



BrushMaster

Electronic Power Brush System

OPERATING INSTRUCTIONS & PARTS MANUAL



NADCA
National Air Duct Cleaners
Association

ISSA
International Sanitary Supply
Association

NAFA
National Air Filter Association

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Unpacking Instructions

Remove the outer box and inspect for damage. Report all damage immediately to your carrier. If special set-up instructions are required, they will be taped to the outside of the Equipment or in the “Operating” section of this manual.

Inspect all of the packing material for small parts before discarding packaging material. Report all damage to Air-Care immediately. Any attempt at repairing damages may void warranty.

Check that all parts are present (See Pages 8-9)

BrushMaster System

BrushMaster Power and Control Box

Handheld Remote is Inside Control Box

Brush (18”), Motor (1500 Watt) and Cable Assembly (35 ft) with Brush Power Connector

Zippered Carrying bag.

15’ AC Grounded Power Cord with “Computer Type” end

BrushMaster Instruction Manual

Safety Precautions

Always use safe and common sense precautions when working with Air-Care equipment. Do not block walkways with equipment, and remove delicate and breakable articles from the immediate work area. The following are precautions that should be reviewed by all persons who will be involved in the cleaning activity:

There are no user serviceable components in the BrushMaster; only trained technicians should attempt to make internal repairs on this equipment.

Never use the BrushMaster in a wet environment.

Always turn off the main power switch on the BrushMaster when the brush and cable are laid down to prevent injury if the Hand Held Remote switch is accidentally activated.

Be sure all power cords and electrical extensions are rated to meet or exceed the original Air-Care Power cord spec’s, and inspect AC power plugs to be sure the Ground Pin is in place.

Never connect power to Air-Care equipment unless all covers and safety shields are in place. Mechanical and electrical parts could activate and cause injury.

Never allow anyone but a properly trained technician to use Air-Care equipment or cleaning products.

All Air-Care equipment is designed for US standard 115 volt, 60 Hz AC. Most Air-Care equipment can be special ordered to meet other worldwide standards for a reasonable price and delivery schedule. Always check the specifications on Air-Care equipment before connecting electrical power to it.

Keep the cable clear of breakable objects as it can whip or flip when removed from its bag.

Turn off main power switch when removing or replacing the Flex-E-Bristle Brush.

If you have questions about the safe use of any Air-Care product, call 702-454-5515

Duct Cleaning with the BrushMaster

YOU WILL NEED: Negative Air Machine and BrushMaster

1. Before using the BrushMaster to clean the air system, the supply and return duct diffuser grills must be removed. Also, pre-vacuum and plug these openings with foam register plugs and then attach the Turbojet or other negative air machine to the system.
2. **CAUTION: DO NOT INSERT OR REMOVE THE BRUSH FROM THE DUCT WHILE THE BRUSH IS TURNING**
3. Begin at the duct opening farthest from the Furnace/Air Conditioner.
4. With the brush STOPPED, Insert the brush and motor assembly one or 2 feet into the duct to be cleaned.
5. The main power must be on for 10 seconds before pressing the "RUN" button on the remote to start the brush.
6. Push the Flex-E-Bristle Brush into the duct with a smooth gentle force. The brush will expand and compress to clean any size duct from 4" to 18" high and any width.

CAUTION: The BrushMaster System should be used with caution to clean older flex ducts, as its aggressive cleaning action may damage these delicate ducts. Do the PINCH test, if the Duct is brittle when pinched, it may be too delicate for the BrushMaster. Internally insulated ducts, brittle flex ducts and fraying duct board ducts should NOT be cleaned with a power brush.

