



• Better Cooling By Design •



**Air Conditioners • Heat Exchangers
Fans • Blowers • Enclosure Accessories**



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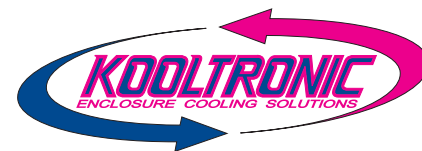


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Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

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KOOLTRONIC AIR CONDITIONERS

Index and Selection Guide

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Guardian/GuardianX Series NEMA 4 or 4X Air-Cooled Panel-Mount, pages 26-35

For NEMA 4 or 4X Enclosures

NEMA
4 or 4X



DP15L 1,000 BTU/H 15"Hx8"Wx7"D	DP21L 3,000 BTU/H 21"Hx12"Wx10"D	DP24L 3,000 BTU/H 24"Hx12"Wx10"D	DP33L 5,000 BTU/H 33"Hx17"Wx11"D	DP43L 7,000 BTU/H 43"Hx17"Wx10"D	DP47L 9,000 BTU/H 47"Hx17"Wx10"D	DP50L 14,000 BTU/H 50"Hx20"Wx12"D	DP53L 18,000 BTU/H 53"Hx22"Wx13"D	DP60L 26,000 BTU/H 60"Hx24"Wx13"D

Guardian/GuardianX Series NEMA 4 or 4X 480 Volt, pages 36-42

For NEMA 4 or 4X Enclosures

NEMA
4 or 4X



DP24L 480 Volt 1-Phase 3,000 BTU/H 24"H x 12"W x 10"D	DP38L 480 Volt 5,000 BTU/H 39"H x 17"W x 11"D	DP50L 480 Volt 14,000 BTU/H 50"H x 20"W x 13"D	DP52L 480 Volt 7,000 & 9,000 BTU/H 52"H x 17"W x 10"D	DP53L 480 Volt 18,000 BTU/H 53"H x 22"W x 13"D	DP60L 480 Volt 26,000 BTU/H 60"H x 24"W x 16"D

Profile Series Indoor/Outdoor Air-Cooled Panel-Mount, pages 43-48

For NEMA 12 & 3R Enclosures

Internal/External Mount



DP17 2,000 BTU/H 17"H x 12"W x 7"D	DP21 3,000 BTU/H 21"H x 13"W x 7"D	DP33 5,000 BTU/H 33"H x 17"W x 8"D	DP43 7,000 BTU/H 43"H x 17"W x 9"D	DP47 9,000 BTU/H 47"H x 17"W x 9"D	DP38 480 Volt 5,000 BTU/H 38"H x 17"W x 8"D	DP52 480 Volt 7,000/9,000 BTU/H 56"H x 17"W x 9"D

Recommended replacement: See Guardian/GuardianX Series

TrimLine Series (NP & NPT) Air-Cooled Panel-Mount, pages 52-60

For NEMA 12 & NEMA 12/3R Enclosures



NP17 2,000 BTU/H 17"H x 12"W x 9"D	Narrow-Mini 2,500 BTU/H 20"H x 10"W x 10"D	NP28 4,000 BTU/H 28"H x 10"W x 11"D	NP33 4,000 BTU/H 33"H x 12"W x 9"D	NP36 4,000 & 6,000 BTU/H 36"H x 15"W x 12"D	NPT47 10,000 & 13,000 BTU/H 47"H x 15"W x 12"D	NPT52 16,000 BTU/H 52"H x 17"W x 14"D

KOOLTRONIC AIR CONDITIONERS (cont.)

Index and Selection Guide

Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Traditional Air-Cooled Panel-Mount, pages 61-62

For NEMA 12 Enclosures

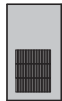


Micro-Mini
1,000 BTU/H
13"H x 14"W x 6"D

Integrity NEMA 4/4X Air-Cooled

For NEMA 4/4X Enclosures

pages 63-64

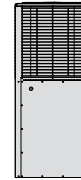


P21L
3,000 BTU/H
21"H x 12"W x 12"D

Intrepid Outdoor

For NEMA 12 & 3R Enclosures

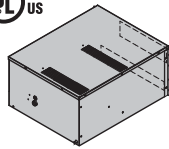
pages 65-66



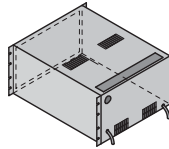
EP56
30,000 BTU/H
56"H x 24"W x 24"D

Horizontal Air-Cooled Rack-Mount

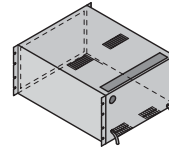
pages 67-68



RML
5,000 BTU/H
10"H x 19"W x 22"D



H9
3,500 BTU/H
10"H x 19"W x 22"D



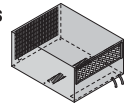
H10
3,500 BTU/H
10"H x 19"W x 22"D

Horizontal Air-Cooled Top-Mount

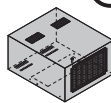
pages 69-73



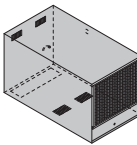
Horizontal Super-Mini
2,500 BTU/H
9"H x 14"W x 16"D



Compact Plus Series
4,200 BTU/H &
5,000 BTU/H
12"H x 17"W x 22"D



Compact Series
4,000 BTU/H
10"H x 17"W x 20"D

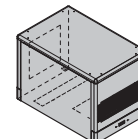


Full-Size Series
12,000 BTU/H
17"H x 17"W x 31"D

Advantage Series Air-Cooled Top-Mount

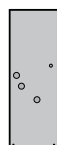
For NEMA 12 & 3R Enclosures

page 74



6RTL
6,000 BTU/H
18"H x 17"W x 26"D

TrimLine Series Water-Cooled Panel-Mount, pages 75-79



WNP28
4,000 BTU/H
28"H x 10"W x 11"D



WNP33
4,000 BTU/H
33"H x 12"W x 9"D



WNP36
4,000 & 6,000
BTU/H
37"H x 15"W x 12"D



WNP47
7,000 & 12,000
BTU/H
47"H x 15"W x 12"D

KOOLTRONIC HEAT EXCHANGERS

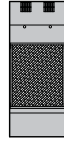
Index and Selection Guide

TrimLine Series Air-to-Air Panel-Mount, pages 86-88

For NEMA 12 Enclosures



KXNP33
33 Watts/°F
33"Hx12"Wx10"D



KXNP36
42 Watts/°F
36"Hx15"Wx10"D



KXNP47
56 Watts/°F
47"Hx15"Wx10"D



KXNP59
91 Watts/°F
59"Hx17"Wx14"D

Integrity Series NEMA 4/4X Air-to-Air Panel-Mount, pages 89-92

For NEMA 4/4X Enclosures



KNHX32
21 Watts/°F
32"Hx14"Wx13"D



KNHX38
44 Watts/°F
38"Hx18"Wx18"D



KNHX47
54 Watts/°F
47"Hx18"Wx18"D



KNHX59
65 Watts/°F
59"Hx18"Wx18"D

KXHE Series Air-to-Air Panel-Mount, pages 93-97

For NEMA 12 Enclosures



KXHE60A
8 Watts/°F
22"Hx6"Wx4"D



KXHE120A
16 Watts/°F
24"Hx11"Wx4"D



KXHE122A
19 Watts/°F
25"Hx11"Wx8"D



KXHE125A
57 Watts/°F
28"Hx19"Wx8"D



KXHE245A
72 Watts/°F
47"Hx19"Wx8"D



KXHE365A
88 Watts/°F
59"Hx19"Wx8"D

KTHE 200 Air-to-Air, page 98

Refrigerant-charged



KTHE200
52 Watts/°F
59"Hx19"Wx8"D






KOOLTRONIC HEAT EXCHANGERS (cont.)

Index and Selection Guide

KPHE Series Water-to-Air Panel-Mount, pages 99-103

For NEMA 12 & 3R Enclosures










				
KPHE20 20 Watts/°F @ 1/4 GPM 21 Watts/°F @ 1/2 GPM 20"H x 10"W x 4"D	KPHE24 33 Watts/°F @ 1 GPM 37 Watts/°F @ 2 GPM 24"H x 10"W x 8"D	KPHE28 42 Watts/°F @ 1 GPM 50 Watts/°F @ 2 GPM 28"H x 10"W x 11"D	KPHE30 58 Watts/°F @ 1 GPM 74 Watts/°F @ 2 GPM 30"H x 12"W x 11"D	KPHE32 80 Watts/°F @ 1 GPM 112 Watts/°F @ 2 GPM 32"H x 15"W x 11"D

KNHE Series NEMA 4/4X Water-to-Air Panel-Mount, pages 104-111

For NEMA 4/4X Enclosures

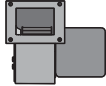
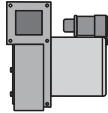
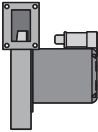

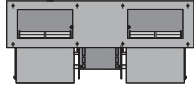


						
KNHE20 20.5 Watts/°F @ .25 GPM 21.5 Watts/°F @ .50 GPM 20"H x 10"W x 4"D	KNHE24 33 Watts/°F @ 1 GPM 37 Watts/°F @ 2 GPM 24"H x 11"W x 8"D	KNHE28 42 Watts/°F @ 1 GPM 50 Watts/°F @ 2 GPM 28"H x 11"W x 11"D	KHNE30 58 Watts/°F @ 1 GPM 74 Watts/°F @ 2 GPM 30"H x 12"W x 11"D	KNHE32 80 Watts/°F @ 1 GPM 112 Watts/°F @ 2 GPM 32"H x 16"W x 11"D	KNHE48 150 Watts/°F @ 3 GPM 65 Watts/°F @ 4 GPM 48"H x 20"W x 9"D	KHNE60 190 Watts/°F @ 3 GPM 215 Watts/°F @ 4 GPM 61"H x 20"W x 9"D

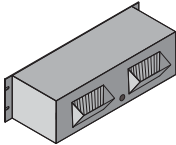
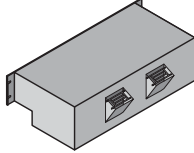
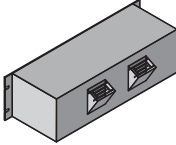
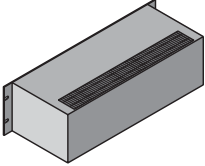
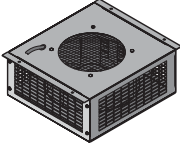
KOOLTRONIC BLOWERS

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Basic Blowers, pages 115-125

				
Single Centrifugal 60 - 425 C.F.M. Cutoff S.P.: 0.85-2.70 I.W.G.	High Pressure Centrifugal 160 - 475 C.F.M. Cutoff S.P.: 1.9 - 6.3 I.W.G.	High Pressure Radial 55 - 265 C.F.M. Cutoff S.P.: 2.3 - 8.0 I.W.G.	Double Centrifugal 155 - 1200 C.F.M. Cutoff S.P.: 0.6-2.5 I.W.G.	Quadruplex Centrifugal 320 - 920 C.F.M. Cutoff S.P.: 1.0 - 3.0 I.W.G.

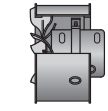
Packaged Blowers, pages 126-140

				
Standard Twin 160 - 800 C.F.M. Cutoff S.P.: 0.42-1.40 I.W.G.	Recessed Twin 130 - 800 C.F.M. Cutoff S.P.: 0.42-1.40 I.W.G.	EMI/RFI Shielded 130 - 800 C.F.M. Cutoff S.P.: 0.42-1.40 I.W.G.	Broad Discharge 270 - 750 C.F.M. Cutoff S.P.: 0.46-1.35 I.W.G.	Pagoda 182 - 1615 C.F.M. Cutoff S.P.: 0.55 - 2.68 I.W.G.

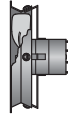
KOOLTRONIC FANS

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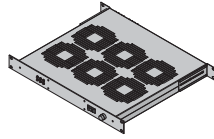
Fans, pages 143-164



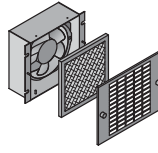
High Performance
385 C.F.M.



Thin
210 - 750 C.F.M.



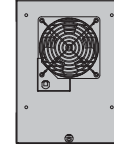
KoolTray II
105 C.F.M.
per Fan



Packaged
105 - 1310 C.F.M.



Advantage Series KBFF
NEMA 12 Filter Fans
13 - 341.4 C.F.M.*



Sentry Series KBFF
NEMA 3R Filter Fans
88 - 405 C.F.M.**

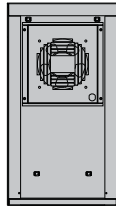
Guardian/GuardianX NEMA 4 and 4X Filter Fans, pages 165-173



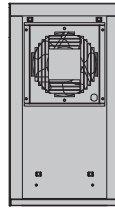
KNP32FL
20 / 27 C.F.M.**
8"H x 6"W x 5"D



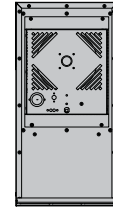
KNP36FL
26 / 26 C.F.M.**
8"H x 6"W x 5"D*



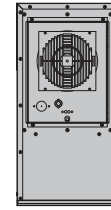
KNP40FL
40 / 45 C.F.M.**
18"H x 10"W x 5"D*



KNP60FL
84 / 92 C.F.M.**
18"H x 10"W x 5"D*



KNP180FL
177 / 179 C.F.M.**
23"H x 12"W x 10"D*



KNP225FL
350 / 444 C.F.M.**
23"H x 12"W x 10"D*

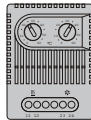
* Fan with grille airflow.

** Fan airflow without filter.

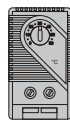
KOOLTRONIC ENCLOSURE ACCESSORIES

Index and Selection Guide

Thermostats pages 180-185



Dual Thermostat
2.6"H x 1.9" x 1.8"D



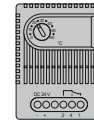
Small Thermostat
2.3"H x 1.3" x 1.7"D



Mechanical Thermostat
2.6"H x 1.9" x 1.5"D



Mechanical Thermostat
2.6"H x 1.1" x 1.7"D



24 VDC Thermostat
2.6"H x 1.9" x 1.8"D

Hygrostats pages 186-187



Mechanical Hygrostat
2.6"H x 1.9" x 1.5"D

Hygrotherms pages 188-189

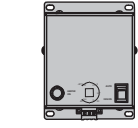


Electronic Hygrotherm
3.0"H x 2.3" x 1.7"D

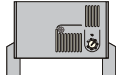
KOOLTRONIC ENCLOSURE ACCESSORIES (cont.)

Index and Selection Guide

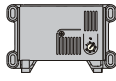
Fan Heaters pages 190-196



KSHET
Compact Fan Heater
5.5"H x 4.0" x 4.5"D
7.5"H x 4.0" x 4.5"D



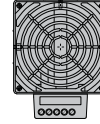
Foot Mount
Fan Heater
3.9"H x 5.7" x 6.6"D



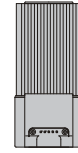
Panel Mount
Fan Heater
3.9"H x 6.3" x 7.7"D



Compact PTC
Fan Heater
5.0"H x 3.9" x 6.5"D

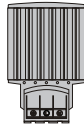


Compact
Fan Heater
1.8"H x 4.6" x 5.9"D
1.8"H x 3.1" x 4.4"D



Extruded Aluminum
Compact Fan Heater
7.2"H x 3.9" x 3.1"D
8.7"H x 3.9" x 3.1"D

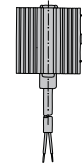
PTC Heaters pages 197-200



KSEH
PTC Heater
2.6"H x 2.7" x 2.3"D
5.5"H x 2.7" x 2.3"D
8.7"H x 2.7" x 2.3"D



KFEHK
PTC Heater
4.1"H x 2.4" x 2.5"D
6.1"H x 2.4" x 2.5"D
9.1"H x 2.4" x 2.5"D



KSEHK
PTC Heater
2.0"H x 1.9" x .98"D
2.8"H x 1.9" x .98"D
4.0"H x 1.9" x .98"D
2.4"H x 1.9" x .98"D

Enclosure Lights pages 201-205



Compact
Enclosure Light
13.9"H x 2.5" x 2.5"D



Slimline
Enclosure Light
13.5"H x 1.5" x 3.5"D



LED Enclosure Light
KSLED
15.6"H x 2.6" x 3.9"D

Miscellaneous pages 206-208



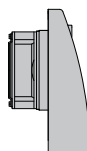
KSDR
Enclosure Receptacle
3.6"H x 2.4" x 1.8"D



KSDR/FIX
Mounting Aid
13.5"H x 1.5" x 3.5"D

Outdoor Filter Fan and Exhaust Package

pages 209-210



KSFF
Outdoor Filter Fan
8.8"H x 6.5" x 5.0"D



KSEF
Exhaust Package
8.8"H x 6.5" x 3.3"D

ABOUT THE COMPANY...

HISTORY

KOOLTRONIC, INC. was founded over 60 years ago to address the unique cooling needs of the emerging electronics, computer and telecommunication industries. Our Company engineered the development of the first air conditioners and heat exchangers for sealed enclosures, introduced in the early 1960s. Since then, KOOLTRONIC has evolved into the industry leader, specializing in the innovative design and production of forced ventilation and closed-loop cooling for various types of enclosures. KOOLTRONIC continues to lead today by applying cutting edge technology to the protection of sensitive electronic components.

FACILITIES

KOOLTRONIC'S 170,000 sq. ft. facility is a modern plant and office complex on 100 acres in Pennington, N. J. KOOLTRONIC'S rooftop solar panel system and parking lot canopy system totals approximately 3,900 solar panels working to generate electricity for the facility. This accounts for 90% of the energy requirements on a given day. Our staff, including Engineering, Sales and Manufacturing Departments, works as a team to serve our customers' needs. Computer-aided design and development keeps KOOLTRONIC on the leading edge of the cooling industry. The Manufacturing Department includes computerized fabrication of our products and their sheet metal components. Our facilities also contain on-site custom painting capabilities and testing laboratory, which are state-of-the-art. Having all of these functions under one roof leads to the efficiency and excellence KOOLTRONIC has become known for. As an additional service, we offer our automated powder painting system and our laboratory for our customers' use.

THE KOOLTRONIC ADVANTAGE

KOOLTRONIC'S success is largely due to its focus on cutting edge technology. We use the same state-of-the-art software used by NASA, Boeing, Harley Davidson and the US Air Force. This software allows us to design every aspect of our products in an efficient, cost effective way while giving our customers the best quality in the industry. Since KOOLTRONIC fabricates its own sheet metal parts, we enjoy a level of self-sufficiency and control over the manufacturing process that is unique in the industry.

CUSTOMER SUPPORT

KOOLTRONIC employees are dedicated to **total customer satisfaction**. The experienced cooling specialists and design engineers at KOOLTRONIC are ready to answer any air moving question you may have. They can assist with model selection, placement, accessories and options, modification or custom-design to achieve the optimum solution **for your application**. In addition, they have access to KOOLTRONIC'S storehouse of previously-designed custom units, which frequently provide the ideal solution to a difficult cooling problem. If an in-stock item is indicated, a sample is available for a 30 day evaluation **in your application, under your conditions**, in order to validate the choice.

MISSION: RESEARCH AND DEVELOPMENT

As a Company Mission we have undertaken a continuing effort to produce new and innovative products. At the same time we continue to improve upon existing product lines in order to anticipate and satisfy the changing needs of the many industries we serve. This catalog includes examples of products developed during the past few years. Research and Development is an ongoing process, with new products announced periodically.

QUALITY ASSURANCE

In order to assure stringent adherence to the highest quality standards, we employ the latest computer-controlled manufacturing practices and state-of-the-art Quality Control procedures. All technical and production employees are trained members of our Quality Assurance Team.

Every unit is run and carefully tested to verify performance to specifications. We have achieved sole source and Certified Vendor status with a number of leading U.S. corporations. We are proud of our quality and on-time delivery records, which are unsurpassed.

CUSTOM CAPABILITY

KOOLTRONIC encourages you to call and discuss solutions to your heat dissipation problems. In most cases, a standard product or modification will provide the answer. If not, we can develop a unique design to meet **your** particular requirements.

STOCKING PROGRAM

Substantial inventories of popular models in every product category are in stock and ready to ship, within 24 hours when needed. We participate in Just-In-Time programs with numerous customers for standard units, as well as volume custom-designed products. KOOLTRONIC has the largest in-stock inventory in the industry.

SERVICE IS OUR COMMITMENT

At KOOLTRONIC, our goals of excellence and responsiveness have been key to customer satisfaction. We are constantly seeking ways to further improve our performance. If you are unable to find the right answer to your problem in this catalog, if you think your application requires a unique design, if you have any questions regarding your cooling requirements or cooling problems in general, please contact us:

Pennington, New Jersey
 (609) 466-3400
 FAX (609) 466-1114

We welcome the opportunity to be of service to you.



Except where noted, Kooltronic products are in compliance with European Economic Union (EEU) Reduction of Hazardous Substances (RoHS) Directive 2015/863/EU, except for the exemptions listed under the RoHS Directive.

DESIGN GUIDE

Heat producing components currently widely used in electronic and industrial equipment enclosures present the problem of dissipating the heat generated before damage can occur to heat-sensitive parts. In many cases, the problem can be solved by ventilation, using simple air moving devices. However, in more and more applications the available ambient air is too warm or too contaminated to be used for the safe dissipation of the unwanted heat. Under those conditions, the life expectancy and performance of sensitive components may be adversely affected, often causing equipment malfunctions, slowdowns or failures.

In forced convection cooling of enclosures, cooler ambient air is drawn or forced through the components in an enclosure and discharged. When electronic/electrical enclosures are sealed to keep out moisture, dust, dirt and other contaminants, the heat generated by the components is trapped and closed-loop cooling (air conditioner or heat exchanger) is needed to maintain the optimum environment for the components.

This Design Guide/Catalog is not merely a collection of product offerings. It is intended as a design aid to be used as a problem-prevention and problem-solving tool, with an extensive array of equipment and specifications so that the best-suited items can be selected as the solutions for virtually every type of enclosure ventilation or cooling requirement. Refer to the Glossary/Technical Comments on page 17 for support with technical terms and additional design information.

COOLING PRODUCT SELECTION

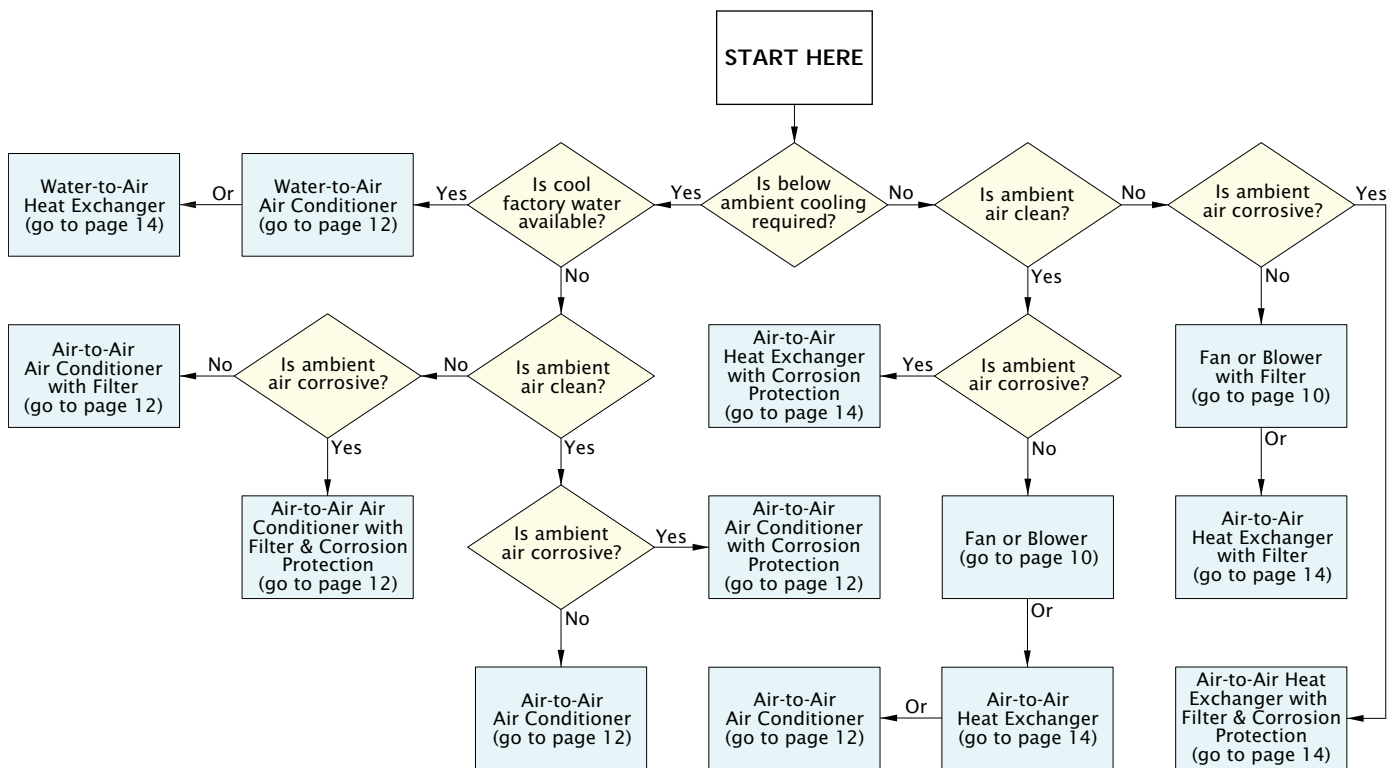
The KOOLTRONIC philosophy is to specify the smallest, least complex cooling device that will satisfy the requirements of the application.

Forced Ventilation Air Cooling

In clean, non-hazardous environments with acceptable ambient temperatures, a simple forced-air cooling system utilizing ambient air is usually adequate. Combined with a low-cost air filter, such devices generally meet the heat removal needs of typical electronic and electrical equipment.

Closed-Loop Cooling

In harsh environments involving high temperatures, heavy particulates, oil, or chemicals capable of damaging components, ambient air must be kept out of the enclosure. Sealed enclosures are generally used, with closed-loop cooling consisting of two separate circulation systems in a single unit. One system, sealed against the ambient air, cools and recirculates the clean cool air throughout the enclosure. The second system uses ambient air or water to remove and discharge the heat.



FAN AND BLOWER SELECTION

DETERMINE THE AIRFLOW REQUIRED:

STEP 1: Determine the amount of heat to be removed (in watts). This step is the same procedure as used for the selection of heat exchangers (See Page 12). The example on page 12 identifies 922 watts for the total cooling capacity required, which equals the total heat needed to be dissipated (removed).

STEP 2: Determine the Delta T. This value is described by the formula:
 Delta T = MAXIMUM ALLOWABLE INTERNAL ENCLOSURE TEMPERATURE - MAXIMUM OUTSIDE AMBIENT ($\Delta T = MAIET - MOA$).
 These numbers have already been identified on page 12 in step 2.
 The example used there was $120^{\circ}F - 110^{\circ}F = 10^{\circ}F$ Delta T.

STEP 3: Plot the values for your applications. On the graph below, locate the watts to be dissipated (922W). Draw a horizontal line over to the diagonal line that represents your Delta T ($10^{\circ}F$). Draw a vertical line down. This is the airflow (CFM) needed for your application. In our example the CFM is 365.

Based on standard air density (.075 lbs. per cubic foot), the graph provides quick solutions for the following equations:

Temperature rise in degrees Fahrenheit: $CFM = (3.17 \times P \times 1.25) / \Delta T$
 Example: $(3.17 \times 922 \times 1.25) / 10 = 365.34$ CFM

Temperature rise in degrees Celsius (Centigrade): $CFM = (1.76 \times P \times 1.25) / \Delta T$

CFM = Cubic Feet per Minute

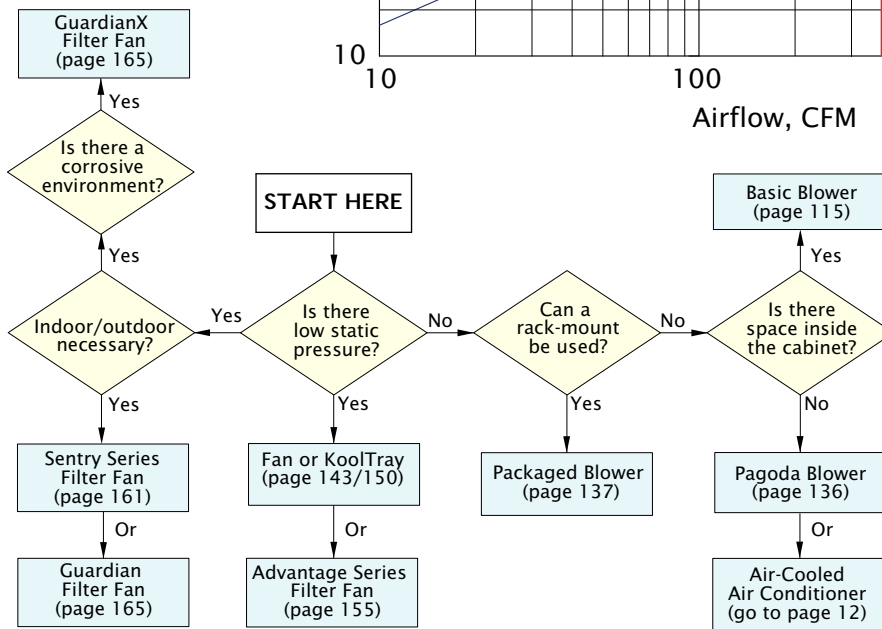
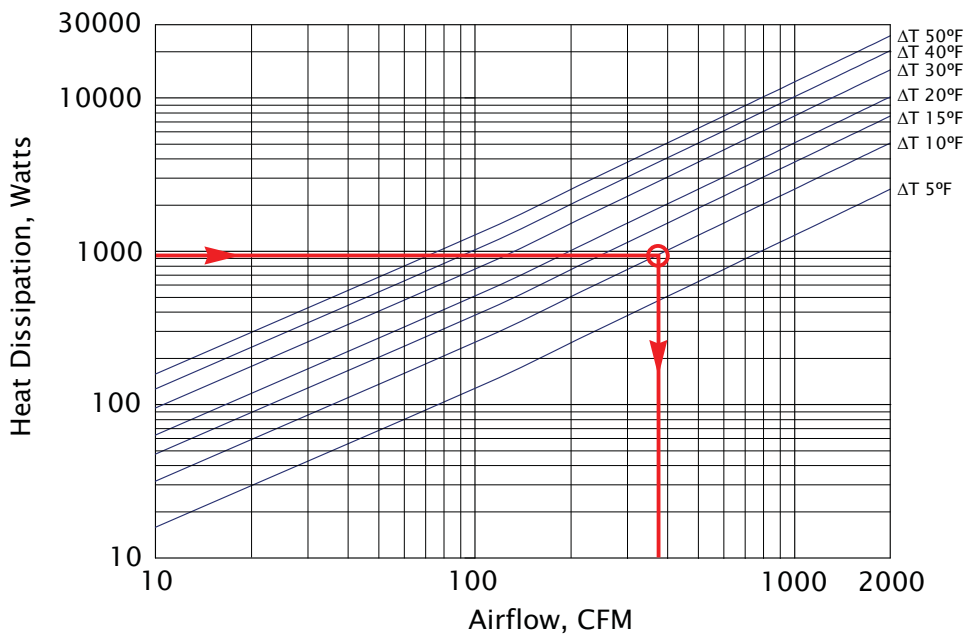
P = Power to be dissipated in watts

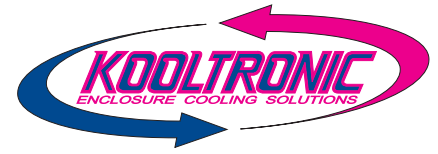
Delta T = (see step 2 above)

These formulas include a "safety factor" of 25 percent more air than is strictly required by theory. This is expressed by the constant 1.25 in the formulas above.

STEP 4: Select the System. On the flow chart below, select the type of air moving product that you need.

Heat Dissipation Graph





NEMA ENCLOSURE RATINGS

Air conditioners typically carry an agency marking such as UL (Underwriters Laboratories), which designates the environmental hazard from which the contents are being protected. This marking should be matched to the enclosure to be cooled. Typical examples include NEMA 12 (indoor use, protection from dust and dripping liquids), NEMA 3R (indoor or outdoor use and rainproof), NEMA 4 (indoor or outdoor use, protection from wash-down) and NEMA 4X (indoor or outdoor use, protection from corrosive environments).

Environments:	NEMA 1	NEMA 12	NEMA 3R	NEMA 4	NEMA 4X
Indoor use only	✓	✓			
Indoor and outdoor use			✓	✓	✓
Falling liquids and light splashing		✓	✓	✓	✓
Non-hazardous dust, lint, fibers		✓		✓	✓
Washdowns and splashing water				✓	✓
Oil and coolant seepage		✓			
Corrosive agents					✓
Hazardous Location (Class I, Division 1 & 2)					✓

Kooltronic offers cooling solutions for situations that fall under these NEMA ratings. We can develop a unique design to meet your particular requirements. Consult with Kooltronic’s design and engineering staff to discuss your heat dissipation problems.

For more information on our thermal management products please visit:

kooltronic.com

30 PENNINGTON-HOPEWELL ROAD
 PENNINGTON, NEW JERSEY 08534
 TEL: 609-466-3400 FAX: 609-466-1114

Email: sales@kooltronic.com

AIR CONDITIONER SELECTION

(for Heat Exchanger applications, see page 14)

DETERMINE THE COOLING CAPACITY REQUIRED:

Air conditioners for cooling electrical enclosures should be sized to provide adequate cooling for the anticipated worst case conditions. This is usually when the ambient is the highest, and also when the electrical loads through the enclosure are at the maximum. However the air conditioner should not be over-sized, as this could result in compressor short cycling. This might cause wide swings in enclosure temperatures.

The total cooling capacity required of the air conditioner includes the:

(A) INTERNAL HEAT LOAD, (B) SOLAR HEAT LOAD and (C) HEAT LOAD TRANSFER.

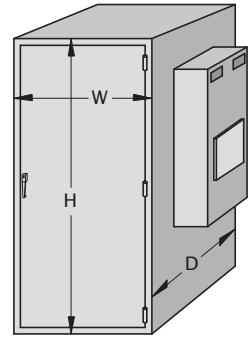
(A) The INTERNAL HEAT LOAD is the heat generated by the components within the enclosure.

(B) The SOLAR HEAT LOAD is the additional heat due to the sun's rays.

NOTE: Unfortunately the calculation required to properly identify the true Solar Heat Load is too extensive to provide here. Therefore we recommend you call the Kooltronic Sales Department. They have access to a computer program that will provide an accurate answer after a few simple questions. If you have an outdoor application, do not ignore the solar heat load. It can be substantial.

(C) The HEAT LOAD TRANSFER is the additional heat that is added through the walls of the enclosure. (This statement assumes the outside ambient is warmer than the air inside the enclosure.)

NOTE: Refer to the Glossary/Technical Comments section for explanations of technical terms and more information about Engineering issues.



STEP 1: Calculate the Internal Heat Load by using the Incoming / Outgoing Power Test Method

The Internal Heat Load can be determined by measuring the electrical energy that stays inside the enclosure. It is assumed that this energy is eventually transformed into waste heat. To measure this electricity, the current going In and Out must be measured in amps. The voltage of this current is also important. It is critical that all wires entering and leaving the enclosure must be included. Typically, a voltmeter and a clamp-on type ammeter should be used. The data must be recorded during the time when the current flow is the highest. A qualified technician is recommended for safety and accuracy reasons.

The Internal Heat Load = $3.413 \times \text{Voltage} (\text{Current IN} - \text{Current OUT})$

NOTE: This equation is derived from: $3.413 \text{ BTU} = 1 \text{ Watt}$ and $\text{watts} = \text{volts} \times \text{amps}$. For example, if you measured 220 volts, 40 amps IN, 35 amps OUT, the Internal Heat Load = $3.413 \times 220 \times (40 - 35) = 3754 \text{ BTU/H}$. Consult with an Electrical Engineer if 3 phase power or a very complicated circuit is involved.

STEP 2: Calculate the Heat Load Transfer

The heat load transfer is the additional heat added to the enclosure through the walls from the surrounding ambient. This is identified by the formula:

Heat Load Transfer = $(\text{Max. Outside Ambient} - \text{Max. Allowable Internal Enclosure Temperature}) \times \text{Surface Area} \times 1.25$
 $\text{HLT} = (\text{MOA} - \text{MAIET}) \times \text{SA} \times 1.25$

NOTE: 1.25 is a constant for metal enclosures. Use 0.8 for a plastic enclosure or 0.6 for an insulated enclosure.

The Maximum Outside Ambient (MOA) is the warmest room temperature surrounding the enclosure that might happen all year long. The MOA might be as high as 130°F in an industrial equipment room. The Maximum Allowable Internal Enclosure Temperature (MAIET) should not exceed the heat tolerance specification of the most sensitive component in your system. The MAIET might not be allowed to go over 90°F per the enclosure's component specifications.

The Surface Area (SA) is calculated as follows:

Surface Area = $(H \times W) + (H \times W) + (H \times D) + (H \times D) + (W \times D)$

H = height in feet, W = width in feet, D = depth in feet

For example; H = 4, W = 2, D = 3: Surface area = $(4 \times 2) + (4 \times 2) + (4 \times 3) + (4 \times 3) + (2 \times 3) = 46 \text{ sq. ft.}$

Therefore in our example, the HLT = $(130^\circ\text{F} - 90^\circ\text{F}) \times 46 \times 1.25 = 2300 \text{ BTU/H}$

STEP 3: Calculate the Total Cooling Capacity Required

The total cooling capacity required to cool your equipment is equal to:

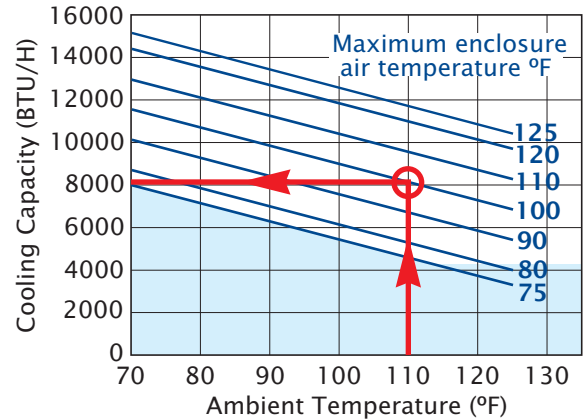
Internal Heat Load + the Heat Load Transfer. The example: $3754 + 2300 = 6054 \text{ BTU/H}$

AIR CONDITIONER PERFORMANCE CHART EXPLANATION:

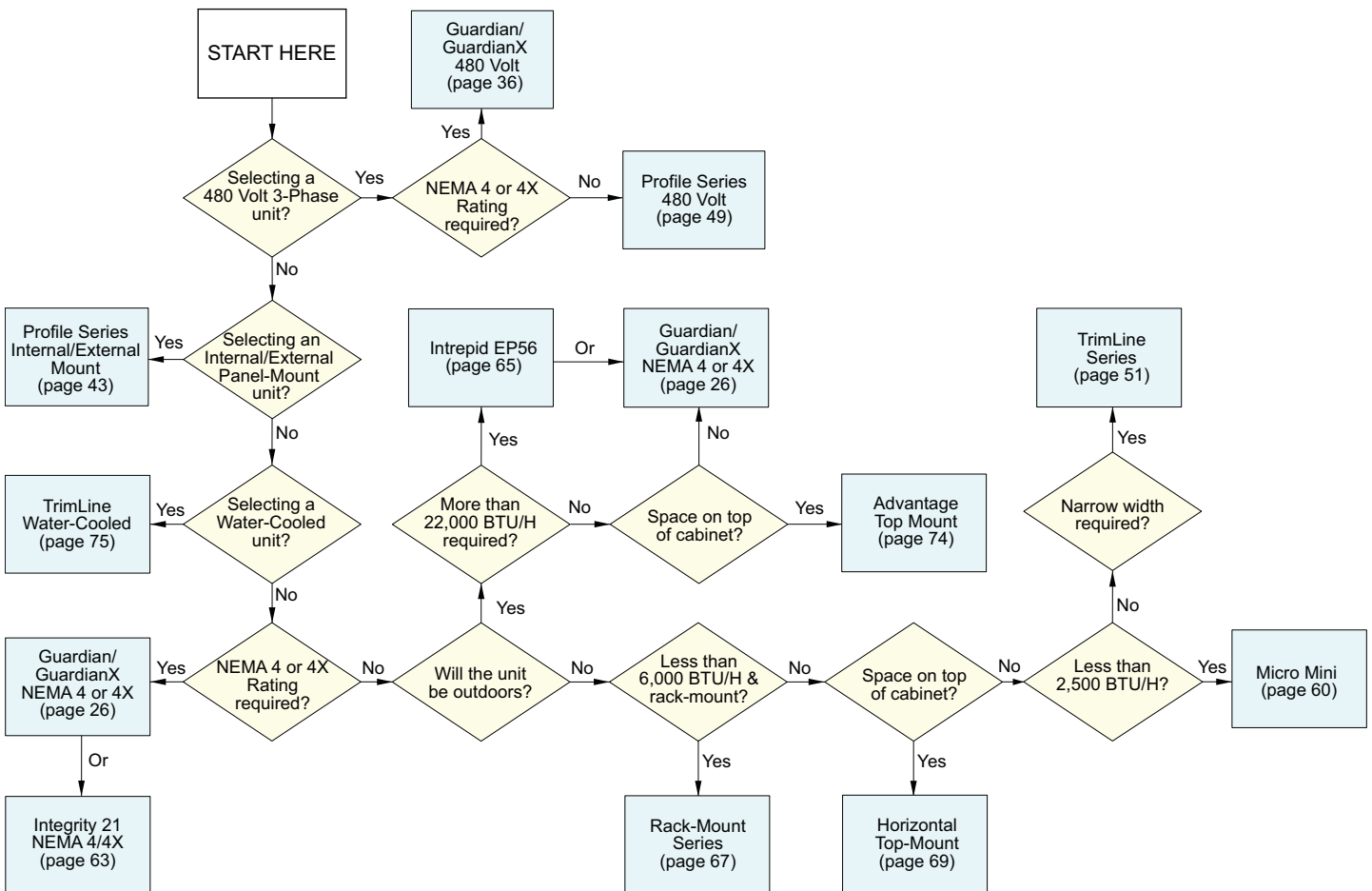
In the air conditioner section there are detailed specifications for each cooling system and a performance chart similar to the one shown below. Use the charts to verify that the correct unit, with the proper cooling capacity, has been selected.

Example:

- The maximum ambient temperature is 110°F.
 - The maximum enclosure air temperature is 100°F.
 - The minimum air conditioner capacity is 8,000 BTU/H.
1. Locate the 110°F requirement at the bottom of the example chart.
 2. Follow the vertical line up until it intersects with the 100°F maximum enclosure air temperature.
 3. Follow the horizontal line to identify the actual cooling capacity that the unit will deliver at these conditions.
 4. In this case, the unit will deliver approximately 8,000 BTU/H which is acceptable. If the unit's capacity under this condition was below 8,000 BTU/H, select another model with more capacity. If the capacity was significantly above the 8,000 BTU/H requirement, the next size smaller model should be selected.



SELECT THE APPROPRIATE AIR CONDITIONER PRODUCT LINE:



HEAT EXCHANGER SELECTION

(for Air Conditioner applications, see page 12)

DETERMINE THE COOLING CAPACITY REQUIRED:

Heat exchangers for cooling electronic/electrical enclosures should be sized to provide adequate cooling for the anticipated worst case conditions. This is usually when the ambient is the highest, and also when the electrical loads through the enclosure are at the maximum. The outward portion of the heat exchanger uses either water or ambient air in the cooling process. The heat exchanger cannot cool the cabinet below the temperature of that water (or air). The greater the temperature differential between 1) the hot internal enclosure air and 2) the cooling water (or air), then, the higher the capacity of any heat exchanger will be. Conversely the smaller the temperature differential available in an application, the larger the heat exchanger size needs to be to achieve the goal.

The total cooling capacity required of the heat exchanger includes the:

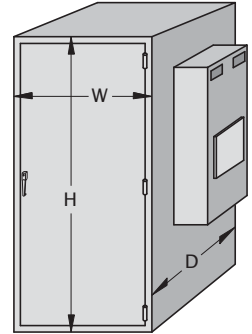
(A) INTERNAL HEAT LOAD, (B) SOLAR HEAT LOAD and (C) HEAT LOAD TRANSFER.

- (A) The INTERNAL HEAT LOAD is the heat generated by the components within the enclosure.
 (B) The SOLAR HEAT LOAD is the additional heat due to the sun's rays.

NOTE: Unfortunately the calculation required to properly identify the true Solar Heat Load is too extensive to provide here. Therefore we recommend you call the Kooltronic Sales Department. They have access to a computer program that will provide an accurate answer after a few simple questions. If you have an outdoor application, do not ignore the solar heat load. It can be substantial.

(C) The HEAT LOAD TRANSFER is the heat that is lost through the walls of the enclosure. (This statement assumes the outside ambient is cooler than the air inside the enclosure.)

NOTE: Refer to the Glossary/Technical Comments section for explanations of technical terms and more information about Engineering issues.



STEP 1: Calculate the Internal Heat Load by using the Incoming / Outgoing Power Test Method

The Internal Heat Load can be determined by measuring the electrical energy that stays inside the enclosure. It is assumed that this energy is eventually transformed into waste heat. To measure this electricity, the current going In and Out must be measured in amps. The voltage of this current is also important. It is critical that all wires entering and leaving the enclosure must be included. Typically, a voltmeter and a clamp-on type ammeter should be used. The data must be recorded during the time when the current flow is the highest. A qualified technician is recommended for safety and accuracy reasons.

The Internal Heat Load = $3.413 \times \text{Voltage} (\text{Current IN} - \text{Current OUT})$

NOTE: This equation is derived from: $3.413 \text{ BTU} = 1 \text{ Watt}$ and $\text{watts} = \text{volts} \times \text{amps}$. For example, if you measured 220 volts, 40 amps IN, 35 amps OUT, the Internal Heat Load = $3.413 \times 220 \times (40 - 35) = 3754 \text{ BTU/H}$. Consult with an Electrical Engineer if 3 phase power or a very complicated circuit is involved.

STEP 2: Calculate the Heat Load Transfer

The heat load transfer is the additional heat lost through the enclosure walls to the surrounding ambient. This is identified by the formula:

Heat Load Transfer = (Max. Outside Ambient - Max. Allowable Internal Enclosure Temperature) x Surface Area x 1.25
 $HLT = (\text{MOA} - \text{MAIET}) \times \text{SA} \times 1.25$

NOTE: 1.25 is a constant for metal enclosures. Use 0.8 for a plastic enclosure or 0.6 for an insulated enclosure.

The Maximum Outside Ambient (MOA) is the warmest room temperature surrounding the enclosure that might happen all year long. The MOA might be as high as 110°F. The Maximum Allowable Internal Enclosure Temperature (MAIET) should not exceed the heat tolerance specification of the most sensitive component in your system. The MAIET might not be allowed to go over 120°F per the enclosure's component specifications.

The Surface Area (SA) is calculated as follows: $\text{Surface Area} = (\text{H} \times \text{W}) + (\text{H} \times \text{W}) + (\text{H} \times \text{D}) + (\text{H} \times \text{D}) + (\text{W} \times \text{D})$.
 H = height in feet, W = width in feet, D = depth in feet. For example: H = 4, W = 2, D = 3: $\text{Surface area} = (4 \times 2) + (4 \times 2) + (4 \times 3) + (4 \times 3) + (2 \times 3) = 46 \text{ sq. ft}$. Therefore in our example, the $HLT = (110^\circ\text{F} - 120^\circ\text{F}) \times 46 \times 1.25 = -575 \text{ BTU/H}$.

STEP 3: Calculate the Total Cooling Capacity Required

The total cooling capacity required to cool your equipment is equal to: Internal Heat Load + Heat Load Transfer. The example: $3754 + (-575) = 3179 \text{ BTU/H}$. The performance of heat exchangers is expressed in WATTS/°F. Therefore you will need to convert the BTUs to WATTS, so multiply by .29. The example; $3179 \text{ BTUs} \times .29 = 922 \text{ watts} = \text{Total Cooling Capacity Required}$.

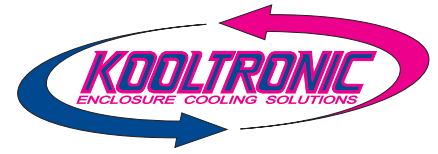
STEP 4: Selecting the Heat Exchanger Performance Rating

Calculate the Temperature Differential: $\text{MAIET} - \text{MOA}$. Use the numbers select in Step 2: $120^\circ\text{F} - 110^\circ\text{F} = 10^\circ\text{F}$.

Divide the Total Cooling Capacity Required from Step 3 by the Temperature Differential to reach the required Watts/°F for this application. Example: $922 \div 10^\circ\text{F} = 92.2 \text{ Watts/}^\circ\text{F}$.

NOTE: If the Temperature Differential in step 3 can be increased to 15°F (by changing the Maximum Outside Ambient and/or the Maximum Allowable Internal Enclosure Temperature) then a smaller heat exchanger (rated at 61 Watts/°F) can be used. NOTE: If Heat Exchanger is determined to be inadequate for your application see Air

Conditioner Selection Guide on page 10 or contact Kooltronic at (609) 466-3400.



HEAT EXCHANGER CAPACITY IN WATTS

TEMPERATURE DIFFERENCE

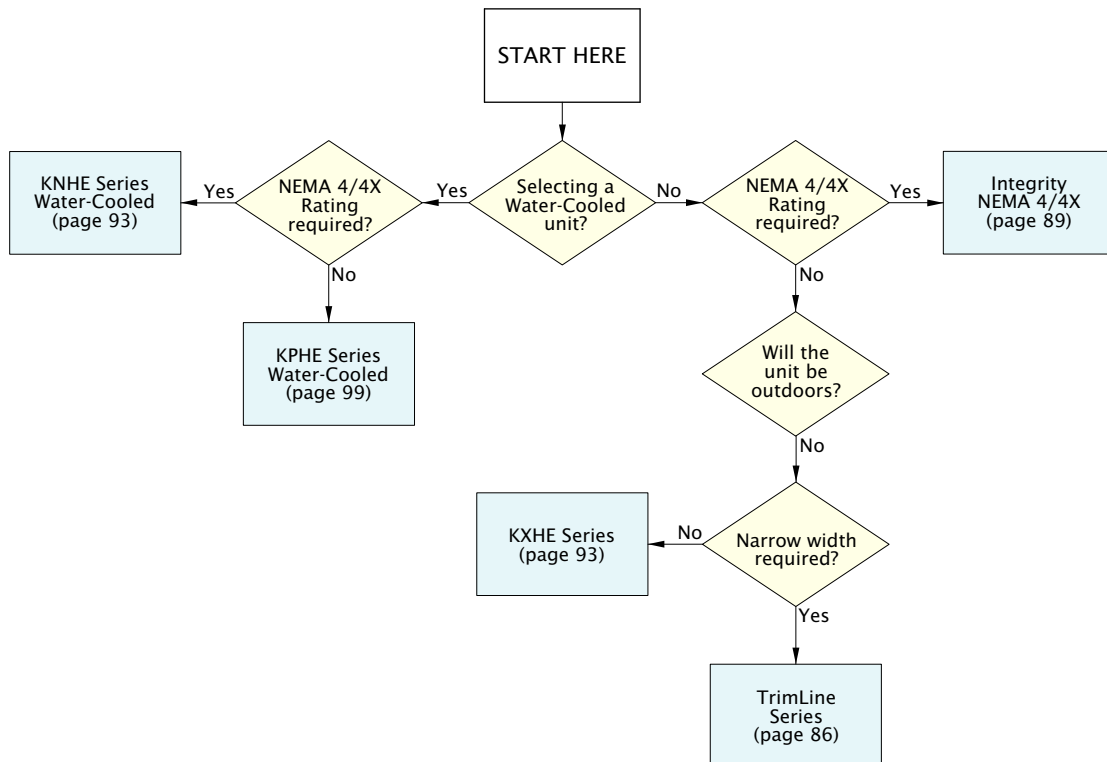
CABINET HOT AIR minus COOLER OUTSIDE AMBIENT AIR (or WATER)

		5	10	15	20	25	30	35	40	45	50
HEAT EXCHANGER PERFORMANCE RATING (WATTS/°F)	8	40	80	120	160	200	240	280	320	360	400
	10	50	100	150	200	250	300	350	400	450	500
	16	80	160	240	360	400	480	560	640	720	800
	17	85	170	255	340	425	510	595	680	765	850
	18	90	180	270	360	450	540	630	720	810	900
	19	95	190	285	380	475	570	665	760	855	950
	21	105	210	315	420	525	630	735	840	945	1050
	22	110	220	330	440	550	660	770	880	990	1100
	26	130	260	390	520	650	780	910	1040	1170	1300
	27	135	270	405	540	675	810	945	1080	1215	1350
	28	140	280	420	560	700	840	980	1120	1260	1400
	30	150	300	450	600	750	900	1050	1200	1350	1500
	33	165	330	495	660	825	990	1155	1320	1485	1650
	37	185	370	555	740	925	1110	1295	1480	1665	1850
	42	210	420	630	840	1050	1260	1470	1680	1890	2100
	44	220	440	660	880	1100	1320	1540	1760	1980	2200
	52	260	520	780	1040	1350	1560	1820	2080	2340	2600
	54	270	540	810	1080	1350	1620	1890	2160	2430	2700
	55	275	550	825	1100	1375	1650	1925	2200	2475	2750
	56	280	560	840	1120	1400	1680	1960	2240	2520	2800
	57	285	570	855	1140	1425	1710	1995	2280	2565	2850
	65	325	650	975	1300	1625	1950	2275	2600	2925	3250
	66	330	660	990	1320	1650	1980	2310	2640	2970	3300
	68	340	680	1020	1360	1700	2040	2380	2720	3060	3400
	74	370	740	1110	1480	1850	2220	2590	2960	3330	3700
	79	395	790	1185	1580	1975	2370	2765	3160	3555	3950
	88	440	880	1320	1760	2200	2640	3080	3520	3960	4400
	91	455	910	1365	1820	2275	2730	3185	3640	4095	4550
	96	480	960	1440	1920	2400	2880	3360	3840	4320	4800
	118	590	1180	1770	2360	2950	3540	4130	4720	5310	5900

TO CONVERT WATTS TO BTU'S, MULTIPLY BY 3.413
1 WATT = 3.413 BTU'S

The boxes above highlighted in yellow demonstrate the benefit of having cooler ambient air available. For example, if you need to eliminate 500 Watts and have 5 degrees of temperature difference, you will need a heat exchanger rated at 118 Watts/°F. But, if ambient air can be reduced by 5°, or 5° warmer cabinet temperature is acceptable, then the temperature difference changes to 10°F. This will allow you to select a smaller heat exchanger rated at 55 Watts/°F.

SELECT THE APPROPRIATE HEAT EXCHANGER PRODUCT LINE:



ENCLOSURE COOLING TIPS

THINK ABOUT COOLING...EARLY! - Cooling needs should be evaluated early in the design process. Nearly all systems require some degree of forced cooling. Early estimates of the location of components in the cabinet, the heat to be dissipated and the amount of space needed for the cooling device will save time, trouble and expense.

FORCED VENTILATION VS. CLOSED-LOOP COOLING - Keep it simple. If ambient air is cool and clean enough, use it. It's free. If the ambient is too hot, dirty or corrosive, a closed-loop system is needed. A heat exchanger is usually a lower-cost choice than an air conditioner. See if it will do the job. Don't over-cool. Don't oversize the cooling equipment.

FAN OR BLOWER? - Propeller fans are designed to move large volumes of air at low static pressure. Blowers are used in higher static pressure applications and are at maximum efficiency when operating near their peak static pressure. Figure 2 shows their relative operating characteristics.

PRESSURIZE, DON'T VACUUMIZE! - Pressurization of the cabinet is far more desirable than drawing the air out. Plan to pump filtered air INTO the cabinet, to gain the advantage of using cracks between panels, around doors or other small openings as part of the exhaust area rather than as sources for the intake of dust and dirt. If pressurization is impossible and a fan or blower must be used to exhaust the enclosure, a filter at the air inlet is recommended.

KEEP IT CLEAN - Nothing is more important than CLEAN filters. Clogged filters restrict airflow and cause motors, compressors, etc. to work harder and fail prematurely. Timely filter servicing is vital to your system.

KEEP INLET AND EXHAUST AIR FAR APART - Be sure that all of the exhaust area is located downstream, as far as possible from the air inlet and beyond all heat-producing components. An open-base cabinet sitting only one-quarter inch off the floor can waste a substantial percentage of cooling air even if the air is directed upward initially. A properly planned air path will avoid all "short circuits" or losses by forcing the cool supply air to pass through the components that are to be cooled before reaching the exhaust area. This will allow for a maximum of cooling efficiency.

LET NATURE HELP - Cooling air should enter the enclosure from as low as possible and leave the enclosure from above the highest hot component. Thus, the forced air flows upward through the heat-producing components and adds to the natural buoyancy of the heated air.

A "BOOSTER" CAN SAVE SPACE AND COST - A booster fan located downstream or at the outlet can draw added cooling power through densely packed components. It could permit the use of a smaller, quieter packaged blower than originally indicated, allowing more panel space for other uses.

ENTERING AIR NEEDS EXIT ROOM - The cross-section area of the airstream throughout the flow path in the cabinet should be at least equal to the effective area of the air intake. If this ratio is less, "choking" of the delivered air may result. The table shown on the right gives the recommended area which should be available for discharge.

For intake and exhaust grille and filter grille assemblies, see the Accessories and Options sections.

USE DUCTS FOR EVEN COOLING - If the maintenance of an even temperature from top to bottom of the enclosure is important, ducts along the sides of the enclosure offer an ideal solution. Multiple duct outlets allow precise control of the location and quantity of air delivered.

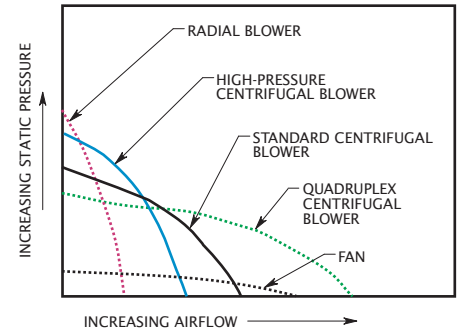
COMPONENT LOCATION - Where possible, locate heat sensitive electrical components toward the bottom of the enclosure, since the warmest air temperatures will be at the top. Maintain adequate spacing between components within the enclosure to minimize airflow restriction.

BAFFLES SOMETIMES WORK WONDERS - At times, an excessively hot component or an isolated area in the enclosure presents a problem in an otherwise well-cooled system. A baffle to channel air across the location is often the best solution.

VIBRATION ISOLATION - Neoprene vibration isolators minimize the possibility of trouble associated with vibration. All portions of a system will respond to periodic forces in varying degrees. This excitation can occur regardless of the balance or design of the air-moving equipment, since any given construction could be in resonance with any of the driving forces in the blower motor. If the sympathetic vibration level is unacceptable, slight weight change or redistribution will usually alleviate the problem.

CALL KOOLTRONIC FOR HELP - For help with your design problems or to resolve questions, give us a call.

RELATIVE OPERATING CHARACTERISTICS OF FANS AND BLOWERS

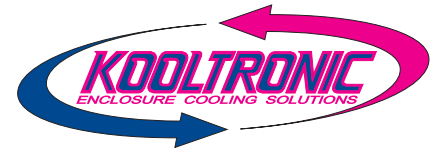


19-inch Front Panel Intake

3.50" [88.9mm]	34 sq. in. [219 sq. cm]
5.25" [133.4mm]	51 sq. in. [329 sq. cm]
7.00" [177.8mm]	68 sq. in. [439 sq. cm]
8.75" [222.3mm]	85 sq. in. [548 sq. cm]
10.50" [266.7mm]	102 sq. in. [658 sq. cm]

Circular Fan Intake

6.50" [165.1mm]	33 sq. in. [213 sq. cm]
8.00" [203.2mm]	50 sq. in. [323 sq. cm]
9.00" [228.6mm]	64 sq. in. [413 sq. cm]
9.50" [241.3mm]	71 sq. in. [458 sq. cm]
10.00" [254.0mm]	78 sq. in. [503 sq. cm]

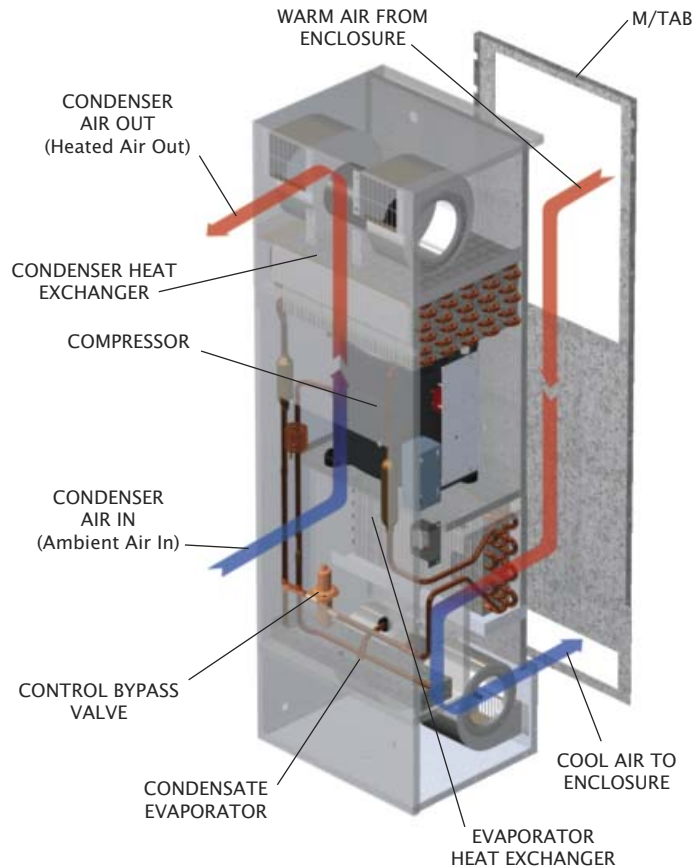


GLOSSARY/TECHNICAL TERMS

AIR CONDITIONER An air conditioner uses a refrigerant system and an air moving system to cool air.

A typical “Special Purpose Air Conditioner” operates as follows: Heat is transferred from the enclosure components by circulating air around and through them, the air is then cooled, dehumidified and returned to the enclosure without the admission of air from the outdoors. The heat is removed from this air within the air conditioner and discharged by means of a vapor compression refrigeration cycle. This takes place in a hermetically sealed system, utilizing either an air-cooled or water-cooled condenser coil. A schematic of a typical air conditioner is illustrated below.

Typical TRIMLINE Series Air Conditioner



The compressor forces refrigerant, in vapor form, into the condenser coil where it is cooled by ambient air. As it cools, the refrigerant condenses into a liquid, which is passed through a filter to remove impurities and excess moisture. The liquid refrigerant flow is metered by a thermostatic expansion valve (or capillary tube), to control its flow into the evaporator coil.

The liquid refrigerant enters the evaporator and begins to evaporate (vaporize) into a gas. As the hot air from the enclosure passes through the evaporator coil, the heat is transferred to the refrigerant, converting the refrigerant to vapor. High levels of humidity present in the air are removed by condensation; the water is drained to the outside or re-evaporated into the outside air. This cool, dehumidified air is then returned to the cabinet. After the heat is transferred to the refrigerant in the evaporator, the refrigerant passes into an accumulator, where any remaining liquid is separated. The gas then returns to the compressor to repeat the cycle in a continuous process.

Control of the system is generally kept simple. When power is applied to the air conditioner the evaporator blower (or fan) starts and runs continuously. If the temperature within the enclosure is high, the condenser blower and the compressor turn on, operating until the thermostat setting is reached. The thermostat is used as a low limit setting. This is typically 75°F, the point at which the compressor and the condenser blower is turned off. Air within the enclosure continues to be circulated by the evaporator blower, picking up heat from the components within the cabinet. The thermostat has a differential setting that is typically 12-15 degrees above the low limit setting. When the air circulated within the enclosure rises by this amount (about 90°F), the compressor and condenser blower turn back on, reducing the cabinet internal air temperature once again. Therefore, it would be normal at start up for the internal temperature to rise to this 90°F temperature before the cooling process would begin. As the air cools, a

balance of temperature within the enclosure is reached. Ideally the compressor and condenser blower continue to run most of the time until the heat load changes.

It is important to understand that enclosure cooling is not “comfort” cooling as found in homes and buildings. Heat producing power and control components are typically limited to maximum enclosure air temperatures of 100°F to 110°F. The actual component surface temperatures are higher. Maintaining enclosure temperatures at excessively low settings often becomes problematic. Condensation may form on live electrical surfaces if their temperature falls below the dew point of the air. Subsequent corrosion or electrical safety becomes a serious issue.

Air conditioners are required where the equipment operating temperature must be kept at or lower than the ambient room temperature, and/or the cabinet must be sealed from oil, dust, fumes and other contaminants.

Specially designed air conditioners protect the components and furnish the required cooling. Such air conditioners employ hermetic refrigeration systems with customized controls. They provide enclosure and air-path geometries for direct installation to the equipment cabinet and accomplish the following:

1. Isolate the interior of the equipment enclosure from ambient conditions
2. Cool the air within the enclosure to the optimum temperature for the sensitive components
3. Circulate the air within the enclosure to equalize temperature and increase heat transfer from hot components
4. Automatically vary cooling rate to maintain close control of equipment temperature
5. Reduce humidity harmful to sensitive components

Air conditioners that are used to cool enclosed equipment differ radically from room air conditioners. In the area of temperature control, for example, most electronic systems are adversely affected by large line transients typical of air conditioner compressor cycling. Electronics also exhibit sensitivity to electromagnetic interference caused by thermostat contacts. The control system of an air conditioning package must be designed accordingly.

In addition, the field experience of many compressor manufacturers has indicated that the frequent start/stop cycling, typical of standard air conditioner operation, shortens compressor reliability.

These factors have led to the development of techniques for close control of internal temperature over a wide range of ambient conditions, without turning the refrigeration compressor on and off and without employing electrically-controlled solenoid valves.

Recent developments in temperature requirements for enclosed components have led to the addition of adjustable Low Temperature Control thermostats in all KOOLTRONIC Air Conditioners to prevent over-cooling.

AIR CONDITIONERS (AIR-COOLED) Heat removed from the enclosure is discharged by circulating the ambient air through the condenser coil and returning the heated air to the ambient. This is the most common form of small air conditioning systems.

AIR CONDITIONERS (WATER-COOLED) Intended primarily for extreme operating conditions of high-ambient temperatures or severe contaminants, these units utilize water as the medium for heat dissipation. The heat is absorbed by cool water circulating through a coaxial condenser coil, following which the heat-laden water is discharged or re-circulated after cooling.

AMBIENT The environment surrounding the product. The word Ambient is typically used to describe the temperature, humidity, air cleanliness or quality including dust and possibly any other harsh weather condition. (See Corrosive Atmosphere)

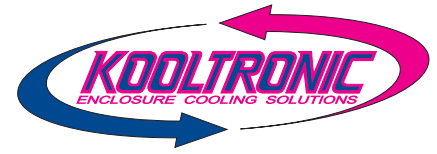
AMBIENT TEMPERATURE RANGE Most KOOLTRONIC Air Conditioners are designed to operate at ambient temperatures ranging from 50°F to 131°F. Optional Low Ambient Kits allow operation in ambient temperatures as low as 0°F.

Maximum operating ambient temperature decreases linearly with altitude at the rate of 3°F per 1,000 feet between 2,500 and 7,500 feet, where maximum operating ambient temperature is 110°F. The ability to operate at high ambient temperatures permits KOOLTRONIC Air Conditioners to be installed indoors in close proximity to furnaces and other heat-producing equipment.

For applications in ambient temperatures higher than the rated maximum, consultation with the KOOLTRONIC Engineering Department often provides the solution.

AUTOMATIC EXPANSION VALVE (AEV) A refrigerant metering device that provides the same function as a capillary tube (See Capillary), but can provide a variable flow rate to match different load conditions. (See Temperature Control)

BLOWER or **BLOWER WHEEL** or **SQUIRREL-CAGE BLOWER** An air moving device typically used to move air against medium to high static pressure systems. Blowers are designed to operate against higher static pressures than fans. Packaged blowers provide compact, filtered, rack-mounted cooling in a variety of airflow configurations.



BLOWERS (VARIABLE SPEED) The optimum open-cycle system for use in contaminated environments combines appropriate air filters and cooling-effect detectors with a variable speed blower that adjusts its operating speed to provide the desired cabinet air temperature, as sensed at some point within the enclosure. Since blower air delivery is directly proportional to motor shaft speed, airflow rate can be adjusted to a minimum compatible with a clean air filter and low ambient temperature. Should ambient temperature increase or the filter clog with contaminants, the sensor and controls would demand an increase in motor speed until the new conditions were satisfied.

The variable speed blower is self-adaptive to changes in ambient temperature, air density, line voltage, power dissipation in the enclosure, and to the degree of filter-loading. Since the blower operates at the minimum speed and air delivery compatible with cooling, both power consumption and the rate of contaminant accumulation on filter surfaces is greatly reduced, compared to a constant speed blower designed to satisfy worst-case conditions. This increases filter life and reduces filter maintenance to a minimum. Conversely, as the filter loads, blower air delivery could increase to levels beyond those that would be obtained under constant speed conditions. However, cost must be considered.

BTU/H British Thermal Unit per Hour is a unit of measure for heat. Heat is also commonly measured in watts: (1 BTU/H = .29 watts)

CAPILLARY A copper tube with a very small inside diameter. Its function in the refrigerant system is to separate the High Pressure (condenser) side from the Low Pressure (evaporator) side, by providing a calibrated restriction and a resulting pressure drop.

CFM Cubic Feet per Minute - A unit of measure for air volume.

COIL An industry term for a device intended to transfer heat. The typical coil is constructed of aluminum fins and copper tubing.

COOLING (CLOSED-LOOP) An industry term used to describe a cooling process that reconditions (reuses) the air inside a chamber. The purpose of this system is to prevent contamination from entering the chamber. Closed-loop cooling is recommended only when open-loop cooling cannot be used.

Many applications using sophisticated electronic/electrical components require a closed-loop cooling system to dissipate heat buildup without introducing outside contaminated air. Closed-loop cooling is required when equipment is operated in hostile environments containing dirt, oil, humidity or corrosives, which adversely affect the performance or ultimate survival of the components. The presence of airborne particulate matter compounds the difficulty of controlling the temperature of the equipment in the enclosure.

Air conditioners and water to-air heat exchangers provide the greatest capacity to transfer heat in closed-loop conditions. They have the unique ability to maintain a lower than ambient temperature and reduce the humidity within the controlled space. It is important to note that enclosure design temperatures may exceed the ambient temperatures, yet be below the electronic components' design limits.

Where maximum internal cabinet design temperatures cannot be maintained using open-loop ambient air cooling, closed-loop devices need to be considered. Air to air heat exchangers, water to air heat exchangers and air conditioning units are able to cool a confined amount of air within an enclosure.

In harsh environments involving high temperatures, heavy particulates, oil, or chemicals capable of damaging components, ambient air must be kept out of the enclosure. Sealed enclosures are generally used, with closed-loop cooling consisting of two separate circulation systems in a single unit. One system, sealed against the ambient air, cools and recirculates the clean cool air throughout the enclosure. The second system uses ambient air or water to remove and discharge the heat.

COOLING (OPEN-LOOP) An industry term used to describe a cooling process that replaces the air inside a chamber with "fresh" cooler air from outside the chamber.

Open-loop cooling is the most commonly used process when the available air supply is cool enough and clean enough to provide the required heat removal. (See Cooling (Closed-Loop))

Open-loop ventilation uses ambient air to remove the heat, and may consist of small muffin type fans that exhaust or supply an electrical cabinet, with optional filters to prevent airborne aerosols and dust from entering the cabinet. The fans have the advantage of utilizing a minimum of cabinet space and will move a substantial volume of air where flow is virtually unimpeded. Cost and complexity is minimized. Where density of components impedes airflow, packaged blowers or motorized impellers may be arranged to operate against these higher static pressures. With a rack enclosure, supplemental fan trays may be used to spot cool or supplement other air-moving devices.

Where maximum internal cabinet design temperatures cannot be maintained using open-loop ambient air cooling, closed-loop devices need to be considered.

COMPRESSOR is the main component in a refrigerant system. Inside our compressors are a motor and a pump that circulates the refrigerant through the rest of the system.

CONDENSATION The process in nature that causes water (condensate) to be removed from the air, and form on a cold surface. This is commonly seen on the outside of a glass of ice water, or dew on grass in the morning.

High ambient relative humidity does not affect the rated capacities of KOOLTRONIC Air Conditioners. They are designed for installation on reasonably tight enclosures of relatively limited internal volume.

Normally, only sensible heat loads are imposed on the air conditioner. Even at an ambient temperature of 95°F and a relative humidity of 100%, the air within a typical electronic equipment enclosure 2.5 feet square and 6 feet high will contain only a small amount of water in vapor form. As the temperature of the air being circulated within the enclosure is reduced from 95°F to 70°F, the water will be condensed quickly in the evaporator heat exchanger and be disposed of through the drain in the condensate tray at the bottom of the air conditioner.

Unless the enclosure is totally sealed, some slow invasion of ambient air will take place through cracks and seams in the cabinetry and the front panels. However, even at ambient relative humidities of 100%, the infiltration rate is normally so small that the effect on cooling capacity of latent heat of water vapor condensation in the infiltrating air is negligible.

Cooling performance of the air conditioner is reduced if its capacity is used for the condensation of excessive moisture. This occurs if the enclosure is poorly sealed or is open for long periods, under high humidity conditions. A continuous flow of condensate denotes that these adverse conditions are present and should be remedied immediately.

CONDENSER The hot section of the refrigerant system that removes the waste heat away from the refrigerant system. This is commonly accomplished with either air or water to carry away the heat. This component is called a condenser, because the refrigerant inside is changing state from a gas to a liquid (condensing).

CORROSIVE ATMOSPHERES Corrosive environments, such as those found in chemical plants and in industries where processes result in harsh chemical by-products, usually preclude the use of filtered ambient air for forced convection cooling. Corrosives generally cannot be filtered out by normal filtration methods. Scrubbing techniques that must be used to rid air of corrosives are complex, costly and often not satisfactory.

For such applications, the cooling method requires isolation of the sensitive components subject to damage from the offending substances. The solution is usually closed-loop cooling - heat exchangers or air conditioners - which consists of two separate circulation systems in a single unit. One recirculates clean cooling air through the electronics within the sealed enclosure, while the other discharges the heat removed from the cabinet to the ambient air or into water for removal.

If the corrosive atmosphere is within an acceptable temperature range, air-to-air heat exchangers can be used to provide cooling for equipment enclosures. When both high ambient temperatures and corrosives are present, either air conditioners or water-to-air heat exchangers must be employed to cool the hot components.

Regardless of the cooling apparatus chosen, it must be constructed of appropriate corrosion-resistant materials, or be treated with corrosive-resistant coatings, to ensure long, trouble-free operation under the conditions to be encountered.

Care should be taken to review the particular conditions involved. In most cases, a system can be designed to meet specific requirements at moderate cost.

DEW POINT The surface temperature at which condensate (water) will form as related to the air temperature and air humidity. (See Condensation)

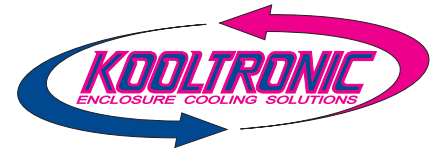
EVAPORATOR The section of a refrigerant system that operates colder than the ambient. This component is called an evaporator, because the refrigerant inside is changing state from a liquid to a gas (evaporating).

