HALCO PRODUCTS COMPANY
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INSTALLATION, OPERATION, & MAINTANANCE MANUAL

FT2448-3-LO-AL-PF

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CHAPTER 1

HALCO PRODUCTS COMPANY
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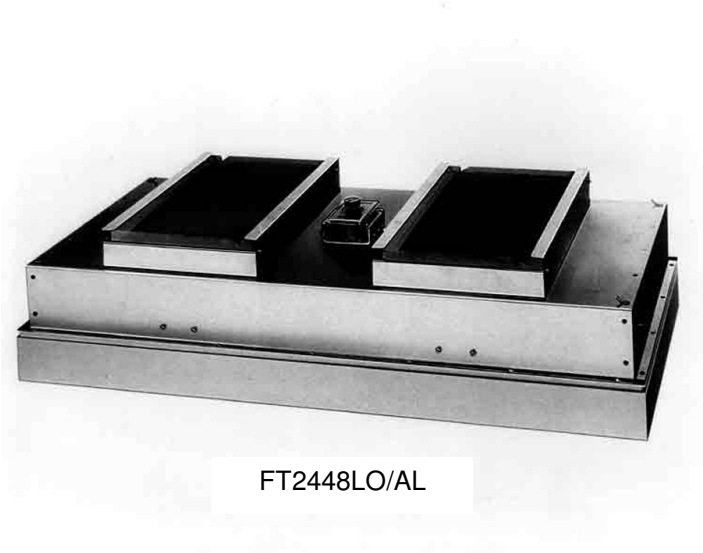
HALCO PRODUCT INFORMATION 400.5000

FT2448-LO HEPA BLOWER

LOW PROFILE SERIES



FT2448LO/AL

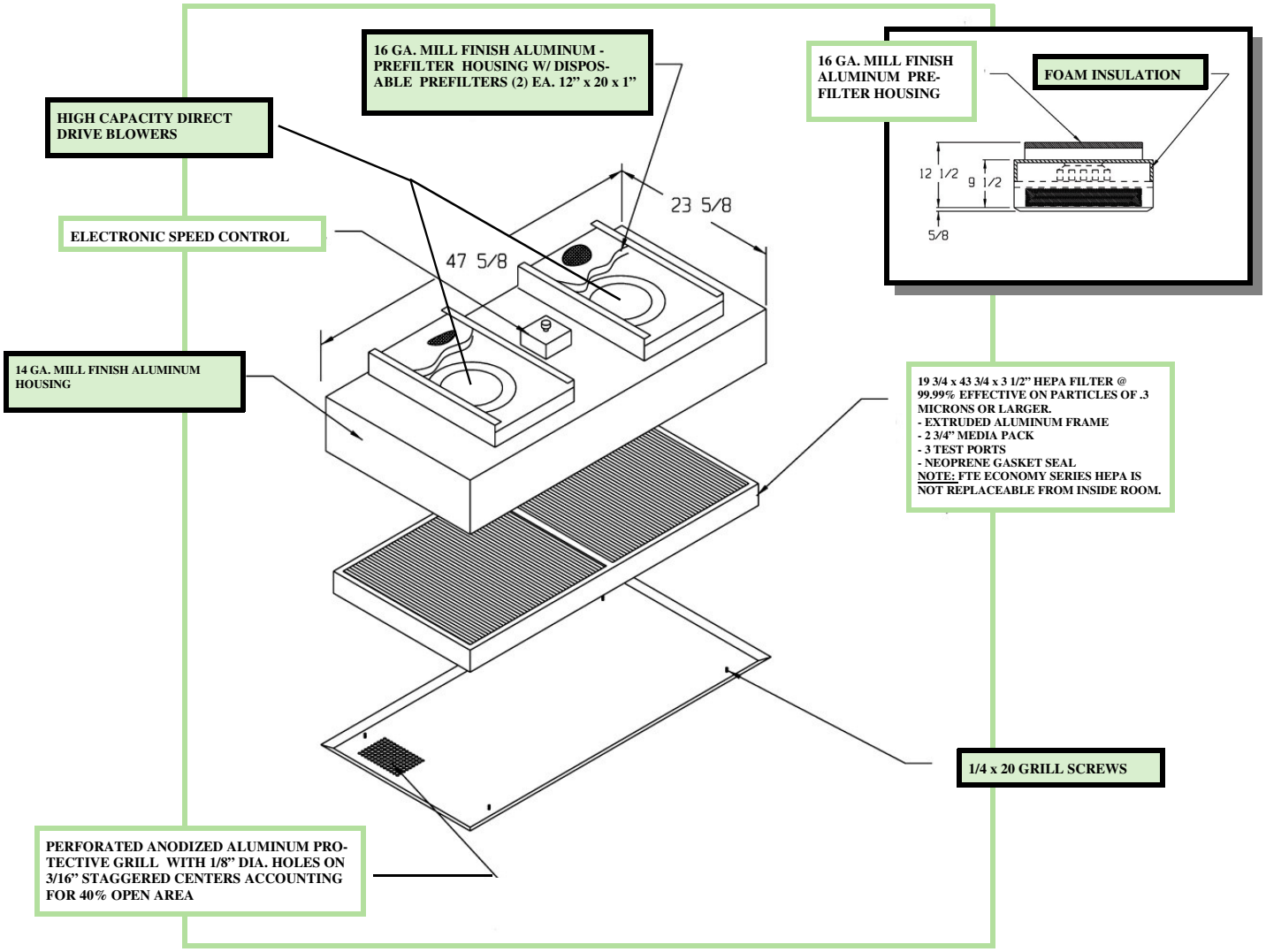
FEATURES

- New Low Profile Design for Low Head Room Applications
- Dual Fans for High CFM Requirements
- Standard or Gel Sealed HEPA
- Room Side Replaceable Filter
- Standard HEPA or Optional ULPA
- Discharge Protective Removable Grill
- Electronic Speed Control
- Internal Insulation for Noise Reduction
- Pre-filters or Duct Collar
- Challenge Test Ports
- 120-1-60 (Optional Voltages Available)
- Available with flo-thru light troffer

MODELS

Model #	Size	Replaceable Filter
FT 2448LO/AL	24" x 48"x 12.5"	YES
FT 2424LO/AL	24" x 24"x 12.5"	YES
FTE2448LO/AL	24" x 48"	NO
FTE2424LO/AL	24" x 24"	NO
CA-24	Plaster Ceiling Adapter 24"x 48"	N/A
CA-22	Plaster Ceiling Adapter 24" x 24"	N/A

3 SPECIFICATIONS



SPECIFICATION

HEPA blower to be Halco™ Model FT2448LO packaged fan powered ceiling HEPA filter **LOW PROFILE** blower module. HEPA to be 2 3/4" media pack, 99.99% eff. On 0.3. Micron, room side replaceable, neoprene gasket seal (optional gel seal). Housing to be 14 ga. Mill finish aluminum (optional insulated), internally foam lined for sound reduction with 12' duct collar or optional pre-filters. Blowers to be backward inclined direct drive variable speed design with electronic speed control. Unit to be capable of providing 100FPM of air at 6" from filter face. Challenge test ports and anodized aluminum protective grill, 40% open, room side accessible Voltage to be 120-1-60 with optional 220 or 277 volts.

