HALCO PRODUCTS COMPANY
100 N. Gordon St. Elk Grove Village, IL 60007-1193
Phone (847) 956-1600 Fax (847) 956-0595
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INSTALLATION, OPERATION, & MAINTANANCE MANUAL

AC6302-ST

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CHAPTER 1

HALCO PRODUCTS COMPANY
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HALCO PRODUCT INFORMATION
500.4000

ABSOLUTE CONSOLE SERIES

ADVANTAGES

- DISPOSABLE PLENUM / NO FILTER SEAL
- VIRTUALLY MAINTENANCE FREE
- GOVERNMENT QA / QC

HOW IT WORKS

The basic concept of the work station Is to take air through a blower system, pressurize a plenum, and force air through the HEPA filter. Since the filter Is subject to extreme air pressures, it must be strong and well built. The air then passes over the central work area driving out air borne contaminants allowing a contamination free environment for particular specifications. If the filter is defective, the workstation filtration system no longer filters and becomes a vacuum cleaner. taking in gross contamination and exploding it through the defective filter onto and around the so coiled “critical work area. This can only happen In two ways: (a] through the filter media itself, or (b] around the filter seal.

NO MORE SEALS

The ABSOLUTE concept eliminates HEPA leakage problems, since the HEPA filter Is permanently installed into a disposable plenum, which means that we hove eliminated the filter seal completely, consequently only the filter media is under direct air pressure and, since there are no seals in the ABSOLUTE concept no seals can leak.

SAY GOODBYE TO THE OLD METHOD

The old method of replacing HEPA filters Is quite involved, time consuming and costly. if the customer elects to change his own HEPA filters, he must be qualified in the use of filter test equipment. A small company, in all probability, would not have this equipment or the technician to perform this work. The ABSOLUTE concept eliminates this extensive and expensive procedure since the plenum and the HEPA filter are integral. The advantages are obvious.

FEATURES

- Easy replacement hepa
- Factory built & tested
- Filter status gauge
- Integral light/UV
- Class 100 ISO 2

OPTIONS

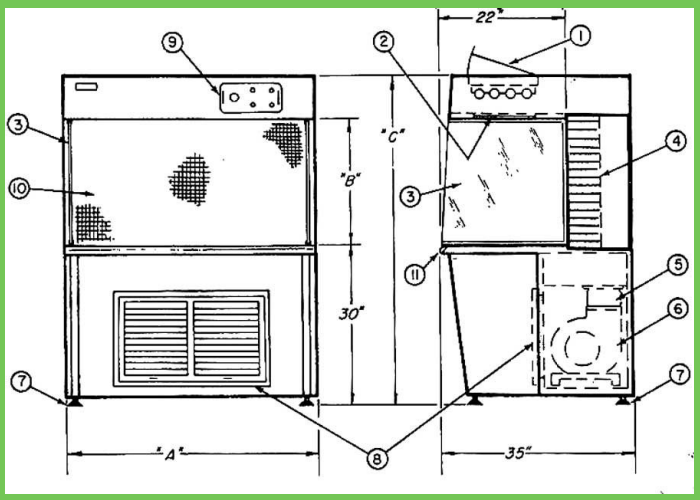
- Gas cocks
- Duplex receptionals
- Heated worksurfacer
- Reverse flow for toxic work

Call for a full list of options

SPECIFICATIONS

TYPICAL COMPONENTS:

1. Light access
2. Sealed light lens
3. Removable plexiglass side panels
4. Disposable HEPA filter/plenum
5. Vibration absorption cushion
6. Shock mounted direct drive blower
7. Leg levelers
8. Air Inlet grill and disposable prefilter
9. Control panel
10. AnodIzed aluminum protective grill, removable
11. comfort edge: saves elbows and garment sleeves



* Optional 6" Deeper WorkSurface

CONSTRUCTION;
Wood and/or Novcply construction with Melamine finish. (Formica or equal).

DESIGN — APPEARANCE:
Color usually white. Other colors on request.

SEALED LIGHT LENS
No chance of contamination fall out through light fixture onto critical work surface. Lights easily serviced from above. (See inset).

REMOVABLE SUPER- INTERCEPTION GRILL:
easy inspection Removable grill allows for and/or repair of HEPA filters.

REMOVABLE ELECTRICAL PANEL:
Complete panel lifts out for Inspection or addition of electrical outlets, meets all electrical codes.

HEPA FILTER PRESSURE GAUGE:
Indicates HERA filter clogged — time to order replacement.

TWO POSITION BLOWER SWITCH:
Allows for increase/decrease of air velocity through HEPA filter. Especially where customer uses gas flame. Also to keep velocities stable once filter starts to clog.

COMFORT EDGE:
Rounded neoprene saves elbows and garment sleeves.

Nominal Dimensions			
Model No.	**A**	**B**	**C**
322AC	38"	22½"	60"
422AC	50"	22½"	60"
522AC	62"	22½"	60"
622AC	74"	22½"	60"
4302AC	50"	28½"	66"
5302AC	62"	28½"	66"
6302AC	74"	28½"	66"

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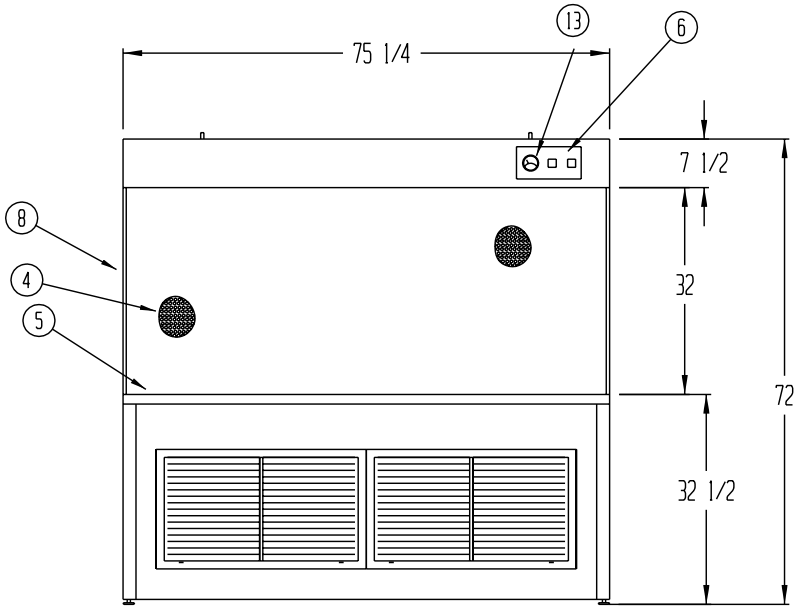
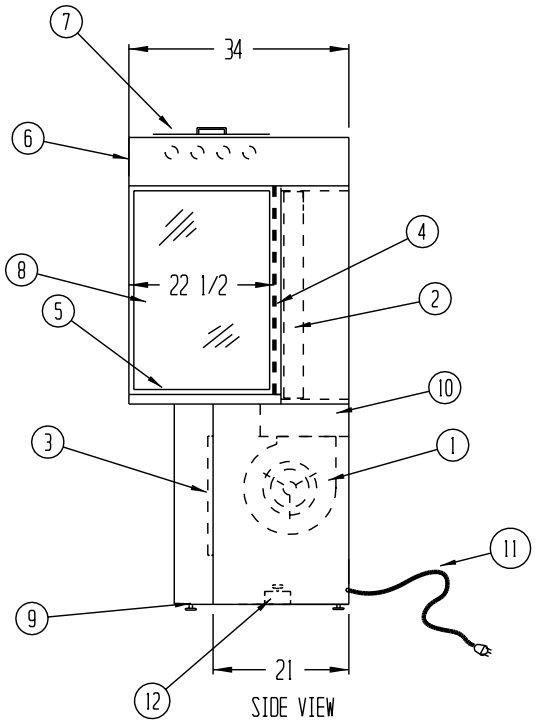
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	AS BUILT	07/28/10	SM



FRONT VIEW



SIDE VIEW

1. 1 EA. DD10-10AT DIRECT DRIVE BLOWER WITH 1/2 HP. MOTOR 115 VOLT/ 1 PHASE/ 60 CYCLE/ 7.7 FLA, CAPABLE OF PRODUCING 1500 CFM EACH AT 1" S.P.
2. 1 EA. 30" X 72" X 3 1/2 HEPA FILTER, 99.99% EFFECTIVE ON PARTICLES OF 0.3 MICRONS IN SIZE, FRONT LOADING GEL
3. 2 EA. 30" X 16" X 1" ANODIZED ALUMINUM PRE-FILTER GRILLE WITH 35% EFFICIENT DISPOSABLE PRE-FILTERS
4. ANODIZED ALUMINUM HEPA FILTER DISCHARGE GRILLE
5. WHITE PLASTIC LAMINATE WORK SURFACE
6. CONTROL/LIGHT SWITCHES
7. FLUORESCENT LIGHT FIXTURE WITH FLUORESCENT TUBES CAPABLE OF PRODUCING 100 F.C.
8. 1/4" POLYCARBONATE SIDE PANELS IN ALUMINUM TRIM
9. LEG LEVELERS
10. PLENUM AREA
11. 8 FT LONG 115 VOLT, 15 AMP POWER CORD FOR UNIT
12. ELECTRONIC SPEED CONTROL
13. MINIHELIC PRESSURE GAUGE FOR HEPA FILTER

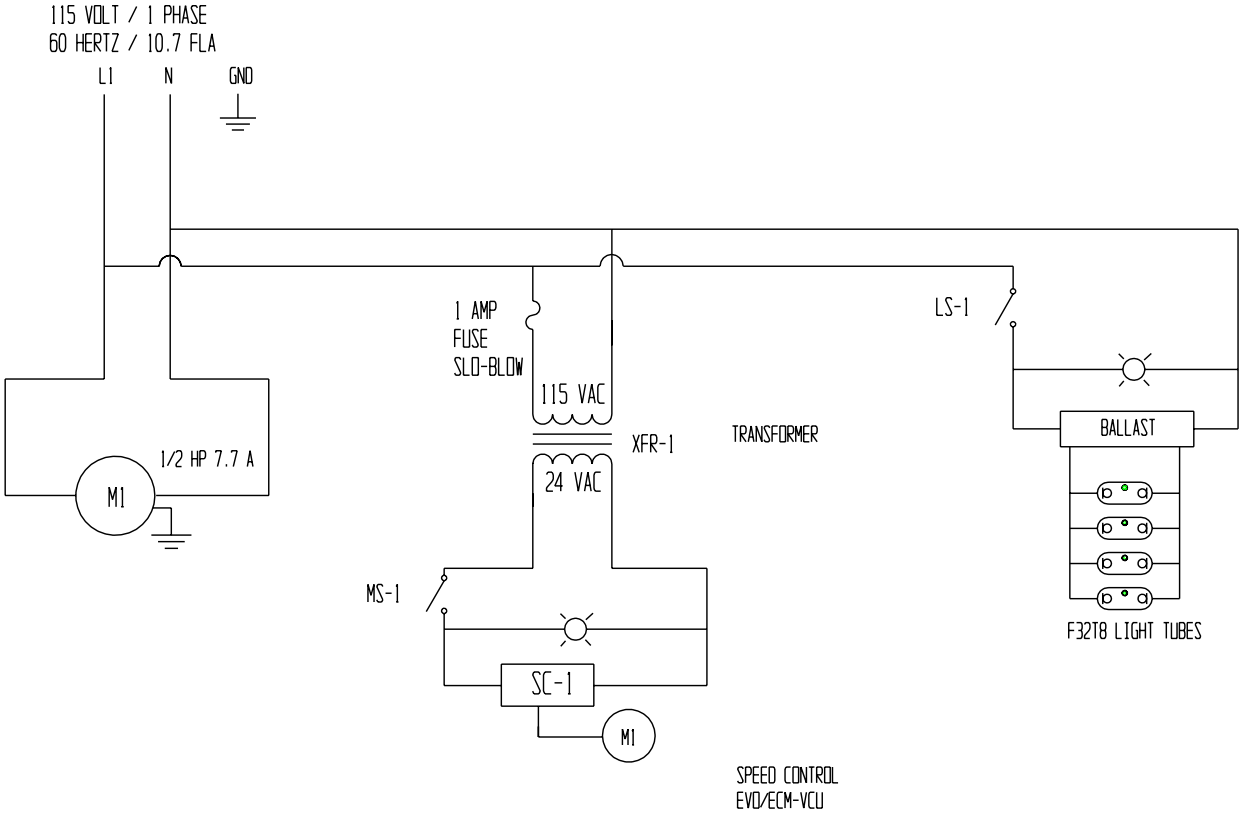
NOTES:

- CONSTRUCTION TO BE 16 GA. GALVANNEALED STEEL COATED WITH WHITE EPOXY PAINT
- UNIT TO MEET ISO STANDARD 14644-1 (FED. STD. 209E) FOR CLASS 100
- ELECTRICAL WIRING TO CONFORM TO LATEST N.E.C. STANDARDS

(4) UNITS REQUIRED, AS SHOWN

DRAWN FOR: BROOKS AUTOMATION LONGMONT, CO	HALCO PRODUCTS CO. 100 NO. GORDON STREET ELK GROVE, IL. 60007			
	TITLE: HORIZONTAL LAMINAR FLOW WORKSTATION MODEL#AC6302-ST			
DRAWN BY: TM	SIZE	JOB NO. 12468	DWG NO. 1416239AA	REV
APPROVED BY	SCALE 3/4"=1'-0"	DATE 7-2-10	SHEET	

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



DRAWN FOR: BROOKS AUTOMATION	HALCO PRODUCTS COMPANY 100 N. GORDON, ELK GROVE, IL 60007	
	TITLE: WIRING DIAGRAM MODEL AC6302-ST	
DRAWN BY: SM	SIZE	JOB NO. 12468 / DWG NO. 211628080 / REV
APPROVED BY:	SCALE N/A	DATE 07/19/2010 / 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.

HORIZONTAL LAMINAR FLOW WORKSTATION SPECIFICATIONS

INSTALLATION:

- Place unit in desired position.
- Remove all shipping tape from unit example; fluorescent lamps that are installed in fixtures, remove all shipping support blocks from motor/blower (if applicable).
- The electrical wiring to meet the latest NEC standards. Customer to supply electrical power source of 115 volt, 1 phase, 60 hertz for the motor/blower and lighting. Refer to the electrical tag to verify proper voltage, hertz and amperage. Manufacturer recommends a 15-amp service.

SEQUENCE OF OPERATION:

- Turn blower and light switches to "on" position.
- Wipe unit down with an approved facility-sterilizing agent.
- Allow unit to purge for at least 30 minutes prior to use.

CONSTRUCTION:

The unit is constructed of 16 ga. galvannealed steel coated with white epoxy paint. The unit includes clear polycarbonate side panels, white plastic laminate work surface, motor speed control, control panel with minihelic pressure gauge, motor/blower and light switches and gel seal HEPA filter, disposable prefilters, fluorescent light fixture and electronic speed control.

TESTING & RECERTIFICATION:

Unit to meet ISO standard 14644-1 classification of air cleanliness. (Fed. Std. 209E for Class 100 Devices)

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.

BASIC CARE & CLEANING:

Wash laminated, epoxy painted steel and acrylic surfaces with a mild soap or detergent and plenty of lukewarm water. Use a clean soft cloth, apply only light pressure. Rinse with clear water and dry by blotting with a damp cloth or chamois.

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.