7. When the end of the duct is reached, the cable can be pulled slowly back toward the opening. If the duct is rectangular in shape, run it in the reverse direction as you pull it back to the duct opening. This will assure that the brush cleans both sides of the rectangular duct.
8. Stop the Brush 1 or 2 feet from the duct entrance then remove the brush. This duct opening can now be plugged with the foam plug, and the next duct opening cleaned in the same manner. Repeat this on each duct opening until all have been cleaned.
9. The duct to which the negative air machine is attached can also be cleaned with the BrushMaster system. The optional Pogo Pole hose adapter & optional 12" adapter plate have a red plug with slits to allow the brush to be inserted while the duct is under negative air vacuum pressure.
10. The duct system is now ready to be decontaminated by fogging in a duct sealant like Soot Set and an EPA registered Biocide such as Envirocon.

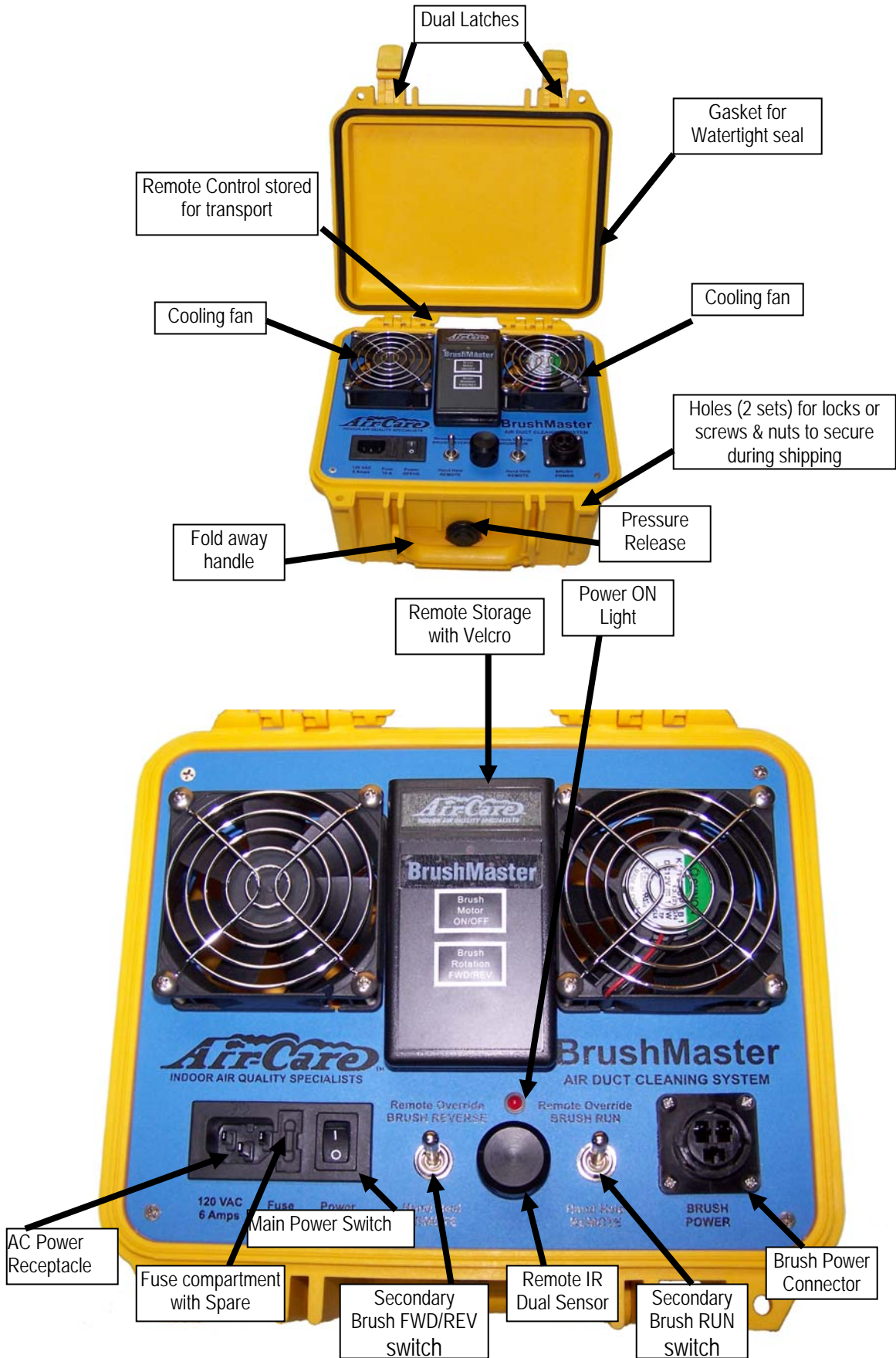
NOTE: The BrushMaster control box has switches to "RUN" or Change Rotation of the brush if the Handheld Remote is Lost or has a dead battery. These switches MUST be in the DOWN or OFF position when using the Handheld Remote.