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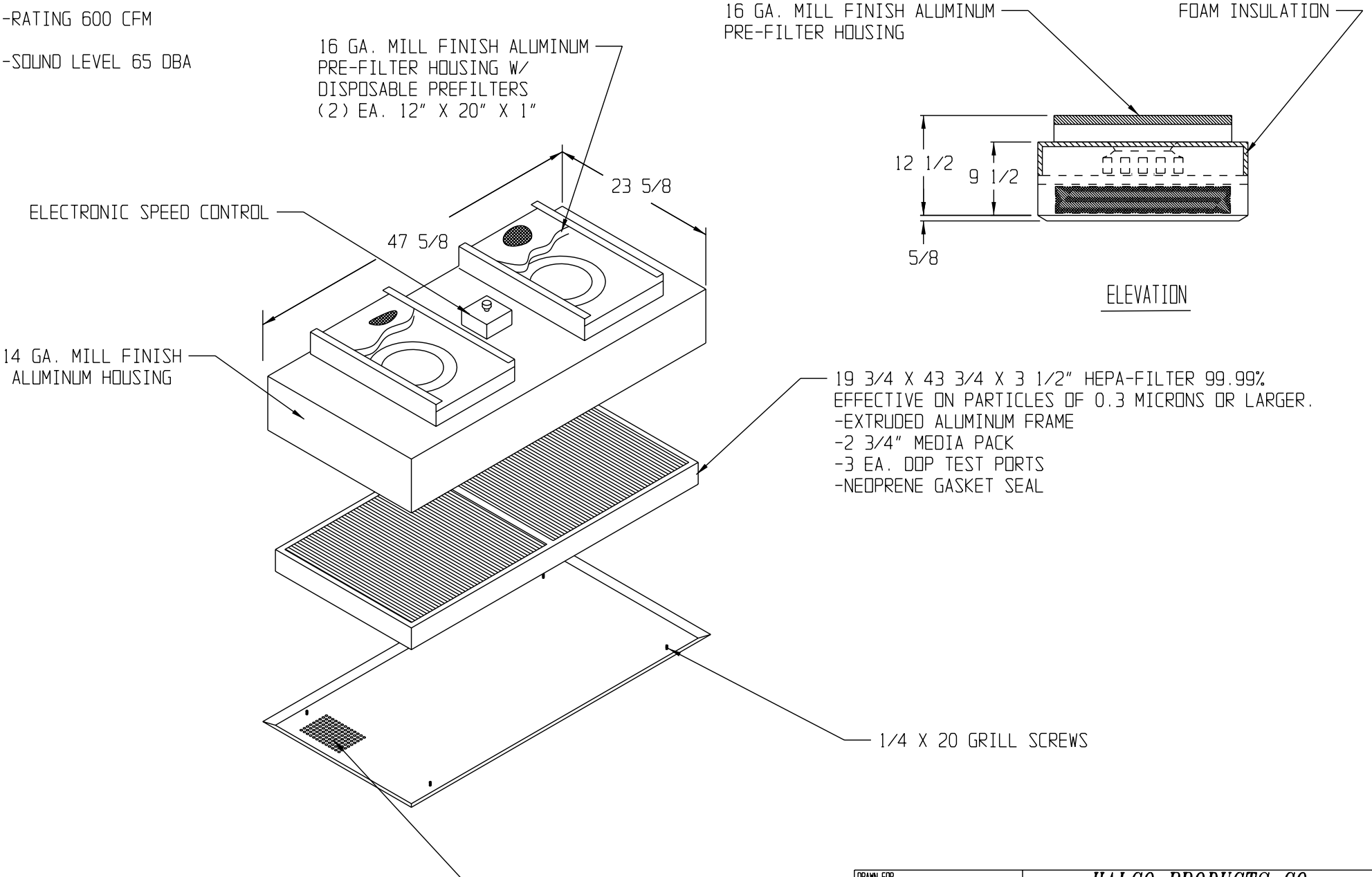
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

NOTES:

-CUSTOMER TO SUPPLY 115 VOLT/60 HERTZ/1.8 FLA

-RATING 600 CFM

-SOUND LEVEL 65 DBA

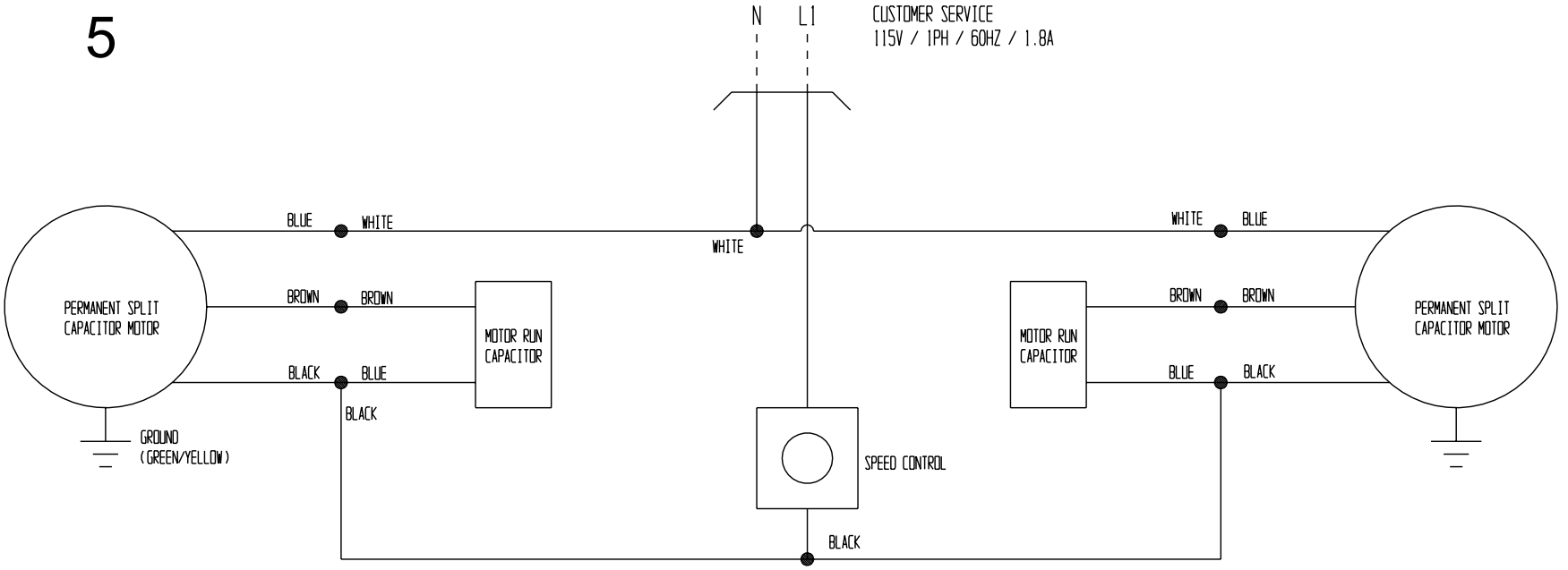


ELEVATION

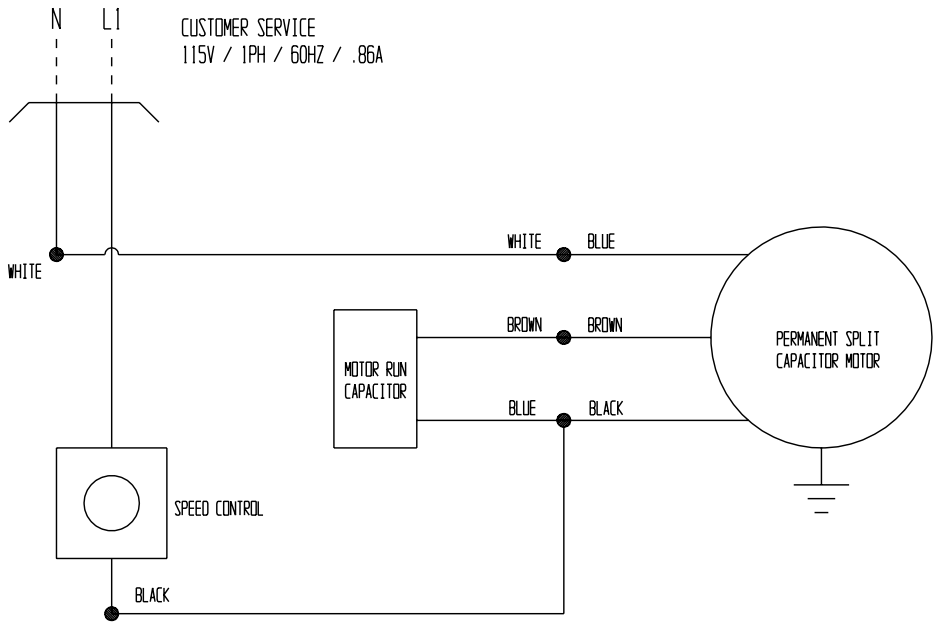
DRAWN FOR: STANDARD	HALCO PRODUCTS CO. 100 NO. GORDON STREET ELK GROVE, IL. 60007			
	TITLE: FT2448-LO/AL/PF			
DRAWN BY: DK	SIZE	JOB NO. ----	DWG NO. 178147CO	REV.
APPROVED BY: TM	SCALE: 1 1/4"=1'	DATE: 05-26-99	SHEET	

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

5



MODEL# FT1824 / FT2436 / FT2448 / FT3636 /FTE1824 / FTE1836 / FTE2436 / FTE2448 / FTE3636



5

MODEL# FT1212 / FT1224 / FT1236 / FT2424 & FTE1212 / FTE1224 / FTE2424

DRAWN FOR: STANDARD	HALCO PRODUCTS CO. 100 NO. GORDON STREET ELK GROVE, IL. 60007				
	TITLE: WIRING DIAGRAM: MODEL# FT / FTE				
DRAWN BY: DK/JY	SIZE	JOB NO.	DWG NO. 2111442A0		REV
APPROVED BY	SCALE 1"=1'-0"		DATE 4/12/01	SHEET	

CHAPTER 2

IMPORTANT SAFETY INSTRUCTIONS

READ AND SAVE THESE INSTRUCTIONS

- Read all of the instructions before operating this equipment.
- Pay particular attention to all safety precautions.
- Retain the instructions for future reference.

WARNING- TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

WARNING- TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

a) Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.

b) Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent backdrafting. Follow the heating equipment manufacturer's guideline and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.

c) When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the manual accompanying the unit.

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INSTALLATION:

1. Utilizing the ceiling wire mount module to upper structure supports and to eyebolts on module. (If applicable)

2. To mount module in T-grid ceiling, remove "T" grid ceiling tile, gasket "T" grid with gasket provided and place filter/module into "T" grid ceiling.

3. Remove the speed control from the junction box (on top of unit) and run power supply of 115 volts, 1 phase, 60 hertz into junction box, and wire per drawing #2111442A0 (black to l1) & (white to n) then replace speed control switch. **Note**: When servicing unit please disengage unit from electrical power source.

4. Turn blower switch to "on" position.

5. Allow unit to purge for at least 30 minutes.

Note: If the module contains a **gel seal** HEPA filter and is hardwired the gel seal HEPA filter should not be installed until **after** the unit is wired.

TESTING & RECERTIFICATION:

Unit to meet ISO standard 14644-1 classification of air cleanliness.

The manufacturer recommends that recertification of the unit should be performed on at least a yearly basis to assure that the unit is working at its optimum performance.

GENERAL MAINTENANCE:

This model requires virtually no maintenance. The few elements, which do require attention, are readily accessible and take a minimum amount of time. Perform visual, electrical and mechanical inspections on a regular basis. This should be determined by the environment and frequency of use.

 **WARNING: Always disconnect primary power source before inspection or servicing unit.**

BLOWER:

Blowers are motorized backward curved AC impeller type and are selected for continuous operation and maintenance is not required.

PREFILTER:

The prefilters should be inspected weekly until a replacement cycle can be established. When contaminants begin to collect on the face of the prefilter, replace it with a new prefilter. If contaminants are allowed to continuously collect on the prefilter the life of the HEPA filter will gradually diminish. The prefilters are located on the upper housing of the filter module and removed by sliding it out of its holding frame. **Note:** If contaminants are allowed to continuously collect on the prefilter the life of the HEPA filter will gradually diminish.

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HEPA FILTER:

The HEPA filter is capable of removing 99.99% of all particles 0.3 microns in size and larger. The average life of the HEPA filter is about two (2) to three (3) years, however, the life of the HEPA (or final) filter will depend on good prefilter maintenance and ambient conditions.

If the HEPA filter has an internal test port for DOP challenge to filter and seal to gain access to the test port, use a (phillips) screwdriver to remove well nut. When testing is completed, replace well nut.

Initially, the static pressure reading should be recorded. Should the pressure rise to twice the initial reading it is an indication that the HEPA filter is reaching its useful life. Periodically, check the static pressure reading. A more specific check is to periodically determine the airflow from the HEPA filter. Initially this will average 90 f.p.m. @ 6" from face of filter, +/-20 f.p.m, should the airflow drop to below 70 f.p.m, with the speed control on high; this would be an indication that the HEPA filter requires changing.

HEPA FILTER REPLACEMENT:

The HEPA filter is replaced through the air discharges grille from inside the cleanroom. To change the HEPA filter:

- Remove the protective grille for access to the HEPA filter.
- Loosen and remove the HEPA filter holding devices.
- Remove old HEPA filter and discard.
- To install new HEPA filter, reverse process being careful not to damage the new HEPA filter and securing holding plates tightly.
- Replace the perforated grille and hand-tighten the T-nuts. **(Do not over-tighten the T-nuts)**

Note: The HEPA filter media is easily damaged please remember to handle the HEPA filters carefully!

