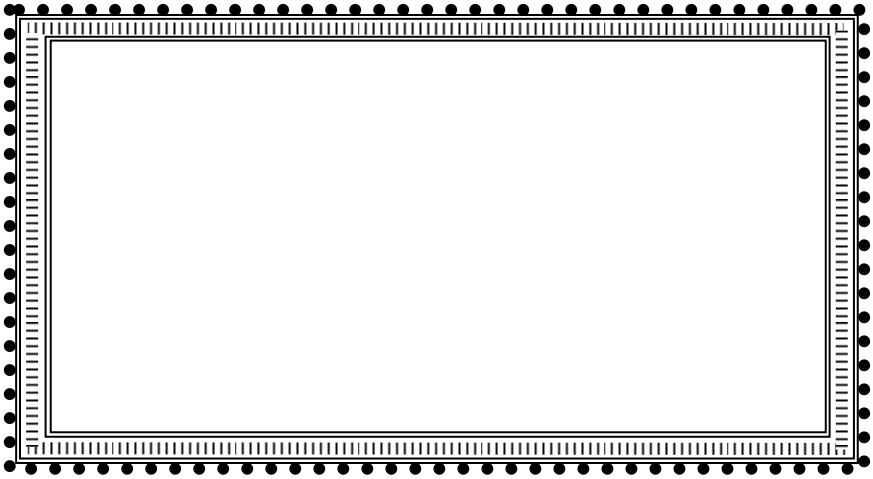
Airephase LE™

Air Filtration Unit

Installation, Operation & Service Manual

Read and Save these Instructions



Manufactured by
BIOLOGICAL Controls
749 Hope Road, Suite A- Eatontown, NJ 07724
Tel: 800-224-9768, 732-389-8922 Fax: 732-389-8821

8/22/2013

SAFETY INSTRUCTIONS

Read and Save these Instructions

Understand the signal words that are universally used for overall safety:

⚠ DANGER This symbol identifies the most serious hazards, which will result in severe personal injury or death.

⚠ WARNING This symbol signifies hazards, which could result in personal injury or death.

⚠ CAUTION This symbol is used to identify unsafe practices, which would result in minor personal injury or product and property damage.

SAFETY INSTRUCTIONS

⚠ DANGER **BEFORE INSTALLATION OR PERFORMING MAINTENANCE OR SERVICE, TURN OFF THE MAIN HIGH VOLTAGE POWER BREAKER TO THE UNIT. ELECTRICAL SHOCK CAN CAUSE INJURY OR DEATH. THERE MAY BE MORE THAN ONE DISCONNECT.**

⚠ WARNING **READ INSTRUCTION MANUAL THOROUGHLY AND FOLLOW ANY WARNINGS OR CAUTIONS IN THIS MANUAL AND ATTACHED TO THE UNIT BEFORE STARTING INSTALLATION OR MAINTENANCE ACTIVITIES. IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE, MAINTENANCE, OR USE CAN CAUSE FIRE, ELECTRICAL SHOCK, OR OTHER CONDITIONS THAT MAY CAUSE PERSONAL INJURY OR PROPERTY DAMAGE. WEAR SAFETY GLASSES AND WORK GLOVES AND FOLLOW ALL SAFETY, LOCAL BUILDING, AND ELECTRICAL CODES. CONSULT A QUALIFIED INSTALLER, SERVICE AGENCY OR YOUR SUPPLIER FOR INFORMATION OR ASSISTANCE.**

⚠ WARNING **NEVER OPERATE THE UNIT WITH THE EXHAUST PORTS UNCOVERED OR WITH FILTER ACCESS AREAS OPEN TO PREVENT CONTACT WITH THE BLOWER IMPELLER BLADES. ALWAYS WAIT FOR THE BLOWER TO STOP SPINNING BEFORE UNCOVERING THE IMPELLER.**

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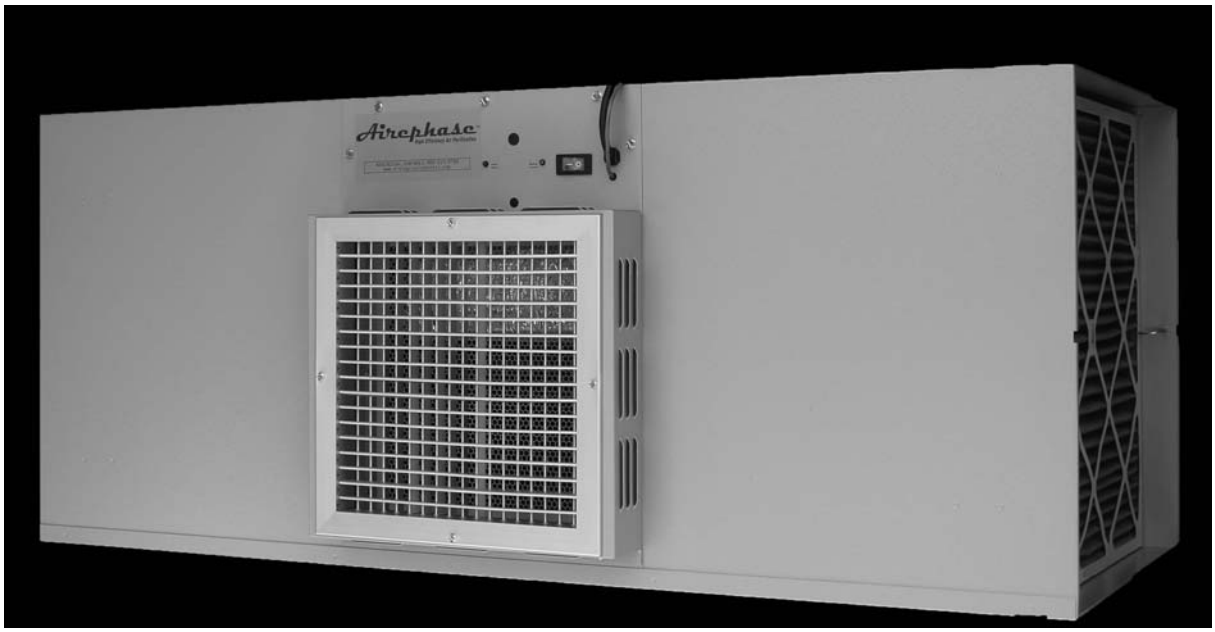
Airephase LE

1. SYSTEM DESIGN AND TECHNICAL DESCRIPTIONS

The combined component quality and features provided in the Airephase LE system makes this industrial air-filtration design a dependable and efficient method of providing air-purification solutions for a wide variety of working environments.

The Airephase LE system incorporates proven filtration-technology to tackle a broad assortment of airborne particulate problems. The system can be integrated with industrial gas monitoring and data acquisition hardware to provide continuous, independent, feedback on facility air-quality and provide metrics to help determine the effectiveness of the Airephase LE system within a facility.



Airephase LE shown with Optional 4-way Exhaust Louver

All auxiliary control and monitoring systems approved for the Airephase LE are powered by Extra-low Voltage (ELV) circuits. Optional micro-processor based controllers, digital day timers, electric eyes, magnetic switches, gas detectors or simple wall switches all utilize 24V to safely control the power-switching, speed, and monitoring functions.