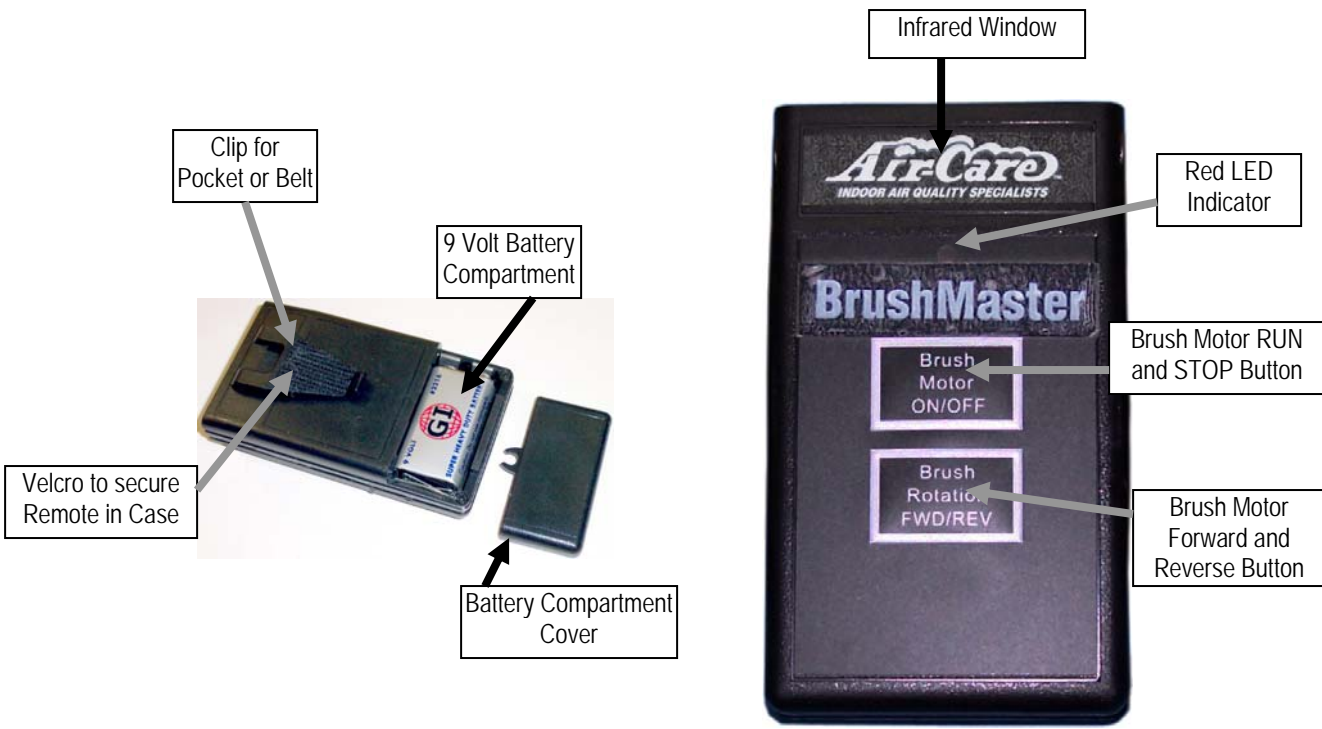
Air-Care also has classroom and self-study training programs available.