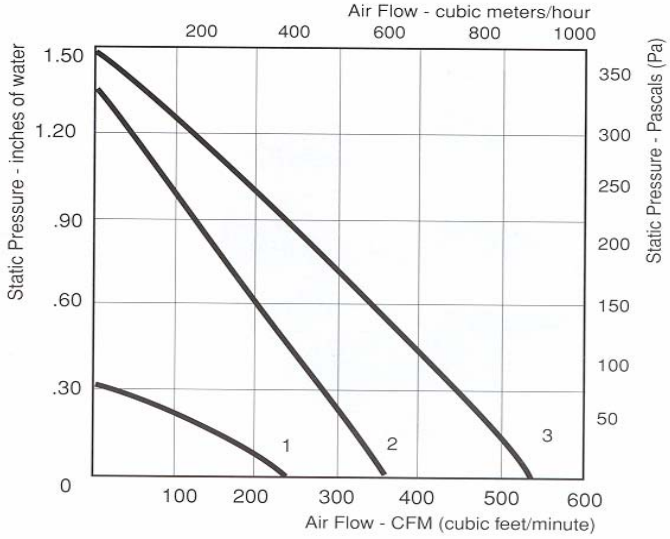
PARTS LIST ▪ MODEL# FT2448-LO/AL/PF

PARTS DESCRIPTION	PART NO.	MFG.	QTY
Motorized Impeller 115V, 100W	R2E220-AA44-23	Ebm Pabst	2
Inlet Ring	9609-2-4013	Ebm Pabst	2
Capacitor 10mfd, 370vac	97F9002BX/6X656	GE	2
Speed Control (5.0Amps)	KBWC-15K	KB Electronics	1
HEPA Filter 99.99% eff. on particles 0.3 micron size or larger	H1943B66-BAABCAA	Halco	1●◊
Prefilter	1220-1 Facet-Aire 3	Purolator	1●

● MANUFACTURER RECOMMENDED STOCKING SPARE PARTS
1 WHEN CONTAMINANTS BEGIN TO COLLECT ON THE FACE OF THE PREFILTER, IT SHOULD BE REPLACED. THE LIFE
◊ THE AVERAGE LIFE OF THE HEPA FILTER IS ABOUT TWO (2) TO THREE (3) YEARS, HOWEVER, THE LIFE OF THE HEPA (OR FINAL) FILTER WILL DEPEND ON GOOD PREFILTER MAINTENANCE AND AMBIENT CONDITIONS

CHAPTER 3

190 & 220 Ø (7.5" and 8.7" Ø)
Backward Curved AC Impellers

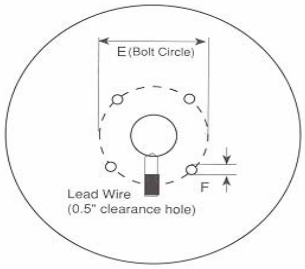


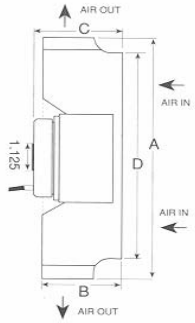
Curve Number	PART NUMBER	AC Volts	Hertz	Watts	CFM @ 0"	dBA	Temp. Max °C	Wgt. (lbs.)	Wiring Dgm.	Capacitor (µf)	Impeller Material
1	**R4S190-AA16-18**	115	60	47	230	50	50	3.0	B	-	Plastic
1	**R4S190-AA02-15**	230	60	47	230	50	50	3.0	B	-	Plastic
2	**R2E190-AE50-29**	115	50/60	85	365	62	40	3.0	A	8	Plastic
2	**R2E190-AE26-29**	230	60	90	365	62	40	3.0	A	2	Plastic
3	**R2E220-AA44-23**	115	50/60	100	530	70	40	3.5	A	10	Plastic
3	**R2E220-AA40-23**	230	60	100	530	70	40	3.5	A	2	Plastic

Impeller Dimensions [Inches (mm)]

Type	A	B	C	D	E	F	Holes
R4S190-AA	7.48 (190)	2.46 (62.5)	2.70 (68.6)	5.16 (131)	2.28 (58)	M4	4 x 90°
R2E190-AE	7.48 (190)	2.46 (62.5)	2.70 (68.6)	5.16 (131)	2.28 (58)	M4	4 x 90°
R2E220-AA	8.66 (220)	2.48 (63)	2.80 (71)	6.26 (159)	2.28 (58)	M4	4 x 90°

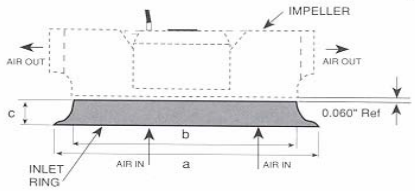
MOUNT DETAIL





Inlet Rings are recommended

Type	Inlet Ring #	a	b	c
All 190's	9588-2-4013	7.28 (185)	5.12 (130)	.67 (17)
R2E220	9609-2-4013	9.96 (253)	6.10 (155)	.79 (20)



Contact **ebm/Papst** at 860-674-1515 • Fax: 860-674-8536 • E-mail: sales@ebm.com for Technical Assistance

E7793

No. 6X653

Oval 370 & 440 Volt Run Capacitors

Operate in temperatures of -40°F to 156°F (-40°C to 70°C) with microfarad values within ±6% of nominal rating. Hermetically sealed aluminum case with turnplate steel cover.

1/4" male quick-connect terminals. Phenolic insulating bushings. Individually cartoned.

Uses: Air conditioners and refrigerators.

MFD Rating	Dimensions (In.) Depth	Width	Height	E.I.A. UL Base	GE Model	Stock No.
370VAC OVAL						
2	1 5/16	2 1/8	2 1/8	A	97F5502BX	6X650
3	1 5/16	2 1/8	2 1/8	A	97F5503BX	6X651
4	1 5/16	2 1/8	2 1/8	A	97F5704BX	6X652
5	1 5/16	2 1/8	2 1/8	A	97F5705BX	6X653
6	1 5/16	2 1/8	2 1/8	A	97F5706BX	6X654
7.5	1 5/16	2 1/8	2 1/8	A	97F9001BX	6X655
10	1 5/16	2 1/8	2 1/8	A	97F9002BX	6X656 ←
12.5	1 5/16	2 1/8	3 1/8	A	97F9003BX	6X657
15	1 13/16	2 15/16	2 1/8	C	97F9121BX	6X658
17.5	1 13/16	2 15/16	2 1/8	C	97F9601BX	6X659
20	1 13/16	2 15/16	2 1/8	C	97F9603BX	6X660
25	1 13/16	2 15/16	2 1/8	C	97F9607BX	6X661
30	1 13/16	2 15/16	3 1/8	C	97F9609BX	6X662
35	1 13/16	2 15/16	3 1/8	C	97F9612BX	6X663
40	1 13/16	2 15/16	3 1/8	C	97F9615BX	6X664
45	2	3 1/16	2 1/8	D	97F9618BX	5X432
50	2	3 1/16	2 1/8	D	97F9622BX	5X433
15/5	1 13/16	2 15/16	2 1/8	C	97F9437BX	4X760
17.5/5	1 13/16	2 15/16	2 1/8	C	97F5474BX	4X762
20/5	1 13/16	2 15/16	2 1/8	C	97F9673BX	4X764
25/5	1 13/16	2 15/16	2 1/8	C	97F9675BX	4X766
30/5	1 13/16	2 15/16	3 1/8	C	97F9681BX	4X767
35/5	1 13/16	2 15/16	3 1/8	C	97F9796BX	4X768
440VAC OVAL						
4	1 5/16	2 1/8	2 1/8	A	97F5337BX	4M988
5	1 5/16	2 1/8	2 1/8	A	97F5339BX	4M989
6	1 5/16	2 1/8	2 1/8	A	97F5436BX	4M990
7.5	1 5/16	2 1/8	2 1/8	A	97F9036BX	4M875
10	1 5/16	2 1/8	3 1/8	A	97F5300BX	6X665
15	1 13/16	2 15/16	2 1/8	C	97F9627BX	6X666
17.5	1 13/16	2 15/16	2 1/8	C	97F9629BX	6X667
20	1 13/16	2 15/16	2 1/8	C	97F9631BX	6X668
25	1 13/16	2 15/16	2 1/8	C	97F9633BX	6X669
30	1 13/16	2 15/16	3 1/8	C	97F9637BX	6X670
35	1 13/16	2 15/16	3 1/8	C	97F9638BX	6X671
40	1 13/16	2 15/16	3 1/8	C	97F9641BX	6X672
45	2	3 1/16	3 1/8	D	97F9644BX	5X434
50	2	3 1/16	3 1/8	D	97F5320BX	4X758
55	2	3 1/16	4 1/4	D	97F9084BX	5X435

