesive Filter Extended Life Filter Economy Filter

*Airflow and noise levels are nominal figures and will vary based on voltage



Safety

PACE Fume Extraction systems are designed to reduce the level of harmful contaminants from the work environment and to assist in the achievement of recommended health and safety requirements for local exhaust ventilation and contaminant removal. Be sure to follow all safety guidelines contained herein and precautions contained in other relevant product safety literature (i.e., Material Safety Data Sheets) provided with the substances and equipment producing the fumes to be extracted.

Disclaimer

PACE hereby disclaims all responsibility for any personal injury, property damage, fine, citation or penalty imposed by any government or private entity which results from any use, misuse or mis-application of this product, failure of the user to regularly maintain the product according to the recommended guidelines, or failure to adequately monitor fume extraction exhaust air and the ambient workplace air for the presence of harmful levels of gases, fumes and particulates.

Compliance with all applicable environmental and personal safety regulations is the sole responsibility of the user and adequate self-monitoring of exhaust air released into the atmosphere or the workplace as well as monitoring of the ambient workplace air is strongly recommended. To insure continued effective performance, the following guidelines must be followed.

Dangers

1. PACE Fume Extractors are not intended to be used as a substitute for devices such as personal protective respirators which are designed to remove poorly adsorbed substances including carbon monoxide, methane, hydrogen, acetylene and other gases. Risk of serious injury or death, fire or explosion may result from improper use. If in doubt, contact your industrial hygienist or PACE.
2. Never use PACE Fume Extraction Systems to extract fumes from highly flammable liquids and gases such as Ether, Gasoline (Petrol) and others. Risk of serious injury, death, fire or explosion may result.
3. High concentrations or airborne contaminants such as Methyl Ethyl Ketone, Cyclohexone, Ozone and others when contacted with activated carbon, can undergo oxidation, decomposition or polymerization resulting in exothermic reactions or heat generation. PACE Fume Extraction Systems must not be used to extract fumes from these substances when high concentrations are present.
4. Failure to comply with the application and maintenance guidelines, filter replacement schedules, monitoring recommendations and safety guidelines contained herein and in other relevant product safety literature (i.e., Material Safety Data Sheets) provided with the substances and equipment producing the fumes to be extracted could result in risk of serious injury, fire or explosion.

Warnings

1. Do not attempt to clean any PACE fume extraction filters for reuse. Cleaning the filters will severely damage the filter media and, consequently, the filter's performance. This will result in unfiltered, contaminated air being returned to the working environment. Unfiltered air can also damage the motor pump.
2. Use with inappropriate chemicals or substances, failure to provide regular maintenance or other misuse of your Fume Extraction System may result in contaminated air being re-circulated into the work environment.

Cautions

1. Failure to supply the correct voltage to the unit will result in damage to the motor.

Notes

1. To ensure the highest level of performance, use only PACE replacement filters in your PACE Fume Extraction System.
2. **BE SURE** the new filter cartridge is installed with the airflow arrow pointing downward.

Filter Cartridge Notes

PACE Fume Extraction Systems are equipped with filters designed to capture particles and noxious gases and odors that are present in the air being filtered. The Fume Extraction Systems are equipped with combinations of pre-filters for coarse particle removal, HEPA filters for fine particle removal and gas filter media to remove gaseous compounds. Over time, the HEPA filter will gradually become clogged, impeding air flow through the system and the capacity of the gas filter will be reached, reducing its ability to neutralize and adsorb noxious gases and odors.

Filter Cartridges ***must be replaced at regular intervals*** to ensure that the fume extraction system is operating effectively. These intervals will vary depending on the type of work being performed, the level of use, and the amount and composition of airborne contaminants produced.

The exhaust air stream from the central filtration unit as well as the ambient air in the workplace should be monitored with appropriate and adequate measuring/detection devices to assure compliance with all applicable Health & Safety regulations.