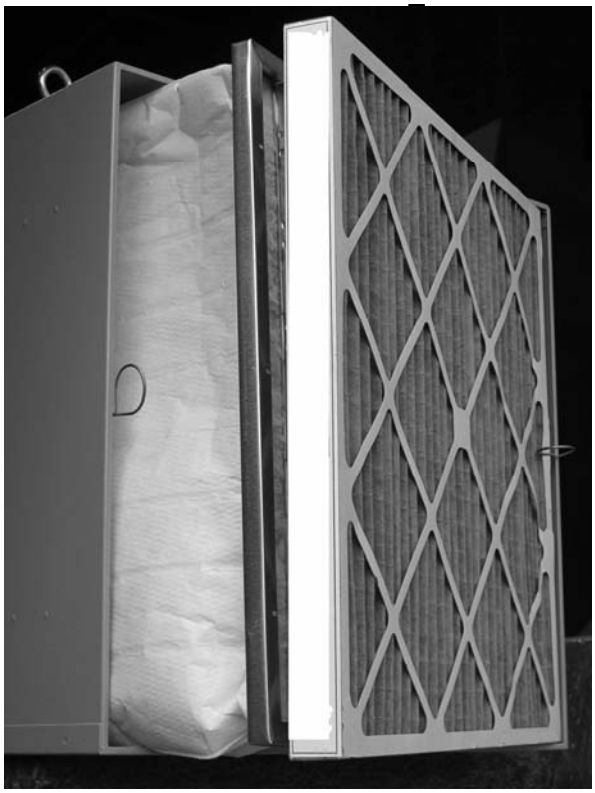
High Efficiency “GREEN” blower-motors are Standard for this unit.

1.1. Airephase LE Filters

The standard Airephase LE houses two sets of filters (total of four (4) filters). Each set contains a pre-filter, and a high efficiency particulate pocket-filter. See Figure below.

The filters are accessible through each end of the chassis and are easily released by simply twisting two (2) wire-retaining clips 90º. See figure below. The right wire-clip is closed and the left is open.

ONE of TWO FILTER_SETS



POCKET FILTER ↑ ↑ **PRE-FILTER**

The frequency of filter renewal will be directly proportional to the "run-time" of the unit, the density, and size of particulate in the environment.

The filter status is continuously monitored by a pressure circuit that activates a red indicator when the filters require maintenance. This information can be monitored via the low voltage control cable to a central controller (i.e.; TCMM or TSCMM).

Optional filter configurations are available for use in the Airephase LE unit for custom applications.

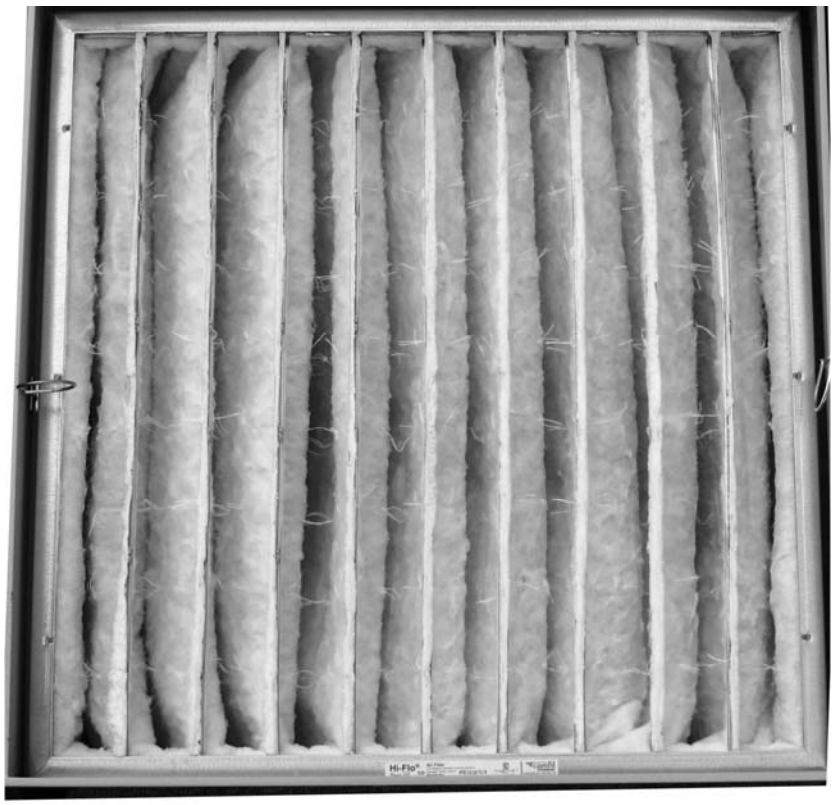
1.1.1. Pre-filter

The Airephase LE unit is equipped with two pleated synthetic pre-filters measuring 24"x24"x2"(optional 4", thicker, size recommended for dusty-environments). The filters have an Underwriters Laboratories (UL) Class 2 flammability rating and a Minimum Efficiency Rating Value (MERV) of 8 to capture larger sized particles in the 1-5 micron range. The factory equipped pre- filter has two-four times the dust-holding capacity of standard filters.

These filters will be the first to require renewal. The timely maintenance of the pre-filters will extend the life of the high efficiency pocket-filters.

1.1.2. High Efficiency Particulate Filter

The standard high efficiency ten-pocket-filter (24”x24”x15”) is designed to capture the smaller size particulate in the **0.3**-micron range. The filter media-tests at a MERV rating of 15, has water-resistant properties, and an Underwriters Laboratories (UL) Class 2 flammability rating. The Airephase LE chassis is designed to easily slide two (2) of these filters (one into each end).



POCKET FITLER END-VIEW
(Ceiling at the top & floor at the bottom)

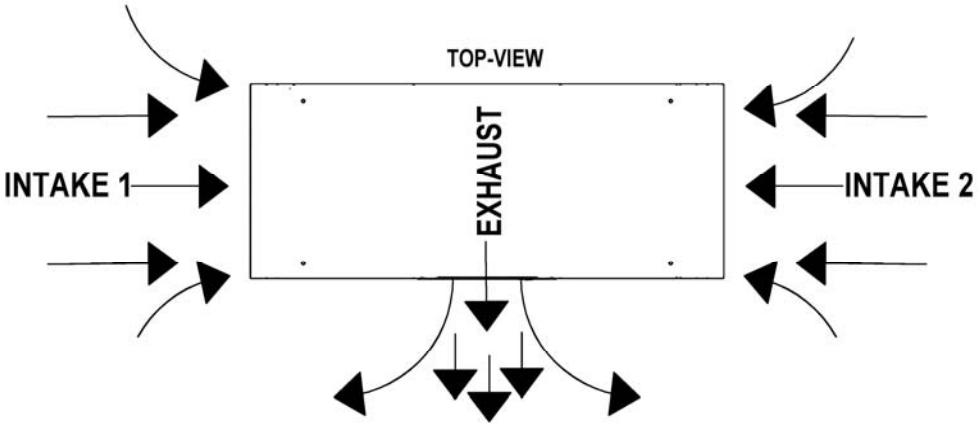
⚠ CAUTION

The long-pleat openings must be positioned perpendicular to the floor as shown above. Since the chassis may be mounted in 90 degree increments, depending upon the exhaust-port position, always check that both pocket-filters have been correctly positioned after the installation of the chassis (see figure above).