MOTOR/BLOWER ASSEMBLY:

Blowers are direct drive type and are selected for continuous operation. Motors have permanently lubricated bearings. The motor/blower assembly is accessed through the prefilter grille. For more details, refer to the GE Motor Installation and Maintenance Information enclosed in the literature section of this manual.

MINIHELIC PRESSURE GAUGE:

The unit is equipped with a minihelic static pressure gauge that records the contamination build up behind the HEPA filter. For instructions on use and maintenance of the minihelic pressure gauge, refer to the manufacturers' (Dwyer) instruction manual, located in the literature section of this manual.

SPEED CONTROL:

The EVO/ECM-VCU-36-mp speed control is located on the control panel. For instructions on use of the speed control, refer to the "Operation" section of the manufacturers' data sheet located in the literature section of this manual.

PREFILTER:

The prefilters are contained in the prefilter grilles. Prefilters should be inspected weekly until a replacement cycle can be established. When contaminants begin to collect on the face of the prefilter, it should be replaced. To change the prefilter:

- Open the prefilter grille.
- Remove, discard and replace with a new prefilter.
- Secure the prefilter grille.

Note: If contaminants are allowed to continuously collect on the prefilter the life of the HEPA filter will gradually diminish.

HEPA FILTER:

The HEPA filter is capable of removing 99.99% of all particles 0.3 microns in size . 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 %. 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 front work surface of the unit. To change the HEPA filter: (**also refer to the Gel Seal Filter Installation Instructions- ¼ turn locking tabs**)

- Turn off electrical power source to unit.
- Remove the protective perforated HEPA from the unit for access to the HEPA filter(s).
- Turn jack (locking) tabs 90° (while gently pushing on filter from filter edge only) so that tabs are parallel to filter knife edge on unit.
- Carefully remove old HEPA filter, discard and install new HEPA filter.
- Make sure filter jack (locking) tabs are parallel to filter knife edge on unit.
- Position filter into opening of unit "make sure filter is centered in opening".
- Push filter firmly from edge to seat filter.

  Caution: **Do not push on filter media as media of filter is easily damaged!**

- Turn filter jack (locking) tabs 90° (while gently pushing on filter from filter edge only) so that tabs are parallel to filter knife edge on unit.
- Filter jack (locking) tabs should now be perpendicular to knife edge and filter frame.

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

LIGHTING:

Periodically, check the fluorescent lamps for flickering or burnout. This is an indication that the fluorescent lamps should be replaced. To replace the fluorescent lamps:

- Make sure power to unit is turned off.
- Remove the retaining screws on the aluminum plate on the top of the unit.
- Lift light fixture out of unit, change lamps and reverse to install.

HORIZONTAL LAMINAR FLOW WORKSTATION
PARTS LIST
MODEL# AC6302-ST
SERIAL# 12468 / UNITS 1-4

PARTS DESCRIPTION	PART NO.	MFG.	QTY
Each Unit Consists of:			
Blower 10/10	DD1010AT	Lau	1
Motor ECM 1/2 HP	2.3 1/2HP	GE	1
Motor Speed Control	ECM-VCU-36	Evolution Controls	1
Transformer	90-T40F3	White-Rodgers	1
Inline Fuseholder	HTB-42I	Cooper-Bussmann	1
Fuse 1-amp	MDL-1	Cooper-Bussmann	1●
Illum. Pushbutton Switch	SLA6A125V2C9	Oslo Switches	1
Illum. Pushbutton Switch	SLA6A28V2C9	Oslo Switches	1
Minihelic Gauge	2-5002	Dwyer	1
Ballast	B431I120RH	Advance	1
Fluorescent Lamp	F32T8/SP41	GE	4●
HEPA Filter 99.99% effy. on particles 0.3 micron in size	H3072B00-BAAECAA	Halco	1●
Prefilter 3-ply poly	3P/3016-1	Tridim	2●

●MANUFACTURER RECOMMENDED STOCKING SPARE PARTS

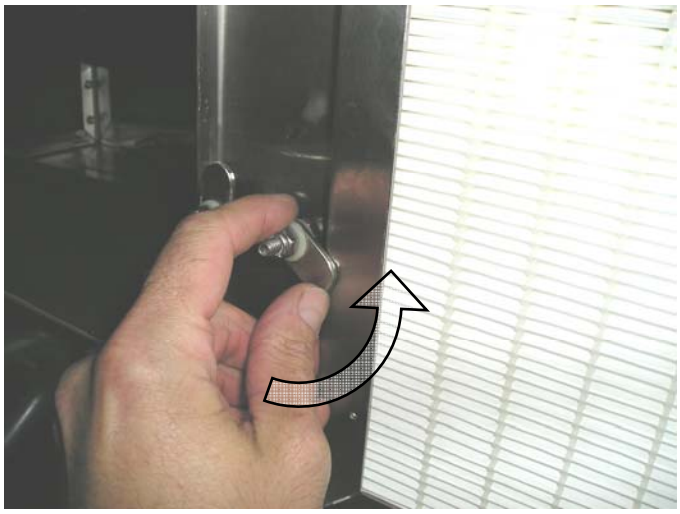
CHAPTER 3

GEL SEAL FILTER INSTALLATION INSTRUCTION (1/4 TURN LOCKING TABS) ND 2008

STEP #1 - TURN ALL FILTER JACK TABS PARALLEL TO FILTER KNIFE EDGE ON UNIT TO ACCOMMODATE FILTER

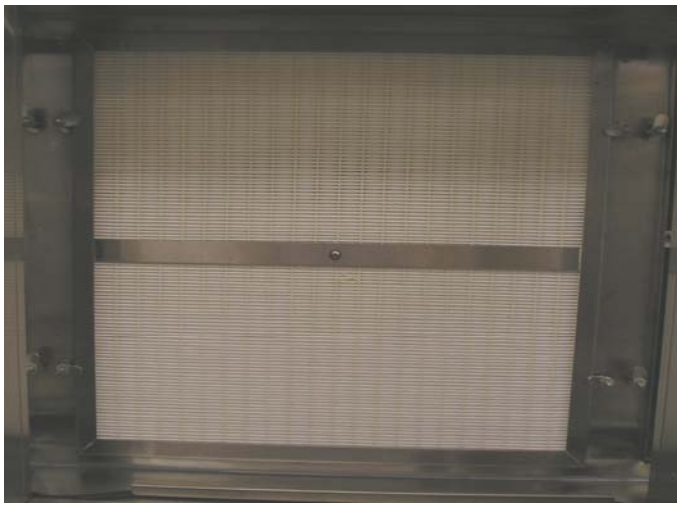
STEP #2 - POSITION FILTER INTO OPENING OF UNIT
* BE SURE FILTER IS CENTERED IN OPENING*

STEP # 3 - PUSH FILTER FIRMLY FROM EDGE TO SEAT FILTER * CAUTION DO NOT PUSH ON FILTER MEDIA!* MEDIA OF FILTER IS EASILY DAMAGED



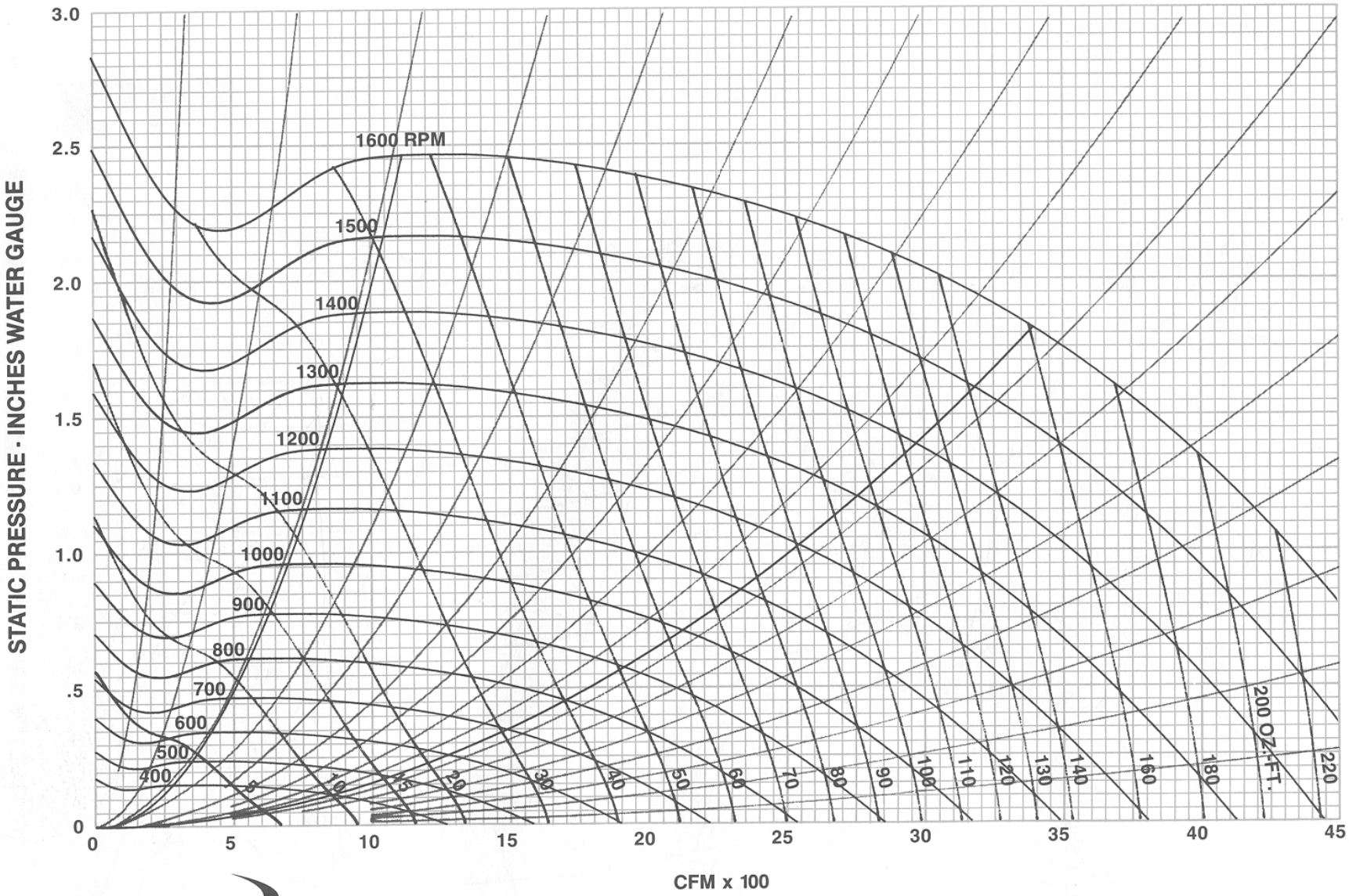
STEP #4 - TURN LOCKING TABS 90 deg WHILE GENTLY PUSHING ON FILTER FROM FILTER EDGE ONLY

STEP # 5 - FILTER JACK LOCKING TABS SHOULD NOW BE PERPENDICULAR TO KNIFE EDGE AND FILTER FRAME



PROPERLY INSTALLED GEL SEAL FILTER
WITH FILTER LOCKING TABS

MODEL DD10-10AT



Lau Industries

GRAPH NO.	G2774-1
DATE	2-15-95
WHEEL DIA.	10.62
WHEEL WIDTH	10.62
OUTLET AREA (Square Feet)	1.02

Performance curves based on test made in accordance with ASHRAE 51-1985, AMCA 210-85. Tested without inlet duct and with discharge duct. Brake horsepower does not include drive losses. Standard Air Density 0.075 lb./cu. ft.

$$SE = \frac{CFM \times SP}{6362 \times BHP}$$

$$BHP = \frac{RPM \times (oz.\ ft.)}{84034}$$

SEE SPECIFICATION DATA SHEET **329** FOR OPERATIONAL LIMITS.

Specification Sheet "DD-T" Series Wheel & Housing

Tight Scroll

Number: **329** Date: **2-15-95**

SHEET 1 OF 1

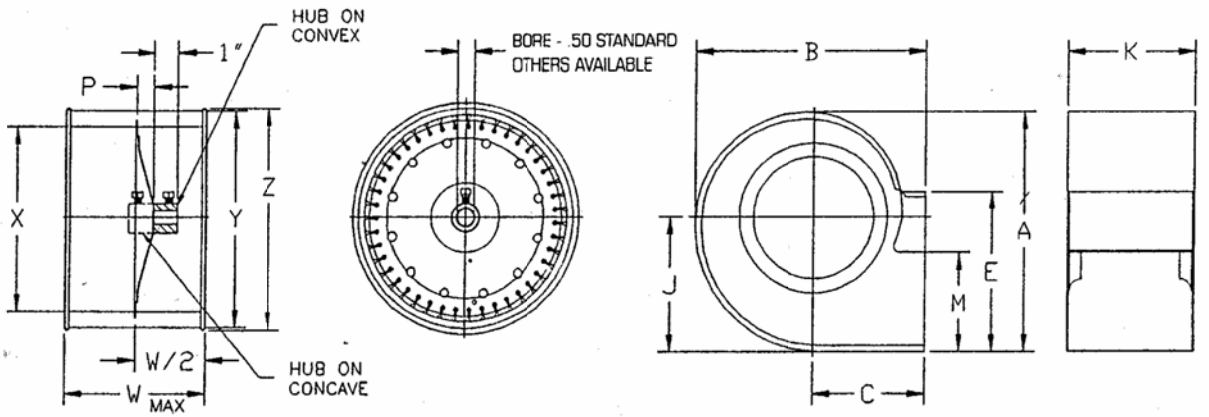
NOTES:

- Shaded areas indicate Lau preferred product. Selections in non-shaded areas and optional features may affect price and availability.
- Product weights may vary with bore size and hub style.
- Solid style hubs with bores up to 3/4" are available for most diameters. (Ref. spec sheet #500
- Wheel Moment of Inertia may vary with bore size and hub style:
  $wk^2 / 32.2 = (Lb\text{-}Ft\text{-}Sec^2)$
- Blast Area = (M/E) * (outlet area)
- Dimensions shown for reference only. For certified product dimensions contact Lau Engineering.
- Contact Lau Engineering for application assistance.
- Outlet Velocity: FPM = CFM/O.A.