FAN or **PROPELLER FAN** An air moving device typically used to move high volumes of air against low static pressure systems. Fans occupy minimal cabinet space and will move a substantial volume of air where flow is virtually unimpeded. Packaged fans can be used for filtered panel or rack-mounted cooling in such applications.

FILTRATION Filtration of contaminated air can be accomplished in some installations to permit forced convection cooling of electronic equipment. Generally, contamination can be broken down into two major categories: airborne particulate matter and corrosives.

In most cases, particulate matter can be filtered out and the air made safe for the cooling of heat-producing equipment. However, removal of corrosives by filtration generally requires processes that are too costly and/or too restrictive to airflow. Therefore, isolation of the enclosure contents is usually necessary.

Careful consideration must be given to the type and severity of the conditions to be encountered. Filters must be able to protect the enclosure at the worst-case level of contamination anticipated. Once the system is installed, adequate preventive maintenance is crucial. Filters must be cleaned or replaced regularly, or means must be provided for continuous monitoring of the filter condition.



In order to prevent choking of airflow, it is important for the filter inlet opening to be at least as large as the total area of all air outlets. Inlet and outlet areas should be determined after allowance for impedance of grille materials or other barriers.

Air inlets and outlets should be as far apart as possible, so the air is forced to circulate through all heat-producing components. All air inlets should be filtered, whether the air enters through a fan or blower, or directly into the cabinet for exhausting, when pressurization is not feasible.

FILTERS (STANDARD) Filters used with typical electronic equipment cooling devices are usually the viscous-impingement type and are approximately 65% efficient. They utilize fibers that have been coated with a nondrying, tacky substance which traps particulates as air is drawn through. Usually constructed of aluminum foil or flock-coated pleated wire screen, the filters can be cleaned, recoated and re-used indefinitely. Often, filters of this type are used as pre-filters in multiple filter systems to extend the service life of high efficiency or absolute filters.

FILTERS (HIGH EFFICIENCY) High efficiency or absolute filters are available in efficiencies ranging up to 99.97% on 0.3 micron size particles. The filter media is a pleated paper which operates as a strainer, since its openings are physically smaller than the particulates it is designed to intercept. This type of filter offers relatively high resistance to airflow and is employed only where more common filter types are incapable of providing acceptable levels of protection. In applications where such filters are required, provision must be made for adequate airflow to overcome the higher resistance in addition to the cooling airflow needed. These filters are not offered in our standard products.

FLOW MONITORS Where higher levels of contamination exist or can develop rapidly, filtered cooling air packages should be equipped with some form of flow monitor. In the event of a reduction in air delivery below a minimum acceptable level due to a clogged filter, a flow-sensing or temperature-sensing device triggers warning alarms or shuts down effected equipment.

Pressure differential switches, which respond to pressure drops across an air filter, are often employed, as are simple vane-type airflow velocity sensors or thermostatic over-temperature detectors located at equipment hot spots. At times, flow-sensing and temperature-sensing devices are employed in combination. In this way, relatively low airflows are accepted when the ambient temperature is low.

At higher ambient temperatures, reduced airflow, resulting in excessive component temperature, activates the warning device or shuts off power. This arrangement permits maximum filter utilization and safety to the equipment.

The need for flow monitoring should be evaluated carefully because of the added cost of the various devices required.

FORCED CONVECTION COOLING or **OPEN-LOOP AMBIENT AIR COOLING** An industry term that describes an air system used to cool a chamber with just the available air surrounding the product.

FORCED VENTILATION vs. CLOSED-LOOP COOLING If ambient air is cool and clean enough, use it. If the ambient is too hot, dirty or corrosive, a closed-loop system is needed. A heat exchanger is usually a lower-cost choice than an air conditioner. See if it will do the job. Don't over-cool. Don't oversize the cooling equipment.

HEAT EXCHANGERS Heat exchangers are recommended to cool equipment which can tolerate operating temperatures moderately higher than ambient, while air conditioners are required where equipment temperatures must be maintained below ambient.

In applications where airborne contaminants pose a threat to electronic components, the enclosure interior must be isolated from the external environment. For such applications, a sealed enclosure, with a heat exchanger or an air conditioner is required.

For installations that can operate at above-ambient temperatures, heat exchangers provide moderate-cost closed-loop cooling. Available in both air-to-air and water-to-air versions, there are models covering a wide range of cabinet sizes and performance capacities. Depending upon the model selected and the heat load, near-ambient to moderately-above-ambient temperatures can be achieved.

For applications that can utilize heat exchangers, the advantages compared with air conditioners include:

- Lower initial cost
- Lower power consumption
- Simpler construction
- Fewer operating components
- Lighter weight

HEAT EXCHANGERS (AIR-TO-AIR) Advanced air-to-air heat exchanger designs for cooling enclosures include two types of heat transfer methods. One design consists of a finned-tube coil which contains liquid refrigerant. The warm air exhausted from the equipment cabinet to the heat exchanger is directed past the coil, causing the refrigerant to

boil and absorb heat. The resultant refrigerant vapor rises to the upper portion of the tubes, where the heat is removed by the cooler ambient air and the refrigerant condenses back to liquid, completing the cooling cycle in a continuous process.

The most recent developments in enclosure heat exchanger design employ high-efficiency heat transfer elements fabricated of embossed convoluted metal foil or thin-film polymer material, constructed into two totally separate air paths. The air leaving the hot enclosure is directed through one side of the exchanger, where the heat passes through the element walls into the ambient-side air stream and is dissipated.

Figure 1 illustrates heat transfer in air-to-air heat exchanger applications.

HEAT EXCHANGERS (WATER-TO-AIR) If ambient air cannot be utilized directly as a cooling medium, another cost-effective method of cooling is a water-to-air system (**Figure 2**). Water is used to remove heat from air circulated within the electrical enclosure.

Cooling water is circulated through a finned-tube coil, which is installed in a compartment isolated from the enclosure to protect the contents from possible leakage of water. As the heat-laden air circulates through the coil, the heat is absorbed by the water and carried away, in a continuous process.

Water-to-air systems are easy to install and usually require minimum maintenance. The water used must be reasonably clean and cold enough to ensure proper operation of the cooling system under the most severe anticipated conditions.

In cases where sufficiently cold water is available, below ambient-temperature cooling can be achieved.

HEAT LOAD TRANSFER The amount of heat that is conducted through the exposed area of the enclosure from the warmer to the cooler space. Heat load transfer can be a heat gain, or a heat loss to the cabinet, depending on the conditions.

If the air outside the cabinet is warmer than the air inside the cabinet, the heat is moving through the cabinet and increasing the total heat load - this will require a larger capacity air conditioner.

If the air outside the cabinet is cooler than the air inside the cabinet, the heat is moving through the cabinet and decreasing the total heat load - this will require a smaller capacity air conditioner.

HOT GAS BYPASS VALVE A refrigerant metering device that allows some of the hot compressor discharge gas to flow into the evaporator. Its function is to prevent the coil from freezing during low load conditions and provide uninterrupted cooling. (See Temperature Control)

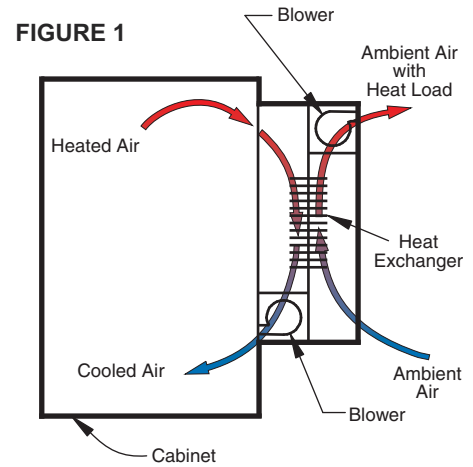
HUMIDITY See Relative Humidity

INTERNAL HEAT LOAD The heat generated by the components inside the cabinet.

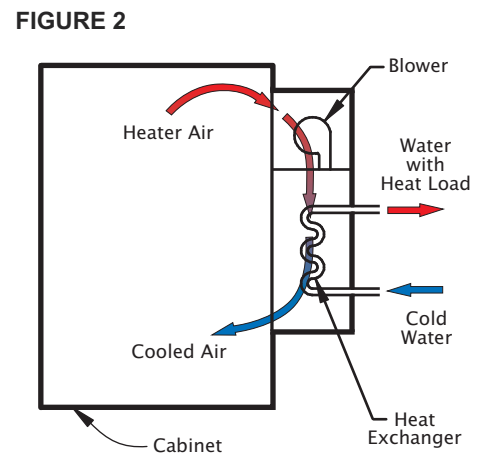
INSULATED ENCLOSURES Insulated enclosures are recommended for outdoor applications, to minimize the additional heat load caused by the sun's rays. It is best to consult your insulation supplier to select the correct material with the right thermal, flame and electrical ratings for your application. In general, a thin layer (about 1/2 inch) of foam insulation, with the proper flame rating, is sufficient for most applications. (See Non-Metallic Enclosures)

LATENT HEAT The energy in air that is reduced when water is removed in the form of condensation. (see Sensible Heat)

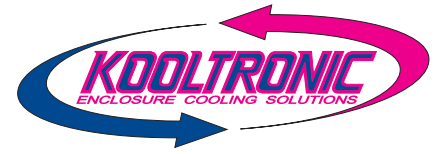
NEMA National Electrical Manufacturers Association - Your equipment may require a NEMA rating to comply with local codes. See page 9 for chart of NEMA Enclosure Ratings. Air conditioners typically carry an agency marking such as UL (Underwriters Laboratories), which designates the environmental hazard from which the contents are being protected. This marking should be matched to the enclosure to be cooled. Typical examples include NEMA 12 (indoor use, protection from dust and dripping liquids), NEMA 3R (indoor or outdoor use and rain proof), NEMA 4 (indoor or outdoor use, protection from wash-down) and NEMA 4X (indoor or outdoor use, protection from corrosive environments). Depending upon the NEMA enclosure type, an air conditioner can be provided to operate in most locations. Locations subject to dust, dripping liquids, rain, washdown and corrosive atmospheres can utilize these "Special Purpose Air Conditioners."



In an air-to-air heat exchanger, heat from air surrounding the components is removed by a specially designed heat transfer element before being routed back into the enclosure.



A water-to-air heat exchanger works by transferring heat of internal air to circulating water, resulting in cooled air which is recirculated throughout the equipment enclosure.



NON-METALLIC ENCLOSURES Although plastics have better insulating properties than metal, a layer of insulation is still recommended for outdoor applications. (See Insulated Enclosures)

RADIO FREQUENCY INTERFERENCE (RFI) “Noise” that is accidentally generated by electrical products that interferes with the normal transmission and reception of radios and other equipment that uses radio waves.

RELATIVE HUMIDITY A unit of measure to describe the amount of water (moisture) in air. It is described in percent, i.e. %RH - over 80%RH is very humid, and below 30% is very dry. (See Condensation)

SENSIBLE HEAT The thermal energy in air that is measured by a change in temperature. (See Latent Heat)

SOLAR LOAD or **SUN LOAD** The heat from the sun must be considered when identifying the total heat load on a system. This solar load can be minimized if the equipment cabinet is shielded from the direct rays of the sun. If this is not possible, painting the cabinet a light color and adding insulation should be considered. If none of these alternatives are possible, the capacity must be increased to address this additional heat load. In the southern USA, this affect can be significant. In the northern USA, this affect might be negligible.

STATIC PRESSURE A method used to quantify the air pressure created by a fan or blower wheel. Low static pressure exists at the outlet of a fan that is blowing into an open air space. High static pressure is created when the same fan is blowing into a restrictive, closed compartment. High static pressure is an indication of low airflow, and possibly poor cooling. If the components in a product are inherently very congested, the air flow through them will be restricted and create high static pressure. This condition can be overcome with an alternate blower wheel housing design. Typically a larger motor is needed to overcome this condition.

TEMPERATURE CONTROL Typical refrigeration and air conditioning systems control temperature by on/off compressor cycling as air temperatures fluctuate between minimum and maximum thermostat settings. Compressor start-up often introduces substantial transient noise into the circuit powering the equipment to be cooled. Thermostat or relay operation results in electromagnetic interference. Both of these factors can adversely affect the function of electronic equipment. On/off compressor control necessitates choosing between large temperature excursions or frequent compressor cycling.

Furthermore, frequent start/stop operation exposes internal compressor components to electrical and mechanical strains not encountered during continuous operation. The use of electrical controls to handle high compressor start-currents results in eventual erosion of the control contacts themselves.

In order to eliminate the possibility of these problems, KOOLTRONIC Air Conditioners feature a continuously operating compressor and non-electric proportional control system, which result in more stable equipment temperatures and prolonged life for the compressor and the control system. Both blowers and the compressor start simultaneously with the application of power to the unit, and continue to operate until power is removed at the time of equipment shutdown.

The Hot Gas Bypass Control Valve permits refrigerant to be injected into the evaporator coil. This high-temperature gas presents an artificial heat load and permits the effective cooling rate to be varied as necessary to maintain a constant return air temperature back to the enclosure. This control also prevents evaporator freeze-ups during periods of low heat load or low ambient temperature.

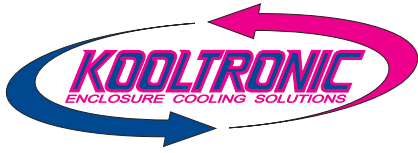
Although the above control system works effectively at most times, there are instances of over-cooling due to low heat load or low ambient temperature. In order to prevent that condition, KOOLTRONIC Air Conditioners are supplied with either a Low Temperature Control Thermostat or a Digital Controller.

When activated, the Low Temperature Control shuts off the compressor and condenser (ambient side) blowers. The evaporator (enclosure side) blowers continue to circulate the air through the enclosure and air conditioner. When the air temperature again reaches the level at which cooling is needed, the compressor and condenser blowers resume operation.

UNDERWRITERS LABORATORIES, INC. (UL) The leading third party product safety organization in the United States, the largest in North America and the leading quality system registrar headquartered in the United States. Providing product safety verification services for more than a century, the UL Mark is one of the world’s most familiar safety certification symbols. The Canadian Standards Association (CSA) provides similar service in Canada. Recently UL and CSA have been working cooperatively and have adopted joint procedures, standards and marks.

VAPOR COMPRESSION REFRIGERATION CYCLE (See Air Conditioner)

WATT A unit of measure for electrical power. Watts are also used to quantify the amount of heat in a system, because 1 watt will convert to 3.413 BTU’s.



AIR CONDITIONERS



AIR CONDITIONERS

The KOOLTRONIC lines of air conditioners offer the most extensive selection of cooling capacities, sizes, mounting configurations and power inputs available. Capacities range from **1,000 to 30,000 BTU/H** in vertical panel-mounted, horizontal internal rack-mounted, external top-mount and internal/externally mounted models. Both air-cooled and water-cooled types are available. Most models use centrifugal blower-driven air systems for maximum penetration. All are engineered for full-capacity performance at high ambient temperatures.

KOOLTRONIC **closed-loop** air conditioners cool, dehumidify, and recirculate clean air within the electrical enclosure through the heat producing components, providing protection from high temperatures, humidity and airborne contaminants. The **Guardian/GuardianX, Intrepid** and **Profile** Air Conditioner product lines have been designed for both indoor or outdoor use without the need for weather shielding. The **Guardian/GuardianX Series** offers models of different sizes and BTU/H outputs to choose from, as well as **NEMA 4** or **4X Ratings** and a variety of voltages, including **480 Volt**. The **Trimline** Air Conditioners, with a **NEMA 12 Rating**, features a **narrow** profile with a full complement of available options. The **Profile Series** offers the versatility and security of internal/external mounting, as well as externally mounted **480 Volt** units.

KOOLTRONIC Air Conditioners feature a **Hot Gas Bypass Valve** or other evaporator temperature controls to limit the potential for over-cooling of critical components and avoid frequent cycling of the compressor, promoting long and reliable operation. A low limit temperature control is also provided to cycle off the compressor.

KOOLTRONIC Air Conditioners are engineered for reliable performance. All applicable components are UL/CSA Recognized. **Most models are UL/CUL Listed or Recognized and maintain NEMA 12 Enclosure Rating (UL50).**

*Most KOOLTRONIC Air Conditioners are designed for normal indoor installation. Outdoor or corrosive environments require weather protection and/or special internal and external protective features. For hosedown or outdoor applications, the **Guardian** and **Intrepid** air conditioners are available. For protection against corrosive atmospheres, KOOLTRONIC offers the **GuardianX NEMA 4X** and **Integrity NEMA 4/4X Air Conditioners**.*

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet unique specifications. We invite your inquiries about our quick-response modification and custom-design capabilities.

GENERAL SPECIFICATIONS FOR ALL STANDARD AIR CONDITIONERS

CLOSED-LOOP COOLING: The enclosure interior airflow system is isolated from the ambient airflow or waterflow system. No ambient air can invade the cool, dehumidified sensitive component compartment.

BALL-BEARING MOTORS: All blower motors are UL/CSA Recognized and include automatic-reset thermal overload protection and double-sealed or double-shielded precision ball bearings. Special permanent lubricants perform over a broad temperature range: -20°F (-29°C) to 250°F (121°C). Tube axial fans are rated to perform at 14°F (-10°C) to 158°F (70°C) and are designed to meet UL, CSA and VDE.

BLOWERS: All centrifugal blowers are KOOLTRONIC-designed and built to provide optimum airflow and pressure for each air conditioner design.

RUGGED CONSTRUCTION: Precision-engineered heavy gauge steel construction of all shells and blowers insures air conditioners will stand up under tough applications.*

BAKED POWDER FINISH: Durable, baked-on powder finish is standard. Other finishes are available.*

POWER: Units are available in 115 VAC, 230 VAC or 480 Volt.

REFRIGERANTS: CFC-free R134a Refrigerant is used in all air conditioners for which compatible compressors are available. All others contain Zero Ozone Depleting Potential (ODP) R410a Refrigerant. The model number reflects the refrigerant. A 4 between the A and C signifies R134a; a 6 signifies R410a. Consult KOOLTRONIC for status at time of requirement.

FILTERS: Multi-layer grid of sturdy, corrugated aluminum in an aluminum frame. May be reused after washing off accumulations and spraying with KOOLTRONIC A-16 Recoating Adhesive. Filters must be kept free of accumulations to prevent reduction or loss of performance and/or damage to equipment. Filters are not required on water-cooled models.

CONDENSATE DISPOSAL: Condensate drain fitting and hose are included. Built-in Condensate Evaporators are standard on **TrimLine** and various other Series. (See Series sections)

POWER CORD: All models have 3-wire power cords. 480 Volt models are supplied with an external junction box for permanent wiring as a Standard Feature. Single phase UL listed units are supplied with a plug.

INSULATION: All cold components, lines and the evaporator compartment are insulated with high-performance insulation for maximum efficiency.

GASKETING: All units are fully gasketed for tight, leakproof installation in compliance with the NEMA 12, 3R or 4/4X Enclosure Ratings.

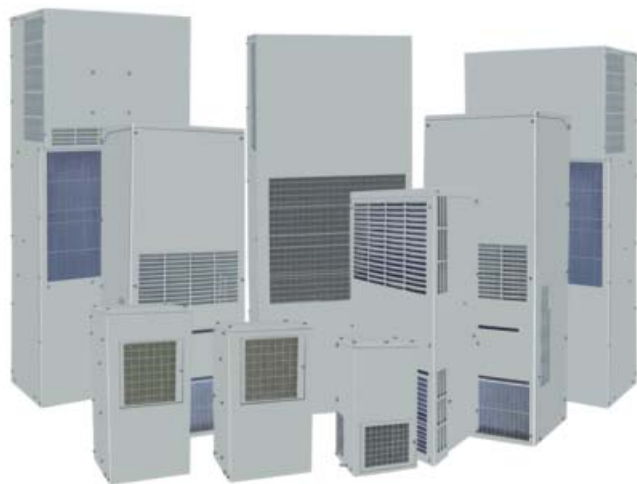
QUALITY ASSURANCE: Refrigeration system components are kept sealed until charged with refrigerant; all brazed joints are thoroughly leak-tested; each unit is functionally tested before shipment.

INSTALLATION: Online Installation Instructions with mounting plans are available on the Kooltronic website: www.kooltronic.com.

* See **Guardian/GuardianX, Guardian/GuardianX 480 Volt, Integrity NEMA 4/4X, Intrepid** and **Profile** for different specifications applicable.

GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS

GUARDIAN/GUARDIANX



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

DESCRIPTION

The **Guardian** and **GuardianX** indoor/outdoor Air Conditioners are designed specifically for NEMA 4 or 4X enclosure applications that require washdown or are subject to outdoor storm conditions. All **Guardian** models have a NEMA 4 Rating. The **GuardianX**, with a NEMA 4X Rating, is offered with a Stainless Steel Shell and Internal Corrosion Protection.

With Epoxy-coated coils and tubing, the closed-loop cooling system of the **Guardian Series** offers added security by providing an operating environment safe from harsh ambient conditions.

The **Guardian Series** consists of units with heights from 15 to 60 inches, offering from 1,000 to 26,000 BTU/H ratings. In addition to the list of standard features, these **Guardian Series** Air Conditioners are also available with a wide range of accessories and options, including remote monitoring and enclosure heaters.

The features engineered into the **Guardian/GuardianX Series** make them a tamper-resistant choice for external applications. With all models UL/CUL Listed, the **Guardian Series** is an excellent choice for telecommunications, wastewater treatment, food and beverage and other challenging applications.

General specifications common to all KOOLTRONIC Air Conditioners are on the first page of this section.

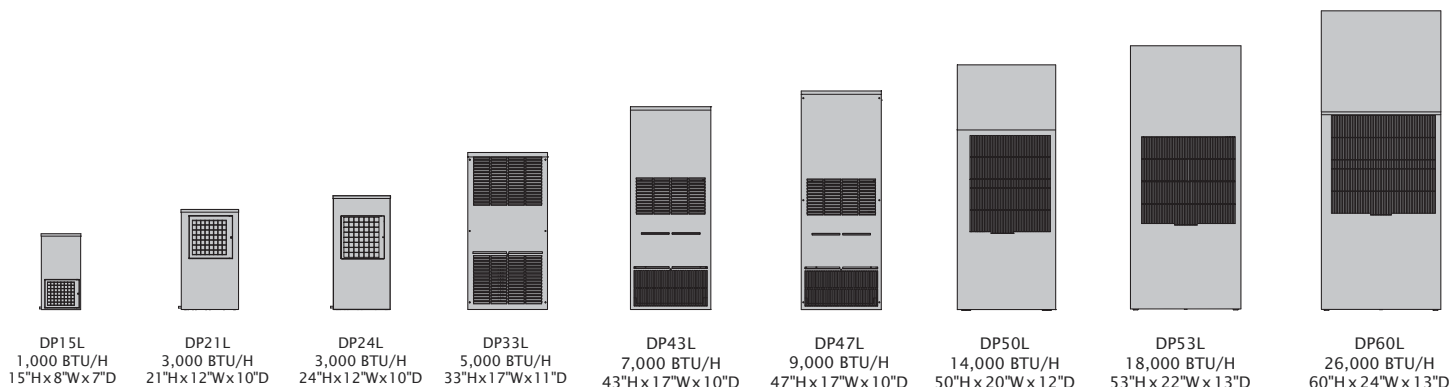
The **Guardian/GuardianX Series** also offers 480 Volt models (page 36).

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

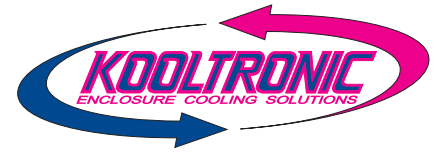
**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

STANDARD FEATURES

- All models UL/CUL Listed
- Baked Powder Finish (NEMA 4 Models)
- Built-in Condensate Evaporator
- Closed-Loop Cooling
- Condenser Blower Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Six foot [1.8m] (minimum) 3-wire power cord
- Stainless Steel Shell (NEMA 4X models)
- Zero ODP or CFC-Free Refrigerant



DP15 GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS



Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	* Hz	** Running Amps	Approx. Weight lbs kg
KNA4C1DP15L	4	Yes	Listed	1160	950	131/-20	115/100	60/50	4.3/4.3	26 12
KNA4C1DP15LV	4X	Yes	Listed	1160	950	131/-20	115/100	60/50	4.3/4.3	26 12

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.
 ** Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish (NEMA 4 Models)
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Epoxy-Coated Condenser and Evaporator Coils
- Filter
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Six-Foot [1.8m] (minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed

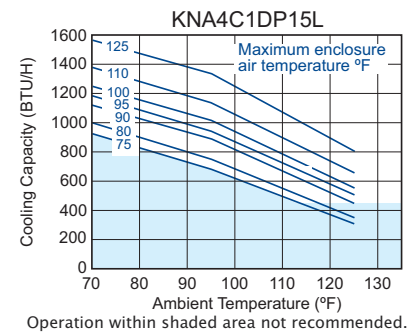
ACCESSORIES AND OPTIONS

- Adapter
- Enclosure Heater
- Filter Recoating Adhesive
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters
- Special materials or finishes
- Special motors, line cords or connectors

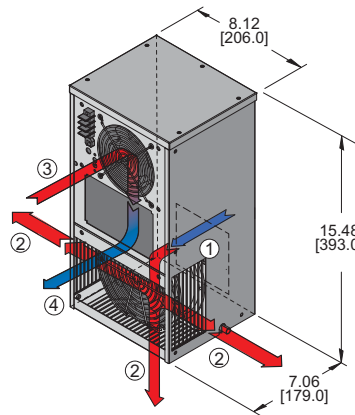
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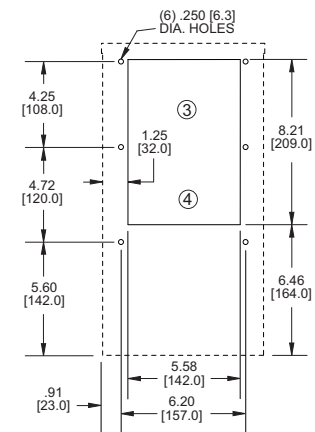
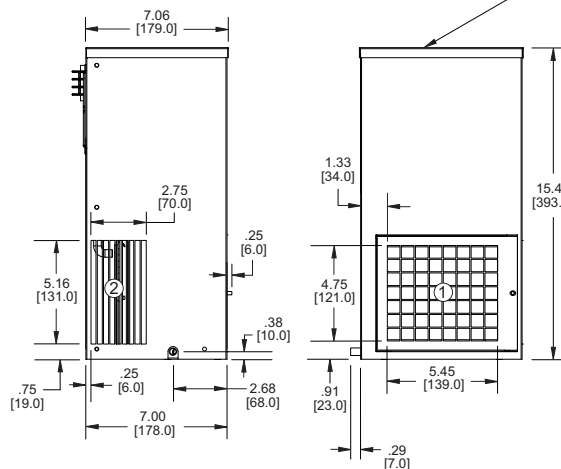
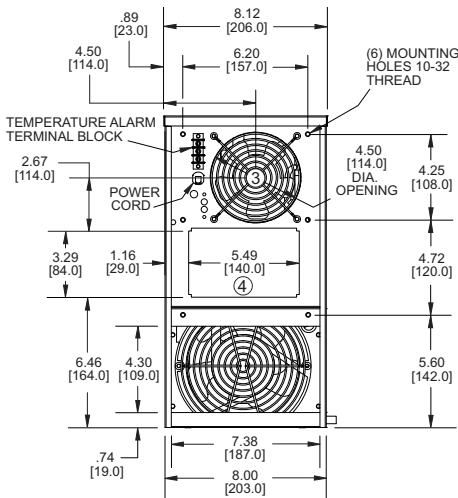
PERFORMANCE CHART



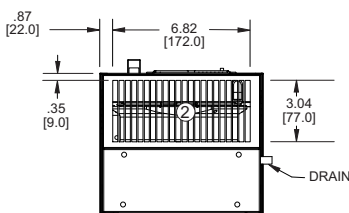
- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



NOTE: REMOVE TOP PANEL TO ACCESS PROGRAMMABLE THERMOSTAT



MOUNTING PLAN



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

GUARDIAN/GUARDIANX

DP21 GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS

Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	* Hz	** Running Amps	Approx. Weight lbs kg
KNA4C3DP21L	4	Yes	Listed	3000	2470	131/-20	115/100	60/50	6.0/5.0	54 25
KNA4C3DP21LV	4X		Listed	3000	2470	131/-20	115/100	60/50	6.0/5.0	54 25

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.

** Rating shown is for operation at maximum ambient temperature.



**NEMA
TYPE 4 OR 4X
MAINTAINED**

STANDARD FEATURES

- Baked Powder Finish (NEMA 4 Models)
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Blower Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Filter
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Six-Foot [1.8m] (minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed

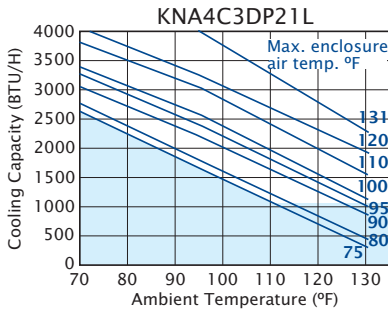
ACCESSORIES AND OPTIONS

- Adapter
- Enclosure Heater
- Filter Recoating Adhesive
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters
- Special materials or finishes
- Special motors, line cords or connectors

Page

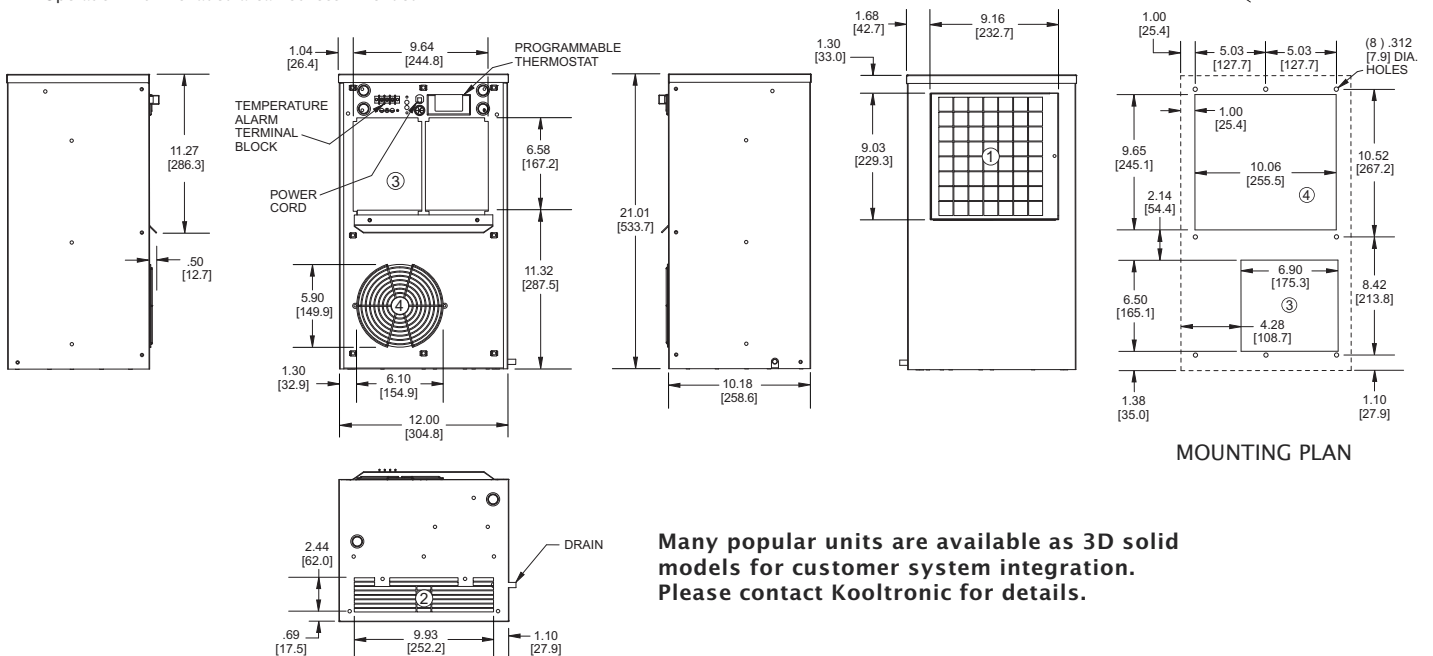
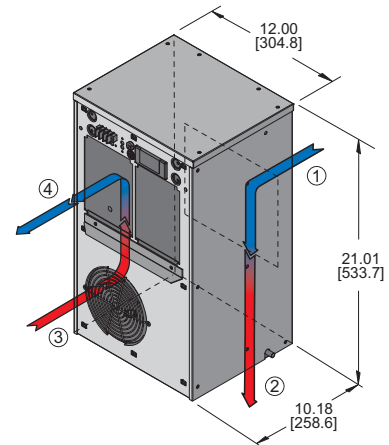
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- 80
- 80
- 80
- 82
- ◆
- ◆

PERFORMANCE CHART



Operation within shaded area not recommended.

- ① CONDENSER AIR INLET (Ambient Air In) (3 sides)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



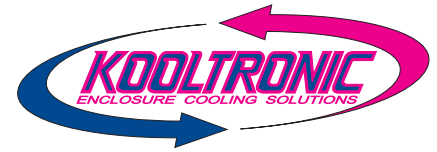
Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

◆ Contact KOOLTRONIC for information.

GUARDIAN/GUARDIANX

DP24 GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS



Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Starting Amps (LRA)	Airflow @60 Hz. Evap./Cond.	Fuse Size (Amps)	dBA @ 5 ft.	Approx. Weight lbs kg
K2NA4C3DP24L	4	Yes	Listed	3000	2500	125/-20	208/230	60	3.0	4	171/173	15	69.2	61 28
K2NA4C3DP24LV	4X	Yes	Listed	3000	2500	125/-20	208/230	60	3.0	4	171/173	15	69.2	61 28
K2NA4C3DP24L	4	Yes	Listed	3000	2500	120/-20	200	50	3.0	4	171/173	15	69.2	61 28
K2NA4C3DP24LV	4X	Yes	Listed	3000	2500	120/-20	200	50	3.0	4	171/173	15	69.2	61 28

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

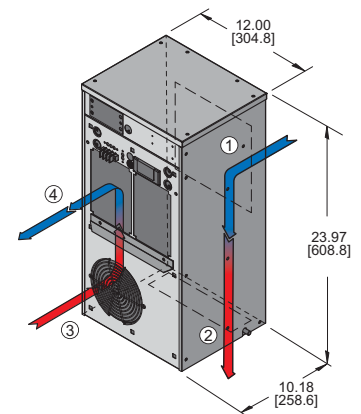
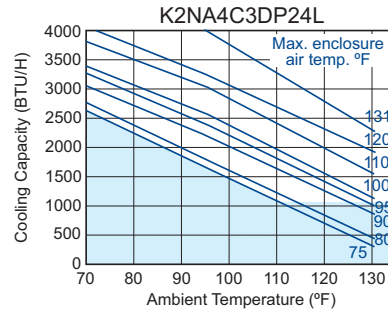
- 208/230/200 Volt
- Baked Powder Finish (NEMA 4 Models)
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Blower Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Filter
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Six-Foot [1.8m] (minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed

ACCESSORIES AND OPTIONS

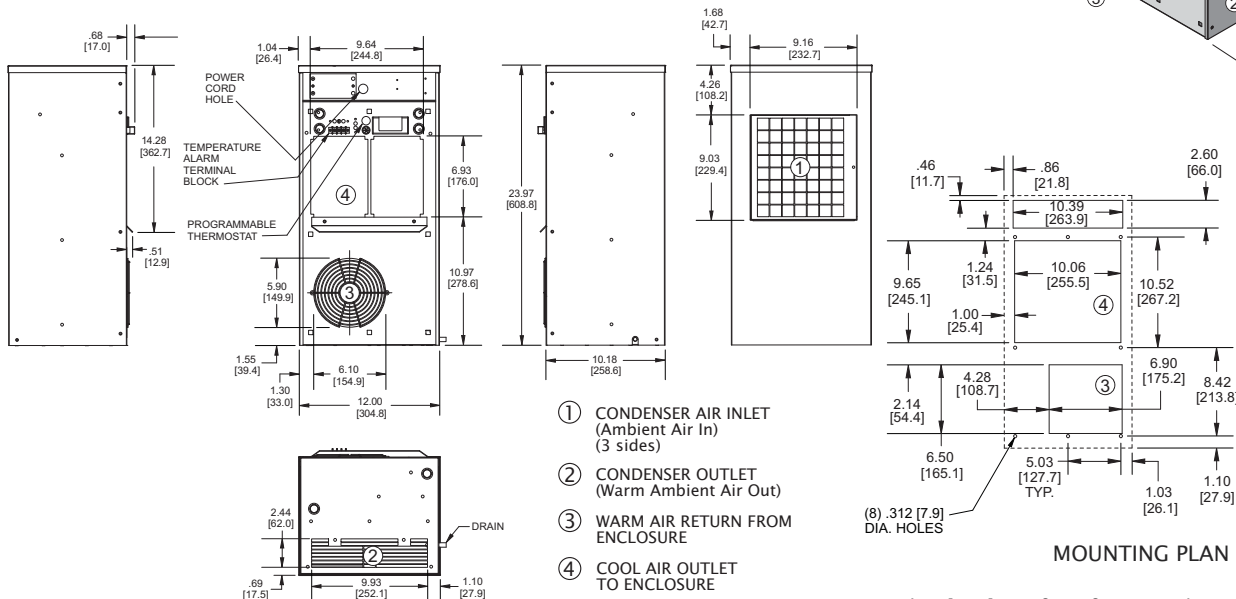
Accessory/Option	Page
■ Adapter	♦
■ Enclosure Heater	80
■ Filter Recoating Adhesive	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special materials or finishes	♦
■ Special motors line cords, or connectors	♦



PERFORMANCE CHART



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.



Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

GUARDIAN/GUARDIANX

DP33 GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS

Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	* Hz	** Running Amps	Approx. Weight lbs kg
KNA4C5DP33L	4	Yes	Listed	5000	4235	125/-20	115/100	60/50	9.7/9.4	95 44
K2NA4C5DP33L	4		Listed	5000	4235	128/-20	230/200	60/50	5.1/4.8	95 44
KNA4C5DP33LV	4X	Yes	Listed	5000	4235	125/-20	115/100	60/50	9.7/9.4	95 44
K2NA4C5DP33LV	4X		Listed	5000	4235	128/-20	230/200	60/50	5.1/4.8	95 44

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.

** Rating shown is for operation at maximum ambient temperature.



**NEMA
TYPE 4 OR 4X
MAINTAINED**

STANDARD FEATURES

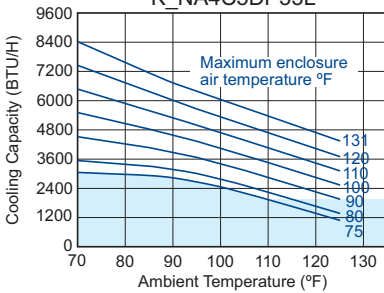
- Baked Powder Finish (NEMA 4 Models)
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Filter
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Six-Foot [1.8m] (minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed

ACCESSORIES AND OPTIONS

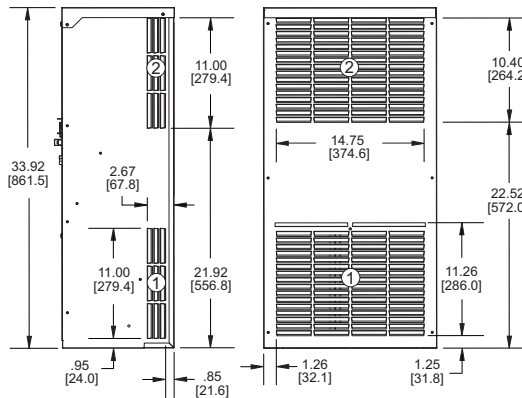
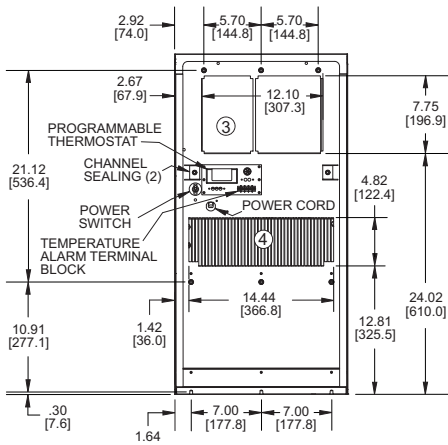
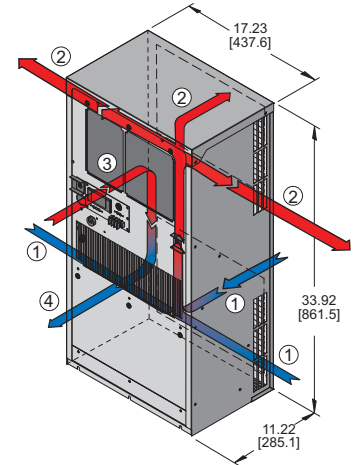
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|--|----|
| ■ Adapter | ◆ |
| ■ Enclosure Heater | 80 |
| ■ Filter Recoating Adhesive | 80 |
| ■ Remote Monitoring | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Replacement Filters | 82 |
| ■ Special materials or finishes | ◆ |
| ■ Special motors line cords, or connectors | ◆ |

PERFORMANCE CHART

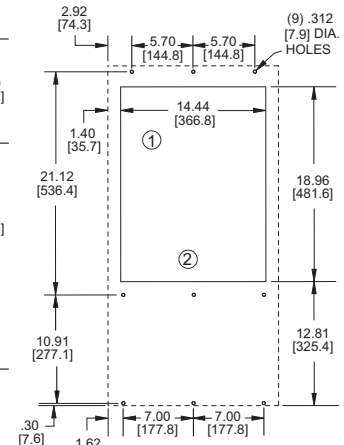
K_NA4C5DP33L



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.



- ① CONDENSER AIR INLET (Ambient Air In) (3 sides)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

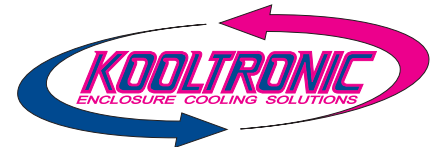


MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

◆ Contact KOOLTRONIC for information.

DP43 GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS



Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	* Hz	** Running Amps	Approx. Weight lbs kg
KNA4C7DP43L	4	Yes	Listed	7000	5509	131/-20	125/100	60/50	14.6/14.3	125 57
K2NA4C7DP43L	4		Listed	7000	5500	131/-20	230/200	60/50	6.7/6.6	125 57
KNA4C7DP43LV	4X	Yes	Listed	7000	5509	131/-20	125/100	60/50	14.6/14.3	125 57
K2NA4C7DP43LV	4X		Listed	7000	5500	131/-20	230/200	60/50	6.7/6.6	125 57

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.

** Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish (NEMA 4 models)
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Filter
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Six-Foot [1.8m] (minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed

ACCESSORIES AND OPTIONS

- Adapter
- Enclosure Heater
- Filter Recoating Adhesive
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters
- Special materials or finishes
- Special motors, line cords, or connectors

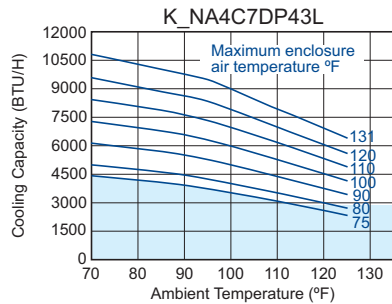
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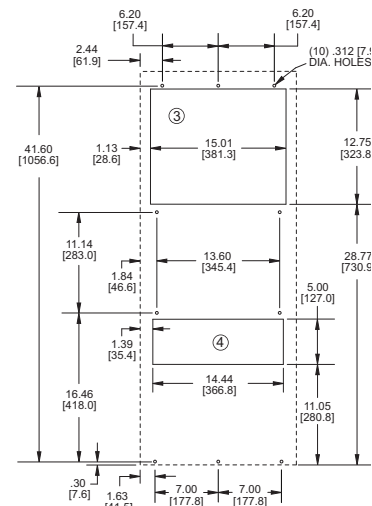
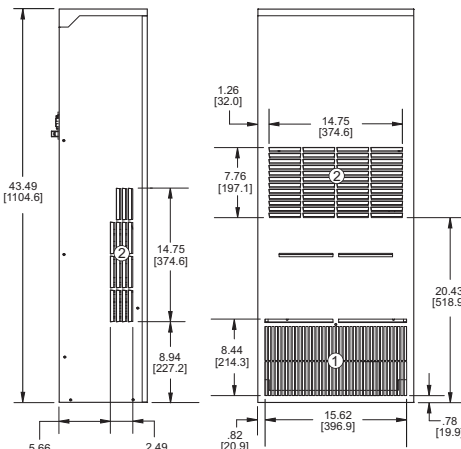
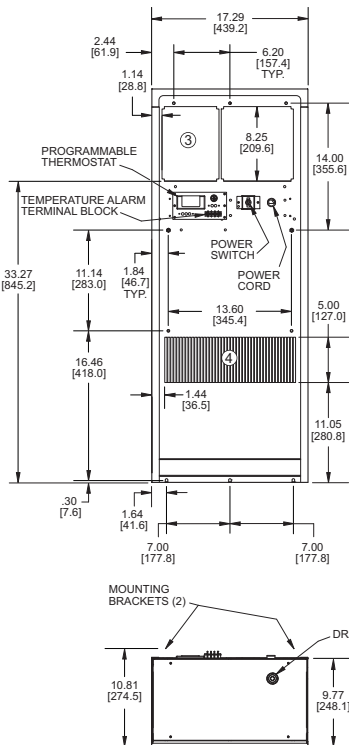
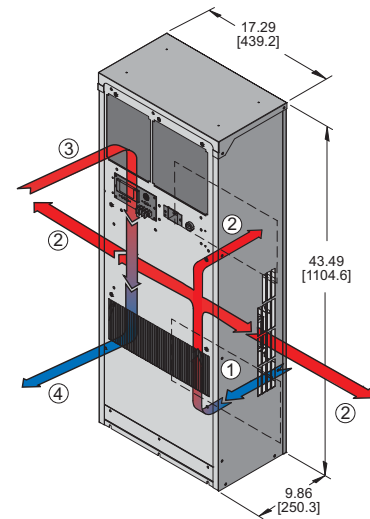


GUARDIAN/GUARDIANX

PERFORMANCE CHART



- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

† Contact KOOLTRONIC for information.

E-mail: sales@kooltronic.com

DP47 GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS



**NEMA
TYPE 4 OR 4X
MAINTAINED**

Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	** Approx. Weight lbs kg
KNA4C9DP47L	4	Yes	Listed	9000	6711	131/-20	115	60	18.5	135 62
K2NA4C9DP47L	4	Yes	Listed	9000	9632	131/-20	230	60	8.13	135 62
KNA4C9DP47LV	4X	Yes	Listed	9000	6711	131/-20	115	60	18.5	135 62
K2NA4C9DP47LV	4X		Listed	9000	9632	131/-20	230	60	8.13	135 62

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.

** Rating shown is for operation at maximum ambient temperature.

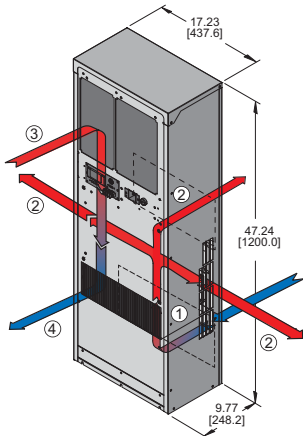
STANDARD FEATURES

- Baked Powder Finish (NEMA 4 models)
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Filter
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Six-Foot [1.8m] (minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed

ACCESSORIES AND OPTIONS

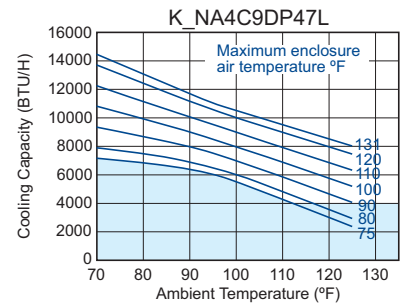
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| ■ Adapter | ♦ |
| ■ Enclosure Heater | 80 |
| ■ Filter Recoating Adhesive | 80 |
| ■ Remote Monitoring | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Replacement Filters | 82 |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords, or connectors | ♦ |

GUARDIAN/GUARDIANX

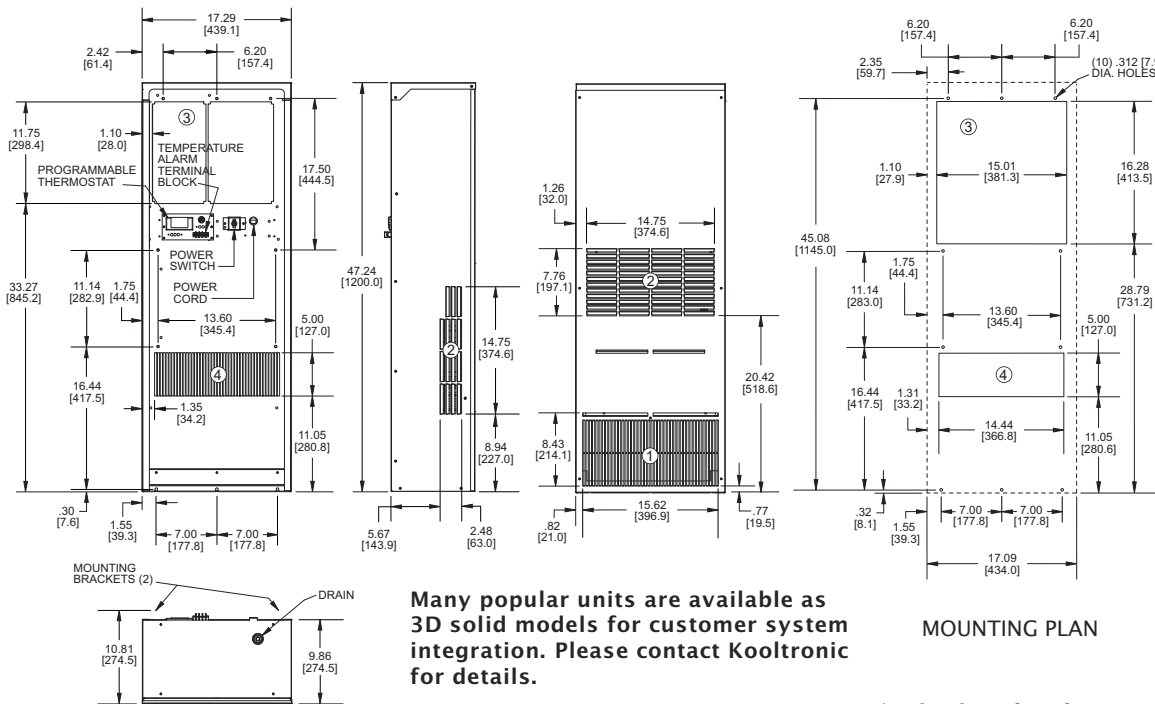


- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

PERFORMANCE CHART



Operation within shaded area not recommended.



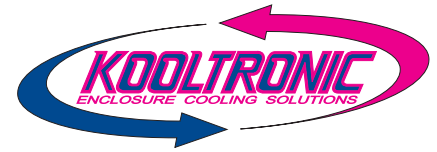
Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

DP50 GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS



Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp. °F Max./Min.	Volts	* Hz	** Running Amps	Approx. Weight lbs kg
K2NA6C14DP50L	4	Yes	Listed	14000	13000	131/-20	208/230	60	13.5	207 95
K2NA6C14DP50L	4	Yes	Listed	13100	11700	131/-20	220	50	12.5	207 95
K2NA6C14DP50LV	4X	Yes	Listed	14000	13000	131/-20	208/230	60	13.5	207 95
K2NA6C14DP50LV	4X	Yes	Listed	13100	11700	131/-20	220	50	12.5	207 95

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.
** Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish (NEMA 4 models)
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Blower Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Filters (2)
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed
- Zero ODP Refrigerant

ACCESSORIES AND OPTIONS

- Adapter
- Enclosure Heater
- Filter Recoating Adhesive
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters
- Special materials or finishes
- Special motors, line cords, or connectors

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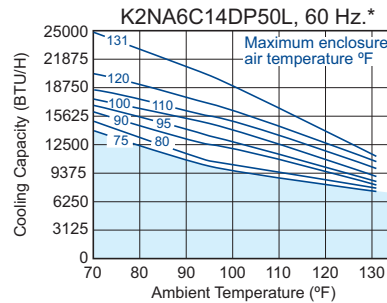


NEMA TYPE 4 OR 4X MAINTAINED

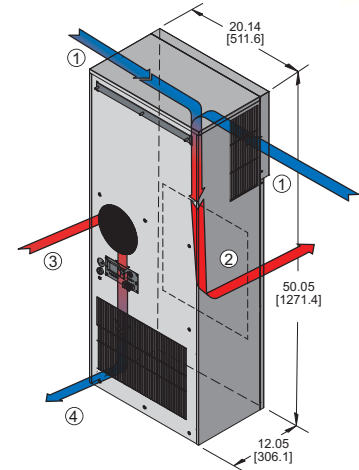


GUARDIAN/GUARDIANX

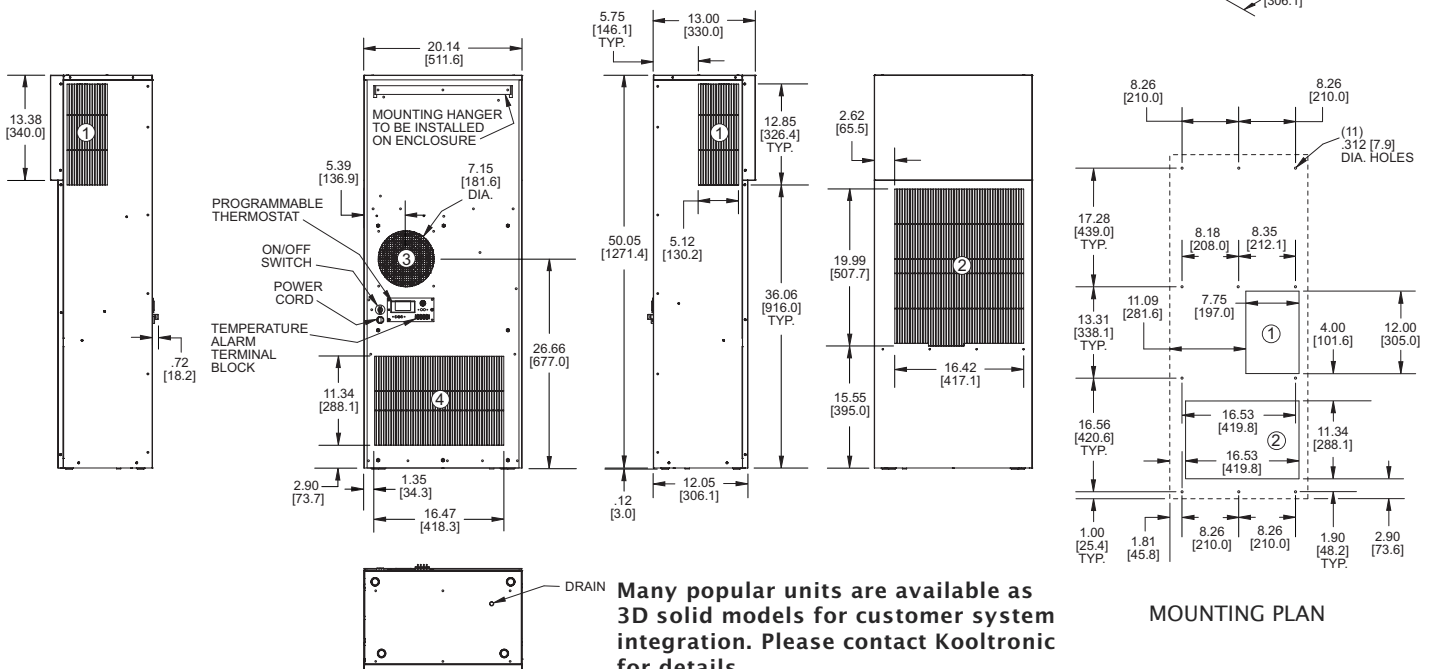
PERFORMANCE CHART



Operation within shaded area not recommended.
* Operation at 50 Hz will be 10 % less.



- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

† Contact KOOLTRONIC for information.

E-mail: sales@kooltronic.com

DP53 GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS

Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp. °F Max./Min.	Volts	* Hz	** Running Amps	Approx. Weight lbs kg
K2NA6C18DP53L	4	Yes	Listed	18000	15800	125/-20	208/230	60	20.0/17.1	224 102
K2NA6C18DP53L	4	Yes	Listed	14400	13000	131/-20	220	50	17.2	224 102
K2NA6C18DP53LV	4X	Yes	Listed	18000	15800	125/-20	208/230	60	20.0/17.1	224 102
K2NA6C18DP53LV	4X	Yes	Listed	14400	13000	131/-20	220	50	17.2	224 102

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.
** Rating shown is for operation at maximum ambient temperature.

ACCESSORIES AND OPTIONS

Accessory/Option	Page
Adapter	♦
Enclosure Heater	80
Filter Recoating Adhesive	80
Remote Monitoring	80
Remote Thermostat Relay	80
Replacement Filters	82
Special materials or finishes	♦
Special motors, line cords, or connectors	♦

STANDARD FEATURES

- Baked Powder Finish (NEMA 4 models)
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Blower Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Filters (2)
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed
- Zero ODP Refrigerant

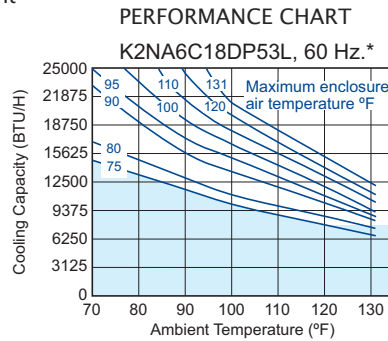


**NEMA
TYPE 4 OR 4X
MAINTAINED**

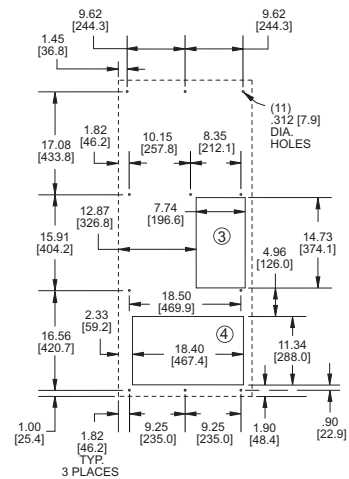
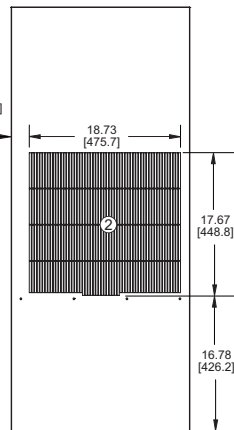
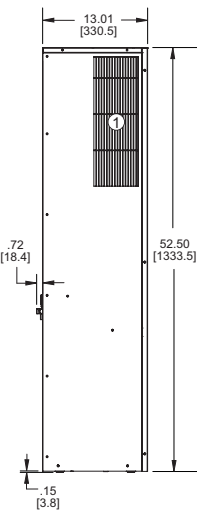
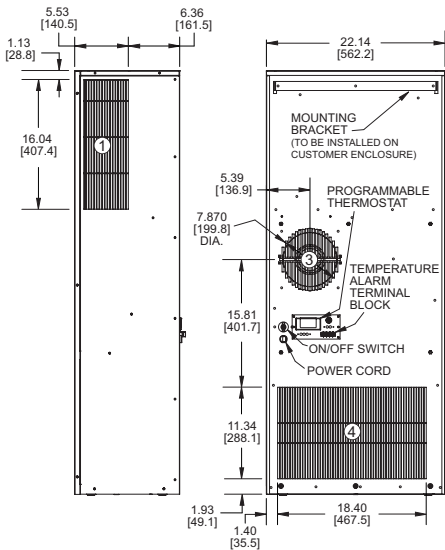
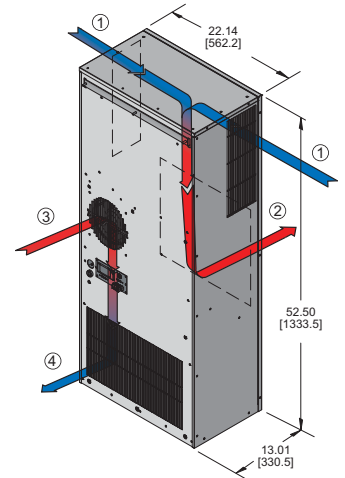


GUARDIAN/GUARDIANX

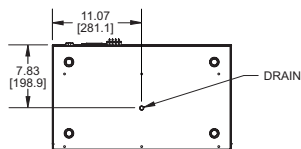
- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



Operation within shaded area not recommended.
* Operation at 50 Hz will be 10% less.



MOUNTING PLAN

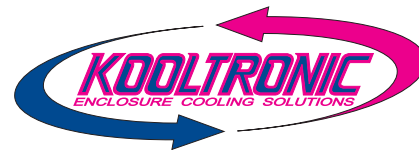


Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

DP60 GUARDIAN/GUARDIANX NEMA 4 OR 4X AIR CONDITIONERS



Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp. °F Max./Min.	Volts	* Hz	** Running Amps	Approx. Weight lbs kg
K2NA6C26DP60L	4	Yes	Listed	26000	18279	129/-20	230	60	24.7	262 120
K2NA6C26DP60LV	4X	Yes	Listed	26000	18279	129/-20	230	60	24.7	262 120

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.

** Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish (NEMA 4 models)
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Blower Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Filters (2)
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed
- Zero ODP Refrigerant

ACCESSORIES AND OPTIONS

- Adapter
- Enclosure Heater
- Filter Recoating Adhesive
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters
- Special materials or finishes
- Special motors line cords, or connectors

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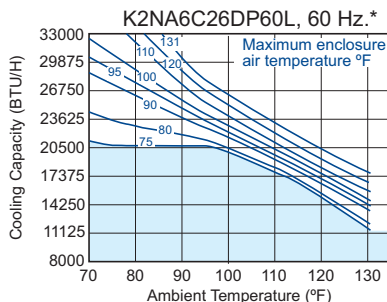


**NEMA
TYPE 4 OR 4X
MAINTAINED**

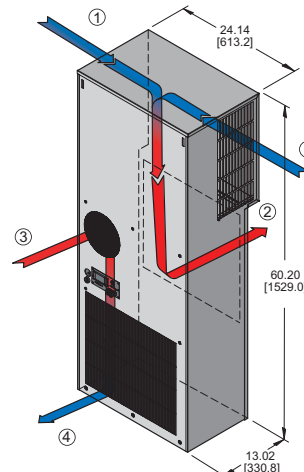


GUARDIAN/GUARDIANX

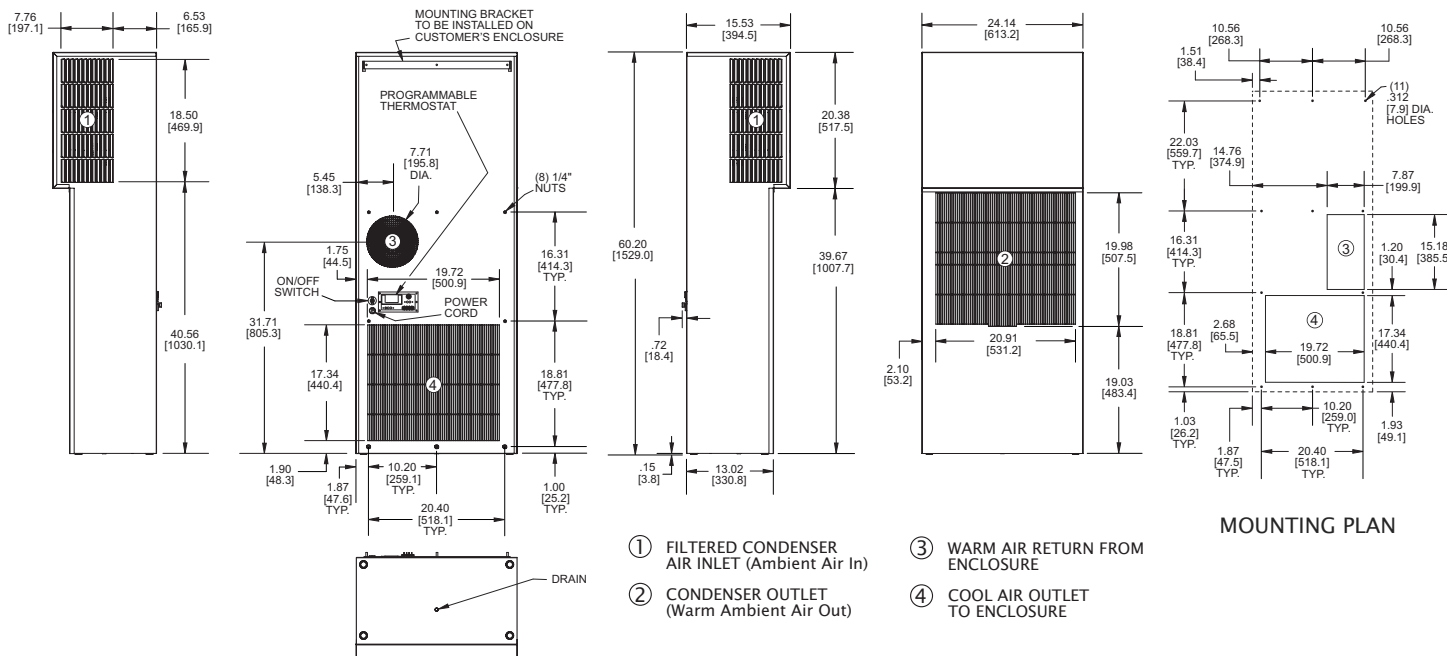
PERFORMANCE CHART



Operation within shaded area not recommended.
* Operation at 50 Hz will be 10 % less.



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.



Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

E-mail: sales@kooltronic.com

GUARDIAN/GUARDIANX 480 VOLT NEMA 4 OR 4X AIR CONDITIONERS

GUARDIAN/GUARDIANX 480 VOLT



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

DESCRIPTION

The **Guardian/GuardianX 480 Volt Series** indoor/outdoor Air Conditioners are designed specifically for NEMA 4 or 4X enclosure applications that require washdown or are subject to outdoor storm conditions. All **Guardian** models have a NEMA 4 Rating. The **GuardianX**, with a NEMA 4X Rating, is offered with a Stainless Steel Shell and Internal Corrosion Protection. These Air Conditioners have been engineered to operate under the most demanding industrial applications. The components used in these models have been specially designed and tested to maintain cooling efficiency in temperature controlled enclosures in bottling plants, the automotive industry and other commercial/manufacturing applications.

With Epoxy-coated coils and tubing, the closed-loop cooling system of the **Guardian/GuardianX 480 Volt Series** offers added security by providing an operating environment safe from harsh ambient conditions.

The **Guardian/GuardianX 480 Volt Series** consists of units with heights from 24 to 60 inches, offering from 3,000 to 26,000 BTU/H ratings. In addition to the list of standard features, these **Guardian/GuardianX 480 Volt Series** Air Conditioners are also available with a wide range of accessories and options, including remote monitoring and enclosure heaters.

The features engineered into the **Guardian/GuardianX 480 Volt Series** make them a tamper-resistant choice for external applications. With all models UL/CUL Listed, the **Guardian Series** is an excellent choice for telecommunications, wastewater treatment, food and beverage and other challenging applications.

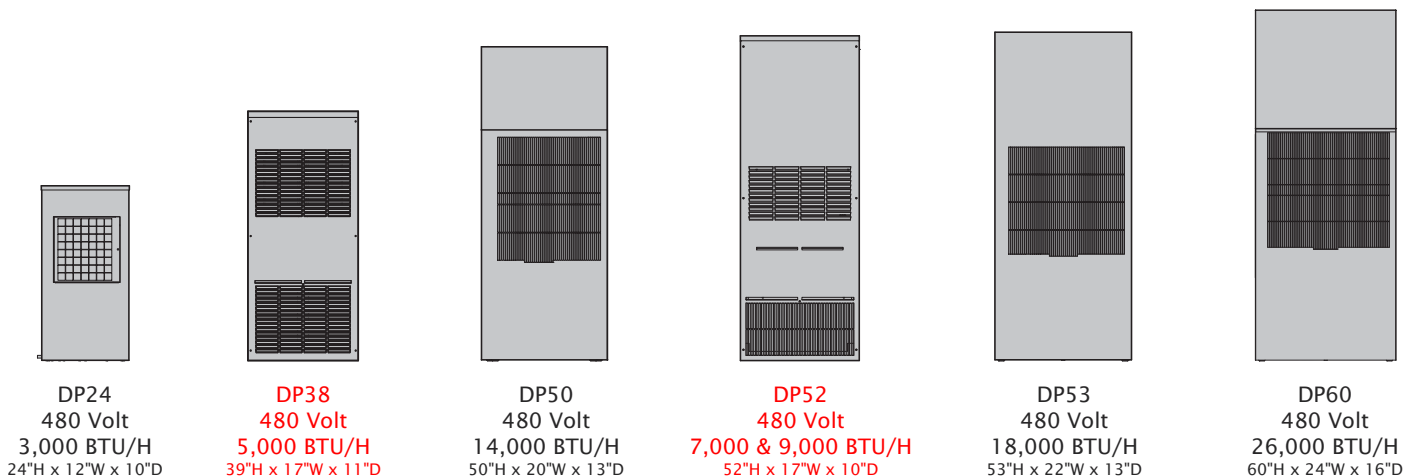
General specifications common to all KOOLTRONIC Air Conditioners are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

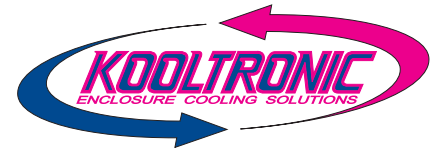
**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

STANDARD FEATURES

- All models UL/CUL Listed
- Baked Powder Finish (NEMA 4 Models)
- Closed-Loop Cooling
- Epoxy-Coated Condenser and Evaporator Coils
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel Shell (NEMA 4X models)
- Zero ODP or CFC-Free Refrigerant



DP24 GUARDIAN/GUARDIANX 480 VOLT 1-PHASE NEMA 4 OR 4X AIR CONDITIONERS



Model	NEMA Rating	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts/Phase	Hz	* Running Amps	Starting Amps (LRA)	Airflow @60 Hz. Evap./Cond.	Fuse Size (Amps)	dBA @ 5 ft.	Approx. Weight lbs kg
K3NA4C3DP24L**	4	3000	2500	125/-20	480/1	60	1.4	4	171/173	15	69.2	61 28
K3NA4C3DP24LV**	4X	3000	2500	125/-20	480/1	60	1.4	4	171/173	15	69.2	61 28

* Rating shown is for operation at maximum ambient temperature.
** Normally in Stock.

STANDARD FEATURES

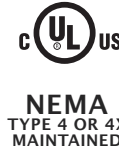
- 480 Volt 1-Phase
- Baked Powder Finish (NEMA 4 models)
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Blower Controller
- Epoxy-Coated Condenser and Evaporator Coils
- Filter
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed

ACCESSORIES AND OPTIONS

- Adapter
- Enclosure Heater
- Filter Recoating Adhesive
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters
- Special paint finishes

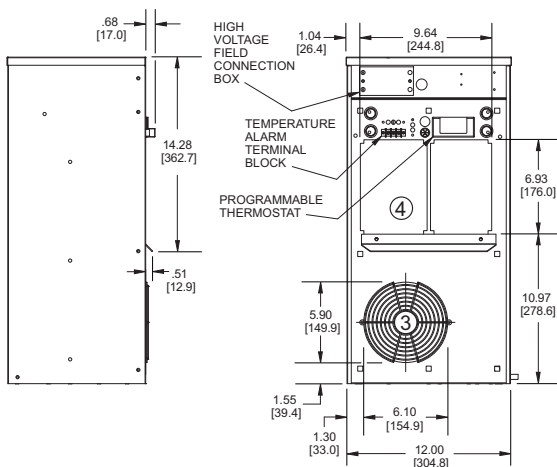
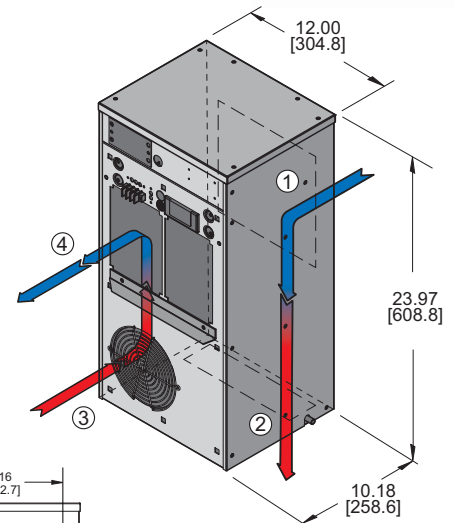
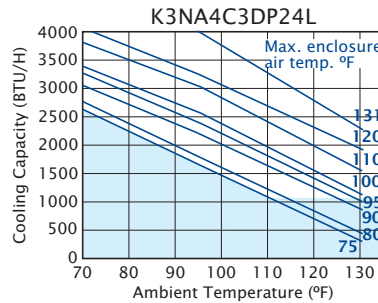
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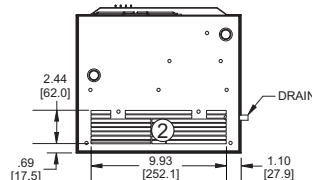


GUARDIAN/GUARDIANX 480 VOLT

PERFORMANCE CHART

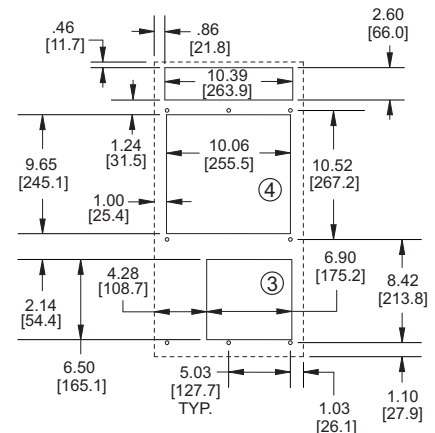


- ① CONDENSER AIR INLET (Ambient Air In) (3 sides)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

◆ Contact KOOLTRONIC for information.

DP38 GUARDIAN/GUARDIANX 480 VOLT NEMA 4 OR 4X AIR CONDITIONERS

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.



Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
K3NA4C5DP38L	4		Listed	5000	4800	131/0	480	60	2.0	115 52
K3NA4C5DP38LV	4X		Listed	5000	4800	131/0	480	60	2.0	115 52

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

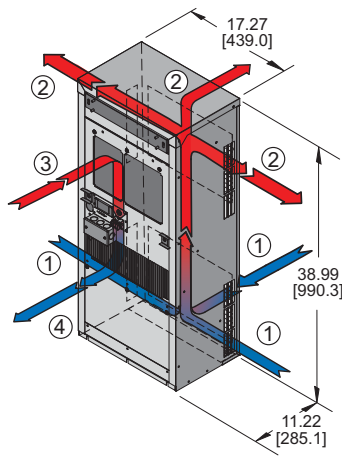
- Baked Powder Finish (NEMA 4 models)
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser and Evaporator Coils
- External junction box for permanent wiring connection
- Filter
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Phase Sequence/Phase Loss Detector/Under Voltage Monitor
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed

ACCESSORIES AND OPTIONS

- | | Page |
|-----------------------------|------|
| ■ Adapter | ♦ |
| ■ Enclosure Heater | 80 |
| ■ Filter Recoating Adhesive | 80 |
| ■ Remote Monitoring | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Replacement Filters | 82 |
| ■ Special paint finishes | ♦ |

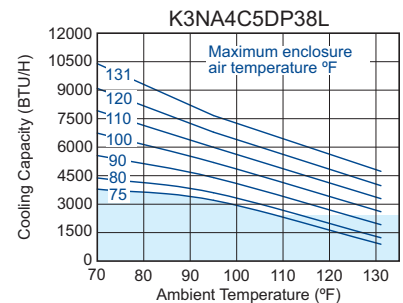


NEMA TYPE 4 OR 4X MAINTAINED

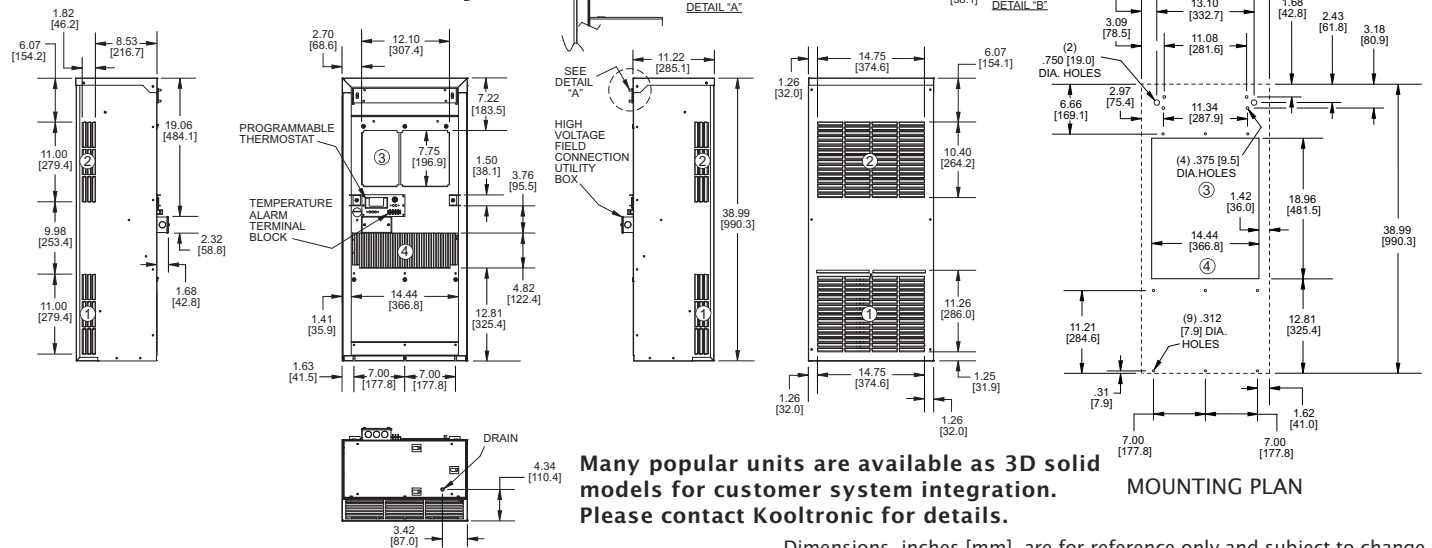


- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

PERFORMANCE CHART



Operation within shaded area not recommended.



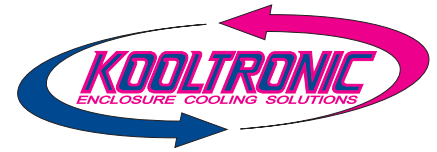
Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

DP50 GUARDIAN/GUARDIANX 480 VOLT NEMA 4 OR 4X AIR CONDITIONERS



Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
K3NA6C14DP50L	4		Listed	14000	12633	131/-20	480	60	6.31	207 94
K3NA6C14DP50LV	4X		Listed	14000	12633	131/-20	480	60	6.31	207 94

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish (NEMA 4 models)
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Epoxy-Coated Condenser and Evaporator Coils
- External junction box for permanent wiring connections
- Filters (2)
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed
- Zero ODP Refrigerant

ACCESSORIES AND OPTIONS

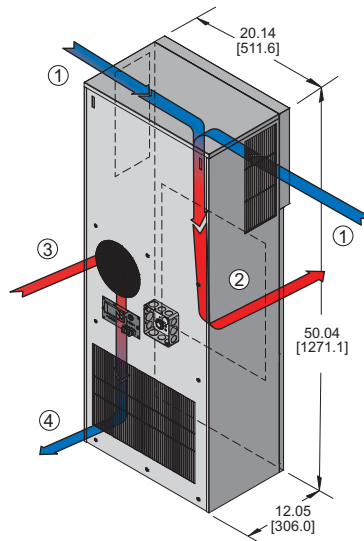
- Adapter
- Enclosure Heater
- Filter Recoating Adhesive
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters
- Special paint finishes

Page

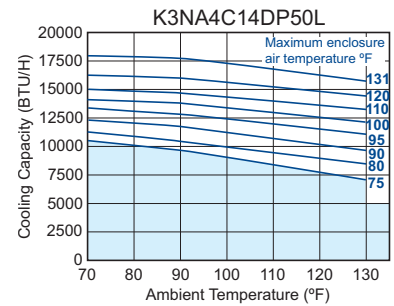
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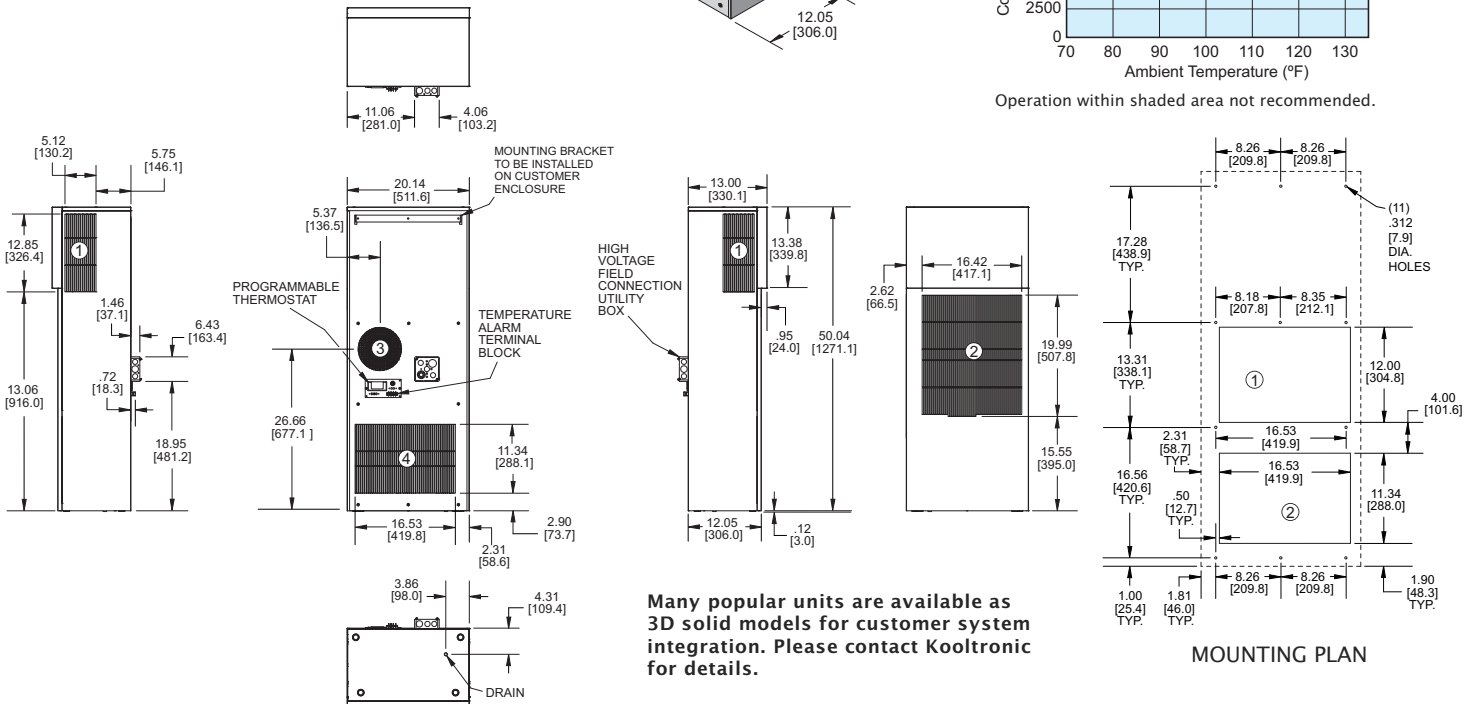
- ① CONDENSER AIR INLET (Ambient Air In) (2 sides)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



PERFORMANCE CHART



Operation within shaded area not recommended.



MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

◆ Contact KOOLTRONIC for information.

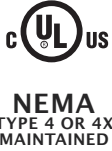
GUARDIAN/GUARDIANX 480 VOLT

DP52 GUARDIAN/GUARDIANX 480 VOLT NEMA 4 OR 4X AIR CONDITIONERS

Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
K3NA4C7DP52L	4		Listed	7000	6300	131/0	480	60	3.0	160 73
K3NA4C9DP52L	4		Listed	9000	8100	131/0	480	60	4.0	164 74
K3NA4C7DP52LV	4X		Listed	7000	6300	131/0	480	60	3.0	160 73
K3NA4C9DP52LV	4X		Listed	9000	8100	131/0	480	60	4.0	164 74

* Rating shown is for operation at maximum ambient temperature.



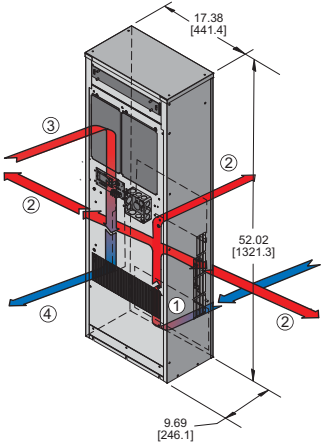
STANDARD FEATURES

- Baked Powder Finish (NEMA 4 models)
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Epoxy-Coated Condenser and Evaporator Coils
- External junction box for permanent wiring connections
- Filters (2)
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Phase Sequence/Phase Loss Detector/Under Voltage Monitor
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed

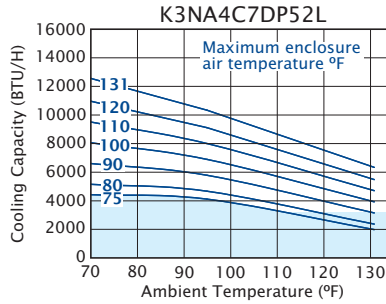
ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Adapter	♦
■ Enclosure Heater	80
■ Filter Recoating Adhesive	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special paint finishes	♦

GUARDIAN/GUARDIANX 480 VOLT

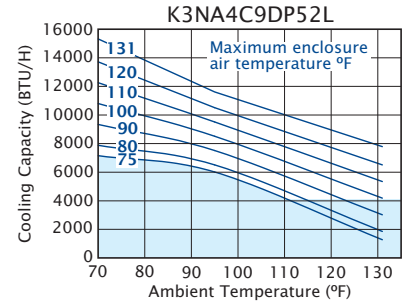


PERFORMANCE CHART

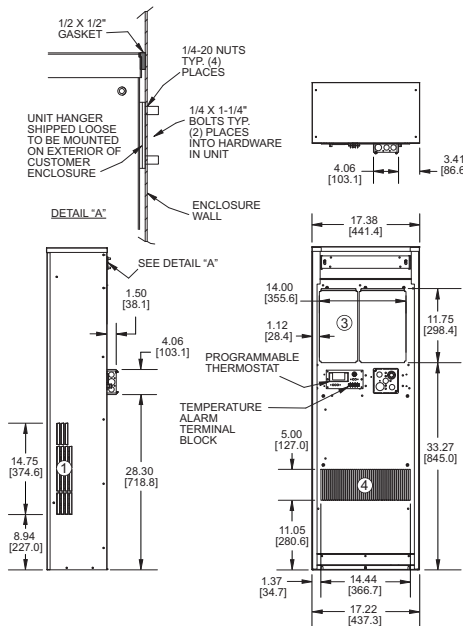


Operation within shaded area not recommended.

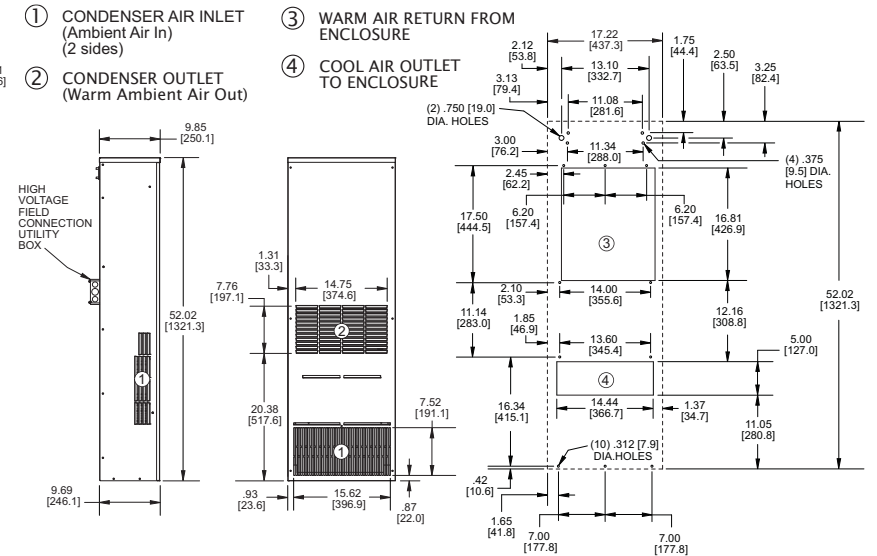
PERFORMANCE CHART



Operation within shaded area not recommended.

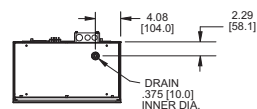


- ① CONDENSER AIR INLET (Ambient Air In) (2 sides)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



MOUNTING PLAN

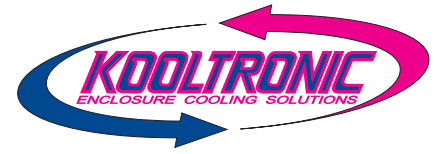
Many popular units are available as 3D solid models for customer system integration. Please contact Kooldronic for details.



Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

DP53 GUARDIAN/GUARDIANX 480 VOLT NEMA 4 OR 4X AIR CONDITIONERS



Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
K3NA6C18DP53L	4		Listed	18000	16300	131/0	480	60	7.25	224 102
K3NA6C18DP53LV	4X		Listed	18000	16300	131/0	480	60	7.25	224 102

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish (NEMA 4 models)
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Blower Controller
- Epoxy-Coated Condenser and Evaporator Coils
- External junction box for permanent wiring connections
- Filters (2)
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed
- Zero ODP Refrigerant

ACCESSORIES AND OPTIONS

- Adapter
- Enclosure Heater
- Filter Recoating Adhesive
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters
- Special paint finishes

Page

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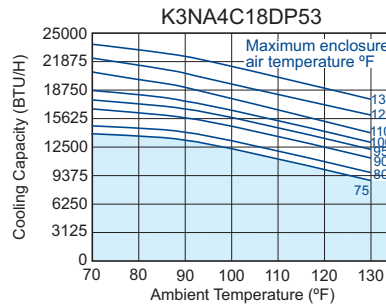


**NEMA
TYPE 4 OR 4X
MAINTAINED**

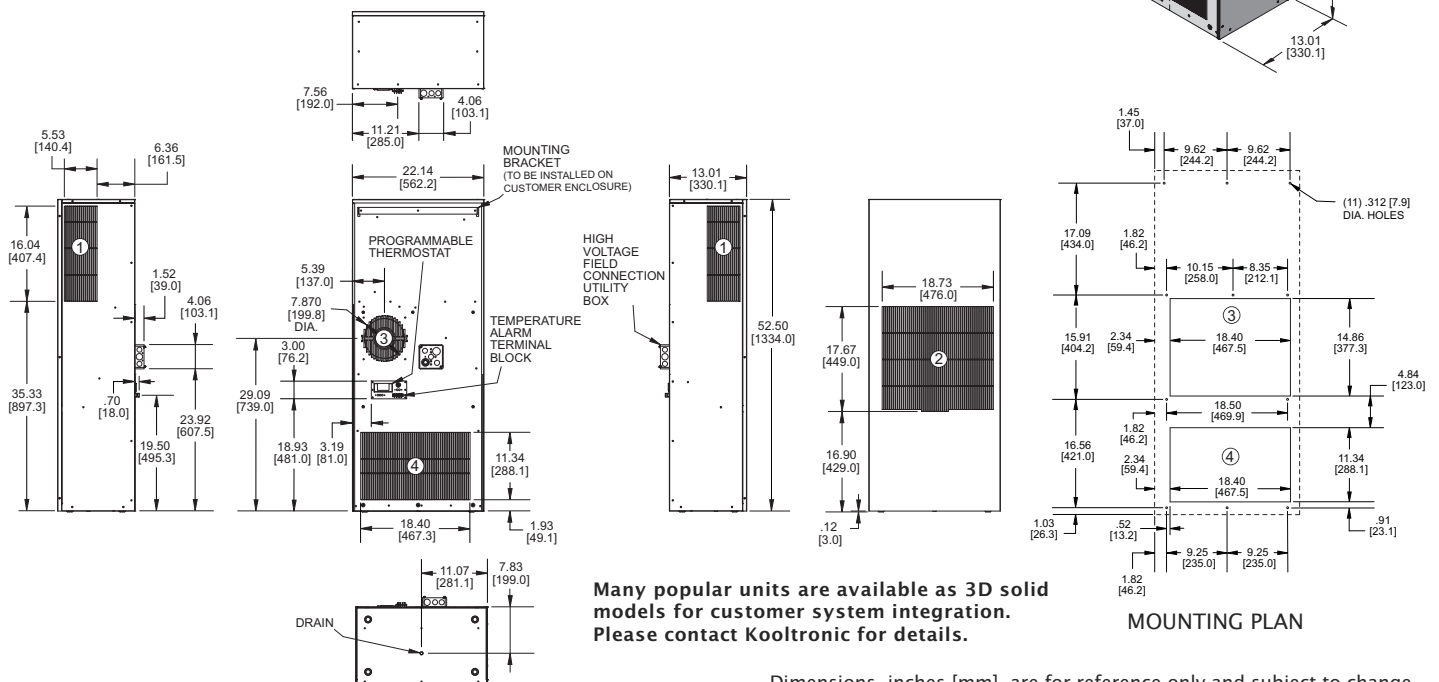
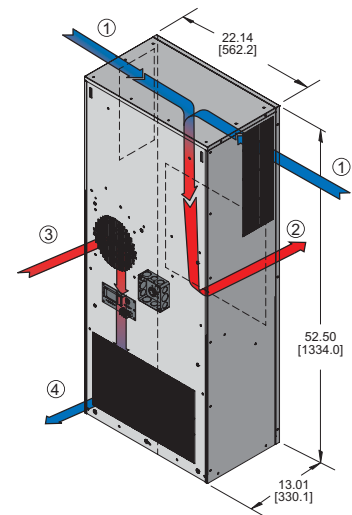


GUARDIAN/GUARDIANX 480 VOLT

PERFORMANCE CHART



- ① CONDENSER AIR INLET (Ambient Air In) (2 sides)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



Dimensions, inches [mm], are for reference only and subject to change.

◆ Contact KOOLTRONIC for information.

DP60 GUARDIAN/GUARDIANX 480 VOLT NEMA 4 OR 4X AIR CONDITIONERS

Model	NEMA Rating	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
K3NA6C26DP60L	4		Listed	26000	22242	125/-20	480	60	8.61	262 119
K3NA6C26DP60LV	4X		Listed	26000	22242	125/-20	480	60	8.61	262 119

* Rating shown is for operation at maximum ambient temperature.

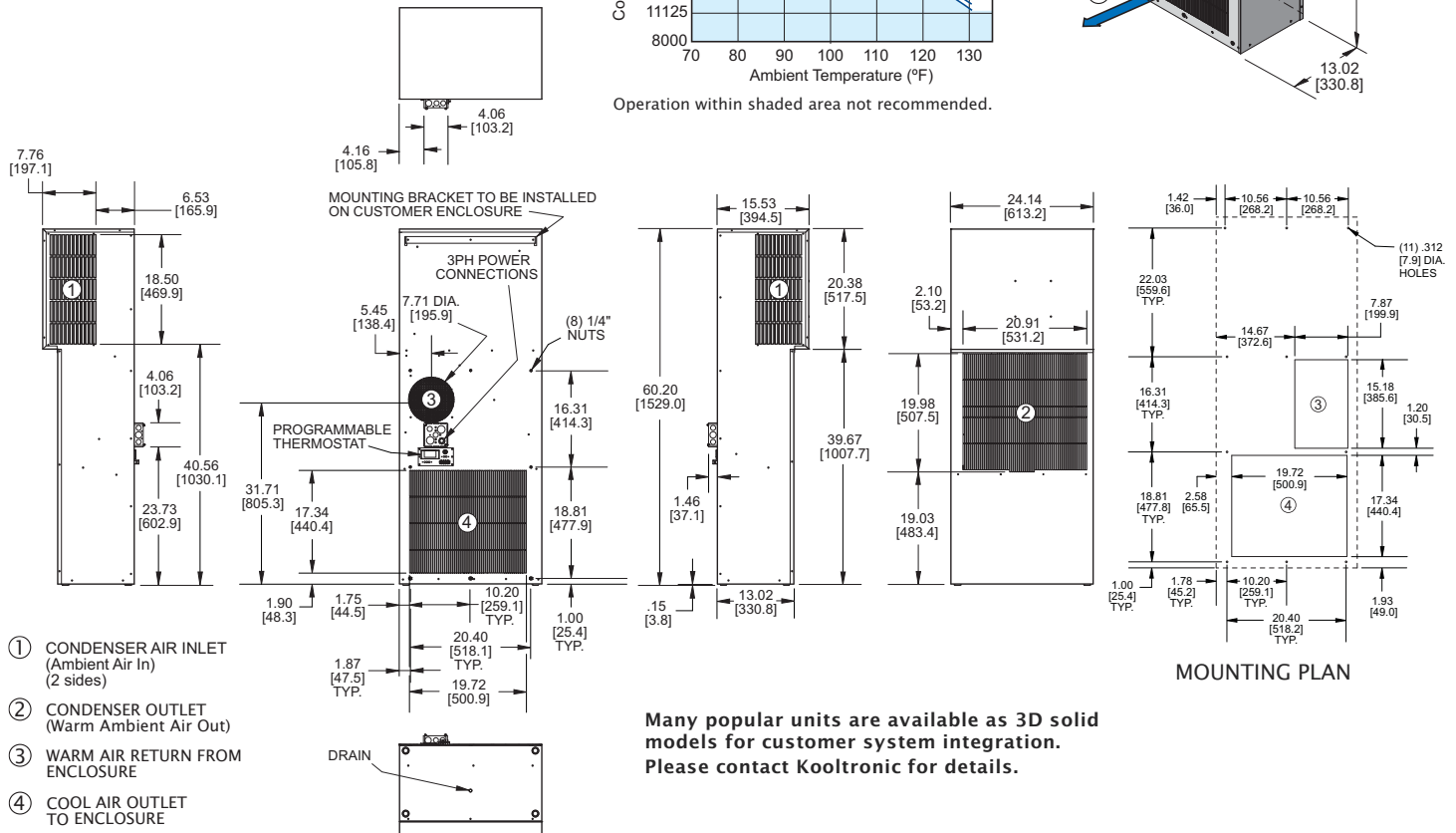
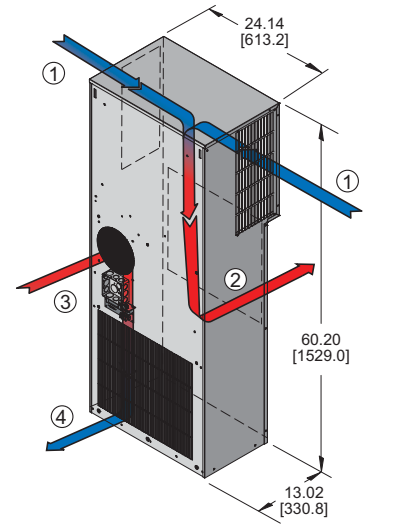
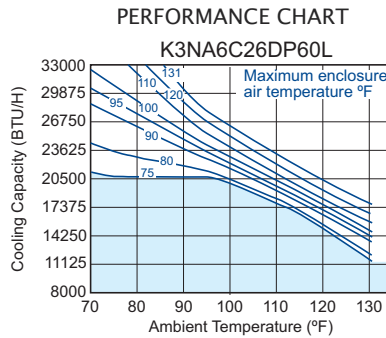
STANDARD FEATURES

- Baked Powder Finish (NEMA 4 models)
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Blower Controller
- Epoxy-Coated Condenser and Evaporator Coils
- External junction box for permanent wiring connections
- Filters (2)
- Heavy-duty Steel Shell (NEMA 4 models)
- Internal Corrosion Protection (NEMA 4X models)
- NEMA 4 or 4X Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed
- Zero ODP Refrigerant

ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Adapter	♦
■ Enclosure Heater	80
■ Filter Recoating Adhesive	80
■ Lead-Lag Controller	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special paint finishes	♦

GUARDIAN/GUARDIANX 480 VOLT

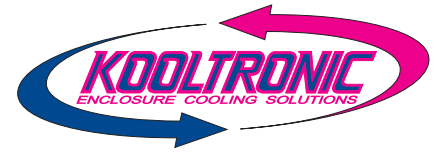


Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

PROFILE AIR-COOLED INTERNAL/EXTERNAL MOUNT AIR CONDITIONERS



DESCRIPTION

The **Profile Series** Air Conditioners are designed specifically for cooling electronic enclosures and can be used for both indoor and outdoor applications. Engineered to be mounted either outside or inside of an enclosure, the **Profile Series** Air Conditioners are the first Kooltronic models to offer this degree of flexibility.

The narrow depth of the **Profile Series** DP17 through DP47 allows the option of internal mounting, making the units virtually tamper-proof. The features engineered into these units make them a tamper-resistant choice for external applications. Combined with NEMA 12 & 3R Ratings, with all models UL/CUL Listed, the **Profile Series** is an excellent choice for telecommunications or other outdoor cabinet applications.

In addition to the list of standard features, these **Profile Series** models are also available with a wide range of accessories and options including a compressor short-cycle protector and temperature alarm. The **Profile Series DP17 & DP21** feature a Programmable Thermostat as a Standard Feature.

The **Profile Series** consists of five air conditioners ranging in heights from 17 to 47 inches with capacities from 2,000 to 9,000 BTU/H.

The **Profile Series** also offers 480 Volt models (page 49).

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.



**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

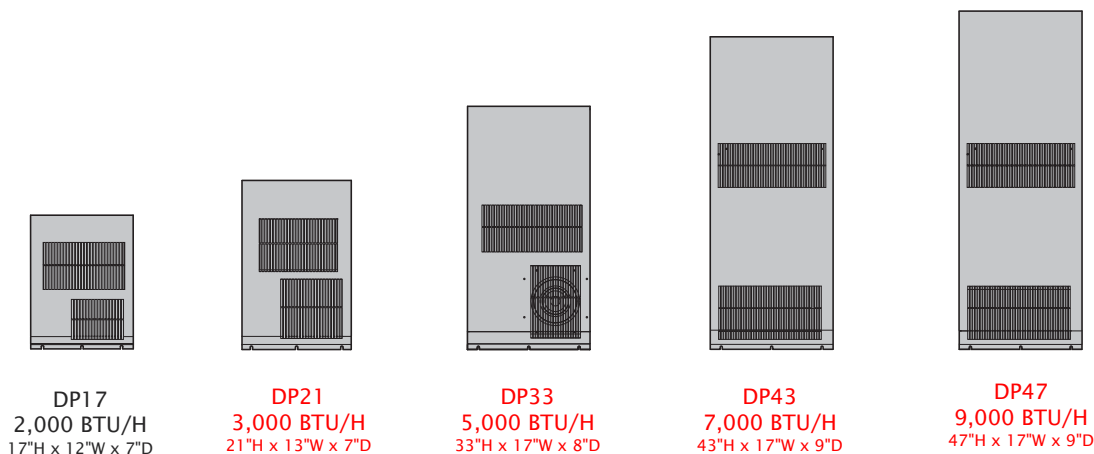
Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

STANDARD FEATURES

- 5 Models Mount Internally or Externally
- All Models UL/CUL Listed
- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller (DP33, DP43 & DP47)
- Epoxy-Coated Condenser Coil
- Heavy-duty Steel Shell
- NEMA 12 & 3R Ratings Maintained (UL50)
- Programmable Thermostat (DP17 & DP21)
- Programmable Temperature Alarm (DP17 & DP21)
- Six foot [1.8m] (minimum) 3-wire power cord
- Thermostatic Low Temperature Control (DP33, DP43 & DP47)



PROFILE

DP17 PROFILE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS

Model	Normally In Stock	UL/CUL		BTU/H Rating	95/95 Rating	Ambient Temp. °F		* Hz	** Running Amps	Approx. Weight	
		Listed or Recognized				Max./Min.	Volts			lbs	kg
KA4C2DP17L	Yes	Listed		2000	1500	131/-20	115/100	60/50	4.0	38	17

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.
** Rating shown is for operation at maximum ambient temperature.



STANDARD FEATURES

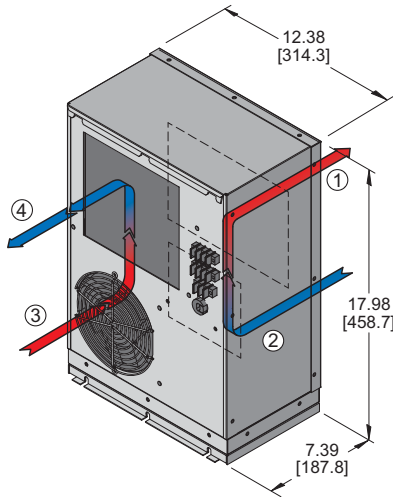
- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Epoxy-Coated Condenser Coil
- Heavy-duty Steel Shell
- Mounts Internally or Externally
- NEMA 12 & 3R Ratings Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- UL/CUL Listed

ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Adapter	♦
■ Enclosure Heater	80
■ Filter	82
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	♦
■ Replacement Filters	82
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Stainless Steel Shell	80

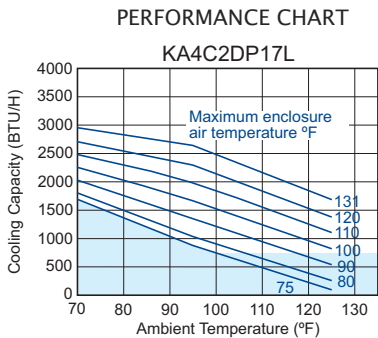


NEMA
TYPE 12 & 3R
MAINTAINED



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

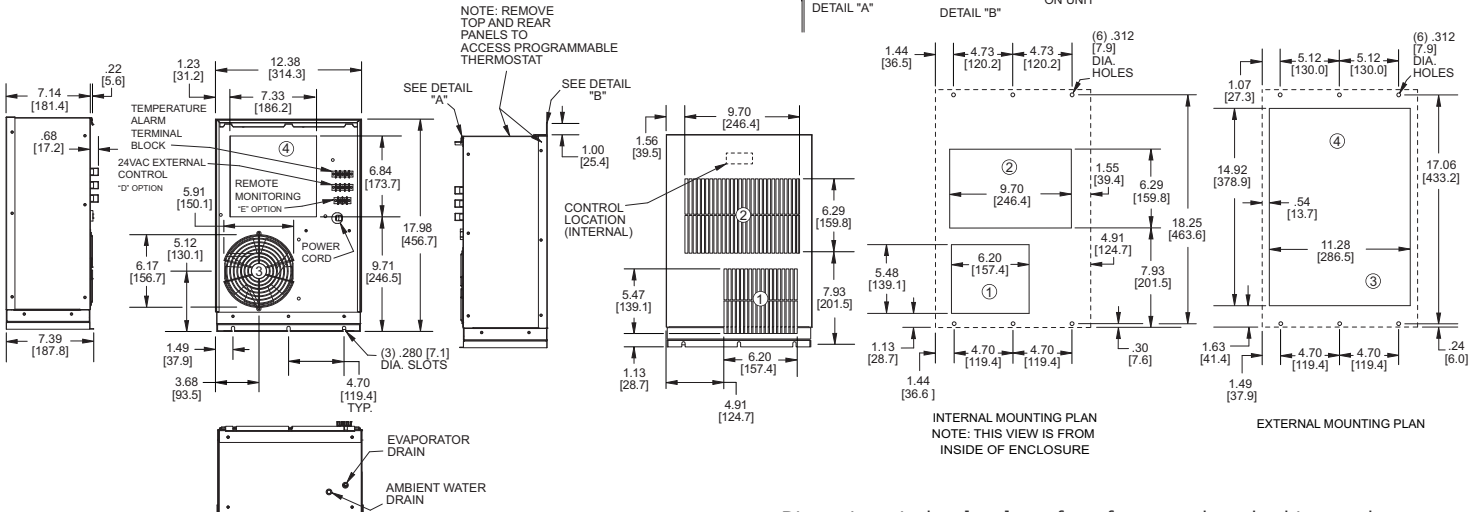


FOR EXTERNAL DOOR MOUNT: MOUNT PIVOT BAR WITH (3) STUDS ONTO OUTSIDE OF ENCLOSURE DOOR

DETAIL "A"

FOR INTERNAL DOOR MOUNT: INSTALL MOUNTING BRACKET USING EXISTING HARDWARE ON UNIT

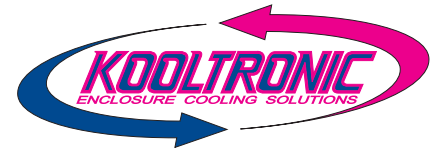
DETAIL "B"



Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

DP21 PROFILE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

Model	Normally In Stock	UL/CUL		BTU/H Rating	95/95 Rating	Ambient Temp. °F		Hz	* Running Amps	Approx. Weight lbs kg
		Listed or Recognized				Max./Min.	Volts			
KA4C3DP21L	Yes	Listed		3000	2100	131/-20	115/100	60/50	5.8	45 20

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

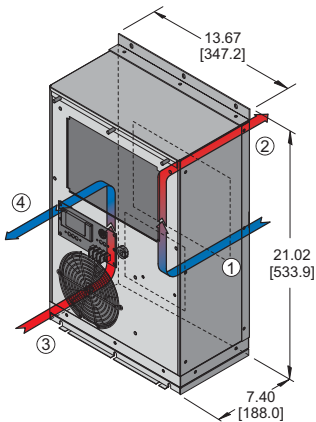
- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Epoxy-Coated Condenser Coil
- Heavy-duty Steel Shell
- Mounts Internally or Externally
- NEMA 12 & 3R Ratings Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- UL/CUL Listed

ACCESSORIES AND OPTIONS

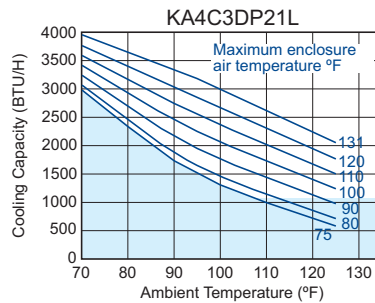
- Adapter ♦
- Enclosure Heater 80
- Filter 82
- Filter Recoating Adhesive 80
- Internal Corrosion Protection 80
- Remote Monitoring 80
- Remote Thermostat Relay ♦
- Replacement Filters 82
- Special motors, line cords, or connectors ♦
- Special paint finishes ♦
- Stainless Steel Shell 80



PROFILE

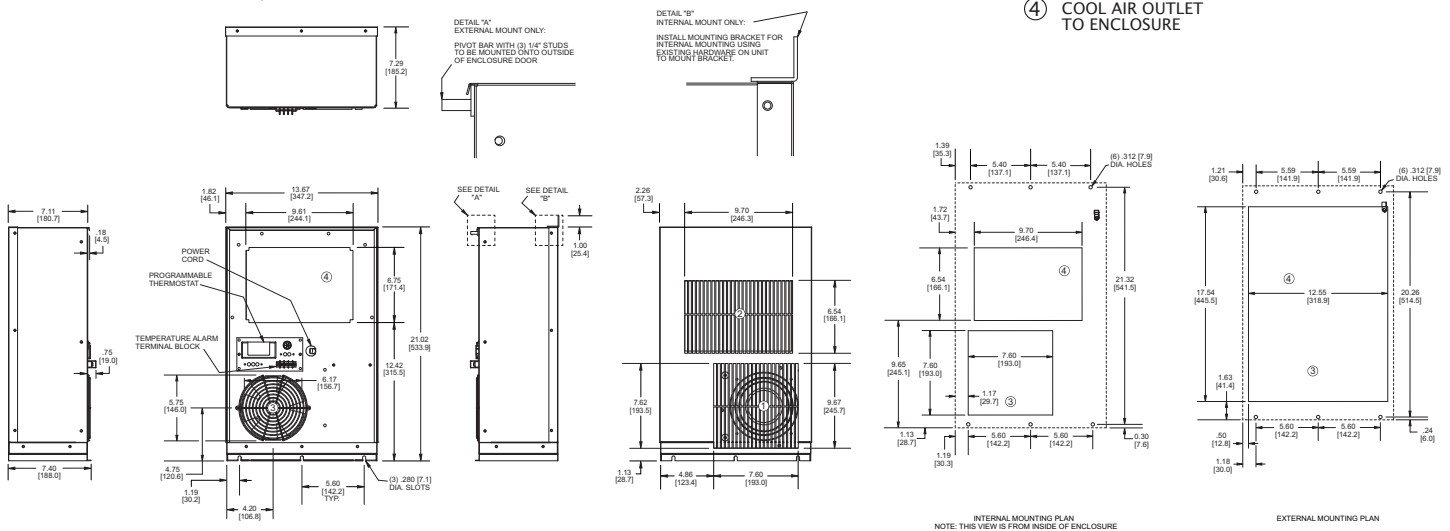


PERFORMANCE CHART



Operation within shaded area not recommended.

- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

E-mail: sales@kooltronic.com

DP33 PROFILE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*



NEMA TYPE 12 & 3R MAINTAINED

Model	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
KA4C5DP33L	Yes	Listed	5000	4000	131/-20	115/100	60/50	9.3/9.0	95 43
K2A4C5DP33L	Yes	Listed	5000	4000	131/-20	230	60/50	4.5	95 43

* Rating shown is for operation at maximum ambient temperature.

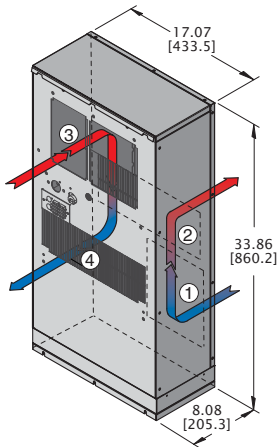
STANDARD FEATURES

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coil
- Heavy-duty Steel Shell
- Low Temperature Control Thermostat
- Mounts Internally or Externally
- NEMA 12 & 3R Ratings Maintained (UL50)
- UL/CUL Listed

ACCESSORIES AND OPTIONS

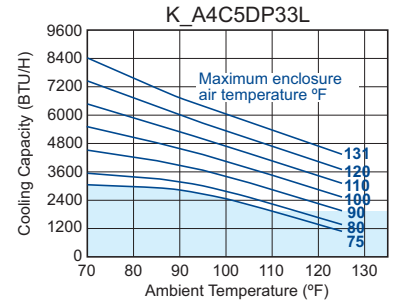
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|---|------|
| ■ Compressor Short Cycle Protector | 80 |
| ■ Enclosure Heater | 80 |
| ■ Filter | 82 |
| ■ Filter Recoating Adhesive | 80 |
| ■ Internal Corrosion Protection | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Replacement Filters | 82 |
| ■ Special motors, line cords, or connectors | ♦ |
| ■ Special paint finishes | ♦ |
| ■ Stainless Steel Shell | 80 |
| ■ Temperature Alarm | 80 |

PROFILE



- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

PERFORMANCE CHART

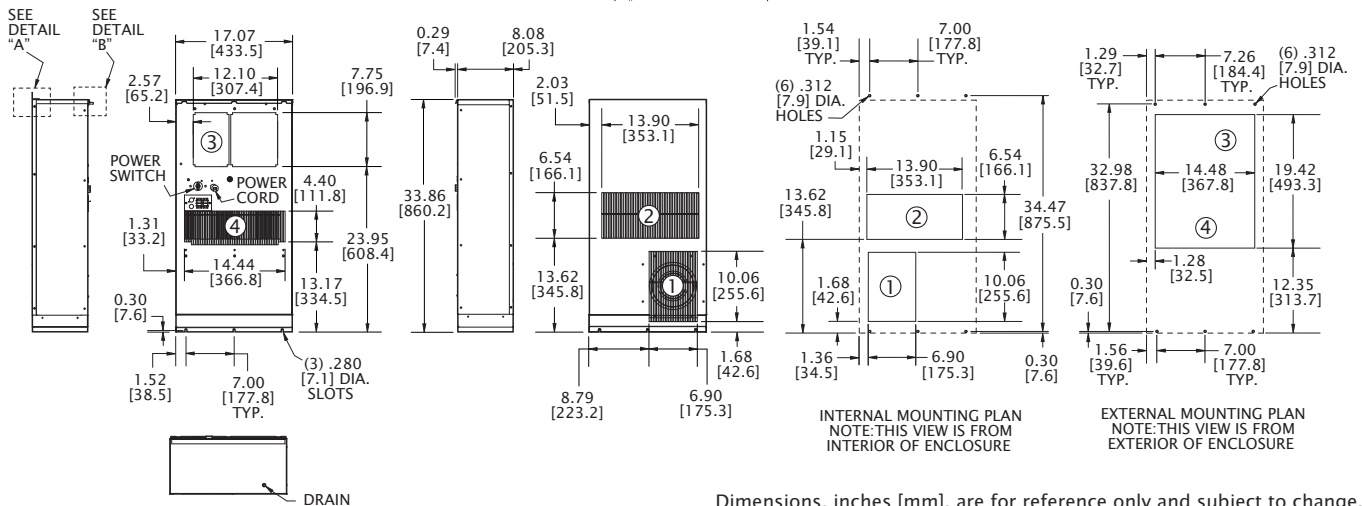


Operation within shaded area not recommended.

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

DETAIL "A" INTERNAL MOUNT ONLY
INSTALL MOUNTING BRACKET FOR INTERNAL MOUNTING. USE EXISTING HARDWARE ON UNIT TO MOUNT BRACKET

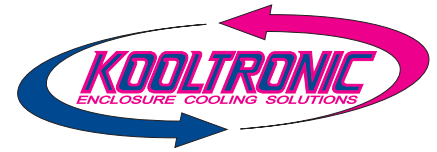
DETAIL "B" EXTERNAL MOUNT ONLY
PIVOT BAR WITH (3) 1/4" STUDS TO BE MOUNTED ON EXTERIOR OF CUSTOMER'S ENCLOSURE



Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

DP43 PROFILE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

Model	Normally In Stock	UL/CUL		BTU/H Rating	95/95 Rating	Ambient Temp. °F		* Running Amps	Approx. Weight	
		Listed or Recognized	Temp. Max./Min.			Volts	Hz		lbs	kg
KA4C7DP43L	Yes	Listed	7000	5500	131/-20	115/100	60/50	13.8	125	57
K2A4C7DP43L	Yes	Listed	7000	5500	131/-20	230/200	60/50	6.7/6.6	125	57

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coil
- Heavy-duty Steel Shell
- Low Temperature Control Thermostat
- Mounts Internally or Externally
- NEMA 12 & 3R Ratings Maintained (UL50)
- UL/CUL Listed

ACCESSORIES AND OPTIONS

	Page
■ Compressor Short Cycle Protector	80
■ Enclosure Heater	80
■ Filter	82
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special motors, line cords, or connectors	♦
■ Special paint finishes	♦
■ Stainless Steel Shell	80
■ Temperature Alarm	80



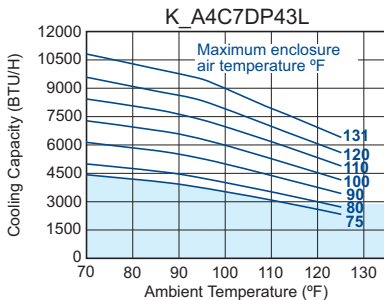
NEMA TYPE 12 & 3R MAINTAINED



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

PROFILE

PERFORMANCE CHART



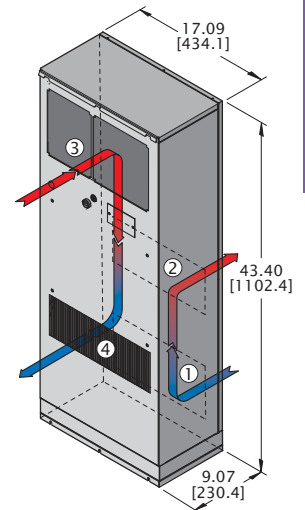
- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

FOR EXTERNAL DOOR MOUNT: MOUNT PIVOT BAR ASSEMBLY ONTO OUTSIDE OF ENCLOSURE DOOR

PIVOT BAR TO BE INSTALLED ON CUSTOMER'S ENCLOSURE

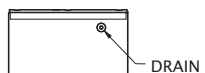
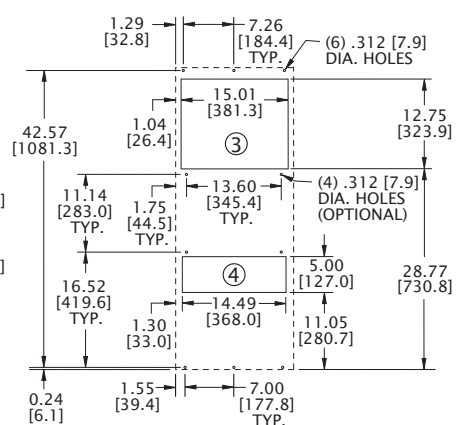
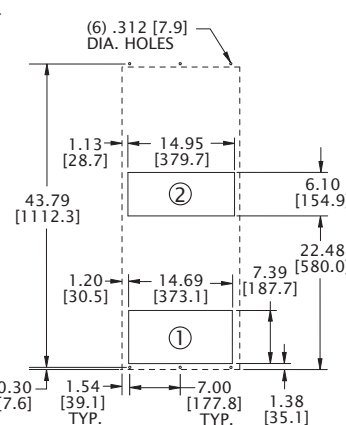
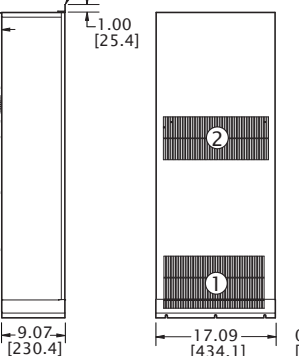
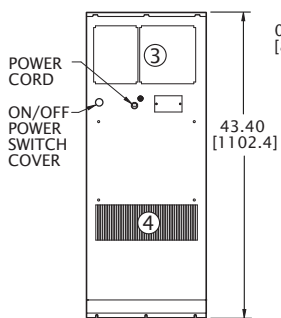


FOR INTERNAL DOOR MOUNT: INSTALL MOUNTING BRACKET USING EXISTING HARDWARE



EXTERNAL DOOR MOUNT SEE DETAIL "A"

INTERNAL DOOR MOUNT SEE DETAIL "B"



INTERNAL MOUNTING PLAN

EXTERNAL MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

E-mail: sales@kooltronic.com

DP47 PROFILE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.
 Recommended replacement: See *Guardian/GuardianX Series*



Model	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F		Hz	* Running Amps	Approx. Weight lbs kg
					Max./Min.	Volts			
KA4C9DP47L		Listed	9000	7400	131/-20	115/100	60/50	19.2	135 61
K2A4C9DP47L		Listed	9000	7400	131/-20	230/200	60/50	8.7	135 61

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coil
- Heavy-duty Steel Shell
- Low Temperature Control Thermostat
- Mounts Internally or Externally
- NEMA 12 & 3R Ratings Maintained (UL50)
- UL/CUL Listed

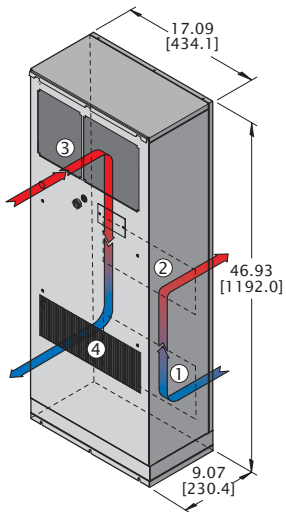


NEMA
TYPE 12 & 3R
MAINTAINED

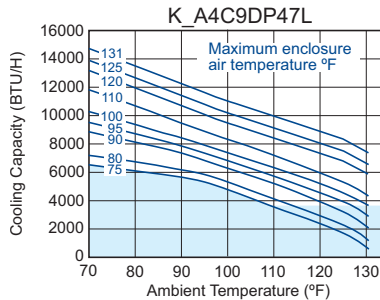
ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Compressor Short Cycle Protector	80
■ Enclosure Heater	80
■ Filter	82
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special motors, line cords, or connectors	♦
■ Special paint finishes	♦
■ Stainless Steel Shell	80
■ Temperature Alarm	80

PROFILE



PERFORMANCE CHART



Operation within shaded area not recommended.

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

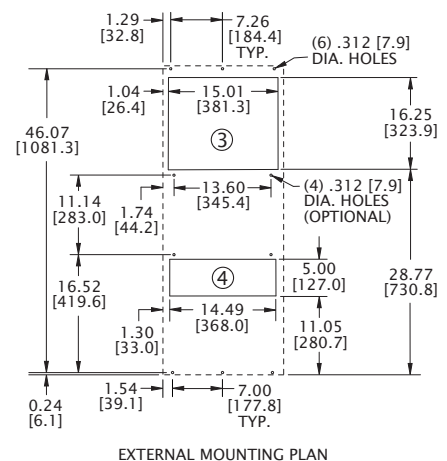
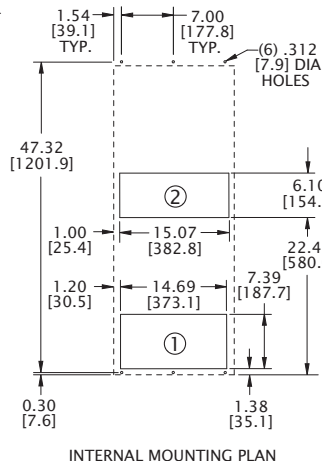
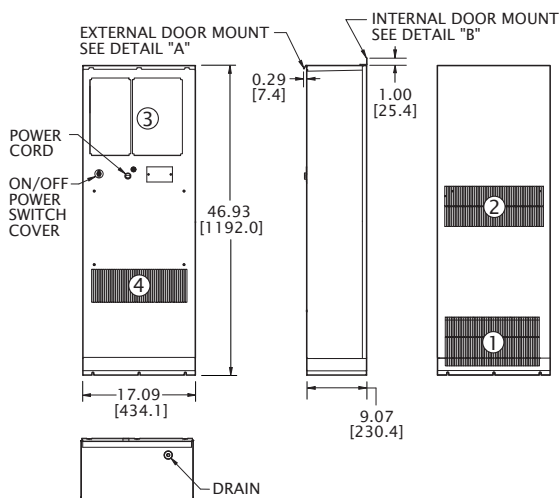
FOR EXTERNAL DOOR MOUNT: MOUNT PIVOT BAR ASSEMBLY ONTO OUTSIDE OF ENCLOSURE DOOR

FOR INTERNAL DOOR MOUNT: INSTALL MOUNTING BRACKET USING EXISTING HARDWARE

PIVOT BAR TO BE INSTALLED ON CUSTOMER'S ENCLOSURE



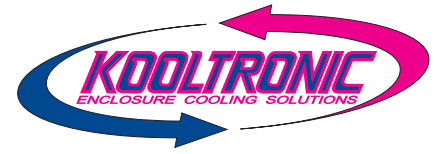
- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

PROFILE 480 VOLT AIR-COOLED AIR CONDITIONERS



NEMA
TYPE 12 & 3R
MAINTAINED

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

STANDARD FEATURES

- All Models UL/CUL Listed
- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coil
- Heavy-duty Steel Shell
- NEMA 12 & 3R Ratings Maintained (UL50)
- Thermostatic Low Temperature Control

DESCRIPTION

The **Profile 480 Series** Air Conditioners have been engineered to operate under the most demanding industrial applications. The components used in these models have been specially designed and tested to maintain cooling efficiency in temperature controlled enclosures in bottling plants, the automotive industry and other commercial/manufacturing applications.

Engineered with 480 Volt compressors, these new **Profile 480 Series** units eliminate the need for costly transformers. The indoor/outdoor **Profile 480 Series** has NEMA 12 & 3R Ratings, with all models UL/CUL Listed, making them the perfect choice for industrial automation applications.

In addition to the list of standard features, the **Profile 480 Series** models are also available with a wide range of accessories and options, including stainless steel shell, compressor short cycle protector, temperature alarm and cabinet heater.

The series consists of three air conditioners in heights of 38 and 52 inches, with capacities of 5,000, 7,000 and 9,000 BTU/H.

The **Profile 480 Series** Air Conditioners join the Internal/External Mount (Page 43), making the **Profile Series** one of the most versatile lines of air conditioners on the market.

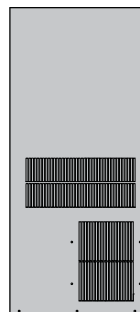
KOOLTRONIC also designs and manufactures a variety of air conditioners to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

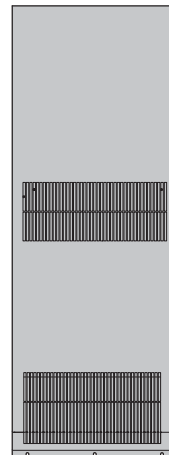
Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

PROFILE 480 VOLT



DP38
5,000 BTU/H
38"H x 17"W x 8"D



DP52
7,000/9,000 BTU/H
52"H x 17"W x 9"D

DP38 PROFILE 480 VOLT AIR-COOLED AIR CONDITIONERS

Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

Model	Normally In Stock	UL/CUL Listed or Recognized	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	Running Amps 131°F/131°F*	Approx. Weight lbs kg
K3A4C5DP38L	Yes	Listed	5000	4800	131/0	480	60	2.0	115 52

* Rating shown is for operation at maximum ambient temperature.

PROFILE 480 VOLT



NEMA
TYPE 12 & 3R
MAINTAINED



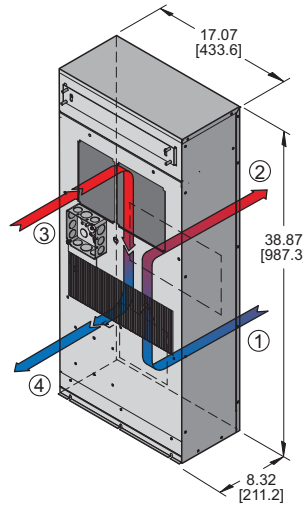
STANDARD FEATURES

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coil
- External junction box for permanent wiring connections
- Heavy-duty Steel Shell
- Low Temperature Control Thermostat
- NEMA 12 & 3R Ratings Maintained (UL50)
- Phase Sequence/Phase Loss Detector/ Under Voltage Monitor
- UL/CUL Listed

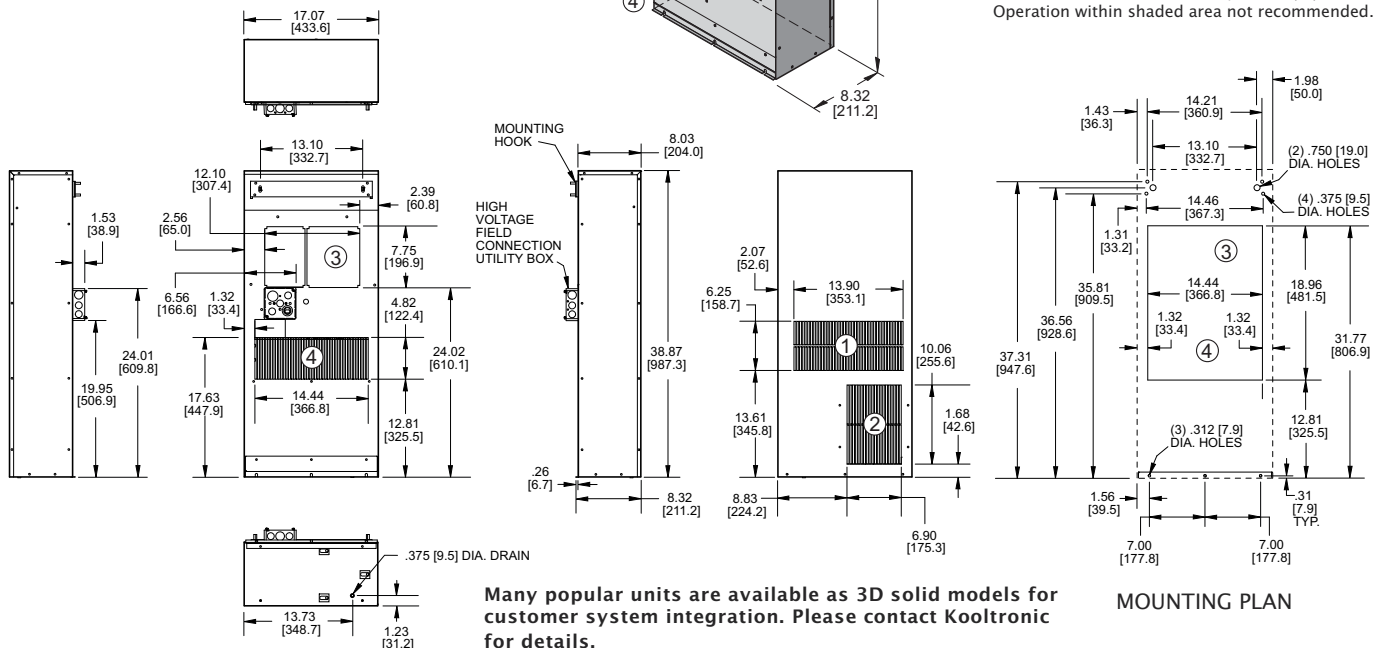
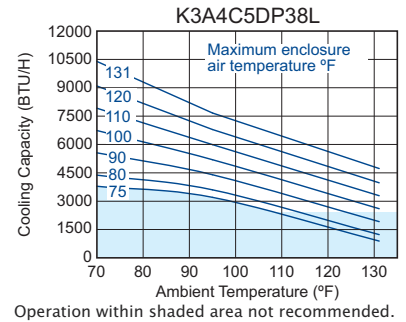
ACCESSORIES AND OPTIONS

Accessory/Option	Page
Compressor Short Cycle Protector	80
Enclosure Heater	80
Filter	82
Filter Recoating Adhesive	80
Internal Corrosion Protection	80
Remote Thermostat Relay	80
Replacement Filters	82
Special paint finishes	♦
Stainless Steel Shell	80
Temperature Alarm	80

- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



PERFORMANCE CHART



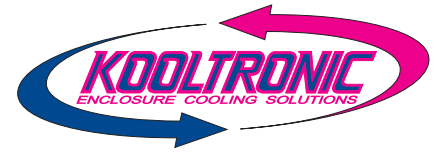
Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

DP52 PROFILE 480 VOLT AIR-COOLED AIR CONDITIONERS



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

Model	Normally In Stock	UL/CUL		BTU/H Rating	95/95 Rating	Ambient Temp. °F		Running Amps	Approx. Weight	
		Listed or Recognized	BTU/H Rating			Max./Min.	Volts		Hz	131°F/131°F
K3A4C7DP52L	Yes	Listed	7000	6300	131/0	480	60	3.0	160	73
K3A4C9DP52L	Yes	Listed	9000	8100	131/0	480	60	4.0	164	74

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

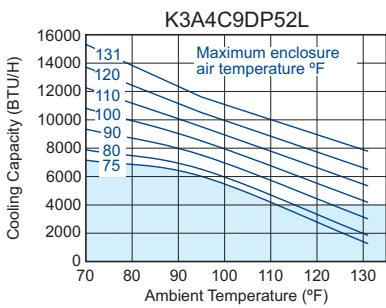
- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coil
- External junction box for permanent wiring connections
- Heavy-duty Steel Shell
- Low Temperature Control Thermostat
- NEMA 12 & 3R Ratings Maintained (UL50)
- Phase Sequence/Phase Loss Detector/Under Voltage Monitor
- UL/CUL Listed

ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Compressor Short Cycle Protector	80
■ Enclosure Heater	80
■ Filter	82
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special paint finishes	♦
■ Stainless Steel Shell	80
■ Temperature Alarm	80

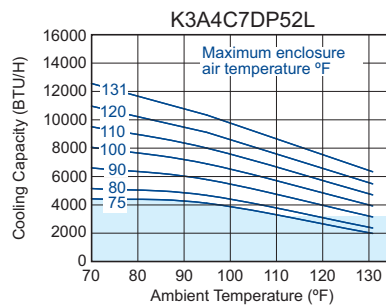


PERFORMANCE CHART



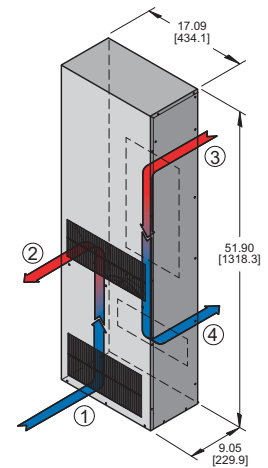
Operation within shaded area not recommended.

PERFORMANCE CHART

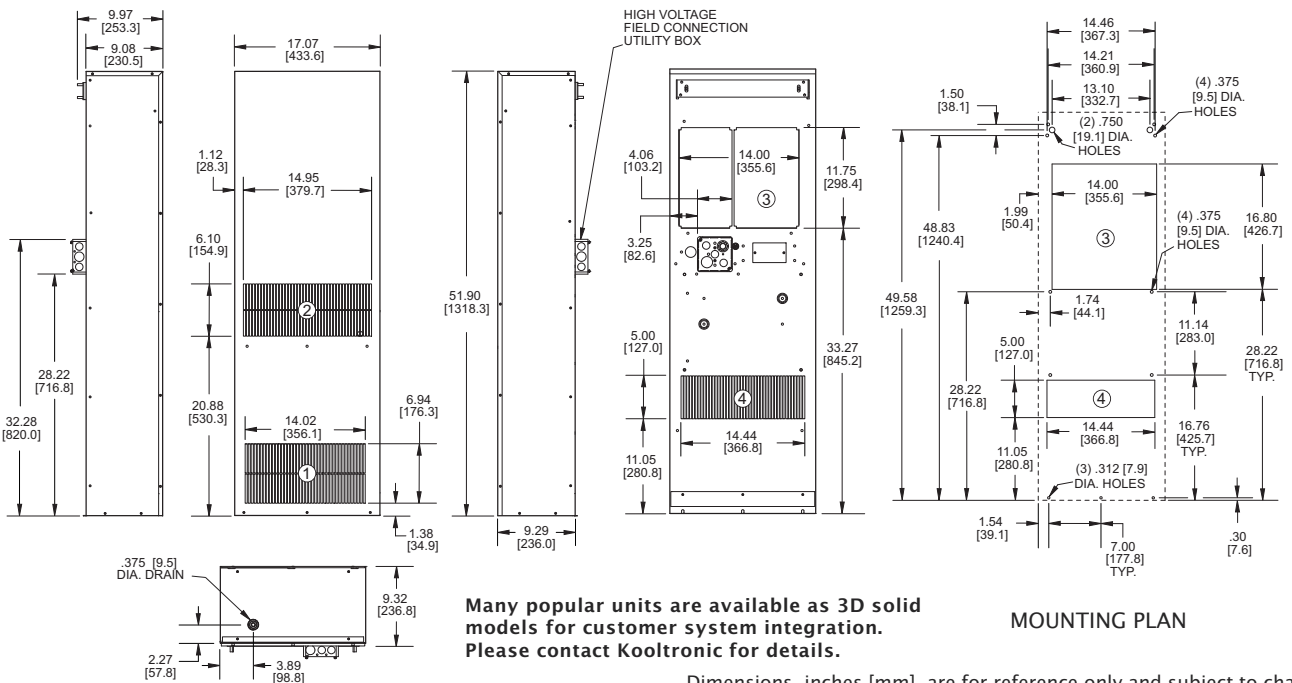


Operation within shaded area not recommended.

- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



PROFILE 480 VOLT



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

TRIMLINE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

DESCRIPTION

Innovations in technology have resulted in much denser components packaging and smaller available panel sizes on which to mount air conditioners. The KOOLTRONIC *TrimLine Series* is the response to these new packaging demands with **Narrow** 10", 12", 15" and 17" width panel-mount air conditioners. In addition to being narrower than traditional air conditioner units, the *TrimLine Series* include a condensate evaporator and low temperature control thermostat as *standard* features, and are available in all popular voltages and frequencies. The **NP17**, **NP28**, **NP33** and **Narrow-Mini** offer a Programmable Thermostat as a standard feature.

The *TrimLine Series* consists of two series of compact models, the **NP Series** and the **NPT Series**. The **NP Series** models offer capacities from 2,000 to 7,000 BTU/H and use CFC-Free R134a refrigerant. The **NPT Series** offers units with capacities from 4,000 to 16,000 BTU/H and use Zero Ozone Depleting R410a refrigerant. The *TrimLine Series* are NEMA Type 12 (NP models and NPT52), and NEMA Type 12 and 3R Maintained (UL50) (NPT47).

Outdoor or corrosive environments require weather protection and/or special internal and external protective features. Also see **Guardian/GuardianX**, **Integrity NEMA 4/4X** and **Intrepid Outdoor Air Conditioners**.

For extreme ambient temperatures and/or severely contaminated environments, the use of **Water-Cooled Air Conditioners** or **Water-Cooled Heat Exchangers** is recommended.

General specifications common to all KOOLTRONIC Air Conditioners are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**



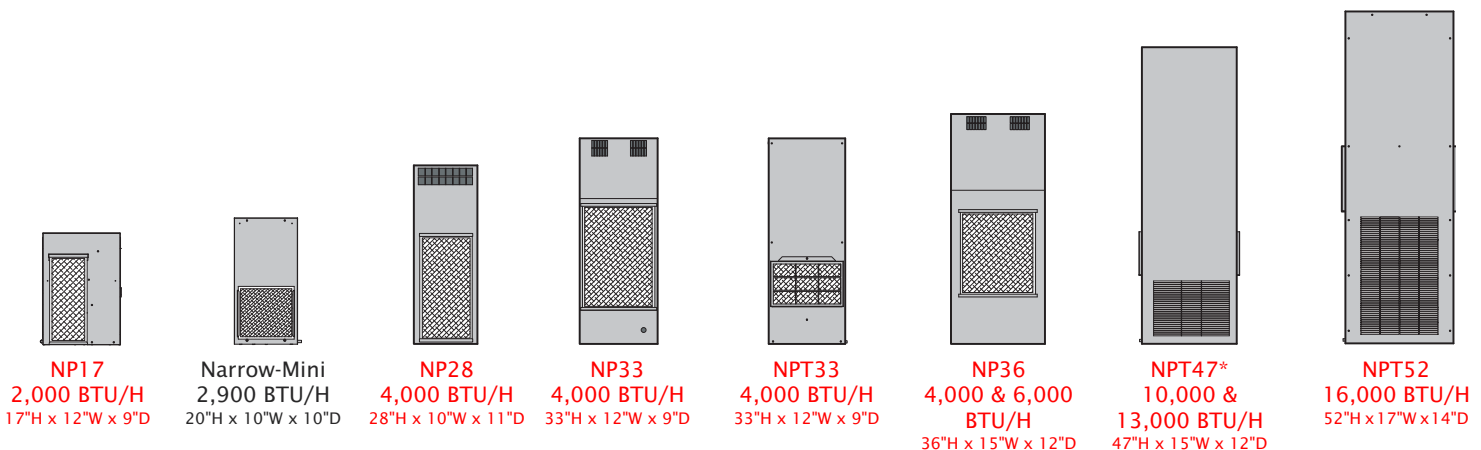
**NEMA
TYPE 12
MAINTAINED
(NP Models)**

**NEMA
TYPE 12 & 3R
MAINTAINED
(NPT 33 & 47)**

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

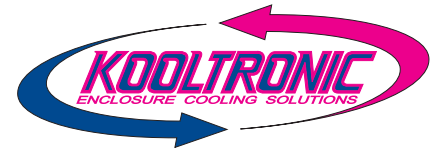
STANDARD FEATURES

- All NP Series Models UL/CUL Listed or Recognized. All NPT Series Models UL Listed
- Built-in Condensate Evaporator
- CFC-free (NP Series) or Zero ODP Refrigerant (NPT Series)
- Compact design with slim 10", 12" and 15" wide mounting footprints
- Field-reversible condenser outlet blower on NP33, NP36 & 7NP47
- Filter
- Heavy-duty Steel Shell with Baked Powder Finish
- High Pressure Limit Switch (NPT Series)
- NEMA 12 & NEMA 12/3R Ratings Maintained (UL50)
- Six foot [1.8m] (minimum) 3-wire Power Cord
- Thermostatic Low Temperature Control



* 7,000 BTU/H NP47 not shown.

NP17 TRIMLINE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
KA4C2.0NP17L	Yes	2000	1800	120/-20	115/110	60/50	5.0	55 25

* Rating shown is for operation at maximum ambient temperature.



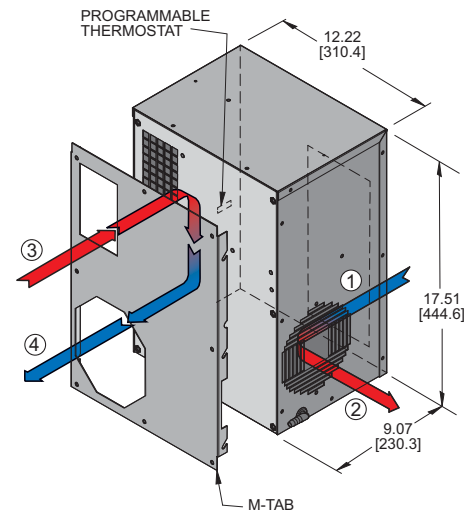
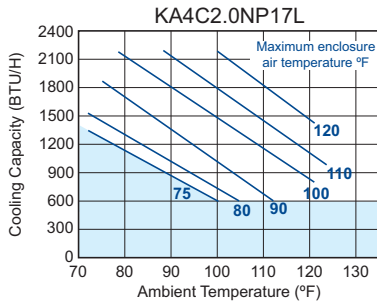
STANDARD FEATURES

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Compressor Short Cycle Protector
- Epoxy-Coated Coils
- Filter
- Low Ambient Kit
- NEMA 12 Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- UL/CUL Listed

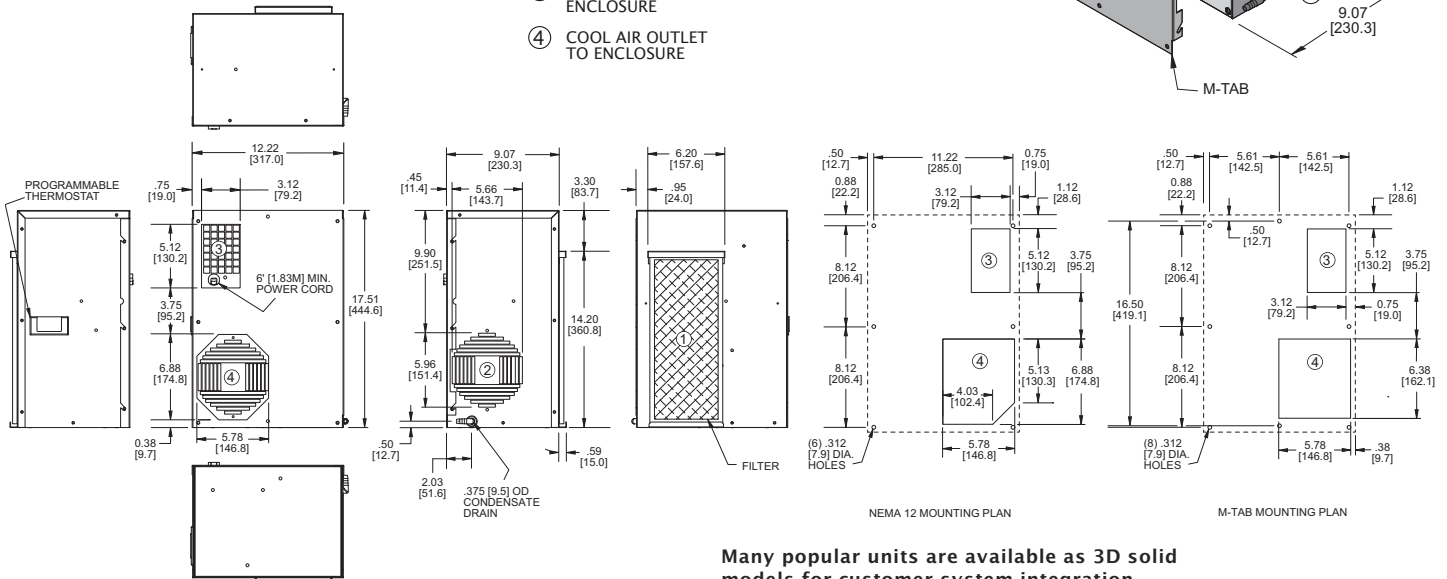
ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special controls or indicators	♦
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Stainless or Aluminum Shell	♦

PERFORMANCE CHART



- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

TRIMLINE

NARROW-MINI TRIMLINE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



Model	NEMA Rating	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Fuse Amps	Approx. Weight lbs kg
KA4C2.5NML	12	2900	2400	120/50	115	60	5.0	15	38 17
K2A4C2.5NML	12	2500	2000	125/50	230/200	60	3.6	15	38 17

* Rating shown is for operation at maximum ambient temperature.