Please visit our website at: www.air-care.com or call 800-322-9919.

Equipment Specifications and part numbers are subject to change without notice.

BrushMaster Power Brush, Control Unit





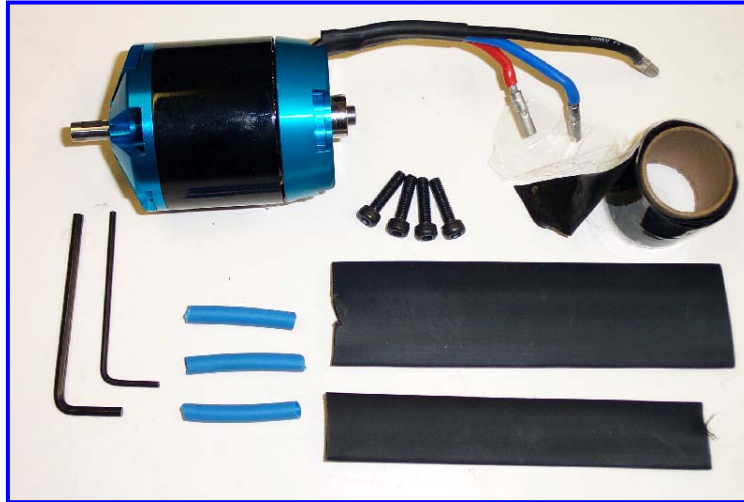
Motor Maintenance Tips:

1. Clean the exterior of the motor periodically to be sure the cooling openings in the motor housing are open for air circulation. The motor has powerful magnets mounted inside the outer case. These magnets can attract and hold ferrous metal particles which may find their way into the motor and cause it to bind. These can sometimes be removed with compressed air from the outside, but it may be necessary to open up the motor to remove them
2. Inspect the screws on the motor for tightness and tighten as necessary:
 - (4) Screws on the motor mount
 - (1) Set screw on the aluminum heat shield
 - (2) Set screws for the motor shaft in the blue housing
 - (3) Screws at the vacuum hose inlet.
3. Inspect the 3 wire connectors for the motor at the vacuum hose inlet.

BrushMaster Brush Motor Replacement Instructions

The BrushMaster motor is a very reliable brushless 3 phase motor. There are, however, situations that may require it to be cleaned or replaced.

The BrushMaster Power Brush Motor can be easily replaced in the field with a few basic tools.



M3070XKIT
Updated: 03/24/10

P/N CE3070XKIT

In addition to the parts and tools in the kit, you will need a box cutter or similar blade to cut the insulating tubing, crimper for the wire connectors and a heat gun or hair dryer to shrink the new insulating tubing over the new connections. You will also need a 9/64" Allen wrench for the motor mount and 1/8" Allen Wrench for the Brush set screw.

1. **Test to be sure that the motor itself is failing** rather than the wiring or the power source that has failed before you proceed using the following procedure.
 - a. Remove AC power to the unit. Wait 30 seconds, then plug it in and turn the AC power back on. Wait 20 seconds before trying to start the brush motor. The BrushMaster has a red Power light to indicate AC power is on and if the fans run, the 12 volt Power Supply is operating.
 - b. Verify that the brush motor power connector is fully inserted and locked into the control box connector.
 - c. Test the power to the motor with the brush switch on the panel. You must wait 20 seconds after turning the power on before turning on the brush RUN switch. (Do not use the remote for this test). If it still does not run you may replace the motor. There may be other causes of the motor not running properly, but they are unlikely.

If you have any questions on how to test these conditions, call the Air-Care technical support line 800-322-9919.