Model	MAX RPM
9"	1750
10"	1750
12"	1200

DIMENSIONS IN INCHES

Model	A	B	C	E	J	K	M	P	Wheel Dimensions W	X	Y	Z	O.A. Sq. ft	WK² lb.-ft.²	No. of Blades	Hub Location	Wheel Wt. (lbs)	Unit Weight
DD9-4AT	12.81	12.53	6.12	10.25	7.19	6.81	5.25	.78	4.50	7.69	9.50	9.94	.48	.33	43	CONVEX	3.4	8.2
DD9-6AT	12.81	12.53	6.12	10.25	7.19	8.25	6.12	.78	6.00	7.69	9.50	9.94	.58	.35	43	CONVEX	3.9	8.8
DD9-7A T	12.81	12.53	6.12	10.25	7.19	9.19	6.12	.78	7.12	7.69	9.50	9.94	.65	.42	43	CONVEX	4.5	10.6
DD9-8A T	12.81	12.53	6.12	10.25	7.19	10.50	6.12	.78	8.00	7.69	9.50	9.94	.75	.47	43	CONVEX	4.9	11.0
DD9-9AT	12.81	12.53	6.12	10.25	7.19	11.81	6.12	.78	9.50	7.69	9.50	9.94	.83	.56	43	CONCAVE	5.4	13.1
DD9-10AT	12.81	12.53	6.12	10.25	7.19	13.12	6.12	.78	10.62	7.69	9.50	9.94	.93	.59	43	CONCAVE	5.9	14.0
DD10-4AT	15.38	15.00	7.31	11.38	8.84	6.81	6.00	.95	4.50	8.88	10.62	11.12	.53	.50	48	CONVEX	3.8	9.5
DD10-6AT	15.38	15.00	7.31	11.38	8.84	8.25	7.00	.95	6.00	8.88	10.62	11.12	.65	.51	48	CONVEX	4.3	10.4
DD10-7AT	15.38	15.00	7.31	11.38	8.84	9.69	7.00	.95	7.12	8.88	10.62	11.12	.77	.65	48	CONVEX	4.9	11.3
DD10-8AT	15.38	15.00	7.31	11.38	8.84	10.50	7.00	.95	8.00	8.88	10.62	11.12	.81	.73	48	CONVEX	5.4	12.3
DD10-9AT	15.38	15.00	7.31	11.38	8.84	11.81	7.00	.95	9.50	8.88	10.62	11.12	.97	.77	48	CONCAVE	6.2	13.6
DD10-10AT	15.38	15.00	7.31	11.38	8.84	13.12	7.00	.95	10.62	8.88	10.62	11.12	1.02	.91	48	CONCAVE	6.8	15.3
DD11-4AT	17.47	16.84	8.03	13.62	10.03	6.81	7.31	1.00	4.50	10.02	11.75	12.25	.65	.74	53	CONVEX	4.2	12.3
DD11-6AT	17.47	16.84	8.03	13.62	10.03	8.25	7.31	1.00	6.00	10.02	11.75	12.25	.78	.88	53	CONVEX	5.0	13.9
DD11-7AT	17.47	16.84	8.03	13.62	10.03	9.44	7.31	1.00	7.12	10.02	11.75	12.25	.89	1.00	53	CONVEX	5.7	14.7
DD11-8AT	17.47	16.84	8.03	13.62	10.03	10.50	7.31	1.00	8.00	10.02	11.75	12.25	.99	1.02	53	CONVEX	5.8	15.5
DD11-9AT	17.47	16.84	8.03	13.62	10.03	11.81	7.31	1.00	9.50	10.02	11.75	12.25	1.11	1.16	53	CONCAVE	6.5	17.5
DD11-10AT	17.47	16.84	8.03	13.62	10.03	13.12	7.31	1.00	10.62	10.02	11.75	12.25	1.24	1.29	53	CONCAVE	7.3	19.7
DD12-6AT	17.47	16.84	8.03	13.62	10.03	8.81	7.31	1.00	6.00	10.31	12.62	13.19	.83	1.09	43	CONVEX	6.1	15.0
DD12-8AT	17.47	16.84	8.03	13.62	10.03	10.75	7.31	1.00	8.00	10.31	12.62	13.19	1.02	1.18	43	CONVEX	6.6	16.3
DD12-9AT	17.47	16.84	8.03	13.62	10.03	12.25	7.31	1.00	9.50	10.31	12.62	13.19	1.16	1.25	43	CONVEX	7.0	17.2
DD12-11AT	17.47	16.84	8.03	13.62	10.03	13.88	7.31	1.00	11.12	10.31	12.62	13.19	1.31	1.60	43	CONCAVE	9.0	20.1
DD12-12AT	17.47	16.84	8.03	13.62	10.03	15.62	7.31	1.00	12.62	10.31	12.62	13.19	1.48	1.75	43	CONCAVE	9.9	21.3



DAILY FILTER TEST REPORT

07/15/10

SERIAL #	JOB #	CUSTOMER	FILTER CODE	OPER.	EQUIP	CHALLEN	TEST SCALE	FILTER SIZE WIDTH	LENGTH	DEPTH	PAK DPTH	MEDIA	FRAME	PPI	PRES FACT	ACT PRES	CFM	TEST VEL	EXPECT PRES	LEAK SCAN TEST DAMAGE CODE					PASS	FAIL
100715	6	12468	BROOKS AUTOMATION	H3072B00-BAAECAA	JB	LASER	PSL	0.1	30	72	3.5	2.75	HEPA	GEL	6	1.26	0.24	1256	90	0.327	LP	LF	CB	DP	DH	PASS	FAIL
100715	7	12468	BROOKS AUTOMATION	H3072B00-BAAECAA	JB	LASER	PSL	0.1	30	72	3.5	2.75	HEPA	GEL	6	1.26	0.24	1256	90	0.327	LP	LF	CB	DP	DH	PASS	FAIL
100715	8	12468	BROOKS AUTOMATION	H3072B00-BAAECAA	JB	LASER	PSL	0.1	30	72	3.5	2.75	HEPA	GEL	6	1.26	0.24	1256	90	0.327	LP	LF	CB	DP	DH	PASS	FAIL
100715	9	12468	BROOKS AUTOMATION	H3072B00-BAAECAA	JB	LASER	PSL	0.1	30	72	3.5	2.75	HEPA	GEL	6	1.26	0.24	1256	90	0.327	LP	LF	CB	DP	DH	PASS	FAIL

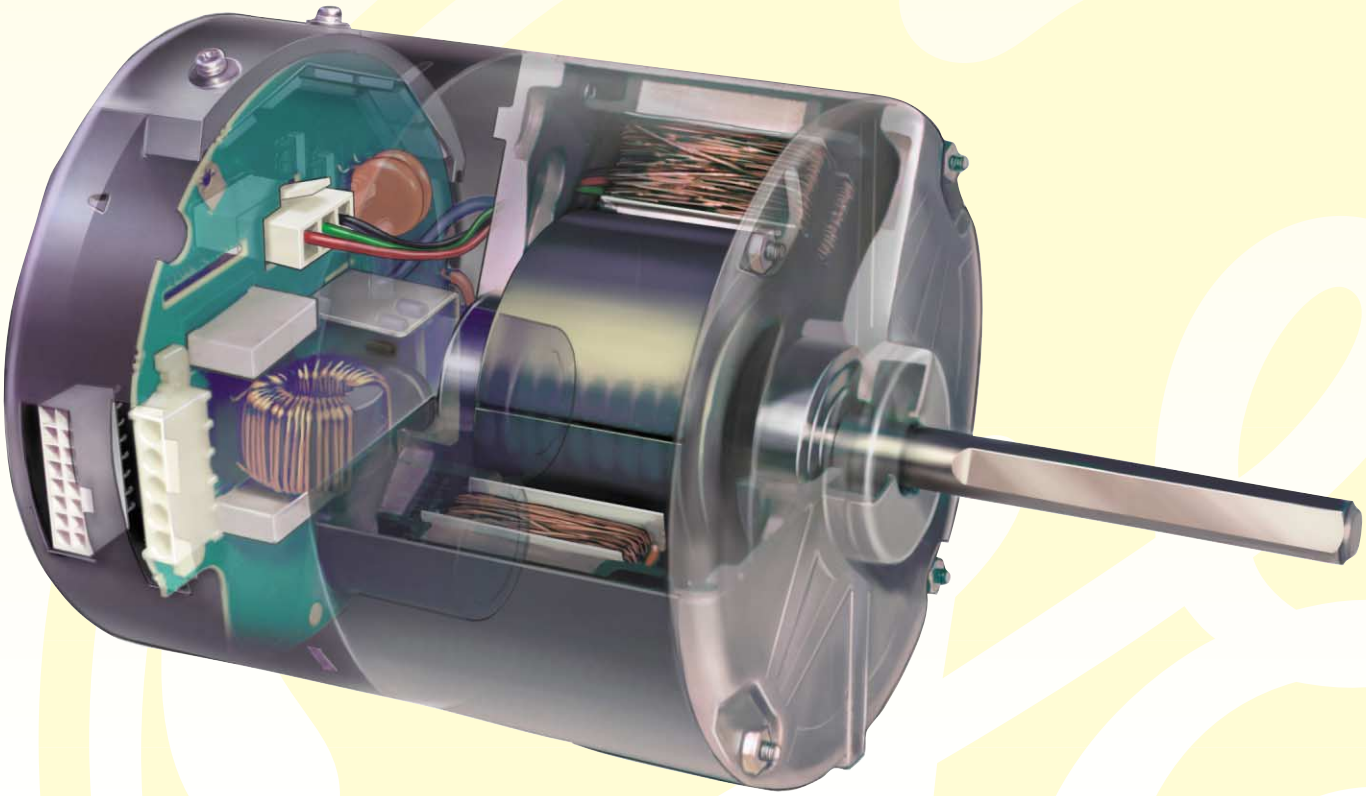
DAMAGE CODE KEY
LP = Leak repaired on pleated edge of urethane seal
LF = Leak repaired on flat edge of urethane seal
CB = Leak repaired on center board urethane seal
DP = Damage repaired due to pleater or paper handling
DH = Damage repaired due to filter handling
< Highlighted areas indicate repair >

CHAPTER 4

GE Industrial Systems

Presenting the GE ECM™ 2.3 Series Motors

The most efficient and versatile motors for any air-moving application.



GE's third-generation ECM 2.3 motors offer virtually unlimited performance possibilities

The family of ECM 2.3 motors offers many possibilities for integrating new capabilities into your products. Their wide speed range, high efficiency and programmability give them a virtually unlimited range of performance characteristics. All in one highly reliable, field-proven, convenient package that allows you to imagine possibilities that no conventional induction motor or competing variable-speed technology could provide.

Create better products with the ECM 2.3.

With features unavailable with conventional induction motors, the ECM motor gives product designers and engineers an extremely versatile tool for improving HVAC-system performance and differentiating products. Here are some examples of the system benefits made possible by the ECM motor: better humidity control, constant airflow, lower set-up and inventory costs, quieter operation, and better indoor-air quality.

Programmable Controls.

Just one motor can optimize your system performance and minimize your inventory. Programming options for the ECM 2.3 include: rotation direction, start/stop ramp rates, on/off blower delays and many other functions—all stored in the motor's microprocessor. Even its speed and torque characteristics can be customized to meet specific performance requirements. As a result, programmability means lower inventory because one motor can serve many applications.

Constant airflow.

The most important programmable feature is GE's patented sensorless, constant-airflow technology that allows the ECM 2.3 to maintain a programmed level of airflow over a wide range of external static pressure in an air-distribution system. It even holds airflow constant under less-than-optimum duct configurations and other conditions that produce high or varying static pressure. It does so by automatically adjusting its speed and torque to deliver the airflow you program into it. Constant airflow capability is critical to providing the greatest performance and comfort. (Go to www.GEindustrial.com, *enter keyword: ECM*, for further details about constant airflow.)

Resilient electronics.

Line transients from lightning strikes or corrupt utility power can cause damage or a temporary interruption of power to any electrical appliance. The ECM 2.3 Series comes standard with robust electronics that allow the motor to operate trouble-free in the event of power irregularities without spark gap. In addition, short power-line interruptions or under-voltage conditions do not affect the operation of the ECM 2.3.

Moisture-resistant design.

The ECM 2.3 addresses the most common problem today in forced-air systems—moisture. GE encapsulates the motor's sensitive controls in potting material to prevent water from reaching its electronic components. In fact, the ECM 2.3 stands up to more than 600 hours of ASTM-B117 salt-spray testing.

Wide range of applications.

The ECM motor has given product designers and engineers a tool for greatly expanding the capability of air-moving appliances. Here are a number of current applications: single-stage, two-stage and variable-capacity furnaces; air handlers; energy-recovery ventilators; powered filter units; unit ventilators; geothermal heat-pump systems; and commercial fan-powered terminal units.

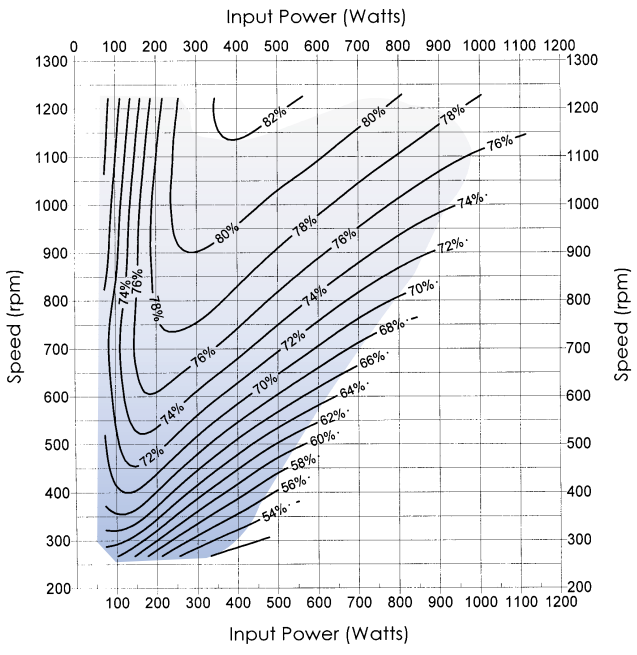
Easy installation and service.

The ECM 2.3 is designed to be easy to install, troubleshoot and service. There is no need to go to the motor for set up. In fact, there are no dip switches or adjustment terminals on the ECM 2.3. The system manufacturer can locate all connections required for set up in any convenient location. When it comes to service, the 2.3 is designed so its electronic controller can be replaced without removing the motor from the blower mounting which greatly reduces service time and cost.

Ultra-high efficiency.

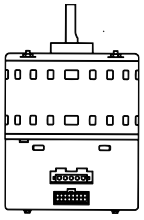
At full load the ECM 2.3 is 20% more efficient than a standard induction motor. In addition, its permanent-magnet, DC design, absence of rotor losses and high power factor allow it to maintain its high efficiency over a wide speed range (go to www.GEindustrial.com, *enter keyword: ECM*, for complete energy-savings data).

1 HP Efficiency
240V Design

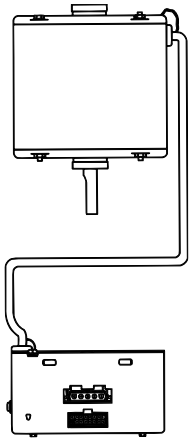


A model for every job.

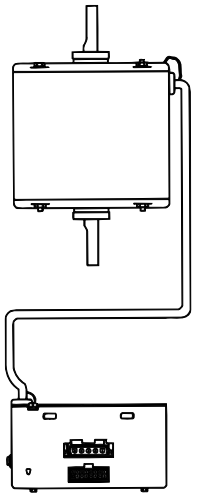
The ECM 2.3 Series is available in three configurations:



Integrated Motor & Control



Remote Control Single Shaft



Remote Control Double Shaft

Rated Power Level		Rated Input Power and Torque @ 1050 RPM		Maximum Input Current Rating at Nominal Input Voltage		
HP	Max Power @< 45˚C	Full Torque @25˚C				
	Watts	Oz-Ft	N-M	120vac	240vac	277 vac
1/3	385	28	2.37	5.0 amps	2.8 amps	2.4 amps
1/2	560	42	3.56	7.7 amps	4.3 amps	4.1 amps
3/4	860	66	5.59	9.6 amps	6.8 amps	5.5 amps
1	1050	80	6.78	12.8 amps	9.1 amps	6.9 amps

Agencies

UL: File # E100625 (motor & control)
CSA: File LR68565 (motor)
CSA: File LR68566 (control)
CE: Certificate of Conformity #156
(for complete agency details, go to www.GEindustrial.com
enter keyword: ECM

EMI Limits

Unit meets FCC Part 15, class B, for conducted EMI. Radiated EMI is influenced by cabinets, grounding, etc., at installation.

Calibrated Torque

100% dynamometer calibration of each unit with calibration stored in memory.