Flammable vapors and gases (i.e. Isopropyl Alcohol) are removed by and accumulate in the gas portion of the Filter Cartridge presenting a potential fire hazard. Therefore, the user must exercise appropriate precautions when extracting such fumes or when handling and disposing of the filters containing such flammable substances. Follow *all fire safety and personnel protection guidelines* contained in the Material Safety Data Sheet (MSDS) for the substance(s) producing the extracted vapors and gases (fumes).

When disposing of used filters, extreme care must be taken to comply with *all* applicable environmental regulations. Carefully consult the MSDS supplied with the material(s) producing the fume. If in doubt, check with your local Environmental Authority.

Extreme care must be exercised when disposing of a used Filter Cartridge containing potentially hazardous substances. When disposing of filters, appropriate and adequate personal protective equipment (i.e. gloves, respirators, plastic containment bags, etc.) must be used when hazardous substances such as asbestos, lead, radioactive or biohazard materials may be present. Consult the Material Safety Data Sheet (MSDS) of the materials generating the extracted fume.

Set up

The Arm-Evac 250 has been designed for ease of use and maximum installation flexibility in mind. The following are recommended guidelines for setting up your system. If you have any specific questions that this section does not cover, please consult your PACE Representative or call PACE directly.

1. Placement

There are three major considerations that need to be addressed for proper placement of the central filtration unit.

Exhaust Port: This is located on the back of the filtration unit. When positioning the unit, make sure that the exhaust port is ***not*** blocked or that airflow from the exhaust port is not restricted in any way.

Proximity to work area: The filtration unit should be placed as close to the work area as possible. If using a flex hose, it is advantageous to keep the length of the flex hose as short as possible. **Do not** kink or create any sharp bends in the flex hose, as this will reduce airflow.

Unit Location The filtration unit should be positioned so that it will not block aisle ways or impede normal operating traffic of material handling pathways. It is important to position the unit in such a way that allows for proper clearance to remove the filter access cover and replace the filter as needed.

2. Power

The Arm-Evac 250 will plug into a standard 110v or 230v electrical outlet, depending on the model you purchased. A line cord is provided with each system. Be sure the unit you have is rated for the intended power supply.

Caution
Failure to supply the correct voltage to the unit will result in damage to the motor.

3. Self-Calibration Procedure

IMPORTANT
This procedure must be performed on the Arm-Evac 250 before initial operation.

4. Filters

Before operating the unit, make sure the filters are correctly positioned. The pre-filter is always located on top, and the direction of airflow is clearly marked on the filter cartridge. Airflow is always in a downward direction for the Arm-Evac 250.

5. Inlet Caps

If an inlet port is not connected to a collection device, it must be covered with the inlet cap provided.

6. **Accessories**

The Arm-Evac 250 is designed to be used with one to four collection accessories (i.e. flex arm, plenum etc). When using two collection devices, *any two* may be used together. When using more than two, you must use either 45mm *or* 50mm Flex Arms and accessories. Performance can only be guaranteed when using genuine PACE Fume Extraction collection accessories. A Silencer/Mobile Cart (8885-1225) is also available.

NOTE
The Arm-Evac 250 can be placed on the benchtop or located under a workbench, depending on operator preference

Fume Extraction Configuration Examples

2 x Metal Plenum 8886-0366
Includes 2.5m Flex Hose

1 x 50mm Flex Arm 8886-0550
1 x Fume Scoop 8886-0530
1 x Bench Mounting Bkt 8886-0552
1 x Reducer 75-50mm 8886-0299
1 x Metal Plenum 8886-0366

2 x 50mm Flex Arms 8886-0550
1 x Fume Scoop 8886-0530
1 x Nozzle 8886-0318
2 x Bench Mounting Brkt 8886-0552
2 x Reducer 75-50mm 8886-0299

2 x 45mm Flex Arms 8886-0429
2 x Bench Mounting Brkt 8886-0552
2 x Reducer 75-50mm 8886-0299

2 x 75mm Flex Arm 8886-0750
1 x Cowl Endpiece 8886-0793

SIMPLY SELECT AND CONNECT!