1.2. Chassis Design

1.2.1. Chassis

The Airephase LE The Chassis houses the four (4) filters, blower sub-assembly, and provides the anchor-hardware used to install the unit with chain, threaded-rod, or strut hardware. The dual-intake design draws air in from both ends and exhausts clean-air out of the center of the chassis. See the figure below.

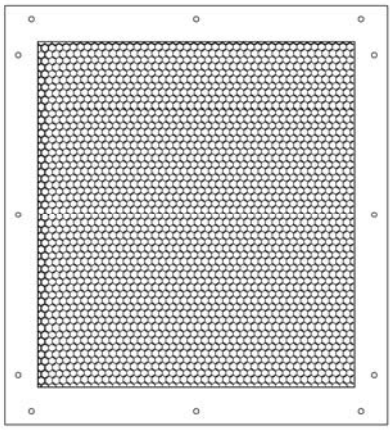


The unit may be installed in one of four (4) horizontal positions. This flexibility allows the exhaust-port to point front, back, up, or down depending on the needs of the customer's facility. The Blower sub-assembly mounts into the chassis along with the four (4) filters and is shipped from the factory fully assembled and tested.

1.2.2. **Blower Sub-Assembly**

The Blower sub-assembly contains the blower motor, all electrical components, associated remote control, and maintenance circuits. The motor and all electrical components can be removed as a single sub-assembly when access is required to components located in these areas. Ten feet (10') of high-voltage, SJ00, 14-2, power-cord, and ten feet (10') of 18-22ga, three (3) to nine (9) conductor low voltage cable is provided with each Blower assembly.

1.2.3. **Perforated Exhaust Cover**



⚠ WARNING

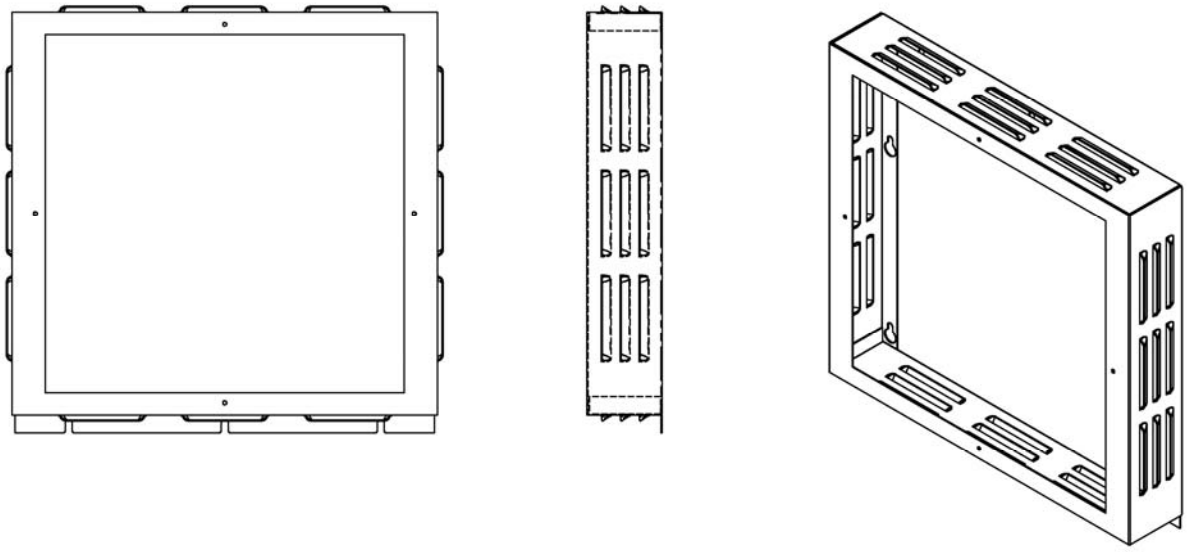
The perforated exhaust cover must always remain attached to the unit chassis to protect personnel from the spinning blower impeller and potential debris.
Never operate the blower without a cover on the exhaust port.

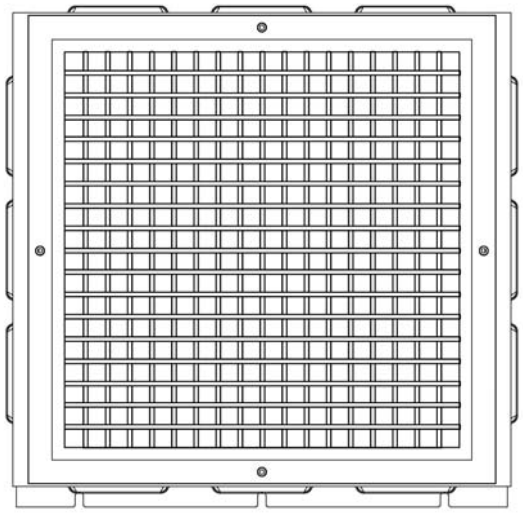
The honeycomb punch-pattern in the cover is an efficient opening for air-flow and provides the necessary protection for safe operation. The Perforated Exhaust Cover must always be present to protect personnel from the spinning blower impeller; loose debris inadvertently lodged in the chassis.

1.2.4. **Exhaust Adaptor and Multi Directional Air-Flow**

The optional exhaust adaptor mounts over the exhaust opening of the Airephase LE unit and is designed to be the base for custom duct-work or the optional four-way adjustable diffuser.

In addition to the 9 sets of permanent louver openings on each side of the adaptor (36 total), the adjustable diffuser allows clean-air exhaust to be directed up, down, left and right using 17 independent horizontal and 17 vertical moveable air-vanes.



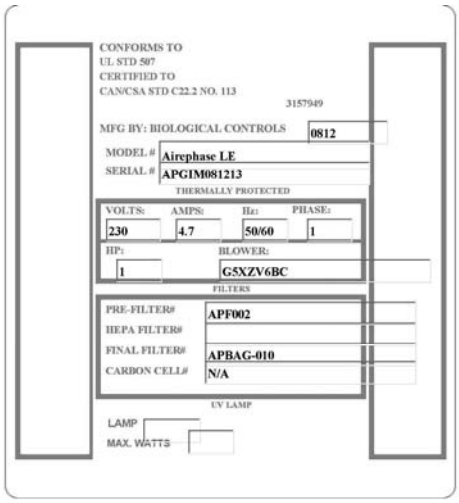


Front View
Exhaust Adaptor eq/w 4-way Adjustable Louvers

2. Electrical Functions

⚠ WARNING

Always check the Manufacturing label placed on each unit for Power specifications and filter options. See example below



2.1. Blower Motor

The Airephase LE blower motor uses a double-inlet, direct-drive motor equipped with a 1-HP high-efficiency "GREEN" motor that may be configured for 120VAC @ 50/60Hz or 208-230VAC @ 50/60Hz. The motors are permanently lubricated ball-bearing models requiring no maintenance. The Green Motor is an ECM (Electronically Commutated Motor) and does not use a start or run-capacitor.

The Unit Serial Numbers starting with prefix APGIM indicates the high efficiency "GREEN" motor.

2.1.1. High Efficiency "GREEN" Motor

The High Efficiency "GREEN" (ECM) motor will operate 25-75% more efficiently than equivalent 1 HP PSC units.