GE Industrial Systems

GE ECM™ Motor

Application

The EVO/ECM-VCU control allows accurate manual adjustment and monitor of fans using General Electric's ECM Motor. These are fractional horsepower air moving motors featuring an internal microprocessor. The design provides exceptional efficiency, performance and motor life. These self regulating motors may be factory configured so the fan will provide constant mass airflow.

The EVO/ECM-VCU features a 4 digit LED numerical display to allow easy reading in dark spaces. Watch the display and set the flow index with a screwdriver adjust. Twenty seconds later, the display shows the motor RPM. Then, the display periodically alternates between the flow index and motor RPM.

The EVO/ECM-VCU may also be used where automation systems only turn the fan on or off.

Specifications

Power	NEC Class II Only 24 Vac ± 20% 50/60 Hz 4 W, 6 VA
Flow Index Adjustment	270° rotation F Off-0-100
RPM	0-2000 RPM ± 2%
Outputs Go & Vspd	24 Vdc @ 20 mA

Vspd Supports ECM Autoswitch Function

Motor Configuration

ECM 2.3	Set for Vspd Operation Set Status Flag (7) to RPM
Thermal Stability	>0.01%/°F
Operating Environment	0°F to 130 °F (-18°C to 55°C) 10-80% rh
Connections	1/4 Tabs

EVO/ECM-VCU-36

Ordering

EVO/ECM-VCU-"a"-"b"

"a" Insert "36 for ECM 2.3 motor
Insert "06" for ECM 84 mm motor

"b" Add "mp" for control mounted to mounting plate

Operation

GE ECM™ motors configured for Vspd operation are factory configured for external torque or airflow adjustment. The configuration data includes the fan manufacturer's specified adjustment range. A numerical flow index accurately adjusts the fan to the desired torque or airflow. The flow index is a number from 0-100 having a linear relationship to the minimum to maximum torque or airflow range specified by the motor fan manufacturer. Refer to the fan manufacturer's specifications, data and charts to convert the flow index to torque or mass airflow.

The EVO/ECM-VCU allows local on/off and fan airflow adjustment. Rotating a single screwdriver adjuster changes the variable output signal to the motor from off to full output. While rotating the adjuster, a numerical flow index is locked on the illuminated numerical display. After adjustment, the display shows fan RPM.

Wiring

Power the EVO/ECM-VCU control with a 24Vac NEC Class II [USA] power source. Observe all code requirements and follow all safety practices regarding low voltage power supplies and circuits to insure a safe, reliable installation. DC voltages from 20 -30 Vdc may also be used to power the control.

Earth one side of the power source. Connect the neutral connection to the grounded side of the 24Vac Class II power source.

Connect the 24Vac 50/60Hz connection to the hot side of the 24Vac Class II power source. You may interrupt this connection as a means to stop the ECM ™Motor Many automation controllers will power the control directly from and on/off output.

Connect to the motor using an EVO/ECM-CBL motor control cable.

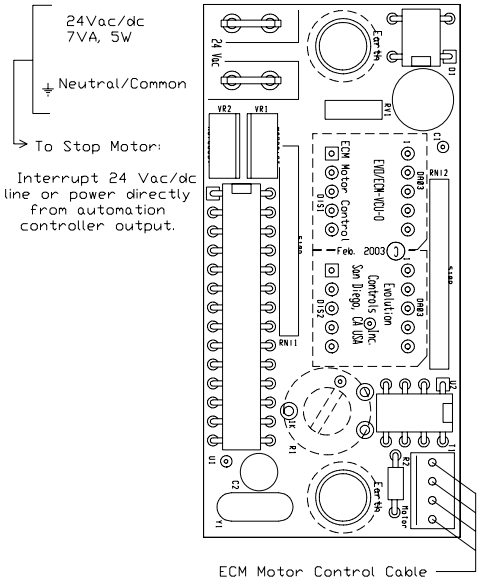
Mounting

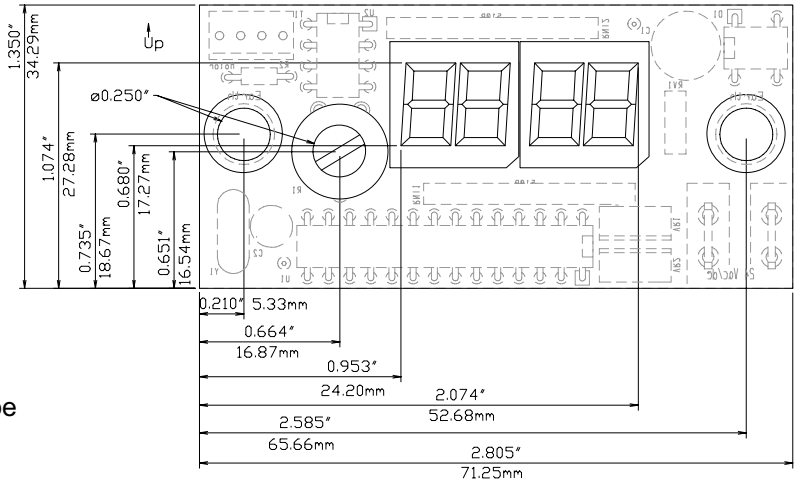
Mount the control inside a metal control cabinet or enclosure with the display and adjuster visible through cutouts through the enclosure. Fasten the control mounting posts to a grounded metal surface.

The “mp” option provides the control mounted to a metal plate that fastens to a single gang electrical box[USA].

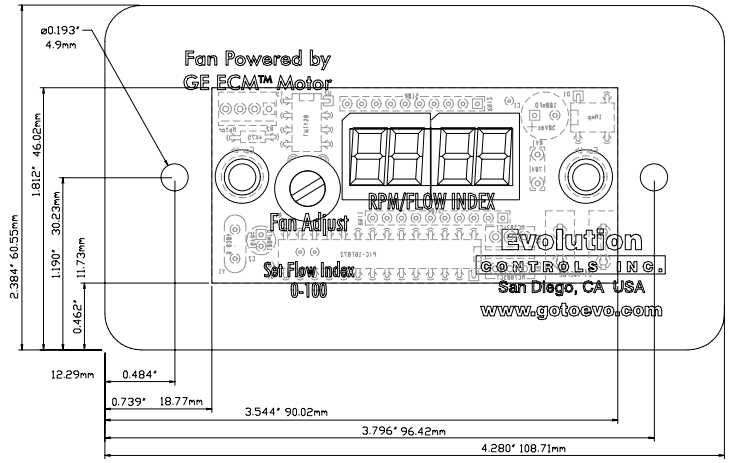
Mount the control with clearance for the 24Vac power wires and control cable connector. The control’s motor cable connector is sized so it may be pulled through an empty 3/4” conduit.

Mounting Plate Dimensions





Display Side View



90-T40S1 THRU 90-T75C3 24 VOLT SECONDARY CLASS 2 TRANSFORMERS ENERGY LIMITING

For Industrial, Heating and Air Conditioning Controls Applications

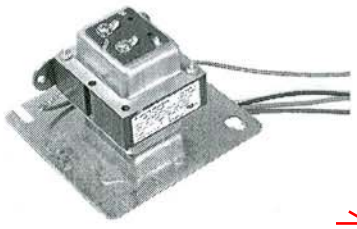
FEATURES

- Color coded primary leads.
- Multi-mount styles available.

SPECIFICATIONS

Agency . . . . . U.L. file number c UL us E33334

90-T40F1



90-T40S3

90-T75C3

MULTI-MOUNT (CLOSED CONSTRUCTION) **UNIVERSAL MOUNTING WITH PLATE**

Model Number	Mars Part No.	Jard Part No.	VA	Hz	Primary	Connections	Sec.	Connections
90-T40M1	50302	4011M	40	60	120V	Leads	24V	Leads
90-T40M2	50303	4021M	40	50/60	208/240V	Leads	24V	Leads
90-T40M3	50304	4031M	40	60	120/208/240V	Leads	24V	Leads
90-T50M3	50314	5031M	50	60	120/208/240V	Leads	24V	Leads

FOOT-MOUNT (OPEN CONSTRUCTION)

Model Number	Mars Part No.	Jard Part No.	VA	Hz	Primary	Connections	Sec.	Connections
90-T40F1	50352	4011F	40	60	120V	Leads	24V	Leads
90-T40F2	50353	4021F	40	50/60	208/240V	Leads	24V	Leads
90-T40F3	50354	4031F	40	60	120/208/240V	Leads	24V	Leads
T40-24	–	–	40	50/60	120/208/240V	Leads	24V	Leads
90-T50F3	–	5031F	50	60	120/208/240V	Leads	24V	Leads

FOOT-MOUNT (MANUAL RESET, OPEN CONSTRUCTION)

Model Number	Mars Part No.	Jard Part No.	VA	Hz	Primary	Connections	Sec.	Connections
90-T50C3	50327	5041C	50	50/60	120/208/240V	Leads	24V	Leads
90-T60C3	50327	6041C	60	50/60	120/208/240V	Leads	24V	Leads
90-T75C3	50321	7541C	75	50/60	120/208/240V	Leads	24V	Leads
NEW! 90-T100C1	–	–	100	60	120V	Leads	25V	Leads
NEW! 90-T100C2	–	–	100	50/60	208/240V	Leads	25V	Leads

TRANSFORMER LEAD COLOR CODING

Primary Side				Secondary Side	
Common	120V	208V	240V	Common	24V
* Black	White	Red	Orange	Blue	Yellow

* Black is common with respect to the transformer winding, not the external circuit.

WALL PLUG-IN

Isolation Step Down Transformer

FEATURES

- Sealed tamper and impact resistant case.
- Output termination is screw terminals.
- Non-polarized 120V plug-in blades.
- Trouble free maintenance.
- Isolated from power source.

SPECIFICATIONS

Dimensions, **5401A-1** . . . . . 3"H x 2½"W x 1¾"D
Dimensions, **5402A-1** . . . . . 3"H x 2¾"W x 2¼"D
Output terminals . . . . . #6-32 screws
Agency ratings . . . . . C.S.A. and U.L. class 2

5401A-1

Model Number	Primary	Secondary
5401A-1	120VAC, 60 Hz, 0.14A	24VAC, 10VA
5402A-1	120VAC, 60 Hz, 0.31A	24VAC, 25VA

COOPER BUSSMANN Holder, Fuse, 16 A

Fuse Holder, Current Rating 16 Amps, Maximum Voltage 250 Volts, Fuse Diameter 1/4 Inch, Fuse Length 1 1/4 Inches, Connector 3/16 Inch Quick Connect, Blown Fuse Indicator No, Fuse Block Design Bayonet, Mounting Style Panel, Number of Poles 1

Grainger Item #	1DD27
Brand	COOPER BUSSMANN
Mfr. Model #	HTB-42I

Tech Specs

Item	Fuse Block
Max. Voltage	250
Amps AC	15
Number of Poles	1
Connector Type	3/16 Slip-On
Mounting Style	Panel
Fuse Block Design	Bayonet
Fuse Size Length (In.)	1-1/4
Fuse Size Dia. (In.)	1/4
Blown Fuse Indicator	No
Fuse Holder Code	G

1/4" x 1-1/4" Fuses

MDL Series, Time Delay, Glass Tube

Description

- Time delay, glass tube
- Optional leaded version available
- 1/4 x 1-1/4 (6.3mm x 32mm) physical size
- Glass tube, nickel-plated brass endcap construction
- UL Listed product meets standard 248-14

ELECTRICAL CHARACTERISTICS		
Rated Current	**Amp Rating**	**Opening Time**
1/16 - 30A	100%	None
	135%	60 minutes max.
	200%	120 seconds max.
1/16 - 3A	200%	5 seconds min.
3-2/10 - 8A	200%	12 seconds min.

Approvals

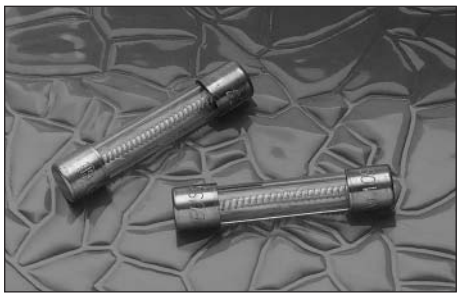
- UL Listed Card: MDL 1/16 - 8A (Guide JDYX, File E19180)
- UL Recognized Card: MDL 9 - 30A (Guide JDYX2, File E19180)
- CSA Certification Card: MDA 2/10 - 15 (Class No. 1422-01)

Environmental Data

- Shock: 1/100A and 8/10A – MIL-STD-202, Method 213, Test Condition I; 1A thru 30A – MIL-STD-202, Method 207, (HI Shock)
- Vibration: 1/100A and 8/10A – MIL-STD-202, Method 201; 1/4A thru 30A – MIL-STD-202, Method 204, Test Condition C (Except 5g, 500HZ)

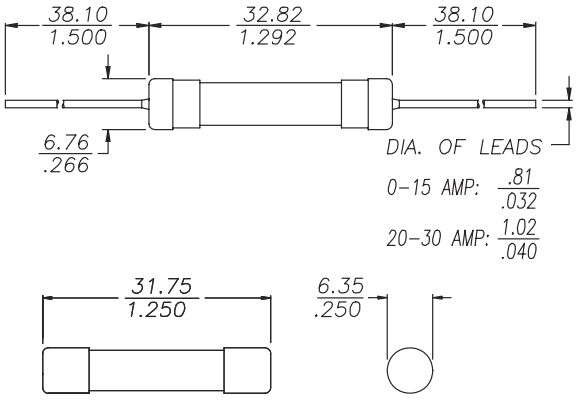
Ordering

- Specify product code, option code and packaging code



Dimensions (mm/in)

Drawing Not to Scale



SPECIFICATIONS

Product Code	Voltage Rating AC	AC Interrupting Rating* 250V	125V	32V	Typical DC Cold Resistance** (ohms)	Typical Melting I²t† AC	Typical Voltage Drop‡
MDL-1/16	250V	35A	10000A	-	38.000	0.0046	2.79
MDL-1/10	250V	35A	10000A	-	15.900	0.0420	1.95
MDL-1/8	250V	35A	10000A	-	9.850	0.0422	1.52
MDL-3/16	250V	35A	10000A	-	4.680	0.116	N/A
MDL-2/10	250V	35A	10000A	-	4.115	0.314	0.972
MDL-1/4	250V	35A	10000A	-	0.320	0.447	0.965
MDL-3/10	250V	35A	10000A	-	2.300	0.412	0.808
MDL-3/8	250V	35A	10000A	-	2.800	0.982	1.46
MDL-1/2	250V	35A	10000A	-	1.725	1.656	1.27
MDL-3/4	250V	35A	10000A	-	0.822	4.343	1.01
MDL-1	250V	35A	10000A	-	0.525	11.498	0.995
MDL-1-1/4	250V	100A	10000A	-	0.320	86.2	0.722
MDL-1-1/2	250V	100A	10000A	-	0.250	22.7	0.721
MDL-2	250V	100A	10000A	-	0.173	62.3	0.644
MDL-2-1/4	250V	100A	10000A	-	0.068	49.6	0.535
MDL-2-1/2	250V	100A	10000A	-	0.096	63.1	0.410
MDL-3	250V	100A	10000A	-	0.067	67.5	0.345
MDL-4	250V	200A	10000A	-	0.035	19.3	0.187
MDL-5	250V	200A	10000A	-	0.023	32.0	0.160
MDL-6	250V	200A	10000A	-	0.018	37.4	0.155
MDL-7	250V	200A	10000A	-	0.018	42.7	0.140
MDL-8	250V	200A	10000A	-	0.011	47.8	0.119
MDL-9	32V	-	-	1000A	0.009	51.5	0.124
MDL-10	32V	-	-	1000A	0.008	64.4	0.114
MDL-15	32V	-	-	1000A	0.006	354.0	0.130
MDL-20	32V	-	-	1000A	0.002	2914.0	0.530
MDL-25	32V	-	-	1000A	0.001	15221.0	0.30
MDL-30	32V	-	-	1000A	0.001	15581.0	0.40