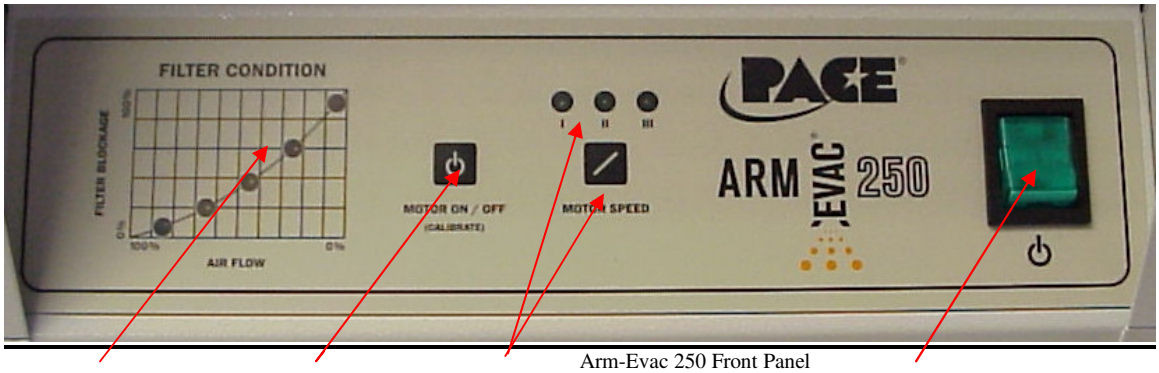
Self-Calibration Feature

The Arm-Evac 250 contains advanced microprocessor-based sensing technology which allows for self-calibration of the filter condition monitor by establishing clean airflow conditions (that is, 0% filter blockage) and fully clogged filter flow conditions (that is, 100% filter blockage). Further, this procedure insures that the airflow sensing process is consistent with and particular to the accessory configuration array and filters being used.

NOTE
This procedure must be performed on the Arm-Evac 250 before initial operation, whenever a filter change out occurs and whenever a change in system configuration occurs. **DO NOT** make any adjustments to the accessory configurations during calibration as this will disrupt the self-calibration process.

1. Turn the Power Switch (4) on ("I"/"0") whilst depressing the "Motor On/Off (CALIBRATE)" button on the front touch panel (2). The system will beep once. Continue to hold the "Motor On/Off (CALIBRATE)" button (2) until the system beeps twice. This sequence signals initiation of the self-calibration procedure. The LED lights will sequence from Green to Amber to Red on the Filter Condition Gauge (1) several times. There is no need to adjust the Speed Controller (3); the self-calibration mode over-rides the controller. Note that the Motor Speed LED's (3) are not illuminated.
2. The Self-Calibration procedure will require a running time of approximately 2 minutes in order to establish clean filter airflow (0% filter blockage) levels for all three speed settings as well as fully clogged filter levels.
3. When the first Green LED (1) remains illuminated and the Motor Speed LED's (3) illuminate, the self-calibration procedure is complete. To initiate normal operation, depress the "Motor On/Off (calibrate)" button (2) on the front panel until the desired motor speed is achieved.
4. Daily operations can be initiated by simply turning the Power Switch (4) (illuminates Green when on) to the "On" ("I") position and setting the 3 position speed controller (3) to the appropriate position. A single beep will sound when the Arm-Evac 250 is turned on.

Arm-Evac 250 Filter Condition Display



Arm-Evac 250 Front Panel

The Arm-Evac 250 has a graphical Filter Condition Display (1) which continuously monitors filter condition. As the system filter(s) collect particulates, LED's on the Filter Condition Display will illuminate along the graphical curve of the display.