When the optional speed-selector switch is equipped one of 3 speed selections (I, (CF) II, III, can be manually chosen. Blower speeds and cycle-times can also be selected or changed automatically for one or for all blowers within a system via a programmable central Timer/Speed Control and Maintenance Monitor control-unit (TSCMM-optional). **When a remote control unit is in use and the filtration unit is equipped with the optional the Speed-selector switch; set the switch to the "continuous fan" (CF) position.**

The "GREEN" motor will start, change speeds, and stop "softly". Normal ramp-up and ramp-down times can be up to 45 seconds for a complete speed-change. Power sequencing is not necessary since current surges are avoided to smooth the loading on facility-power; especially when multiple blowers are part of a filtration system.

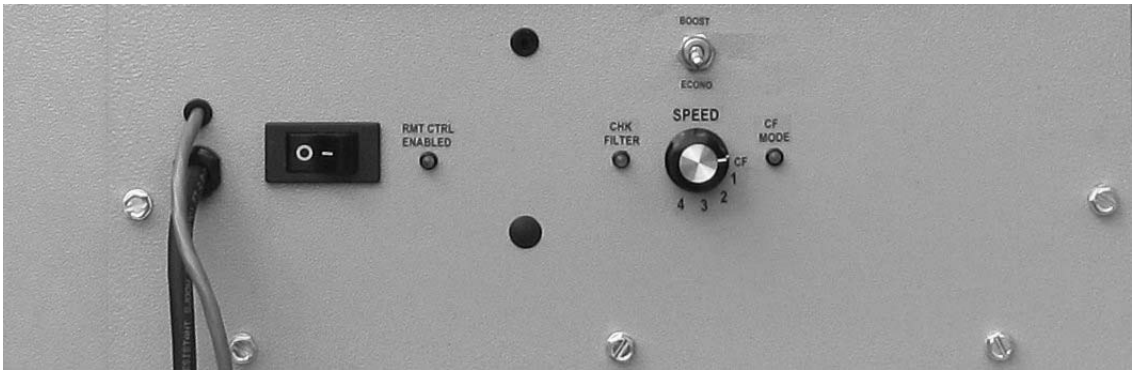
One end of the motor contains an integrated plug-in Electronic-Controller module that is connectorized for easy renewal, if necessary, without having to disassemble the motor from the blower chassis or lower the filtration unit from the installed position.

2.2. Power Control Options

Although the Airephase LE filtration system may be activated manually via a low voltage wall switch, it may be permanently hard-wired to run 24/7. Most installations incorporate some form of automatic remote activation and cycle-timing. An optional Timer Control and Maintenance Monitor (TCMM, TCMb or TSCMM) along with one or more other optional activation circuits are usually utilized for automatic control of a filtration system. Consult the Controller Installation & User Manual for technical descriptions, application notes, and troubleshooting. An optional 24V digital day-timer (eq/w battery backup) can also be used to automatically cycle filtration units based on daily work-schedules. The timer is easily programmed by the customer.

2.3. Airephase LE Control Panel

Shown with optional speed-control switches.



2.3.1. Power Switch /Circuit Breaker/RMT CTRL ENABLE LED

A rocker-switch/circuit-breaker is provided on the front of the Blower Assembly. The "LEFT" position is OFF=0, and "RIGHT" is ON=1 as noted on the switch.
A 10 amp circuit-breaker is built into the power-switch.
The 230V circuit-breaker switch glows amber when activated, but the blower will not start unless the 24VDC low-voltage control is present (indicated by a green RMT CTRL ENABLED LED). If the circuit-breaker trips (the amber light will go off). Cycle the switch after a 1 to 5 minute cool-down period before restarting the unit.
Circuit-breakers that are tripping indicate a current over-load condition. Check the load-current at the end of the power cord to make sure the unit is operating within specifications.

2.3.2. Air Switch and Filter Alarm/ Remote Control

The differential pressure across the filter combinations and the pressure outside chassis are monitored. A red "Check Filter" indicator illuminates to signal the fact that the filters need renewal.
The standard Airephase LE unit is equipped with a red "CHK FILTER" LED and a three (3) to nine (9) wire remote control cable.

The high-efficiency "GREEN" motor always requires a 24V input cable to start the unit and for motor speed selections (either manual or automatic). See the schematic section of this document for wiring information.
Airephase LE units monitored by a controller have additional Filter-Check LEDs to centralize the system filter status on a per unit basis.

2.3.3. Speed Control

The multi-position SPEED selector and the ECON/Boost switch are used to manually select the blower-motor speeds. Set the ECO/Normal Toggle-Switch and the Speed Control Rotary-Switch to the desired positions. See the Motor Speed Control and Efficiency guidelines in the Appendix. When the Optional TSCMM controller is connected to the Airephase unit, set the Speed Rotary-Switch to the default Continuous Fan (CF) mode. In this position the controller will override the manual switch-position as determined by various programming options. See the TSCMM manual for cycle-time and speed programming information.

2.4. TIMER CONTROL and ACTIVATION EQUIPMENT

2.4.1. Timer Control and Maintenance Monitor Options))

The TCMM, TCMb and TSCMM are central controller platforms used for automatic maintenance monitoring and microprocessor controlled features. The standard TCMM or TSCMM module, is offered in an 8.5" X 10.5" X 4" deep, hinged-door NEMA4 rated, electrical enclosure (optional NEMA4X and or locks are available). All of the controller circuits operate at 24V low voltage (ELV) and low energy levels allowing the hardware to be located safely within a facility. The control units are UL507, CSA 22.2 compliant accessories.
The Controllers provide automatic "hands-free" activation and cycle-timing of any of the Biological Controls air-filtration systems. These include, but are not limited to combinations of Airephase, Airephase LE, AirMATION, and MICROCON CD® units.

The Controller Units contain all of the wiring terminations and the enclosure necessary to interface up to eight (8) individual filtration units. For larger systems multiple controllers may be placed in master/slave arrangements. A smaller, less-featured, TCMMb Control unit (4" X 6" X 3" deep, hinged-door, NEMA Type 3R, 4, 12, 13, UL508) enclosure is available for facilities using 1 to 4 filtration units. The Timer Speed Control and Maintenance Monitor (TSCMM) is designed specifically for the high-efficiency "GREEN" blower-motor models to provide various automatic speed control and timing-cycle features.

2.4.2. Optional Airephase LE Low Voltage Wall Switch

Single or multiple Airephase LE units that do not require a control unit may be powered on and off via a wall switch(s) or key-switch(s). The low voltage switch circuits are all mounted on standard stainless steel switch-plate covers. The plate is equipped with either a keyed or rocker-switch to activate one or more units, a green LED indicates that power has been directed to the filtration unit (s), and an optional hour-meter and red filter-check LED to monitor filter status. All low voltage control circuits will be powered from a 24VDC wall-plug power module provided with each optional control unit.

3. GENERAL MAINTENANCE INFORMATION

⚠ WARNING

Always remove power during any maintenance routine. Keep water away from all electrical connections.

⚠ WARNING

Do not perform maintenance on the Blower motor or Chassis parts without disconnecting the high voltage power at the Facility Main Fuse Panel.

Other than the normal filter changes outlined in this document, the unit requires no maintenance. All Airephase LE blowers are double inlet direct drive units and are permanently lubricated. The blower is not in the "dirty" air-stream eliminating the need to clean the squirrel cage blades. If particulate falls from a dirty filter to the bottom surfaces of the chassis, use a damp cloth soaked in a mild dish detergent to clean inside the chassis and rinse with a damp cloth.