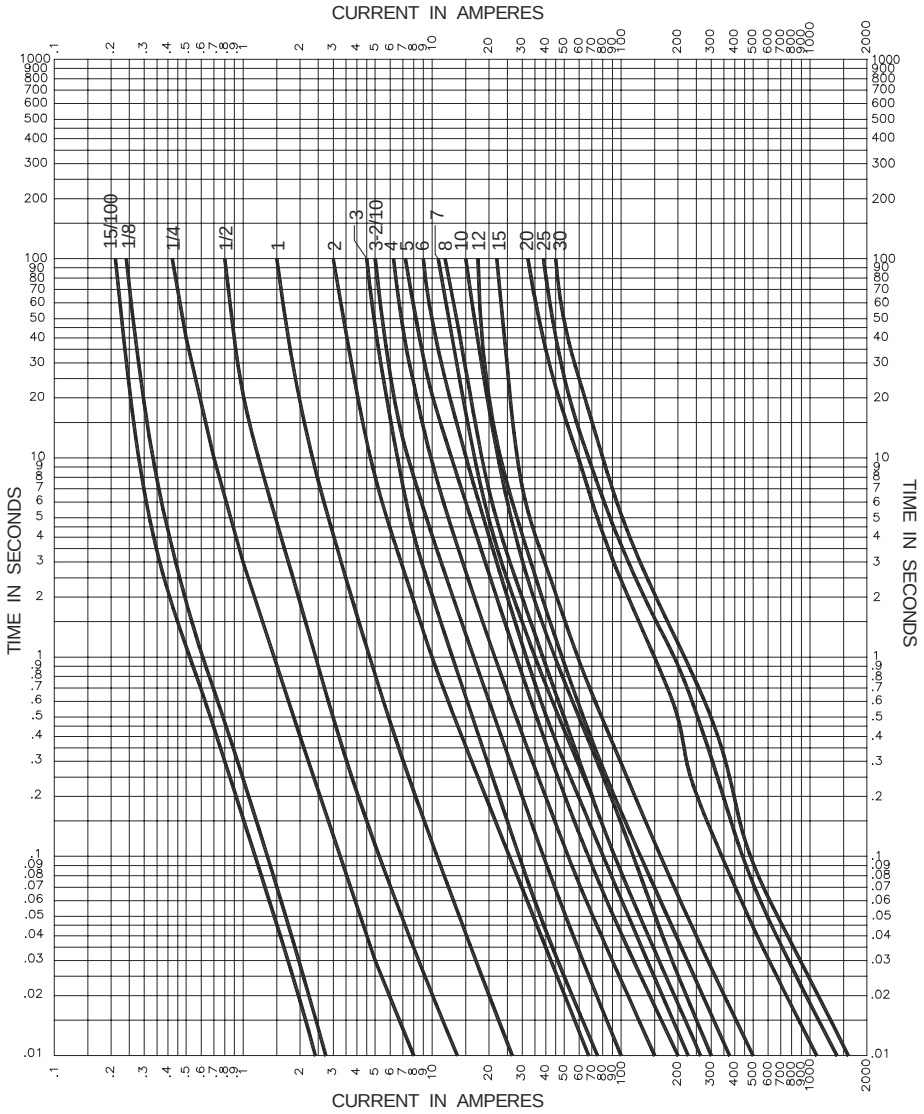
* Interrupting Ratings (Interrupting ratings were measured at 70% - 80% power factor on AC)

** DC Cold Resistance (Measured at ≤10% of rated current)

† Typical Melting I^2t (A^2Sec) (I^2t was measured at listed interrupting rating and rated voltage.)

‡ Typical Voltage Drop (Voltage drop was measured at 25°C±3°C ambient temperature at rated current)

TIME CURRENT CURVE



OPTION CODE	
Option Code	**Description**
B	Board Washable - Hermetically sealed to withstand aqueous cleaning
V	Axial leads - brass overcaps with copper and nickel flash, plated in tin lead

PACKAGING CODE	
Packaging Code	**Description**
BK	100 pieces of fuses packed into a cardboard carton with flaps folded
BK1	1,000 pieces of fuses packed into a cardboard carton with flaps folded
BK8	8,000 pieces of fuses packed into a cardboard carton with flaps folded

OC-2546 10/01

Visit us on the Web at www.cooperET.com
3601 Quantum Boulevard Boynton Beach, Florida 33426-8638
Tel: +1-561-752-5000 Toll Free: +1-888-414-2645 Fax: +1-561-742-1178

S-Series Pushbutton Switches

Series S Pushbutton switches are designed for snap-in panel mounting.

Approvals

UL recognized, CSA certified, VDE approved. Load rating: 10A 125/250 VAC, 1/4 HP, 125 VAC; 10A 14VDC. Contacts: fine silver, double break. Circuits: single-pole and double-pole. Dielectric strength: 2000 VAC RMS. Life: 25,000 operations at maximum rating.

Low Level Control

For low level/dry circuit applications (<100 ma) contact factory for part number.

Terminals

1/4" quick-connect, 3/16" quick-connect and solder lug for #12 wire. Fine silver contacts (gold plating available).

Mechanical Features

Positive mechanical indication of switch contact position. 100,000 mechanical operations.

Lamps

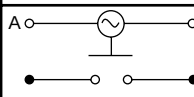
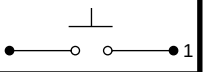
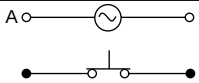
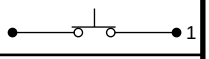
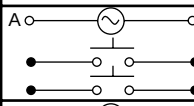
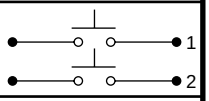
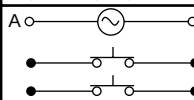
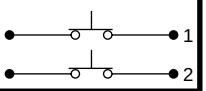
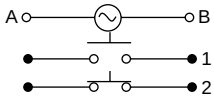
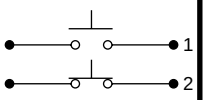
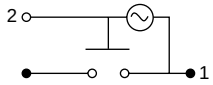
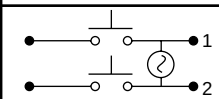
Integral with switch; internally connected per diagram. 6, 12 and 28 volt incandescent lamps standard. 125 and 250 volt neon lamps standard.

Special Lamps

Green neon 125 and 250 volt lamps. LED 6 and 12 volt. Consult factory for special requirements.

Markings

Letters, numbers and symbols can be engraved, hot-stamped or pad printed on lens cap; mylar inserts are also available. See page 28 for details.

Circuit	Switching	Circuit Diagram (Lighted)	Circuit Diagram (Non-Lighted)
1	Single-Pole Single-Throw Normally Open		
2	Single-pole Single-throw Normally Closed		
3	Double-Pole Single-Throw Normally Open		
4	Double-pole Single-throw Normally Closed		
5	Double-Pole Circuit #1 Normally Open Circuit #2 Normally Closed		
6	Single-Pole Single-Throw Normally Open		**N/A**
7	Double-Pole Single-Throw Normally Open		**N/A**
G	Indicator Light Only		**N/A**

Ordering Information:

S — [L] — [A] — [6] — [A]

Lighting
L=Lighted
P=Non-Lighted
G=Indicator Light

Action
M=Momentary
A=Alternating
T= Indicator Light
Short Stroke Available****

Circuit
1=SPST, Normally Open
2=SPST, Normally Closed
3=DPST, Normally Open
4=DPST, Normally Closed
5=DPST, Normally 1 Circuit Open, 1 Closed
6*=SPST, Normally Open
7*=DPST, Normally Open
G=Indicator Light

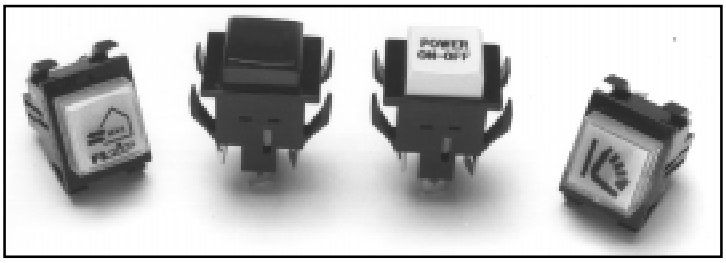
Terminal
A=1/4" Quick Connect
B=3/16" Quick Connect
C=Solder Connect

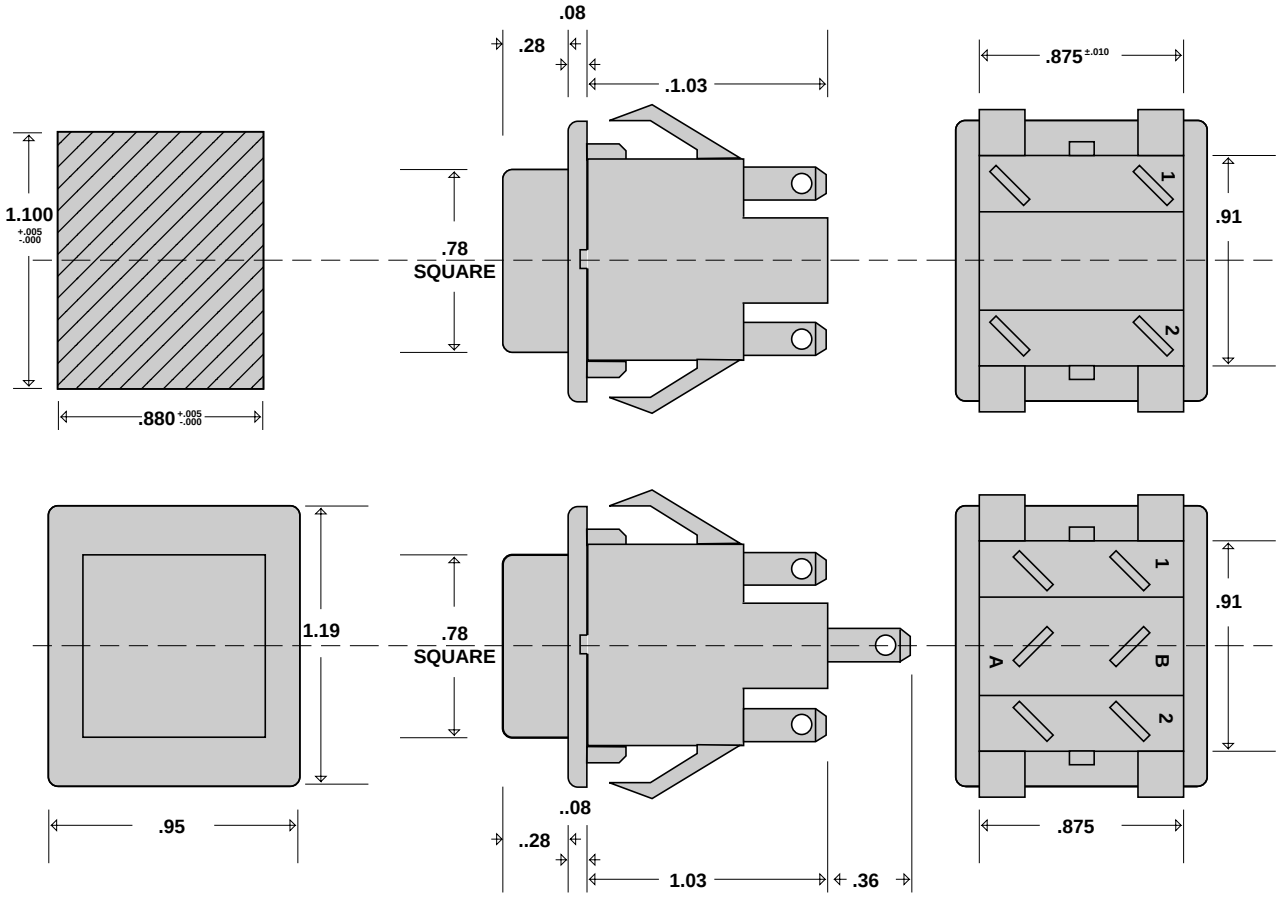
* Lighted models only
** Available only with transparent colors.
***Green & Blue lenses require non-standard neon lamps for units with neon lamps.
****Momentary, normally open circuits only. Consult Factory.

OSLO SWITCH

Telephone (203) 272-2794 ● Fax (203) 272-3492

MADE IN U.S.A.





125V		2	C9	

Lamp or LED Voltage*

6V=6 Volt Incandescent
12V=12 Volt Incandescent
28V=28 Volt Incandescent
125V= 125 Volt Neon
250V=250 Volt Neon
125VG=125 Volt Green Neon
250VG=250 Volt Green Neon
6VR=6 Volt Red LED
6VG=6 Volt Green LED
12VR=12 Volt Red LED
12VG=12 Volt Green LED

Cap Style

D**=Beveled
Blank=Square Edged

Lens Cap Color

TRANSPARENT COLORS
1=Red
2=Clear
3=Amber
4=Green***
5=Blue***

OPAQUE COLORS
7=White
9=Black
11=Green
12=Red

Housing Color

Matte Finish
M9=Black
(For other colors contact factory)

Accessories (Optional)

B=Protective Barrier
T=Boot
CD=Clear Diffuser

OSLO SWITCH
Telephone (203) 272-2794 ● Fax (203) 272-3492

MADE IN U.S.A.

S-Series Pushbutton Switches

Series S Pushbutton switches are designed for snap-in panel mounting.

Approvals

UL recognized, CSA certified, VDE approved. Load rating: 10A 125/250 VAC, 1/4 HP, 125 VAC; 10A 14VDC. Contacts: fine silver, double break. Circuits: single-pole and double-pole. Dielectric strength: 2000 VAC RMS. Life: 25,000 operations at maximum rating.

Low Level Control

For low level/dry circuit applications (<100 ma) contact factory for part number.

Terminals

1/4" quick-connect, 3/16" quick-connect and solder lug for #12 wire. Fine silver contacts (gold plating available).

Mechanical Features

Positive mechanical indication of switch contact position. 100,000 mechanical operations.

Lamps

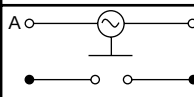
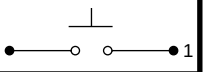
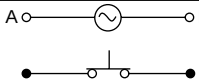
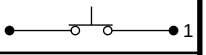
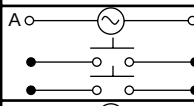
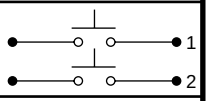
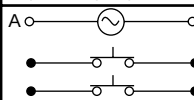
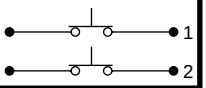
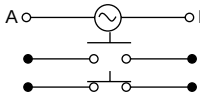
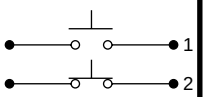
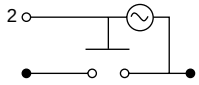
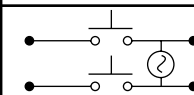
Integral with switch; internally connected per diagram. 6, 12 and 28 volt incandescent lamps standard. 125 and 250 volt neon lamps standard.