UL recognized by type number: (*) Type P921, (†) Type P923, (‡) Type P924.

Oval or Round Capacitor Accessories

13

KBWC

Wall-Mount Series

Solid-State
Variable Speed AC Motor Controls

For Use with Shaded Pole, Permanent Split Capacitor (PSC) and Universal Motors

Ratings: 2.5 thru 15.0 Amps
115 and 230 VAC – 50/60 Hz

TYPICAL APPLICATIONS

- Fans • Fireplace Blowers • Humidifiers • Air Conditioners
- Ceiling Fans • Attic Fans
- Ventilators • Range Hoods

ISO 9001 2000 QMS

Pkg."B"

Pkg."C"

Dial Plate & Knob Pkgs. "B" & "C"

Pkg."E"

Pkg."D"

STANDARD FEATURES

- Built-In On/Off AC Line Switch
- Minimum Speed Trimpot
- RFI Filter (Provides RFI and EMI Suppression)
- All Models Mount in a Standard 2" x 4" Electrical Wall Box
- Agency Approvals*

  UL Listing / Recognition

  CSA Certified

  ISO-9001: 2000 QMS Certified

OPTIONAL FEATURES (See Options Table)

- Custom Packaging
- Special Lead Lengths, Colors, and Terminations

DESCRIPTION

The KBWC Series is a comprehensive line of motor speed controls for air-moving applications that utilize Shaded Pole, Permanent Split Capacitor (PSC), and AC/DC motors. These economical speed controls are designed to replace obsolete, tapped winding, or reactive methods of speed control. The full-wave phase control circuitry minimizes power loss, thereby reducing energy requirements. The controls provide infinitely variable speed adjustment which allows the end-user to select the desired level of air volume. These models cover a wide range of current ratings (2.5 - 15 Amps AC) and voltage ratings (115, 230, 277 Volts AC).

Important features, such as RFI Filter, Minimum Speed Trimpot, and built-in On/Off Line Switch are standard. These speed controls are available as bulk packaged or in distributor type packaging with accessories such as: knob, dial plate, mounting hardware, instructions, and individual carton. All models are designed to be mounted into a standard 2" X 4" electrical wall box.

OPTIONS (Add Suffix to Model No.)

Suffix	Description	Example
C	Omits mounting tabs (KBWC-16 only).	KBWC-16C
F	Adds Built-In Fuse (not available for Model KBWC-23NS).	KBWC-15F
K	Mounting Kit: Includes individual packaging with dial plate, knob, mounting screws, wire connectors, and instructions. Supplied standard on all models rated 8 Amps and above.	KBWC-15K
L	Adds auxiliary lead (3-wire control).	KBWC-15L
4L	Adds DPDT On/Off Switch (4-wire control) (Model KBWC-25 only).	KBWC-25 (4L)
NS	Omits On/Off Switch.	KBWC-15NS
R	Reverses control output from standard rotation. Standard: Controls with On/Off Switch – Off to High to Low. Controls without On/Off Switch (suffix "NS") – Low to High.	KBWC-15R

Note: **See Electrical Ratings table for agency approvals by Model No.*

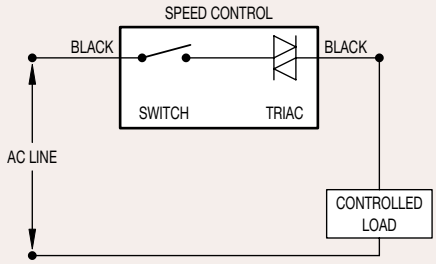
ELECTRICAL RATINGS AND AGENCY APPROVALS

Model No.	AC Line Input Voltage (Volts AC – 50/60 Hz)	Maximum Current Rating (Amps RMS)	Ambient Temperature (°C)	Agency Approvals			Package Type
				c UL us	c UL us	SP	
KBWC-13	115	2.5	25	√		√	B
KBWC-15	115	5	40		√	√	C
KBWC-16	115	6	25	√			C
KBWC-18K[1]	115	8	40		√	√	D
KBWC-110K[1]	115	10	25	√		√	D
KBWC-110K[1]	115	10	40		√	√	E
KBWC-112K[1]	115	12	40				E
KBWC-115K[1]	115	15	25	√			E
KBWC-23[2]	230	2.5	25	√			B
KBWC-25[3]	230	5	40	√			C
KBWC-26	230	6	25				C
KBWC-28K[1]	230	8	40			√	D
KBWC-210K[1]	230	10	40				E
KBWC-212K[1]	230	12	40				E
KBWC-215K[1]	230	15	25				E
KBWC-35	277	5	25	√			C
KBWC-36	277	6	25				C
KBWC-38K[1]	277	8	25				D
KBWC-310K[1]	277	10	25				D
KBWC-312K[1]	277	12	25				E
KBWC-315K[1]	277	15	25				E

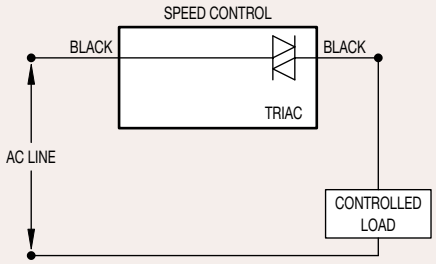
Notes: ***1.*** *Models rated 8 Amps and above include Mounting Kit (suffix "K").* ***2.*** *Only model containing suffix "NS" is UL Recognized.* ***3.*** *Only Model KBWC-25 (4L) is UL Recognized.* ***4.*** *The maximum Locked Rotor current for UL listed controls is 6 times the Maximum Current Rating.*

CONNECTION DIAGRAMS

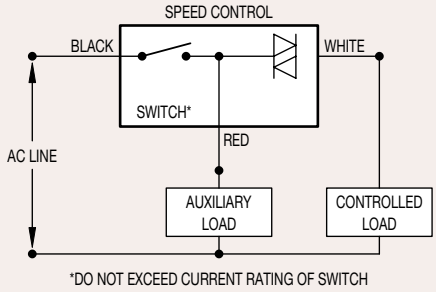
2-Wire Controls with On/Off Switch (Standard)