4. PROCEDURES FOR FILTER RENEWAL

4.1. Filter Replacement

Filter renewal takes place in seconds rather than minutes and requires no tools. The filters are lightweight and easily handled by one person. They are secured with two (2) wire-clips per filter-set. To release or secure a filter-set; simply finger-twist the clips 90º (one flips clock-wise (CW) and the other counter clock-wise (CCW). (See Photo section 1.1)

The filters are high capacity-cells selected specifically to work with the Airephase LE blower motor, pressure-switch, and optional microprocessor controlled sensors. All factory pressure-settings are based on the performance characteristics of the combined components. Altering the combination affects the pressure set-points and may result in premature maintenance procedures or component failures. Filters, other than supplied by the manufacturer, will void both the unit and individual component manufacturer's warranty.

⚠ CAUTION **Do not operate the blower without all filters.** Loose items can easily be sucked into the Airephase LE blower causing damage. A Factory Distributor should be contacted for approved filter and part replacements.

4.1.1. Pre-filter, High Efficiency Particulate Filter

When the Check-Filter (CHK FLTR) indicator turns-on (RED), one or more of the filters requires renewal. The indicator may flicker as the set-point is reached and will eventually go to a "steady-on" mode if the filters are not renewed. The performance of the Airephase LE unit is diminished when the red indicator is on.

When a pre-filter is clogged, replace it with a new one and the reduction in pressure should deactivate the red light or TCMM indicators. **Both Pre-filters should be changed as a set**. If the pre-filters are new and the red light remains on, then the high efficiency **pocket- filters will need renewal as a set**.

The filters in the enclosure are accessible through the ends of the chassis. The two inch (2") thick pre-filters (or optional four inch (4") pre-filters) mount in the outer-most filter-compartment and flush against the High Efficiency pocket-filter header. Replace filters in the same orientation as they were provided. The air-flow direction-arrow on the pre-filter should point towards the center of the unit. **The long openings of the pocket-filter pleats are always positioned perpendicular to the floor (point up & down rather than left & right. see figure in section 1.**

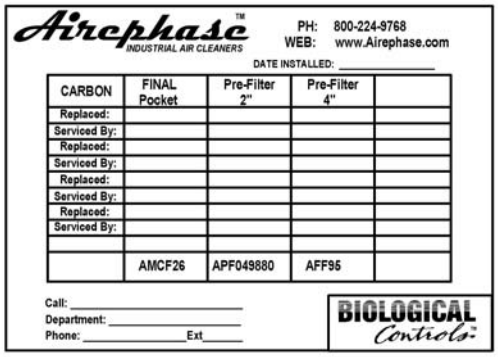
⚠ CAUTION **Be careful not to pinch the pocket-filter media between the metal filter frame and Airephase chassi**s.

When inserting the pocket-filter into the chassis fold the media inward from both sides. Gently shake the filter as it approaches the metal chassis frame to be sure that none of the filter material gets pinched between the filter frame and the chassis. When properly positioned one can feel the metal filter frame hitting the chassis on all four sides of the filter with no resistance. Insert the

Pre-filter flush against the pocket filter and twist the two (2) wire-clips 90º to secure the filters. *Note that one wire-clip flips up; and the other flips down.*

IMPORTANT!

Maintain accurate filter maintenance records to help determine how frequently the filters are replaced. Proper maintenance assures that the air cleaner will perform at maximum efficiency. Use the label provided on the inside wall of the chassis in the Pre-filter area to record the filter change activity. Systems controlled by an optional Controller module will have the ability to query the filter health of any or all of the units in the system.


Airephase™ INDUSTRIAL AIR CLEANERS
PH: 800-224-9768
WEB: www.Airephase.com
DATE INSTALLED: _____

CARBON	FINAL Pocket	Pre-Filter 2"	Pre-Filter 4"	
Replaced:				
Serviced By:				
Replaced:				
Serviced By:				
Replaced:				
Serviced By:				
Replaced:				
Serviced By:				
	AMCF26	APF049880	AFF95	

Call: _____
Department: _____
Phone: _____Ext_____

BIOLOGICAL Controls

4.2. Disposal of Filters

Differing State and local regulations make it is impossible to draw a blanket statement as to the approved means for filter disposal. Follow disposal procedures consistent with the regulations covering a particular facility. All questions should be directed to the local county waste-management authorities or EPA for guidance.

5. ELECTRICAL and MECHANICAL INSTALLATION

5.1. General Electrical Installation Instructions

⚠ DANGER **Turn off power at the facility Main Fuse Panel before proceeding with wiring or installation activities. All electrical installation and maintenance must be performed by qualified individuals and in accordance with the National Electrical Code, ANSI/NFPA 70-1999 and local codes.**

5.1.1. **Schematics- See the APPENDIX**

5.1.2. **Power Requirements**
See the Specifications section and the Serial Number lable on each unit.

5.1.3. **Timer Speed Control and Maintenance Control Unit Installation**
See The TSCMM Installation & User Manual.

5.1.4. **Power Cord Receptacles**
These are **provided by the installer**. Plug and Twist-types are recommended.

5.1.5. **Low Voltage Power & Wiring**
A Low voltage 24V wall-plug power module (supplied with each system) is required to power all system-associated with the 24V control circuits. These include auxiliary activation hardware (i.e., gas detectors, electric-eyes, Controllers, day-timers, remote control power options, etc.) The power-module plugs into any standard wall outlet. The outlet must be associated with circuits that remain on 24/7.

Alarm-type cable (18-24ga wire) is recommended for the 24V control circuits.

5.2. Blower Sub-Assembly Access and Maintenance

The Blower Sub-Assembly is designed to be accessed by removing eighteen (18) ¼-20 hex bolts, 6 on the top and 12 on the front of the unit and sliding the whole sub-assembly out of the chassis.

- Remove all of the filters from one end of the chassis.
- Remove twelve (l2) bolts from the front first, and then remove the six (6) motor support bracket bolts last.
- If the motor support brackets are connected to the top of the unit, place a three inch (3") block of wood or spacer between the chassis floor and the bottom of the blower to support it while it is sliding in or out of the chassis.
- Reassemble in the reverse order.
- Do not tighten the six (6) motor support bracket bolts until all of the front collar-bolts are tightened.
- *Note that before sliding Sub-assemblies equipped with the "GREEN" High Efficiency motor in or out of a chassis, **the motor end-cap equipped with the motor controller-module** must*

be removed. The module-end of the motor can be identified by the power cables that are connected to the motor via two (2) connectors.

- Unplug the cables (2 connectors - One for High Voltage Wiring and one for Low Voltage Control Wiring). **Do not remove the white (120V) or yellow (230V) selector-connector that is equipped in the High Voltage motor connector.**
- Remove the two (2) ¼" hex-head screws holding the motor controller-module to the motor. One of the screws anchors the motor Safety-Ground connection (green wire). **Make sure the green wire is reattached in the same manor during reassembly.**
- Pull the motor wiring-module straight out from the motor-end. Disconnect the 3-wire interconnect cable joining the module to the motor.
- Set the motor-controller and two (2) screws aside in a safe place.
- Reattach the controller-module in the reverse assembly-order after sliding the blower-motor assembly into the chassis.

5.3. Chassis Mechanical Installation

The Blower Assembly and a Filter Chassis are normally shipped assembled and tested to the installation site.