Special Lamps

Green neon 125 and 250 volt lamps. LED 6 and 12 volt. Consult factory for special requirements.

Markings

Letters, numbers and symbols can be engraved, hot-stamped or pad printed on lens cap; mylar inserts are also available. See page 28 for details.

Circuit	Switching	Circuit Diagram (Lighted)	Circuit Diagram (Non-Lighted)
1	Single-Pole Single-Throw Normally Open		
2	Single-pole Single-throw Normally Closed		
3	Double-Pole Single-Throw Normally Open		
4	Double-pole Single-throw Normally Closed		
5	Double-Pole Circuit #1 Normally Open Circuit #2 Normally Closed		
6	Single-Pole Single-Throw Normally Open		**N/A**
7	Double-Pole Single-Throw Normally Open		**N/A**
G	Indicator Light Only		**N/A**

Ordering Information:

S — [L] — [A] — [6] — [B]

Lighting
L=Lighted
P=Non-Lighted
G=Indicator Light

Action
M=Momentary
A=Alternating
T= Indicator Light
Short Stroke Available****

Circuit
1=SPST, Normally Open
2=SPST, Normally Closed
3=DPST, Normally Open
4=DPST, Normally Closed
5=DPST, Normally 1 Circuit Open, 1 Closed
6*=SPST, Normally Open
7*=DPST, Normally Open
G=Indicator Light

Terminal
A=1/4" Quick Connect
B=3/16" Quick Connect
C=Solder Connect

* Lighted models only
** Available only with transparent colors.
***Green & Blue lenses require non-standard neon lamps for units with neon lamps.
****Momentary, normally open circuits only. Consult Factory.

OSLO SWITCH

Telephone (203) 272-2794 ● Fax (203) 272-3492

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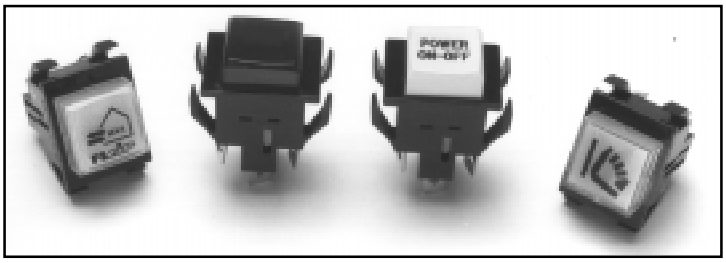
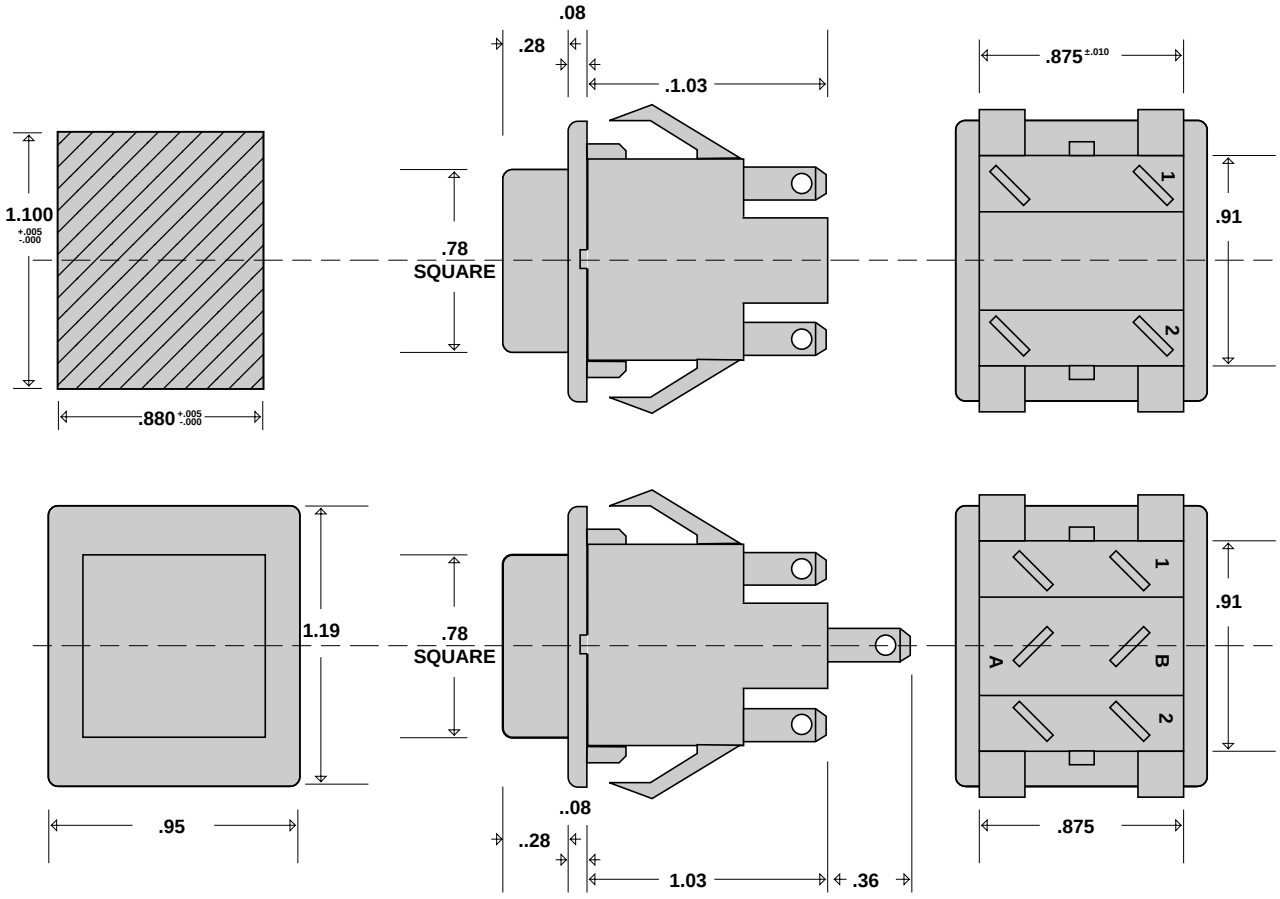




28V		2	C9	

Lamp or LED Voltage*

6V=6 Volt Incandescent
12V=12 Volt Incandescent
28V=28 Volt Incandescent
125V= 125 Volt Neon
250V=250 Volt Neon
125VG=125 Volt Green Neon
250VG=250 Volt Green Neon
6VR=6 Volt Red LED
6VG=6 Volt Green LED
12VR=12 Volt Red LED
12VG=12 Volt Green LED

Cap Style

D**=Beveled
Blank=Square Edged

Lens Cap Color

TRANSPARENT COLORS
1=Red
2=Clear
3=Amber
4=Green***
5=Blue***

OPAQUE COLORS
7=White
9=Black
11=Green
12=Red

Housing Color

Matte Finish
M9=Black
(For other colors contact factory)

Accessories (Optional)

B=Protective Barrier
T=Boot
CD=Clear Diffuser

OSLO SWITCH

Telephone (203) 272-2794 ● Fax (203) 272-3492

MADE IN U.S.A.

Dwyer®

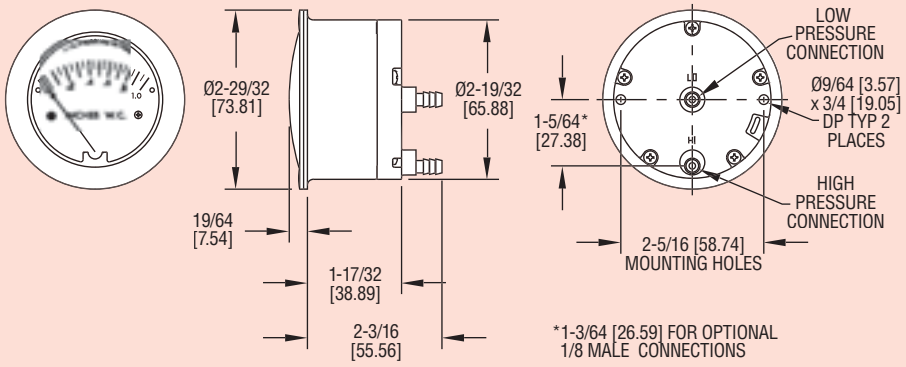
Series 2-5000

Minihelic® II Differential Pressure Gages

Combining High Accuracy, Compactness, Dependability, and Low Cost

Patent No. 4,347,744

The Series 2-5000 Minihelic® II low differential pressure gage provides excellent readability in a compact size.



Dimensions, Series 2-5000 Minihelic® II Gage.

Combining clean design, small size and low cost with enough accuracy for all but the most demanding applications our Minihelic® II gage offers the latest in design features for a dial type differential pressure gage. It is our most compact gage but is easy to read and can safely operate at total pressures up to 30 psig. The Minihelic® II is designed for panel mounting in a single 2⅝" diameter hole. Standard pressure connections are barbed fittings for 3/16" I.D. tubing; optional ⅛" male NPT connections are also available. Over-pressure protection is built into the Minihelic II® gage by means of a blow-out membrane molded in conjunction with the diaphragm. Accidental over-ranging up to the rated total pressure will not damage the gage. With removable lens and rear housing, the gage may be easily serviced at minimum cost.

With the housing molded from mineral and glass filled nylon and the lens molded from polycarbonate, the gage will withstand rough use and exposure as well as high total pressure. The 5% accuracy and low cost of the Minihelic® II gage make it well-suited for a wide variety of OEM and user applications. OEM applications include cabinet air purging, medical respiratory therapy equipment, air samplers, laminar flow hoods, and electronic air cooling systems. As an air filter gage, the Minihelic® II finds many end use applications on large stationary engines, compressors, ventilators, and air handling units. The Minihelic® II gage is suitable for many of the same applications as the Magnehelic® gage where the greater accuracy, sensitivity, and higher and lower differential pressure ranges of the Magnehelic® gage are not required.

SPECIFICATIONS

Service: Air and compatible gases.
Wetted Materials: Consult factory.
Housing: Glass filled nylon; polycarbonate lens.
Accuracy: ±5% of full scale at 70°F (21.1°C).
Pressure Limits: 30 psig (2.067 bar) continuous to either pressure connection.
Temperature Limits: 20 to 120°F (-6.67 to 48.9°C).
Size: 2-1/16″ (52.39 mm) diameter dial face.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Process Connections: Barbed, for 3/16″ I.D. tubing (standard); 1/8″ male NPT (optional).
Weight: 6 oz (170.1g).

CAUTION: FOR USE ONLY WITH AIR OR COMPATIBLE GASES.

PRESSURE CONNECTIONS

A

B

A The standard Minihelic® II gage is supplied with two barbed pressure taps molded into the rear housing of the gage. These connections allow easy, fast connection to the gage using 3/16" I.D. rubber or plastic tubing.

B For applications in systems having higher total operating pressures, optional male ⅛" NPT pressure connections can be supplied.

Note the oblong over-pressure vent hole on the back of the gage at the right of the connections. This vent is sealed by a membrane molded in conjunction with the diaphragm and will blow out at approximately 75 psi.

Simplicity of Design Ensures Reliable Operation

Housing is molded from strong mineral and glass filled nylon.

Pointer stops of molded rubber prevent pointer over-travel without damage.

Full view lens is removable and molded of tough polycarbonate.

Aluminum scale litho-printed black on white, enhances readability.

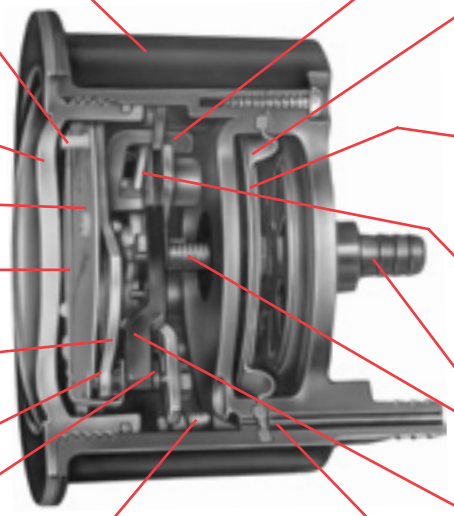
Red tipped aluminum pointer, rigidly mounted to helix is easy to see.

Wishbone assembly provides mounting for helix, helix bearings, and pointer shaft.

Jewel bearings provide virtually friction-free helix motion.

Helix is free to rotate in jewel bearings. It aligns with magnetic field of magnet to transmit pressure indications to pointer.

Zero adjustment screw, located behind the removable lens, eliminates tampering.



Range spring calibration clamp fixes live length of spring for proper gage calibration and is factory set and sealed.

Silicone rubber diaphragm allows accurate response to a broad range of temperatures and at extremely low pressure. Incorporates blow out area for overpressure protection.

Diaphragm support plates of lightweight aluminum on each side of the diaphragm minimize position or attitude sensitivity and help define pressure area.

Flat leaf range spring reacts to pressure on the diaphragm. Live length is adjustable for calibration. Small amplitude of motion minimizes inaccuracies and assures long life.

Low pressure tap connects to rear chamber.

Coil spring link provides a resilient connection between the diaphragm and the range spring.

Ceramic magnet mounted on a molded bracket at the end of the range spring rotates the helix without direct mechanical linkage.

High pressure tap connects with the front chamber through passageway in the plastic case and a sealing ring molded into the edge of the diaphragm.

Patent No. 4,347,744

PANEL MOUNTING

Mounting hardware is supplied with the Minihelic® II gage for panel mounting through a single hole, 2-5/8″ (67 mm) in diameter. Panel thickness up to 1/2″ (13 mm) can be accommodated with the hardware supplied. If necessary, surface mounting of the gage can be accomplished by means of two 4-40 screws into the tapped mounting bracket stud holes in the rear of the gage. Surface mounting requires clearance holes in the panel for the two pressure taps.

STOCKED MODELS

Model Number	Range, Inches of Water
2-5000-0	0-0.5
2-5001	0-1.0
2-5002	0-2.0
2-5003	0-3.0
2-5005	0-5.0
2-5010	0-10
2-5020	0-20
2-5040	0-40
2-5060	0-60
2-5100	0-100

Model Number	Range, PSI
2-5205	0-5
2-5210	0-10
2-5215	0-15
***2-5230**	0-30

Model Number	Range, MM of Water
2-5000-25MM	0-25
2-5000-50MM	0-50
2-5000-100MM	0-100

Model Number	Range, Pascals
2-5000-125Pa	0-125
2-5000-250Pa	0-250
2-5000-500Pa	0-500

Model Number	Range, kPa
2-5000-1 kPa	0-1
2-5000-3 kPa	0-3

Accessories
A-434 Portable Kit . . . . . .
A-497 Surface Mtg. Brkt. . .
A-609 Air Filter Kit . . . . . .

*THIS RANGE EMPLOYS SPIRALLY WOUND BERYLLIUM COPPER BOURDON TUBE POINTER DRIVE MECHANISM.

NOTE: CONSULT FACTORY REGARDING AVAILABILITY OF ADDITIONAL RANGES.