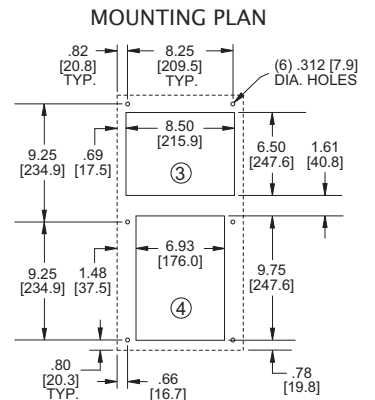
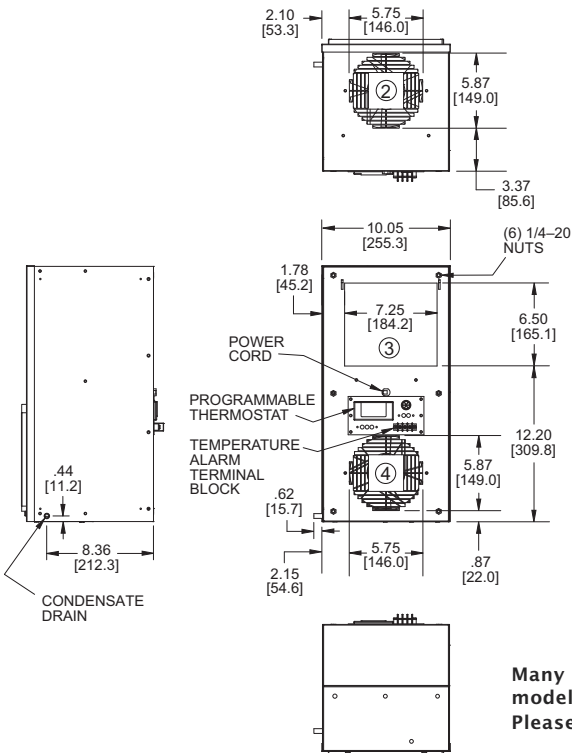
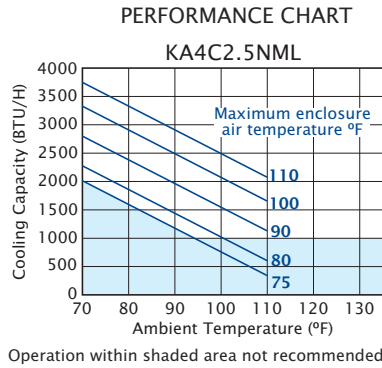
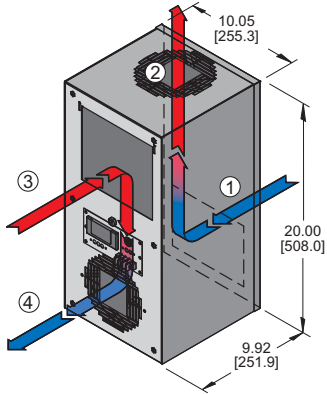
STANDARD FEATURES

- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Epoxy-Coated Evaporator Coils
- Filter
- NEMA 12 Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- UL/CUL Listed

ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Adapter	♦
■ Filter Recoating Adhesive	80
■ High-Capacity Condensate Evaporator	81
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ M-Tab Mounting (for existing retrofits)	♦
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Stainless or Aluminum Shell	80
■ Weather Protection Kit	81

TRIMLINE



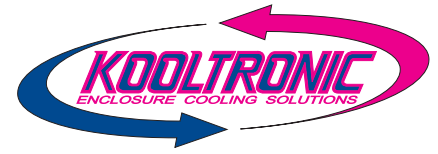
- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

NP28 TRIMLINE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Fuse Amp	Approx. Weight lbs kg
KA6C4NP28L	Yes	4000	2823	120/50	115/100	60/50	8.0/8.0	15	85 39

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Compressor
- Epoxy-Coated Coils
- Filter
- Low Ambient Kit
- NEMA 12 Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- UL/CUL Listed

ACCESSORIES AND OPTIONS

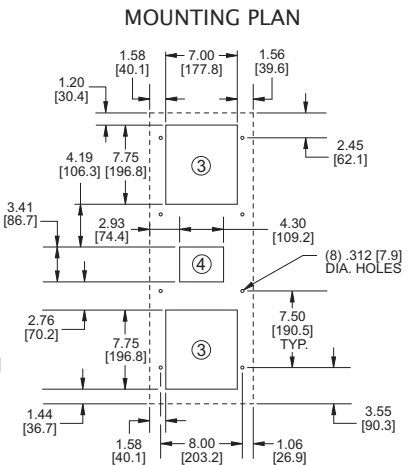
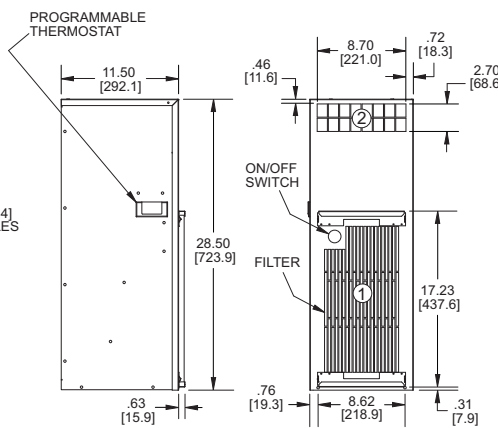
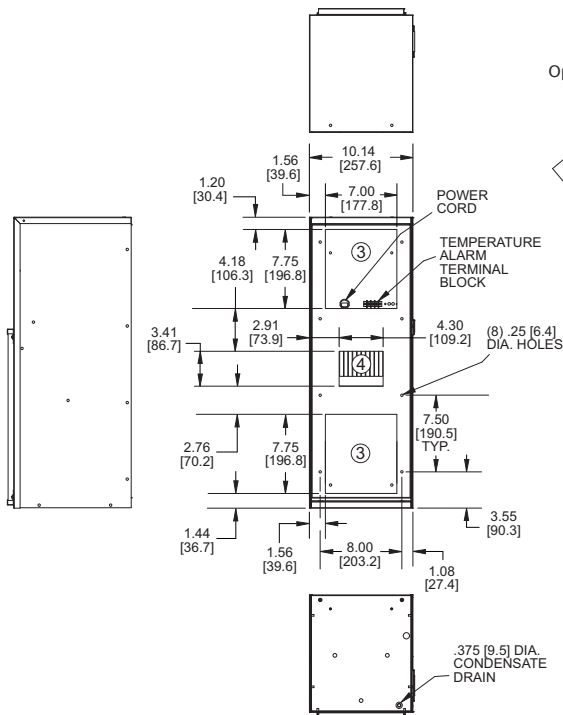
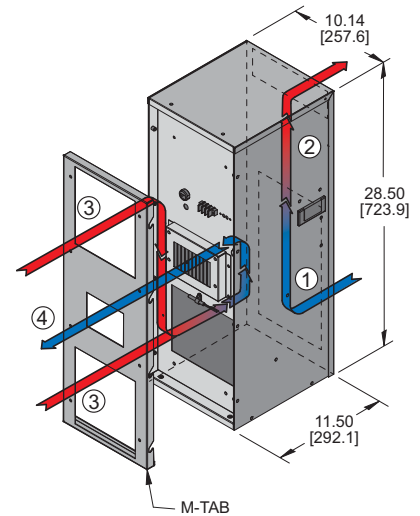
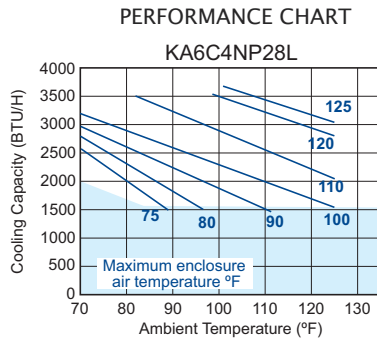
	Page
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special controls or indicators	♦
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Stainless or Aluminum Shell	80



NEMA
TYPE 12
MAINTAINED



- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



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Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

TRIMLINE

NP33 TRIMLINE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*



Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient Temp. °F		Hz	* Running Amps	Approx. Weight	
				Max./Min.	Volts			lbs	kg
KA4C4NP33L	Yes	4000	2770	125/50	115/100	60/50	9.3/10.0	90	41
K2A4C4NP33L	Yes	4000	2283	120/50	230/200	60/50	5.5	90	41

* Rating shown is for operation at maximum ambient temperature.

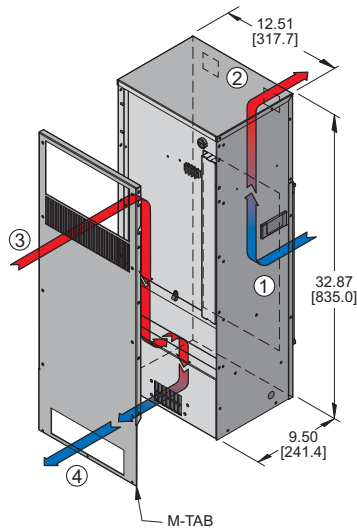
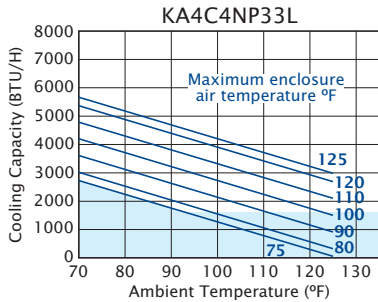
STANDARD FEATURES

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Filter
- Low Ambient Kit
- NEMA 12 Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- UL/CUL Listed

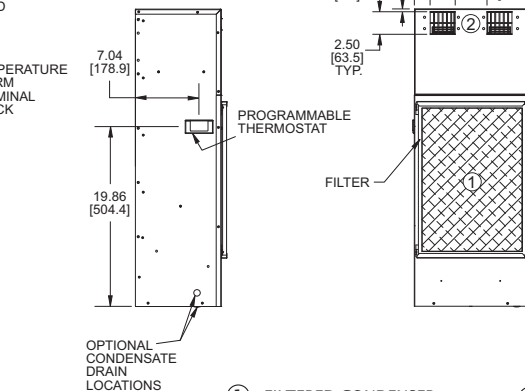
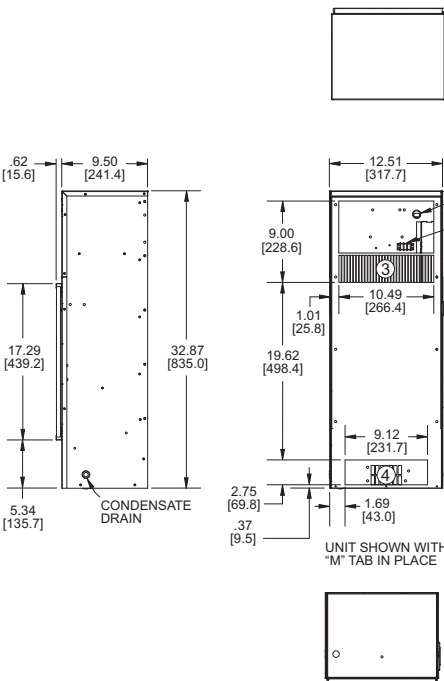
ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special controls or indicators	♦
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Stainless or Aluminum Shell	80

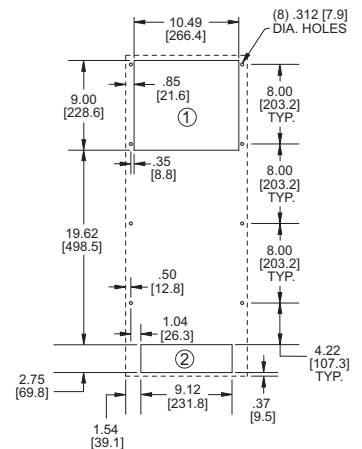
PERFORMANCE CHART



Many popular units are available as 3D solid models for customer system integration. Please contact Kooldronic for details.



MOUNTING PLAN

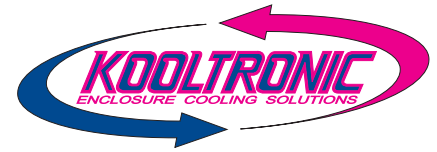


- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

NPT33 TRIMLINE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
KA6C4NPT33L		4000	3200	131/-20	115	60	8.3	71 32
K2A6C4NPT33L		4000	3200	125/-20	230	60	3.7	71 32
K2A6C4NPT33L		4000	3200	123/-20	208	60	4.0	71 32

* Rating shown is for operation at maximum ambient temperature.

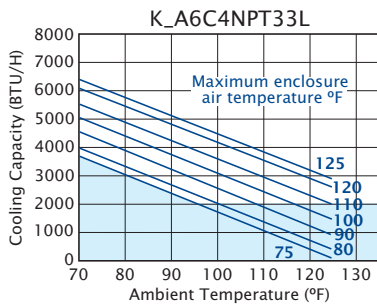
STANDARD FEATURES

- Built-in Condensate Evaporator
- Closed-Loop Cooling
- Condenser Impeller Controller
- Filter
- High-Pressure Limiter Switch
- Low Temperature Control Thermostat
- NEMA 12 & 3R Ratings Maintained (UL50)
- UL/CUL Listed
- Zero ODP Refrigerant

ACCESSORIES AND OPTIONS

	Page
■ Compressor Short Cycle Protector	80
■ Enclosure Heater	80
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special controls or indicators	♦
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Stainless or Aluminum Shell	80
■ Temperature Alarm	80

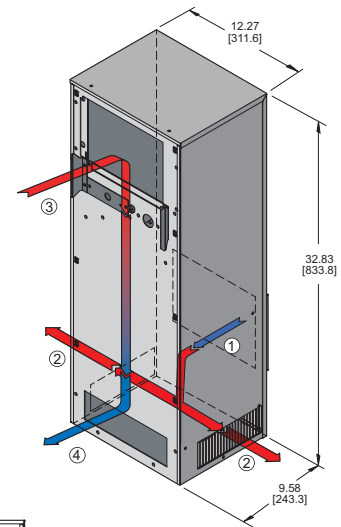
PERFORMANCE CHART



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

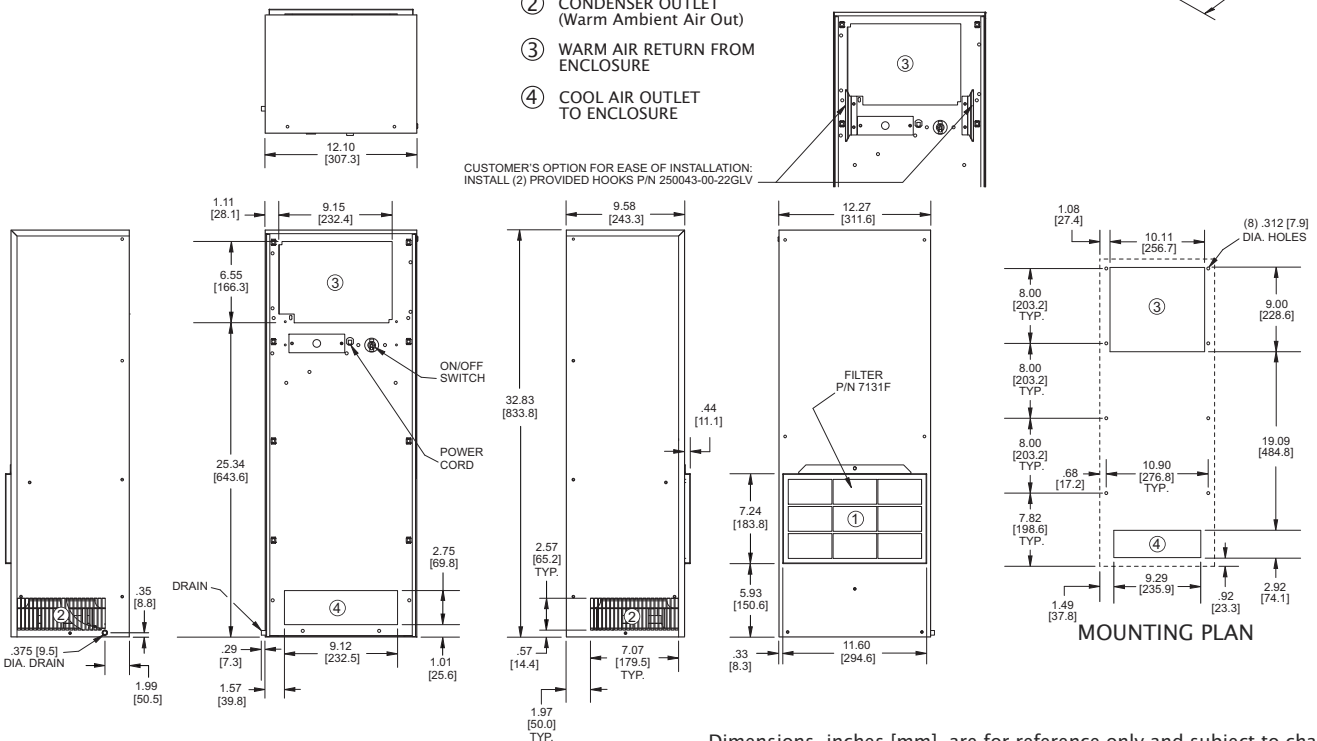


NEMA TYPE 12 & 3R MAINTAINED



- 1 FILTERED CONDENSER AIR INLET (Ambient Air In)
- 2 CONDENSER OUTLET (Warm Ambient Air Out)
- 3 WARM AIR RETURN FROM ENCLOSURE
- 4 COOL AIR OUTLET TO ENCLOSURE

CUSTOMER'S OPTION FOR EASE OF INSTALLATION: INSTALL (2) PROVIDED HOOKS P/N 250043-00-22GLV



Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

E-mail: sales@kooltronic.com

TRIMLINE

NP36 TRIMLINE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



**NEMA
TYPE 12
MAINTAINED**

Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
KA4C4NP36L	Yes	4000	3700	125/50	115/100	60/50	13.5	125 57
K2A4C4NP36L	Yes	4000	3700	125/50	230/200	60/50	7.5	125 57
KA4C6NP36R	Yes	6000	4100	125/50	115/100	60/50	16.5/17.0	125 57
K2A4C6NP36L	Yes	6000	4100	125/50	230/200	60/50	8.2	125 57

* Rating shown is for operation at maximum ambient temperature.

Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

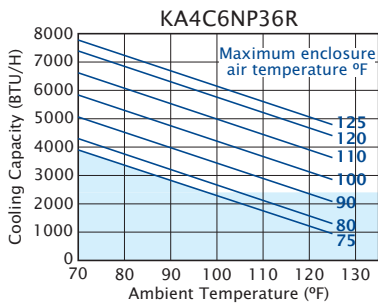
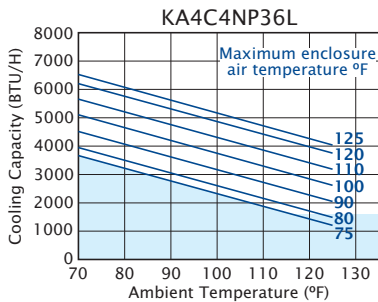
STANDARD FEATURES

- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Filter
- Low Temperature Control Thermostat
- NEMA 12 Rating Maintained (UL50)
- Reversible Condenser Outlet Blower
- UL/CUL Listed/Recognized*

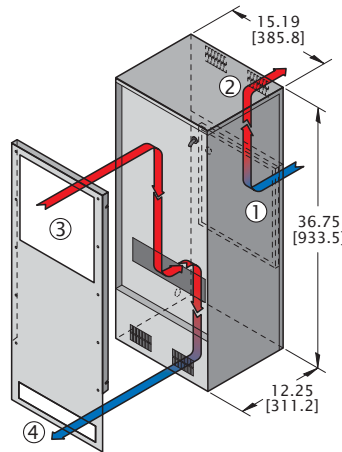
ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Compressor Short Cycle Protector	80
■ Enclosure Heater (Single)	80
■ Filter Recoating Adhesive	80
■ High-Capacity Condensate Evaporator	81
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ Low Airflow Detector	80
■ Low Ambient Kit	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special controls or indicators	♦
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Stainless or Aluminum Shell	80
■ Temperature Alarm	80
■ Weather Protection Kit	81

PERFORMANCE CHARTS

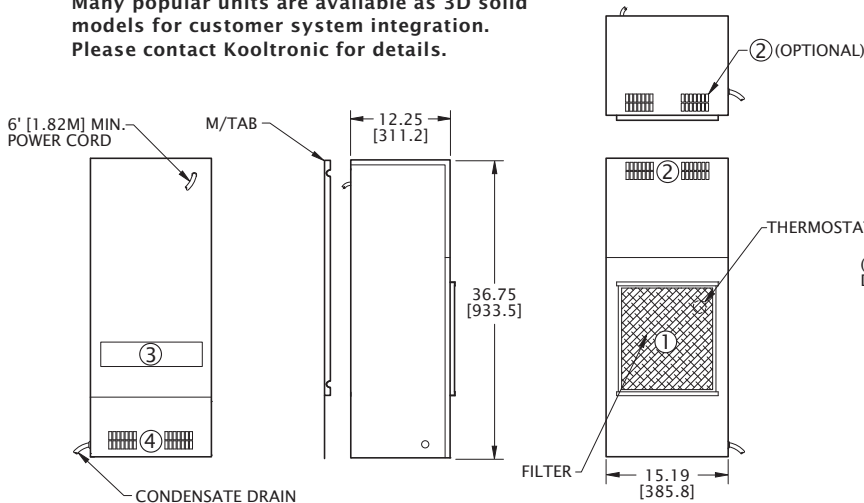


Operation within shaded areas not recommended.

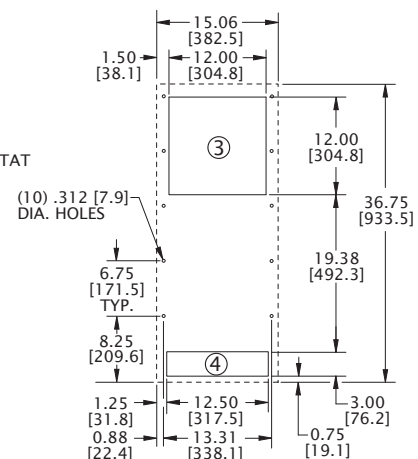


- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.



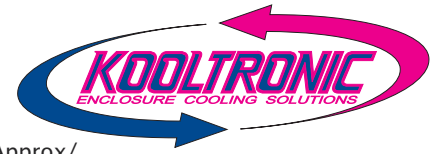
MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

- ♦ UL/CUL Recognized models are available as Listed at added cost.
- ♦ Contact KOOLTRONIC for information.

NP/NPT47 TRIMLINE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	Running Amps	Approx/Weight lbs kg
KA4C7NP47R	Yes	7000	4750	125/50	115/110	60/50	16.5	150 68
K2A4C7NP47L	Yes	7000	4750	125/50	230/200	60/50	8.6	150 68
KA6C10NPT47L		10000	8300/7730	131/-40	115/115	60/50	19.4/18.4	128 58
K2A6C10NPT47L		10000	8300/7730	131/-40	208/230	60/50	8.7/9.9	128 58
K2A6C10NPT47L		10000	7730	131/-40	230	50	8.9	128 58
K2A6C13NPT47L		13000	9700	131/-40	230	60	11.7	131 59
K2A6C13NPT47L		13000	8770/8770	131/-40	208/230	60/50	13.0/12.7	131 59

* Rating shown is for operation at maximum ambient temperature.



NPT47

NP47



NEMA
TYPE 12 & 3R
MAINTAINED
(NPT 47)

NEMA
TYPE 12
MAINTAINED
(NP 47)

STANDARD FEATURES

- Built-in Condensate Evaporator
- CFC-Free Refrigerant (NP)
- Condenser Impeller Controller (NPT)
- Filter
- High-Pressure Limiter Switch (NPT)
- Low Temperature Control Thermostat
- NEMA 12 Rating Maintained (UL50) (NP47)
- NEMA 12 & 3R Ratings Maintained (UL50) (NPT47)
- UL/CUL Listed or Recognized*
- Zero ODP Refrigerant (NPT)

* All NPT Series models are Listed. All NP Series models are Listed or Recognized. All Recognized models are available as Listed at added cost.

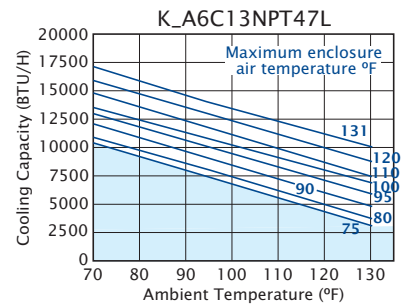
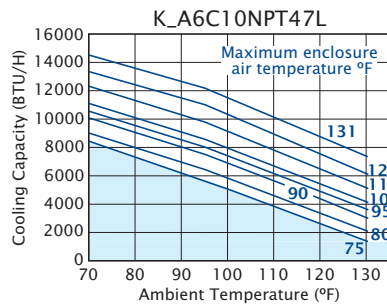
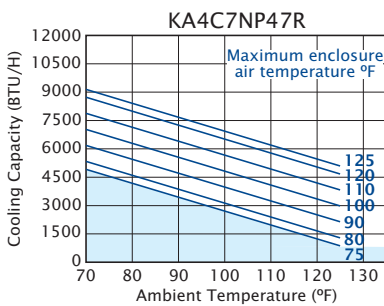
Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

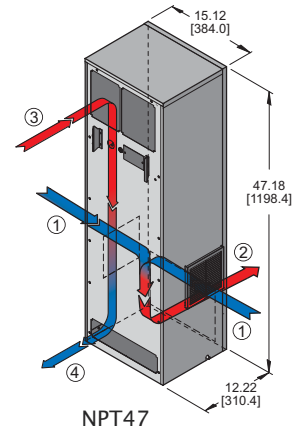
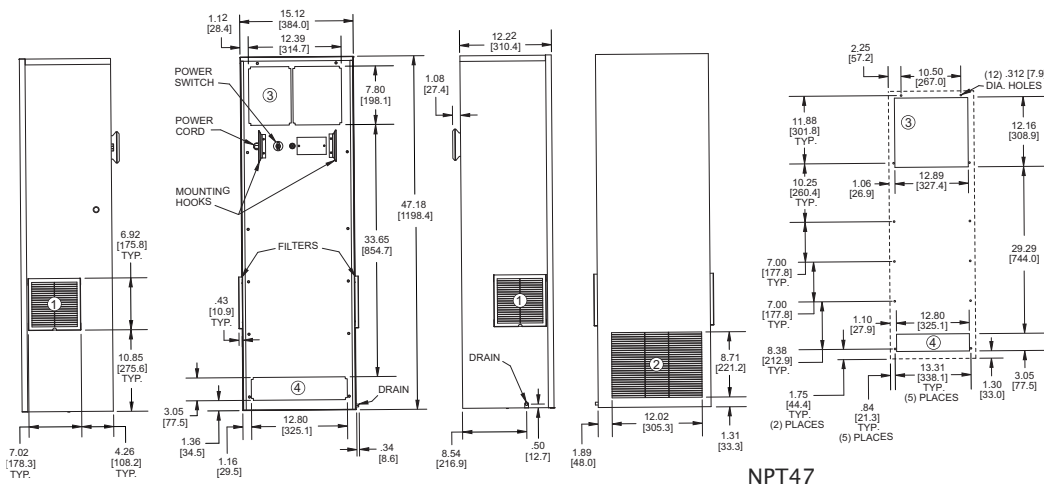
ACCESSORIES AND OPTIONS

	Page
■ Compressor Short Cycle Protector	80
■ Enclosure Heater (Single)	80
■ Filter Recoating Adhesive	80
■ High-Capacity Condensate Evaporator	81
■ Internal Corrosion Protection	80
■ Low Ambient Kit (NP)	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special controls or indicators	+
■ Special materials or finishes	+
■ Special motors, line cords, or connectors	+
■ Stainless or Aluminum Shell	80
■ Temperature Alarm	80
■ Weather Protection Kit (NP)	81

PERFORMANCE CHARTS



Operation within shaded areas not recommended.



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

† Contact KOOLTRONIC for information.

NPT52 TRIMLINE AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*



Model	Nema Rating	BTU/H Rating	95/95 Rating	Ambient	Volts	Hz	* Running Amps	Approx. Weight	
				Temp. °F Max./Min.				lbs	kg
K2A6C16NPT52L	12	16000	13300/11300	125/-40	230	60/50	18.0	189	86

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

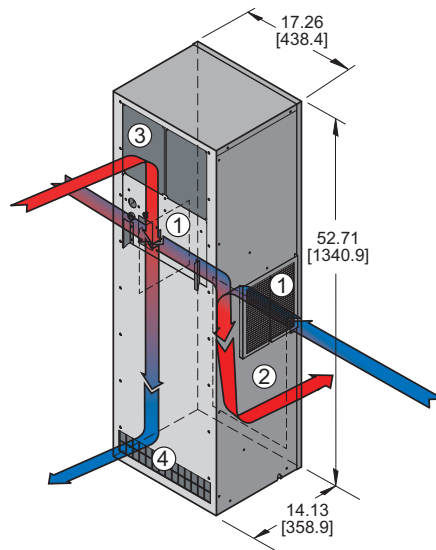
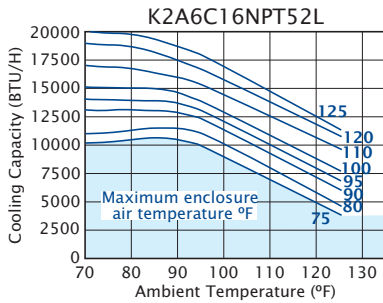
- Built-in Condensate Evaporator
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Filters (2)
- Low Temperature Control Thermostat
- NEMA 12 Rating Maintained (UL50)
- UL/CUL Listed
- Zero ODP Refrigerant

ACCESSORIES AND OPTIONS

	Page
■ Compressor Short Cycle Protector	80
■ Enclosure Heater	80
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special controls or indicators	♦
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Stainless or Aluminum Shell	80
■ Temperature Alarm	80

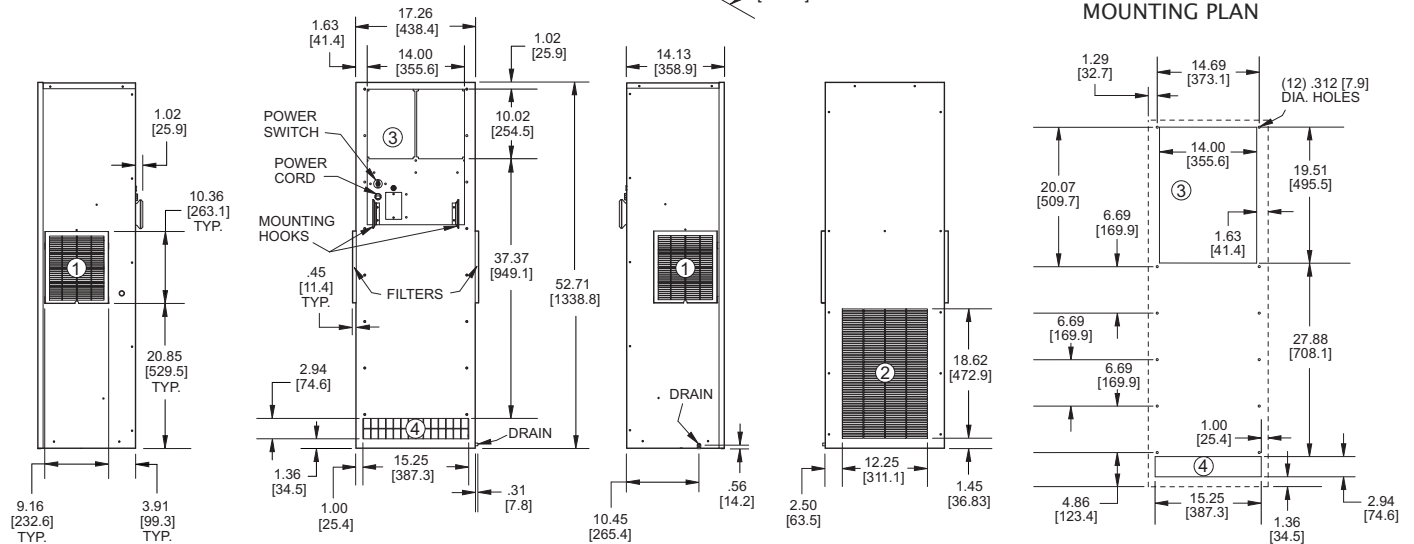
UL **NEMA TYPE 12 MAINTAINED**

PERFORMANCE CHART



- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

MOUNTING PLAN

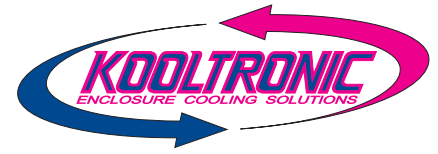


Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

TRADITIONAL AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



DESCRIPTION

These KOOLTRONIC Air Conditioners offers cooling capacities of 1,000 BTU/H, in 14" width, including side flanges. The **Micro Mini** is ideal for low-capacity applications with space limitations, such as a kiosk. **Micro Mini Air Conditioners** are suitable for applications that have low static pressures, where fans can provide adequate airflow. Mounted on any vertical panel of equipment enclosures, they occupy minimal floor space and no cabinet space. The **Micro Mini** offers a Programmable Thermostat as a standard feature.

Gasketed mountings and the closed-loop design seal out moisture and contaminant-laden ambient air. Powerful **Kooltronic-designed** centrifugal blowers circulate clean, cool air throughout the enclosure.

Outdoor or corrosive environments require weather protection and/or special internal and external protective features. Also see **Guardian/GuardianX, Integrity NEMA 4/4X** and **Intrepid Outdoor Air Conditioners**.

For extreme ambient temperatures and/or severely contaminated environments, the use of **Water-Cooled Air Conditioners** or **Water-Cooled Heat Exchangers** is recommended.

General specifications common to all KOOLTRONIC Air Conditioners are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114



NEMA
TYPE 12
MAINTAINED

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

STANDARD FEATURES

- Ball-bearing motors
- CFC-free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Filter
- Heavy-duty Steel Shell with Baked Powder Finish
- NEMA 12 Rating Maintained (UL50)
- Programmable Thermostat
- Temperature Alarm
- UL/CUL Listed

Accessories, Options,
Performance Data and other
detailed information on the
Traditional Series can be
found at kooltronic.com



Micro-Mini
1,000 BTU/H
13"H x 14"W x 6"D

TRADITIONAL MICRO-MINI AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



Model	Nema Rating	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Running Amps	Approx. Weight lbs kg
KA4C1.0MML	12	1000	850	125/-20	115/100	60/50	2.7	30 14

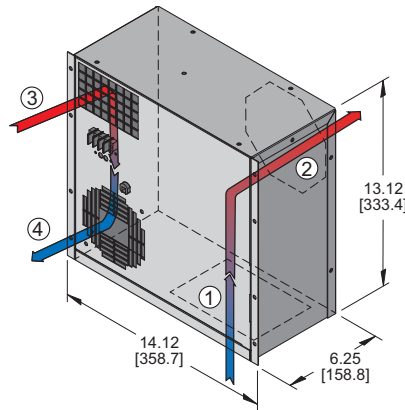
* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

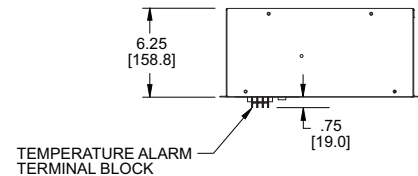
- Ball-bearing motors
- CFC-free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Filter
- NEMA 12 Rating Maintained (UL50)
- Programmable Thermostat
- Temperature Alarm
- UL/CUL Listed

ACCESSORIES AND OPTIONS

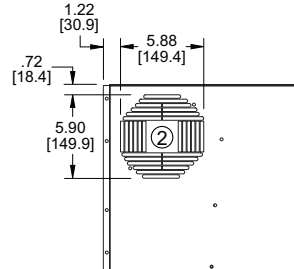
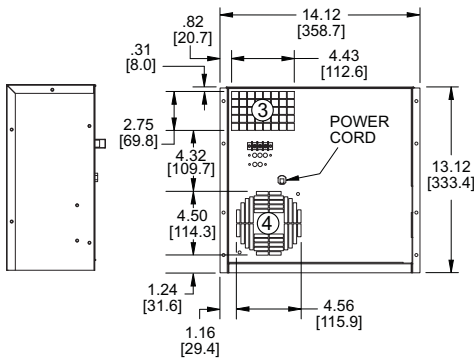
Accessory/Option	Page
■ Adapter	♦
■ Filter Recoating Adhesive	80
■ High-Capacity Condensate Evaporator	81
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	♦
■ Replacement Filters	82
■ Special materials or finishes	♦
■ Stainless or Aluminum Shells	80
■ Weather Protection Kit	81



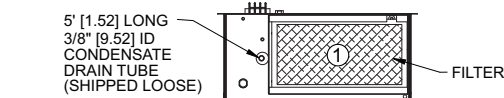
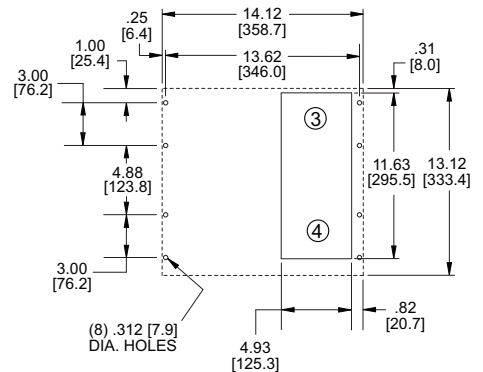
- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



NOTE: REMOVE TOP PANEL TO ACCESS PROGRAMMABLE THERMOSTAT



MOUNTING PLAN

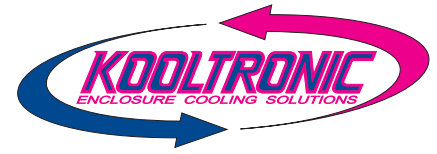


Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

INTEGRITY NEMA 4/4X AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS



DESCRIPTION

Designed specifically for NEMA 4/4X Enclosure applications that require washdown or are subject to outdoor storm conditions, KOOLTRONIC **Integrity NEMA 4/4X Air Conditioners** protect the ratings of NEMA 4/4X Enclosures.

These exclusive **patented** UL/CUL Panel-Mounted Air Conditioners provide superior closed-loop cooling and also protect against the hazards specified for both Indoor and Outdoor NEMA 4/4X enclosures. Tested and rated by universally recognized Underwriters Laboratories, these **304-2B Stainless Steel** Air Conditioners prevent unwanted environmental penetration of NEMA 4/4X Enclosures as they provide a clean, cool internal environment.

For extreme ambient temperatures and/or severely contaminated environments, the use of **Water-Cooled Air Conditioners** or **Water-Cooled Heat Exchangers** is recommended.

General specifications common to all KOOLTRONIC Air Conditioners are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*



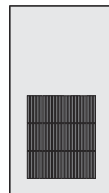
**NEMA
TYPE 4/4X
MAINTAINED**

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

INTEGRITY NEMA 4/4X

STANDARD FEATURES

- Baked Powder Finish
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Impeller Speed Controller
- Filter
- NEMA 12 & 4/4X Ratings Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel (304-2B) Shell
- UL/CUL Listed



P21L
3,000 BTU/H
21"H x 12"W x 12" D

INTEGRITY 21 AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.
Recommended replacement: See *Guardian/GuardianX Series*



Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient	Volts	Hz	* Running Amps	Approx. Weight	
				Temp. °F Max./Min.				lbs	kg
KNA4C3P21L	Yes	3000	2260	125/0	115	60	9.3	76	34
K2NA4C3P21L	Yes	3000	2160	131/0	230	60	4.7	76	34

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

- Baked Powder Finish
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Impeller Speed Controller
- Filter
- NEMA 12 & 4/4X Ratings maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- Stainless Steel (304-2B) Shell
- UL/CUL Listed

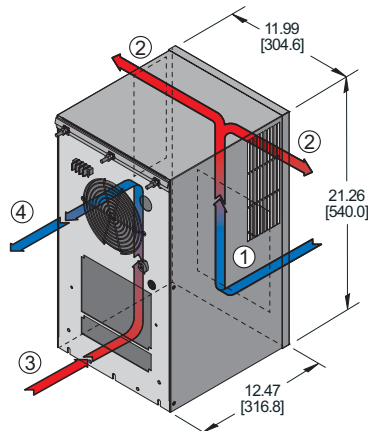
ACCESSORIES AND OPTIONS

	Page
■ Enclosure Heater	80
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special materials or finishes	♦
■ Special motors, line cords or connectors	80

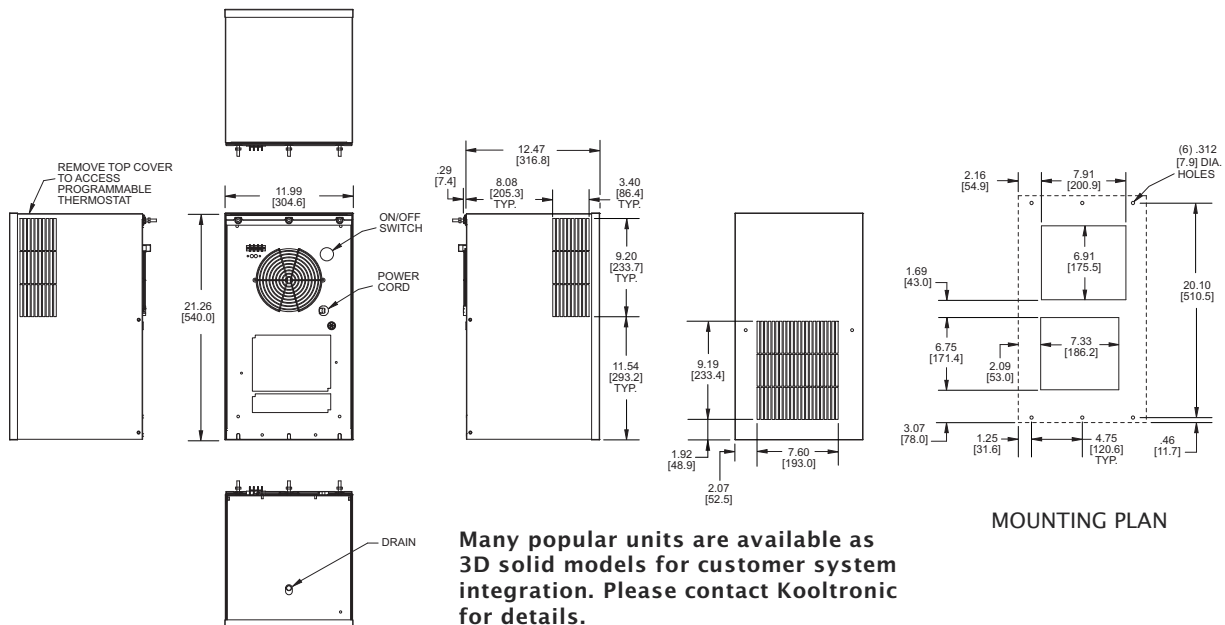
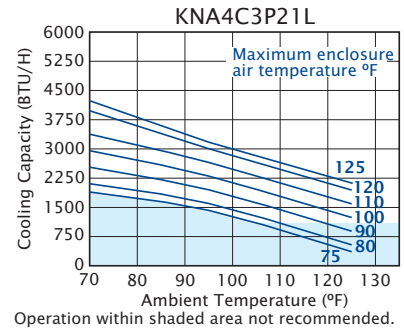


INTEGRITY NEMA 4/4X

- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



PERFORMANCE CHART

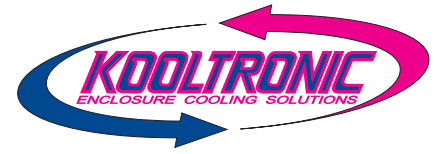


Many popular units are available as 3D solid models for customer system integration. Please contact Koooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

INTREPID AIR-COOLED OUTDOOR PANEL-MOUNTED AIR CONDITIONERS



NEMA
TYPE 12 & 3R
MAINTAINED

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

DESCRIPTION

These specifically-designed **Intrepid Outdoor Air Conditioners** are UL Recognized and approved for outdoor use to protect the enclosure against nearly all outdoor climate hazards.

Sensitive internal components are shielded from invasion by the outdoor elements, while the internal enclosure environment is effectively controlled. Cooling, dehumidification and heating (optional) are provided over a wide range of conditions.

The weather protection afforded by these air conditioners is integral to the cabinetry, without protruding weather hoods. These units feature a sturdy painted galvanized exterior, gasketed flanges and tamper-resistant external fasteners to prevent vandalism or unauthorized access.

Powerful **Kooltronic-designed** blowers in the interior compartment assure maximum airflow and efficient heat transfer, even in densely-packed enclosures, for the most demanding electronic, industrial or telecommunications applications.

These **EP56 Air Conditioners** have been specially designed for applications where sound level must be minimized. The air conditioners utilize a condenser fan speed controller, which delivers significant noise reduction.

For more extreme climatic conditions or applications requiring total sealing of the enclosure from the environment, Kooltronic offers the **GuardianX Series** that maintains NEMA 4 or 4X enclosure ratings.

General specifications common to all KOOLTRONIC Air Conditioners are on the first page of this section.

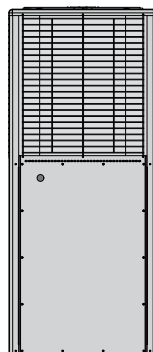
KOOLTRONIC also designs and manufactures a variety of air conditioners to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114

INTREPID OUTDOOR

STANDARD FEATURES

- Available in either top or bottom evaporator air discharge models
- Baked Powder Finish
- Closed-Loop Cooling
- Condenser Blower Speed Controller
- Crankcase Compressor Heater
- Heavy-duty Steel Shell
- Low Temperature Control Thermostat
- NEMA 12 & 3R Ratings Maintained (UL50)
- Six foot [1.8m] (minimum) 3-wire Power Cord
- Tamper-resistant hardware for protection at remote sites
- UL Recognized
- Zero ODP Refrigerant



EP56
30,000 BTU/H
56"H x 24"W x 24" D

INTREPID OUTDOOR AIR-COOLED PANEL-MOUNTED AIR CONDITIONERS

Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Cooling Amps	Heating Amps	Approx. Weight lbs kg
K2A6C30EP56TR**	Yes	30000	28000	131/0	230	60	25.5	15.3	302 137
K2A6C30EP56BR***		30000	28000	131/0	230	60	25.5	15.3	304 138

* Rating shown is for operation at maximum ambient temperature.
 ** Top Evaporator Air Discharge - 230V models with Short Cycle Protector are not RoHS compliant.
 *** Bottom Evaporator Air Discharge - 230V models with Short Cycle Protector are not RoHS compliant.



NEMA
TYPE 12 & 3R
MAINTAINED



STANDARD FEATURES

- Available in either top or bottom evaporator air discharge models
- Baked Powder Finish
- Closed-Loop Cooling
- Condenser Blower Speed Controller
- Crankcase Compressor Heater
- Heavy-duty Steel Shell
- Low Temperature Control Thermostat
- NEMA 12, 3R & 1 Ratings Maintained (UL50)
- Tamper-resistant hardware
- UL Recognized
- Zero ODP Refrigerant

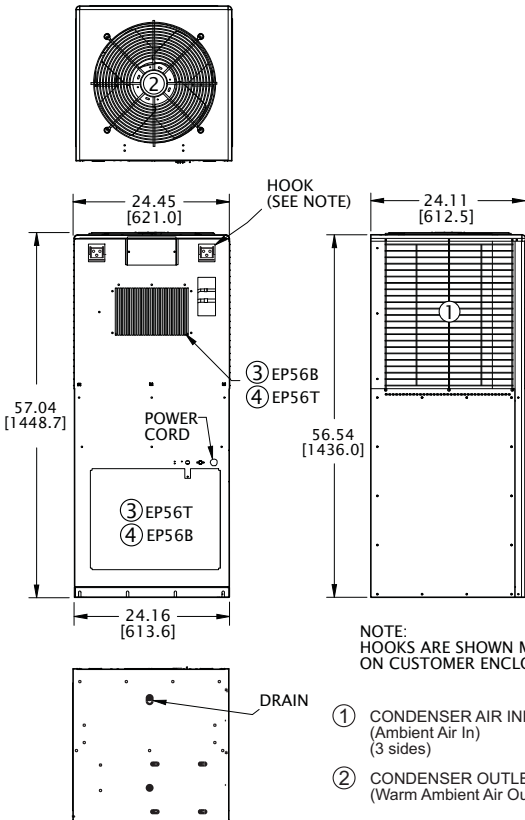
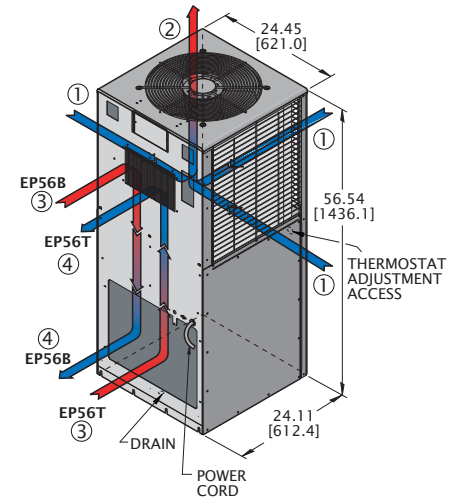
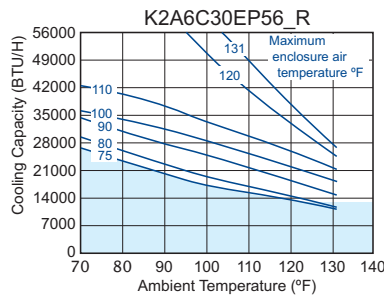
ACCESSORIES AND OPTIONS

- | | |
|-------------------------------|----|
| Enclosure Heater | 80 |
| Internal Corrosion Protection | 80 |
| Remote Thermostat Relay | 80 |
| Special paint finishes | ♦ |
| Temperature Alarm | 80 |

INTREPID OUTDOOR

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

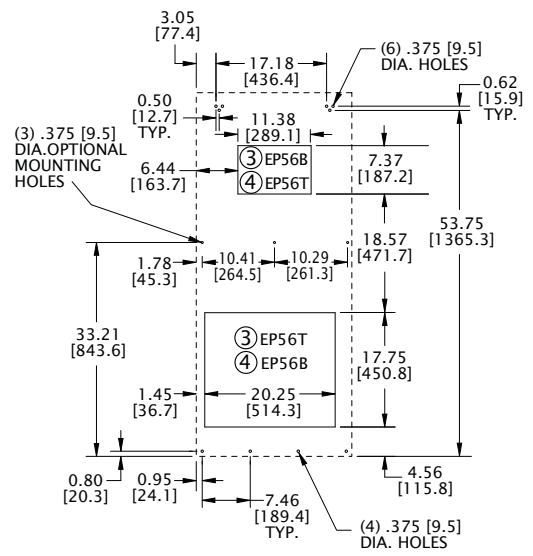
PERFORMANCE CHART



NOTE:
HOOKS ARE SHOWN MOUNTED ON CUSTOMER ENCLOSURE

- ① CONDENSER AIR INLET (Ambient Air In) (3 sides)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

MOUNTING PLAN

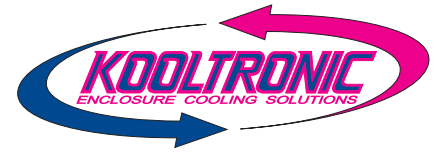


Dimensions, inches [mm], are for reference only and subject to change.

† UL/CUL Listed models are available at added cost.

♦ Contact KOOLTRONIC for information.

HORIZONTAL AIR-COOLED RACK-MOUNTED AIR CONDITIONERS



DESCRIPTION

KOOLTRONIC **Air-Cooled Rack-Mounted Air Conditioners** are particularly suited for applications where internal horizontal mounting is preferred over external panel, door or top mounting.

These models are available in two series. The **RML Series**, with a capacity of 5,000 BTU/H, offers a choice of up to five airflow patterns, allowing installation in any location within a data rack. Using supplied baffle plates the **RML** can easily be configured for a variety of applications. In addition, the **RML** features a unique condenser airflow design with both intake and outlet at the front of the unit. The **RML** is the only air conditioner on the market with this same-side condenser airflow configuration. This design eliminates the need for additional duct work, which takes up valuable space within an enclosure. With the **RML**, enclosure space normally taken up by duct work can now be used for electronic components.

The **H9 and H10 Series** offer 3,500 BTU/H. The **H9** and **H10** are typically mounted internally at the bottom of the cabinet. For rack-mounting at the top of a cabinet use the **Compact Plus Series of Horizontal Top-Mount Air Conditioners** with optional Brackets for Rack Mounting (see page 72).

KOOLTRONIC **Rack-Mounted Air Conditioners** all include EIA-notched flanges. Air-cooled models are provided with attractive 19-inch wide stainless steel grilles and knurled captive fasteners for easy removal. Grille area is 65% open. If preferred, side rails can be supplied.

Outdoor or corrosive environments require weather protection and/or special internal and external protective features.

For extreme ambient temperatures and/or severely contaminated environments, the use of **Water-Cooled Air Conditioners** or **Water-Cooled Heat Exchangers** is recommended.

General specifications common to all KOOLTRONIC Air Conditioners are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

RACK-MOUNTED

STANDARD FEATURES (RML)

- All Models UL/CUL Listed
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Compressor Short Cycle Protector
- Customized airflow with supplied baffle plates
- Filter
- Heavy-duty Steel Shell with Baked Powder Finish
- Ideal for inconspicuous internal mounting
- Programmable Temperature Alarm
- Programmable Thermostat
- NEMA 12 Rating Maintained (UL50)
- Six foot [1.8m] (minimum) 3-wire Power Cord
- Unique condenser airflow design

ACCESSORIES

AND OPTIONS (RML)

	Page
■ Enclosure Heater	80
■ Filter Recoating Adhesive	80
■ Internal corrosion protection	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special materials or finishes	+
■ Special motors, line cords or connectors	+
■ Stainless or Aluminum Shell	80

STANDARD FEATURES (H9 & H10)

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Filter
- Programmable Temperature Alarm
- Programmable Thermostat
- Six foot [1.8m] (minimum) 3-wire Power Cord
- UL/CUR Recognized*

ACCESSORIES

AND OPTIONS (H9 & H10)

	Page
■ Filter Recoating Adhesive	80
■ Internal corrosion protection	80
■ Lifting Eyes	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special materials or finishes	+
■ Special motors, line cords or connectors	+
■ Stainless or Aluminum Shell	80

* UL/CUL Listed models are available at added cost.

HORIZONTAL AIR-COOLED RACK-MOUNTED AIR CONDITIONERS

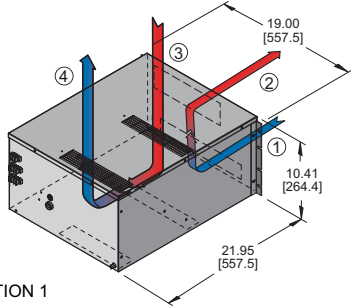
RML

Model	Normally In Stock	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp. °F Max./Min.	Volts	Hz	** Running Amps	Approx. Weight lbs kg
KA4C5RML	Yes	5000	4400	120*/0	115/100	60/50	15.0/14.5	97 44
K2A4C5RML	Yes	5000	4150/4030	120*/0	230	60/50	7.8/6.8	97 44

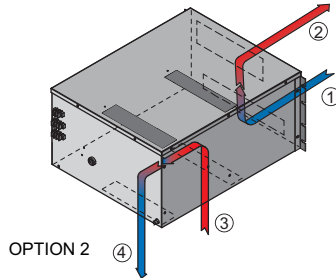
* Maximum ambient temperature is shown for Option 1 evaporator airflow. For other options maximum ambient temperature is 115°F.

** Rating shown is for operation at maximum ambient temperature.

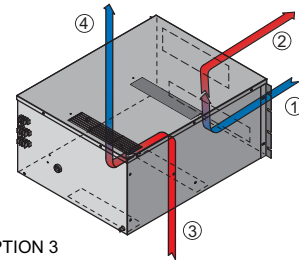
- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out) 2.25 x 3.38 [57.2 x 85.9] each
- ③ WARM AIR RETURN FROM ENCLOSURE 2.00 x 15.00 [50.8 x 381.0]
- ④ COOL AIR OUTLET TO ENCLOSURE 2.00 x 4.50 [50.8 x 114.3] each



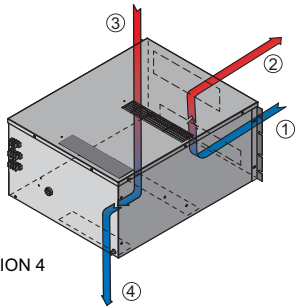
OPTION 1



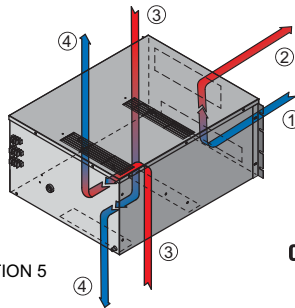
OPTION 2



OPTION 3



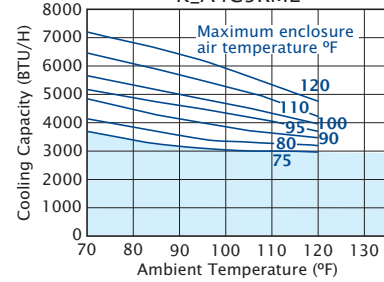
OPTION 4



OPTION 5



PERFORMANCE CHART
K_A4C5RML



Operation within shaded areas not recommended.

RACK-MOUNTED

Dimensions, inches [mm], are for reference only and subject to change.

TECHNICAL DATA H9

Recommended replacement: *RML Series*

Model	UL/CUR Listed or Recognized	95/95 Capacity BTU/H	95/95 Rating BTU/H	Ambient Temp. °F Max./Min	Ambient Temp. °C Max./Min	Volts	Hz	Running Amps	Fuse Size (Amps)	Approx. Weight lbs kg
KA4C3.5H9R	Recognized	3500	3516	120/50	49/10	115/100	60/50	10.0	15	95 44
K2A4C3.5H9R	Recognized	3500	3137	125/50	52/10	230/200	60/50	5.1	15	95 44

Rating shown is for operation at maximum ambient temperature.

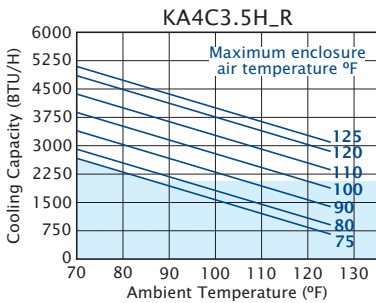
TECHNICAL DATA H10

Recommended replacement: *RML Series*

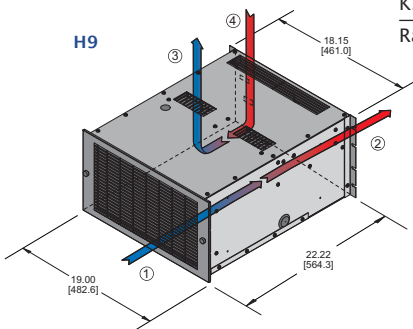
Model	UL/CUR Listed or Recognized	95/95 Capacity BTU/H	95/95 Rating BTU/H	Ambient Temp. °F Max./Min	Ambient Temp. °C Max./Min	Volts	Hz	Running Amps	Fuse Size (Amps)	Approx. Weight lbs kg
KA4C3.5H10R	Recognized	3500	3516	120/50	49/10	115/100	60/50	10.0	15	95 43
K2A4C3.5H10R	Recognized	3500	3137	125/50	52/10	230/200	60/50	5.1	15	95 43

Rating shown is for operation at maximum ambient temperature.

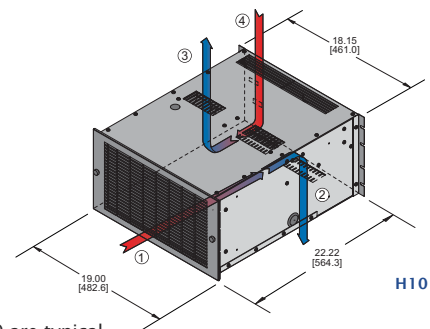
PERFORMANCE CHARTS



Operation within shaded areas not recommended.



H9



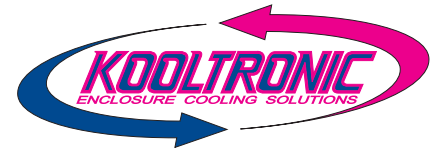
H10



Dimensions, inches [mm], are for reference only and subject to change.

All dimensions shown on H10 are typical.

HORIZONTAL AIR-COOLED TOP-MOUNTED AIR CONDITIONERS



DESCRIPTION

KOOLTRONIC **Horizontal Top-Mounted Air Conditioners** provide a full range of cooling capacities where space or other limitations prevent panel or internal rack mounting.

This line of **Top-Mounted Air Conditioners** offers five series of models, from 2,500 to 12,000 BTU/H, in five sizes. They feature specially designed, heavy-duty centrifugal blowers or fans (Horizontal Super Mini Series) to force the cooling air throughout the enclosure.

The low profile **Horizontal Super-Mini** or **Compact Series** are recommended for lower to moderate-demand cooling applications in smaller enclosures.

For more demanding applications, or for larger or denser enclosures, the **Compact Plus Series** is preferred. This series provides 4,200 to 5,000 BTU/H performance for medium-size enclosures and a choice of two heat-laden ambient air discharges.

The **Full Size** model of the **Horizontal Top-Mounted Series** has a capacity of 12,000 BTU/H.

Outdoor or corrosive environments require weather protection and/or special internal and external protective features.

For extreme ambient temperatures and/or severely contaminated environments, the use of **Water-Cooled Air Conditioners** or **Water-Cooled Heat Exchangers** is recommended.

General specifications common to all KOOLTRONIC Air Conditioners are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

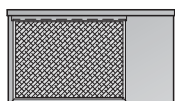
**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**



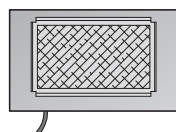
TOP-MOUNTED

STANDARD FEATURES

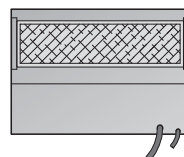
- All models are UL/CUL Listed or Recognized
- Built-in Condensate Evaporator
- Filter
- Heavy-duty Steel Shell with Baked Powder Finish
- Occupies no internal enclosure space
- Six foot [1.8m] (minimum) 3-wire Power Cord
- Thermostatic Low Temperature Control
- Zero ODP or CFC-Free Refrigerant



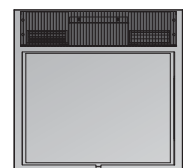
Horizontal Super-Mini
2,500 BTU/H
9"H x 14"W x 16"D



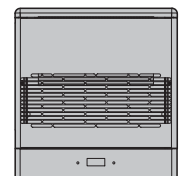
Compact
4,000 BTU/H
10"H x 17"W x 20"D



Compact Plus
4,200-5,000 BTU/H
12"H x 17"W x 22"D



Full Size
12,000 BTU/H
17"H x 18"W x 31"D



RTL
6,000 BTU/H
18"H x 17"W x 26"D

HORIZONTAL SUPER-MINI



Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient	Volts	Hz	* Running Amps	Fuse Amp	Approx. Weight	
				Temp. °F Max./Min.					lbs	kg
KA4C2.5HSR	Yes	2500	2085	125/50	115/100	60/50	7.4	15	58	26
K2A4C2.5HSR		2500	2356	125/50	230/200	60/50	3.0	15	58	26

* Rating shown is for operation at maximum ambient temperature.

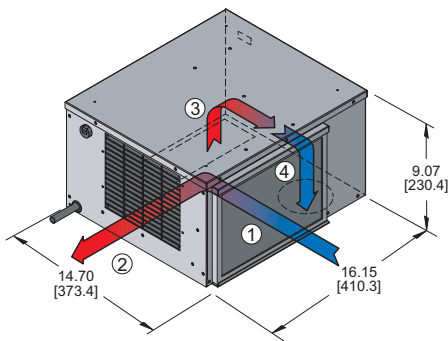
STANDARD FEATURES

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Epoxy-Coated Coils
- Filter
- Low Ambient Kit
- NEMA 12 Rating Maintained (UL50)
- Programmable Temperature Alarm
- Programmable Thermostat
- UL/CUR Recognized

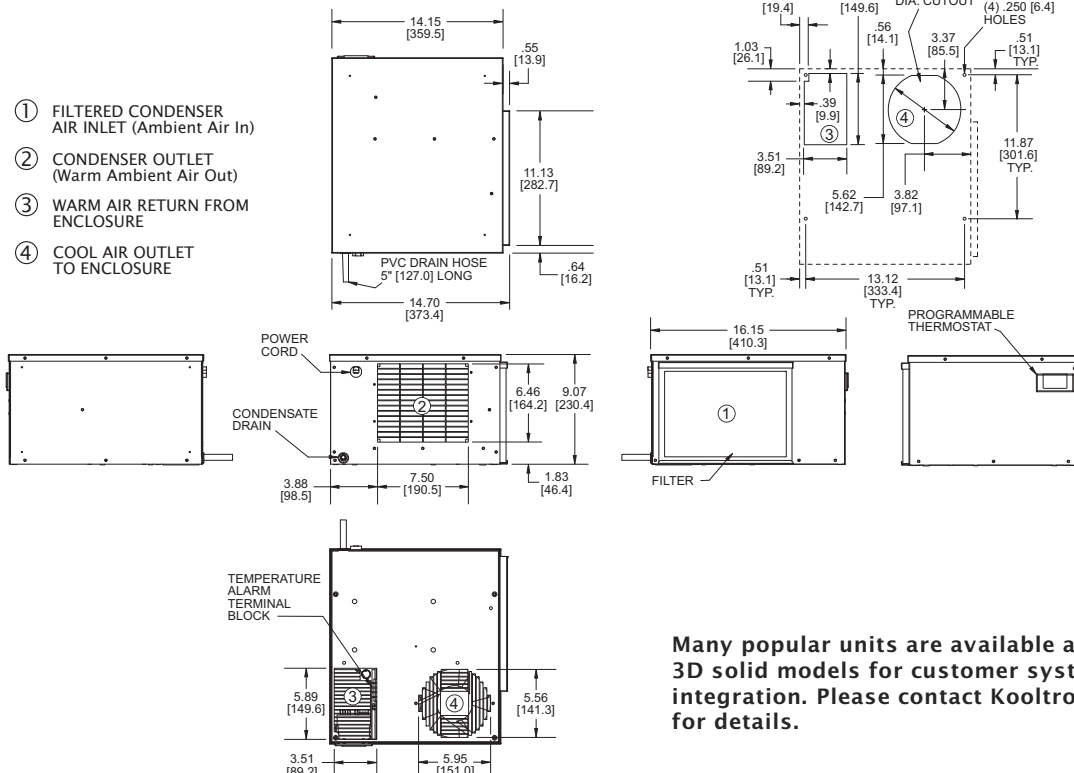
ACCESSORIES AND OPTIONS

	Page
■ Filter Recoating Adhesive	80
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ Remote Monitoring	80
■ Remote Thermostat Relay	80
■ Replacement Filters	82
■ Special controls or indicators	♦
■ Special materials or finishes	♦
■ Special motors, line cords or connectors	♦
■ Stainless or Aluminum Shell	80

TOP-MOUNTED



- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

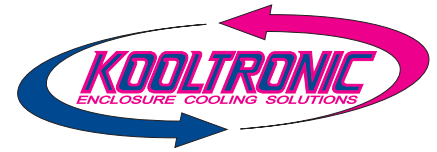


Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

- ▼ UL/CUL Listed models are available at added cost.
- ♦ Contact KOOLTRONIC for information.

COMPACT SERIES



Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient	Volts	Hz	* Running Amps	Approx. Weight	
				Temp. °F Max./Min.				lbs	kg
KA4C4HTL	Yes	4000	3442	122/50	115/100	60/50	10.0	85	39
K2A4C4HTL	Yes	4000	2984	125/50	230/200	60/50	5.0	85	39

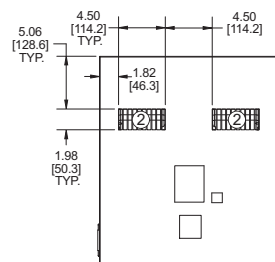
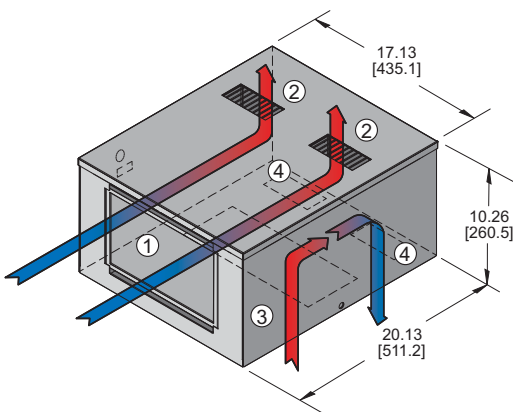
* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

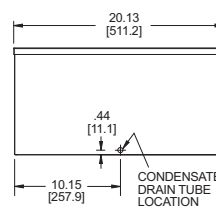
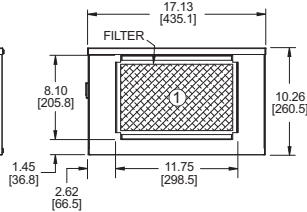
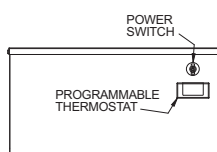
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Filter
- Low Ambient Kit
- Programmable Temperature Alarm
- Programmable Thermostat
- UL/CUL Listed

ACCESSORIES AND OPTIONS

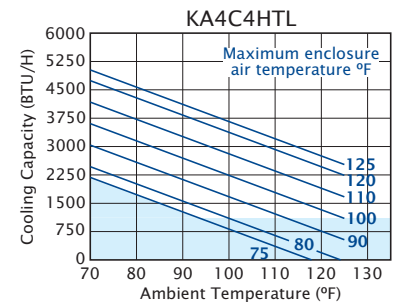
- | | |
|--|----|
| ■ Filter Recoating Adhesive | 80 |
| ■ Internal Corrosion Protection | 80 |
| ■ Lifting Eyes | 80 |
| ■ Remote Monitoring | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Replacement Filters | 82 |
| ■ Special controls or indicators | ♦ |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords or connectors | ♦ |
| ■ Stainless or Aluminum Shell | 80 |



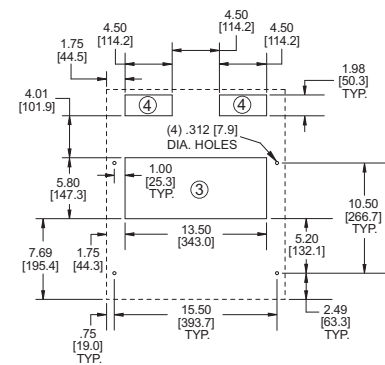
- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



PERFORMANCE CHART

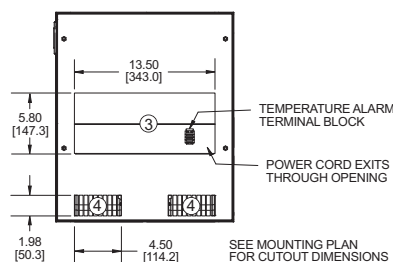


Operation within shaded area not recommended.



MOUNTING PLAN

Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.



SEE MOUNTING PLAN FOR CUTOUT DIMENSIONS

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

TOP-MOUNTED

COMPACT PLUS SERIES



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Model	BTU/H Rating	95/95 Rating	Ambient	Volts	Hz	* Running Amps	Approx. Weight
			Temp. °F Max./Min.				
KA4C4.2H5R	4200	2800	125/50	115/100	60/50	13.4	95 43
K2A4C4.2H5R	4200	2800	115/50	230/200	60/50	6.0	95 43
KA4C5.0H5R	5000	3500	125/50	115/100	60/50	16.5	95 43
K2A4C5.0H5R	5000	3500	115/50	230/200	60/50	9.2	95 43

* Rating shown is for operation at maximum ambient temperature.

STANDARD FEATURES

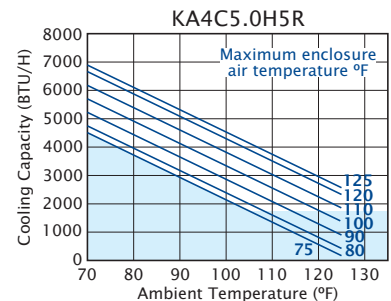
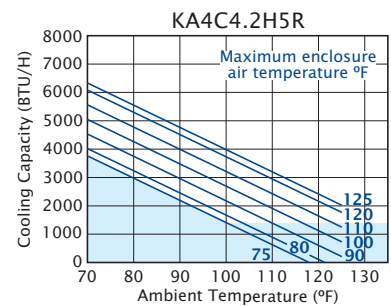
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Filter
- Low Temperature Control Thermostat
- Reversible Condenser Inlet Filter
- UL/CUL Recognized*

Many popular units are available as 3D solid models for customer system integration. Please contact Cooltronic for details.

ACCESSORIES AND OPTIONS

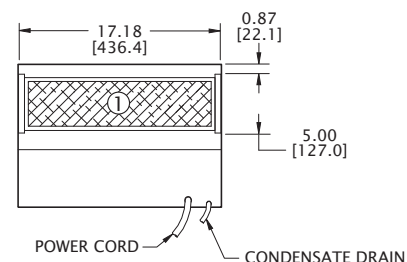
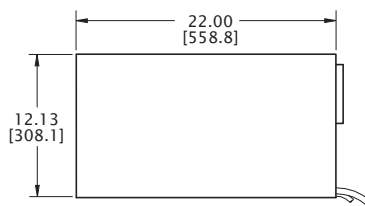
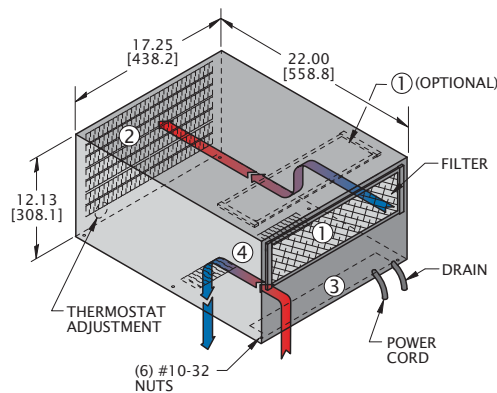
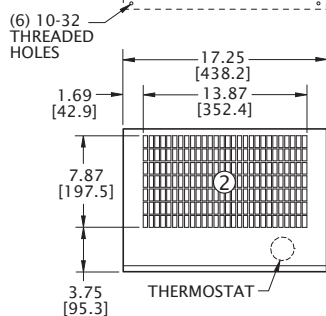
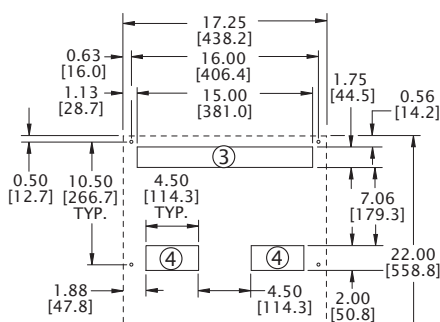
- | | Page |
|--|------|
| ■ Brackets for Rack Mounting | ♦ |
| ■ Compressor Short Cycle Protector | 80 |
| ■ Enclosure Heater | 80 |
| ■ Filter Recoating Adhesive | 80 |
| ■ Internal Corrosion Protection | 80 |
| ■ Lifting Eyes | 80 |
| ■ Low Airflow Detector | 80 |
| ■ Low Ambient Kit | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Replacement Filters | 82 |
| ■ Side Mounting Rails | ♦ |
| ■ Special controls or indicators | ♦ |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords or connectors | ♦ |
| ■ Stainless or Aluminum Shell | 80 |
| ■ Temperature Alarm | 80 |

PERFORMANCE CHARTS



Operation within shaded areas not recommended.

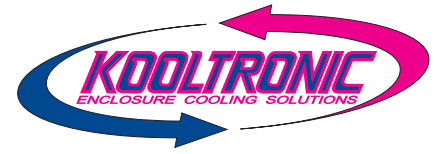
MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

- ▼ UL/CUL Listed models are available at added cost.
- ♦ Contact KOOLTRONIC for information.

FULL-SIZE SERIES



Model	Normally In Stock	BTU/H Rating	95/95 Rating	Ambient	Volts	Hz	* Running	Approx.
				Temp. °F			Amps	Weight
				Max./Min.				lbs kg
K2A6C12HTL		12000	11500	125/-20	230	60/50	12.0/12.0	152 69
K2A6C12HTL		12000	11500	125/-20	208	60	13.4	152 69

* Rating shown is for operation at maximum ambient temperature.