The Main Chassis is generally packaged in shipping-box that is split in the middle. The boxes are released near the center of the chassis and slide off each end. The boxes may remain in place until the unit is installed to help prevent damage during installation and lifting operations. Split-open or remove only the box material necessary to install and access the hardware support areas.

5.3.1. Installation Kit

Four (4) three inch (3") eye-bolts, retaining nuts, and a manual are packaged inside the end of the chassis marked with a packing-label and check-list.

When an optional 24VDC power-module is part of the order it will be included in the kit and indicated on the check-list. When a controller unit and/or auxiliary activation hardware are part of the order, those components along with the power module(s) will be packaged in a separate box as noted on the customer packing-list.

The optional exhaust louver parts when ordered are generally packaged inside the chassis behind the blower and are accessed by removing one set of filters from the end with the packing-label.

⚠ **WARNING** Support Directly From Building Structure. Obtain an approved fixture attachment design proceeding with the installation. The ceiling support system of the building must be checked to assure that it is sufficient to carry the weight of the hardware.

Chassis Anchor-point dimensions used for installation are shown in Appendix A.
Since the Filter Module may be mounted in one-of-four (4) different horizontal positions a set of four (4) eye-bolt mounting holes are provided on **both the top and bottom of the chassis.** One set of bolt-holes are shipped with plastic-plugs. If it is necessary for the plugs to be removed they must be driven out from the inside. (Do not attempt to pull the plugs out since they will most likely break). . **Always plug the unused set of mounting holes with plastic plugs, a short (1/2") 3/8-16 bolt, or silicon calking to prevent air-leaks into the chassis**.

⚠ CAUTION

Plugs or support hardware that extend more than 5/8" into the chassis may interfere and tear the pocket filters.

5.3.2. Strut Installation

Use two (2) 30" lengths of Unistrut® or similar strut-hardware and bolt them to the bottom of the chassis using four (4) 3/8-16 x 5/8" bolts. This provides a good support method whether using chain or threaded rod to support the struts. The bolts should be secured with 3/8-16 nuts from inside the chassis **making sure the hardware does not extend more than 5/8" into the chassis.**

5.3.3. Threaded Rod or Chain Installation

When using the supplied eye-bolts always use one nut on the outside and one on the inside of the chassis and tightened correctly (16ft/lbs torque)**.**
If threaded rod is used directly or eye-bolts and chain are utilized make sure that the threaded rod or Eye-bolts are capped off inside the chassis with a nut and are properly tightened from inside the chassis. **The attaching hardware may rip the pocket filters if it extends into the chassis by more than 5/8".**

5.4. Installing the Exhaust Louver

The Airephase LE exhaust louver is usually field installed. When ordered, the parts are usually packaged inside the chassis behind the blower motor.

⚠ WARNING **Never operate an Airephase LE unit without the perforated exhaust cover. It is required for safe operation.**

The Exhaust provides a base for the adjustable louver feature or for attaching custom ducting to the unit.
Remove the aluminum adjustable louver if it is attached to exhaust adaptor by removing four (4) hex head screws. Retain the screws for reassembly later.
Loosen six (6) ¼-20 bolts on the blower sub-assembly of the Airephase LE chassis (use a 3/8" inch nut-driver or wrench). Back the three (3) screws at the top of the exhaust port out approximately 3/8" but **do not remove them from the chassis.** The remaining screws can be temporally removed and set aside.
Align the exhaust adaptor to slide over the heads of the loosened bolts. Position the adaptor so it is square with the top and side of the main chassis and re-tighten the bolts and replace the screws set aside in the previous step. Re-attach the 4-way aluminum louver to the adaptor.

5.4.1. 4-way Louver Adjustments

The 4-way louvers are provided to adjust the horizontal and vertical air-flow component of the exhaust. It is good practice to angle the exhaust-air at a 45 degree angle so air is returned to the space to create multiple circulating air-flow patterns. **Typically the air-vanes are adjusted at a**

45 degree angle with 8 in the up direction and 8 in the down position; 8 to the right and 8 to the left. The adjustable air-vanes can direct air away from items such as hanging space heaters, bulletin boards, etc. or used to provide optimum air-circulation patterns within a facility.

5.5. Airephase LE Unit Placement Guidelines

A placement plan helps optimize the effectiveness of the Airephase LE units installed within a facility. Consult the distributor representative for guidance. In general, the intake ends of an Airephase LE unit are placed above and in close proximity to the pollution sources and the exhaust directed for best air-flow. When more than one unit is installed in a facility, a distributed array may be formed to multiply the effectiveness of the overall system.

5.5.1. Vertical Height

For installations such as Departments of Public Works, Fleet Maintenance facilities or Fire Stations/EMS where units are suspended from the ceiling, **have a safety official determine the required clearance distances, signs, blockades and/or markings for vehicles or machinery to pass safely beneath or beside the units.**

5.5.2. Horizontal Placement

When possible, allow six feet (6') of clearance between a wall and the exhaust end of the unit. If this is not possible the blower-module may be mounted 180 degrees from normal to allow the exhaust to exit the opposite side. The exhaust may also face up or down and be equipped with an optional louver or ducting.

Always check the position of the pocket-filter pleats as shown in Section 1 after installation.

5.6. Installation / Service Checklist- See APPENDIX

After an installation or service, always go to the **Installation Checklist** to make sure that all of the items have been addressed.

6. WARRANTY PROCESS

Limited Warranty

Biological Controls warrants the following to be free of defects in workmanship and materials during normal use and service for a period of twelve (12) months: the blower module, filter module (not including filters), electric-eye, gas detectors and timer control hardware from the date of purchase by the original end user.

If at anytime during the warranty period the product is defective or malfunctions, Biological Controls or its dealer or distributor, from whom the product was purchased, shall at the option of Biological Controls replace or repair the defective parts or components.

This warranty does not cover removal or installation costs. This warranty shall not apply if it is shown that the defect or malfunction was caused by damage due to shipment, improper electrical connections, or improper use or abuse of the product.

The sole responsibility of Biological Controls shall be to repair or replace the product within the terms stated above. **Biological Controls shall not be liable for any loss or damage of any kind, including any incidental or consequential damages resulting, directly or indirectly, from any breach of warranty, expressed or implied, or any other failure of this product.** (Some states do not allow the exclusion or limitation of incidental or consequential damages, so this limitation may not apply to you.) **The warranties set forth are exclusive and Biological Controls expressly disclaims all other warranties, whether written or oral, implied or statutory, including but not limited to any warranties of merchantability, workmanship, or fitness for a particular use.**

In our continuing effort to produce the highest quality products, we reserve the right to change or alter product specifications and materials without notice.

This warranty gives you specific legal rights and you may have other rights, which vary, from state to state.

6.1. Making a Warranty Claim

To make a warranty claim or if you have questions about the warranty policy, contact your local Airephase LE distributor from whom you purchased the product.