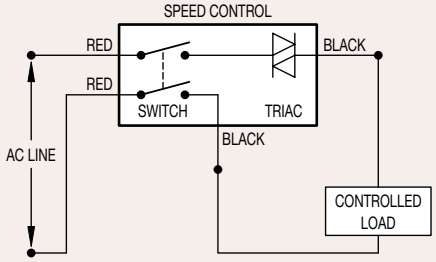
2-Wire Controls without On/Off Switch (Suffix "NS")



3-Wire Controls with Auxiliary Lead (Suffix "L")

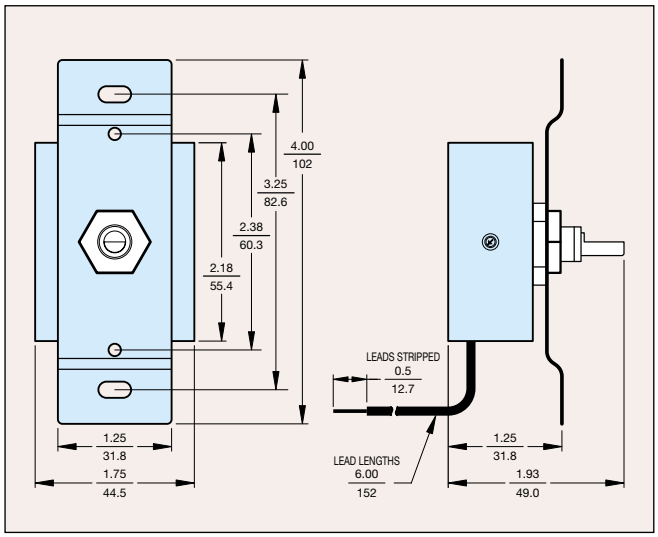


4-Wire Controls with DPDT On/Off Switch (Suffix "4L")

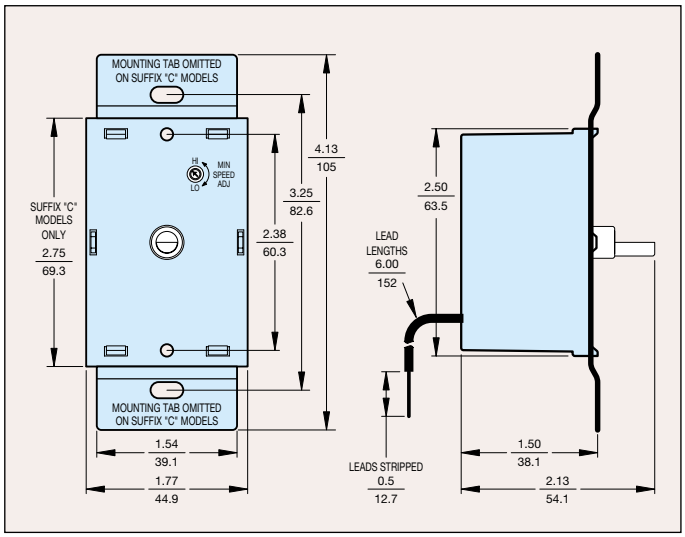


15

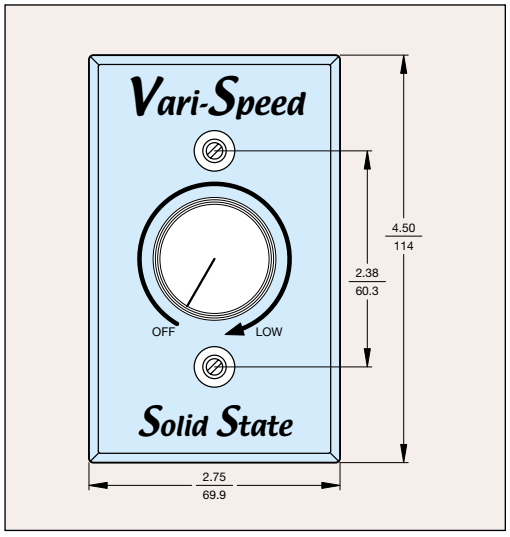
KBWC-13, 23 (Pkg. B)
Mechanical Specifications (Inches/mm)



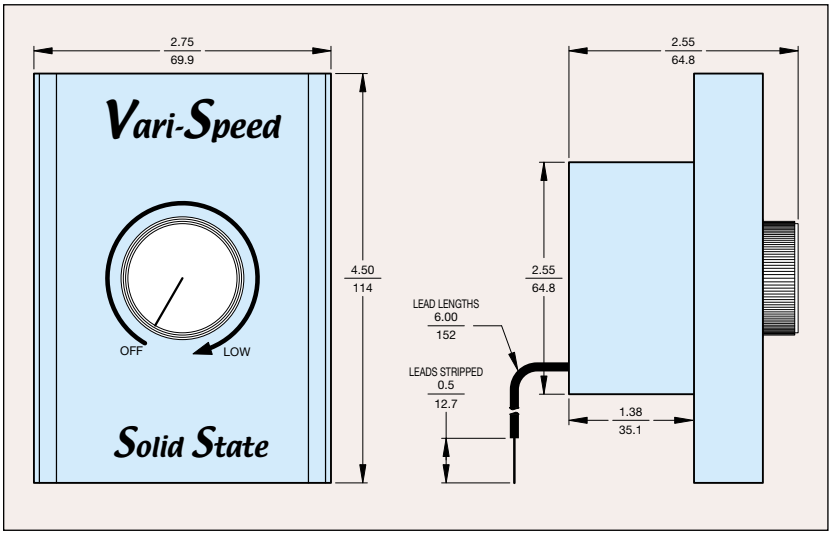
KBWC-15, 16, 25, 26, 35, 36 (Pkg. C)
Mechanical Specifications (Inches/mm)