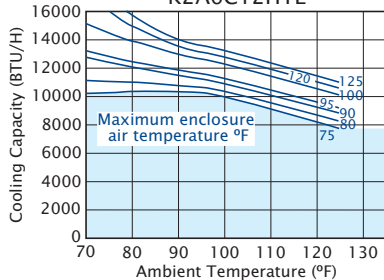
STANDARD FEATURES

- Built-in Condensate Evaporator
- Closed-Loop Cooling
- Condensate Blower Controller
- Filter
- High Refrigerant Temperature Protection
- Low Temperature Control Thermostat
- NEMA 1 Rating Maintained (UL50)
- UL/CUL Listed
- Zero ODP Refrigerant

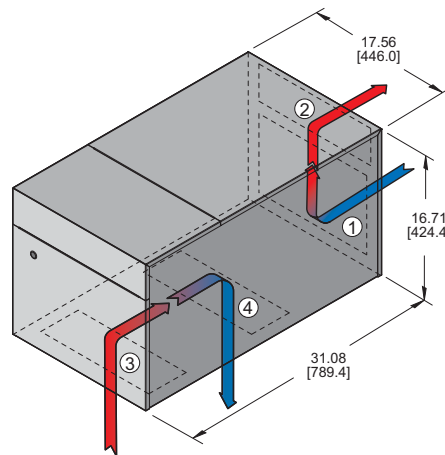
ACCESSORIES AND OPTIONS

- | | Page |
|--|------|
| ■ Compressor Short Cycle Protector | 80 |
| ■ Enclosure Heater | 80 |
| ■ Filter Recoating Adhesive | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Replacement Filters | 82 |
| ■ Special controls or indicators | ♦ |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords or connectors | ♦ |
| ■ Stainless or Aluminum Shell | 80 |
| ■ Temperature Alarm | 80 |

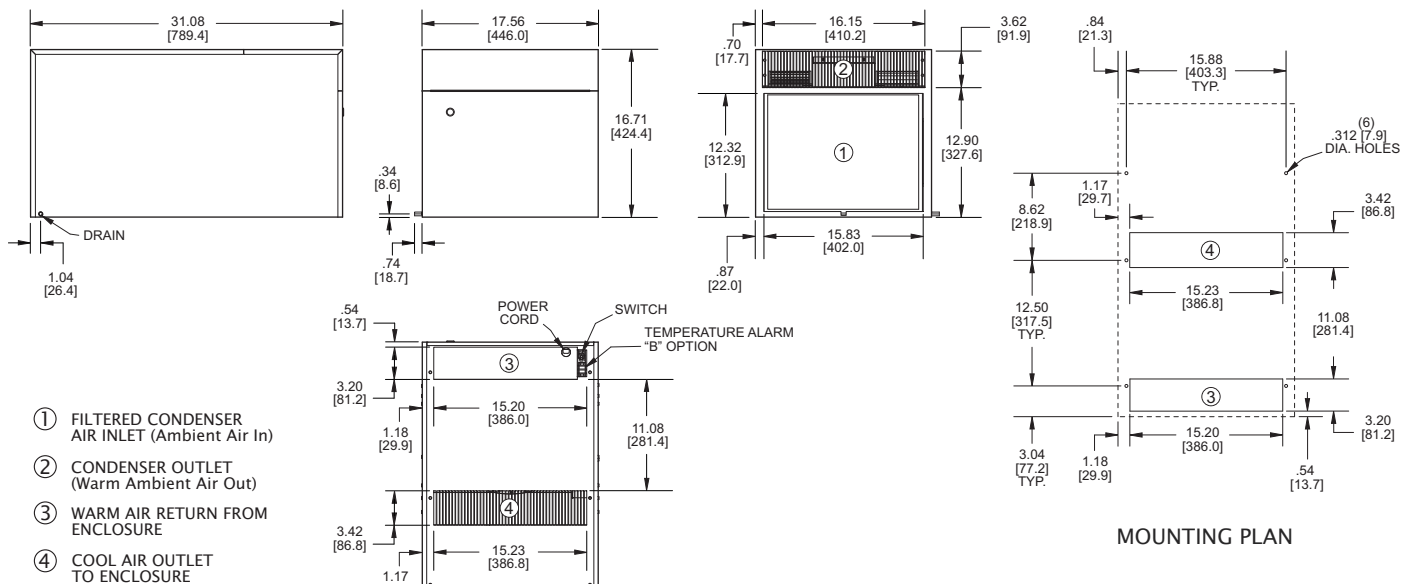
PERFORMANCE CHART
K2A6C12HTL



Operation within shaded area not recommended.



TOP-MOUNTED



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

ADVANTAGE SERIES INDOOR/OUTDOOR TOP-MOUNT AIR CONDITIONERS

Model	BTU/H Rating	95/95 Rating	Ambient Temp. °F Max./Min.	Volts	Hz	* Cooling Amps	* Heating Amps	Approx. Weight lbs kg
KA4C6RTL	6000	6171	125/0	115/100	60/50	12.8/13.0	8.0/14.6	131 59
K2A4C6RTL	6000	4600	120/0	230/208	60	6.3/7.0	4.0/7.5	131 59
K2A4C6RTL	6000	4600	120/0	220/200	50	5.6/6.0	4.0/7.5	131 59

* Rating shown is for operation at maximum ambient temperature.



TOP-MOUNTED

STANDARD FEATURES

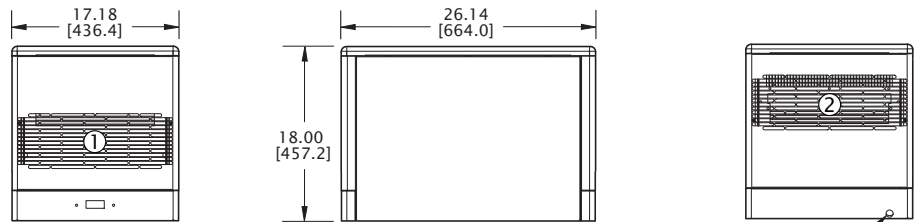
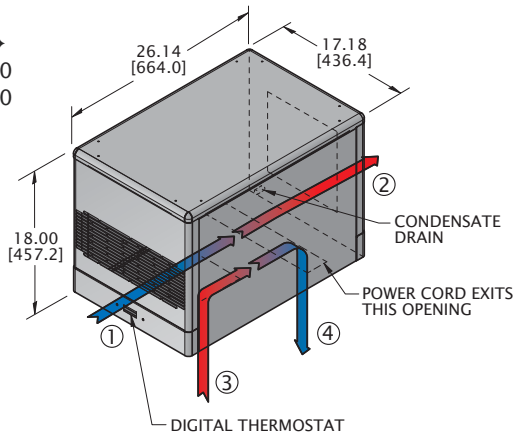
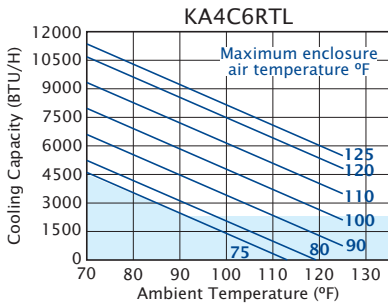
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Digital Temperature Display
- Filter
- Head Pressure Control
- Low Ambient Kit
- Low Temperature Control Thermostat
- NEMA 12 & 3R Ratings Maintained (UL50)
- Painted Metal Grille
- UL/CUL Listed

ACCESSORIES AND OPTIONS

- | | Page |
|--|------|
| ■ Compressor Short Cycle Protector | 80 |
| ■ Enclosure Heater | 80 |
| ■ Filter Recoating Adhesive | 80 |
| ■ Internal Corrosion Protection | 80 |
| ■ Lifting Eyes | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Replacement Filters | 82 |
| ■ Special controls or indicators | ♦ |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords or connectors | ♦ |
| ■ Stainless or Aluminum Shell | 80 |
| ■ Temperature Alarm | 80 |

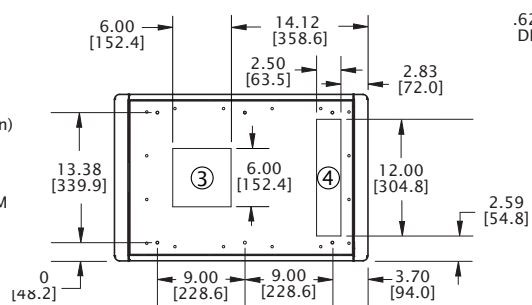


PERFORMANCE CHART



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

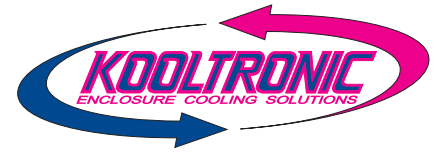


MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

♦ Contact KOOLTRONIC for information.

TRIMLINE WATER-COOLED PANEL-MOUNTED AIR CONDITIONERS



DESCRIPTION

Cool circulating water has greater heat-removal capacity than warm ambient air.

KOOLTRONIC **Water-Cooled Air Conditioners** are recommended for applications with extreme ambient temperatures and/or severely contaminated environments, if a reliable supply of cool, clean water is available.

Since ambient air is sealed out of the air conditioner as well as the enclosure, no contaminants can enter and there are no filters to clean.

These units contain a regulating valve that automatically adjusts the condenser waterflow rate for water temperature and/or cooling load changes. When the air conditioner is shut off, the valve closes, cutting off the water supply to the unit.

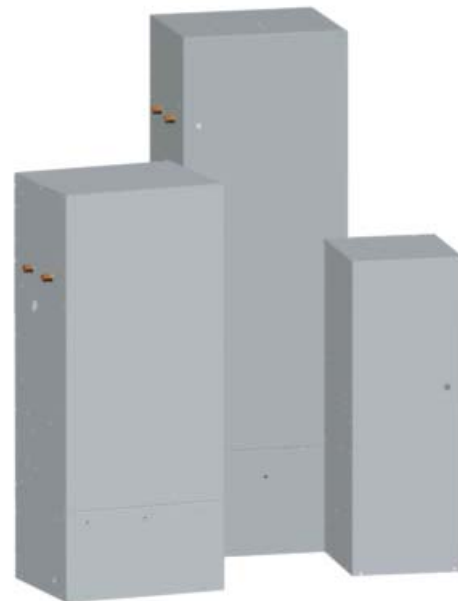
Should the water supply become inadequate for any reason, the built-in Excess Pressure Control senses the increased compressor discharge pressure and turns off the unit. For added protection, the switch must be reset manually after the waterflow problem has been corrected.

Sized interchangeably with the **TrimLine Air-Cooled Panel-Mounted Series**, these units can be installed either fixed or hinged to any vertical enclosure panel or door. They retain the closed-loop design and gasketed mounting features, to seal out contaminants and protect the electronics.

General specifications common to all KOOLTRONIC Air Conditioners are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of air conditioners to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

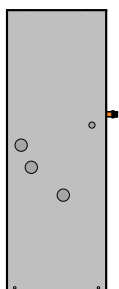
Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

WATER-COOLED

STANDARD FEATURES

- All Models UL/CSA Recognized components
- CFC-free Refrigerant
- Compact design with slim 10", 12" and 15" wide mounting footprints
- Heavy-duty Steel Shell with Baked Powder Finish
- Protective waterflow controls
- Six foot [1.8m] (minimum) 3-wire Power Cord
- Suitable for extreme environments
- Thermostatic Low Temperature Control
- Versatile mounting locations



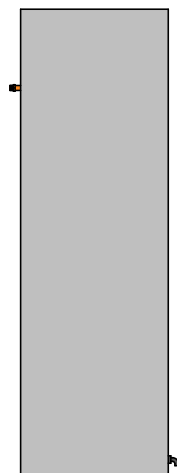
WNP28
4,000 BTU/H
28"H x 10"W x 11"D



WNP33
4,000 BTU/H
33"H x 12"W x 9"D



WNP36
4,000 & 6,000
BTU/H
37"H x 15"W x 12"D



WNP47
7,000 & 12,000
BTU/H
47"H x 15"W x 12"D

WNP28 TRIMLINE WATER-COOLED PANEL-MOUNTED AIR CONDITIONERS

Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.
 Recommended replacement: See *Guardian/GuardianX Series*



Model	BTU/H Rating	Water Flow (GPM) @85°F Max.▼	Volts	Hz	* Running Amps	Approx. Weight lbs kg
KA4C4WNP28	4000	1.0	115/100	60/50	10.4	85 39
K2A4C4WNP28	4000	1.0	230/200	60/50	5.4	85 39

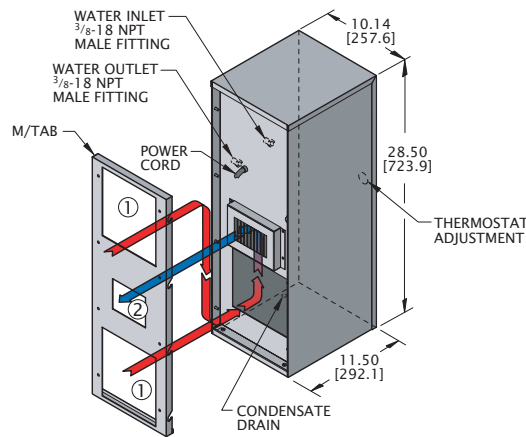
* Rating shown is for operation at maximum water temperature.

STANDARD FEATURES

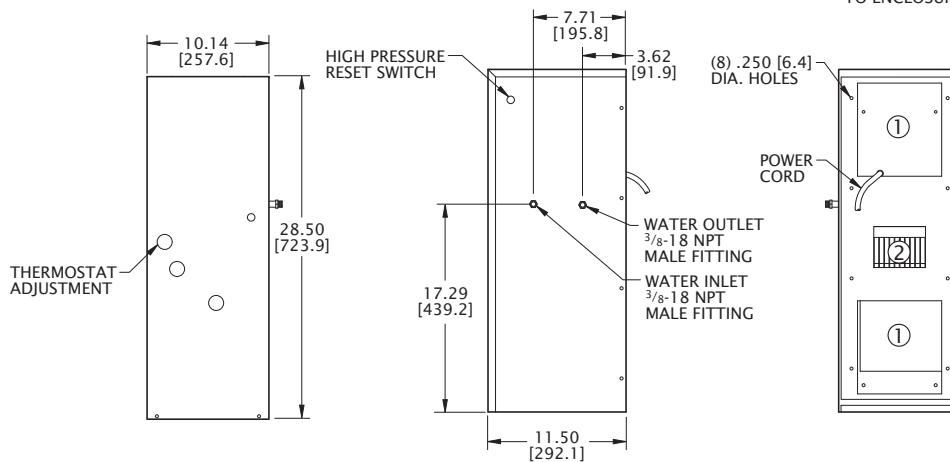
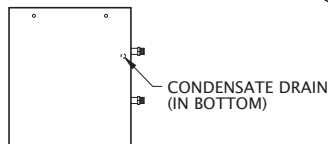
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Excess Pressure Control
- Low Temperature Control Thermostat
- Water Regulating Valve

ACCESSORIES AND OPTIONS

	Page
■ Adapter	♦
■ Aluminum Shell	80
■ Compressor Short Cycle Protector	80
■ Enclosure Heater	80
■ High-Capacity Condensate Evaporator	81
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ Low Airflow Detector	80
■ Remote Thermostat Relay	80
■ Special controls or indicators	♦
■ Special materials or finishes	♦
■ Special motors, line cords or connectors	♦
■ Stainless Steel Shell	80
■ Temperature Alarm	80

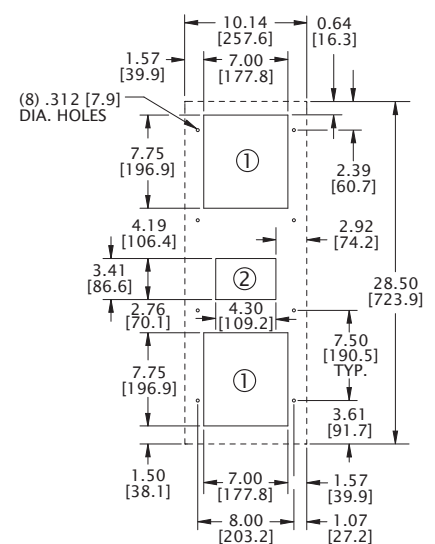


Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.



- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

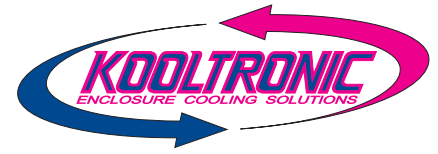
MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

- ▼ Rated for full capacity load at 85°F water. Usage will vary at lower load or cooler water conditions.
- ♦ Contact KOOLTRONIC for information.

WNP33 TRIMLINE WATER-COOLED PANEL-MOUNTED AIR CONDITIONERS



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Guardian/GuardianX Series*

Model	BTU/H Rating	Water Flow (GPM) @85°F Max.▼	Volts	Hz	* Running Amps	Approx. Weight lbs kg
KA4C4WNP33	4000	1.0	115/100	60/50	10.4	85 39
K2A4C4WNP33	4000	1.0	230/200	60/50	5.4	85 39

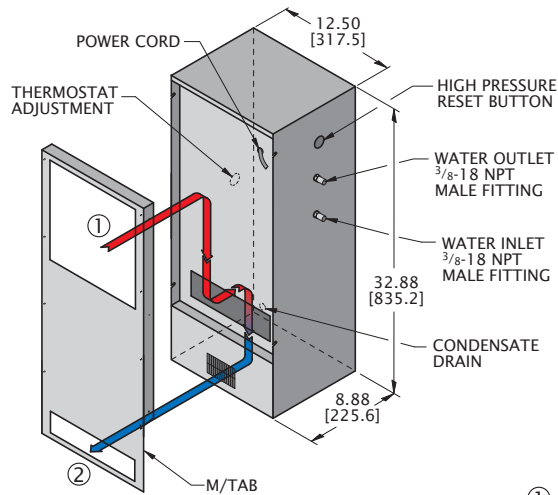
* Rating shown is for operation at maximum water temperature.

STANDARD FEATURES

- CFC-Free Refrigerant
- Closed-Loop Cooling
- Excess Pressure Control
- Low Temperature Control Thermostat
- Water Regulating Valve

ACCESSORIES AND OPTIONS

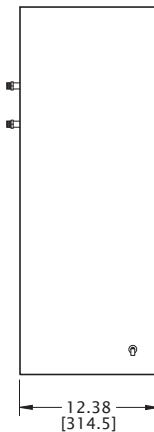
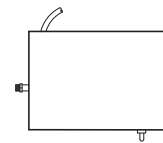
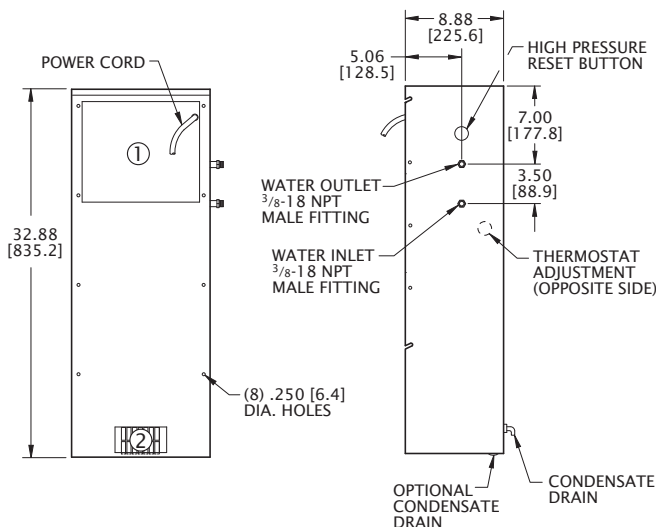
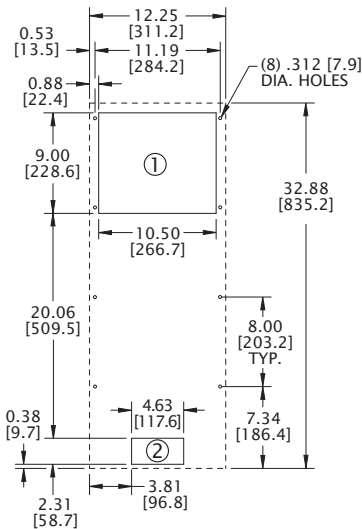
- | | Page |
|--|------|
| ■ Adapter | ♦ |
| ■ Aluminum Shell | 80 |
| ■ Compressor Short Cycle Protector | 80 |
| ■ Condenser Access Panel | 80 |
| ■ Enclosure Heater | 80 |
| ■ High-Capacity Condensate Evaporator | 81 |
| ■ Internal Corrosion Protection | 80 |
| ■ Lifting Eyes | 80 |
| ■ Low Airflow Detector | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords or connectors | ♦ |
| ■ Stainless Steel Shell | 80 |
| ■ Temperature Alarm | 80 |



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

- ▼ Rated for full capacity load at 85°F water. Usage will vary at lower load or cooler water conditions.
- ♦ Contact KOOLTRONIC for information.

WATER-COOLED

WNP36 TRIMLINE WATER-COOLED PANEL-MOUNTED AIR CONDITIONERS



Model	BTU/H Rating	Water Flow (GPM) @85°F Max.▼	Volts	Hz	* Running Amps	Approx. Weight lbs kg
KA4C6WNP36	6000	1.5	115/100	60/50	11.8	125 57
K2A4C6WNP36	6000	1.5	230/200	60/50	6.8	125 57

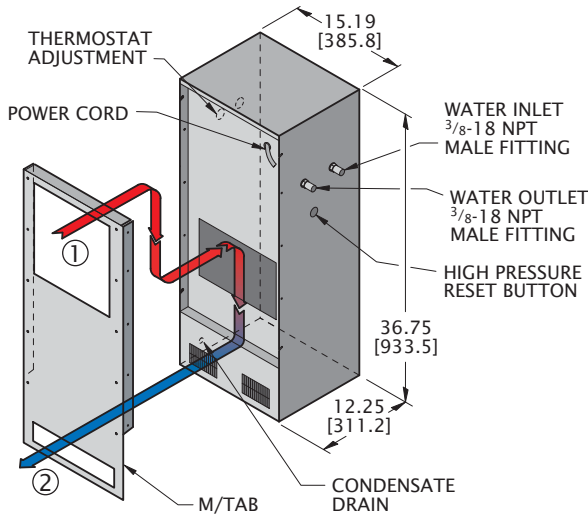
* Rating shown is for operation at maximum water temperature.
230V models with Short Cycle Protector are not RoHS compliant.

STANDARD FEATURES

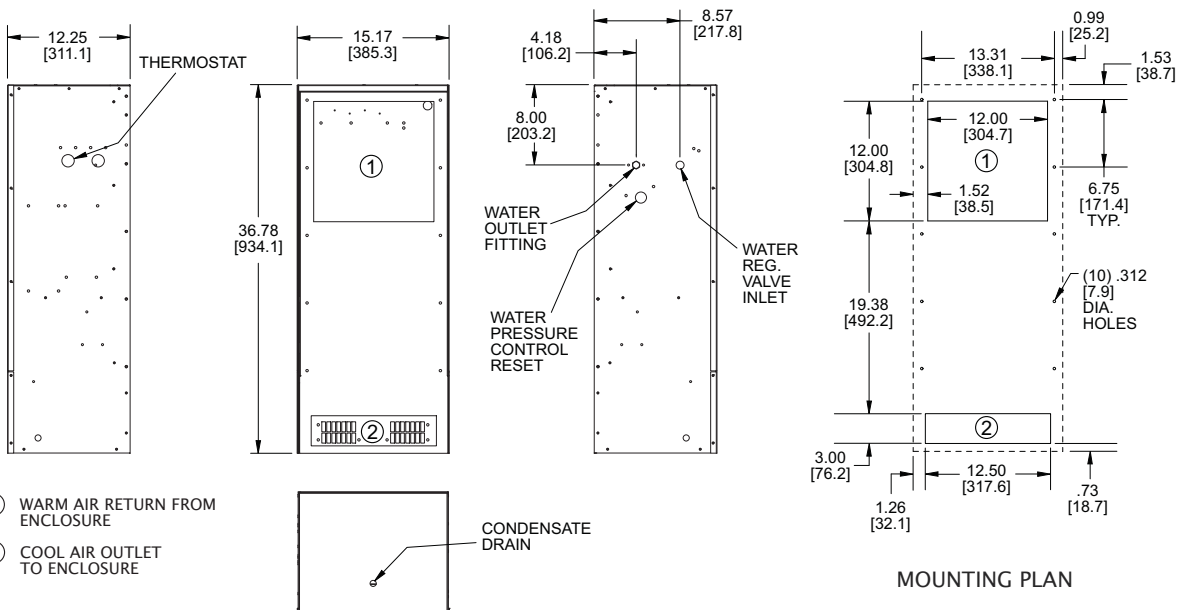
- CFC-Free Refrigerant
- Closed-Loop Cooling
- Excess Pressure Control
- Low Temperature Control Thermostat
- Water Regulating Valve

ACCESSORIES AND OPTIONS

	Page
■ Adapter	♦
■ Aluminum Shell	80
■ Compressor Short Cycle Protector	80
■ Enclosure Heater	80
■ High-Capacity Condensate Evaporator	81
■ Internal Corrosion Protection	80
■ Lifting Eyes	80
■ Low Airflow Detector	80
■ Remote Thermostat Relay	80
■ Special controls or finishes	♦
■ Special controls or indicators	♦
■ Special motors, line cords or connectors	♦
■ Stainless Steel Shell	80
■ Temperature Alarm	80



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.



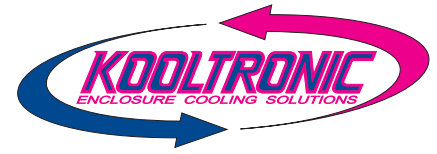
- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

- ▼ Rated for full capacity load at 85°F water. Usage will vary at lower load or cooler water conditions.
- ♦ Contact KOOLTRONIC for information.

WNP47 TRIMLINE WATER-COOLED PANEL-MOUNTED AIR CONDITIONERS



Model	BTU/H Rating	Water Flow (GPM) @85°F Max.▼	Volts	Hz	* Running Amps	Approx. Weight lbs kg
KA4C7WNP47	7000	2.0	115/100	60/50	12.0	160 73
K2A4C7WNP47	7000	2.0	230/200	60/50	7.0	160 73
K2A4C12WNP47	12000	2.5	230/200	60/50	9.6	160 73

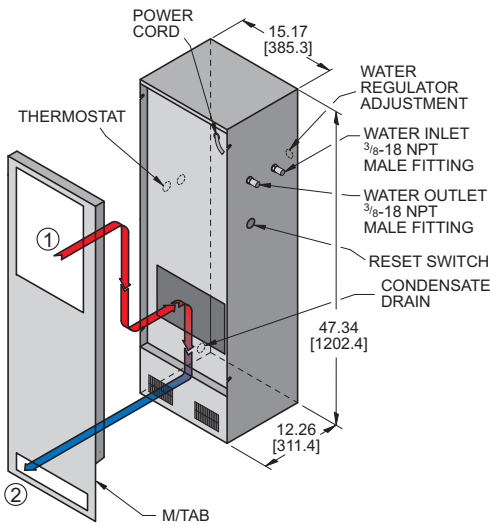
* Rating shown is for operation at maximum water temperature.

STANDARD FEATURES

- CFC-Free Refrigerant
- Closed-Loop Cooling
- Excess Pressure Control
- Low Temperature Control Thermostat
- Water Regulating Valve

ACCESSORIES AND OPTIONS

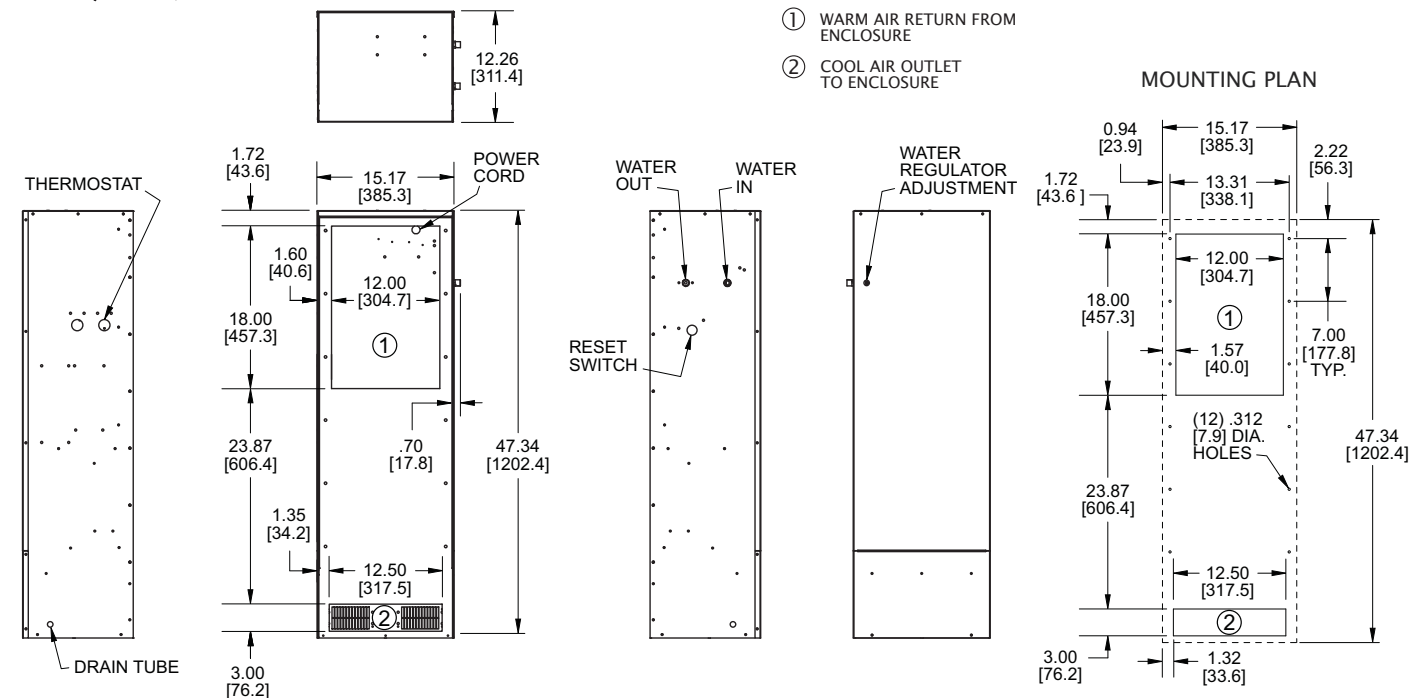
- | | Page |
|--|------|
| ■ Adapter | ♦ |
| ■ Aluminum Shell | 80 |
| ■ Compressor Short Cycle Protector | 80 |
| ■ Condensate Evaporator Kit | 81 |
| ■ Enclosure Heater | 80 |
| ■ Internal Corrosion Protection | 80 |
| ■ Lifting Eyes | 80 |
| ■ Low Airflow Detector | 80 |
| ■ Remote Thermostat Relay | 80 |
| ■ Special controls or indicators | ♦ |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords or connectors | ♦ |
| ■ Stainless Steel Shell | 80 |
| ■ Temperature Alarm | 80 |



Many popular units are available as 3D solid models for customer system integration. Please contact Kooltronic for details.

- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

- ▼ Rated for full capacity load at 85°F water. Usage will vary at lower load or cooler water conditions.
- ♦ Contact KOOLTRONIC for information.

WATER-COOLED

AIR CONDITIONER ACCESSORIES AND OPTIONS

FACTORY-INSTALLED OPTIONS

ALUMINUM SHELL: Where light weight and/or compatibility with appearance of aluminum enclosures are required. Unpainted Type 5052 is standard. Other types and ultraviolet-resistant baked powder finish are available.

COMPRESSOR SHORT CYCLE PROTECTOR: Protects the compressor from possible damage due to harmful short cycling, (frequent starting) where temperature controls enable the compressor to restart frequently or after a power interruption. These conditions could be due to low or fluctuating heat loads within the electrical enclosure or a power failure. The Compressor Short Cycle Protector will prevent the compressor from starting when it has been shut off for less than several minutes. By limiting the number of compressor starts per hour, the life of the compressor is prolonged. It is recommended where installations are subject to solar gain and or changes in the enclosure internal load due to the degree of usage of the equipment being cooled. It is also recommended where higher capacity units are specified in anticipation of the future addition of heat producing equipment being added to the enclosure.

CONDENSER ACCESS PANEL: Expressly designed for quick, convenient access to the condenser coil for easy cleaning and servicing. Recommended for units operating in dirty environments, the panel is easily removed and replaced by use of a few fasteners, without removal of the entire rear cover panel.

ENCLOSURE HEATER: 120V or 240V fin strip heater, installed singly or ganged, used to maintain desired internal enclosure temperature, under cold operating conditions.

INTERNAL CORROSION PROTECTION: An air cured coating is sprayed on copper lines and brazed joints on the condenser side, providing a degree of protection from corrosive environments. This coating will withstand 1000 hours of salt spray per the ASTM B 117 test method. Also see Stainless Steel Cabinet or Integrity NEMA 4/4X Air Conditioners.

NOTE: Severe operational environments such as waste water treatment and salt spray are likely to cause corrosion failure over a period of time regardless of coating. **Warranty:** Corrosive conditions may affect the warranty coverage. Consult factory for warranty limitations in corrosive environments. **NOTE:** For additional corrosion protection options, contact factory.

LIFTING EYES: Heavy-gauge steel lifting eyes, attached to the side panels, assist in positioning units.

LOW AIRFLOW DETECTOR: Similar to the Airflow Switch shown in the Blower Accessories Section, the switch is installed in a suitable location in the air conditioner to detect loss of airflow, and sends a signal to a terminal block, through which user-installed wiring and warning devices are activated.

LOW AMBIENT KIT: Maintains sufficient operating pressures when ambient temperatures drop below 50°F. Includes a compressor heater and a pressure device that senses the reduced discharge pressure and modulates the condenser blower. Effective to a minimum ambient temperature of 0°F.

MOUNTING HINGE: (Left-hand or Right-hand) Allows the air conditioner itself to be used as a cabinet door. (Caution: The cabinet must be able to support the full weight of the unit in open position). Specify left-hand or right-hand, determined by facing the mounting side of the air conditioner.

REMOTE MONITORING: An optional feature for models with Programmable Thermostat, Remote Monitoring provides temperature data for warning of early action required, accomplished through a Hot Key connection from the Programmable Thermostat to a monitoring system (not supplied).

REMOTE THERMOSTAT RELAY: Used only with a user-installed remote thermostat, the 24VAC relay can be used with a lead lag control (see below) for the sequential operation of two units or with a single unit. An external terminal strip is provided for field interconnection. **NOTE:** A factory installed thermostat is not provided with this option.

STAINLESS STEEL SHELL: For applications in corrosive or other hostile environments such as those requiring Internal Corrosion Resistant Coatings, especially where chemical/moisture combinations are present.

TEMPERATURE ALARM: A thermostat is mounted inside the cabinet and attached to a sensor in the warm air return. When the air temperature increases to the set point, a signal is sent to a terminal block. User-installed wiring from the terminal block to local and/or remote warning devices (light, bell, siren, etc.) can be for normally open or closed operation.

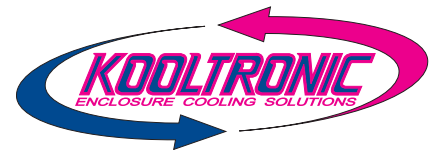
CUSTOMER-INSTALLED ACCESSORIES

CONDENSATE EVAPORATOR: Heated add-on unit for air conditioners without built-in condensate evaporator system. Eliminates need for draining of condensate under normal operating conditions. May not be adequate in extremely high humidity with open or leaky enclosure.

FILTERS: See page 82.

FILTER RECOATING ADHESIVE: This compound is a superior product for recoating filters after washing. The adhesives penetrate dirt layers to keep the filter surface tacky for longer effective performance between washings. Part No. A-16 - 10 ounce container.

AIR CONDITIONER ACCESSORIES AND OPTIONS (cont.)



WEATHER PROTECTION KIT: For outdoor installations subject to invasion by rain, snow or windblown dirt, special deflectors shield the condenser air inlet and outlet ports. Air conditioners or heat exchangers installed outdoors may also require special exterior paint. **NOTE:** Units using the Weather Protection Kit are not UL Listed.

HIGH-CAPACITY CONDENSATE EVAPORATOR KIT: Condensate evaporator kits are available for attachment to the bottom of Micro-Mini, Air or Water Cooled Panel Mounted Air Conditioners, and Water-to-Air Heat Exchangers. Condensate is collected, vaporized and discharged to the surrounding air. All units include a safety overflow drain which discharges excessive condensate when required. Overflow may occur when cabinets are poorly sealed, or when cabinet doors are frequently opened, permitting the invasion of moisture-laden air. Built-In Condensate Evaporators are standard equipment on Kooltronic TrimLine Series, Horizontal Top-Mounted, Profile Series models and selected Guardian/GuardianX Series models.

UNIT APPLICATIONS

KCH20 & K2CH20 for use on Kooltronic Micro-Mini Air Conditioners.

KCH30 & K2CH30 for use on Kooltronic Panel Mount Air Conditioners and Water-to-Air Heat Exchangers.

ELECTRICAL REQUIREMENTS

KCH20	115 Volt	2.5 amps	50/60 Hz
K2CH20	230 Volt	1.2 amps	50/60 Hz
KCH30	115 Volt	2.6 amps	50/60 Hz
K2CH30	230 Volt	1.3 amps	50/60 Hz

- Voltage need not match Air Conditioner as long as unit is connected to a matching power source.
- 115 Volt units are furnished with NEMA 5-15 P plugs.
- 230 Volt units are furnished with NEMA 6-15 P plugs.

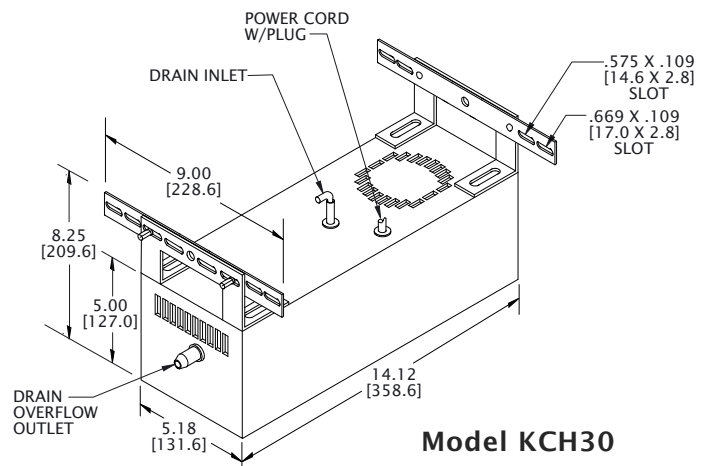
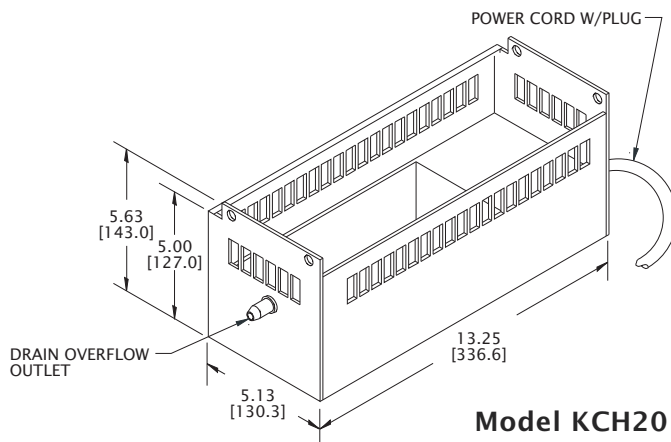
(For wiring directly to Air Conditioners, contact KOOLTRONIC)

CAPACITY

Units capable of evaporating up to 8 ounces of water per hour under normal operating conditions.



ACCESSORIES & OPTIONS



Dimensions, inches [mm], are for reference only and subject to change.

FILTERS

REPLACEMENT FILTERS: All KOOLTRONIC filters consist of a multi-layer grid of sturdy corrugated aluminum, securely held in a one-piece aluminum frame. Filters are required wherever air is drawn into an electronics enclosure or related cooling equipment to keep internal parts as clean as possible. A non-drying adhesive coating traps a high percentage of particulate matter. These filters are reusable, they may be washed and recoated with the appropriate filter recoating adhesive. Replacements are available for those which become damaged or otherwise non-serviceable.

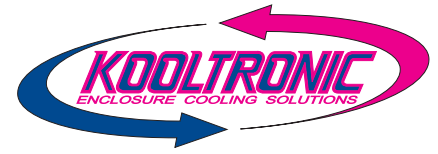
Model	Filter P/N	Dimensions, inches*** (H x W x D)			Dimensions, mm*** (H x W x D)		
Guardian/GuardianX							
DP15	525F	5.25	x	6.44	x	0.09	133.3 x 163.5 x 2.3
DP21	8388F	8.38	x	8.88	x	0.38	212.8 x 225.5 x 9.7
DP24	8388F	8.38	x	8.88	x	0.38	212.8 x 225.5 x 9.7
DP33	9501F	9.50	x	10.50	x	0.38	241.3 x 266.7 x 9.7
DP43	8001F	8.00	x	16.00	x	0.38	203.2 x 406.4 x 9.7
DP47	8001F	8.00	x	16.00	x	0.38	203.2 x 406.4 x 9.7
DP50 - (Qty. 2)	13658F	13.63	x	5.88	x	0.38	346.2 x 149.4 x 9.7
DP53 - (Qty. 2)	6382F	16.88	x	6.38	x	0.38	428.8 x 162.0 x 9.7
DP60 - (Qty. 2)	19381F	19.38	x	9.25	x	0.38	492.2 x 235.0 x 9.7
Guardian/GuardianX 480 Volt							
DP24	8388F	8.38	x	8.883	x	0.38	212.8 x 225.5 x 9.7
DP38	11001F	11.00	x	8.00	x	0.50	279.4 x 203.2 x 12.7
DP50	13658F	13.63	x	5.88	x	0.38	346.2 x 149.4 x 9.7
DP52 - (Qty. 2)	8001F	8.00	x	16.00	x	0.38	203.2 x 406.4 x 9.7
DP53 - (Qty. 2)	6382F	16.88	x	6.38	x	0.38	428.8 x 162.0 x 9.7
DP60 - (Qty. 2)	19381F	19.38	x	9.25	x	0.38	492.2 x 235.0 x 9.7
Profile**							
DP17	7007F	7.00	x	6.25	x	0.38	177.8 x 158.8 x 9.7
DP21	650F	8.38	x	8.38	x	0.50	212.9 x 212.9 x 12.7
DP33	11001F	11.00	x	8.00	x	0.50	279.4 x 203.2 x 12.7
DP38 480 Volt	11001F	11.00	x	8.00	x	0.50	279.4 x 203.2 x 12.7
DP43	8001F	8.00	x	16.00	x	0.38	203.2 x 406.4 x 9.7
DP47	8001F	8.00	x	16.00	x	0.38	203.2 x 406.4 x 9.7
DP52 480 Volt	8001F	8.00	x	16.00	x	0.38	203.2 x 406.4 x 9.7
Advantage							
RP17	6501F	12.00	x	6.50	x	0.38	304.8 x 165.1 x 9.7
RP28	7006F	12.00	x	7.00	x	0.50	304.8 x 177.8 x 12.7
RP33	7006F	12.00	x	7.00	x	0.50	304.8 x 177.8 x 12.7
RP36	9121F	15.38	x	9.13	x	0.38	390.7 x 231.9 x 9.7
RP47	9622F	15.38	x	9.63	x	0.38	390.7 x 244.6 x 9.7
RP52▼	11751F	16.75	x	11.75	x	0.38	425.5 x 298.5 x 9.7
RP55▼	11631F	11.63	x	21.63	x	0.38	295.4 x 549.4 x 9.7
TrimLine							
NP17	13658F	13.62	x	5.87	x	0.34	346.0 x 149.2 x 8.6
Narrow-Mini	8751F	16.63	x	8.38	x	0.50	422.4 x 212.9 x 12.7
NP28	8751F	16.63	x	8.38	x	0.50	422.4 x 212.9 x 12.7
NP33	12251F	16.63	x	11.88	x	0.50	422.4 x 301.8 x 12.7
NPT33	7131F	7.50	x	11.50	x	0.38	190.5 x 292.1 x 9.7
NP36	1000F	12.38	x	12.38	x	0.50	314.5 x 314.5 x 12.7
NP47	12251F	16.63	x	11.88	x	0.50	422.4 x 301.8 x 12.7
NPT47 - (Qty. 2)	681F	6.81	x	6.81	x	0.38	173.0 x 173.0 x 9.7
NPT52	9001F	9.00	x	10.25	x	0.38	228.6 x 260.3 x 9.7
NP59▼	20001F	19.63	x	15.63	x	1.00	498.6 x 397.0 x 25.4
Mini							
Micro-Mini	5001F	9.56	x	5.00	x	0.50	242.8 x 127.0 x 12.7
Super-Mini▼	650F	8.38	x	8.38	x	0.50	212.9 x 212.9 x 12.7
Integrity NEMA 4/4X							
Series 21	9501F	9.50	x	10.50	x	0.38	241.3 x 266.7 x 9.7
Series 32	650F	8.38	x	8.38	x	0.50	212.9 x 212.9 x 12.7
	8751F	16.63	x	8.38	x	0.50	422.4 x 212.9 x 12.7
Series 38	16001F*	16.63	x	10.50	x	0.50	422.4 x 266.7 x 12.7
Series 47	16001F*	16.63	x	10.50	x	0.50	422.4 x 266.7 x 12.7
Series 59	16001F*	16.63	x	10.50	x	0.50	422.4 x 266.7 x 12.7
Rack-Mounted							
RML	8752F	16.59	x	8.34	x	0.38	421.4 x 211.8 x 9.7
H9	1175F	16.63	x	9.63	x	0.50	422.4 x 244.6 x 12.7
H10	1175F	16.63	x	9.63	x	0.50	422.4 x 244.6 x 12.7
Top-Mounted							
Super-Mini (HSL)	11001F	11.00	x	8.00	x	0.50	279.4 x 203.2 x 12.7
Compact	240F	12.38	x	7.38	x	0.50	314.5 x 187.5 x 12.7
Compact Plus	4811F	4.81	x	15.00	x	0.38	122.2 x 381.0 x 9.7
Full Size	17001F	16.00	x	13.00	x	0.50	406.4 x 330.2 x 12.7
Advantage	10871F	16.63	x	10.13	x	0.50	422.4 x 257.3 x 12.7

*** Nominal; actual size may vary slightly.

** Profile Series filters are for externally mounted units only.

* T-Shape

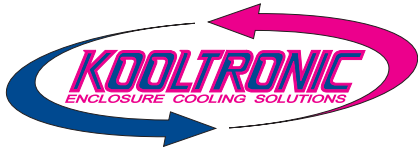
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QUALITY ASSURANCE

Quality Assurance

At KOOLTRONIC, our goal of cooling excellence begins with teamwork. All of our technical and production employees are trained members of our Quality Assurance Team. At each level of the manufacturing process, from conception and design through assembly and testing, every KOOLTRONIC employee is dedicated to producing the finest quality cooling products available. This teamwork and dedication to quality helps KOOLTRONIC stay at the forefront of the electronics cooling industry.



HEAT EXCHANGERS



HEAT EXCHANGERS

The KOOLTRONIC standard line of heat exchangers is one of the most versatile available. It satisfies a large range of application requirements by utilizing various heat transfer technologies. Heat exchangers provide many of the advantages of air conditioners, and are generally less costly to install and operate.

KOOLTRONIC high performance Heat Exchangers combine powerful forced convection cooling with the advantages of a closed-loop cooling system, for environments that pose contaminant problems. The closed-loop design cools and recirculates the same clean air, isolating components from the hostile environment.

Air-to-Air Heat Exchangers are the ideal choice for applications that can tolerate operating temperatures somewhat higher than ambient. The **KTHE Series** features a refrigerant-charged fin-and-tube coil, employing the heat pipe principle. The **KXRP, KXHE, KXNP and KNHX Series** utilize a high-efficiency convoluted aluminum heat transfer element. These elements provide excellent thermal transfer performance and are easily removed for cleaning.

KOOLTRONIC manufactures its own heat exchanger elements. All KOOLTRONIC Heat Exchangers provide a large heat transfer area in a compact package with high performance air systems for high flow rates and thorough air distribution within the electronics or electrical enclosure.

KPHE and KNHE Water-to-Air Heat Exchangers fill the performance gap between **Air-to-Air Heat Exchangers** and **Air Conditioners**. Where a reliable, clean, cool water supply is available, they are often the ideal solution when extreme contaminant or temperature conditions are present.

The adaptability of KOOLTRONIC Heat Exchangers is increased by flexible mounting configurations (external, internal, vertical, horizontal) and a comprehensive line of accessories and options.

Most KOOLTRONIC Heat Exchangers are designed for installation in normal indoor atmospheres. For operation outdoors, weather protection and special protective features are required. The use of standard indoor units outdoors would invite damage and early component failure, and will invalidate the KOOLTRONIC warranty. Integrity NEMA 4/4X Heat Exchangers are available for outdoor installation or applications requiring washdown.

Each KOOLTRONIC Heat Exchanger is engineered for performance and built for reliability. Most standard **Heat Exchangers** are UL/CUL **Listed** and maintain the NEMA Enclosure Rating referred to in the individual Series sections.

Popular heat exchangers are stocked and ready to ship. Emergency shipment service is available.

KOOLTRONIC also designs and manufactures a variety of heat exchangers to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.

GENERAL SPECIFICATIONS FOR ALL STANDARD HEAT EXCHANGERS

PRECISION BALL-BEARING MOTORS: All blower motors are UL/CSA Recognized and include automatic-reset thermal overload protection and double-sealed or double-shielded precision ball bearings. Special permanent lubricants perform over a broad temperature range: -20°F (-29°C) to 250°F (121°C). Consult KOOLTRONIC for motors designed to meet military or other extreme environmental specifications.

Tube axial fans are rated to perform at 14°F (-10°C) to 158°F (70°C) and are designed to meet UL, CSA, and VDE.

RUGGED CONSTRUCTION: Precision-engineered heavy gauge steel construction insures that Heat Exchangers will stand up under tough applications.

FILTERS: Multi-layer grid of sturdy, corrugated aluminum in an aluminum frame. May be reused after washing off accumulations and spraying with KOOLTRONIC A-16 Recoating Adhesive. Filters must be kept free of accumulations to prevent reduction or loss of performance and/or damage to equipment. Filters are not required on water-cooled models (**KPHE Series**).

BAKED POWDER FINISH: Durable, baked-on powder finish is standard. Other finishes are available.

POWER: 115 VAC or 230 VAC, 50/60 Hz is standard. For multiphase power, other voltages and frequencies or Brushless DC applications for other than the TrimLine Series, consult KOOLTRONIC.

POWER CORD: All 115 and 230 VAC models are supplied with six-foot three-wire cord with plug. Brushless DC units have three-wire cords without plugs for direct wiring to power source. Special lengths and/or plugs are available.

TRIMLINE SERIES AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



DESCRIPTION

The slender, versatile **TrimLine KXNP Heat Exchangers** feature the KOOLTRONIC exclusive convoluted, embossed aluminum heat transfer elements. These state-of-the-art elements and specially-sized KOOLTRONIC double-inlet blowers provide excellent near-ambient cooling performance in a closed-loop system.

These features provide the ultimate in cooling flexibility when designing enclosures for applications that can have varying heat loads.

Where internal temperatures must be kept below ambient, one of the **KPHE Series Water-to-Air Heat Exchangers** or either **Air-Cooled** or **Water Cooled Air Conditioners** should be considered.

Outdoor operations require weather protection and external protective features. See **Advantage Indoor/Outdoor Series** and **Integrity NEMA 4/4X Series**.

General specifications common to all KOOLTRONIC Heat Exchangers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of heat exchangers to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.

CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114

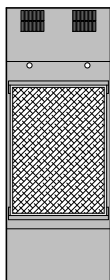


NEMA
TYPE 12
MAINTAINED

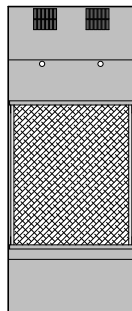
TRIMLINE

STANDARD FEATURES

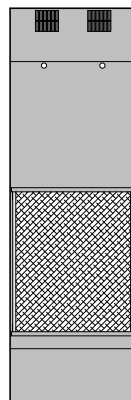
- All Models UL/CUL Listed
- Closed-Loop Near-Ambient Cooling
- Epoxy-Coated Element
- Filter
- NEMA 12 Rating Maintained (UL50)
- Powerful Centrifugal Blowers and Convoluted Aluminum Element
- Removable Element Access Panel
- Rugged Heavy-duty Steel Construction with Baked Powder Finish
- Six foot 3-wire power cord with plug



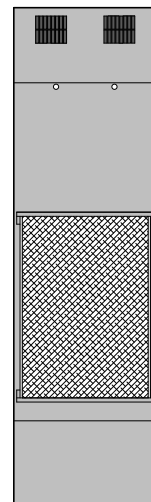
KXNP33
33 Watts/°F
33"H x 12"W x 10"D



KXNP36
42 Watts/°F
36"H x 15"W x 10"D

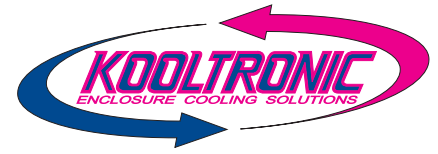


KXNP47
56 Watts/°F
47"H x 15"W x 10"D



KXNP59
91 Watts/°F
59"H x 17"W x 14"D

KXNP33 & KXNP36 TRIMLINE AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight	
		Amps	Watts	Enclosure	Ambient		lbs	kg
KXNP33	115	2.60	227	160	-20 to 131	33	56	25
K2XNP33	230	1.90	227	160	-20 to 125	33	56	25
K7XNP33	24VDC	10.0	240	160	131	33	56	25
K8XNP33	48VDC	5.8	270	160	131	33	56	25
KXNP36	115	3.20	363	160	-20 to 131	42	67	30
K2XNP36	230	1.60	363	160	-20 to 131	42	67	30
K7XNP36	24VDC	12.3	296	160	131	42	67	30
K8XNP36	48VDC	1.60	370	160	131	42	67	30

STANDARD FEATURES

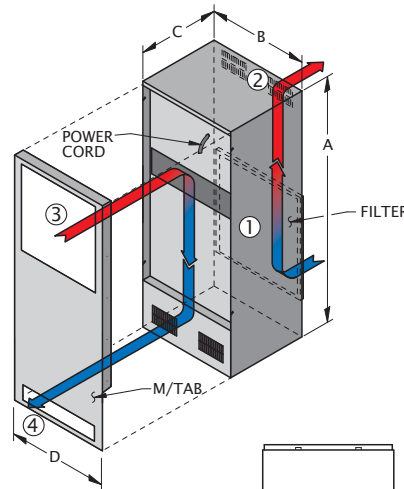
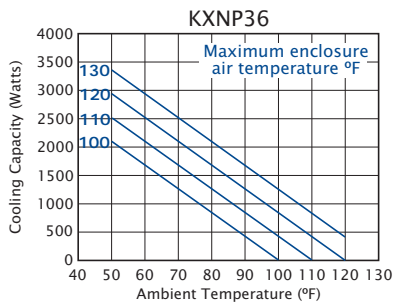
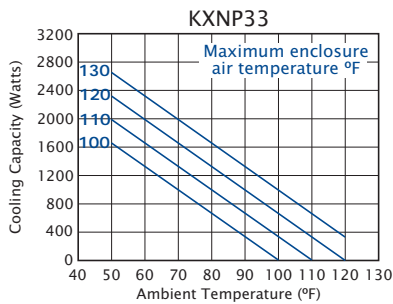
- Closed-Loop Near-Ambient Cooling
- Convuluted Aluminum Element
- Epoxy-Coated Element
- Filter
- Heavy-duty Steel Shell
- NEMA 12 Rating Maintained (UL50)
- Removable Element Access Panel
- UL/CUL Listed

ACCESSORIES AND OPTIONS

- | | |
|--|-----|
| ■ Filter Recoating Adhesive | 112 |
| ■ Lifting Eyes | 112 |
| ■ Low Airflow Detector | 112 |
| ■ Other voltages and frequencies | ♦ |
| ■ Replacement Filters | 113 |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords or connectors | ♦ |
| ■ Stainless or Aluminum Shell | 112 |
| ■ Temperature Alarm | 112 |
| ■ Weather Protection Kit | 112 |



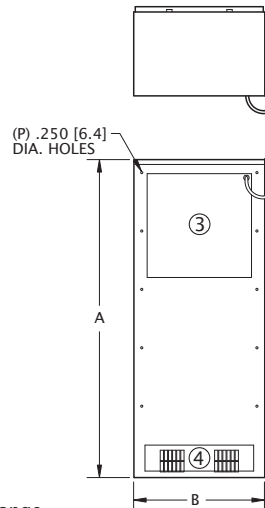
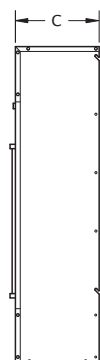
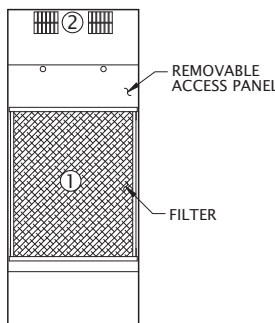
PERFORMANCE CHARTS*



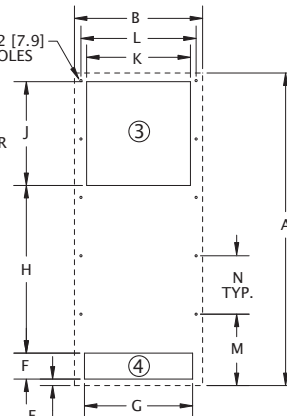
DIMENSIONS

	KXNP33	KXNP36
A	32.88 [835.2]	36.75 [933.5]
B	12.50 [317.5]	15.13 [384.3]
C	9.75 [247.7]	9.75 [247.7]
D	12.19 [309.6]	14.81 [376.2]
E	0.38 [9.7]	0.75 [19.1]
F	2.75 [69.9]	3.00 [76.2]
G	9.13 [231.9]	12.50 [317.5]
H	19.63 [498.6]	19.38 [492.3]
J	9.00 [228.6]	12.00 [304.8]
K	10.50 [266.7]	12.00 [304.8]
L	11.19 [284.2]	13.31 [338.1]
M	7.38 [187.5]	8.25 [209.6]
N	8.00 [203.2]	6.75 [171.5]
P	8	10

- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

TRIMLINE

KXNP47 & KXNP59 TRIMLINE AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS

TECHNICAL DATA*



**NEMA
TYPE 12
MAINTAINED**

Model	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight	
		Amps	Watts	Enclosure	Ambient		lbs	kg
KXNP47	115	3.40	354	160	-20 to 131	56	79	36
K2XNP47	230	1.70	354	160	-20 to 131	56	79	36
K7XNP47	24VDC	12.3	296	160	131	56	79	36
K8XNP47	48VDC	7.9	370	160	131	56	79	36
KXNP59	115	7.20	665	160	-20 to 131	91	130	59
K2XNP59	230	3.25	665	160	-20 to 131	91	130	59

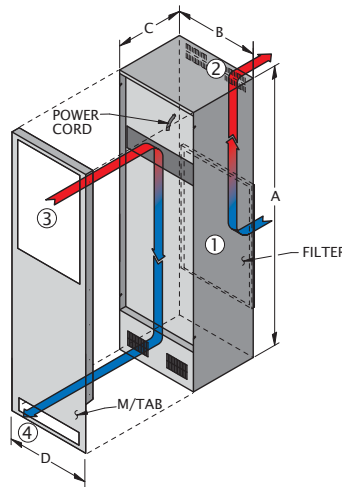
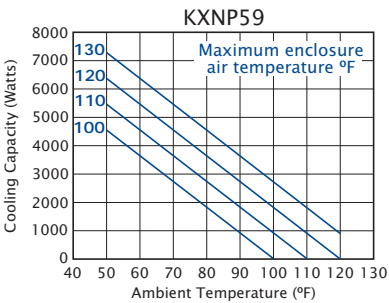
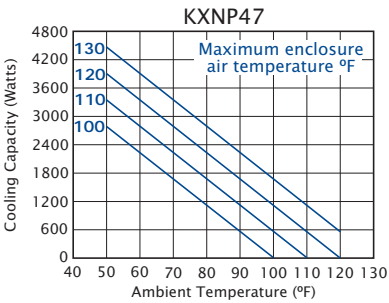
STANDARD FEATURES

- Closed-Loop Near-Ambient Cooling
- Convoluted Aluminum Element
- Epoxy-Coated Element
- Filter
- Heavy-duty Steel Shell
- NEMA 12 Rating Maintained (UL50)
- Removable Element Access Panel
- UL/CUL Listed

ACCESSORIES AND OPTIONS

	Page
■ Filter Recoating Adhesive	112
■ Lifting Eyes	112
■ Low Airflow Detector	112
■ Other voltages and frequencies	♦
■ Replacement Filters	113
■ Special materials or finishes	♦
■ Special motors, line cords or connectors	♦
■ Stainless or Aluminum Shell	112
■ Temperature Alarm	112
■ Weather Protection Kit	112

PERFORMANCE CHARTS*

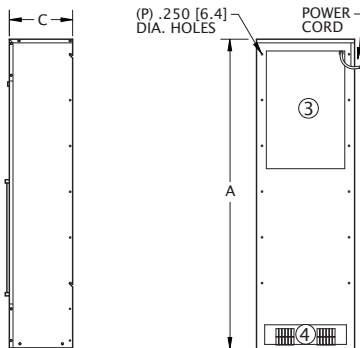
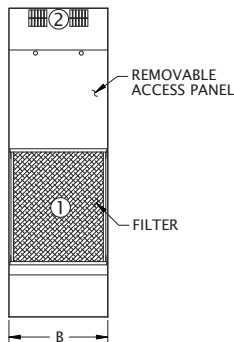
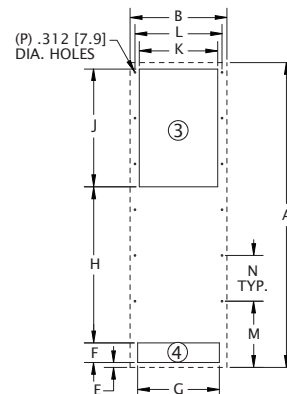


DIMENSIONS

	KXNP47		KXNP59	
A	47.25	[1200.2]	59.56	[1512.8]
B	15.13	[384.3]	17.13	[435.1]
C	9.75	[247.7]	13.75	[349.3]
D	14.81	[376.2]	16.75	[425.5]
E	0.75	[19.1]	7.50	[191.0]
F	3.00	[76.2]	2.94	[74.7]
G	12.50	[317.5]	15.25	[387.4]
H	23.88	[606.6]	27.88	[708.2]
J	18.00	[457.2]	20.00	[508.0]
K	12.00	[304.8]	14.00	[355.6]
L	13.31	[338.1]	14.69	[373.1]
M	10.13	[257.3]	11.00	[279.4]
N	7.00	[177.8]	6.69	[169.9]
	12		16	

- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

MOUNTING PLAN

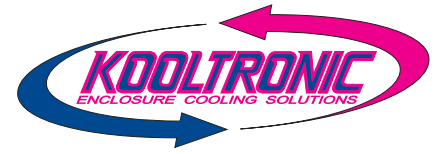


Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

INTEGRITY NEMA 4/4X AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



DESCRIPTION

KOOLTRONIC *Integrity NEMA 4/4X Heat Exchangers* were designed for those applications that require the protection of closed-loop cooling, but can tolerate operating temperatures somewhat above the ambient.

Tested and rated by Underwriters Laboratories, these uniquely designed (Patented) stainless steel heat exchangers provide a clean, cool internal environment and also protect against the hazards specified for both **Indoor** and **Outdoor NEMA 4** and **4X Enclosures**.

More powerful ambient-side blowers are used than in comparably sized standard **KXHE** and **KXNP** models, to overcome the added static pressure caused by the special baffles and dampers required to comply with NEMA 4/4X sealing and performance standards.

For extreme ambient temperatures and/or severely contaminated environments, the use of **Water-to-Air Heat Exchangers** or either **Air-Cooled** or **Water-Cooled Air Conditioners** is recommended.

General specifications common to all KOOLTRONIC Heat Exchangers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of heat exchangers to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

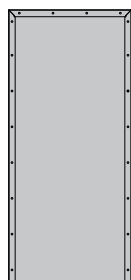


**NEMA
TYPE 4/4X
MAINTAINED**

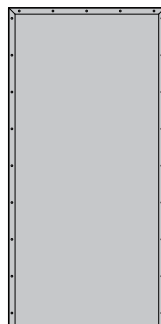
INTEGRITY NEMA 4/4X

STANDARD FEATURES

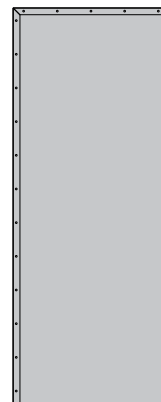
- Epoxy-Coated Aluminum Element
- Filter
- Gasketed flanges on all four mounting edges for positive leakproof seal
- NEMA 4/4X Rating Maintained (UL50)
- Powerful Centrifugal Blowers and Convolved Aluminum Element
- Six foot 3-wire power cord with plug
- Stainless Steel Shell
- UL Listed



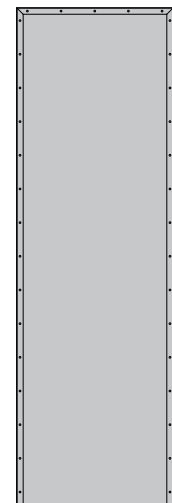
KNHX32
21 Watts/°F
32"H x 14"W x 13"D



KNHX38
44 Watts/°F
38"H x 18"W x 18"D



KNHX47
54 Watts/°F
47"H x 18"W x 18"D



KNHX59
65 Watts/°F
59"H x 18"W x 18"D

KNHX32 AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Normally In Stock	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight	
			Amps	Watts	Enclosure	Ambient		lbs	kg
KNHX32	Yes	115	1.50	160	160	-20 to 131	21	70	32
K2NHX32		230	1.10	260	160	-20 to 131	21	70	32

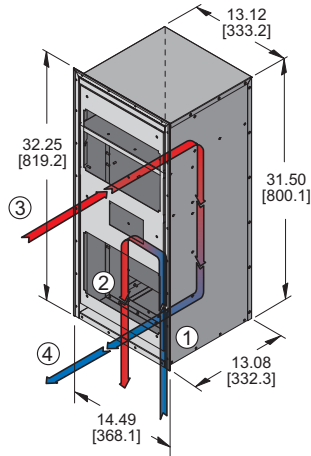
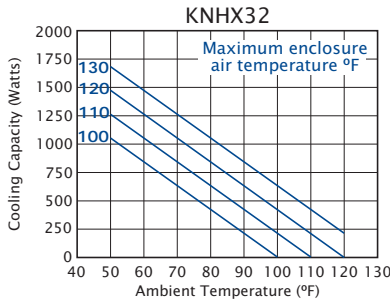
STANDARD FEATURES

- Closed-Loop Near-Ambient Cooling
- Epoxy-Coated Aluminum Element
- Filter
- Gasketed Flanges
- NEMA 4/4X Rating Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

ACCESSORIES AND OPTIONS

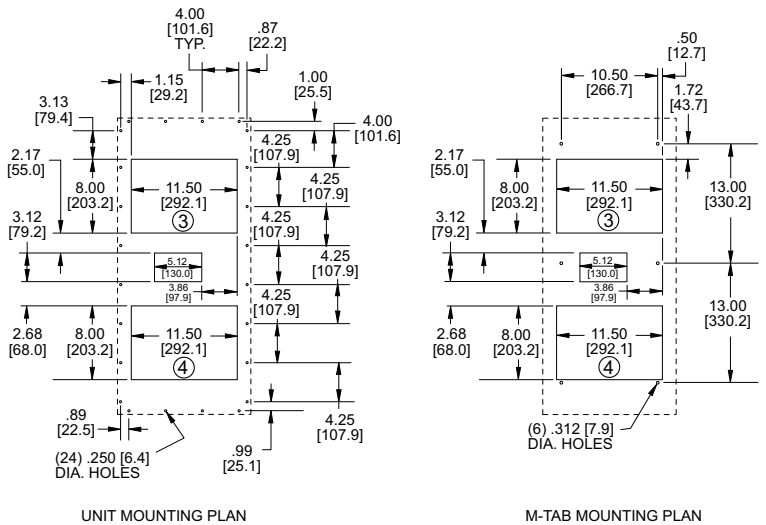
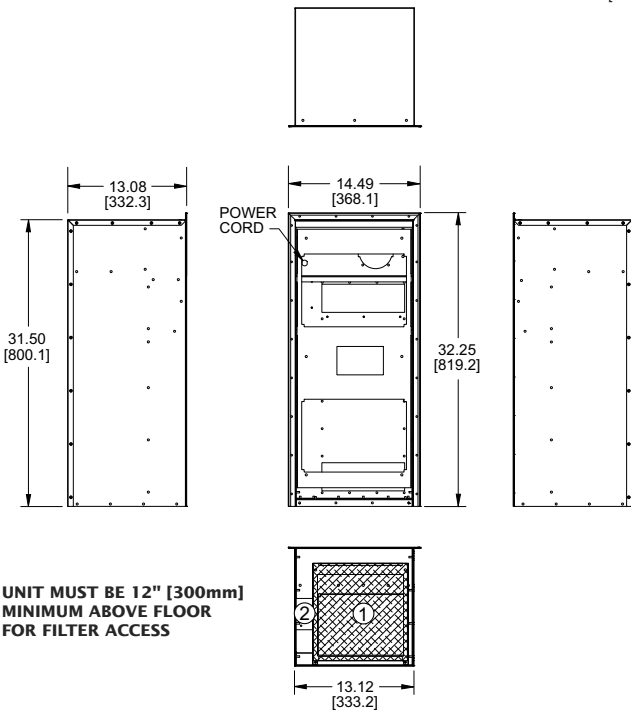
	Page
■ Filter Recoating Adhesive	112
■ Lifting Eyes	112
■ Low Airflow Detector	112
■ Other voltages and frequencies	♦
■ Replacement Filters	113
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Temperature Alarm	112

PERFORMANCE CHART*



- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

INTEGRITY NEMA 4/4X

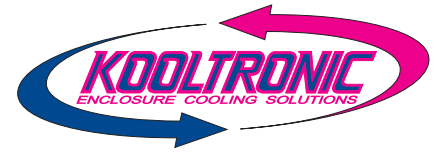


Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KNHX38 & KNHX47 AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

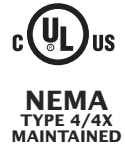
Model	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight	
		Amps	Watts	Enclosure	Ambient		lbs	kg
KNHX38	115	3.00	340	160	-20 to 131	44	115	52
K2NHX38	230	2.10	440	160	-20 to 131	46	115	52
KNHX47	115	3.00	340	160	-20 to 131	54	135	61
K2NHX47	230	2.10	440	160	-20 to 131	56	135	61

STANDARD FEATURES

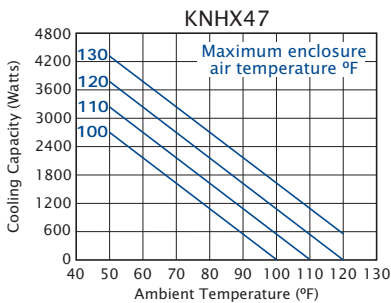
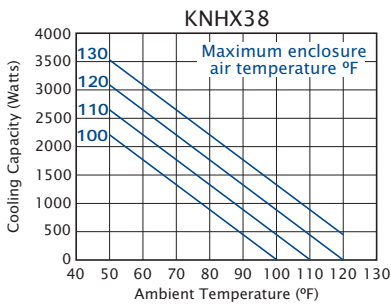
- Closed-Loop Near-Ambient Cooling
- Epoxy-Coated Aluminum Element
- Filter
- Gasketed Flanges
- NEMA 4/4X Rating Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

ACCESSORIES AND OPTIONS

- | | |
|---|-----|
| ■ Filter Recoating Adhesive | 112 |
| ■ Lifting Eyes | 112 |
| ■ Low Airflow Detector | 112 |
| ■ Other voltages and frequencies | ♦ |
| ■ Replacement Filters | 113 |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords, or connectors | ♦ |
| ■ Temperature Alarm | 112 |

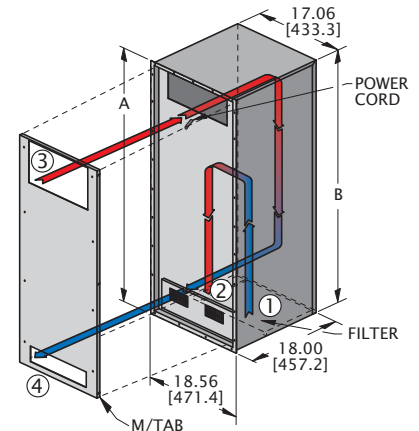


PERFORMANCE CHARTS*

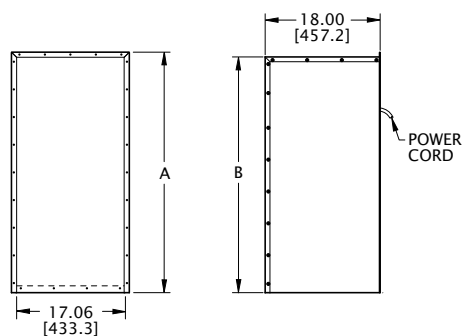


DIMENSIONS

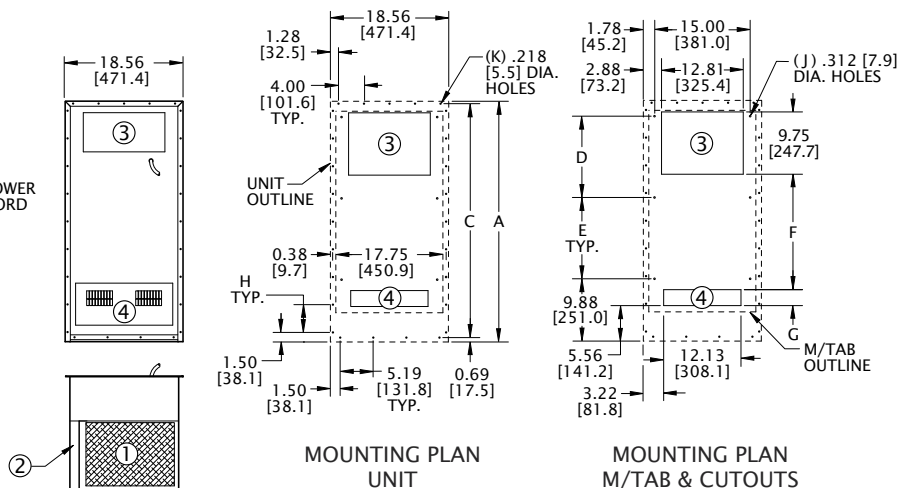
	KNHX38	KNHX47
A	37.75 [958.9]	47.00 [1193.8]
B	37.00 [939.8]	46.25 [1174.8]
C	36.69 [931.9]	45.94 [1166.9]
D	12.75 [323.9]	12.25 [311.2]
E	12.75 [323.9]	11.25 [285.8]
F	18.13 [460.5]	27.38 [695.5]
G	2.50 [63.5]	2.50 [63.5]
H	4.34 [110.2]	4.00 [101.6]
J	6	8
K	27	33



- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



UNIT MUST BE 12" [300mm]
MINIMUM ABOVE FLOOR
FOR FILTER ACCESS



MOUNTING PLAN
UNIT

MOUNTING PLAN
M/TAB & CUTOUTS

Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

INTEGRITY NEMA 4/4X

KNHX59 AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS

TECHNICAL DATA*

Model	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight	
		Amps	Watts	Enclosure	Ambient		lbs	kg
KNHX59	115	4.50	400	160	-20 to 131	65	170	77
K2NHX59	230	3.30	660	160	-20 to 131	65	170	77



**NEMA
TYPE 4/4X
MAINTAINED**



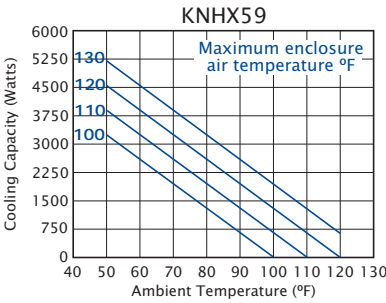
STANDARD FEATURES

- Closed-Loop Near-Ambient Cooling
- Epoxy-Coated Aluminum Element
- Filter
- Gasketed Flanges
- NEMA 4/4X Rating Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

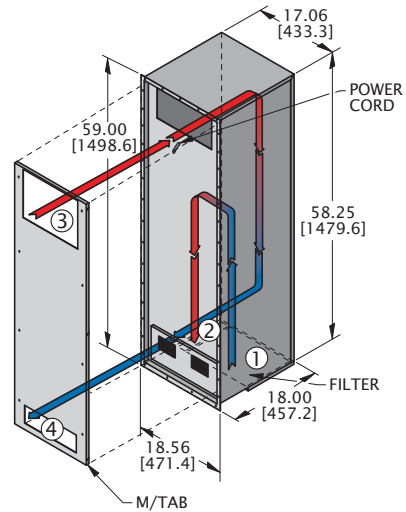
ACCESSORIES AND OPTIONS

	Page
■ Filter Recoating Adhesive	112
■ Lifting Eyes	112
■ Low Airflow Detector	112
■ Other voltages and frequencies	♦
■ Replacement Filters	113
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Temperature Alarm	112

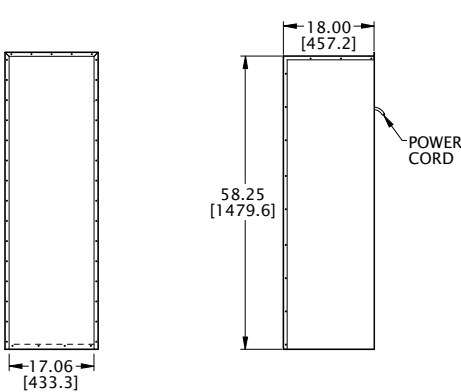
PERFORMANCE CHART*



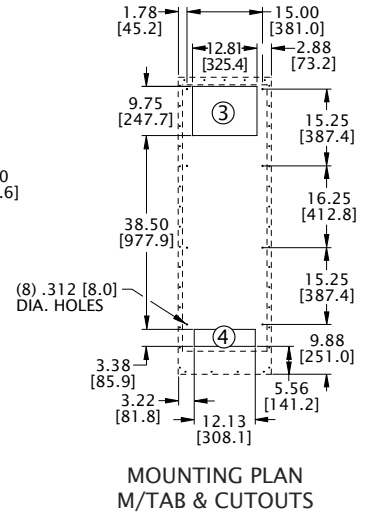
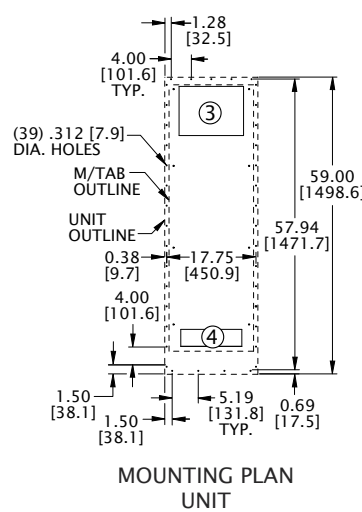
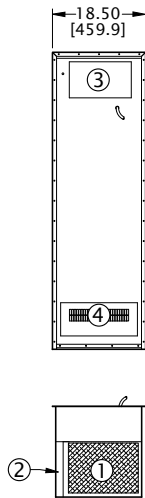
- ① FILTERED CONDENSER AIR INLET (Ambient Air In)
- ② CONDENSER OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



INTEGRITY NEMA 4/4X



**UNIT MUST BE 12" [300mm]
MINIMUM ABOVE FLOOR
FOR FILTER ACCESS**

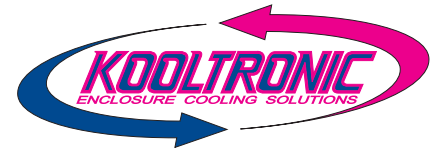


Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KXHE SERIES AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



DESCRIPTION

The **KXHE Series Air-to-Air Heat Exchangers** incorporate the use of a state of the art, high-efficiency convoluted aluminum heat transfer element with powerful air movers. This combination uses counterflowing airstreams, for maximum heat transfer efficiency, in a closed-loop system, to provide cooling within sealed electronics or industrial enclosures. This makes the **KXHE** an ideal choice for applications in dirty or oil-laden environments. KOOLTRONIC manufactures its own **KXHE** heat transfer elements.