NOTE: *Do not return any products or components directly to the factory without a factory issued "Return Merchandise Authorization (RMA) number" issued by the Biological Controls Customer Service Department. Any products returned without the issuance of the RMA number will be refused and returned to shipper.*

For questions related to this warranty call or write:

Manufacturer:	Sales Distributor:
BIOLOGICAL CONTROLS	
749 Hope Road Suite A	
Eatontown, NJ 07724	
TEL: 800-224-9768	
FAX: 732-389-8821	
WEB SITE: www.biologicalcontrols.com	

7. SPECIFICATIONS

Weight	**Airephase LE** AMB - 170 lbs. total weight (Including Standard Filters)
Delivered Air: **High Efficiency "GREEN" Motor:**	2500-2100 CFM@ 0"-1.8"WC 150,000 Cubic Feet /hr. max 3-6 Speed Control settings typical- High, Med, and Constant Fan circulation (very low)
Model Number & **High Voltage Power**	**Model APGIM (High Efficiency "GREEN" motor)** 115VAC +/- 10%, 50/60Hz @ .8A to 8.3A (current is speed dependant) or 208-230VAC +/-10%, 50/60 Hz @ .4 A to 4.7A (current is speed dependant) See Speed & Efficiency data in the Appendix.
Low Voltage Control Power **(ELV) extra low voltage control circuits**	24VDC+/-10% @ 80ma max.(Standard) Required for hard wired powering (no remote control options) 24VDC+/-10% @ 80ma max.(Standard for speed control options)
Dimensions	See **APPENDIX**.
Approvals	ETL - USA and Canada (UL507 and CSA C22.2)

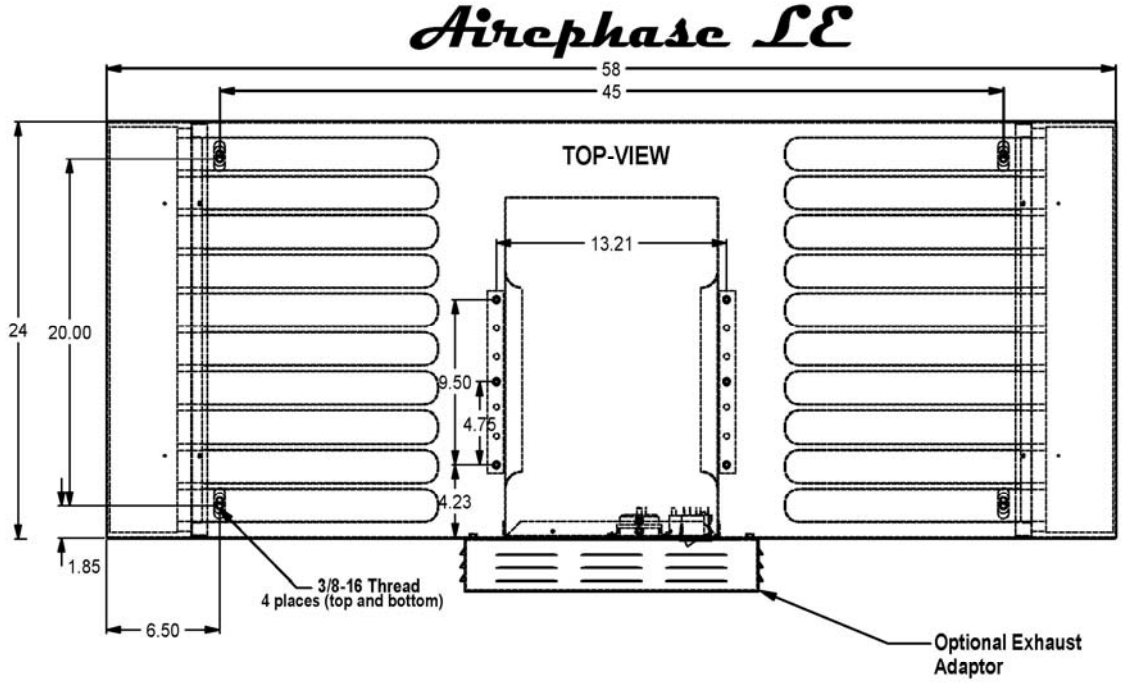
8. Filter Packages

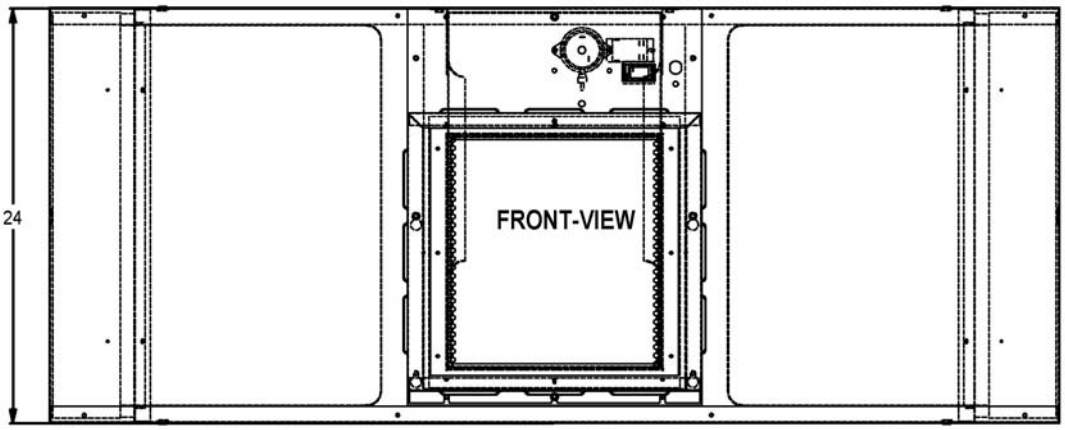
STANDARD BIOLOGIC FILTER PACKAGE	
First Stage Filter (pre-filter) 2" thick	Two (2) MERV 8 rating, 24"x24"x2"pleated Extra Large Holding Capacity
Second Stage Filter (High efficiency cell) 15"L	Two (2) MERV 15, 24"x24"x15" 10 pocket filter
OPTIONAL BIOLOGIC FILTER PACKAGE	
First Stage Filter (pre-filter) 4" thick	Two (2) MERV 8 rating, 24"x24"x4"pleated Extra Large Holding Capacity
Second Stage Filter (High efficiency) 10" L	Two (2) MERV 15, 24"x24"x10" 10 pocket filter

9. APPENDIX A Dimensions

Units are in inches.