2. Once it has been determined that the brush motor is the most likely problem, it is time to turn off the power, unplug the power cords and follow the **removal instructions below.**

a. Locate the replacement motor kit which will include the needed 9/64" Allen wrench. The Allen set screw for the brush hub requires a 1/8" Allen wrench which was packaged with the brush – it is not in this kit.



b. Remove the brush, using a 1/8" Allen wrench to loosen the set screw, then pull the brush off the motor shaft and set it aside.



c. With a box cutter or other blade, cut the black heat shrink tubing off the flexible portion of the motor mount –CAUTION: DO NOT CUT THE 3 MOTOR WIRES LOCATED ON ONE SIDE OF THE MOTOR MOUNT. Remove this tubing and discard it. Use the Allen wrenches in the kit (9/64") to loosen and remove the 4 black motor mounting screws that hold it to the mount. Save them in case they are needed for reassembly – 4 new screws are included, but it is good to have a spare.



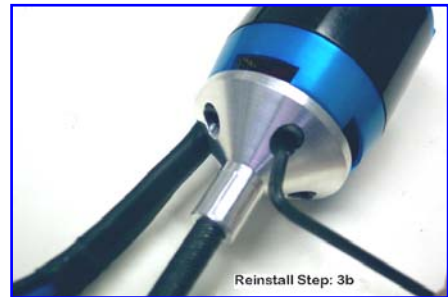
d. There are 3 motor wires that are connected with 3 butt splices on current BrushMaster motors and the wires are cut to 3 different lengths so they do not overlap.

Set the motor aside to be repaired or returned to Air-Care.



3. Reinstall motor. **Follow the re-install new motor instructions below:**

- a. Install the motor adapter to the motor with the 4 Allen screws removed For the older round motor mount, align the hole in the motor mount with the side of the motor that has the 3 wires coming out.
- b. Install the 4 Allen head screws through the motor mount and into the motor housing. Install all 4 loosely at first then tighten them in stages: first snug, and finally tight. Be sure all 4 are tight.
- c. Connect the 3 Motor wires to the Motor Power Cord with the Butt Splices. Be sure to crimp them very well so the Motor will be full power. The flexible shaft can be curved to get better access to the butt connector.
- d. Hold the wires along one side of the motor mount and slide the heat shrink tubing over the shaft and the wires. Adjust the position of the shrink tubing so that it will hold the wires in place at side of the Square mount so the 2 holes in the motor mount are not covered. It may be necessary to trim the tubing to the proper length. The 3/4" shrink tubing must cover the crimped section of the Motor Adapter.



- e. Use a hair dryer or heat gun to heat the tubing so it will shrink tight onto the motor mount and the wires.



- f. Re-Install the Brush to the Motor shaft.
- g. The last step is to use the "Stretch and Stick" silicone rubber tape, 1" wide x 13" long to wrap over the shrink tubing. This tape is not sticky, but when stretched it activates a binder that sticks to itself for a lifetime grip. You **MUST** stretch this tape as you apply it starting at the Hose end of the motor cable and overlapping 1/2" per layer. You may cut off any excess after covering the wires at the motor end.



The Motor replacement is complete and can be tested now.
For technical questions, call Air-Care 800-322-9919

Specifications

Specification	Description
Size	11" W x 10" D x 7" H
Weight	7.5 Pounds
Power requirements:	115 Volt AC, 60Hz, 5 AMPS (Transformer required for 220/240 Volt, 50/60 Hz,)
Power Cord	16 gauge, 3 wired grounded to Computer type Receptacle
Insertion Cable	The Insertion hose is 35 feet long x ½" O.D. and contains 14 gage wires for the Motor and a steel stiffener. There is a 10 foot flexible power cord and connector to attach it to the Power and Control Box. The Motor is attached to the working end of the hose via a flexible steel shaft to allow it to easily navigate around corners.
Operating Environment	25 to 125 Deg F (-4 to 50Deg C)
Case	Durable Poly case with dual latches and waterproof lid
Operating Controls, BrushMaster	ON/OFF main power with Red LED power indicator Wireless Handheld IR Remote Control with 2 Activating Buttons to Start/Stop and change direction of brush rotation. Secondary Brush On/Off and Brush Fwd/Rev switches on panel