These unique heat exchangers operate effectively when mounted vertically or horizontally, internally or externally, and are available in numerous sizes, capacities and configurations.

KXHE Air-to-Air Heat Exchangers are an excellent choice for all applications requiring a closed-loop system which can tolerate cabinet temperatures slightly above ambient.

Where internal temperatures must be kept below ambient, one of the **KPHE Series Water-to-Air Heat Exchangers** or either **Air-Cooled** or **Water-Cooled Air Conditioners** should be considered.

Outdoor operations require weather protection and external protective features. Also see **Advantage Series** and **Integrity NEMA 4/4X Series**.

General specifications common to all KOOLTRONIC Heat Exchangers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of heat exchangers to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.



CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114

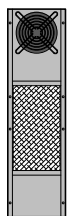


NEMA
TYPE 12
MAINTAINED

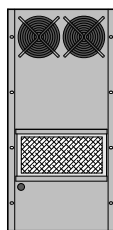
KXHE SERIES

STANDARD FEATURES

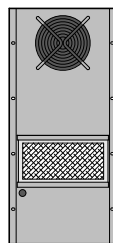
- All Models UL/CUL Listed
- Closed-Loop Cooling
- Convoluted Aluminum Element
- Epoxy-Coated Element
- Filter
- Heavy-duty Steel Construction with Baked Powder Finish
- NEMA 12 Rating maintained (UL50)
- Six foot (minimum) 3-wire power cord with plug



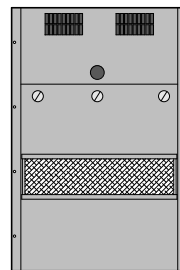
KXHE60A
8 Watts/°F
22"H x 6"W x 4"D



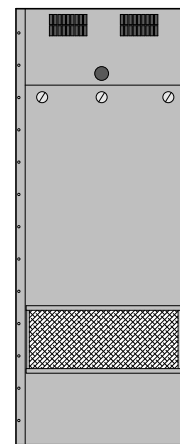
KXHE120A
16 Watts/°F
24"H x 11"W x 4"D



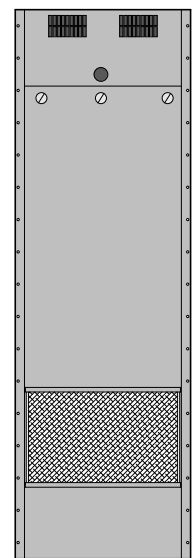
KXHE122A
19 Watts/°F
25"H x 11"W x 8"D



KXHE125A
57 Watts/°F
28"H x 19"W x 8"D



KXHE245A
74 Watts/°F
47"H x 19"W x 8"D



KXHE365A
88 Watts/°F
59"H x 19"W x 8"D

KXHE60A AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS

TECHNICAL DATA*

Model	Normally In Stock	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight lbs kg
			Amps	Watts	Enclosure	Ambient		
KXHE60A	Yes	115	0.4	38	160	-20 to 115	8	11 5
K2XHE60A		230	0.2	38	160	-20 to 115	8	11 5



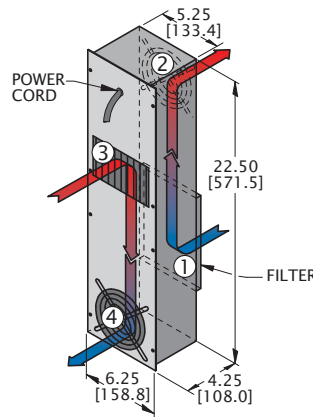
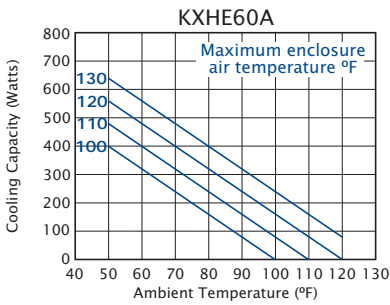
STANDARD FEATURES

- Closed-Loop Cooling
- Epoxy-Coated Element
- Filter
- Heavy-duty Steel Shell
- NEMA 12 Rating Maintained (UL50)
- Refrigerant-Free Aluminum Element
- UL/CUL Listed

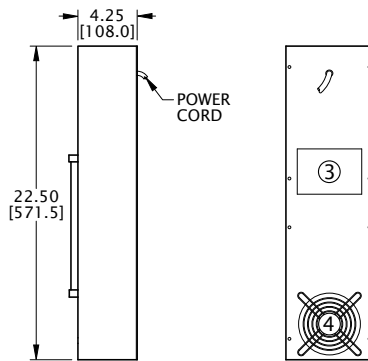
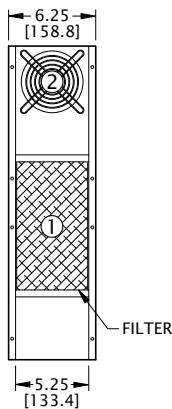
ACCESSORIES AND OPTIONS

	Page
■ Filter Recoating Adhesive	112
■ Mounting Hinge	112
■ Other voltages and frequencies	♦
■ Replacement Filters	113
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Temperature Alarm	112
■ Weather Protection Kit	112

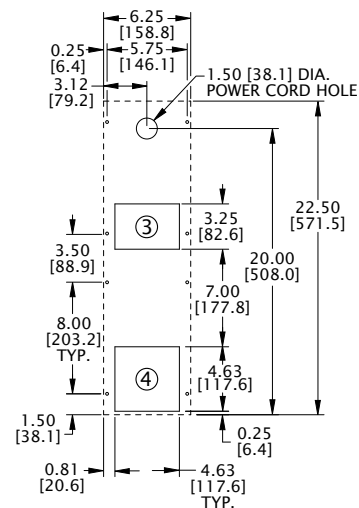
PERFORMANCE CHART*



- ① FILTERED AIR INLET (Ambient Air In)
- ② AIR OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



MOUNTING PLAN

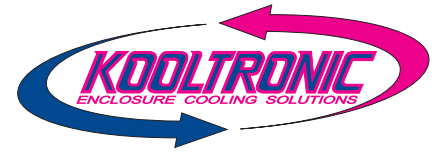


Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KXHE120A & KXHE122A AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Normally In Stock	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight	
			Amps	Watts	Enclosure	Ambient		lbs	kg
KXHE120A	Yes	115	0.8	75	160	-20 to 115	16	20	9
K2XHE120A		230	0.4	75	160	-20 to 115	16	20	9
KXHE122A		115	1.1	90	160	-20 to 115	19	30	14
K2XHE122A		230	0.5	90	160	-20 to 110	19	30	14

STANDARD FEATURES

- Closed-Loop Cooling
- Epoxy-Coated Element
- Filter
- Heavy-duty Steel Shell
- NEMA 12 Rating Maintained (UL50)
- Refrigerant-Free Aluminum Element
- UL/CUL Listed

ACCESSORIES AND OPTIONS

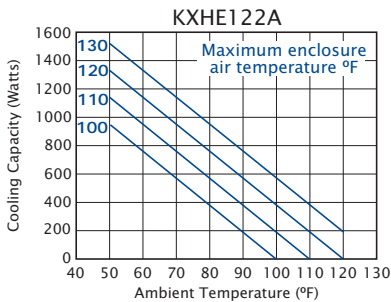
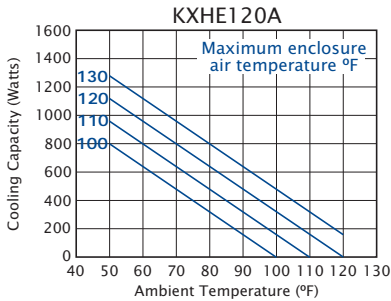
- Filter Recoating Adhesive 112
- Lifting Eyes 112
- Low Airflow Detector 112
- Mounting Hinge 112
- Other voltages and frequencies †
- Replacement Filters 113
- Special materials or finishes †
- Special motors, line cords, or connectors †
- Temperature Alarm 112
- Weather Protection Kit 112



NEMA TYPE 12 MAINTAINED

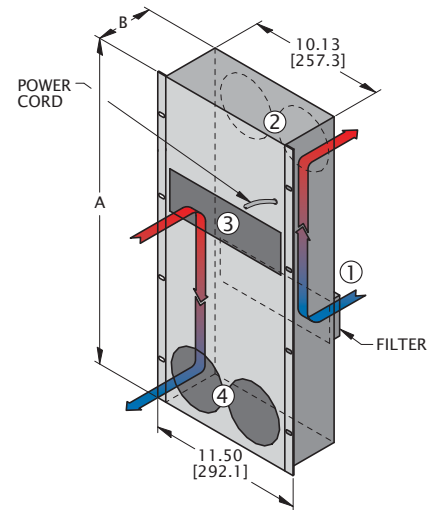


PERFORMANCE CHARTS*



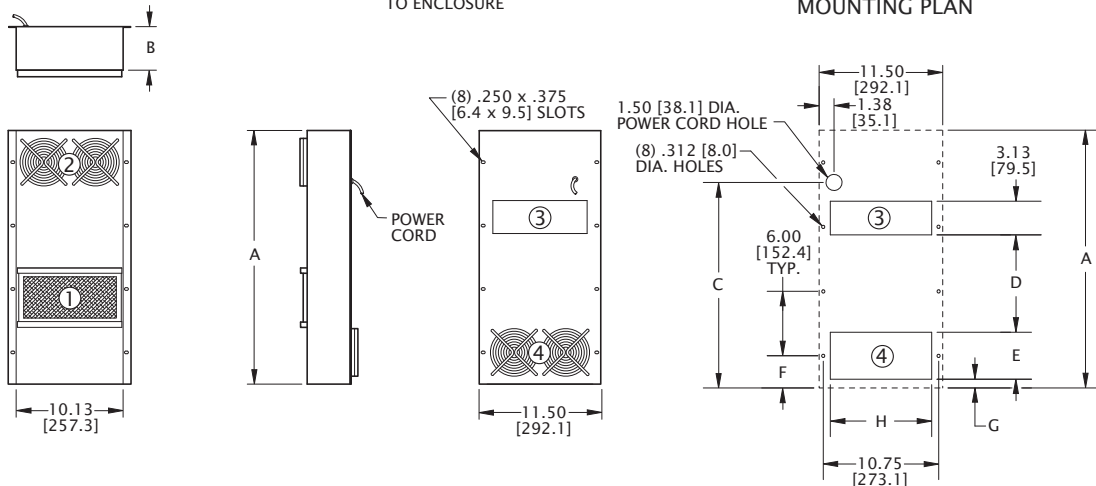
DIMENSIONS

	KXHE120A	KXHE122A
A	24.00 [609.6]	25.50 [647.7]
B	4.19 [106.4]	8.31 [211.1]
C	19.13 [485.9]	19.88 [505.0]
D	8.88 [225.6]	8.19 [208.0]
E	4.75 [120.7]	6.25 [158.8]
F	3.00 [76.2]	3.75 [95.3]
G	0.63 [16.0]	0.50 [12.7]
H	9.50 [241.3]	7.00 [177.8]



- ① FILTERED AIR INLET (Ambient Air In)
- ② AIR OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

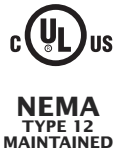
* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

† Contact KOOLTRONIC for information.

KXHE SERIES

KXHE125A & KXHE245A AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS

TECHNICAL DATA*



Model	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight	
		Amps	Watts	Enclosure	Ambient		lbs	kg
KXHE125A	115	3.2	300	160	-20 to 131	57	55	25
K2XHE125A	230	1.6	300	160	-20 to 131	57	55	25
KXHE245A	115	3.6	400	160	-20 to 131	74	80	36
K2XHE245A	230	1.8	400	160	-20 to 131	74	80	36

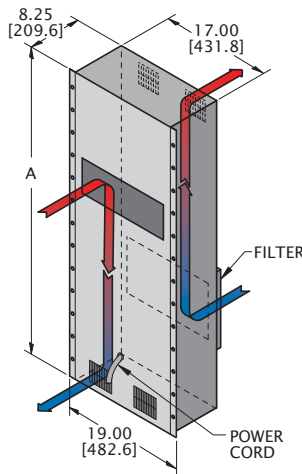
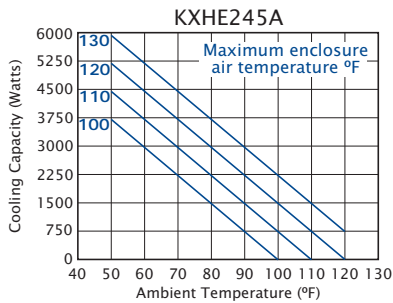
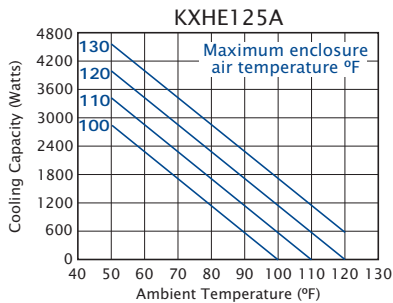
STANDARD FEATURES

- Closed-Loop Cooling
- Epoxy-Coated Element
- Filter
- Heavy-duty Steel Shell
- NEMA 12 Rating Maintained (UL50)
- Refrigerant-Free Aluminum Element
- UL/CUL Listed

ACCESSORIES AND OPTIONS

Accessory/Option	Page
■ Filter Recoating Adhesive	112
■ Lifting Eyes	112
■ Low Airflow Detector	112
■ Mounting Hinge	112
■ Other voltages and frequencies	♦
■ Replacement Filters	113
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Temperature Alarm	112
■ Weather Protection Kit	112

PERFORMANCE CHARTS*

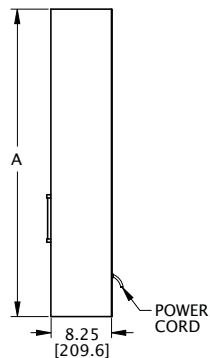
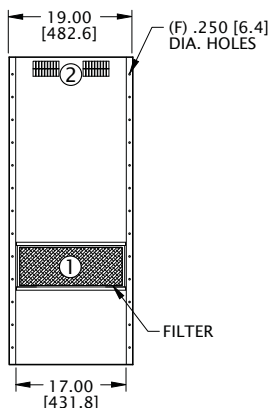
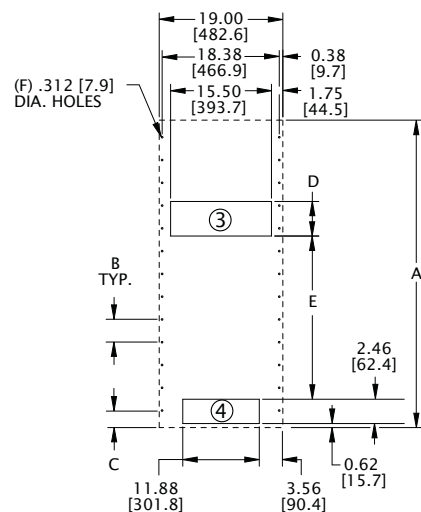


DIMENSIONS

	KXHE125A	KXHE245A
A	28.50 [723.9]	47.25 [1200.2]
B	7.00 [177.8]	3.50 [88.9]
C	3.75 [95.3]	1.75 [44.5]
D	3.75 [95.3]	8.69 [220.7]
E	13.25 [336.5]	28.44 [722.4]
F	8	26

- ① FILTERED AIR INLET (Ambient Air In)
- ② AIR OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE

MOUNTING PLAN

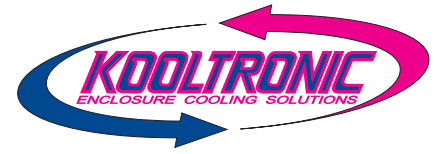


Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KXHE365A AIR-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

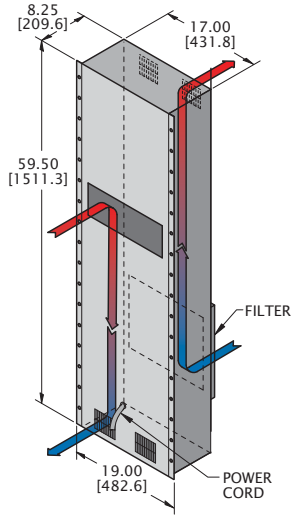
Model	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight lbs kg
		Amps	Watts	Enclosure	Ambient		
KXHE365A	115	7.2	665	160	-20 to 131	88	105 48
K2XHE365A	230	3.0	665	160	-20 to 131	88	105 48

STANDARD FEATURES

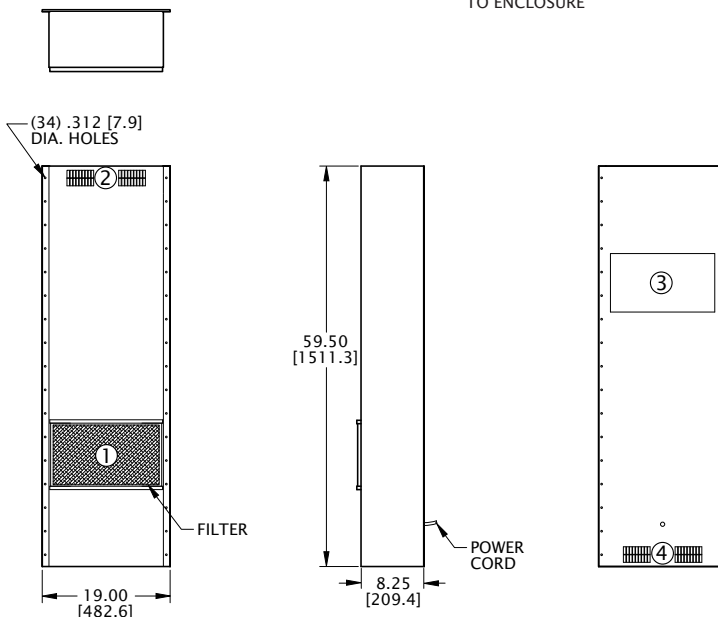
- Closed-Loop Cooling
- Epoxy-Coated Element
- Filter
- Heavy-duty Steel Shell
- NEMA 12 Rating Maintained (UL50)
- Refrigerant-Free Aluminum Element
- UL/CUL Listed

ACCESSORIES AND OPTIONS

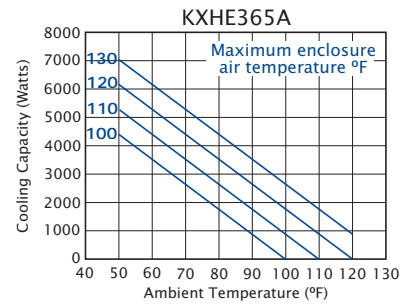
- | | |
|---|-----|
| ■ Filter Recoating Adhesive | 112 |
| ■ Lifting Eyes | 112 |
| ■ Low Airflow Detector | 112 |
| ■ Other voltages and frequencies | ♦ |
| ■ Replacement Filters | 113 |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords, or connectors | ♦ |
| ■ Temperature Alarm | 112 |
| ■ Weather Protection Kit | 112 |



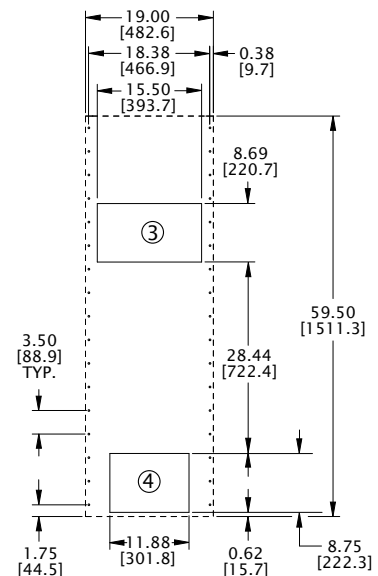
- ① FILTERED AIR INLET (Ambient Air In)
- ② AIR OUTLET (Warm Ambient Air Out)
- ③ WARM AIR RETURN FROM ENCLOSURE
- ④ COOL AIR OUTLET TO ENCLOSURE



PERFORMANCE CHART*



MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KXHE SERIES

KTHE200 REFRIGERANT-CHARGED AIR-TO-AIR HEAT EXCHANGER

DESCRIPTION



The **KTHE200 Air-to-Air Heat Exchangers** utilize a refrigerant-charged coil to provide closed-loop cooling in applications where slightly above ambient temperatures are required. They have powerful air movers to remove substantial heat loads from sealed cabinets while maintaining low temperature differential above ambient. These units operate efficiently in a variety of mounting orientations (vertical, horizontal, external, internal).

KTHE Air-to-Air Heat Exchangers are an excellent choice for applications requiring a closed-loop system with good cooling performance, where convoluted aluminum heat transfer elements may not be appropriate.

Where internal temperatures must be kept below ambient, one of the **KPHE Series Water-to-Air Heat Exchangers** or either **Air Cooled** or **Water-Cooled Air Conditioners** should be considered. Outdoor operations require weather protection and external protective features. Also see **Advantage Indoor/Outdoor Series** and **Integrity NEMA 4/4X Series**.

General specifications common to all KOOLTRONIC Heat Exchangers are on the first page of this Section.

KOOLTRONIC also designs and manufactures a variety of heat exchangers to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.

CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114

TECHNICAL DATA*

Model	Normally In Stock	Volts	Power		Maximum Temperature °F		Performance Watts/°F (Air In)	Approx. Weight	
			Amps	Watts	Enclosure	Ambient		lbs	kg
KTHE200	Yes	115	0.6	52	160	-20 to 125	17	22	10
K2THE200		230	0.3	52	160	-20 to 125	17	22	10

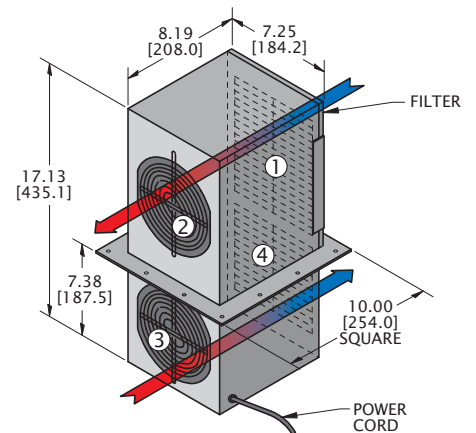
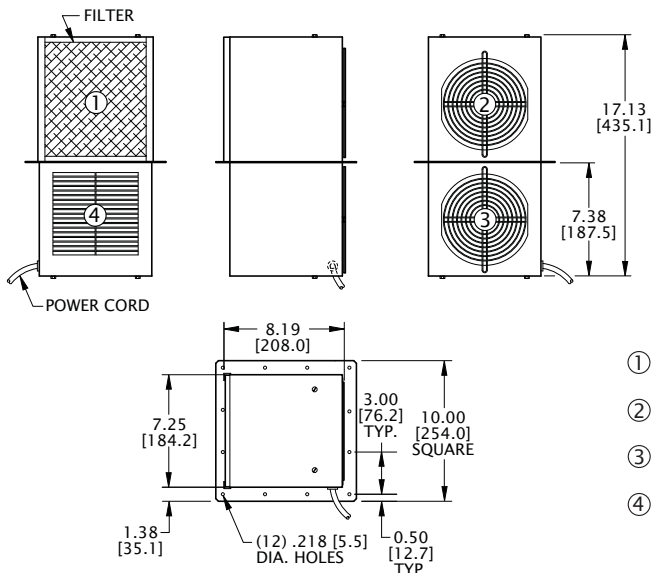
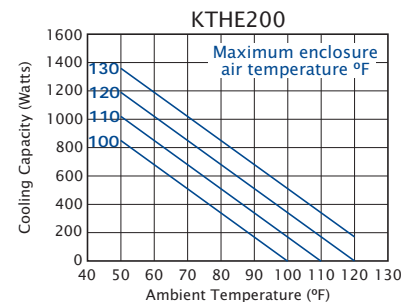
STANDARD FEATURES

- CFC-free Refrigerant
- Closed-Loop Cooling
- Filter
- Heavy-Duty Steel Shell with Baked Powder Finish
- Modified Heat Pipe Design
- UL/CSA Ball-Bearing Motors

ACCESSORIES AND OPTIONS

- | | |
|---|------|
| | Page |
| ■ Filter Recoating Adhesive | 112 |
| ■ Low Airflow Detector | 112 |
| ■ Other voltages and frequencies | ♦ |
| ■ Replacement Filters | 112 |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords, or connectors | ♦ |
| ■ Stainless or Aluminum Shell | 112 |
| ■ Temperature Alarm | 112 |

PERFORMANCE CHART*

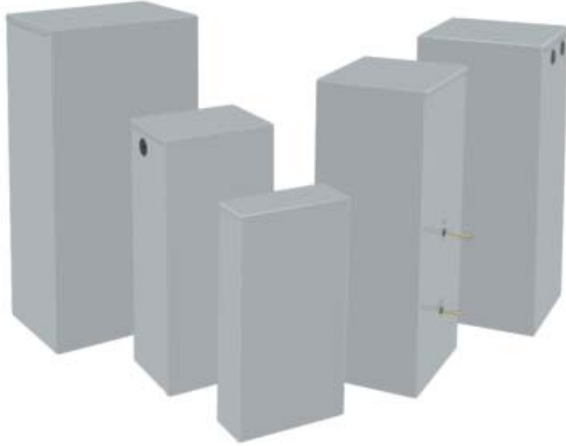
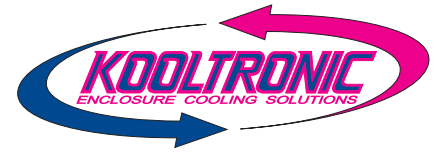


Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KPHE SERIES WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



DESCRIPTION

KOOLTRONIC **Water-to-Air Heat Exchangers** provide uniform cooling in a closed-loop system where a reliable source of clean, cool water is available. The **KPHE Series** is designed primarily for use in harsh environments with cooling requirements in excess of the capabilities of **Air-to-Air Heat Exchangers**. They are particularly useful in highly contaminated environments that would require very frequent cleaning or changing of ambient air filters, or require frequent cleaning of the heat exchanger core. KOOLTRONIC **Water-to-Air Heat Exchangers** can furnish greater cooling capacities than air-to-air models, depending on water temperature and rate of flow. Ambient air is sealed out; heat transfer surfaces remain clean.

The higher cooling ability of the **KPHE Series** depends on the temperature of the cooling water. Thus, if the water is cold enough, the temperature of the air delivered to the electronics cabinet can actually be lower than that provided by air conditioners, at less cost.

KPHE Series Heat Exchangers are available in five sizes and capacities. All models are UL/CUL Listed and meet NEMA 12 and NEMA 3R requirements. A complete range of accessories and options is available for both units, adding to their versatility.

Outdoor operations require weather protection and external protective features.

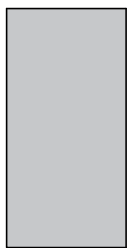
General specifications common to all KOOLTRONIC Heat Exchangers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of heat exchangers to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

STANDARD FEATURES

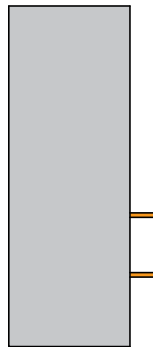
- All Models UL/CUL Listed
- Capable of Below-Ambient Cooling
- Heavy-duty Steel Construction with Baked Powder Finish
- NEMA 12 & 3R Ratings Maintained (UL50)
- Six foot (minimum) 3-wire power cord
- UL/CSA ball-bearing motors



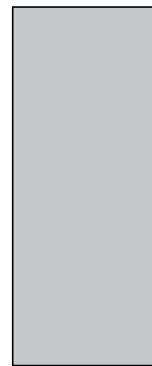
KPHE20
20 W/°F Air In at 0.25GPM
21 W/°F Air In at 0.50GPM
20"H x 10"W x 4"D



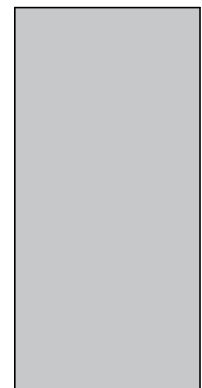
KPHE24
33 W/°F Air In at 1GPM
37 W/°F Air In at 2GPM
24"H x 10"W x 8"D



KPHE28
42 W/°F Air In at 1GPM
50 W/°F Air In at 2GPM
28"H x 10"W x 11"D



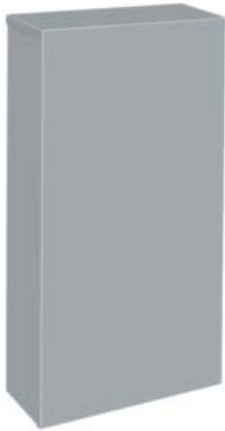
KPHE30
58 W/°F Air In at 1GPM
74 W/°F Air In at 2GPM
30"H x 12"W x 11"D



KPHE32
80 W/°F Air In at 1GPM
112 W/°F Air In at 2GPM
32"H x 15"W x 11"D

WATER-TO-AIR

KPHE20 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Normally In Stock	Volts	Power		Maximum Inlet Water Temp. °F	Performance Watts/°F		Approx. Weight lbs kg
			Amps	Watts		0.25GPM	0.50GPM	
KPHE20	Yes	115	0.30	33	85	20.5	21.5	15 7
K2PHE20		230	0.13	25	85	20.5	21.5	15 7

STANDARD FEATURES

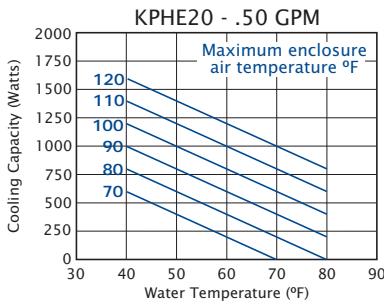
- Below-Ambient Cooling Capability
- Closed-Loop Cooling
- Heavy-duty Steel Shell with Baked Powder Finish
- NEMA 12 & 3R Ratings Maintained (UL50)
- UL/CSA Ball-Bearing Motors
- UL/CUL Listed

ACCESSORIES AND OPTIONS

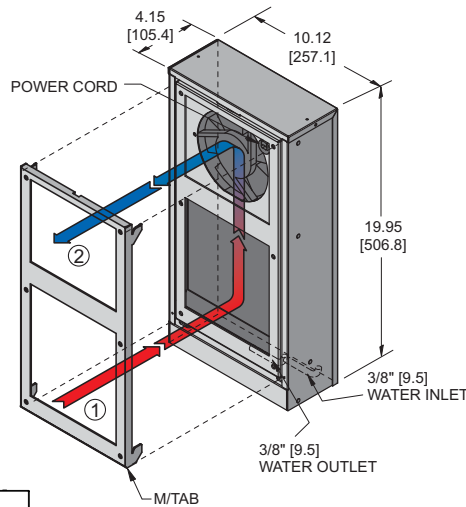
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| Internal Corrosion Protection | ♦ |
| Other voltages and frequencies | ♦ |
| Special materials or finishes | ♦ |
| Special motors, line cords, or connectors | ♦ |



PERFORMANCE CHART*

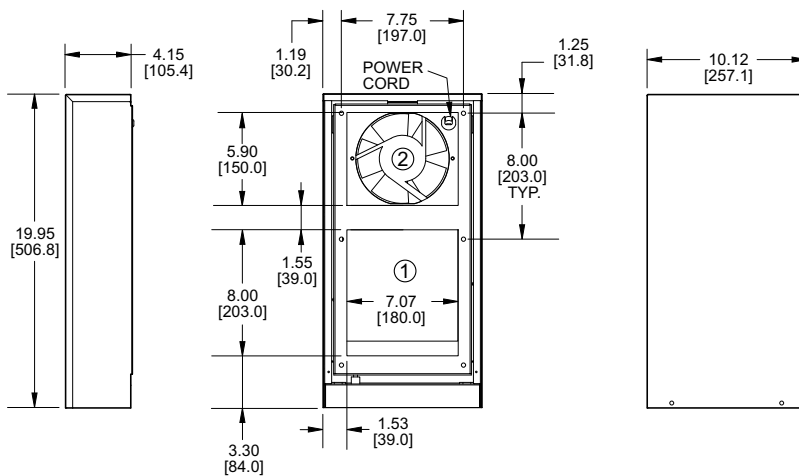


For performance at other flow rates contact the factory or visit kooltronic.com.

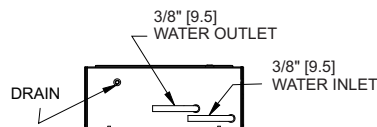
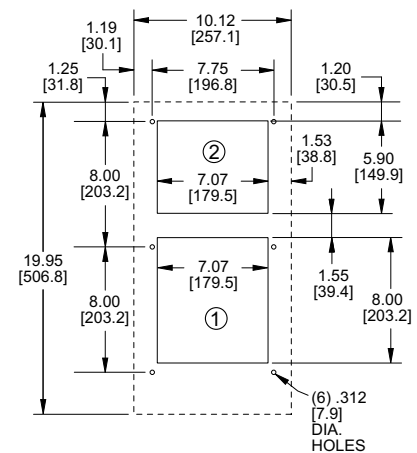


- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

WATER-TO-AIR



MOUNTING PLAN

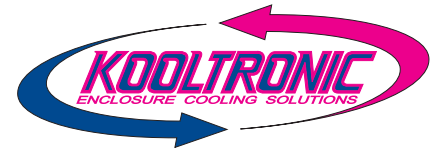


Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KPHE24 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

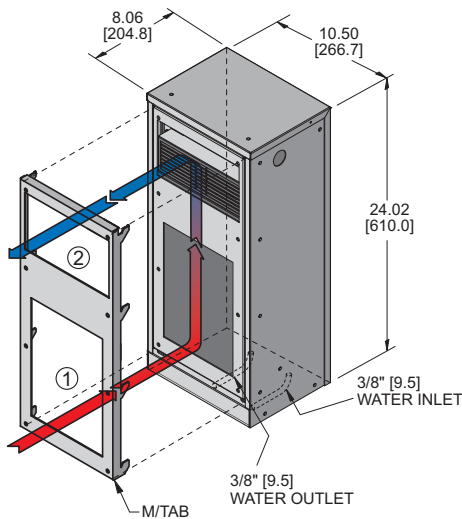
Model	Normally In Stock	Volts	Power		Maximum Inlet Water Temp. °F	Performance Watts/°F		Approx. Weight	
			Amps	Watts		1GPM	2GPM	lbs	kg
KPHE24	Yes	115	0.64	72	85	33	37	34	15
K2PHE24		230	0.31	70	85	33	37	34	15

STANDARD FEATURES

- Below-Ambient Cooling Capability
- Closed-Loop Cooling
- Epoxy-Coated Heat Exchanger Coils
- Heavy-duty Steel Shell with Baked Powder Finish
- NEMA 12 & 3R Ratings Maintained (UL50)
- UL/CSA Ball-Bearing Motors
- UL/CUL Listed

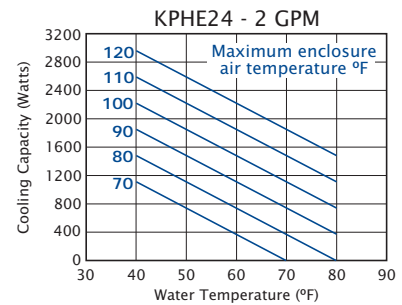
ACCESSORIES AND OPTIONS

- Automatic Water Flow Control 112
- High Water Level Detector 112
- Internal Corrosion Protection †
- Low Airflow Detector 112
- Other voltages and frequencies †
- Special materials or finishes †
- Special motors, line cords, or connectors †
- Temperature Alarm 112

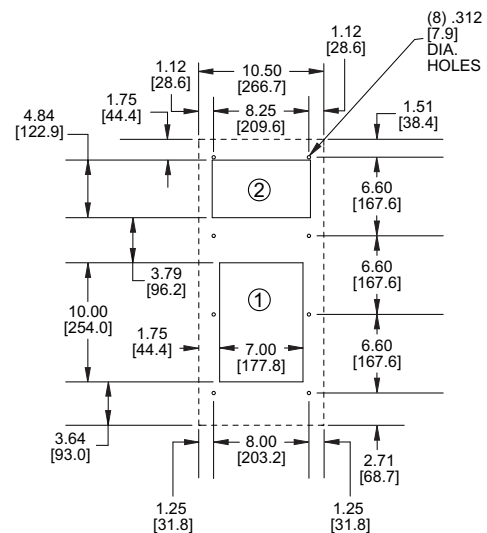
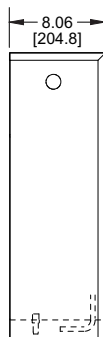
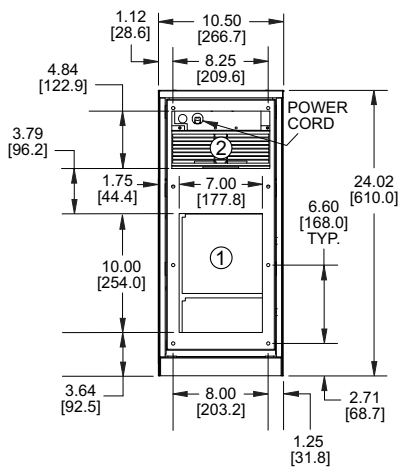


- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

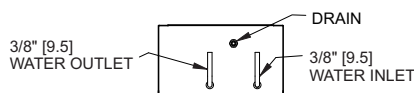
PERFORMANCE CHART*



For performance at other flow rates contact the factory or visit kooltronic.com.



MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

† Contact KOOLTRONIC for information.

WATER-TO-AIR

KPHE28 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Normally In Stock	Volts	Power		Maximum Inlet Water Temp. °F	Performance Watts/°F		Approx. Weight	
			Amps	Watts		1GPM	2GPM	lbs	kg
KPHE28	Yes	115	1.2	140	85	42	50	44	20
K2PHE28		230	0.6	140	85	42	50	44	20

STANDARD FEATURES

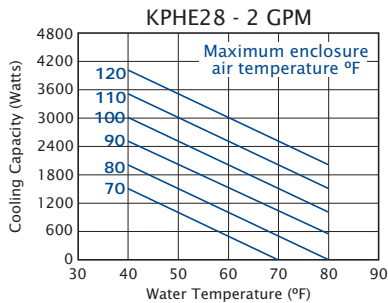
- Below-Ambient Cooling Capability
- Closed-Loop Cooling
- Epoxy-Coated Heat Exchanger Coils
- Heavy-duty Steel Shell with Baked Powder Finish
- NEMA 12 & 3R Ratings Maintained (UL50)
- UL/CSA Ball-Bearing Motors
- UL/CUL Listed

ACCESSORIES AND OPTIONS

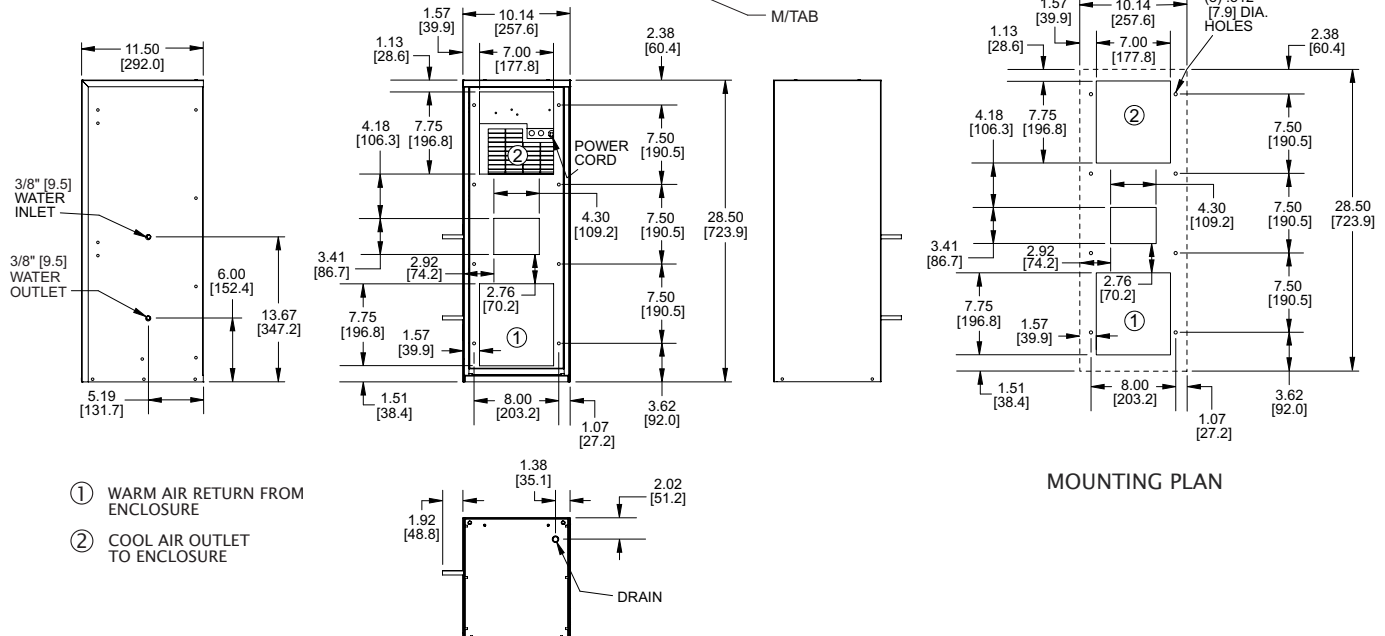
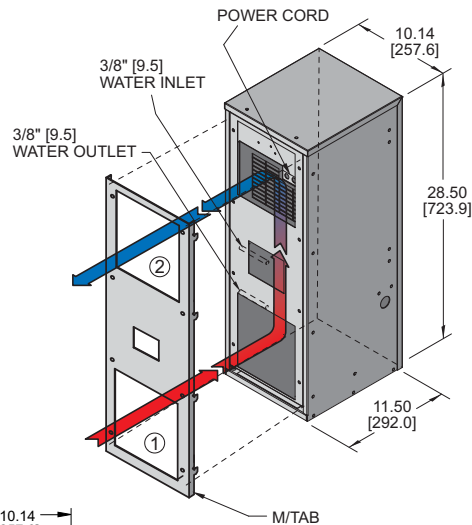
- | | Page |
|---|------|
| ■ Automatic Water Flow Control | 112 |
| ■ High Water Level Detector | 112 |
| ■ Internal Corrosion Protection | ♦ |
| ■ Low Airflow Detector | 112 |
| ■ Other voltages and frequencies | ♦ |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords, or connectors | ♦ |
| ■ Temperature Alarm | 112 |



PERFORMANCE CHART*



For performance at other flow rates contact the factory or visit kooltronic.com.

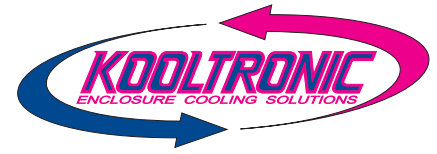


Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KPHE30 & KPHE32 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Normally In Stock	Volts	Power		Maximum Inlet Water Temp. °F	Performance Watts/°F		Approx. Weight	
			Amps	Watts		1GPM	2GPM	lbs	kg
KPHE30	Yes	115	1.16	133	85	58	74	53	24
K2PHE30		230	0.57	128	85	58	74	53	24
KPHE32	Yes	115	3.70	370	85	80	112	66	30
K2PHE32		230	1.50	334	85	80	112	66	30

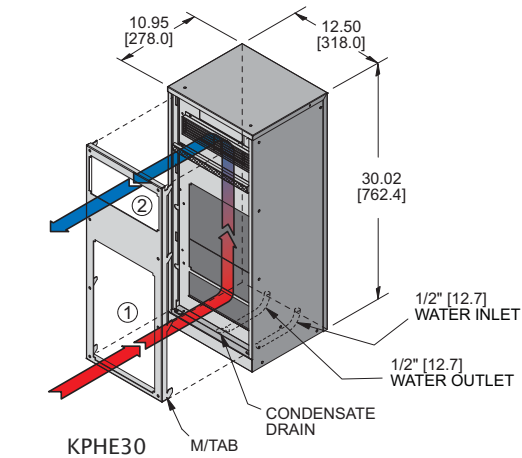


STANDARD FEATURES

- Below-Ambient Cooling Capability
- Closed-Loop Cooling
- Heavy-duty Steel Shell with Baked Powder Finish
- NEMA 12 & 3R Ratings Maintained (UL50)
- UL/CSA Ball-Bearing Motors
- UL/CUL Listed

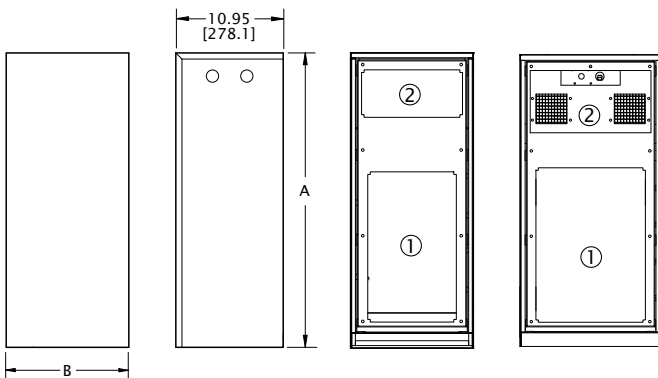
ACCESSORIES AND OPTIONS

- Automatic Water Flow Control 112
- High Water Level Detector 112
- Internal Corrosion Protection †
- Low Airflow Detector 112
- Other voltages and frequencies †
- Special materials or finishes †
- Special motors, line cords, or connectors †
- Temperature Alarm 112

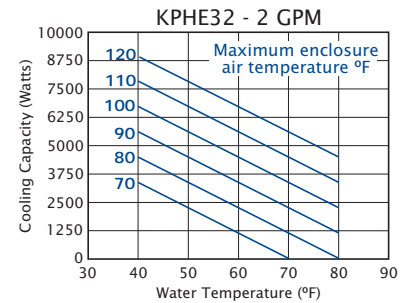
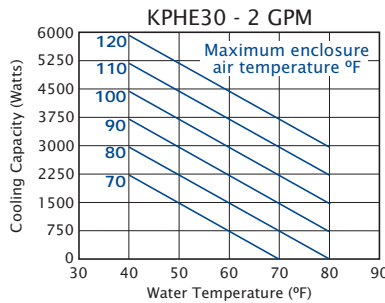


DIMENSIONS

	KPHE30		KPHE32	
A	30.02	[763.0]	32.02	[813.3]
B	12.50	[317.5]	15.50	[393.7]

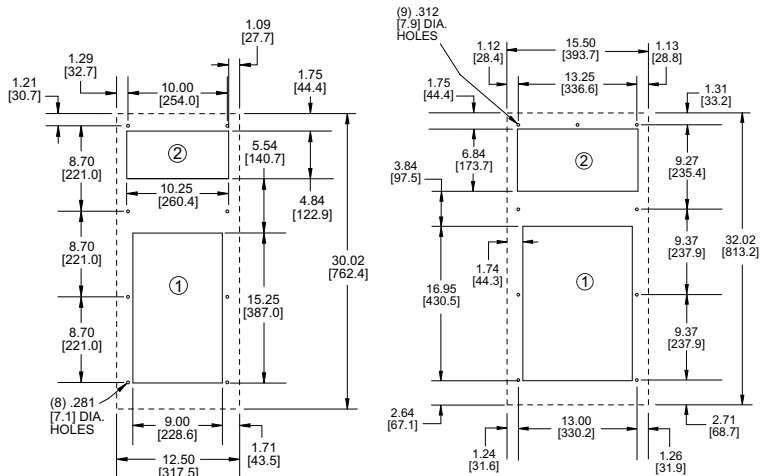


PERFORMANCE CHARTS*



For performance at other flow rates contact the factory or visit kooltronic.com.

- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE



Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

† Contact KOOLTRONIC for information.

WATER-TO-AIR

KNHE NEMA 4/4X WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



DESCRIPTION

KOOLTRONIC **Water-to-Air Heat Exchangers** provide uniform cooling in a closed-loop system where a reliable source of clean, cool water is available. The **KNHE Series** was designed primarily for use in harsh environments with cooling requirements in excess of the capabilities of air-to-air heat exchangers or air conditioners. They are particularly useful in highly contaminated environments that would require very frequent cleaning or changing of ambient air filters, or require frequent cleaning of the heat exchanger core. KOOLTRONIC **KNHE NEMA 4/4X Water-to-Air Heat Exchangers** can furnish greater cooling capacities than air-to-air models, depending on water temperature and rate of flow. Ambient air is sealed out; heat transfer surfaces remain clean.

The higher cooling capacity of the **KNHE Series** depends on the temperature of the cooling water. Thus, if the water is cold enough, the temperature of the air delivered to the electronics cabinet can actually be lower than that provided by air conditioners, at less cost. These units combine the best features of the NEMA 4/4X heat exchangers with the increased cooling capacity offered by the water-to-air models, in addition to the added benefit of compact size.

General specifications common to all KOOLTRONIC Heat Exchangers are on the first page of this Section.

KOOLTRONIC also designs and manufactures a variety of heat exchangers to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

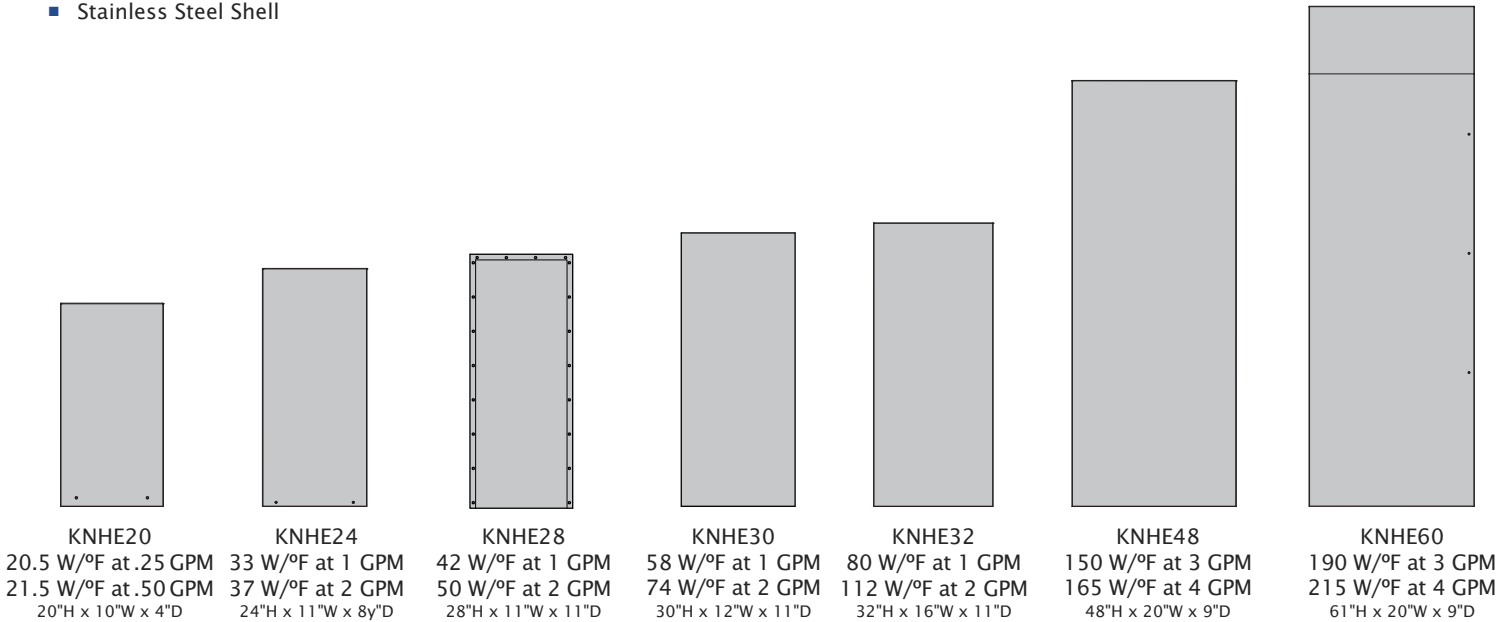


**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

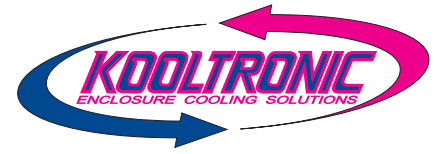
WATER-TO-AIR NEMA 4/4X

STANDARD FEATURES

- All Models are UL/CUL Listed
- Capable of Below-Ambient Cooling
- Closed-Loop Cooling
- NEMA 4/4X Ratings Maintained (UL50)
- Powerful centrifugal blowers
- Rugged heavy-duty Steel Construction with Baked Powder Finish
- Six foot [1.8m] (minimum) 3-wire power cord
- Stainless Steel Shell



KNHE20 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

TECHNICAL DATA*

Model	Volts	Power		Maximum Inlet Water Temp. °F (°C)	Performance Watts/°F (°C)		BTU/H (Watts) @		Approx. Weight lbs kg
		Amps	Watts		0.25GPM	0.50GPM	95°F(35°C) Enclosure Air Temp.	50°F(10°C) Inlet Water Temp.	
KNHE20	115	0.30	33	85 (29)	20.5 (36.9)	21.5 (38.7)	3,148 (923)	3,301 (968)	15 7
K2NHE20	230	0.13	25	85 (29)	20.5 (36.9)	21.5 (38.7)	3,148 (923)	3,301 (968)	15 7

60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

STANDARD FEATURES

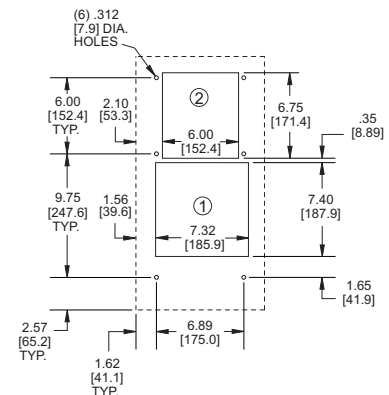
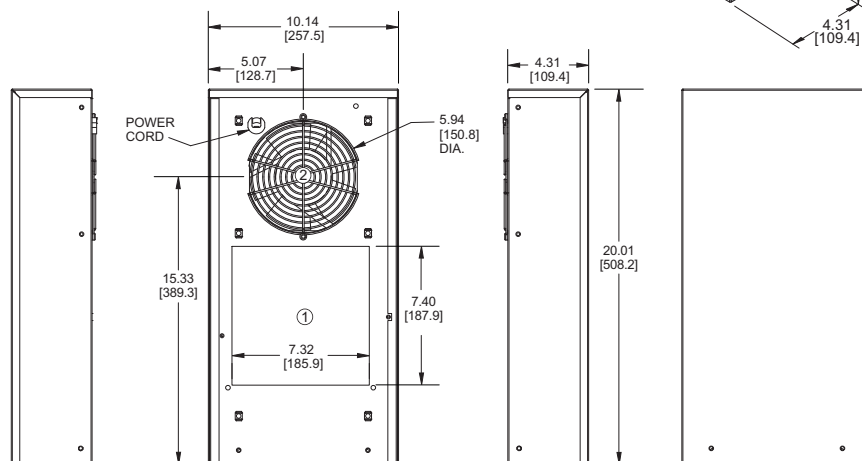
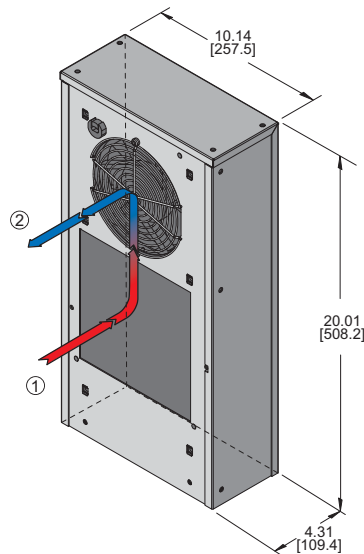
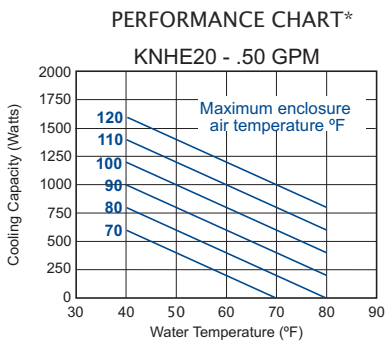
- Closed-Loop Cooling
- NEMA 4/4X Ratings Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

ACCESSORIES AND OPTIONS

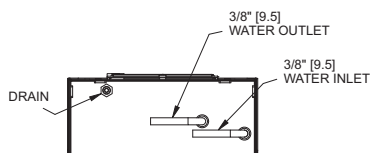
- Internal Corrosion Protection 1 1 2
- Other voltages and frequencies ✦
- Special materials or finishes ✦
- Special motors, line cords, or connectors ✦



WATER-TO-AIR NEMA 4/4X



MOUNTING PLAN



- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

✦ Contact KOOLTRONIC for information.

KNHE24 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS

TECHNICAL DATA*

Model	Volts	Power		Maximum Inlet Water Temp. °F (°C)	Performance Watts/°F (°C)		BTU/H (Watts) @ 95°F(35°C) Enclosure Air Temp. 50°F(10°C) Inlet Water Temp.		Approx. Weight	
		Amps	Watts		1GPM	2GPM	1GPM	2GPM	lbs	kg
KNHE24	115	0.64	72	85 (29)	33 (59)	37 (67)	5,067 (1,485)	5,681 (1,665)	34	15
K2NHE24	230	0.31	70	85 (29)	33 (59)	37 (67)	5,067 (1,485)	5,681 (1,665)	34	15



**NEMA
TYPE 4/4X
MAINTAINED**

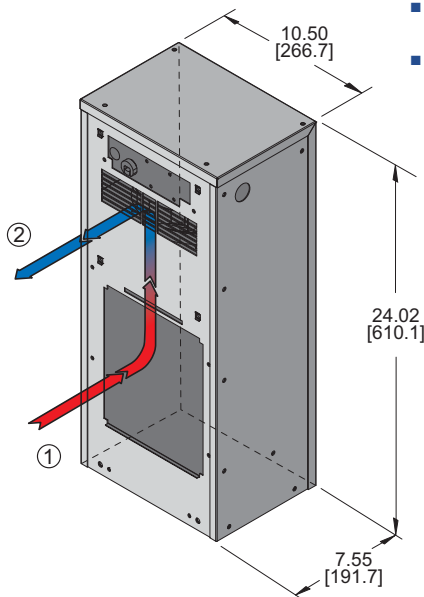
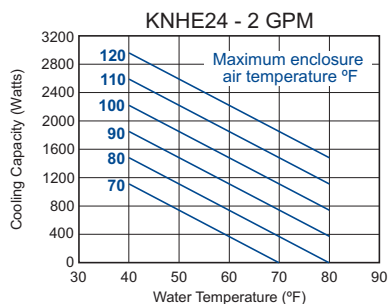
STANDARD FEATURES

- Closed-Loop Cooling
- Epoxy-Coated Heat Exchanger Coils
- NEMA 4/4X Ratings Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

ACCESSORIES AND OPTIONS

	Page
■ Automatic Water Flow Control	112
■ High Water Level Detector	112
■ Internal Corrosion Protection	112
■ Low Airflow Detector	112
■ Other voltages and frequencies	♦
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Temperature Alarm	112

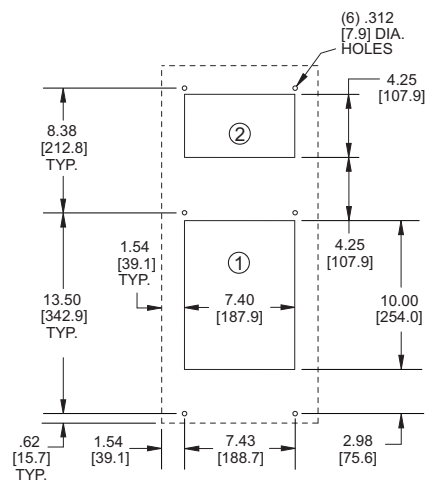
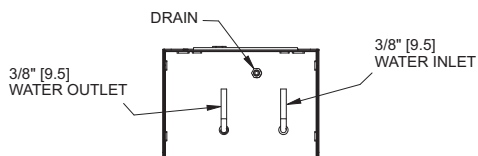
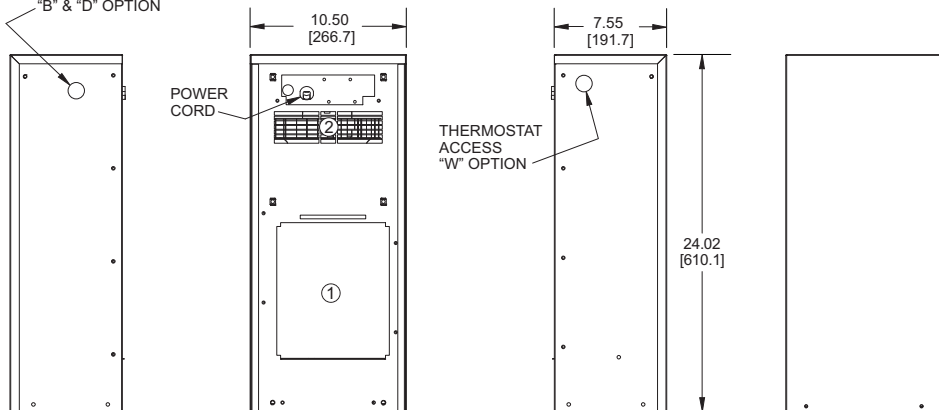
PERFORMANCE CHART*



- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

WATER-TO-AIR NEMA 4/4X

THERMOSTAT ACCESS
ACCESS "B" & "D" OPTION



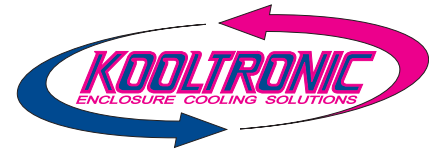
MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KNHE28 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Volts	Power		Maximum Inlet Water Temp. °F (°C)	Performance Watts/°F (Watts/°C)		BTU/H (Watts) @ 95°F(35°C) Enclosure Air Temp. 50°F(10°C) Inlet Water Temp.		Approx. Weight	
		Amps	Watts		1GPM	2GPM	1GPM	2GPM	lbs	kg
KNHE28	115	1.2	140	85 (29)	42 (76)	50 (90)	6,449 (1,890)	7,677 (2,250)	44	20
K2NHE28	230	0.6	140	85 (29)	42 (76)	50 (90)	6,449 (1,890)	7,677 (2,250)	44	20

STANDARD FEATURES

- Closed-Loop Cooling
- Epoxy-Coated Heat Exchanger Coils
- Gasketed Flanges
- NEMA 4/4X Ratings Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

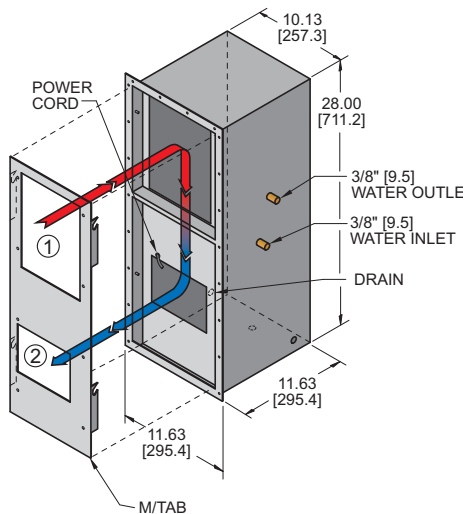
ACCESSORIES AND OPTIONS

- Automatic Water Flow Control 112
- High Water Level Detector 112
- Internal Corrosion Protection 112
- Low Airflow Detector 112
- Other voltages and frequencies †
- Special materials or finishes †
- Special motors, line cords, or connectors †
- Temperature Alarm 112

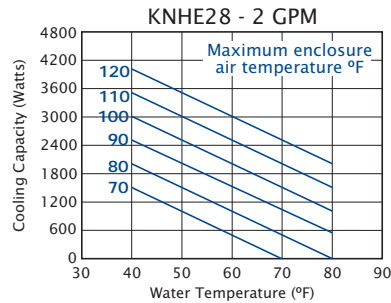
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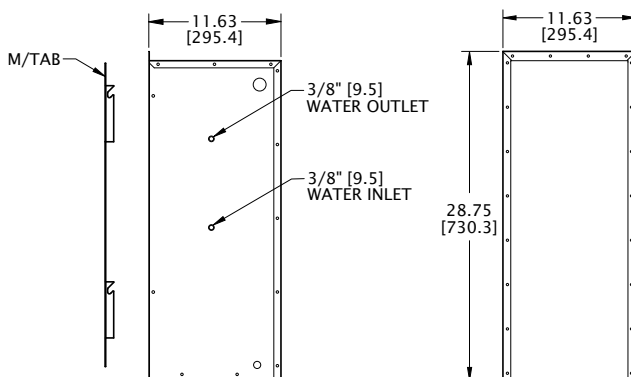
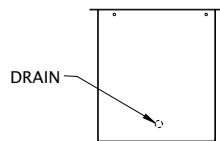
**NEMA
TYPE 4/4X
MAINTAINED**



PERFORMANCE CHART*

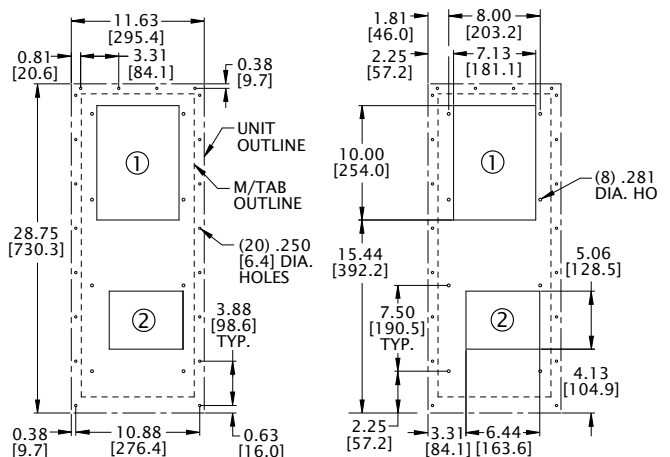


- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE



MOUNTING PLAN
UNIT

MOUNTING PLAN
M/TAB



Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

† Contact KOOLTRONIC for information.