Initially, a Green LED will illuminate (at bottom of graph). As the airflow rate decreases (as the filter(s) start to become clogged), LED's will illuminate high on the graphical display.

Illumination colors will darken to shades of Yellow and finally to Red as the illumination reaches the top of the graphical curve.

When the first Red LED illuminates, it is indicating insufficient airflow. Replacement of the filter(s) at this point is highly recommended. Refer to "Filter Replacement", page 12.

If the last Red LED (at the upper right of the display) illuminates, an alarm will sound. **Immediately**, turn the system power off (Power Switch) and change filters.

Caution
Overheating may occur and cause motor damage if the system is operated with completely clogged filters.

Motor Compensation Feature

The Arm-Evac 250 features intelligent pump flow sensors that increase the power to the motor as filters become blocked to assure peak performance.

Maintenance

General Tips:

- Before opening the Arm-Evac 250, always turn off the power source.
- Protect the Arm-Evac and accessories from dampness.
- Do not extract water vapor or steam.
- The Arm-Evac 250 must not be operated without filters. Impurities in the extracted air can damage the motor pump.
- Do not allow the Arm-Evac 250 or ducting hoses to become blocked.
- Do not extract corrosive compounds without checking with PACE.
- Re-calibrate the Arm-Evac 250 whenever a filter change out or system configuration change occurs.

Filter Replacement

Pre-Filter

This filter removes coarse particles from the air. In general, the pre-filter must be changed on a monthly basis. However, depending on your particular process, the filter may need to be changed more or less frequently. A visual inspection on a weekly basis is recommended.

Main Filters

Fume Extraction Filters remove particulates from the air and capture noxious odors and gases. Depending on your particular process, the filter cartridge may need to be changed more or less frequently.

Replacement Procedure

1. Turn the Power Switch to the Off ("0") position.
2. Remove the Filter access cover.
3. Remove the old Filter Cartridge(s).
4. Install new Filter(s). Insure that the Pressure Tube (black coiled cable inside filter compartment) does not become kinked when the new Filter is installed. Insure that the airflow arrow on Filter cartridge is pointing downward.
5. Replace the Filter access cover.
6. Dispose of used Filter(s) properly.
7. Re-calibrate according to Self-Calibration Feature (see page 9).
8. Turn the Power Switch to the On ("I") position.

Fuses

The fuse is located in a sliding tray at rear of the unit, just below the power receptacle. Each Arm-Evac 250 is supplied with one replacement fuse, also located in the sliding tray.

Replacement fuses are available for the Arm-Evac 250 systems in packages of 5 fuses.

230 VAC systems (part number 8889-0250) come standard with a 3.15amp fuse, part number **8884-9966-P5.**

110 VAC systems (part number 8889-0255) come standard with an 8 amp fuse, part number **8884-9961-P5.**

Motor

The Arm-Evac 250 is fitted with a maintenance-free, brush-less, single inlet fan assembly, which does not require routine maintenance. It is important that fume extractor filters are changed on a regular basis to protect the fan assembly.

A vent is located at the rear of the unit to allow the cleaned air to return to the workplace. Do not cover this vent as this may cause damage to the fan assembly.

Accessories

Monthly cleaning of the Arm-Evac 250 extraction accessories is recommended. Arm-Evac accessories should be cleaned with a non-aggressive cleaning solvent or detergent only. Make sure the Arm-Evac accessories are completely dry before re-use.

Troubleshooting

Symptom	Possible Cause	Solution
System does not power up	No power supplied to unit	Check power cord
		Is connected and power
		Is switched on.
Reduced Airflow	Filter blocked, Optional	Check & change filter(s)
	Arm attachment not installed	if req, check Arm
	correctly	attachment connection.

If the unit does not work after checking the above, please contact PACE, or your Authorized PACE Distributor if outside U.S.