Parts List

Description	Part Number	Notes
BrushMaster Duct Cleaning system	CE3050	Power & Control Box, ft Hose, 18" brush 1500 watt Motor, AC cord and Bag
BrushMaster Power and Control Box	AC3106	Power Cord included
Remote Transmitter, hand held, 2 button, Belt/Pocket clip	AC1340	9 Volt Battery Included
Battery for remote (9 Volt)	1153	Standard 9 Volt Battery
Brush, Motor, and Insertion hose assembly with Brush	CE2970	Includes 18" Brush w/ .032" dia bristles
Replacement Brush Motor Kit, 1500 Watt w/ Instructions	AC3070AKIT	
Replacement Flex-E-Bristle Brush with Hub, 12" (Optional)	AC1321C	.021" Diameter Nylon, Black, Level
Replacement Flex-E-Bristle Brush with Hub 18" (Standard)	AC1322B	.032" Diameter Nylon, Black, Level
Bristles, 1 hank, 12"	AC1293	Enough for 5 replacements
Bristles, 1 hank, 18"	AC1295	Enough for 5 replacements
Power Cord, 15 ft, 18 ga x 3 wire grounded	1741	Standard Computer type end
Bag, Equipment for Hose Assembly and Power Control unit.	CE3056	Round zipper bag for Power and Control Unit, Insertion hose Asm and Power Cord.
Fuse, 10 Amp, 5mm x 20mm	1951	TruckMaster has 1 SPARE fuse in holder

Air Care BrushMaster Troubleshooting Guide

Symptom	Possible Causes	Suggested Action
Remote does not operate Brush	<ol style="list-style-type: none"> 1. Be sure Handheld Remote is pointed at the Remote Receiver sensor in the center of the control panel. 2. Check that the Red indicator on the Handheld remote flashes (Once) when any button is pressed 	<p>Locate the DuctMaster so the remote has an unobstructed view of the center of the panel. If the red LED does not flash, replace the battery.</p> <p>If that does not correct the problem, call Air-Care for assistance</p>
Brush cannot be inserted far enough into duct.	<ol style="list-style-type: none"> 1. Duct is too small for the brush (Less than 2" wide opening). 2. Duct makes two 90° turns in less than 12 inches. 	<p>Try to access the duct from another opening.</p>
Brush Motor does not turn.	<ol style="list-style-type: none"> 1. The Brush Switch on the Panel was "ON" when the power cord was plugged in 2. Electronic Torque control shut down brush motor power. 3. There was a power loss in the building or a power surge. 4. Motor Connectors have come loose. 5. Motor has collected metal particles inside due to its magnetic pull. 	<p>Be sure the Brush Switch on the Panel is OFF.</p> <p>Turn OFF power switch for 30 seconds, and then turn on – wait 20 seconds before attempting to run motor.</p> <p>Be sure the Brush Switch on the Panel is OFF. Try using remote again.</p> <p>Be sure Brush Power Cable is fully inserted into the Panel Connector</p> <p>Clean out debris from the motor without damaging the internal wires. A soft brush or air gun may work.</p>
		<p>Call Air-Care 800-322-9919 or 702-454-5515 info@air-care.com</p>