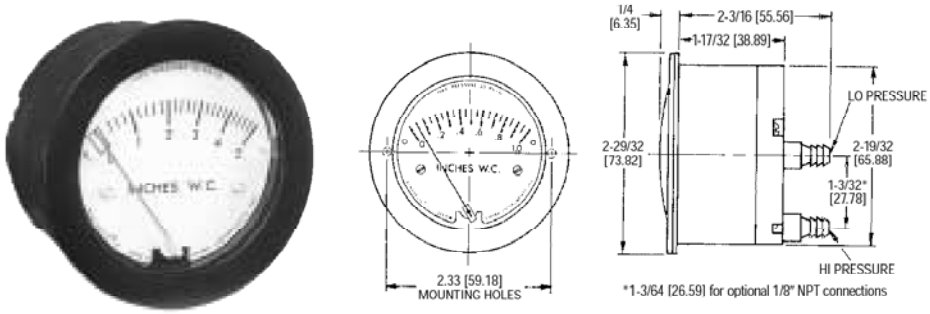
For optional ⅛" male NPT connections, add suffix -NPT to model numbers listed above.
Example: 2-5001-NPT. No extra charge.

Dwyer Instruments, Inc./P.O. Box 373/Michigan City, IN 46361/Phone 219 879-8000/Fax 219 872-9057 • U.K. Phone (+44) (0)1494-461707 • Australia Phone 61 2 4272-2055

Bulletin A-36

Series 2-5000 Minihelic II® Differential Pressure Gage

Specifications: Installation & Operating Instructions



Dimensions, Series 2-5000 Minihelic II® Gage.

Series 2-5000 Minihelic II® Differential Pressure Gages have clean design, small size, low cost and sufficient accuracy for all but the most demanding applications. With housing molded from mineral- and glass-filled nylon and a lens molded from polycarbonate, this gage will withstand rough use and exposure, as well as high total pressure up to 30 psig [2.067 bar]. Over-pressure is accommodated by a blow-out membrane molded in conjunction with the diaphragm.

INSTALLATION

1. Select a location free from excessive vibration and where ambient temperature will be between 20° to 120°F (-6.7°C to 49°C). Sensing lines may be any length necessary without affecting accuracy. However, long runs of tubing will dampen readings slightly and cause a minor increase in response time. If pulsing pressure or vibration cause excessive pointer oscillation, please contact factory for ways to provide additional damping.

2. This gage is calibrated and zeroed in the vertical position at the factory. If the gage is used in any other position, it must be re-zeroed each time the position is changed. Gages with ranges under 5 inches w.c.(1.24 kPa), or the equivalent, should be used only in the vertical position unless special calibration was specified when ordering.

PHYSICAL DATA

Dimensions: 2-29/32″ (73.82 mm) x 2- 7/16″ (61.93 mm).
Weight: 6 oz. [170 gr].
Rated Total Pressure: 50 psig (3.445 bar) surge; 30 psig (2.067 bar) continuous to either pressure connection.
Ambient Temperature Range: 20°F to 120°F (- 6.7°C to 49°C).
Accuracy: ± 5% of full scale at 70°F (21.1°C).
Connections: standard, barbed for 3/16″ I.D. tubing; optional,1/8″ NPT(M).
Housing: glass-filled nylon, polycarbonate lens.
Finish: black
Standard Accessories: (2) 4-40 x 1-5/8″ mounting studs, (2) 4-40 hex nuts, (1) .050″ hex allen wrench, (1) panel mounting bracket.

CAUTION:

Use only with air or compatible non-corrosive gases.

DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, IN 46361, U.S.A.

Phone: 219/879-8000 www.dwyer-inst.com
Fax: 219/872-9057
e-mail: info@dwyer-inst.com
Lit-By Fax: 888/891-4963

PANEL MOUNTED INSTALLATION

3. To surface-mount the gage, drill two 5/32″ holes on a horizontal line, 2-1/3″ apart for mounting screws. Next, drill two 7/16″ holes 1-1/32″ apart on a vertical line for pressure connections. Install mounting studs in back of the gage, insert through holes in the panel, and secure with hex nuts provided. Be careful not to block the slotted hole near the right-hand mounting hole. This provides a path for pressure relief in the event of over-pressurization.

4. To panel-mount gage, cut a 2-5/8″ diameter hole. Install the mounting studs in the back of gage, position gage in the panel, and place bracket over the studs. Thread hex nuts over studs and tighten.

5. After installation, the gage may need to be zeroed before placing in operation. If re-zeroing is required, firmly hold the case of gage with one hand and unscrew the front cover with the palm of the other hand in a counterclockwise direction. If difficult to loosen, place a small sheet of rubber between the cover and the palm of the hand. Zero-adjust screw is located behind the scale at the pair marked "zero." Use the hex allen wrench supplied and adjust until pointer is on zero. This must be done with both pressure connections vented to atmosphere and the gage oriented in the final mounting position. Replace cover.

6. To measure positive pressure, connect tubing to port marked "HI" and vent "LO" port to atmosphere. For negative pressure (vacuum), connect to port marked "LO" and vent "HI" port to atmosphere. For differential pressure, connect higher pressure to port marked "HI" and lower to "LO" port. If gage is supplied with 1/8″ NPT connections, be careful not to over-tighten fittings to avoid damage to the gage.

CALIBRATION CHECK

Select a second gage or manometer of known accuracy and in an appropriate range. Use short lengths of rubber or vinyl tubing to connect the high-pressure side of the Minihelic gage and the test gage to two legs of a tee. Very slowly, apply pressure through the third leg. Allow enough time for pressure to equalize throughout the system and for fluid to drain. if a manometer is being used. Compare readings. If the gage being tested exceeds rated accuracy, it should be returned to the factory for recalibration.

MAINTENANCE

No lubrication or periodic servicing is required. Keep case exterior and cover clean. Occasionally, disconnect pressure lines to vent both sides of the gage to atmosphere and re-zero per paragraph 5.

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DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, IN 46361, U.S.A.
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Universal Lighting Technologies

TRIAD®

HomeStar™ A Triad® Brand

B432I120RH

APPLICATION and PERFORMANCE SPECIFICATION

Description: High frequency electronic ballasts for (4 or 3) F32T8 lamps
(4) F25T8, (4) F17T8, (4) F25T12, and equivalent U-Shaped Lamps.

- Line Voltage: 120vac, ±10%, 60Hz
- Parallel Lamp Operation
- Instant Start
- Passive Power Factor Correction

Lamps		Input	Nominal	Power	Ballast	Ballast Efficacy	Harmonic	Crest
Type	#	Watts	Line Amps	Factor	Factor	Factor	Total	Factor
F32T8	**4**	**113**	**0.97**	**> .98**	**.88**	**0.78**	**< 20%**	**<1.7**
F32T8	3	93	0.82	> .95	.95	1.02	< 20%	<1.7
F25T8	4	90	0.78	> .95	.91	1.01	< 20%	<1.7
F17T8	4	62	0.63	> .90	.91	1.47	< 32%	<1.7
F25T12	4	92	0.82	> .95	.79	0.86	< 20%	<1.7

Application and Performance Specification Information Subject to Change without Notification.

Performance:

- Meets ANSI Standard C82.11-1993
- Meets ANSI Standard C62.41-1991
- Meets FCC Part 18 **(Class B)** for EMI and RFI
  Consumer Limits
- Meets Energy Star® Requirements for (4,3) F32T8, (4) F25T8 and (4) F17T8

Safety:

- No PCB's
- UL listed (Class P, Type 1 Outdoor)
- CSA Certified

Application:

- Minimum Starting Temperature: 50°F, 10 °C
- Maximum Ambient Temperature: 105° F, 40° C
- Sound Rated: A
- Remote Mounting: 18 ft. max. lead length, 18 AWG
- Compatible with "Powerline Carrier" (PLC) Systems and/or infrared systems

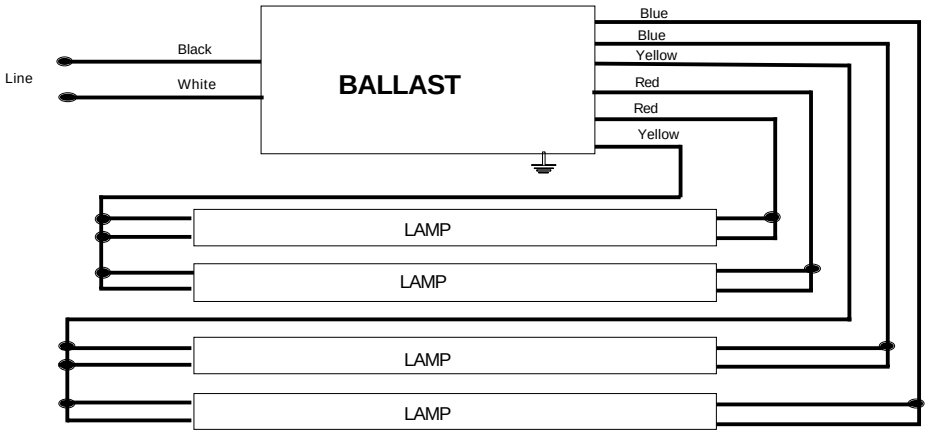
Physical Parameters

Length:	9.50"	
Width:	2.40"	
Height:	1.55"	
Weight:	2.70 lbs.	
Lead Length:	White, Black	25" (± 1")
	Red	31" (± 1")
	Blue	31" (± 1")
	Yellow	39" (± 1")

Warranty:

Universal Lighting Technologies warrants to the purchaser that each electronic ballast will be free from defects in material or workmanship for a period of 5 years from date of manufacture when properly installed and under normal conditions of use. Call **1-800-BALLASTx800** for technical assistance.

Manufactured in North America



Note: For three lamp operation, cap any blue lead, insulate to 600 volts

Ballast Must be Grounded

Energy Star® is a registered trademark of US government

Selected Product Listings*

■ BEST COLOR ■ EXTRA LIFE°

PRODUCT CODE	DESCRIPTION	NOMINAL WATTS	MOL IN.	CRI/COLOR TEMPERATURE	LUMENS INITIAL	LUMENS MEAN†	LIFE 3 HRS/ START	LIFE 12 HRS/ START	CASE QTY.
STARCOAT™ T8									
22642	F17T8/SPX30	17	24	86 @ 3000K	1350	1280	20,000	24,000	24
22646	F17T8/SPX35	17	24	86 @ 3500K	1350	1280	20,000	24,000	24
22647	F17T8/SPX41	17	24	86 @ 4100K	1350	1280	20,000	24,000	24
17033	F17T8/SP30	17	24	78 @ 3000K	1325	1260	20,000	24,000	24
17035	F17T8/SP35	17	24	78 @ 3500K	1325	1260	20,000	24,000	24
17036	F17T8/SP41	17	24	78 @ 4100K	1325	1260	20,000	24,000	24
22648	F25T8/SPX30	25	36	86 @ 3000K	2150	2040	20,000	24,000	24
22650	F25T8/SPX35	25	36	86 @ 3500K	2150	2040	20,000	24,000	24
22651	F25T8/SPX41	25	36	86 @ 4100K	2150	2040	20,000	24,000	24
15943	F25T8/SP30	25	36	78 @ 3000K	2080	1970	20,000	24,000	24
15944	F25T8/SP35	25	36	78 @ 3500K	2080	1970	20,000	24,000	24
15945	F25T8/SP41	25	36	78 @ 4100K	2080	1970	20,000	24,000	24
22655	F32T8/SPX30	32	48	86 @ 3000K	2950	2800	20,000	24,000	36
22656	F32T8/SPX35	32	48	86 @ 3500K	2950	2800	20,000	24,000	36
22657	F32T8/SPX41	32	48	86 @ 4100K	2950	2800	20,000	24,000	36
23460	F32T8/SPX50	32	48	86 @ 5000K	2800	2660	20,000	24,000	36
15946	F32T8/SP30	32	48	78 @ 3000K	2850	2710	20,000	24,000	36
15947	F32T8/SP35	32	48	78 @ 3500K	2850	2710	20,000	24,000	36
15949	F32T8/SP41	32	48	78 @ 4100K	2850	2710	20,000	24,000	36
14613	F32T8/SP50	32	48	78 @ 5000K	2750	2610	20,000	24,000	36
12132	F32T8/SP65	32	48	78 @ 6500K	2700	2565	20,000	24,000	36
STARCOAT™ XL T8									
45485	F17T8/XL/SPX30	17	24	86 @ 3000K	1350	1280	24,000	30,000	24
45486	F17T8/XL/SPX35	17	24	86 @ 3500K	1350	1280	24,000	30,000	24
45487	F17T8/XL/SPX41	17	24	86 @ 4100K	1350	1280	24,000	30,000	24
45488	F17T8/XL/SP30	17	24	78 @ 3000K	1325	1260	24,000	30,000	24
45489	F17T8/XL/SP35	17	24	78 @ 3500K	1325	1260	24,000	30,000	24
45490	F17T8/XL/SP41	17	24	78 @ 4100K	1325	1260	24,000	30,000	24
45491	F25T8/XL/SPX30	25	36	86 @ 3000K	2150	2040	24,000	30,000	24
45492	F25T8/XL/SPX35	25	36	86 @ 3500K	2150	2040	24,000	30,000	24
45493	F25T8/XL/SPX41	25	36	86 @ 4100K	2150	2040	24,000	30,000	24
45494	F25T8/XL/SP30	25	36	78 @ 3000K	2080	1970	24,000	30,000	24
45495	F25T8/XL/SP35	25	36	78 @ 3500K	2080	1970	24,000	30,000	24
45496	F25T8/XL/SP41	25	36	78 @ 4100K	2080	1970	24,000	30,000	24
12582	F32T8/XL/SPX30	32	48	86 @ 3000K	2950	2800	24,000	30,000	36
12529	F32T8/XL/SPX35	32	48	86 @ 3500K	2950	2800	24,000	30,000	36
12530	F32T8/XL/SPX41	32	48	86 @ 4100K	2950	2800	24,000	30,000	36
12539	F32T8/XL/SPX50	32	48	86 @ 5000K	2850	2660	24,000	30,000	36
25359	F32T8/XL/SP30	32	48	78 @ 3000K	2850	2710	24,000	30,000	36
25360	F32T8/XL/SP35	32	48	78 @ 3500K	2850	2710	24,000	30,000	36
25363	F32T8/XL/SP41	32	48	78 @ 4100K	2850	2710	24,000	30,000	36