Replacement Filter part numbers

Item #	Name	Description	Typical Applications	Part Number
1	Arm-Evac 250 Pre-filter	Designed for coarse particle capture.	Used with all Arm-Evac 105 systems.	8883-0111-P5 (Pkg. Of 5)
2	Arm-Evac 250 General Purpose Filter	Comprised of HEPA filter media & gas blend media	Soldering, Pharmaceuticals, Laser Cutting/Laser Marking, Jewellery manufacture & repair.	8883-0931
3*	Arm-Evac 250 Extended Life Pre-Filter	Designed for coarse particle capture.	Heavy-Duty Soldering operations	8883-0986-P10 (Pkg. Of 10)
4*	Arm-Evac 250 Extended Life Combo HEPA/Gas Filter	Comprised of HEPA filter media & gas blend media	Heavy-Duty Soldering operations	8883-0987-P1
5	Arm-Evac 250 Adhesives Filter	Blend of Adsorptive & Chemisorptive media.	Benchtop Adhesives Procedures, Gluing Applications, Circuit Board Cleaning, Laboratory Applications	8883-0951
6	Arm-Evac 250 Cleanroom Filter	Comprised of HEPA filter media & bonded activated carbon.	Fine particulate and gas removal in designated Cleanroom environments.	8883-0921
7	Economy Foam Filter	Reticulated foam media. Designed for coarse particle capture.	Sanding applications, Benchtop Machining Operations, Benchtop Prototyping Operations, and Grinding Applications.	8883-0871

*These items must be used together. **NEVER** use them separately!

When disposing of used filters, extreme care must be taken to comply with *all* applicable environmental regulations. Carefully consult the MSDS supplied with the material(s) producing the fume. If in doubt, check with your local Environmental Authority.

PACE WORLDWIDE LIMITED WARRANTY

PACE warrants to the first user that Products manufactured by it and supplied hereunder are free of defects in materials and workmanship for a period of: (1) year from the date of receipt by such user. This Warranty as applied to blowers and motor pumps is limited to a period of six (6) months. Monitors, computers and other brand equipment supplied but not manufactured by PACE are covered under their respective manufacturer's warranty in lieu of this Warranty.

This warranty does not cover wear and tear under normal use, repair or replacement required as a result of misuse, improper application, mishandling or improper storage. Consumable items such as tips, heaters, filters etc. which wear out under normal use are excluded. Failure to perform recommended routine maintenance, alterations or repairs made other than in accordance with PACE's directions, or removal or alteration of identification markings in any way will void this warranty. This warranty is available only to the first user, but the exclusions and limitations herein apply to all persons and entities. PACE Incorporated retains the right to make changes to the terms contained herein at any time, without notice.

PACE MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

PACE will, at its option, repair or replace any defective products at its facility or other location approved by it at no charge to user, or provide parts without charge for installation by the user in the field at user's expense and risk. User will be responsible for all costs of shipping equipment to PACE or other location for warranty service.

EXCEPT FOR THE REMEDY ABOVE DESCRIBED, UNLESS OTHERIWSE REQUIRED BY APPLICABLE LAW, PACE WILL HAVE NO OTHER OBLIGATION WITH REGARD TO ANY BREACH OF WARRANTY OR OTHER CLAIM WITH RESPECT TO THE PRODUCTS, OR LIABILITY FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, OR INCIDENTAL LOSS OR DAMAGE CAUSED BY OR OCCURRING IN CONNECTION WITH ANY OF THE PRODUCTS.

Warranty service may be obtained by contacting the appropriate PACE Company or local Authorised PACE distributor as set forth below to determine if return of any item is required, of if repairs can be made by the user in the field.

Defective products may not be returned to PACE without a Service Authorization ("SA") Number.

Any warranty or other claim with respect to the products must be made in writing delivered to PACE (or local Authorised PACE Distributor for Buyers outside the USA and the United Kingdom) within a reasonable time of the expiration date of this warranty with sufficient evidence of purchase and date of receipt, otherwise user's rights under this warranty shall be deemed waived.

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