Glossary & Acronyms

1. ACGIH—American Conference of Government Industrial Hygienists
2. ASHRAE—American Society of Heating, Refrigerating, and Air Conditioning Engineers
3. Air Handler/ AHU—The Furnace or air conditioner that heats, cools and moves the air.
4. Antimicrobial—Agent that kills Bacteria, Molds and viruses. See “Sanitizer
5. Arrestance – An ASHRAE standard procedure to measure air filter efficiency (52.1)
6. Bioaerosols— Molds and bacteria that are found floating in the air.
7. Biological Contaminants— Bacterial, Mold/Fungus, viruses and their waste, byproducts and decomposition materials that can be inhaled and cause many types of health effects.
8. Building Related Illness—Diagnosable illness whose symptoms can be identified and whose cause can be directly attributed to airborne building pollutants (e.g., Legionnaire’s disease, and hypersensitivity pneumonitis).
9. CFM—Cubic Feet per Minute, a measure of how much air is flowing in an air system.
10. CO—Carbon Monoxide, an odorless, toxic gas produced during combustion.
11. CO₂—Carbon Dioxide, an odorless, non-toxic gas produced during combustion and exhaled by people.
12. Ceiling Plenum – The area above a suspended ceiling that may be used as a return path to the Air Handler.
13. Conditioned Air – The air that has been filtered, heated or cooled by the air handler.
14. Dampers – Flaps or valves in the air duct that control the amount of airflow in the duct.
15. Diffusers & Grilles & Registers – The covers at the end of supply and return ducts that control the amount and direction of the air-conditioned air entering or leaving a room.
16. Electrostatic Filter – A High Efficiency (95% Arrestance) Air filter that generate static electricity from the air movement through the air handler and captures dust from the air while the clean air move freely through it.
17. EPA—Environmental Protection Agency
18. Duct – A metal, plastic or fiberglass tube that transports air to and from the Air Handler. They can be round, square or rectangular.
19. Duct Board – Compressed fiberglass material used to make air ducts, particularly in the southern U.S.
20. Fiberglass Filter – A disposable, very low efficiency filter (approx. 10% arrestance).
21. Flex duct – Plastic fabric duct with a spiral wire support. It is used extensively in the Western U.S.
22. HEPA—High Efficiency Particulate Air
23. HVAC—Heating, ventilation and air-conditioning
24. IAQ—Indoor Air Quality
25. MSDS—Material Safety Data Sheet
26. Make-up Air – Fresh “outside” air that is brought into a Commercial building.
27. NADCA-- National Air Duct Cleaners Association
28. NAFA – National Air Filter Association
29. NIOSH—National Institute for Occupational Safety and Health
30. Negative building pressure – A condition that allows air to flow into a building when a door is opened.
31. NSC -- Nevada Safety Counsel
32. NSF International – An independent testing laboratory for Air filters
33. OSHA—Occupational Safety and Health Administration
34. Positive building Pressure – A condition when air will come out of a building when a door is opened.
35. Re-entrainment – The flow of dust and debris removed from an air system back into the same building
36. Return/Return Duct
37. Sanitizer – A material designed to kill mold, bacteria, and viruses.
38. Sick Building Syndrome – A group of symptoms such as headache and watery eyes that disappear after the sufferer leaves the building for a few hours.
39. Supply/ Supply Duct—The opening and related ductwork that delivers conditioned air to a room.
40. VAV—Variable air volume system – A system that varies the amount of flow of air to regulate temperature.
41. VOC’s—See “Volatile Organic Compounds”
42. Volatile Organic Compounds (VOC’s)—Chemicals that release gasses into the air such as solvents.

Limited Warranty

Air-Care warrants its products free from defects in materials and workmanship to the original purchaser for a period designated below from the date of purchase. Individual components, such as motors, blowers and electronic devices carry the warranty from the original manufacturer.

Report any suspected warranty failure of an Air-Care product to Air-Care immediately for a Return Authorization Code. Upon examination by Air-Care, if the product is found defective in workmanship or material, it will be repaired or exchanged, at Air-Care's discretion. Failure of components not manufactured by Air-Care will be handled on an individual basis.

General Conditions

This warranty shall be held void on any Air-Care equipment which has been modified or altered in any way or which has been subject to improper maintenance, improper usage or abuse.

Air Care warrants its equipment to the original purchaser only.

The Purchaser is responsible for the cost of shipping the equipment to Air-Care for evaluation. If found defective, Air-Care will pay FedEx ground shipping charges on the repaired or replaced item back to purchaser's location. Any additional expedited service charges shall be born by the purchaser.

Warranty Periods

1 Year Limited Warranty on Duct Leakage Testers

2 Year Limited Warranty on VIS Models, TruckMaster, and BrushMaster

3 Year Limited Warranty on all Turbojet Models, Cobra Models and Air Care DuctMaster Models

90 days on all other products



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