PRODUCT CODE	DESCRIPTION	NOMINAL WATTS	MOL IN.	CRI/COLOR TEMPERATURE	LUMENS INITIAL	LUMENS MEAN†	LIFE 3 HRS/ START	LIFE 12 HRS/ START	CASE QTY.
ECOLUX® T8 WITH STARCOAT™									
45742	F17T8/SPX30/ECO	17	24	86 @ 3000K	1350	1280	20,000	24,000	24
45747	F17T8/SPX35/ECO	17	24	86 @ 3500K	1350	1280	20,000	24,000	24
45749	F17T8/SPX41/ECO	17	24	86 @ 4100K	1350	1280	20,000	24,000	24
45741	F17T8/SP30/ECO	17	24	78 @ 3000K	1325	1260	20,000	24,000	24
45743	F17T8/SP35/ECO	17	24	78 @ 3500K	1325	1260	20,000	24,000	24
45748	F17T8/SP41/ECO	17	24	78 @ 4100K	1325	1260	20,000	24,000	24
45753	F25T8/SPX30/ECO	25	36	86 @ 3000K	2150	2040	20,000	24,000	24
45755	F25T8/SPX35/ECO	25	36	86 @ 3500K	2150	2040	20,000	24,000	24
45757	F25T8/SPX41/ECO	25	36	86 @ 4100K	2150	2040	20,000	24,000	24
45750	F25T8/SP30/ECO	25	36	78 @ 3000K	2080	1970	20,000	24,000	24
45754	F25T8/SP35/ECO	25	36	78 @ 3500K	2080	1970	20,000	24,000	24
45756	F25T8/SP41/ECO	25	36	78 @ 4100K	2080	1970	20,000	24,000	24
25611	F32T8/SPX30/ECO	32	48	86 @ 3000K	2950	2800	20,000	24,000	36
25612	F32T8/SPX35/ECO	32	48	86 @ 3500K	2950	2800	20,000	24,000	36
25613	F32T8/SPX41/ECO	32	48	86 @ 4100K	2950	2800	20,000	24,000	36
42064	F32T8/SPX50/ECO	32	48	86 @ 5000K	2950	2800	20,000	24,000	36
26666	F32T8/SP30/ECO	32	48	78 @ 3000K	2850	2710	20,000	24,000	36
26667	F32T8/SP35/ECO	32	48	78 @ 3500K	2850	2710	20,000	24,000	36
26668	F32T8/SP41/ECO	32	48	78 @ 4100K	2850	2710	20,000	24,000	36
ECOLUX® XL T8 WITH STARCOAT™									
27619	F32T8/XL/SPX30/ECO	32	48	86 @ 3000K	2950	2800	24,000	30,000	36
27620	F32T8/XL/SPX35/ECO	32	48	86 @ 3500K	2950	2800	24,000	30,000	36
27621	F32T8/XL/SPX41/ECO	32	48	86 @ 4100K	2950	2800	24,000	30,000	36
27616	F32T8/XL/SP30/ECO	32	48	78 @ 3000K	2850	2710	24,000	30,000	36
27617	F32T8/XL/SP35/ECO	32	48	78 @ 3500K	2850	2710	24,000	30,000	36
27618	F32T8/XL/SP41/ECO	32	48	78 @ 4100K	2850	2710	24,000	30,000	36
T8 MOD-U-LINE® WITH STARCOAT™									
10483	F32T8/SPX30/U/6	32	22.5	86 @ 3000K	2800	2630	20,000	24,000	12
10485	F32T8/SPX35/U/6	32	22.5	86 @ 3500K	2800	2630	20,000	24,000	12
10488	F32T8/SPX41/U/6	32	22.5	86 @ 4100K	2800	2630	20,000	24,000	12
10489	F32T8/SPX50/U/6	32	22.5	86 @ 5000K	2660	2510	20,000	24,000	12
10479	F32T8/SP30/U/6	32	22.5	78 @ 3000K	2700	2565	20,000	24,000	12
23585	F32T8/SP35/U/6	32	22.5	78 @ 3500K	2700	2565	20,000	24,000	12
10480	F32T8/SP41/U/6	32	22.5	78 @ 4100K	2700	2565	20,000	24,000	12
F96T8 8-FOOT HIGH OUTPUT WITH STARCOAT™									
12532	F96T8/SPX30/HO	86	96	86 @ 3000K	8200	7380	18,000	24,000	24
12533	F96T8/SPX35/HO	86	96	86 @ 3500K	8200	7380	18,000	24,000	24
12534	F96T8/SPX41/HO	86	96	86 @ 4100K	8200	7380	18,000	24,000	24
12535	F96T8/SPX50/HO	86	96	86 @ 5000K	8200	7380	18,000	24,000	24
12536	F96T8/SP30/HO	86	96	78 @ 3000K	8000	7200	18,000	24,000	24
12537	F96T8/SP35/HO	86	96	78 @ 3500K	8000	7200	18,000	24,000	24
12538	F96T8/SP41/HO	86	96	78 @ 4100K	8000	7200	18,000	24,000	24
F96T8 8-FOOT• WITH STARCOAT™									
23414	F96T8/SPX30	59	96	86 @ 3000K	5950	5440	15,000	20,000	24
23415	F96T8/SPX35	59	96	86 @ 3000K	5950	5440	15,000	20,000	24
23416	F96T8/SPX41	59	96	86 @ 3000K	5950	5440	15,000	20,000	24
23575	F96T8/SPX50	59	96	86 @ 3000K	5950	5308	15,000	20,000	24
23407	F96T8/SP30	59	96	78 @ 3000K	5800	5310	15,000	20,000	24
23411	F96T8/SP35	59	96	78 @ 3500K	5800	5310	15,000	20,000	24
23412	F96T8/SP41	59	96	78 @ 4100K	5800	5310	15,000	20,000	24
F25T12									
11439	F25T12/SP30	25	48	70 @ 3000K	2300	2140	20,000	24,000	30
11440	F25T12/SP35	25	48	73 @ 3500K	2300	2140	20,000	24,000	30
11442	F25T12/SP41	25	48	72 @ 4100K	2300	2140	20,000	24,000	30

For the most up-to-date, comprehensive product information, visit the GE Lighting Web site at

www.GELighting.com

* All data is based on a reference ballast of 60Hz, except life, which is based on a high frequency electronic ballast.

° 20% extra life at 3 hours/start, 25% extra life at 12 hours/start.

† Mean lumens calculated at 40% of rated life.

• F96 lamp bases are single pin, all other bases are medium bipin.

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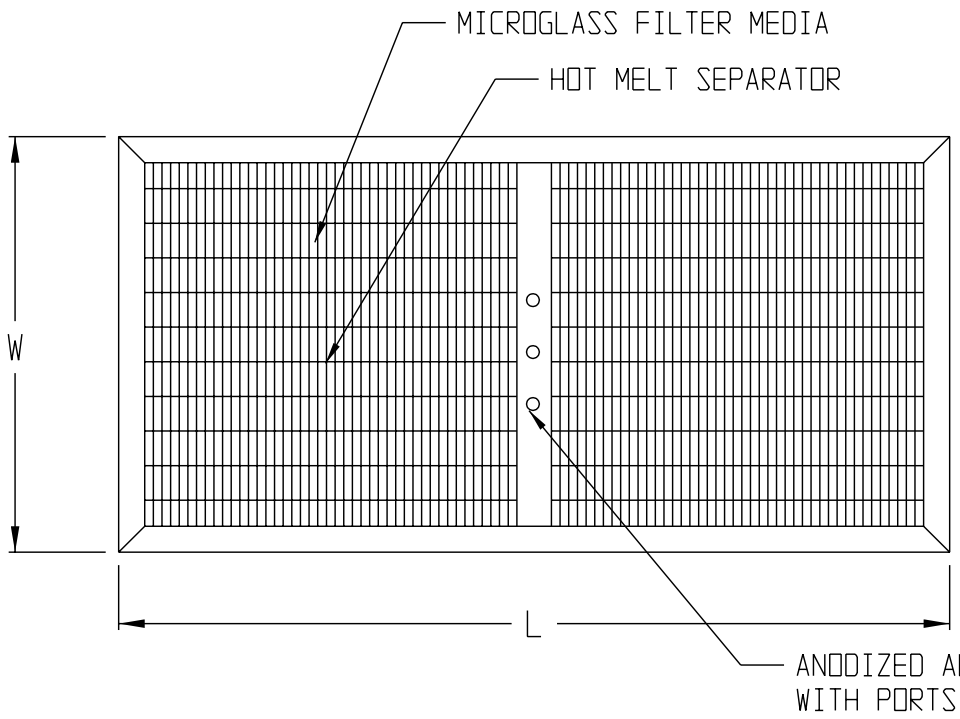
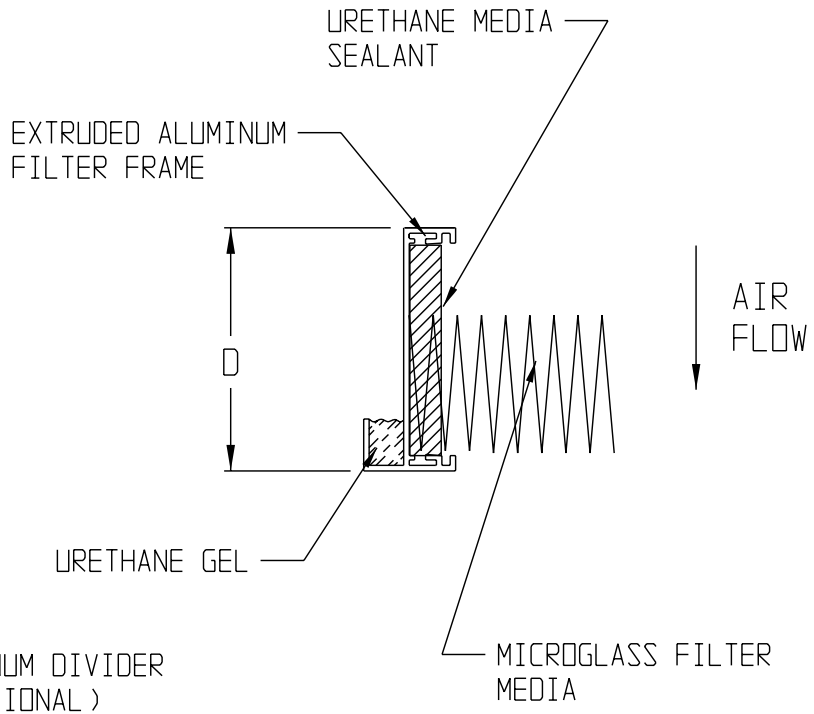
Printed in USA





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 PSL AND SCANNED FOR LEAKS

MODEL	SIZE= W X L X D	MEDIA (SF)	CFM@ 1" SP	S.P.@90FPM
H3072B00-BAAECAA	30 X 72 X 3.5			

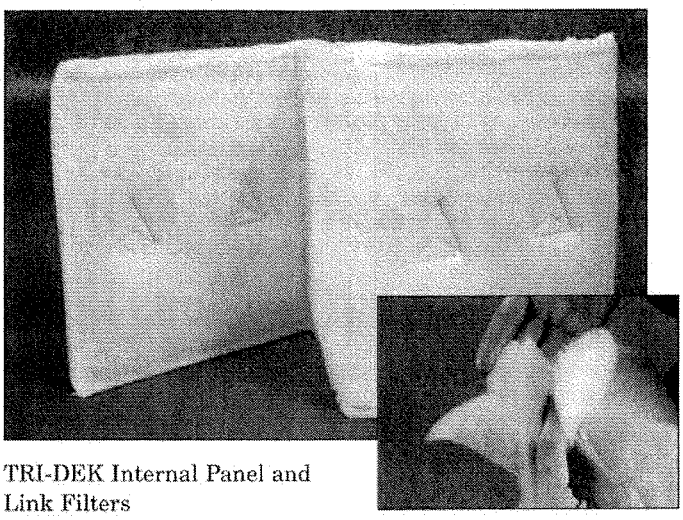
HALCO PRODUCTS CO.
100 NO. GORDON STREET ELK GROVE, IL. 60007

TITLE	GEL-SEAL HEPA FILTER		
DRAWN BY	DK	DWG NO. 2514287BB	REV
SCALE	N/A	DATE 1/23/07	SHEET

TRI DIM
FILTER CORPORATION

TRI-DEK™

15/40 INTERNAL RING PANEL AND LINK FILTER



TRI-DEK Internal Panel and Link Filters

- Unitized heavy-duty internal wire frame, and heat sealed laminated construction eliminates filter collapse, fiber break-off, and contamination carry-over (special size panels and links may be sewn).
- Link filters are specially designed for slide-in side loading systems. Filters are sized to completely fill out a filter track without need for filler pieces; no perimeter, or joint, dirty air leakage.
- Filter changing time is reduced by up to 70%. No need for metal hooks or special removal devices to "fish" individual panels from slide-in tracks.
- An exclusive non-migrating, non-toxic, non-allergenic adhesive is applied between the last two plys of **TRI-DEK 15/40** panel and link filters to effectively retain all particulate matter trapped by its fibers.
- Available with "Aegis" antimicrobial system.
- To satisfy all building codes, "TRI-DEK" Panels, Links, and Cubes are available with UL Class I and Class II ratings (Ref. R6378).

A SUPERIOR CONCEPT IN MULTI-GRADUATED, LAMINATED AIR FILTRATION

The two-sided responsibility facing maintenance engineers in this era of increased **INDOOR AIR QUALITY (IAQ)** awareness is to provide a healthful, comfortable indoor environment, while maintaining responsible control of maintenance costs.

TRI-DEK 15/40 internal ring panel and link filters provide superior filtration at an economical price.

MEDIA CONSTRUCTION A multi-graduated laminant of tough, durable, variable denier "Dacron" fibers, permanently bonded together for extraordinary efficiency, tensile strength, and durability. This revolutionary structuring features pre-crimped fibers in three laminates, each graduating downward in diameter, forming millions of funnel shaped, intersticed dust contaminant traps, resulting in unequalled filtration, and superior service life. These interceptor stations are arranged by design to arrest and permanently retain in depth, solid particulate matter in proportion to size, and without interrupting uniform air flow. **TRI-DEK 15/40** medias utilize three methods of filtration "in harmony" ("impingement, straining, and interception"), to effectively remove particulate from atmospheric air.

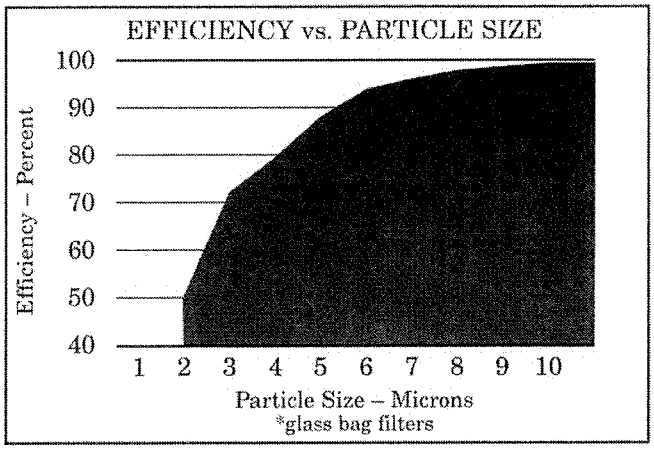
INTERNAL FRAME A unitized heavy gauge internal wire frame supports **TRI-DEK 15/40** panel and link filters, guaranteeing structural integrity. Heat sealed, laminated construction prevents fiber break-off, dirt unloading, and contamination carry-over.

APPLICATIONS Designed for medium to heavy dirt loading conditions, **TRI-DEK 15/40** medias offer superior value for commercial and industrial applications, providing extraordinary efficiency and superior service life.

PRODUCT BENEFITS

- Increased efficiency vs. paper framed panel and pleated filters; three times greater efficiency than fiberglass panel filters, and up to twice the life of pleats.
- Total utilization of filter face area as opposed to less than 70% utilization with paper framed, or pleated filters.
- All-synthetic, pre-crimped "Dacron" fibers are unaffected by moisture and most corrosive atmospheres.
- Integral gasket selvedge edge, and exclusive friction fit prevent dirty air bypass, and eliminates the need for additional hardware, or holding clips.
- Non-Toxic, Non-Allergenic, and Non-Shedding, **TRI-DEK 15/40** panel and link filters will not support bacterial growth, as do paper framed filters.

NOMINAL SIZES	15/40 3-PLY 30-35%			
	CAPACITY CFM@ 400 FPM	INITIAL RESIST. IN. W.G.	CAPACITY CFM @ 500 FPM	INITIAL RESIST. IN. W.G.
12 x 24	800	.28	1000	.36
15 x 20	850	.28	1150	.36
16 x 20	900	.28	1200	.36
16 x 25	1100	.28	1400	.36
18 x 24	1250	.28	1550	.36
20 x 20	1100	.28	1400	.36
20 x 24	1350	.28	1700	.36
20 x 25	1400	.28	1750	.36
24 x 24	1600	.28	2000	.36
25 x 25	1700	.28	2125	.36



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: _____

CHAPTER 5