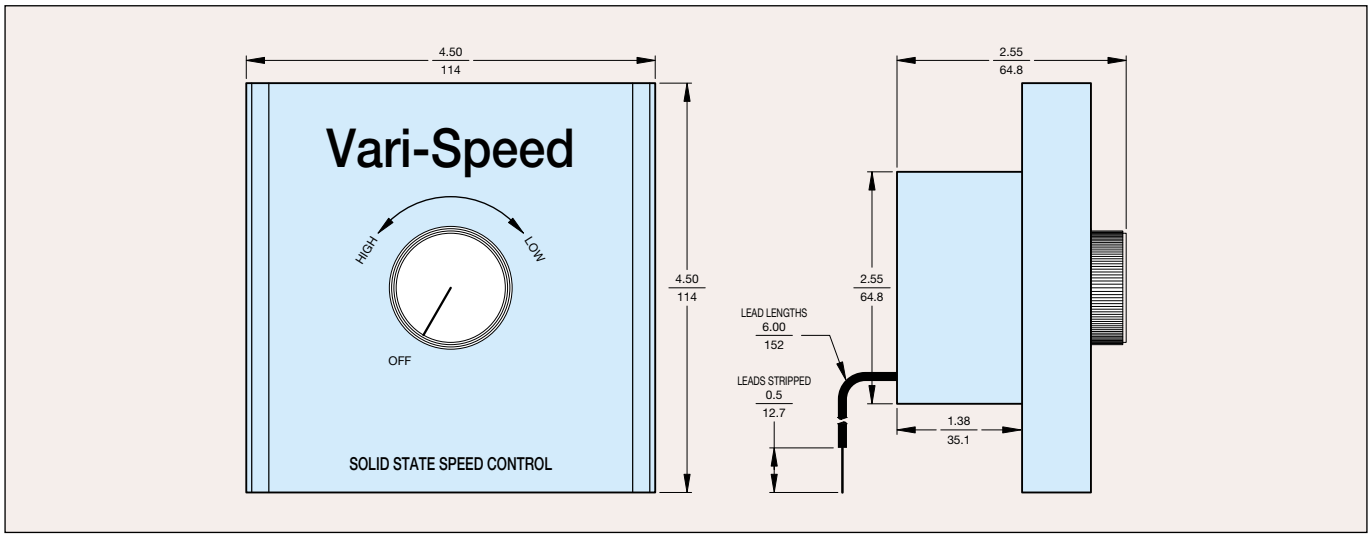
Dial Plate and Knob Kit (Suffix "K")
Mechanical Specifications (Inches/mm)



KBWC-18K, 110K, 28K, 38K, 310K (Pkg. D)
Mechanical Specifications (Inches/mm)



KBWC-110K, 112K, 115K, 210K, 212K, 215K, 312K, 315K, (Pkg. E)
Mechanical Specifications (Inches/mm)



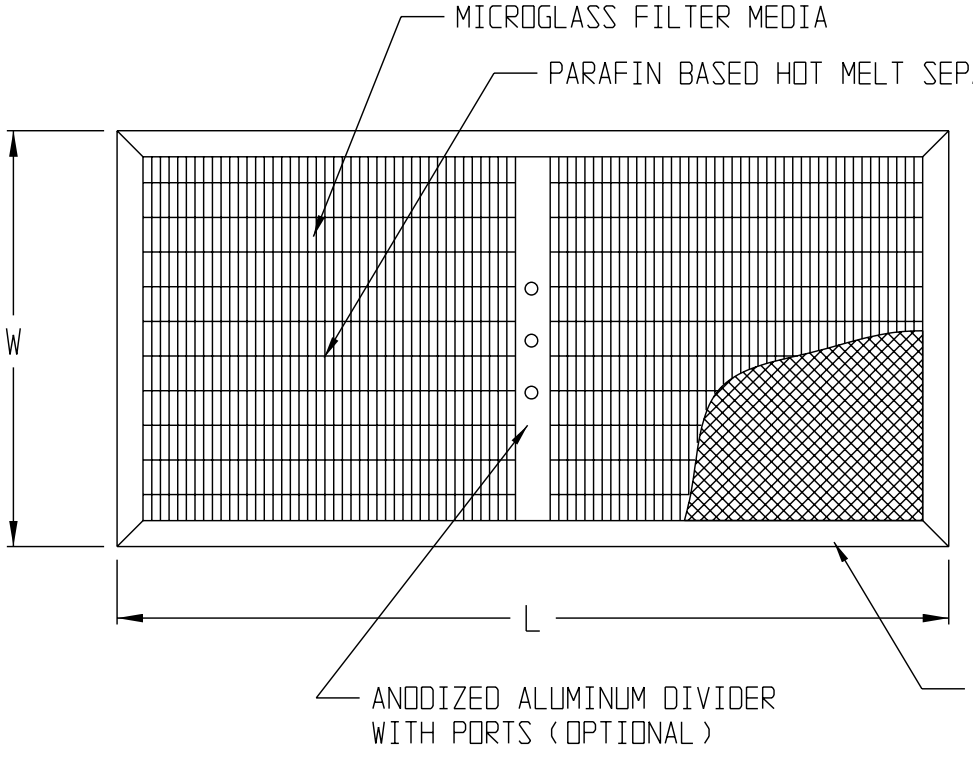
APPLICATION NOTES

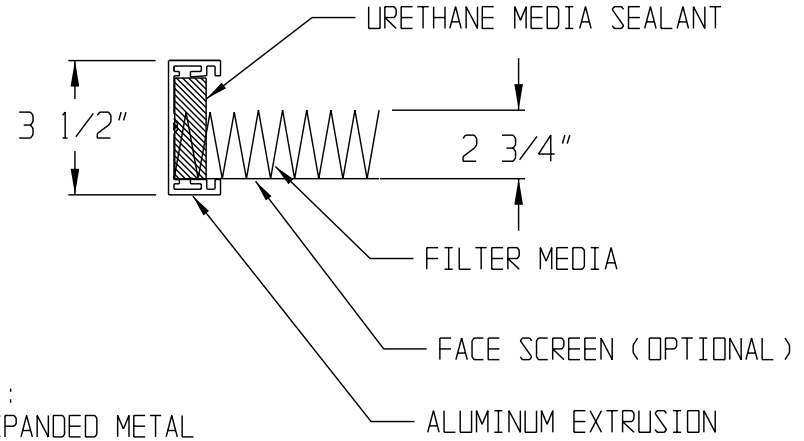
1. **Radio Frequency Interference (RFI):** All solid-state speed controls generate annoying radio noise on the AM band. KB speed controls contain, as standard, a high-gain RFI suppression filter which significantly reduces this interference.
2. **Low End Set Point (Minimum speed):** All 115 Volt input speed controls are factory set to 60 Volts AC output (±3 Volts), as standard. All 230 Volt input speed controls are factory set to 120 Volts AC output (±6 Volts), as standard. All controls are factory calibrated using an average responding AC voltmeter. Custom voltage settings are available.
3. **Motor Suitability:** Motors must be loaded to near full capacity with the appropriate fan blade in order to achieve proper speed control. Generally, motor suitability is established by determining motor speed as a function of applied voltage. A motor is determined as suitable if it changes speed linearly over a wide range of voltage.
   It is required that all motors contain a built-in thermal overload protector when used with solid-state speed controls.
4. **230 & 277 VAC Controls:** To achieve maximum reliability, all 230 VAC controls contain snubber networks that utilize Y-Type capacitors and flame-proof resistors. In addition, all 277 VAC controls contain MOV Transient Suppression.
5. **Temperature Test:** The non-sinusoidal output voltage of a solid-state speed control may increase motor heating. Therefore, it is necessary that a temperature test be performed to ensure that the motor is operating within manufacturer's specifications.
6. **Leads:** All leads are approximately 6" (15 cm) long and stripped 1/2" (1.25 cm). Custom lead lengths, colors, and terminations also available.

OTHER AC MOTOR SPEED CONTROLS

KBNH	KBMS	KBMC	Dial-A-Temp
			

RATINGS			
2.5 Amps AC at 115 and 230 Volts AC 50/60 Hz	1.6 and 3 Amps at 115 and 230 Volts 50/60 Hz	1.6, 2.5 and 4 Amps at 115 and 230 Volts AC 50/60 Hz	300 Watts, 3 Amps AC at 125 Volts AC 50/60 Hz
DESCRIPTION			
PANEL MOUNT: For ceiling fans, range hoods, vibrators, humidifiers, air conditioners, fireplace blowers, window fans, etc. Designed for Shaded Pole, AC/DC, and Permanent Split Capacitor Motors.			PLUG-IN: For incandescent lamps and wood-burning fireplaces and stove fans. Plugs into a standard 115 Volt AC outlet.