WATER-TO-AIR NEMA 4/4X

KNHE30 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS

TECHNICAL DATA*

Model	Volts	Power		Maximum Inlet Water Temp. °F (°C)	Performance Watts/°F (Watts/°C)		BTU/H (Watts) @ 95°F(35°C) Enclosure Air Temp. 50°F(10°C) Inlet Water Temp.		Approx. Weight	
		Amps	Watts		1GPM	2GPM	1GPM	2GPM	lbs	kg
KNHE30	115	1.16	133	85 (29)	58 (104)	74 (133)	8,906 (2,610)	11,362 (3,330)	53	24
K2NHE30	230	0.57	128	85 (29)	58 (104)	74 (133)	8,906 (2,610)	11,362 (3,330)	53	24



**NEMA
TYPE 4/4X
MAINTAINED**

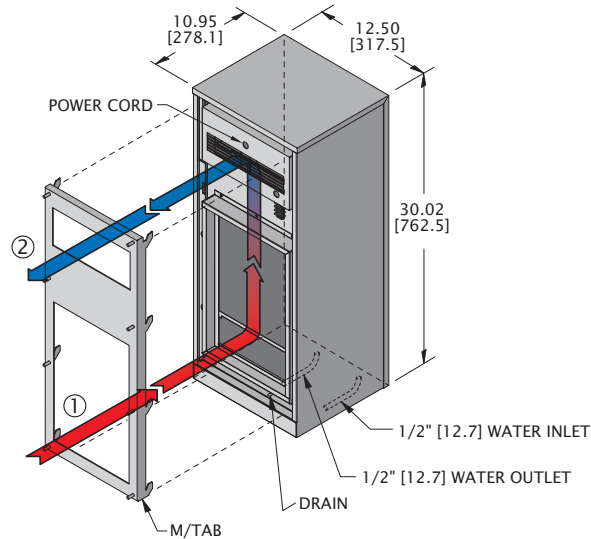
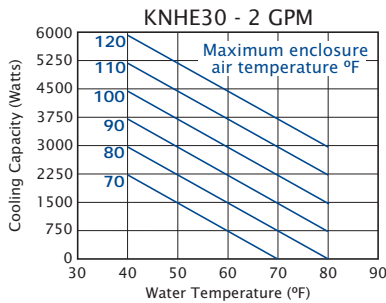
STANDARD FEATURES

- Closed-Loop Cooling
- NEMA 4/4X Ratings Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

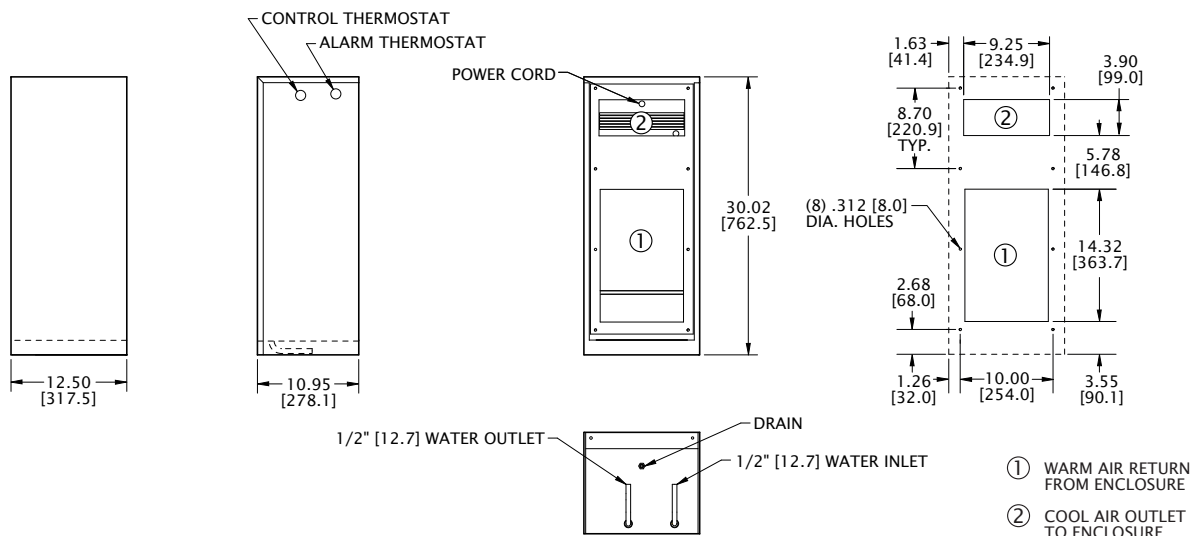
ACCESSORIES AND OPTIONS

	Page
■ Automatic Water Flow Control	112
■ High Water Level Detector	112
■ Internal Corrosion Protection	112
■ Low Airflow Detector	112
■ Other voltages and frequencies	♦
■ Special materials or finishes	♦
■ Special motors, line cords, or connectors	♦
■ Temperature Alarm	112

PERFORMANCE CHART*



MOUNTING PLAN



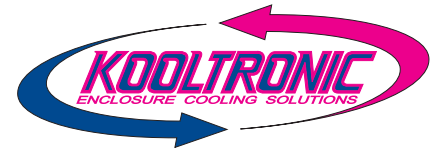
Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

WATER-TO-AIR NEMA 4/4X

KNHE32 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Volts	Power		Maximum Inlet Water Temp. °F (°C)	Performance Watts/°F (°C)		BTU/H (Watts) @ 95°F(35°C) Enclosure Air Temp. 50°F(10°C) Inlet Water Temp.		Approx. Weight	
		Amps	Watts		1GPM	2GPM	1GPM	2GPM	lbs	kg
KNHE32	115	3.7	370	85 (29)	80 (144)	112 (202)	12,284 (3,600)	17,197 (5,040)	66	30
K2NHE32	230	1.5	334	85 (29)	80 (144)	112 (202)	12,284 (3,600)	17,197 (5,040)	66	30

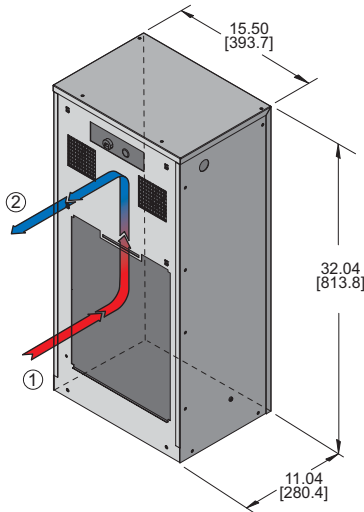
STANDARD FEATURES

- Closed-Loop Cooling
- NEMA 4/4X Ratings Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

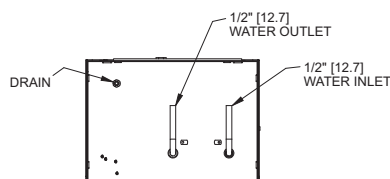
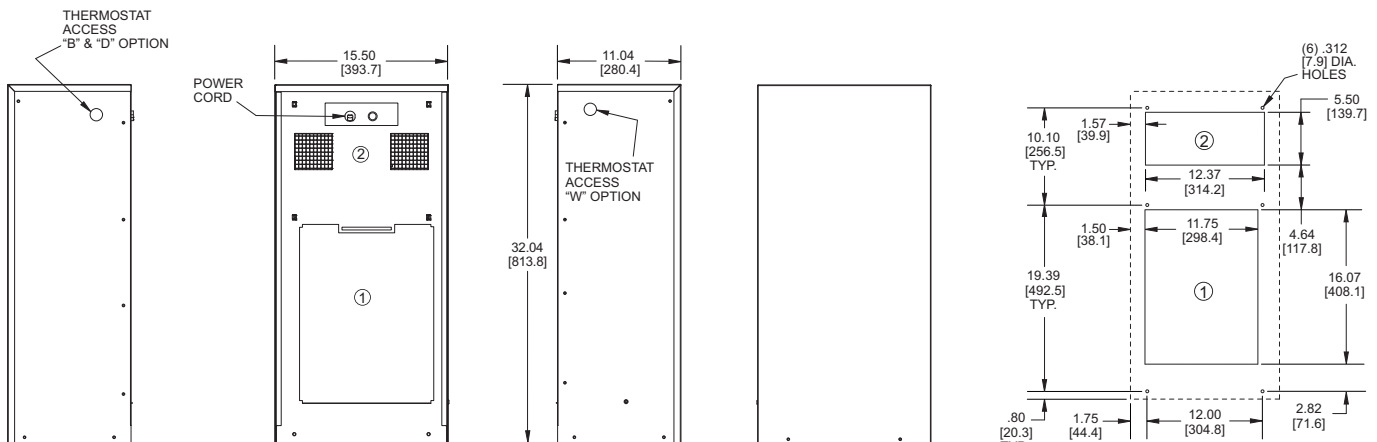
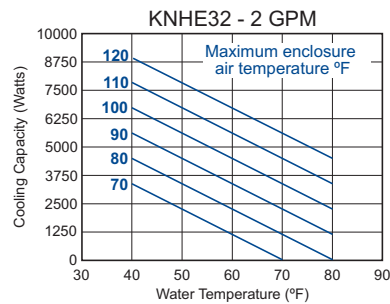
ACCESSORIES AND OPTIONS

- | | |
|---|-----|
| ■ Automatic Water Flow Control | 112 |
| ■ High Water Level Detector | 112 |
| ■ Internal Corrosion Protection | 112 |
| ■ Low Airflow Detector | 112 |
| ■ Other voltages and frequencies | ♦ |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords, or connectors | ♦ |
| ■ Temperature Alarm | 112 |

**NEMA
TYPE 4/4X
MAINTAINED**



PERFORMANCE CHART*



- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

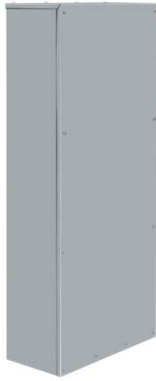
MOUNTING PLAN

Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

KNHE48 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Volts	Power		Maximum Inlet Water Temp. °F (°C)	Performance Watts/°F (Watts/°C)			
		Amps	Watts		1GPM	2GPM	3GPM	4GPM
KNHE48	115	2.2	255	85 (29)	90 (162)	135 (243)	150 (270)	165 (297)
K2NHE48	230	1.1	255	85 (29)	90 (162)	135 (243)	150 (270)	165 (297)

Model	BTU/H (Watts) @				Approx. Weight	
	1GPM	2GPM	3GPM	4GPM	lbs	kg
KNHE48	13,819 (4,050)	20,729 (6,079)	23,032 (6,750)	25,335 (7,425)	89	40
K2NHE48	13,819 (4,050)	20,729 (6,079)	23,032 (6,750)	25,335 (7,425)	89	40

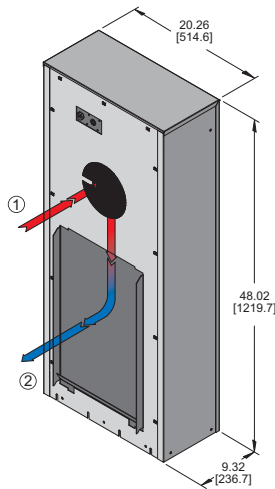


STANDARD FEATURES

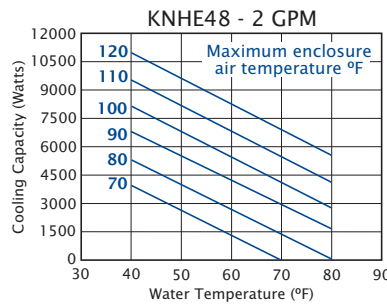
- Closed-Loop Cooling
- Epoxy-Coated Heat Exchanger Coils
- NEMA 4/4X Ratings Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

ACCESSORIES AND OPTIONS

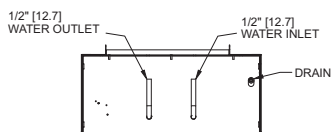
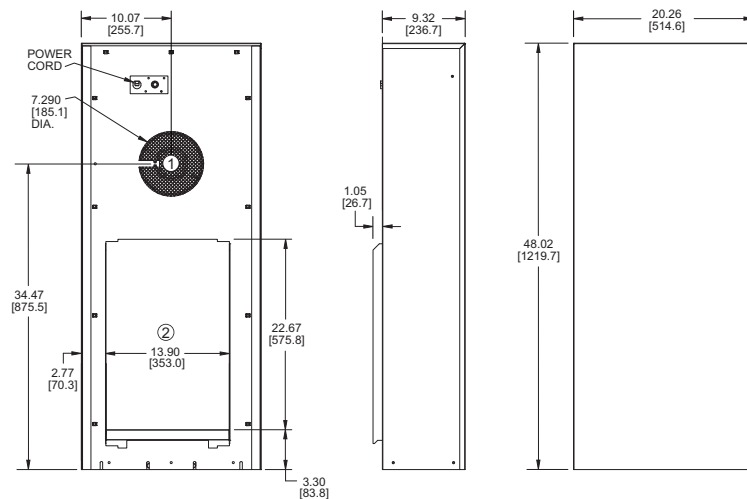
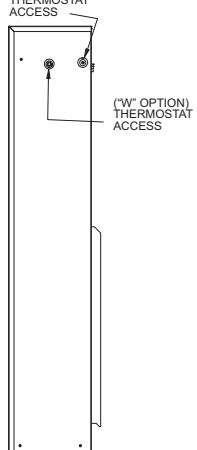
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|---|-----|
| ■ Automatic Water Flow Control | 112 |
| ■ High Water Level Detector | 112 |
| ■ Internal Corrosion Protection | 112 |
| ■ Low Airflow Detector | 112 |
| ■ Other voltages and frequencies | ♦ |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords, or connectors | ♦ |
| ■ Temperature Alarm | 112 |



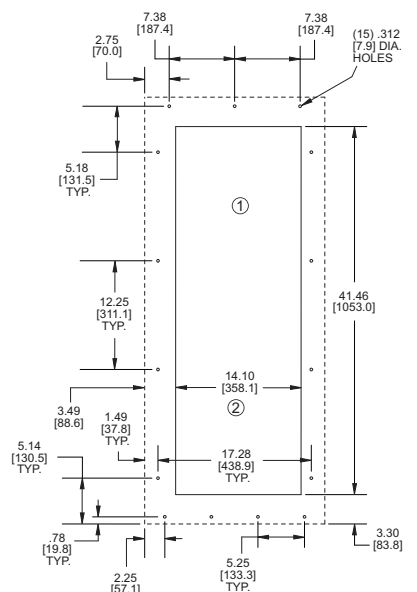
PERFORMANCE CHART*



(*B* & *D* OPTION)
THERMOSTAT ACCESS



MOUNTING PLAN



- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE

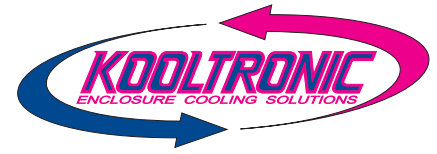
Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

WATER-TO-AIR NEMA 4/4X

KNHE60 WATER-TO-AIR PANEL-MOUNTED HEAT EXCHANGERS



TECHNICAL DATA*

Model	Volts	Power		Maximum Inlet	Performance			
		Amps	Watts	Water Temp. °F (°C)	Watts/°F (Watts/°C)			
					1GPM	2GPM	3GPM	4GPM
KNHE60	115	3.8	430	85 (29)	100 (180)	175 (315)	190 (342)	215 (387)
K2NHE60	230	1.7	390	85 (29)	100 (180)	175 (315)	190 (342)	215 (387)



**NEMA
TYPE 4/4X
MAINTAINED**



Model	BTU/H (Watts) @				Approx. Weight	
	1GPM	2GPM	3GPM	4GPM	lbs	kg
KNHE60	15,355 (4,500)	26,871 (7,875)	29,174 (8,550)	33,012 (9,675)	122	55
K2NHE60	15,355 (4,500)	26,871 (7,875)	29,174 (8,550)	33,012 (9,675)	122	55

STANDARD FEATURES

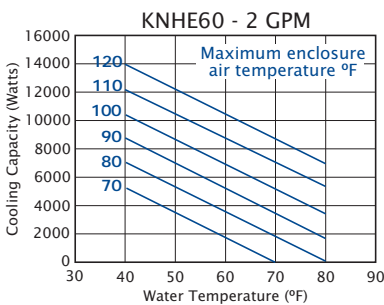
- Closed-Loop Cooling
- Epoxy-Coated Heat Exchanger Coils
- NEMA 4/4X Ratings Maintained (UL50)
- Stainless Steel Shell
- UL/CUL Listed

ACCESSORIES AND OPTIONS

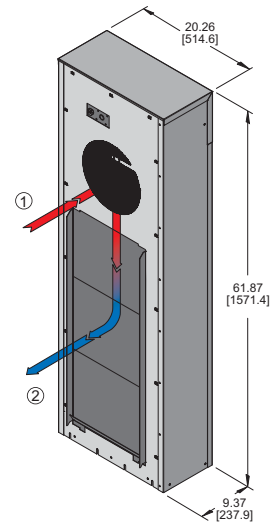
- | | |
|---|-----|
| ■ Automatic Water Flow Control | 112 |
| ■ High Water Level Detector | 112 |
| ■ Internal Corrosion Protection | 112 |
| ■ Low Airflow Detector | 112 |
| ■ Other voltages and frequencies | ♦ |
| ■ Special materials or finishes | ♦ |
| ■ Special motors, line cords, or connectors | ♦ |
| ■ Temperature Alarm | 112 |

Page

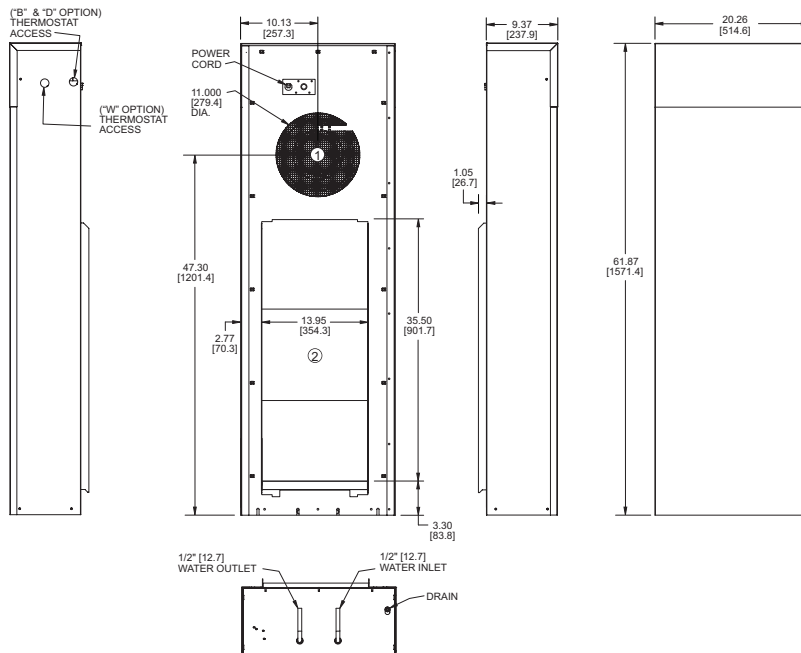
PERFORMANCE CHART*



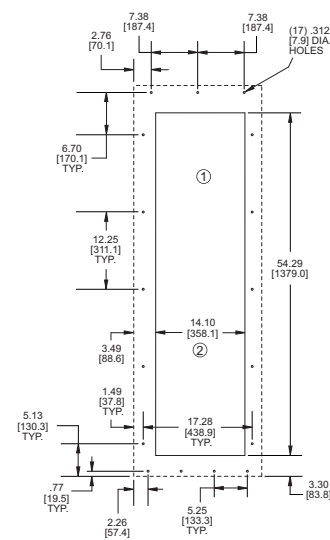
- ① WARM AIR RETURN FROM ENCLOSURE
- ② COOL AIR OUTLET TO ENCLOSURE



WATER-TO-AIR NEMA 4/4X



MOUNTING PLAN



Dimensions, inches [mm], are for reference only and subject to change.

* 60 Hz. operation. For 50 Hz. operation, consult Kooltronic.

♦ Contact KOOLTRONIC for information.

HEAT EXCHANGER ACCESSORIES AND OPTIONS

FACTORY-INSTALLED OPTIONS

ALUMINUM SHELL: Where light weight and/or compatibility with appearance of aluminum enclosures are required. Unpainted Type 5052 is standard. Other types and ultraviolet-resistant baked powder finish are available.

AUTOMATIC WATER FLOW CONTROL: This control consists of a temperature control thermostat and a solenoid valve. When the temperature within the enclosure drops below the thermostat set point due to decreased load or decreasing water temperature, the thermostat closes the solenoid valve. When the temperature increases to the set point (plus a differential) the thermostat opens the solenoid valve and the supply water cools the enclosure. In most models the Automatic Water Flow Control also includes a bypass flow meter which allows a small amount of water (0.25 gpm) to pass through the heat exchanger at all times.

EPOXY-COATED ELEMENT: Fabricated to the same standards as the uncoated convoluted aluminum elements, these are made from epoxy-coated aluminum stock that exceeds 1000 hour salt spray testing requirements.

ENCLOSURE HEATER: 120V or 240V fin strip heater, installed singly or ganged, used to maintain desired internal enclosure temperature, under cold operating conditions. Includes thermostatic control and safety limiter.

HIGH WATER LEVEL DETECTOR PACKAGE: Closes water-supply valve to prevent flooding if excess water accumulates in the drain pan. Signal circuit activates a user-supplied warning device. The low voltage power for the signal circuit is supplied by the user.

INTERNAL CORROSION PROTECTION: An air cured coating is sprayed on copper lines and brazed joints on the condenser side, providing a degree of protection from corrosive environments. This coating will withstand 1000 hours of salt spray per the ASTM B 117 test method. Also see Stainless Steel Cabinet or Integrity NEMA 4/4X Air Conditioners. **NOTE:** Severe operational environments such as waste water treatment and salt spray are likely to cause corrosion failure over a period of time regardless of coating. **Warranty:** Corrosive conditions may affect the warranty coverage. Consult factory for warranty limitations in corrosive environments. **NOTE:** For additional corrosion protection options, contact factory.

LIFTING EYES: A pair of heavy-gauge steel lifting eyes, attached to the side panels assist in positioning units.

LOW AIRFLOW DETECTOR: Similar to the Airflow Switch shown in the Blower Accessories Section, the switch is installed in a suitable location in the heat exchanger to detect loss of airflow, and sends a signal to a terminal block, through which user-installed wiring and warning devices are activated.

MOUNTING HINGE: (Left-hand or Right-hand) Allows the heat exchanger itself to be used as a cabinet door. (Caution: The cabinet must be able to support the full weight of the unit in open position.) Specify left-hand (LH) or right-hand (RH), determined by facing the mounting side of the heat exchanger.

STAINLESS STEEL SHELL: For applications in corrosive or other hostile environments such as those requiring Internal Corrosion Resistant Coatings, especially where chemical/moisture combinations are present.

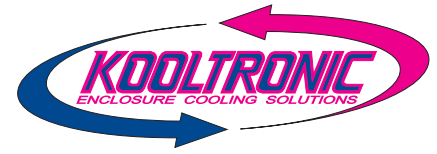
TEMPERATURE ALARM: A thermostat is mounted inside the cabinet and attached to a sensor in the warm air return. When the air temperature increases to the set point, a signal is sent to a terminal block. User-installed wiring from the terminal block to local and/or remote warning devices (light, bell, siren, etc.) can be for normally open or normally closed operation.

CUSTOMER-INSTALLED ACCESSORIES

FILTERS: See next page.

FILTER RECOATING ADHESIVE: This compound is a superior product for recoating filters after washing. The adhesives penetrate dirt layers to keep the filter surface tacky for longer effective performance between washings. Part No. A-16 - 10 ounce container.

WEATHER PROTECTION KIT: For outdoor installations subject to invasion by rain, snow or windblown dirt, special deflectors shield the condenser air inlet and outlet ports. Air conditioners or heat exchangers installed outdoors require special exterior paint. **Note:** Units using the Weather Protection Kit are not UL Listed.



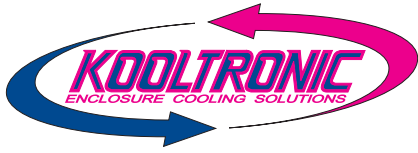
FILTERS

REPLACEMENT FILTERS: All KOOLTRONIC filters consist of a multi-layer grid of sturdy corrugated aluminum, securely held in a one-piece aluminum frame. Filters are required wherever air is drawn into an electronics enclosure or related cooling equipment to keep internal parts as clean as possible. A non-drying adhesive coating traps a high percentage of particulate matter. These filters are reusable, they may be washed and recoated with the appropriate filter recoating adhesive. Replacements are available for those which become damaged or otherwise non-serviceable.

Model	Filter P/N	Dimensions, inches** (H x W x D)	Dimensions, mm** (H x W x D)
Advantage*			
KXRP28	5381F	5.38 x 8.63 x 0.38	136.7 x 219.2 x 9.7
KXRP33	7131F	7.50 x 11.50 x 0.38	190.5 x 292.1 x 9.7
KXRP47	17121F	14.50 x 17.13 x 0.50	368.3 x 435.1 x 12.7
TrimLine			
KXNP33	12251F	16.63 x 11.88 x 0.50	422.4 x 301.8 x 12.7
KXNP36	17121F	14.50 x 17.13 x 0.50	368.3 x 435.1 x 12.7
KXNP47	17121F	14.50 x 17.13 x 0.50	368.3 x 435.1 x 12.7
KXNP59	22501F	22.13 x 16.38 x 0.50	562.1 x 416.1 x 12.7
Integrity NEMA 4/4X			
KNHX32	800F	10.38 x 10.38 x 0.50	263.7 x 263.7 x 12.7
KNHX38	10871F	10.88 x 14.88 x 0.50	276.4 x 378.0 x 12.7
KNHX47	10871F	10.88 x 14.88 x 0.50	276.4 x 378.0 x 12.7
KNHX59	10871F	10.88 x 14.88 x 0.50	276.4 x 378.0 x 12.7
Standard			
KXHE60	5001F	5.00 x 9.56 x 0.50	127.0 x 242.8 x 12.7
KXHE120	100-3F	9.56 x 5.00 x 0.50	242.8 x 127.0 x 12.7
KXHE122	100-3F	9.56 x 5.00 x 0.50	242.8 x 127.0 x 12.7
KXHE125	5251F	16.63 x 4.81 x 0.50	422.4 x 122.2 x 12.7
KXHE245	7001F	16.63 x 6.63 x 0.50	422.4 x 168.4 x 12.7
KXHE365	10501F	16.63 x 10.13 x 0.50	422.4 x 257.3 x 12.7
Refrigerant-Charged			
KTHE200	9621F	7.06 x 9.63 x 0.50	179.3 x 244.6 x 12.7

** Nominal; actual size may vary slightly.

* Advantage Series filters are optional.



BASIC BLOWERS

BASIC BLOWERS

KOOLTRONIC Centrifugal Blowers are engineered for performance and built for reliability. These blowers are available in five series designations to meet a multitude of design and cooling or air handling needs. They may be mounted in any position required.

Every KOOLTRONIC blower is equipped with a custom engineered ball-bearing motor designed for low temperature rise under zero static conditions. Added assurance of long, trouble-free operation is provided by the application of fan cooling or by drawing a small portion of the intake air directly through the motor and past the bearings. Operation under static pressure conditions further reduces the motor load. Service failures are almost unknown.

All KOOLTRONIC blowers are designed to isolate vibration of rotating parts from housings and mounting flanges for smooth, quiet, trouble-free operation.

These blowers are used extensively in virtually every type of cooling application in the electronics industries, as well as for a host of other industrial, medical, telecommunications and food & beverage requirements. They are also used exclusively in virtually all KOOLTRONIC Packaged Blowers, Air Conditioners and Heat Exchangers.

Popular blowers are stocked and ready to ship. Emergency shipment service is available.

Modifications to inlets or outlets, special mounting flanges, brackets, supports or other sheet metal changes are available to meet your specific application. In addition, KOOLTRONIC also designs and manufactures a variety of blowers to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.

GENERAL SPECIFICATIONS FOR ALL BASIC BLOWERS

RUGGED CONSTRUCTION: Precision-engineered heavy-gauge steel construction insures blowers stand up under tough applications.

BAKED POWDER FINISH: Durable, baked-on gray powder finish is standard on all painted units. Other finishes and colors are available.

PRECISION BALL-BEARING MOTORS: All motors, whether permanent split capacitor or shaded pole, are UL/CSA Recognized and include automatic-reset thermal overload protection. Designed for low temperature rise, KOOLTRONIC motors are also cooled by the blowers' intake air, for maximum motor life. All motors are UL Recognized and carry a Declaration of Conformity to applicable CE Standards. Special permanent lubricants perform over a broad temperature range: -20°F (-29°C) to 250°F (121°C).

Consult KOOLTRONIC for motors designed to meet military or extreme environmental specifications.

POWER: 115 VAC or 230 VAC, 50/60Hz is standard. For multi-phase power, other voltages and frequencies or brushless DC applications, consult KOOLTRONIC. **NOTE:** Some 230 Volt models may not be available or minimum purchases may apply. Contact Kooltronic for information.

LEADS: 12-inch [304.8mm] (minimum) power and ground leads. Special lengths and/or plugs available.

AIRFLOW AND STATIC PRESSURE CONVERSION FACTORS

Multiply airflow in cubic feet per minute (CFM) by:

- 1.7 to obtain airflow in cubic meters per hour ($m^3/hr.$)
- 0.47 to obtain airflow in liters per second (L/S)

Multiply static pressure in inches of water (in. W.G.) by:

- 25.4 to obtain static pressure in millimeters of water (mm W.G.)
- 249 to obtain static pressure in Pascals (Pa)

SINGLE CENTRIFUGAL BLOWERS



DESCRIPTION

KOOLTRONIC *Single Centrifugal Blowers* are designed for performance against low to moderate static pressures. They are available in seven sizes and capacities. Easily installed, they can be mounted in any orientation for maximum cooling efficiency.

These popular blowers are a low cost alternative for a multitude of applications. They are the workhorses of electronics cooling and are widely used in other non-electronic applications.

General specifications common to all KOOLTRONIC Basic Blowers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of blowers to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

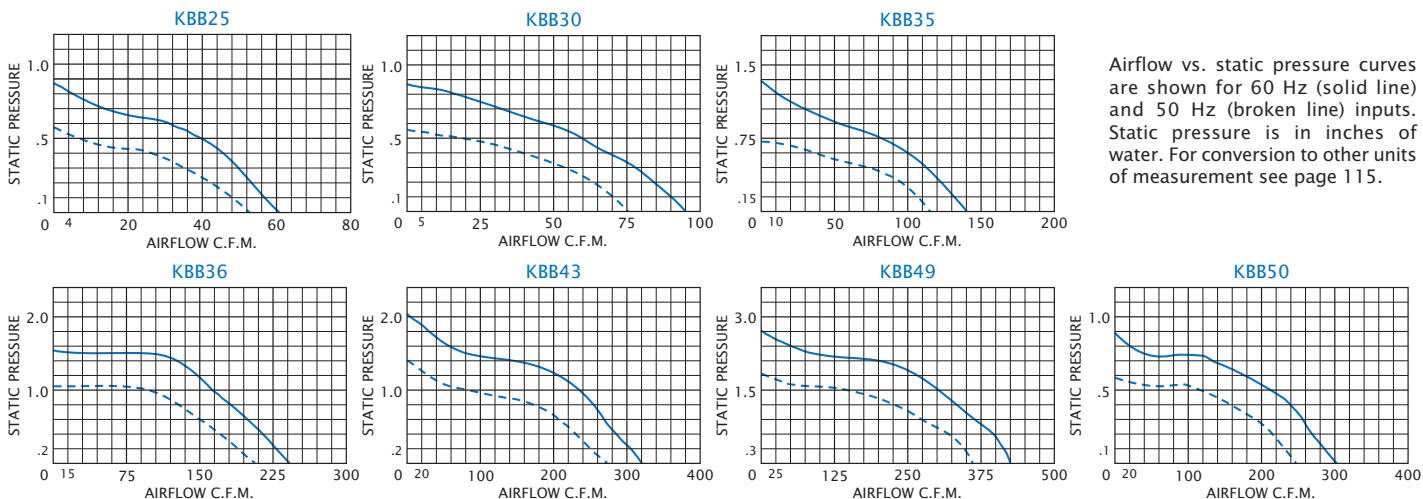
STANDARD FEATURES

- Capacities: 60 to 425 CFM
- Full performance in any mounting position
- Rugged Construction with Baked Powder Finish
- UL/CSA ball bearing motors
- 12-inch [304.8mm] (minimum) power and ground leads

ACCESSORIES AND OPTIONS

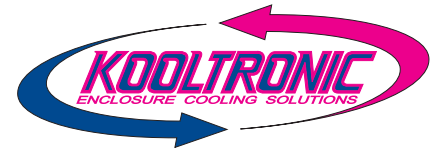
	Page
■ Airflow Switch	139
■ Automatic Speed Control	141
■ Inlet Finger Guard	♦
■ Other voltages and frequencies	♦
■ Special external paint finishes	♦
■ Special line cord or connectors	♦
♦ Contact KOOLTRONIC for information.	

PERFORMANCE GRAPHS

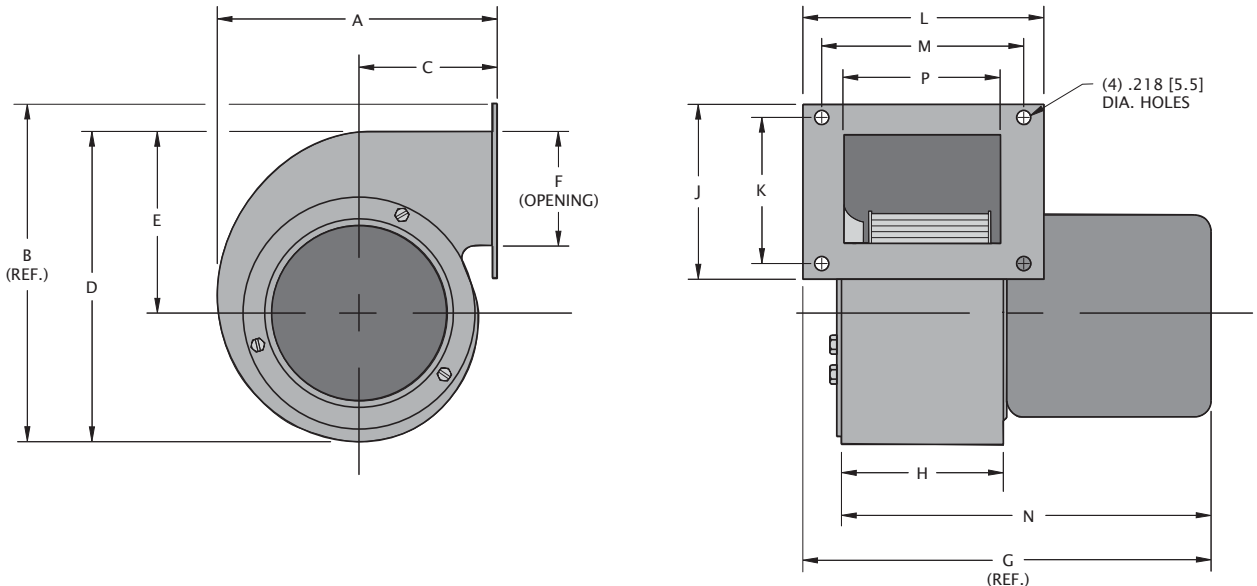


SINGLE CENTRIFUGAL

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS inches [mm]



Model	A	B	C	D	E	F	G
KBB25	4.56 [115.8]	5.25 [133.4]	2.25 [57.2]	4.93 [125.2]	2.88 [73.2]	1.83 [46.5]	5.25 [133.4]
KBB30	5.31 [134.9]	6.00 [152.4]	2.56 [65.0]	5.44 [138.2]	3.13 [79.5]	1.88 [47.8]	5.88 [149.4]
KBB35	6.32 [160.5]	7.53 [191.3]	3.00 [76.2]	6.69 [169.9]	3.83 [97.3]	2.41 [61.2]	6.32 [160.5]
KBB36	6.44 [163.6]	7.10 [180.3]	3.21 [81.5]	6.72 [170.7]	3.77 [95.8]	2.41 [61.2]	8.44 [214.4]
KBB43	7.31 [185.7]	8.25 [209.6]	3.44 [87.4]	7.63 [193.8]	4.19 [106.4]	3.31 [84.1]	8.25 [209.6]
KBB49	7.31 [185.7]	8.19 [208.0]	3.44 [87.4]	7.65 [194.3]	4.38 [111.3]	3.25 [82.6]	10.50 [266.7]
KBB50	8.25 [209.6]	9.19 [233.4]	4.06 [103.1]	8.68 [220.5]	5.00 [127.0]	3.11 [79.0]	8.94 [227.1]

Model	H	J	K	L	M	N	P
KBB25	2.00 [50.8]	2.69 [68.3]	2.25 [57.2]	3.06 [77.7]	2.63 [66.8]	4.75 [120.7]	2.00 [50.8]
KBB30	2.50 [63.5]	3.13 [79.5]	2.44 [62.0]	3.75 [95.3]	3.13 [79.5]	5.25 [133.4]	2.44 [62.0]
KBB35	2.56 [65.0]	3.75 [95.3]	3.00 [76.2]	3.75 [95.3]	3.13 [79.5]	5.71 [145.0]	2.44 [62.0]
KBB36	3.44 [87.4]	3.25 [82.6]	2.00 [50.8]	4.63 [117.6]	4.06 [103.1]	8.00 [203.2]	3.38 [85.9]
KBB43	4.00 [101.6]	4.50 [114.3]	3.75 [95.3]	5.13 [130.3]	4.63 [117.6]	7.69 [195.3]	3.88 [98.6]
KBB49	4.25 [108.0]	4.50 [114.3]	3.75 [95.3]	5.63 [143.0]	5.00 [127.0]	9.56 [242.8]	4.06 [103.1]
KBB50	4.31 [109.5]	4.38 [111.3]	3.75 [95.3]	5.50 [139.7]	4.93 [125.2]	8.43 [214.1]	4.19 [106.4]

For motor on opposite side, consult KOOLTRONIC.
Dimensions, inches [mm], are for reference only and subject to change.

TECHNICAL DATA*

Model	Normally In Stock	CFM @ 0" S.P.	Cutoff S.P.	RPM Nominal	Amps		Watts	Approximate Weight	
					Run.	L.R.		Lbs.	Kg.
KBB25	Yes	60	0.85	3300	0.5	0.8	35	5	2.3
KBB30	Yes	95	0.85	3150	0.6	0.8	41	5	2.3
KBB35	Yes	140	1.30	3200	1.3	2.1	90	6	2.7
KBB36	Yes	235	1.50	3275	1.3	3.0	150	7	3.2
KBB43	Yes	320	2.00	3300	1.6	3.1	180	9	4.1
KBB49	Yes	425	2.70	3450	3.3	13.6	335	13	5.9
KBB50		300	0.88	1550	0.9	1.3	95	8	3.6

* 115V, 60 Hz. operation

HOW TO ORDER

Specify model number. For 230 VAC operation, add a 2 after the K. Example: K2BB43. **NOTE:** Some 230 Volt models may not be available or minimum purchases may apply. Contact Kooltronic for information.

SINGLE CENTRIFUGAL

HIGH PRESSURE CENTRIFUGAL BLOWERS



DESCRIPTION

High Pressure Centrifugal Blowers fill the performance range between **Single Centrifugal Blowers** and **High Pressure Radial Blowers**. They have been specifically engineered for applications requiring higher airflow against somewhat lower static pressures than **High Pressure Radial Blowers**.

These high pressure blowers are available in a variety of sizes and output capacities, to satisfy many airflow/static pressure requirements. Representative performance: 120 CFM to 430 CFM at 1" static pressure; 120 CFM to 375 CFM at 2.5" static pressure.

General specifications common to all KOOLTRONIC Basic Blowers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of blowers to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

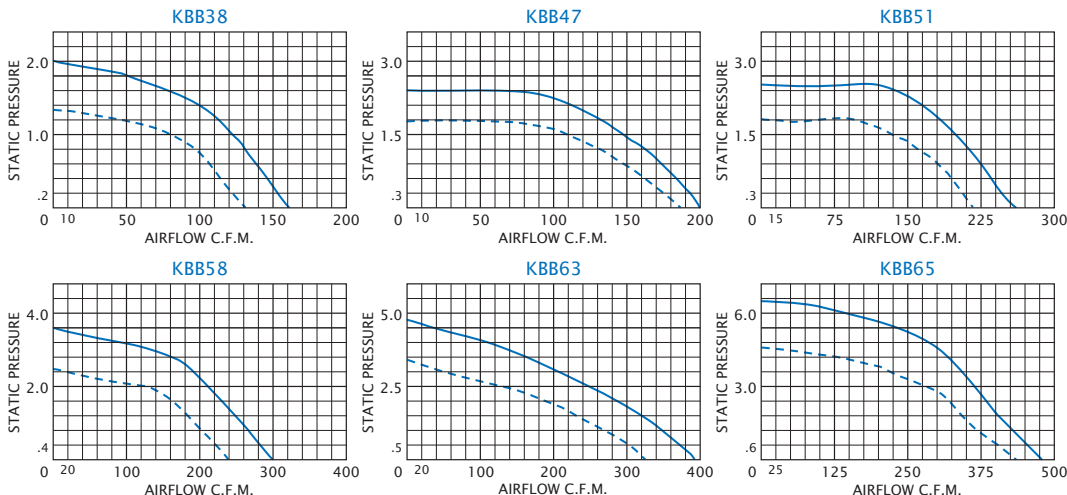
STANDARD FEATURES

- Capacities: 160 to 475 CFM
- Designed for mid-range static pressures
- Full performance in any mounting position
- Rugged Construction with Baked Powder Finish
- UL/CSA ball bearing motors
- 12-inch [304.8mm] (minimum) power and ground leads

ACCESSORIES AND OPTIONS

	Page
■ Airflow Switch	139
■ Automatic Speed Control	141 *
■ Inlet Finger Guard	♦
■ Other voltages and frequencies	♦
■ Special external paint finishes	♦
■ Special line cord or connectors	♦
♦ Contact KOOLTRONIC for information.	
* Not an accessory for KBB65.	

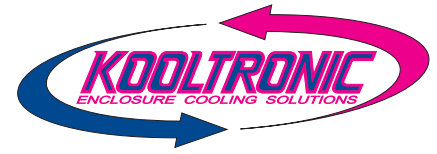
PERFORMANCE GRAPHS



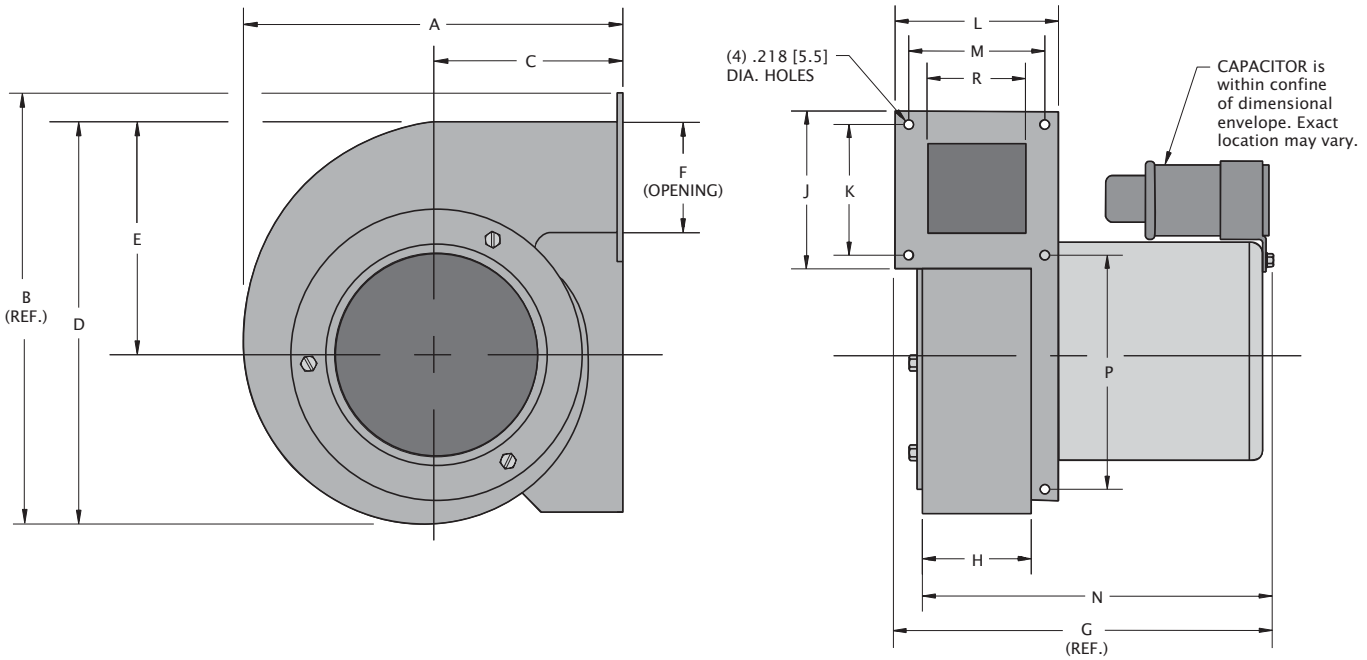
Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water. For conversion to other units of measurement see page 115.

HIGH PRESSURE CENTRIFUGAL

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS inches [mm]



Model	A	B	C	D	E	F	G	H
KBB38	6.43 [163.3]	7.43 [188.7]	3.00 [76.2]	6.81 [173.0]	3.88 [98.6]	2.00 [50.8]	7.50 [190.5]	2.50 [63.5]
KBB47	7.31 [185.7]	8.13 [206.5]	3.53 [89.7]	7.56 [192.0]	4.27 [108.5]	2.31 [58.7]	7.54 [191.5]	2.25 [57.2]
KBB51	8.13 [206.5]	9.25 [235.0]	4.00 [101.6]	8.63 [219.2]	5.00 [127.0]	2.38 [60.5]	8.44 [214.4]	2.50 [63.5]
KBB58	8.56 [217.4]	9.88 [251.0]	4.00 [101.6]	9.25 [235.0]	5.27 [133.9]	2.67 [67.8]	8.63 [219.2]	2.50 [63.5]
KBB63	9.56 [242.8]	11.00 [279.4]	4.19 [106.4]	10.33 [262.4]	5.98 [151.9]	2.67 [67.8]	8.75 [222.3]	2.50 [63.5]
KBB65	9.63 [244.6]	11.31 [287.3]	4.50 [114.3]	10.50 [266.7]	6.06 [153.9]	3.75 [95.3]	9.00 [228.6]	2.75 [69.9]

Model	J	K	L	M	N	P	R
KBB38	3.25 [82.6]	2.63 [66.8]	3.50 [88.9]	2.88 [73.2]	7.00 [177.8]	*	2.38 [60.5]
KBB47	3.63 [92.2]	3.00 [76.2]	3.50 [88.9]	2.88 [73.2]	6.93 [176.0]	*	2.00 [50.8]
KBB51	3.63 [92.2]	3.00 [76.2]	3.75 [95.3]	3.13 [79.5]	7.81 [198.4]	5.38 [136.7]	2.38 [60.5]
KBB58	4.00 [101.6]	3.38 [85.9]	3.75 [95.3]	3.13 [79.5]	7.79 [197.9]	5.75 [146.1]	2.38 [60.5]
KBB63	4.00 [101.6]	3.38 [85.9]	3.75 [95.3]	3.13 [79.5]	8.06 [204.7]	5.75 [146.1]	2.38 [60.5]
KBB65	5.31 [134.9]	4.56 [115.8]	4.25 [108.0]	3.50 [89.0]	8.25 [209.6]	4.56 [115.8]	2.63 [66.8]

*Does not have extended flange.
 For motor on opposite side, consult KOOLTRONIC.
 Dimensions, inches [mm], are for reference only and subject to change.

HIGH PRESSURE CENTRIFUGAL

TECHNICAL DATA*

Model	Normally In Stock	CFM @ 0" S.P.	Cutoff S.P.	RPM Nominal	Amps		Watts	Approximate Weight	
					Run.	L.R.		Lbs.	Kg.
KBB38		160	1.90	3400	1.3	2.1	150	8	3.6
KBB47	Yes	200	2.10	3000	1.6	2.4	187	8	3.6
KBB51		260	2.60	3500	2.4	13.6	230	13	5.9
KBB58	Yes	300	3.60	3475	2.9	13.6	290	13	5.9
KBB63	Yes	390	4.70	3375	4.6	15.0	290	15	6.8
KBB65	Yes	475	6.30	3000	7.6	15.0	810	16	7.3

* 115V, 60 Hz. operation

HOW TO ORDER

Specify model number. For 230 VAC operation, add a 2 after the K. Example: K2BB63. **NOTE:** Some 230 Volt models may not be available or minimum purchases may apply. Contact Kooltronic for information.

HIGH PRESSURE RADIAL BLOWERS



DESCRIPTION

This series of blowers was specifically designed for maximum efficiency in the movement of moderate volumes of air against substantial static pressures. Applications include cooling computer disk drives, densely-packed enclosures, forcing gas-air mixtures into small boiler combustion chambers, and in chromatography and pollution sampling equipment, to name just a few.

High Pressure Radial Blowers are available in a choice of sizes and capacities, ranging from 40 CFM to 240 CFM at 1" static pressure and up to 150 CFM at 5" static pressure. Consult performance graphs for airflows available at your static pressure requirements.

General specifications common to all KOOLTRONIC Basic Blowers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of blowers to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

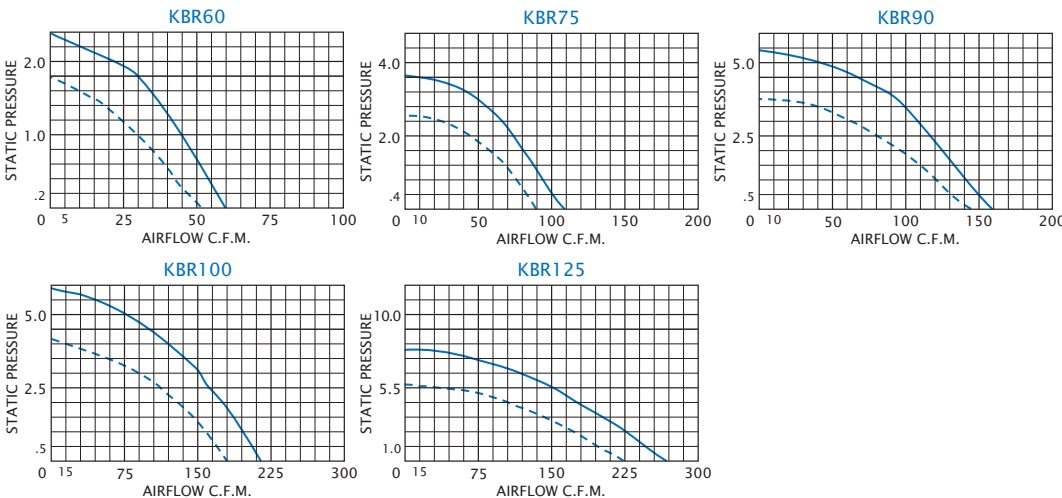
STANDARD FEATURES

- Capacities: 55 to 265 CFM
- Designed for substantial static pressures
- Full performance in any mounting position
- Rugged Construction with Baked Powder Finish
- UL/CSA ball bearing motors
- 12-inch [304.8mm] (minimum) power and ground leads

ACCESSORIES AND OPTIONS

	Page
■ Airflow Switch	139
■ Automatic Speed Control	141
■ Inlet Finger Guard	♦
■ Other voltages and frequencies	♦
■ Special external paint finishes	♦
■ Special line cord or connectors	♦
♦ Contact KOOLTRONIC for information.	

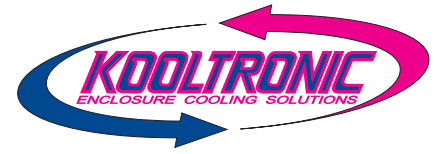
PERFORMANCE GRAPHS



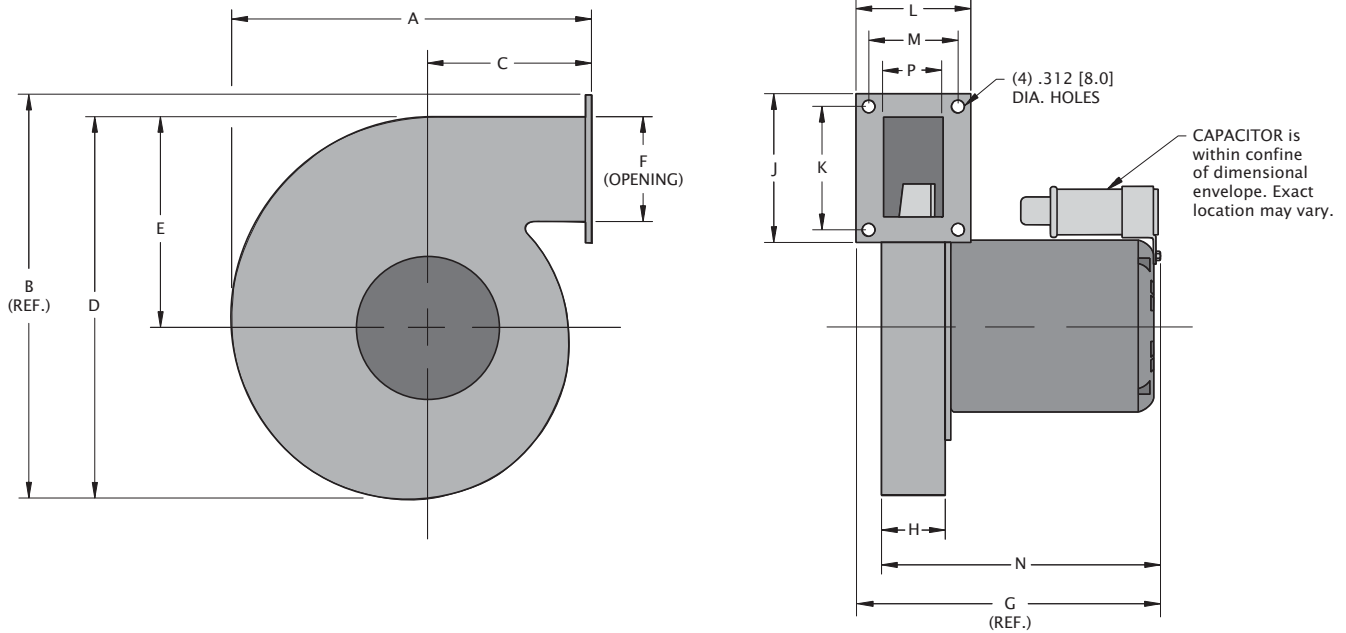
Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water. For conversion to other units of measurement see page 115.

HIGH PRESSURE RADIAL

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS inches [mm]



Model	A	B	C	D	E	F	G
KBR60	7.81 [198.4]	9.25 [235.0]	3.81 [96.8]	8.63 [219.2]	4.94 [125.5]	2.06 [52.3]	6.56 [166.6]
KBR75	9.69 [246.1]	11.00 [279.4]	4.50 [114.3]	10.31 [261.9]	5.50 [139.7]	2.50 [63.5]	6.75 [171.5]
KBR90	11.25 [285.8]	12.29 [312.2]	5.69 [144.5]	11.62 [295.1]	6.25 [158.8]	3.13 [79.5]	6.75 [171.5]
KBR100	13.53 [343.7]	13.75 [349.3]	7.43 [188.7]	13.03 [331.0]	7.06 [179.3]	3.94 [100.1]	7.81 [198.4]
KBR125	13.53 [343.7]	13.75 [349.3]	7.43 [188.7]	13.03 [331.0]	7.06 [179.3]	3.94 [100.1]	7.88 [200.2]

Model	H	J	K	L	M	N	P
KBR60	1.31 [33.3]	3.25 [82.6]	2.63 [66.8]	2.50 [63.5]	1.88 [47.8]	5.93 [150.6]	1.19 [30.2]
KBR75	1.50 [38.1]	3.88 [98.6]	3.25 [82.6]	2.88 [73.2]	2.25 [57.2]	6.06 [153.9]	1.38 [35.1]
KBR90	1.63 [41.4]	4.25 [108.0]	3.88 [98.6]	2.88 [73.2]	2.25 [57.2]	6.13 [155.7]	1.50 [38.1]
KBR100	1.50 [38.1]	5.25 [133.4]	4.63 [117.6]	2.88 [73.2]	2.13 [54.1]	7.13 [181.1]	1.38 [35.1]
KBR125	1.50 [38.1]	5.25 [133.4]	4.63 [117.6]	2.88 [73.2]	2.13 [54.1]	7.19 [182.6]	1.38 [35.1]

For motor on opposite side, consult KOOLTRONIC.
Dimensions, inches [mm], are for reference only and subject to change.

TECHNICAL DATA*

Model	Normally In Stock	CFM @ 0" S.P.	Cutoff S.P.	RPM Nominal	Amps		Watts	Approximate Weight	
					Run.	L.R.		Lbs.	Kg.
KBR60		55	2.30	3500	0.8	2.1	91	6	2.7
KBR75		110	3.60	3400	1.0	2.1	106	9	4.1
KBR90	Yes	160	5.60	2900	2.2	3.1	235	11	5.0
KBR100		215	6.00	3450	3.1	8.1	315	15	6.8
KBR125		265	7.00	3450	3.7	7.2	410	19	8.6

Note: Power input is substantially reduced at higher static pressures.
* 115V, 60 Hz. operation

HOW TO ORDER

Specify model number. For 230 VAC operation, add a 2 after the K. Example: K2BR90. **NOTE:** Some 230 Volt models may not be available or minimum purchases may apply. Contact Kooltronic for information.

HIGH PRESSURE RADIAL

DOUBLE CENTRIFUGAL BLOWERS



DESCRIPTION

KOOLTRONIC **Double Centrifugal Blowers** are designed to provide greater airflow than the related single blower series, in the same types of low to moderate static pressure applications. Similarly, they are easily installed and operate with equal effectiveness in any mounting orientation.

Ten models comprise the series, offering a choice of sizes and capacities to satisfy a wide variety of cooling requirements. Together, single and double centrifugal blowers are the backbone of forced convection air cooling.

These **Double Centrifugal Blowers** and the **Quadruplex Centrifugal Blowers** are the exclusive air movement components in virtually all KOOLTRONIC Packaged Blowers, Heat Exchangers and Air Conditioners.

General specifications common to all KOOLTRONIC Basic Blowers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of blowers to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

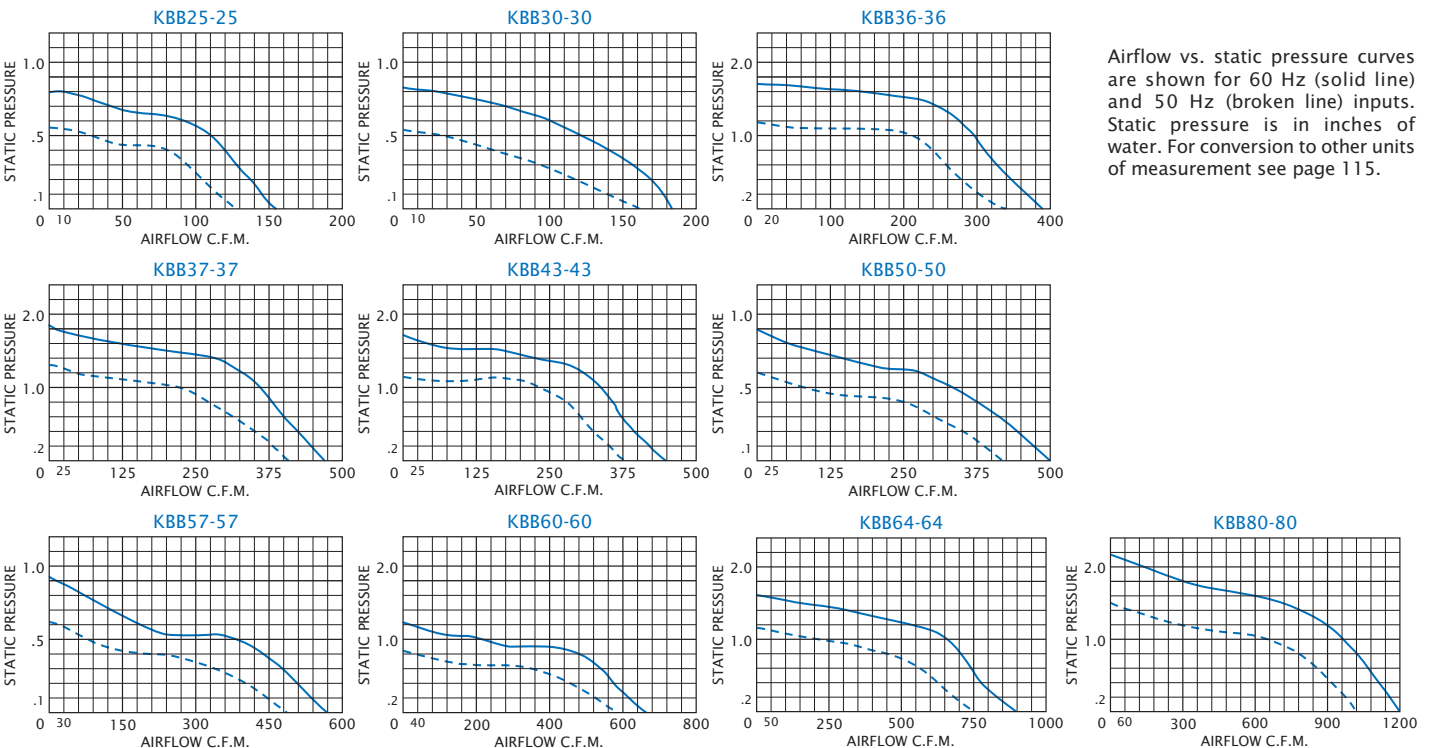
STANDARD FEATURES

- Capacities: 155 to 1200 CFM
- Full performance in any mounting position
- Rugged Construction with Baked Powder Finish
- UL/CSA ball bearing motors
- 12-inch [304.8mm] (minimum) power and ground leads

ACCESSORIES AND OPTIONS

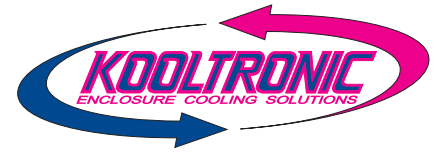
	Page
■ Airflow Switch	139
■ Automatic Speed Control	141*
■ Inlet Finger Guard	♦
■ Other voltages and frequencies	♦
■ Special external paint finishes	♦
■ Special line cord or connectors	♦
♦ Contact KOOLTRONIC for information.	
*Not an accessory for KBB80-80.	

PERFORMANCE GRAPHS

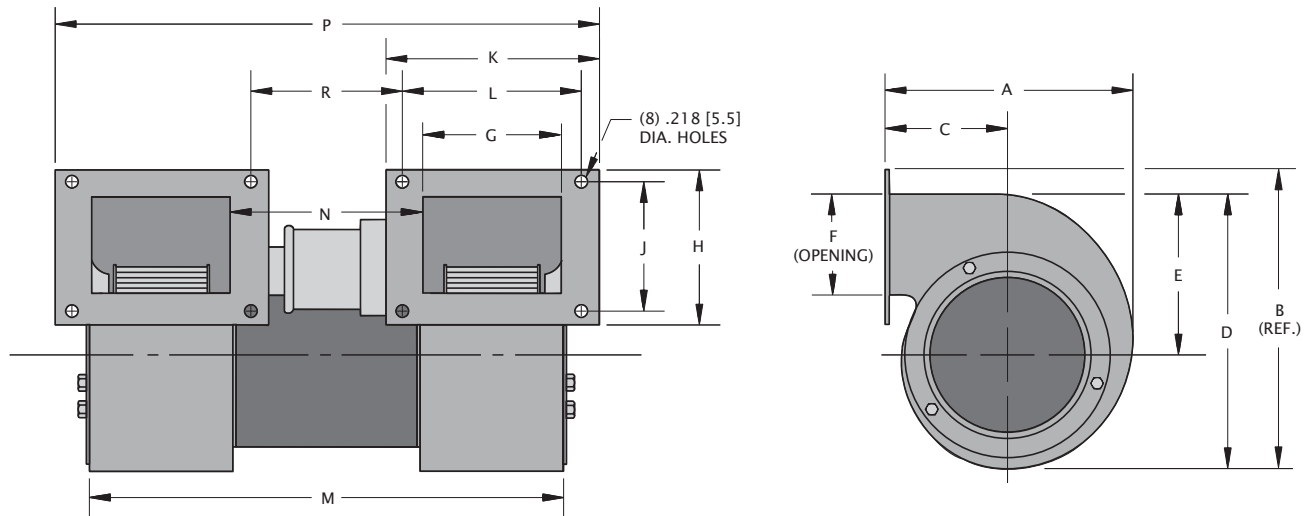


DOUBLE CENTRIFUGAL

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS inches [mm]



Model	A	B	C	D	E	F	G	H
KBB25-25**	4.63 [117.6]	5.25 [133.4]	2.31 [58.7]	4.81 [122.2]	2.88 [73.2]	1.88 [47.8]	2.50 [63.5]	2.69 [68.3]
KBB30-30	5.28 [134.1]	5.43 [138.0]	2.60 [66.0]	-	3.09 [78.5]	2.01 [51.0]	-	3.12 [79.2]
KBB36-36 [▲]	6.44 [163.6]	7.19 [182.6]	3.19 [81.0]	6.81 [173.0]	3.81 [96.8]	2.50 [63.5]	3.37 [85.6]	3.25 [82.6]
KBB37-37 [▲]	6.44 [163.6]	7.19 [182.6]	3.19 [81.0]	6.81 [173.0]	3.81 [96.8]	2.50 [63.5]	4.06 [103.1]	3.25 [82.6]
KBB43-43 [▲]	7.25 [184.2]	8.25 [209.6]	3.50 [88.9]	7.63 [193.8]	4.31 [109.5]	3.25 [82.6]	3.25 [82.6]	4.63 [117.6]
KBB50-50	8.16 [207.4]	9.16 [232.5]	4.00 [101.6]	8.54 [217.0]	4.95 [125.6]	3.21 [81.5]	4.26 [108.1]	4.38 [111.1]
KBB57-57	8.44 [214.4]	9.75 [247.7]	3.75 [95.3]	9.25 [235.0]	5.38 [136.7]	3.68 [93.5]	4.50 [114.3]	4.63 [117.6]
KBB60-60	9.25 [235.0]	11.06 [280.9]	3.81 [96.8]	10.50 [266.7]	6.00 [152.4]	4.25 [108.0]	3.50 [88.9]	5.38 [136.7]
KBB64-64 [▲]	10.63 [270.0]	11.38 [289.1]	5.06 [128.5]	11.00 [279.4]	6.19 [157.2]	4.25 [108.0]	3.75 [95.3]	5.06 [128.5]
KBB80-80 [▲]	12.06 [306.3]	-	5.44 [138.2]	13.25 [336.5]	7.60 [193.0]	5.63 [143.0]	-	5.94 [150.9]

Model	J	K	L	M	N	P	R
KBB25-25**	2.25 [57.2]	3.75 [95.3]	3.13 [79.5]	8.37 [212.6]	3.87 [98.3]	9.62 [244.3]	2.75 [69.9]
KBB30-30	2.44 [62.0]	3.75 [95.3]	3.12 [79.2]	8.35 [212.0]	-	9.55 [242.6]	2.68 [68.0]
KBB36-36 [▲]	2.00 [50.8]	4.63 [117.6]	4.06 [103.1]	10.81 [274.6]	4.13 [104.9]	12.00 [304.8]	3.31 [84.1]
KBB37-37 [▲]	2.50 [63.5]	5.50 [139.7]	5.00 [127.0]	12.25 [311.2]	4.00 [101.6]	13.63 [346.2]	3.06 [77.7]
KBB43-43 [▲]	4.00 [101.6]	4.38 [111.3]	3.88 [98.6]	10.69 [271.5]	4.00 [101.6]	11.70 [297.2]	3.44 [87.4]
KBB50-50	3.75 [95.3]	5.50 [139.7]	4.88 [123.8]	12.51 [317.8]	3.96 [100.5]	13.71 [348.3]	3.34 [84.7]
KBB57-57	4.13 [104.9]	5.50 [139.7]	5.00 [127.0]	12.93 [328.4]	4.00 [101.6]	13.88 [352.6]	3.38 [85.9]
KBB60-60	4.88 [123.9]	4.63 [117.6]	4.13 [104.9]	11.00 [279.4]	3.88 [98.6]	12.00 [304.8]	3.25 [82.6]
KBB64-64 [▲]	4.56 [115.8]	5.00 [127.0]	4.50 [114.3]	12.81 [325.4]	5.00 [127.0]	14.00 [355.6]	4.43 [112.5]
KBB80-80 [▲]	5.44 [138.2]	5.00 [127.0]	4.50 [114.3]	12.62 [320.5]	-	13.75 [348.3]	-

Dimensions, inches [mm], are for reference only and subject to change.

TECHNICAL DATA*

Model	Normally In Stock	CFM @ 0" S.P.	Cutoff S.P.	RPM Nominal	Amps		Watts	Approximate Weight	
					Run.	L.R.		Lbs.	Kg.
KBB25-25**		155	0.80	3300	1.3	2.1	85	7	3.2
KBB30-30	Yes	185	0.80	3250	1.4	2.1	90	7	3.2
KBB36-36		390	1.65	3250	2.3	5.4	240	12	5.5
KBB37-37		465	1.80	3150	2.7	5.4	280	12	5.5
KBB43-43		450	1.70	3200	2.5	5.4	260	13	5.9
KBB50-50	Yes	500	0.90	1700	1.5	4.7	150	15	6.8
KBB57-57		560	0.90	1650	1.6	4.7	160	16	7.3
KBB60-60	Yes	665	1.20	1575	2.3	4.7	235	18	8.2
KBB64-64 [▲]		890	1.60	1700	4.6	17.5	430	25	11.4
KBB80-80 [▲]	Yes	1200	2.15	1650	6.6	17.5	650	26	11.8

* 115V, 60 Hz. operation

HOW TO ORDER

Specify model number. For 230 VAC operation, add a 2 after the K. Example: K2BB30-30. **NOTE:** Some models (KBB64-64, 80-80, 36-36, 43-43, 37-37) unavailable in 230 VAC or minimum purchases may apply. Contact Kooltronic for availability of 230 VAC models.

****NOTE:** For KBB25-25 Minimum Order Quantities Apply.

DOUBLE CENTRIFUGAL

QUADRUPLEX CENTRIFUGAL BLOWERS



DESCRIPTION

KOOLTRONIC *Quadruplex Centrifugal Blowers* move more air with less noise and greater efficiency than comparably sized double centrifugal blowers. The optimum wheel width-to-diameter ratio and the specially designed housings, which minimize inlet losses, also contribute to an exceptionally even distribution of airflow for maximum cooling.

A unique motor mount design isolates the drive motor and rotating components from the blower structure for smooth, quiet operation with minimum vibration. *Quadruplex Blowers* are suitable wherever wide-band air movement is required and are especially useful for applications such as cooling printed circuit cards and other components in densely packed electronics cabinets.

General specifications common to all KOOLTRONIC Basic Blowers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of blowers to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

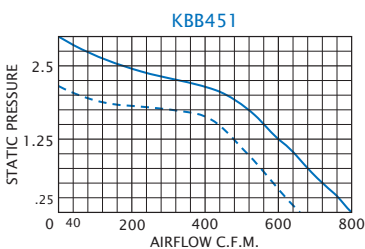
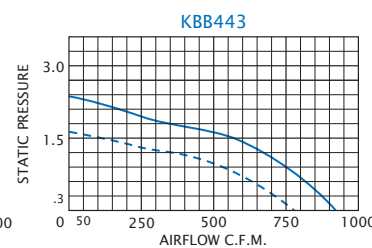
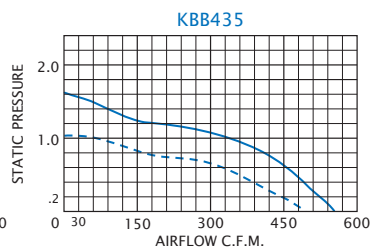
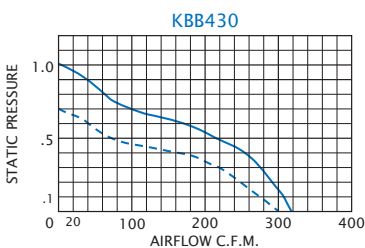
FEATURES

- Capacities: 320 to 920 CFM
- Extremely quiet, efficient operation
- Full performance in any mounting position
- Rugged Construction with Baked Powder Finish
- UL/CSA ball bearing motors
- 12-inch [304.8mm] (minimum) power and ground leads

ACCESSORIES AND OPTIONS

	Page
■ Airflow Switch	139
■ Automatic Speed Control	141
■ Inlet Finger Guard	♦
■ Other voltages and frequencies	♦
■ Special external paint finishes	♦
■ Special line cord or connectors	♦
♦ Contact KOOLTRONIC for information.	

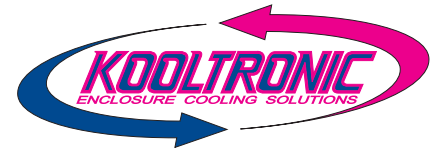
PERFORMANCE GRAPHS



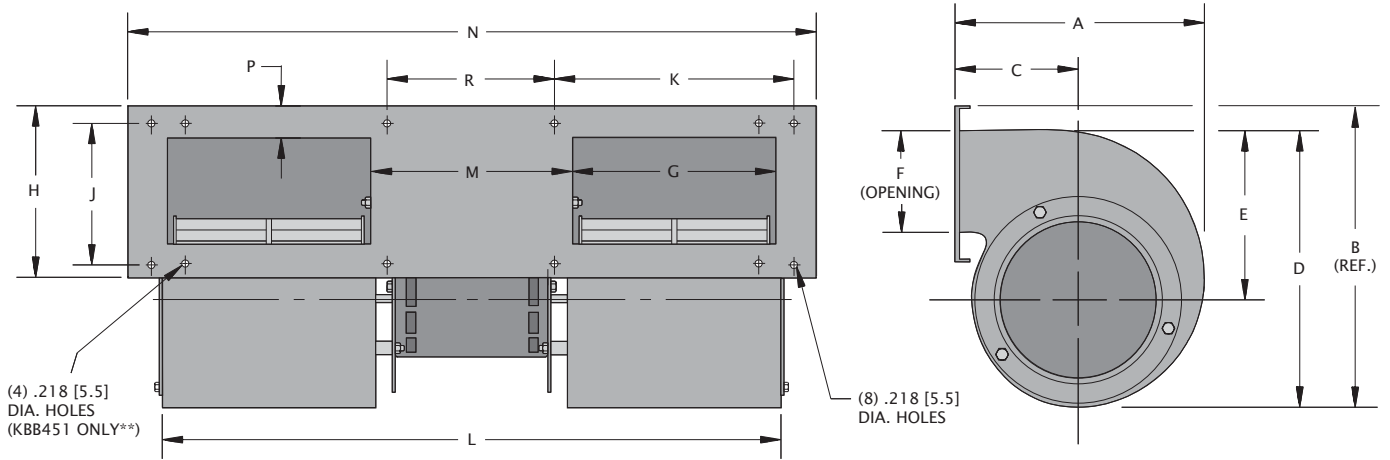
Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water. For conversion to other units of measurement see page 115.

QUADRUPLEX CENTRIFUGAL

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 139, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS inches [mm]



Model	A	B	C	D	E	F	G	H
KBB430	5.00 [127.0]	6.25 [158.8]	2.19 [55.6]	5.50 [139.7]	3.13 [79.5]	2.06 [52.3]	4.50 [114.3]	4.00 [101.6]
KBB435	6.39 [162.3]	-----	3.08 [78.2]	-----	3.82 [97.0]	-----	4.65 [118.1]	3.88 [98.5]
KBB443*	7.43 [188.7]	7.94 [201.7]	3.50 [88.9]	7.63 [193.8]	4.38 [111.3]	3.25 [82.6]	4.75 [120.7]	6.75 [171.5]
KBB451	8.31 [211.1]	9.31 [236.5]	4.25 [108.0]	8.63 [219.2]	5.00 [127.0]	3.25 [82.6]	3.25 [82.6]	4.63 [117.6]

Model	J	K	L	M	N	P	R
KBB430	2.78 [70.6]	5.25 [133.4]	13.44 [341.4]	4.44 [112.8]	14.94 [379.5]	0.75 [19.1]	3.81 [96.8]
KBB435	3.12 [79.2]	5.50 [139.7]	14.19 [360.4]	4.79 [120.6]	16.00 [406.4]	-----	4.38 [111.3]
KBB443*	6.00 [152.4]	5.38 [136.7]	15.88 [403.4]	6.25 [158.8]	17.00 [431.8]	0.38 [9.7]	5.63 [143.0]
KBB451	3.91 [99.3]	4.00 [101.6]	13.50 [342.9]	7.00 [177.8]	14.88 [378.0]	0.69 [17.5]	6.25 [158.8]

Dimensions, inches [mm], are for reference only and subject to change.

* Diagram does not depict oversized mounting plate on this model.

** KBB451 has four additional mounting holes.

TECHNICAL DATA *

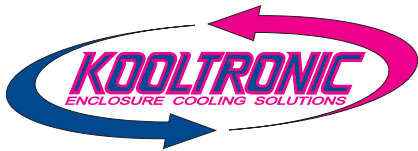
Model	Normally In Stock	CFM @ 0" S.P.	Cutoff S.P.	RPM Nominal	Amps		Watts	Approximate Weight	
					Run.	L.R.		Lbs.	Kg.
KBB430		320	1.00	2900	1.8	2.5	140	9	4.1
KBB435	Yes	550	1.60	3150	2.0	3.1	220	11	5.0
KBB443	Yes	920	2.30	3350	5.6	18.1	630	22	10.0
KBB451	Yes	800	3.00	3350	5.6	18.1	630	22	10.0

* 115V, 60 Hz. operation

HOW TO ORDER

Specify model number. For 230 VAC operation, add a 2 after the K. Example: K2BB451. **NOTE:** Some models unavailable in 230 VAC or minimum purchases may apply. Contact Kooltronic for availability of 230 VAC models.

QUADRUPLEX CENTRIFUGAL



PACKAGED BLOWERS

PACKAGED BLOWERS

KOOLTRONIC Packaged Blowers are used in semi-clean environments for equipment that can operate at temperatures above ambient and against moderate static pressures while providing adequate filtration. Each combines a specially-designed double-inlet blower in a sturdy cabinet, with a filter and grille.

Packaged Standard Twin Blowers, Recessed Twin Blowers, EMI/RFI-Shielded Twin Blowers and **Broad Discharge Twin Blowers** comprise one of the most extensive and versatile standard product lines available. When combined with selections from the complete array of accessories and options, these blowers can provide the solution to virtually every application requiring a packaged unit utilizing ambient air for cooling.

Each packaged blower is engineered for performance and built for reliability. All applicable components are UL/CSA Recognized.

Popular blowers are stocked and ready to ship. Emergency shipment service is available.

KOOLTRONIC also designs and manufactures a variety of packaged blowers to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.

GENERAL SPECIFICATIONS FOR ALL PACKAGED BLOWERS

RUGGED CONSTRUCTION: Precision-engineered heavy-gauge steel construction ensures blower will stand up under tough industrial applications. EIA-notched flanges extend 17-inch [431.8mm] blower cabinet to 19-inch [482.6mm] panel width.

BAKED POWDER FINISH: Durable, baked-on powder finish is standard. Other finishes are available.

PRECISION BALL-BEARING MOTORS: All motors, whether permanent split capacitor or shaded pole, are UL/CSA Recognized, and include automatic-reset thermal overload protection. Designed for low temperature rise, KOOLTRONIC motors are also cooled by the blowers' intake air, for maximum motor life. All motors are UL Recognized and carry a Declaration of Conformity to applicable CE Standards. Special permanent lubricants perform over a broad temperature range: -20°F (-29°C) to 250°F (121°C). Consult KOOLTRONIC for motors designed to meet military or extreme environmental specifications.

POWER: 115 VAC or 230 VAC, 50/60 Hz is standard. **NOTE:** Some 230 Volt models may not be available or minimum purchases may apply. Contact Kooltronic for information. For multi-phase power, other voltages and frequencies or brushless DC applications, consult KOOLTRONIC.

GRILLE: All units include attractive 19-inch [482.6mm] wide stainless steel grilles with knurled captive fasteners for easy removal. Grille area is 65% open and complies with OSHA and UL safety standards.

FILTERS: Multi-layer grid of sturdy, corrugated aluminum in an aluminum frame. May be reused after washing off accumulations and spraying with KOOLTRONIC A-16 Recoating Adhesive. Filters must be kept free of accumulations to prevent reduction or loss of performance and/or damage to equipment.

POWER CORD: All 115 VAC, 50/60 Hz units are supplied with a minimum of 3-foot [0.9m] three-wire cord with molded plug included, internally grounded and securely locked to the case by a strain relief bushing. 230 VAC, 50/60 Hz blowers are supplied without a plug. Special lengths and/or plugs are available.