9.1. Main Chassis Dimensions





9.2. Optional Controller Dimensions

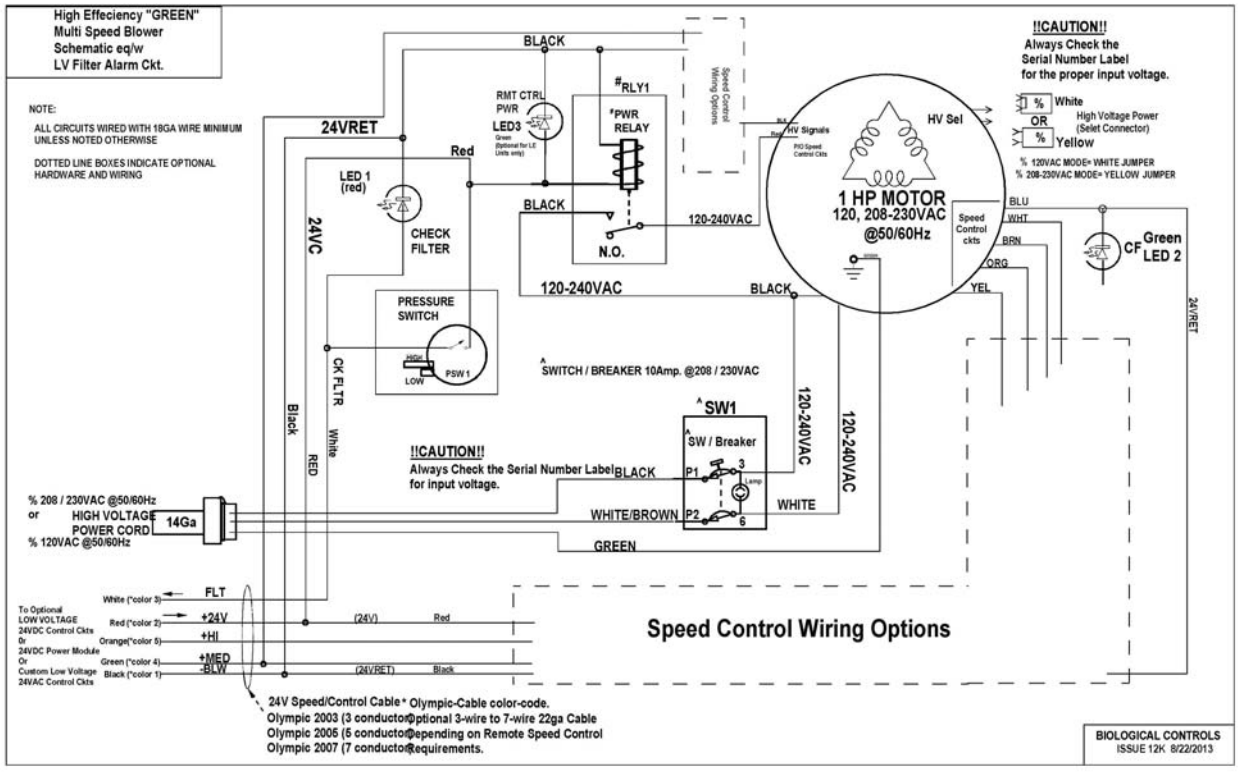
Typical Timer Control and Maintenance Monitor Enclosures (TCMM, TSCMM) Dimensions:

1-8 Airephase LE Units	8.5”X10.5” Utility Box 4”deep (.250” mounting holes)
Custom Configurations	Custom size

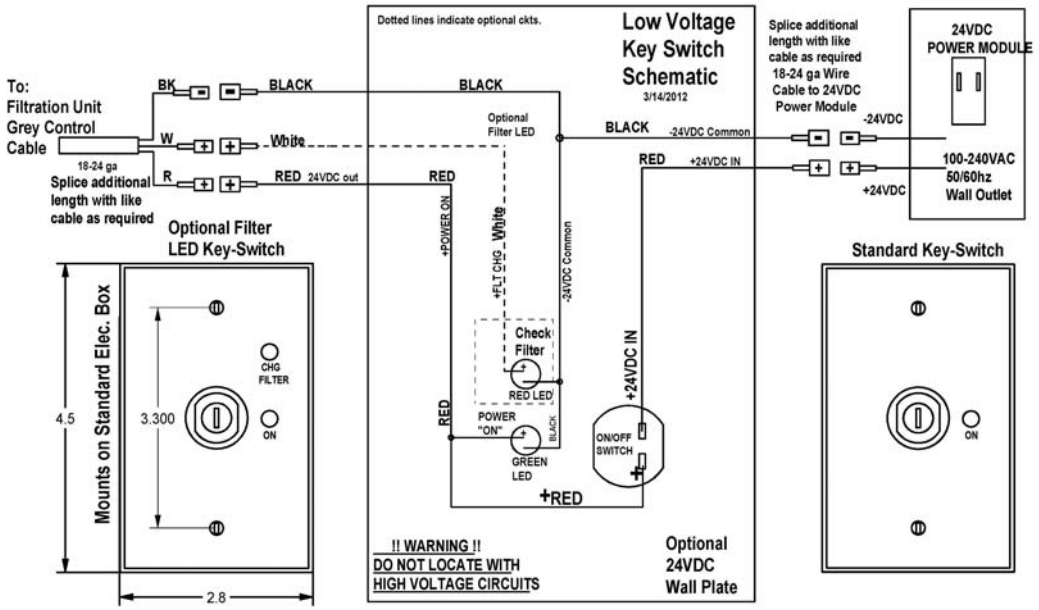
10. APPENDIX B SCHEMATICS

10.1. Airephase LE Blower Assembly Schematics

Dotted lines indicate optional wiring or components.



10.1.1. 24VDC Wall Switch Control Schematic (Optional)



10.1.2. Optional Control Unit Schematics

Note that the schematic provided inside door of every Controller enclosure will represent the wiring for that specific unit.

Consult the Controller Installation & User Manual for details.

11. APPENDIX C Blower Motor Speed and Efficiency Control

The speed selection can be set manually via (optional) switches on the front panel of the filtration unit or be programmed into the optional TSCMM controller-unit or a combination of both.
Note: ***Set the Speed Switch Dial, if equipped, to the LOW-CF (Constant Fan) mode as the default setting when an external control unit is also part of the system.*** *The external controller can override the CF speed.*
Set the HI/ECO switch in the position best suited for the system overall performance/power usage requirements. When a TSCMM is also connected to the unit set the switch to the ECO default position.

11.1. Standard Speed Settings

For manual speed control; place the HI/ECO Switch (when equipped) according to the table and set the SPEED control dial as follows:

HI/ECO	SPEED	CFM	Watts	Noise 10' from Exhaust
ECO	(I) Low(CF)	***1000**	125W	Quiet
ECO	(II) Medium	***1670**	386W	Mild-Strong
HI	(III) High	***2500**	859W	Strong

*Typical-Default (3-Speeds) programmed into the Standard TSCMM Controller

To enable an automatic TSCMM controller to override a filtration unit equipped with manual control switches place the Speed Control Dial in the **CF** position and the HI/ECO switch in the ECO mode.

12. APPENDIX D - Airephase LE INSTALLATION CHECKLIST

USE LIST PRIOR TO PLACING UNITS INTO SERVICE

Is the unit securely fastened to the chassis mounting hardware and ceiling?

Is the unit level, side to side, back to front?

Are all filters properly installed and placed in the correct positions?

Are the long Pocket-Filter Pleats installed perpendicular to the floor?

Has the installation date been recorded on filter change label?

Is High Voltage power connected to all units and control cables connected to the 24V circuits?

Measure all voltage connections for proper source voltages.

Are louvers on optional exhaust register properly adjusted (directionally)?

Is the power switch "on" for blower operation?

Is the cycle-time programmed at the Controller or Day Timer when equipped?

WHEN A REMOTE CONTROLLER IS EQUIPPED:

Are all of the optional activation sources connected, programmed and operational?

Are facility FIRE ALARM circuits tested with the TCMM Control (when equipped)?

Have all cycle-times/speed selections been selected?

Are all timer override switches in the off position?

Have all low voltage control cable connections been connected and tested?

WHEN THE ABOVE STEPS HAVE BEEN COMPLETED, THE Airephase LE SYSTEM MAY BE POWERED.

WHEN POWER IS TURNED-ON CHECK THE FOLLOWING:

Blower power switch/breaker is illuminated – glows amber.

The red "filter change" light is off.

Is the green 24V LED (Remote Control Power) on?

Blower is running smoothly.

Exhaust air is directed correctly.

When equipped, set the speed-control selector switch and Boost/Econo switch to the proper positions for the particular application. (Check with the facility installation engineer).