NOTES:

-MEDIA PACK TO BE 2 3/4" DEEP
-FILTER MANUFACTURED TO MEET I.E.S. SPECIFICATIONS
-FILTER IS RATED AT 99.99% ON PARTICLES OF 0.3 MICRONS
-FILTER IS CHALLENGED WITH EMERY 3004 AND SCANNED FOR LEAKS

MODEL	SIZE= W X L X D	MEDIA	CFM@1"SP	SP@90FPM
H1919B66-BAABCAA	19.75 X 19.75 X 3.5	68 SF	551	.28
H1943B66-BAABCAA	19.75 X 43.75 X 3.5	163 SF	1319	.28

HALCO PRODUCTS CO.
100 NO. GORDON STREET ELK GROVE, IL. 60007

TITLE	FT HEPA FILTER		
DRAWN BY	DK/JY	DWG NO. 2513107B0	REV
SCALE	N/A	DATE 9/16/04	SHEET

FACET-Aire 3 and 2F

Space-saving Industrial Strength 1" and 2" Air Filters

Facet-Aire 3

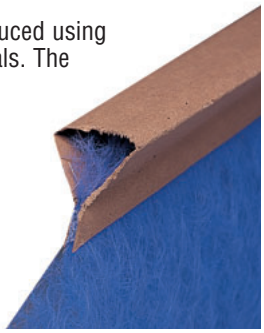
Facet 2F

- Reduce warehouse space and shipping costs with innovative Monobond frame design
- Tri-directional scrim backing increases filter integrity
- Improved aerodynamics reduce restriction to air flow
- Safe, easy, fast installation
- Larger effective filtering surface area
- Class 2 listed by Underwriters Laboratories, Inc.

The FACET-Aire 3 (F312) and Facet 2F (2F) disposable panel filters are designed to withstand the demands of tough industrial and commercial applications. Purolator assures filter durability by utilizing construction features not found in traditional designs.

Frame

Both the F312 and 2F frames are produced using 100% recycled post consumer materials. The unique Monobond concept involves a one-piece frame sealed to the media under heat and pressure. This construction feature produces a continuous bond of media to board around the periphery of the frame eliminating weak corners and air bypass. The use of a high tensile strength polyethylene binder increases the integrity of the seal, allowing the filter to withstand varying temperatures and humidity levels.



Cut-away of the Facet Monobond frame construction feature - 2" size depicted here.

The space saving notched corner feature of a monobond frame

When compared to traditional designs, the Monobond type filter's notched frame corners allow units to interlock providing up to 33% savings on warehouse space and freight costs.

For certain heavy duty applications, Facet also offers a 2" Box frame construction available in sixteen (16) standard sizes.

Media

Both the F312 and 2F are manufactured with superior grade fiberglass media to guarantee full depth loading and high dust holding capacity. A computer controlled manufacturing process assures a uniform gradient density pattern in the media.

To enhance filtration capability and prevent migration of finer particles, the filter media is evenly coated with a gelled adhesive.

Overall filter integrity is assisted by the addition of a Tri-Directional Scrim backing to the downstream side of the media. This scrim backing is laminated to the fiberglass and provides downstream support while promoting minimum fiber displacement at high velocities, and reducing restriction to air flow. The non-metal nature of the backing also eliminates sharp edges making for safe installation and easy disposal.

Performance data

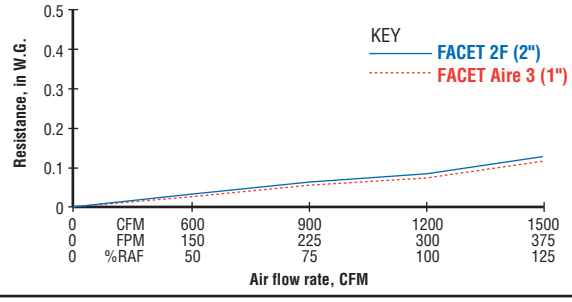
Category	F312 (1")	2F (2")
Air Velocity (FPM)	300	300
Initial Resistance (in. W.G.)	.07	.09
Final Resistance (in. W.G.)	.50	.50
Average Arrestance (%)	72	80
Dust Holding Capacity (gm/ft^2)	55.9	74.0

Resistance performance curves

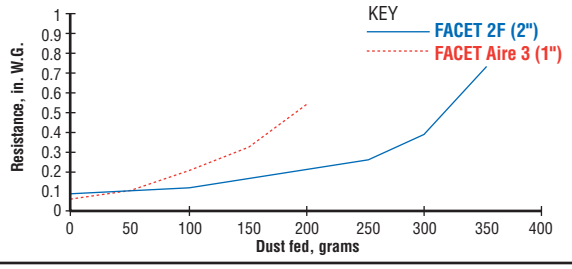
Resistance climbs more rapidly on 1" thus reducing dust holding capacity and filter life.

Testing conducted in accordance with ASHRAE 52.1-1992 test standards. Approved and listed Class 2 by Underwriters Laboratories, Inc.

Air flow vs. Resistance curve



Dust held vs. Resistance curve



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800/334-6659
FAX: 252/492-6157
800/356-2397

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Kenly, North Carolina 27542

4010 Kimmel Drive
Davenport, Iowa 52802

3800 Pell Circle
Sacramento, California 95838

212 Durham Avenue
Metuchen, New Jersey 08840
Phone: 732/744-1420
Fax: 732/744-1423

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Member ASHRAE

PB1-1 (8/02)

CHAPTER 4

HALCO PRODUCTS COMPANY

100 N. Gordon St. Elk Grove Village, IL 60007-1193
Phone (847) 956-1600 Fax (847) 956-0595
E-mail: info@halco-products.com
Website: www.halco-products.com

WARRANTY

HALCO PRODUCTS COMPANY warrants that the workmanship, materials, and construction of this item is free of manufacturing defects. This item and its associated systems are such that if operated and maintained in accordance with the manual supplied by **HALCO PRODUCTS COMPANY**, it will meet all contract specifications for a period of one (1) year from date of delivery. This warranty shall not apply to replaceable items such as filters or light bulbs, or if the equipment is subject to misuse, accident, negligence, or lack of proper maintenance. Electrical motors and blowers and pre-manufactured items are subject to manufacturers' guarantees.

CUSTOMER: _____

ADDRESS: _____

_____

P.O. # : _____ INVOICE # :_____SERIAL #: _____

MODEL #: _____ SIZE: _____

START-UP DATE: _____ INSPECTED BY: _____ DATE: _____

WARRANTY REGISTRATION CARD

Please return this card within 30 days of delivery

Customer:_____

Address:_____

_____

P.O.#: _____ Invoice #: _____ Serial #: _____

Model #: _____ Start-Up Date: _____

Sizes: _____ Customer Inspector: _____ Date: _____