EXHAUST GUARDS: Included on all packaged blowers.

AIRFLOW AND STATIC PRESSURE CONVERSION FACTORS

Multiply airflow in cubic feet per minute (CFM) by:

- 1.7 to obtain airflow in cubic meters per hour ($m^3/hr.$)
- 0.47 to obtain airflow in liters per second (L/S)

Multiply static pressure in inches of water (in. W.G.) by:

- 25.4 to obtain static pressure in millimeters of water (mm W.G.)
- 249 to obtain static pressure in Pascals (Pa)

STANDARD TWIN PACKAGED BLOWERS



DESCRIPTION

Standard Twin Packaged Blowers are the most popular KOOLTRONIC Packaged Blower. These blowers achieve exceptional performance through use of the largest possible blower housings and wheels. Each contains a quadruplex centrifugal blower powered by a single precision ball-bearing motor, except for the KP350, which contains a twin blower design powered by two precision ball-bearing motors.

These widely-used **Standard Twin Packaged Blowers** deliver air from more than 50% of their 17-inch [431.8mm] width, while conventional blowers deliver air from only about 30%. Internal neoprene isolation mounts reduce transmission of vibration and AC hum to the enclosure. Long service life and trouble-free performance are assured through the use of precision ball-bearing motors in all models and by the dual inlet quadruplex design, which uses intake air to cool the motor.

General specifications common to all KOOLTRONIC Packaged Blowers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of packaged blowers to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

STANDARD FEATURES

- Attractive 19-inch [482.6mm] Stainless Steel Grilles
- Capacities: 130 to 800 CFM
- Dual inlet quadruplex blower design for maximum airflow*
- Exhaust guards included
- Filter
- Heavy-gauge Steel Shell with EIA-notched flanges and Baked Powder Finish
- Inlet air cools motor for longer life
- Three foot [0.9m] (minimum) 3-wire power cord
- UL/CSA ball-bearing motors

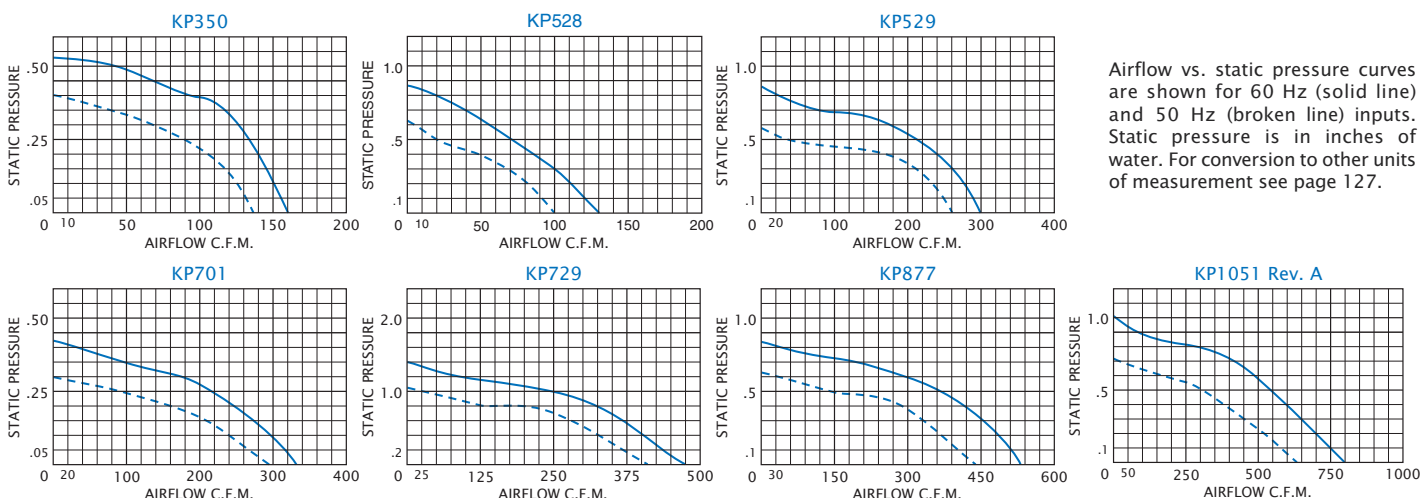
* Except the KP350, which contains a twin blower design powered by two precision ball-bearing motors.

ACCESSORIES AND OPTIONS

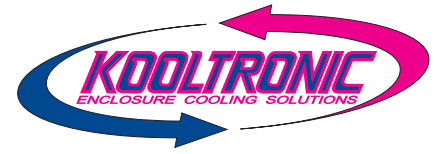
	Page
■ Adapters	139
■ Airflow Switch	139
■ Automatic Speed Control	141
■ EMI/RFI Shielding	140
■ Filter Recoating Adhesive	140
■ Other voltages and frequencies	♦
■ Replacement Filters	140
■ Replacement Grille Assemblies	140
■ Special external paint finishes	♦
■ Special line cord or connectors	♦

♦ Contact KOOLTRONIC for information.

PERFORMANCE GRAPHS

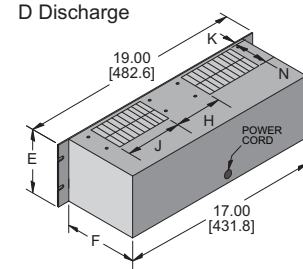
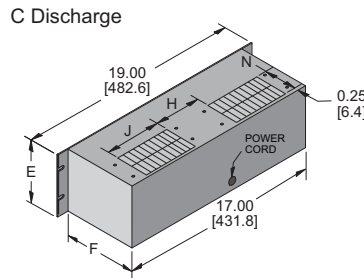
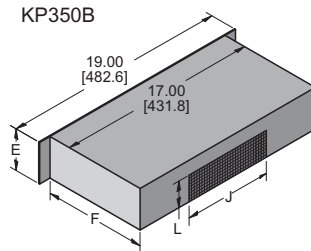
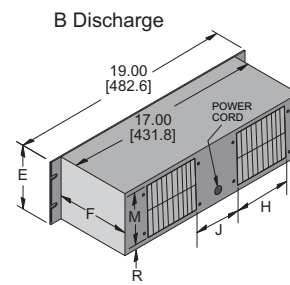
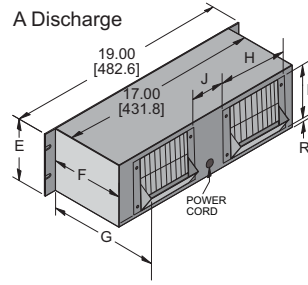
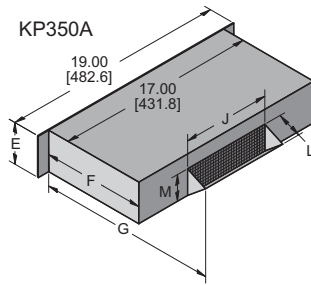


For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS AND DISCHARGE LOCATIONS

ALL OTHER MODELS



Model	Discharge Available	Max. Panel Height		F	G	H	J	K
		E						
KP350 [▲]	A B	3.50	[88.9]	8.75	[222.3]	10.50	[266.7]	-
KP528	A B C D	5.25	[133.4]	6.25	[158.8]	7.67	[195.0]	0.62 [16.0]
KP529	A B C D	5.25	[133.4]	6.25	[158.8]	7.69	[195.3]	0.62 [16.0]
KP701	A B C D	7.00	[177.8]	8.25	[209.6]	10.11	[257.0]	0.62 [16.0]
KP729	A B C D	7.00	[177.8]	8.25	[209.6]	10.13	[257.4]	1.00 [25.4]
KP877 [▲]	A B C D	8.75	[222.3]	10.00	[254.0]	11.74	[298.0]	0.75 [19.0]
KP1051 ^{**}	A B C D	10.50	[266.7]	11.50	[292.1]	13.16	[334.0]	1.05 [27.0]
** Rev. A	Discharge Available	L	M	N	P	R		
KP350 [▲]	A B	2.25	[57.2]	2.25	[57.2]	-	-	-
KP528	A B C D	1.88	[47.8]	3.00	[76.2]	1.94	[49.3]	1.19 [30.2]
KP529	A B C D	1.42	[36.0]	3.00	[76.2]	1.94	[49.3]	1.19 [30.2]
KP701	A B C D	1.86	[47.0]	5.44	[138.2]	3.22	[82.0]	0.89 [23.0]
KP729	A B C D	-		4.00	[101.6]	2.50	[63.5]	3.54 [101.6]
KP877 [▲]	A B C D	1.74	[44.0]	6.09	[254.0]	3.63	[92.2]	6.06 [153.9]
KP1051 ^{**}	A B C D	1.66	[42.0]	7.31	[186.0]	4.18	[106.0]	7.44 [189.0]

Dimensions, inches [mm], are for reference only and subject to change.

** Rev. A

TECHNICAL DATA *

Model	Normally In Stock	CFM @ 0" S.P.	Cutoff S.P.	RPM Nominal	Amps		Watts	Approximate Weight	
					Run.	L.R.		Lbs.	Kg.
KP350 [▲]	Yes	160	0.52	1500	1.2	1.6	90	18	8.2
KP528		130	0.87	3150	0.8	1.3	65	13	5.9
KP529	Yes	300	0.87	3000	1.9	2.9	105	13	5.9
KP701	Yes	330	0.42	1600	1.1	1.6	85	18	8.2
KP729	Yes	470	1.40	3250	1.7	3.1	185	18	8.2
KP877 [▲]	Yes	525	0.82	1500	1.3	1.9	140	28	12.7
KP1051 ^{**}		800	1.00	1500	2.6	4.9	257	35	15.9

*115V, 60 Hz. operation

** Rev. A

HOW TO ORDER

Specify model number, adding discharge suffix A, B, C or D. Example: KP701A. For 230 VAC operation, add a 2 after the K. Example: K2P701A. **▲NOTE:** KP877 and KP350 models unavailable in 230 VAC. Contact Kooltronic for availability of 230 VAC models.

STANDARD TWIN

RECESSED TWIN PACKAGED BLOWERS



DESCRIPTION

Where panel space is a critical element in the design and packaging of an electronics system, KOOLTRONIC **Recessed Twin Packaged Blowers** provide maximum air delivery using a minimum of panel height. Extending into the often wasted space in the base of the cabinet below the panel mounting area, these recessed units save a full 1¾-inch [44.5mm] of panel height. There is no loss of airflow because the size of the open grille design still provides sufficient area to meet air delivery requirements.

The **Recessed Twin Packaged Blowers** utilize the same powerful quadruplex blowers featured in **Standard Twin Packaged Blowers**. They provide the same excellent performance and service-life characteristics.

General specifications common to all KOOLTRONIC Packaged Blowers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of packaged blowers to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

STANDARD FEATURES

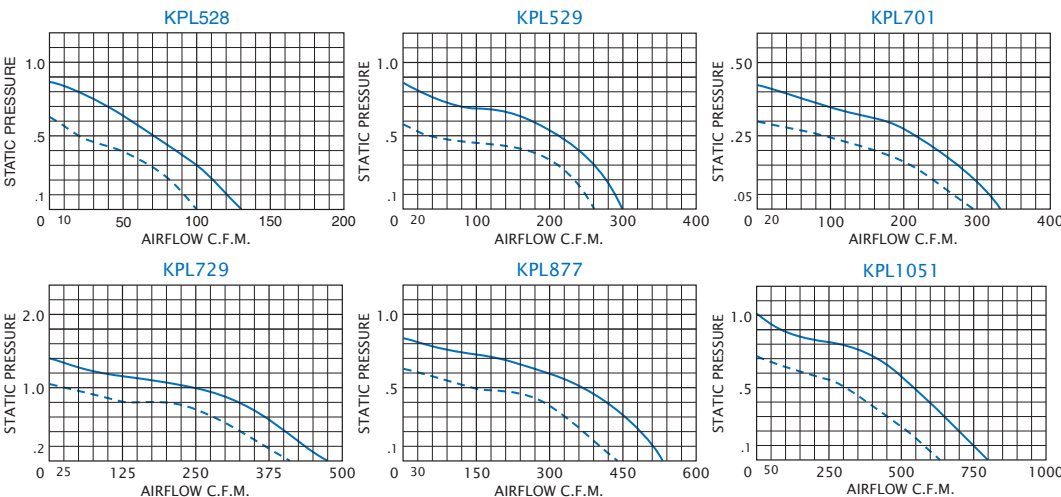
- Attractive 19-inch [482.6mm] Stainless Steel Grilles
- Capacities: 130 to 800 CFM
- Dual inlet quadruplex blower design for maximum airflow
- Exhaust guards included
- Filter
- Full air delivery, minimum panel height
- Heavy-gauge Steel Shell with EIA-notched flanges and Baked Powder Finish
- Inlet air cools motor for longer life
- Three foot [0.9m] (minimum) 3-wire power cord
- UL/CSA ball-bearing motors

ACCESSORIES AND OPTIONS

Accessories and Options	Page
■ Adapters	139
■ Airflow Switch	139
■ Automatic Speed Control	141
■ EMI/RFI Shielding	140
■ Filter Recoating Adhesive	140
■ Other voltages and frequencies	♦
■ Replacement Filters	140
■ Replacement Grille Assemblies	140
■ Special external paint finishes	♦
■ Special line cord or connectors	♦

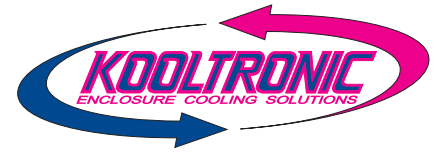
♦ Contact KOOLTRONIC for information.

PERFORMANCE GRAPHS

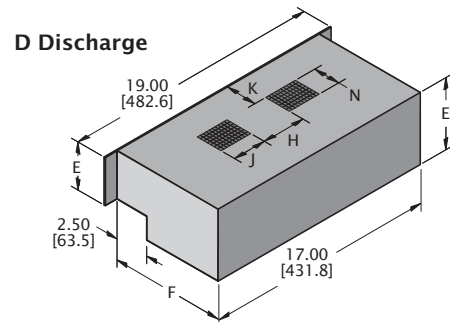
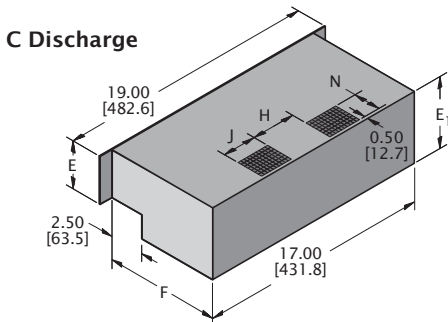
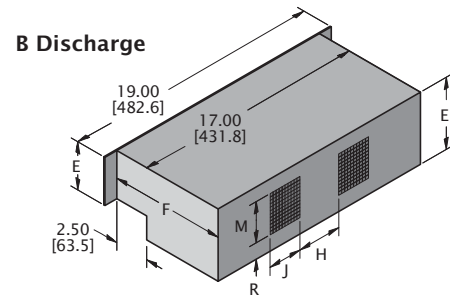
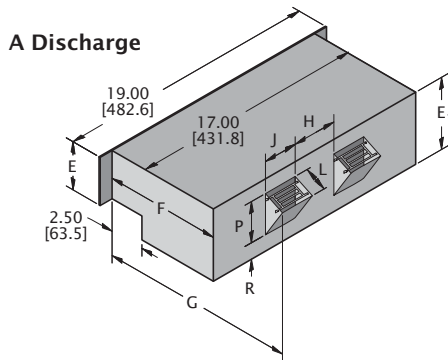


Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water. For conversion to other units of measurement see page 127.

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS AND DISCHARGE LOCATIONS



Max. Panel Height

Model	Discharge Available	E	E ₁	F	G	H	J
KPL528	A B C D	3.50 [88.9]	5.25 [133.4]	8.50 [215.9]	9.94 [252.5]	3.25 [82.6]	2.50 [63.5]
KPL529	A B C D	3.50 [88.9]	5.25 [133.4]	8.50 [215.9]	9.94 [252.5]	4.50 [114.3]	4.50 [114.3]
KPL701	A B C D	5.25 [133.4]	7.00 [177.8]	10.50 [266.7]	12.31 [312.7]	3.25 [82.6]	4.75 [120.7]
KPL729	A B C D	5.25 [133.4]	7.00 [177.8]	10.50 [266.7]	12.50 [317.5]	4.44 [112.8]	4.88 [124.0]
KPL877 [▲]	A B C D	7.00 [177.8]	8.75 [222.3]	12.50 [317.5]	14.06 [357.1]	2.13 [54.1]	5.94 [150.9]
KPL1051	A B C D	8.75 [222.3]	10.50 [266.7]	12.75 [323.9]	14.38 [365.3]	4.00 [101.6]	4.56 [115.8]

Model	Discharge Available	K	L	M	N	P	R
KPL528	A B C D	2.38 [60.5]	1.88 [47.8]	3.00 [76.2]	1.94 [49.3]	3.00 [76.2]	1.19 [30.2]
KPL529	A B C D	2.38 [60.5]	1.88 [47.8]	3.00 [76.2]	1.94 [49.3]	3.00 [76.2]	1.19 [30.2]
KPL701	A B C D	1.94 [49.3]	3.50 [88.9]	5.50 [139.7]	3.31 [84.1]	5.50 [139.7]	0.88 [22.4]
KPL729	A B C D	1.94 [49.3]	2.50 [63.5]	4.00 [101.6]	2.50 [63.5]	4.00 [101.6]	1.44 [36.6]
KPL877 [▲]	A B C D	1.75 [44.5]	4.19 [106.4]	6.13 [155.7]	3.63 [92.2]	6.13 [155.7]	1.25 [31.8]
KPL1051	A B C D	1.50 [38.1]	5.38 [136.7]	7.44 [189.0]	4.19 [106.4]	7.44 [189.0]	1.81 [46.0]

Dimensions, inches [mm], are for reference only and subject to change.

TECHNICAL DATA*

Model	Normally In Stock	CFM @ 0" S.P.	Cutoff S.P.	RPM Nominal	Amps		Watts	Approximate Weight	
					Run.	L.R.		Lbs.	Kg.
KPL528		130	0.87	3150	0.8	1.3	65	14	6.4
KPL529		300	0.87	3000	1.4	1.9	95	15	6.8
KPL701		330	0.42	1600	1.1	1.6	85	19	8.6
KPL729		470	1.40	3250	1.7	3.1	185	21	9.5
KPL877 [▲]		525	0.82	1500	1.3	1.9	140	30	13.6
KPL1051		800	1.00	1500	2.5	5.1	260	37	16.8

*115V, 60 Hz. operation

HOW TO ORDER

Specify model number, adding discharge suffix A, B, C or D. Example: KPL529B. For 230 VAC operation, add a 2 after the K. Example: K2PL529B. **NOTE:** KPL877 models unavailable in 230 VAC. Contact Kooltronic for availability of 230 VAC models.

RECESSED TWIN

EMI/RFI SHIELDED TWIN PACKAGED BLOWERS



DESCRIPTION

The KOOLTRONIC EMI/RFI shield conforms to the latest technology in attenuation of electromagnetic interference. The **KPR Series** combines this shield with **Standard Twin Packaged Blowers**. In addition, the shielded front end can be incorporated into the entire broad line of KOOLTRONIC Packaged Blowers, as an option, with a few dimensional changes. This same front end can also be used as an enclosure accessory. See EMI-Shielded Filter-Grille Assemblies.

KOOLTRONIC achieves a high degree of EMI attenuation by the use of proven techniques and scrupulous production and quality controls. The honeycomb element and copper and tin-plated iron wire gasketing are sandwiched between a plated unitized steel frame and a plated flange welded to the cabinet. These are rigidly clamped in place with precision-torqued Allen head cap screws. This permits high clamping pressures for maximum EMI attenuation without distortion. The use of metallic chromate finish on the steel frame and corrosion-protected aluminum honeycomb provides uniform high attenuation and minimum internodal resistance. No conductive plastics are used. A full mounting flange provides a continuous conductive surface for interface with the user's cabinet.

KOOLTRONIC also offers a full line of **EMI-Shielded Filter-Grille Assemblies**, independent of the blower package. These assemblies can be used at remote inlet or discharge locations, for EMI-protected air paths.

For unusual or higher-level attenuation requirements, or special EMI/RFI problems, consult our Engineering Department.

EMI/RFI-shielded fronts, in packaged blowers or used separately, do not reduce air delivery.

General specifications common to all KOOLTRONIC Packaged Blowers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of packaged blowers to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

STANDARD FEATURES

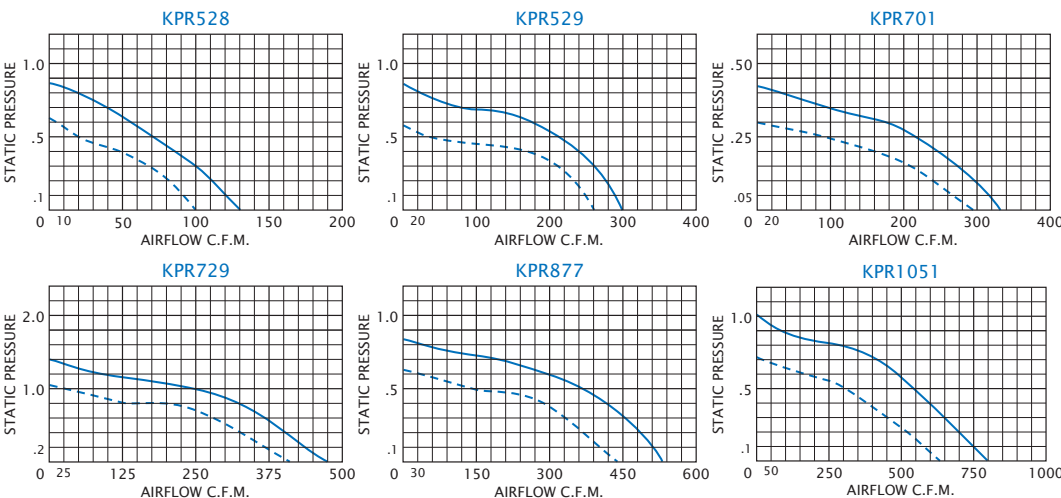
- Attractive 19-inch [482.6mm] Stainless Steel Grilles
- Capacities: 130 to 800 CFM
- Dual inlet quadruplex blower design for maximum airflow
- Exhaust guards included
- Filter
- Heavy-gauge Steel Shell with EIA-notched flanges and Baked Powder Finish
- Inlet air cools motor for longer life
- Shielding available for all KOOLTRONIC Packaged Blowers
- Three foot [0.9m] (minimum) 3-wire power cord
- UL/CSA ball-bearing motors

ACCESSORIES AND OPTIONS

	Page
■ Adapters	139
■ Airflow Switch	139
■ Automatic Speed Control	141
■ Filter Recoating Adhesive	140
■ Other voltages and frequencies	♦
■ Replacement Filters	140
■ Replacement Grille Assemblies	140
■ Special external paint finishes	♦
■ Special line cord or connectors	♦

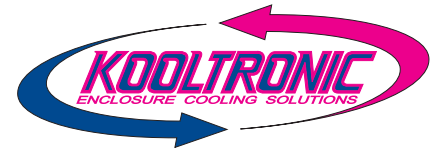
♦ Contact KOOLTRONIC for information.

PERFORMANCE GRAPHS

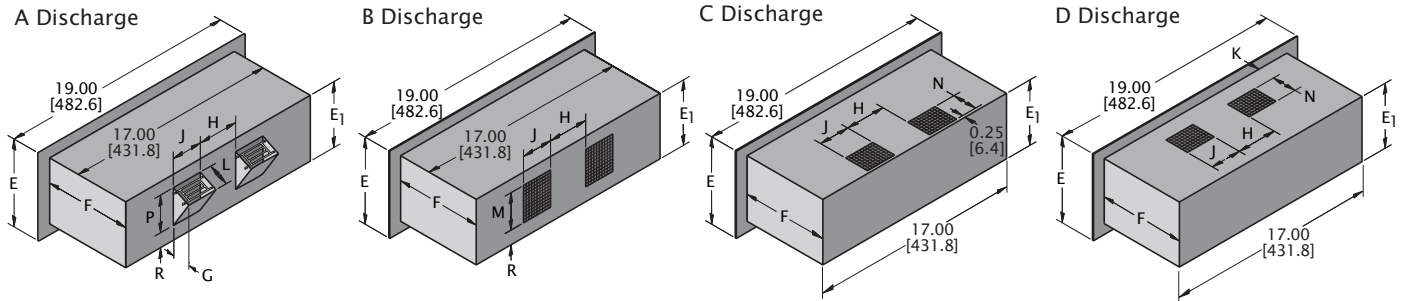


Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water. For conversion to other units of measurement see page 127.

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS AND DISCHARGE LOCATIONS



Max. Panel Height

Model	Discharge Available	E	E ₁	F	G	H	J
KPR528	A B C D	7.00 [177.8]	5.25 [133.4]	7.00 [177.8]	1.44 [36.6]	3.25 [82.6]	2.50 [63.5]
KPR529	A B C D	7.00 [177.8]	5.25 [133.4]	7.00 [177.8]	1.38 [35.1]	4.50 [114.3]	4.50 [114.3]
KPR701	A B C D	8.75 [222.3]	7.00 [177.8]	9.50 [241.3]	1.81 [46.0]	3.25 [82.6]	4.75 [120.7]
KPR729	A B C D	8.75 [222.3]	7.00 [177.8]	9.50 [241.3]	2.00 [50.8]	4.63 [117.6]	4.88 [123.8]
KPR877 [▲]	A B C D	10.50 [266.7]	8.75 [222.3]	11.00 [279.4]	1.63 [41.4]	2.13 [54.1]	5.94 [150.9]
KPR1051	A B C D	12.25 [311.2]	10.50 [266.7]	12.38 [314.5]	1.62 [41.1]	4.00 [101.6]	4.56 [115.8]

Model	Discharge Available	K	L	M	N	P	R
KPR528	A B C D	1.38 [35.1]	1.88 [47.8]	3.00 [76.2]	1.94 [49.3]	3.00 [76.2]	1.19 [30.2]
KPR529	A B C D	1.38 [35.1]	1.88 [47.8]	3.00 [76.2]	1.94 [49.3]	3.00 [76.2]	1.19 [30.2]
KPR701	A B C D	1.19 [30.2]	4.00 [101.6]	5.50 [139.7]	3.25 [82.6]	5.50 [139.7]	0.94 [23.9]
KPR729	A B C D	2.25 [57.2]	2.50 [63.5]	4.00 [101.6]	2.50 [63.5]	4.00 [101.6]	1.44 [36.6]
KPR877 [▲]	A B C D	1.75 [44.5]	4.38 [111.3]	6.13 [155.7]	1.81 [46.0]	6.13 [155.7]	1.13 [28.7]
KPR1051	A B C D	1.88 [47.8]	5.63 [143.0]	7.44 [189.0]	4.19 [106.4]	7.44 [189.0]	1.81 [46.0]

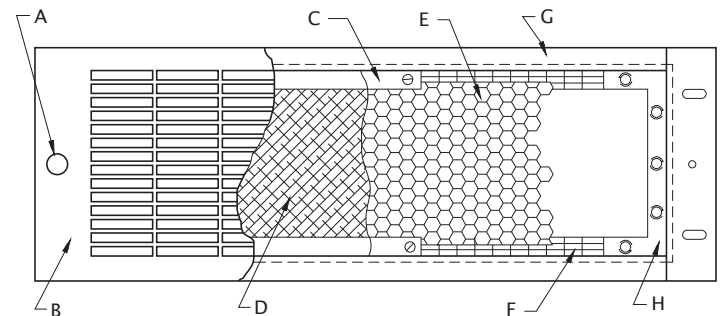
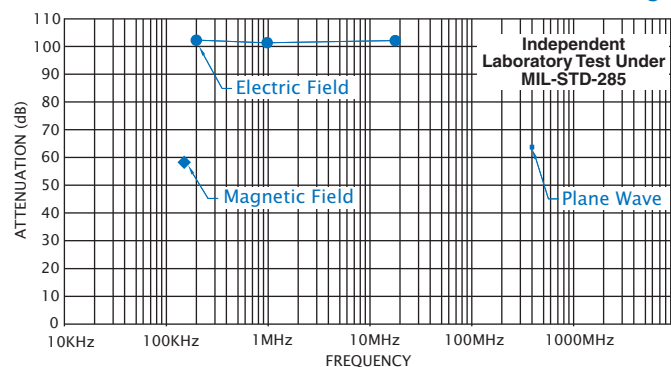
Dimensions, inches [mm], are for reference only and subject to change.

TECHNICAL DATA*

Model	CFM @ 0" S.P.	Cutoff S.P.	RPM Nominal	Amps		Watts	Approximate Weight	
				Run.	L.R.		Lbs.	Kg.
KPR528	130	0.87	3150	0.8	1.3	65	18	8.2
KPR529	300	0.87	3000	0.4	1.9	95	18	8.2
KPR701	330	0.42	1600	1.1	1.6	85	23	10.5
KPR729	470	1.40	3250	1.7	3.1	185	25	11.4
KPR877 [▲]	525	0.82	1500	1.3	1.9	140	33	15.0
KPR1051	800	1.00	1500	2.5	5.1	260	40	18.2

*115V, 60 Hz. operation

Attenuation Levels of Standard KOOLTRONIC EMI Shielding



EMI-SHIELDED FILTER-GRILLE ASSEMBLIES: (A) Captive Thumbnut, (B) Grille, (C) Plated Steel Retainer Frame, (D) Aluminum Filter, (E) Honeycomb, (F) EMI Gasket (Plated knitted wire mesh), (G) EMI Frame (Plated steel rear surface), (H) Plated steel surface

HOW TO ORDER

Specify model number, adding discharge suffix A, B, C or D. Example: KPR877A. For 230 VAC operation, add a 2 after the K. Example: K2PR877A. **NOTE:** KPR877 models unavailable in 230 VAC. Contact Kooltronic for availability of 230 VAC models.

BROAD DISCHARGE TWIN PACKAGED BLOWERS



DESCRIPTION

KOOLTRONIC **Broad Discharge Packaged Blowers** combine a quadruplex centrifugal blower with an internal plenum chamber to provide an even distribution of air, delivered across the entire width of the cabinet. This permits installation directly beneath the electronics for overall cooling of rows of printed circuit cards or similar electronic components, without need for a space-consuming external plenum chamber.

The blower assembly that provides the cooling air includes the same quality features as in the **Twin, Recessed** and **EMI/RFI-Shielded Packaged Blowers**.

General specifications common to all KOOLTRONIC Packaged Blowers are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of packaged blowers to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

STANDARD FEATURES

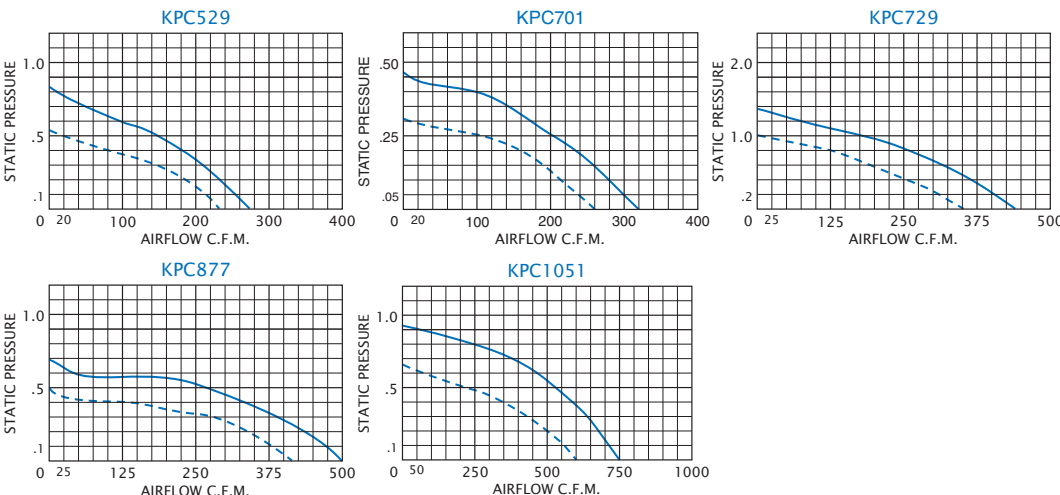
- Attractive 19-inch [482.6mm] Stainless Steel Grilles
- Capacities: 270 to 750 CFM
- Dual inlet quadruplex blower design for maximum airflow
- Exhaust guards included
- Filters
- Heavy-gauge Steel Shell with EIA-notched flanges and Baked Powder Finish
- Inlet air cools motor for longer life
- Internal plenum chamber distributes airflow
- Three foot [0.9m] (minimum) 3-wire power cord
- UL/CSA ball-bearing motors

ACCESSORIES AND OPTIONS

	Page
■ Adapters	139
■ Airflow Switch	139
■ Automatic Speed Control	141
■ EMI/RFI Shielding	140
■ Filter Recoating Adhesive	140
■ Other voltages and frequencies	♦
■ Replacement Filters	140
■ Replacement Grille Assemblies	140
■ Special external paint finishes	♦
■ Special line cord or connectors	♦

♦ Contact KOOLTRONIC for information.

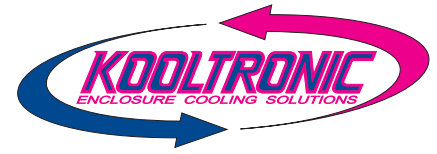
PERFORMANCE GRAPHS



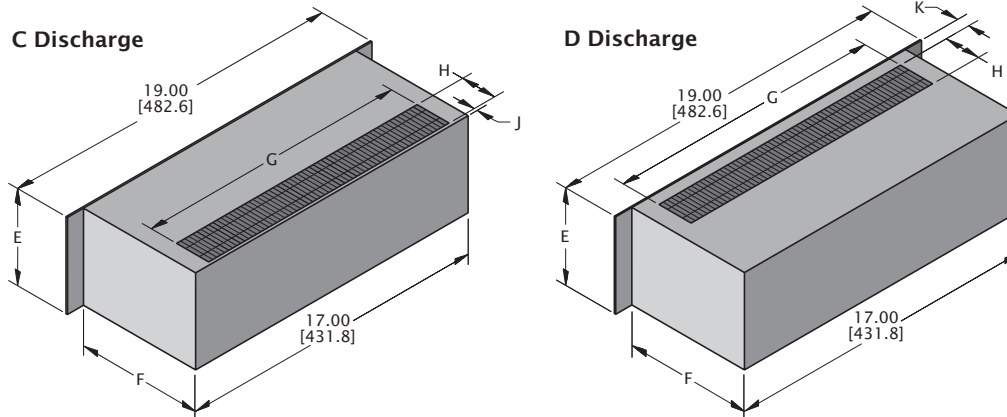
Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water. For conversion to other units of measurement see page 127.

BROAD DISCHARGE TWIN

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS AND DISCHARGE LOCATIONS



Model	Discharge Available	E	F	G	H	J	K
KPC529	C D	5.25 [133.4]	6.25 [158.8]	15.06 [382.5]	1.94 [49.3]	0.19 [4.8]	0.69 [17.5]
KPC701	C D	7.00 [177.8]	9.50 [241.3]	16.00 [406.4]	2.50 [63.5]	0.75 [19.1]	0.75 [19.1]
KPC729	C D	7.00 [177.8]	8.25 [209.6]	16.00 [406.4]	2.50 [63.5]	0.75 [19.1]	0.75 [19.1]
KPC877 [▲]	C D	8.75 [222.3]	10.00 [254.0]	16.00 [406.4]	3.19 [81.0]	0.25 [6.4]	0.75 [19.1]
KPC1051	C D	10.50 [266.7]	11.50 [292.1]	16.00 [406.4]	4.19 [106.4]	0.31 [7.9]	0.88 [22.4]

Dimensions, inches [mm], are for reference only and subject to change.

TECHNICAL DATA*

Model	CFM @ 0" S.P.	Cutoff S.P.	RPM Nominal	Amps		Watts	Approximate Weight	
				Run.	L.R.		Lbs.	Kg.
KPC529	270	0.80	3050	1.6	1.9	105	13	5.9
KPC701	320	0.46	1600	1.2	1.6	90	19	8.6
KPC729	435	1.35	3250	1.5	3.1	170	21	9.5
KPC877 [▲]	500	0.70	1500	1.3	1.9	150	32	14.5
KPC1051	750	0.92	1500	2.4	5.1	240	40	18.2

*115V, 60 Hz. operation

HOW TO ORDER

Specify model number, adding discharge suffix C or D. Example: KPC729C. For 230 VAC operation, add a 2 after the K. Example: K2PC729C. **▲NOTE:** KPC877 models unavailable in 230 VAC. Contact Kooltronic for availability of 230 VAC models.

BROAD DISCHARGE TWIN

PAGODA SERIES PACKAGED IMPELLER BLOWERS



DESCRIPTION

The **Pagoda Series** uses motorized impeller blowers for maximum efficiency and performance at reduced noise levels and have been designed for mounting on the top or sides of the cabinet. Air flows out of the cabinet into the inlet of the blower, exiting on all four sides.

The Pagoda is available in standard and custom sizes. They are designed to accommodate 115 and 230 volts, 50 and 60 Hz, and are available in various sizes, flows and static pressures for a wide range of applications. Components are UL, cUL Recognized and the motor carries a CE mark.

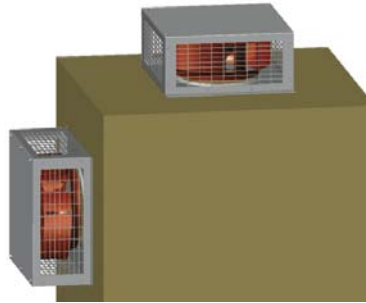
General specifications common to all KOOLTRONIC Packaged Blowers are on the first page of this Section.

KOOLTRONIC also designs and manufactures a variety of packaged blowers to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

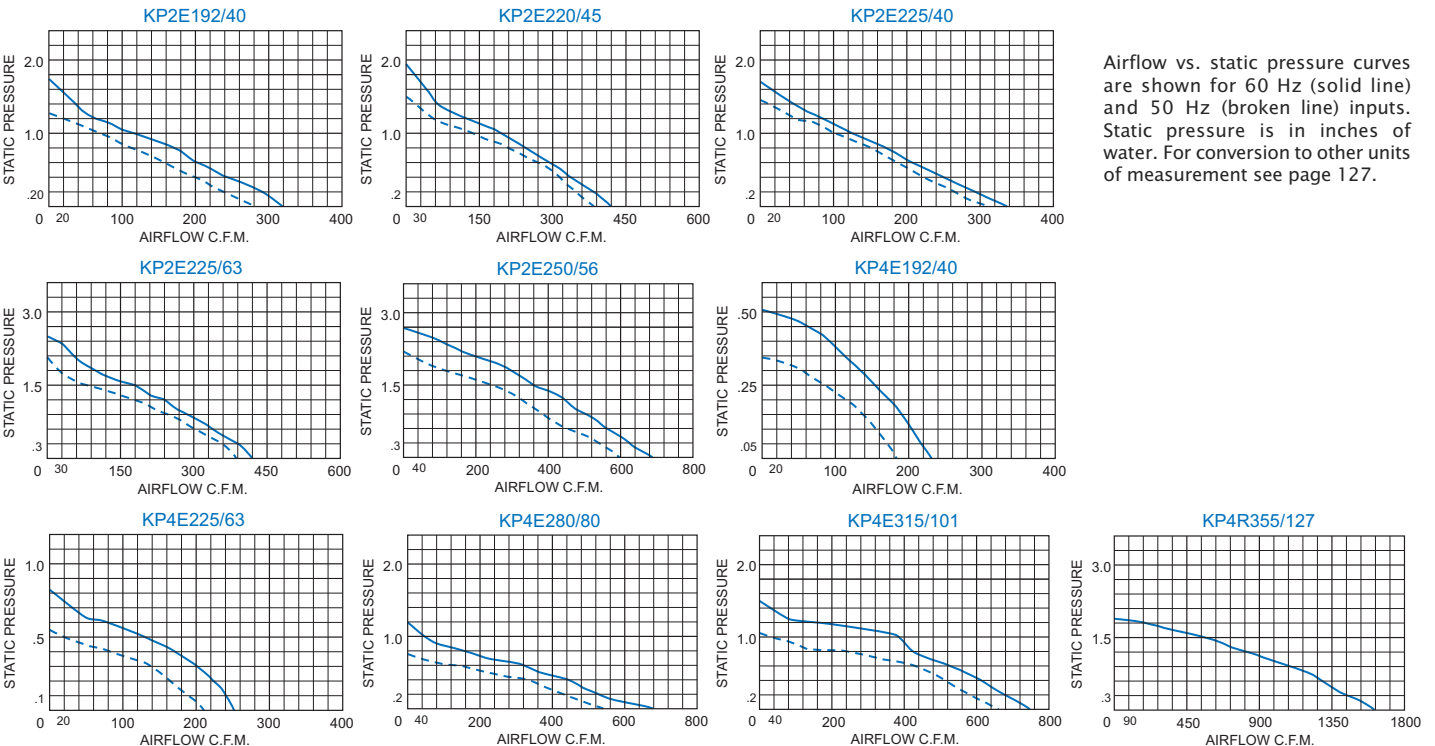
STANDARD FEATURES

- Ball-bearing motors
- Baked Powder Finish
- Capacities: 182 to 1615 CFM
- Compact size
- Heavy-gauge Steel Shell
- Integral finger guards
- Low noise level
- Occupies no internal cabinet space
- Precision balanced external rotor design
- Three foot [0.9m] (minimum) 3-wire power cord



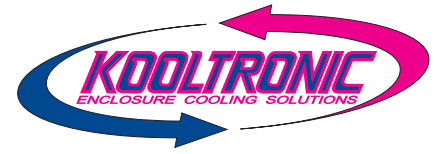
Versatile Mounting:
Mount on cabinet's top,
side or even bottom.

PERFORMANCE GRAPHS

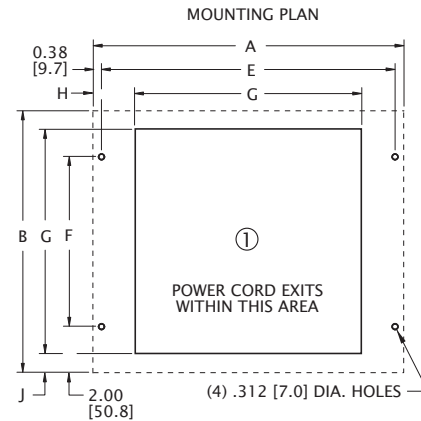
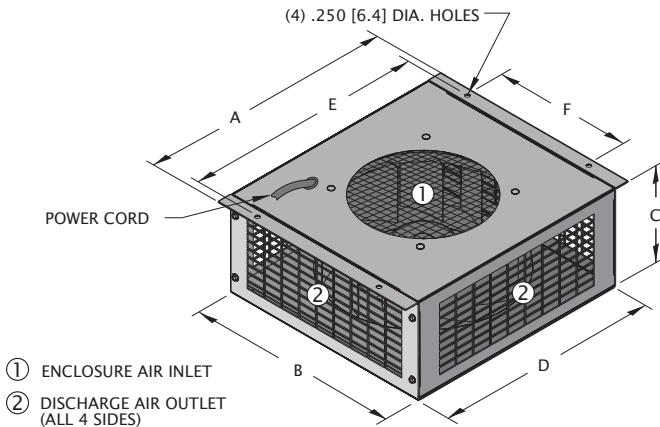


PAGODA

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS inches [mm]



Model	A	B	C	D	E
KP2E192/40	13.50 [342.9]	11.38 [289.1]	5.18 [131.6]	12.00 [304.8]	12.75 [323.9]
KP2E220/45	13.50 [342.9]	11.38 [289.1]	5.18 [131.6]	12.00 [304.8]	12.75 [323.9]
KP2E225/40	13.50 [342.9]	11.38 [289.1]	5.18 [131.6]	12.00 [304.8]	12.75 [323.9]
KP2E225/63	13.50 [342.9]	11.38 [289.1]	5.18 [131.6]	12.00 [304.8]	12.75 [323.9]
KP2E250/56	15.50 [393.7]	13.38 [339.9]	7.00 [177.8]	14.00 [355.6]	14.75 [374.7]
KP4E192/40	13.50 [342.9]	11.38 [289.1]	5.18 [131.6]	12.00 [304.8]	12.75 [323.9]
KP4E225/63	13.50 [342.9]	11.38 [289.1]	5.18 [131.6]	12.00 [304.8]	12.75 [323.9]
KP4E280/80	15.50 [393.7]	13.38 [339.9]	7.00 [177.8]	14.00 [355.6]	14.75 [374.7]
KP4E315/101	15.50 [393.7]	13.38 [339.9]	7.00 [177.8]	14.00 [355.6]	14.75 [374.7]
KP4R355/127	16.75 [425.5]	15.25 [387.4]	10.65 [270.5]	15.25 [387.4]	14.75 [374.7]

Model	F	G	H	J
KP2E192/40	7.38 [187.5]	9.50 [241.3]	2.00 [50.8]	0.94 [23.9]
KP2E220/45	7.38 [187.5]	9.50 [241.3]	2.00 [50.8]	0.94 [23.9]
KP2E225/40	7.38 [187.5]	9.50 [241.3]	2.00 [50.8]	0.94 [23.9]
KP2E225/63	7.38 [187.5]	9.50 [241.3]	2.00 [50.8]	0.94 [23.9]
KP2E250/56	9.38 [238.3]	13.10 [332.7]	1.20 [30.5]	0.14 [3.6]
KP4E192/40	7.38 [187.5]	9.50 [241.3]	2.00 [50.8]	0.94 [23.9]
KP4E225/63	7.38 [187.5]	9.50 [241.3]	2.00 [50.8]	0.94 [23.9]
KP4E280/80	9.38 [238.3]	13.10 [332.7]	1.20 [30.5]	0.14 [3.6]
KP4E315/101	9.38 [238.3]	13.10 [332.7]	1.20 [30.5]	0.14 [3.6]
KP4R355/127	9.38 [238.3]	13.10 [332.7]	1.38 [35.1]	0.63 [16.0]

Dimensions, inches [mm], are for reference only and subject to change.

TECHNICAL DATA*

Model	Type	CFM @ 0" S.P.	Cutoff S.P.	dBA	Amps	Watts	Approximate Weight	
							Lbs.	Kg.
KP2E192/40	2-Pole	319	1.72	63.6	0.74	85	11	5.0
KP2E220/45	2-Pole	418	1.94	68.6	1.05	120	10	4.5
KP2E225/40	2-Pole	338	1.71	71.7	1.11	127	13	5.9
KP2E225/63	2-Pole	421	2.66	73.4	1.89	215	14	6.4
KP2E250/56	2-Pole	688	2.68	77.6	2.33	269	17	7.7
KP4E192/40	4-Pole	182	0.55	55.6	0.25	26	11	5.0
KP4E225/63	4-Pole	253	0.81	59.1	0.62	56	12	5.5
KP4E280/80	4-Pole	630	1.18	65.8	0.94	101	16	7.3
KP4E315/101	4-Pole	749	1.46	68.7	1.36	156	18	8.2
KP4R355/127	4-Pole	1615	1.93	74.0	4.00	450	36	16.3

*115V, 60 Hz. operation

HOW TO ORDER

Specify model number. For 230 VAC operation, add a 2 after the K. Example: K2P4E195/35.

BLOWER AND FAN SELECTION NOMOGRAPH

This nomograph will assist you in making a rapid evaluation of the airflow required to cool the average electronics enclosure, if the approximate wattage to be dissipated and the acceptable temperature rise are known.

First, determine the amount of heat to be removed, in watts. Then identify the acceptable rise in temperature. Theoretically, this is the maximum allowable component temperature minus the maximum anticipated ambient temperature.

Lay a straight edge across the nomograph to intersect these two points. The straight edge will intersect the required volume on the airflow scale. The nomograph automatically includes a "safety factor" of 25 percent more air than is dictated by strict adherence to theoretical considerations. This is expressed by the constant, 1.25, in the first two equations.

Based on standard air density (0.075 lbs. per cubic foot), the nomograph furnishes quick solutions for the following equations:

$$CFM = \frac{3.17P}{T_F} (1.25) \quad \text{for temperature rise in degrees Fahrenheit}$$

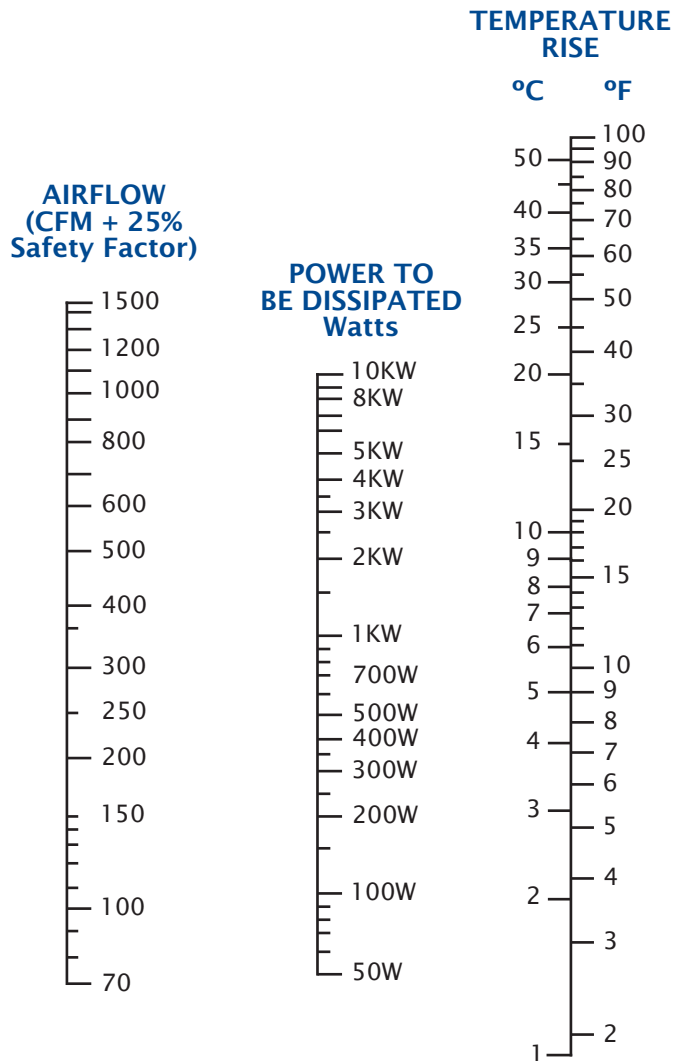
$$CFM = \frac{1.76P}{T_C} (1.25) \quad \text{for temperature rise in degrees Celsius}$$

The average temperature rise (T_F or T_C) in the cabinet equals the cabinet outlet temperature minus the cabinet inlet temperature.

CFM = volume flow of cooling air in cubic feet per minute.

P = power to be dissipated in watts.

The constant, 1.25, represents the "safety factor" discussed above.

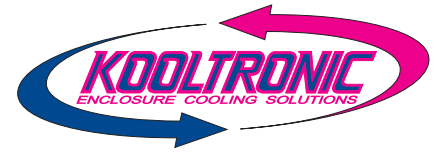


Specific heat of air is considered constant in these formulae. If the atmospheric density at which the equipment is to operate deviates significantly from standard air density, the following formula will convert the approximation obtained from the nomograph to the CFM requirement at the different density:

$$CFM_n + CFM_{0.075} \left(\frac{0.075}{\rho_n} \right)$$

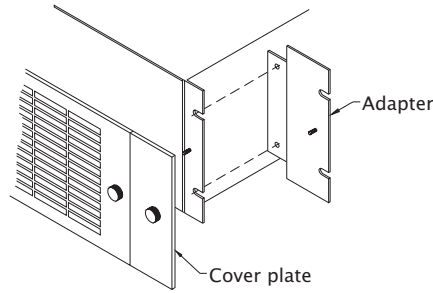
Where
 Subscript n = non-standard air density
 Subscript 0.075 = nominal standard air density
 ρ_n = non-standard air density (lbs. per cubic foot)

PACKAGED BLOWER ACCESSORIES AND OPTIONS



ADAPTERS (Set of two): These extend the width of any 19-inch [482.6mm] Packaged Blower, Packaged Fan or Rack-Mounted Air Conditioner to permit mounting in a cabinet designed for 24-inch [609.6mm] units. The EIA-notched adapters are covered by a plate of mirror-finish stainless steel to match KOOLTRONIC Standard Grilles.

These adapters are non-structural. Therefore, Packaged Blowers and Rack-Mounted Air Conditioners must be supported at the rear, due to their weight.



Model	Mirror Finish	Brushed Finish	Height
KA24-3M		KA24-3	3.50 [88.9]
KA24-5M		KA24-5	5.25 [133.4]
KA24-7M		KA24-7	7.00 [177.8]
KA24-8M		KA24-8	8.75 [222.3]
KA24-10M		KA24-10	10.50 [266.7]

Dimensions, inches [mm], are for reference only and subject to change.

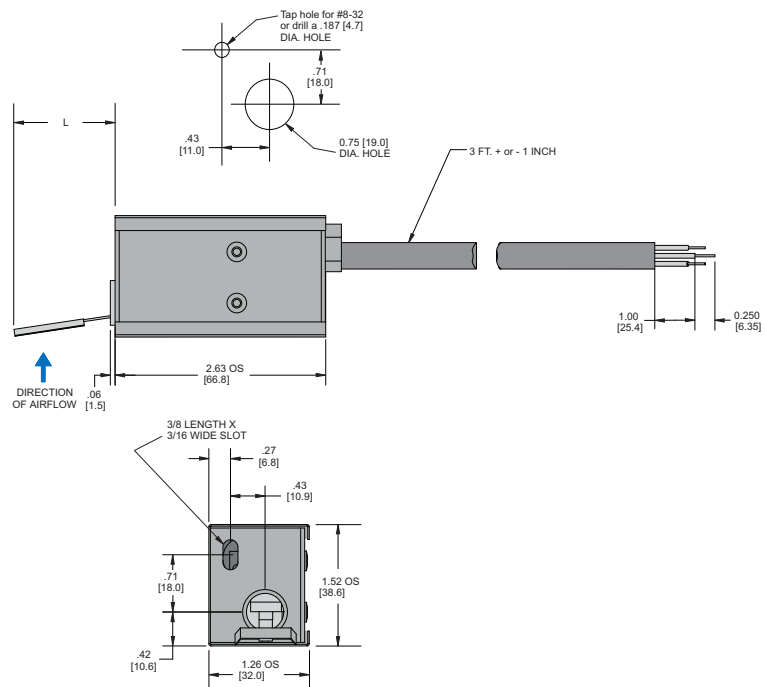
AIRFLOW SWITCH: The built-in airflow switch option protects equipment against damage caused by loss of cooling airflow by activating a customer supplied alarm or turning off power. The switch is factory mounted on a suitable surface, which allows the stainless steel air vane to be placed in the critical airstream. This switch is a single-pole double throw type, with normally open and normally closed contacts.

The UL rating for the level actuated switch is 11 amps at 250 volts AC. A three foot [0.9m] power cord is provided, allowing connection to normally open or normally closed circuits.

The choice of air vanes is determined by location and orientation in the airstream, and the normal operating air velocity at the point of installation. Refer to the chart below or consult KOOLTRONIC Engineering for assistance.

For other switch orientations or if air velocity cannot be measured by conventional means, KOOLTRONIC can supply additional individual or sets of air vanes to determine the optimum size.

DRAWINGS



TECHNICAL DATA

Orientation of Airflow Switch

Model	Dim. "L" Max.	Vane Length	Orientation of Airflow Switch									
			Vertical Airstream				Horizontal Airstream					
			Airstream Up		Airstream Down		Arm Horizontal		Arm Vertical Vane Down			
			Increasing Air	Decreasing Air	Increasing Air	Decreasing Air	Increasing Air	Decreasing Air	Increasing Air	Decreasing Air		
			Actuate ft/min	Deactuate ft/min	Actuate ft/min	Deactuate ft/min	Actuate ft/min	Deactuate ft/min	Actuate ft/min	Deactuate ft/min	Actuate ft/min	Deactuate ft/min
KV-1A	2.940 [74.7]	2.500 [63.5]	550	400	700	600	500	400	600	400		
KV-2A	2.677 [68.0]	1.875 [47.6]	850	750	800	750	750	650	800	750		
KV-3A	2.489 [63.2]	1.688 [42.9]	950	800	900	800	1000	900	1200	1100		
KV-4A	1.935 [44.1]	1.500 [38.1]	1150	1000	1100	1000	1100	1050	1400	1300		
KV-5A	2.052 [52.1]	1.250 [31.7]	1200	1100	1100	900	1200	1100	1300	1200		
KV-6A	1.802 [45.8]	1.000 [25.4]	1400	1300	1300	1200	1350	1300	1600	1550		
KV-7A	1.552 [39.4]	0.750 [19.0]	1900	1850	1900	1800	1650	1450	1900	1800		
KV-8A	1.489 [37.8]	0.687 [17.4]	2100	1900	1800	1700	1950	1850	2000	1950		
KV-9A	1.240 [31.5]	0.875 [22.2]	2200	2000	2250	2150	2250	2150	2200	2100		

Dimensions, inches [mm], are for reference only and subject to change.

PACKAGED BLOWER ACCESSORIES AND OPTIONS (cont.)

FILTERS: All KOOLTRONIC filters consist of a multi-layer grid of sturdy corrugated aluminum, securely held in a one-piece aluminum frame. Filters are required wherever air is drawn into an electronics enclosure or related cooling equipment to keep internal parts as clean as possible.

A non-drying adhesive coating traps a high percentage of particulate matter. These filters are reusable, they may be washed and recoated with the appropriate filter recoating adhesive. Replacements are available for those which become damaged or otherwise non-serviceable.

Models:	KP350, KPL528, KPL529	KP528, KP529, KPC529, KPL701, KPL729, KPR528, KPR529	KP701, KP729, KPC701, KPC729, KPL877, KPR701, KPR729	KP877, KPC877, KPL1051, KPR877	KP1051, KPC1051, KPR1051
Filter P/N:	3501F	5251F	7001F	8751F	10501F
Size:	16.63 x 3.13 x .50 [422.4 x 79.5 x 12.7]	16.63 x 5.13 x .50 [422.4 x 130.3 x 12.7]	16.63 x 6.63 x .50 [422.4 x 168.4 x 12.7]	16.63 x 8.38 x .50 [422.4 x 212.9 x 12.7]	16.63 x 10.13 x .50 [422.4 x 257.3 x 12.7]

Dimensions, inches [mm], are for reference only and subject to change.

FILTER RECOATING ADHESIVE: This compound is a superior product for recoating filters after washing. The adhesives penetrate dirt layers to keep the filter surface tacky for longer effective performance between washings. Part No. A-16 - 10 ounce container.

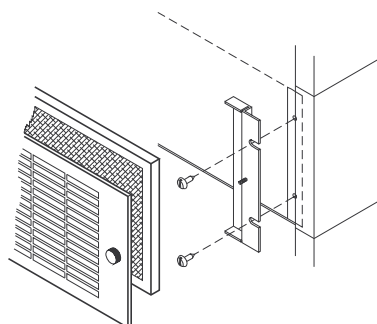
STANDARD STAINLESS STEEL GRILLES: These attractive grilles are made of mirror-finish stainless steel and are identical to those on KOOLTRONIC Packaged Blowers. All are 19-inch [482.6mm] wide. They are 65% open and comply with OSHA and UL safety standards. Photographs appear in various product sections.

GRILLE ASSEMBLIES: These assemblies are ideal for venting applications on the enclosure. These attractive grilles are made of mirror-finish stainless steel and are identical to those furnished on KOOLTRONIC Packaged Blowers. All are 19-inch [482.6mm] wide. They are 65% open, comply with OSHA and UL safety standards, and include knurled captive fasteners for easy attachment and removal. Photographs appear in various product sections.

FILTER-GRILLE ASSEMBLIES: To provide a filtered air intake in applications where the enclosure is being exhausted, each KOOLTRONIC Filter-Grille Assembly consists of a Grille Assembly, filter and two EIA-notched brackets. By loosening the captive thumbnuts, the filter is instantly available for cleaning.

Model	Grille Assemblies	Filter Grille Assemblies	Height
	3501X	KFG350-19	3.50 [88.9]
	5251X	KFG525-19	5.25 [133.4]
	7001X	KFG700-19	7.00 [177.8]
	8751X	KFG875-19	8.75 [222.3]
	10501X	KFG1050-19	10.50 [266.7]
Overall depth, including fasteners:			
	0.50 [12.7]	0.75 [19.1]	

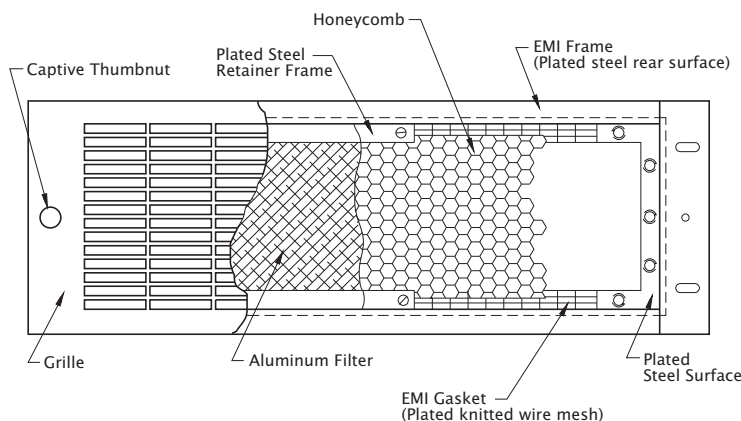
Dimensions, inches [mm], are for reference only and subject to change.



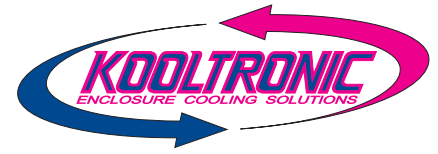
EMI/RFI-SHIELDED FILTER GRILLE ASSEMBLIES: For enclosures with filtered air intakes requiring EMI shielding, these assemblies are identical in design to the front ends of the KOOLTRONIC EMI/RFI Shielded Packaged Blowers (see page 137). Each consists of a Grille Assembly, filter and EMI frame with integral EIA-notched flanges. For venting applications requiring no filtration, removal of the filter will not materially effect EMI attenuation.

Model	Height
KFRG350-19	5.25 [133.4]
KFRG525-19	7.00 [177.8]
KFRG700-19	8.75 [222.3]
KFRG875-19	10.50 [266.7]
KFRG1050-19	12.25 [311.2]
Overall depth, including fasteners:	
Standard Grille - 1.88 [47.8]	

Dimensions, inches [mm], are for reference only and subject to change.



AUTOMATIC SPEED CONTROL



DESCRIPTION

The Kooltronic Fan and Blower Automatic Speed Control (Part Number KSC100) is a solid state “smart” controller packaged in a NEMA 1 type enclosure for remote mounting. The allowable input power supply range is 95 to 250 Volts, 47 to 63 Hz. It is furnished standard with an IEC 320 connector, a power supply fuse and a temperature sensor. Additional temperature sensors are optional. Power Cord is not provided.

The controller will operate single or multiple fans or blowers of compatible voltage and frequency up to a combined load of 6 Amps. The controller may be operated by either a control voltage signal of 0 to 10 VDC, a control current signal of 0 to 20 mA or one to three temperature sensors. With multiple temperature sensors, the controller will respond to the highest sensed temperature.

The control circuit board is furnished with a terminal strip for field connecting the sensor and fan wires. A pressure type strain relief connector is furnished in the enclosure. If required by the installation or by code, this connector can be replaced with a ½-inch [12.7mm] trade size conduit connector.

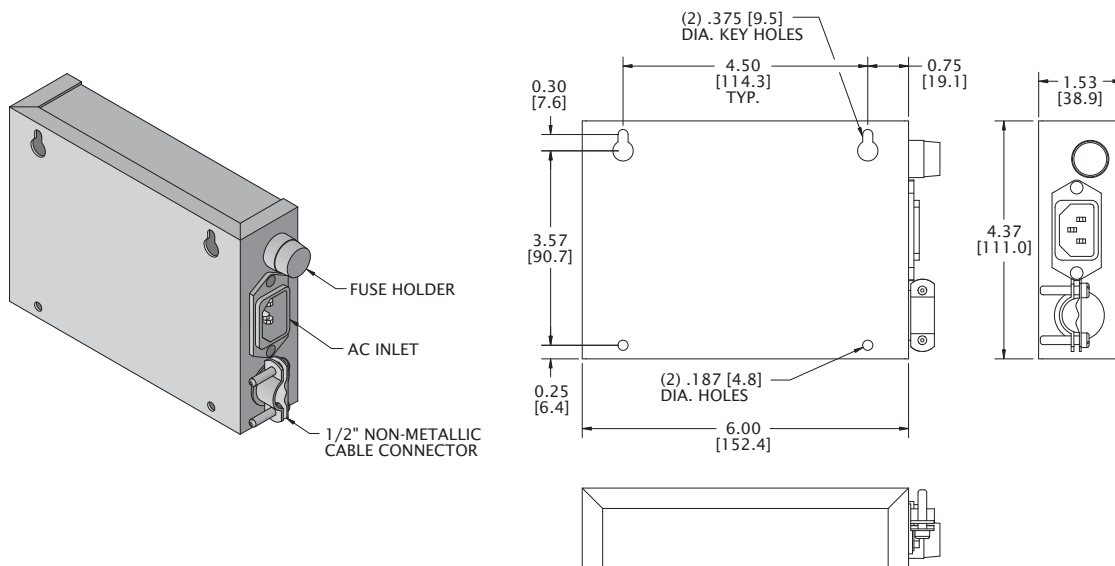
A wide variety of control logic options can be field programmed into the controller by means of a board mounted DIP switch. These include fan idle or starting speed at 30%, 40%, 50% or 60% of supply voltage, fan on or off below the idle setting, control temperature setting of 86°F (30°C), 95°F (35°C), 104°F (40°C), 113°F (45°C), and temperature differential settings of 7°F (4°C) and 18°F (10°C). The selectable fan on/off feature is operative when the temperature(s) drop below the control temperature setting.

Consult factory for use with compatible KOOLTRONIC fans or blowers.



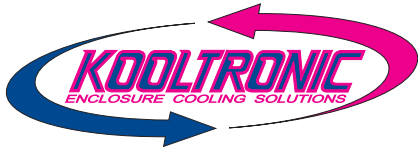
DRAWINGS AND DIMENSIONS

P/N: KSC100



ACCESSORIES & OPTIONS

Dimensions, inches [mm], are for reference only and subject to change.



FANS

FANS

The KOOLTRONIC line of propeller-type fans offers a wide selection of airflow capacities and styles to meet your needs efficiently and economically. They are ideal for clean-environment applications where there is minimal static pressure and equipment can tolerate temperatures higher than ambient.

The wide range of models and configurations offers unsurpassed capability and flexibility: from the ultra-compact yet powerful **Thin Fan Series** (210 to 840 CFM capacities) to **High Performance Fans** capable of delivering far more air than comparably sized units to **Twin, Triple** and **Filter Box Packaged Fans** (250 to 1310 CFM capacities) to **KoolTrays** with up to 9 Fans (315 to 945 CFM capacities). Our filter fan series offer NEMA ratings for virtually every application. The **Advantage Series Filter Fans**, with a **NEMA 12** Rating are available in a variety of sizes and cooling capacities. The **Advantage Sentry Series Filter Fans** with a **NEMA 3R** Rating offer the versatility and convenience of indoor or outdoor cooling, and are available in a variety of sizes, voltages and protection levels. The **Guardian/GuardianX Series Filter Fans** are **NEMA 4** or **4X Rated**, and are necessary in washdown, wastewater or other challenging applications.

Each fan is engineered for performance and built for reliability. All applicable components are UL/CSA Recognized.

Popular fans are stocked and ready to ship. Emergency shipment service is available.

KOOLTRONIC also designs and manufactures a variety of fans to meet unique specifications. We invite your inquiries about our modification and custom-design capabilities.

GENERAL SPECIFICATIONS FOR ALL FANS

RUGGED CONSTRUCTION: Precision-engineered heavy gauge steel construction insures fans stand up under tough applications.

BAKED POWDER FINISH: Durable, baked-on gray powder finish is standard on fans, except the Kooltray II which comes standard with textured beige powder finish. Other finishes and colors are available.

PRECISION BALL-BEARING MOTORS: All motors, whether permanent split capacitor or shaded pole, are UL/CSA Recognized and include automatic-reset thermal overload protection. Designed for low temperature rise, KOOLTRONIC motors are also cooled by the fan's intake air, for maximum motor life. All motors meet Federal Specification CC-M-1807A, and include double-sealed or double-shielded precision ball bearings which meet Federal Specification FF-B-171A. Special permanent lubricants perform over a broad temperature range: -20°F [-29°C] to 250°F [121°C]. Consult KOOLTRONIC for motors designed to meet military or extreme environmental specifications.

POWER: 115 VAC or 230 VAC, 50/60 Hz is standard, except for the KP1212, which is unavailable in 230 VAC. For multiphase power, other voltages and frequencies or brushless DC applications, consult KOOLTRONIC.

ADDITIONAL SPECIFICATIONS:

KoolTraysPage 150

Packaged FansPage 152

AIRFLOW AND STATIC PRESSURE CONVERSION FACTORS

- Multiply airflow in cubic feet per minute (CFM) by:
- 1.7 to obtain airflow in cubic meters per hour (m³/hr.)
 - 0.47 to obtain airflow in liters per second (L/S)
- Multiply static pressure in inches of water (in. W.G.) by:
- 25.4 to obtain static pressure in millimeters of water (mm W.G.)
 - 249 to obtain static pressure in Pascals (Pa)

HIGH PERFORMANCE FANS



DESCRIPTION

High Performance Fans are ideal for applications where severe space limitations and restrictions are present. They are typically found in telecommunications and medical applications, industrial control and printed circuit board arrays.

KB653: Within its recommended operating range (150-288 CFM), the KB653 fan provides more air than other fans of comparable size. It is also quieter, less costly and overcomes higher static pressures. It can be mounted to pressurize or exhaust the enclosure. (Pressurizing, with use of a filter, is preferred).

General specifications common to all KOOLTRONIC Fans are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of fans to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

FEATURES

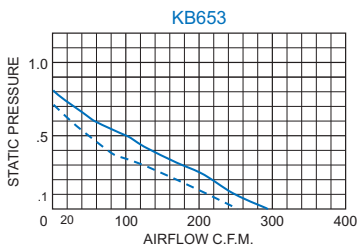
- 12-inch [300mm] (minimum) power and ground leads
- Both models can pressurize or exhaust
- Capacities: 288 CFM
- Complete line of accessories
- High static pressure performance
- Quiet operation
- Rugged Construction with Baked Powder Finish
- Small size for restricted spaces
- UL/CSA ball bearing motors

ACCESSORIES AND OPTIONS

	Page
■ Automatic Speed Control	141
■ Filter Recoating Adhesive	148
■ Replacement Filters	148
■ Special external paint finishes	♦
■ Special line cord or connectors	♦
■ Variable Speed Control	♦

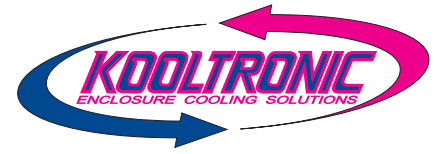
♦ Contact KOOLTRONIC for information.
See additional Accessories on next page.

PERFORMANCE GRAPHS



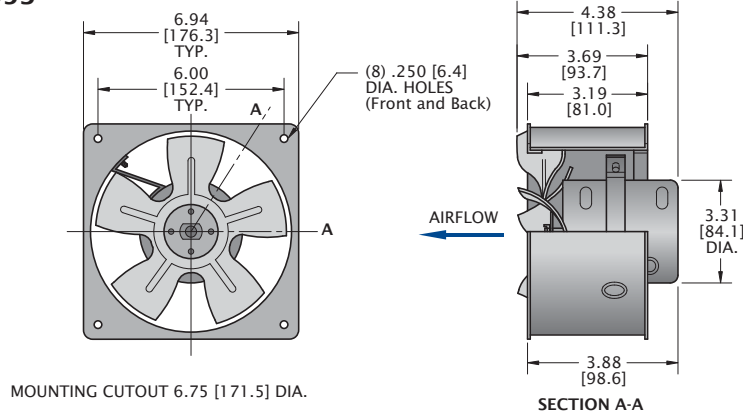
Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water. For conversion to other units of measurement see page 143.

For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



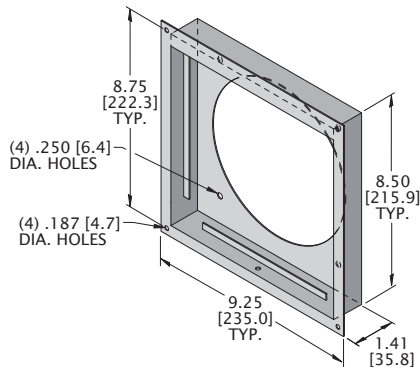
DIMENSIONS inches [mm]

KB653



MOUNTING CUTOUT 6.75 [171.5] DIA.

MODEL 654HF FILTER HOLDER



CAUTION: We strongly recommend proper guarding of fans to prevent serious injury.

ACCESSORIES FOR HIGH PERFORMANCE FANS

The following accessories, available at moderate cost, add versatility to the application of these High Performance Fans.

KB653 FAN

FILTER: Model 654F: 8.25" [209.6mm] square x 0.50" [12.7mm] deep. See page 149, Filters, for description.

FILTER HOLDER: Model 654HF: Precision-made heavy-gauge steel construction. Can be mounted either internally or externally on enclosure using (4) .187 [4.7mm] dia. holes (See diagram). Suggested use is on the intake (motor) side of the fan where it will add less than 0.75" [19.1mm] to depth of fan. Filter inserts easily.

GUARD: Model 654G: Made of sturdy corrosion-protected wire, these guards comply with OSHA and UL safety standards. Suggested use is on blade side of fans and on motor side, if being used without a filter. Adds less than 0.75" [19.1mm] to depth of fan.

TECHNICAL DATA

Model	Volts/Hz	CFM@ 0" S.P.	RPM Nominal	Amps		Watts	Weight	
				Run.	L.R.		Lbs.	Kg.
KB653	115/60	385	3200	1.7	2.4	132	5	2.3
KB653	115/50	330	2900	1.7	2.4	132	5	2.3
K2B653	230/60	385	3200	1.7	2.4	132	5	2.3
K2B653	230/50	330	2900	1.7	2.4	132	5	2.3

HOW TO ORDER

FANS: Specify model number. For 230 VAC operation, add a 2 after the K. Example: K2B653.

ACCESSORIES: Specify model number.

THIN FANS



DESCRIPTION

These uniquely compact and versatile fans are designed specifically for cooling electronics and are unsurpassed for their economy of space. Delivering from 210 to 750 CFM, these powerful fans provide a large volume of air to ensure a broad distribution of the cooling effect throughout an enclosure. Complementing these fans is a complete line of accessories.

KOOLTRONIC *Thin Fans* are designed for mounting in virtually any position, internally or externally. With or without accessories, these fans usually can be mounted directly to a panel or door of the electronics enclosure. Often they can be located in the base or top of the enclosure, leaving side walls and all or most of the panel space free.

Each fan, whether a B Series or an S Series, can be used to either pressurize or exhaust the enclosure by simply reversing its orientation. (See Typical Accessory Combination and Mounting Orientations diagram on page 148). After selecting the basic model of fan for the performance required, the final choice will be determined by the differences in their configurations and dimensions, the preferred location for mounting and whether the need is to pressurize or exhaust the enclosure. (See "Pressurize, Don't Vacuumize" in the **Cabinet Cooling Tips** section of the **Design Guide**). Because of the numerous combinations of choices available, virtually any requirement can be met.

General specifications common to all KOOLTRONIC Fans are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of fans to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

FEATURES

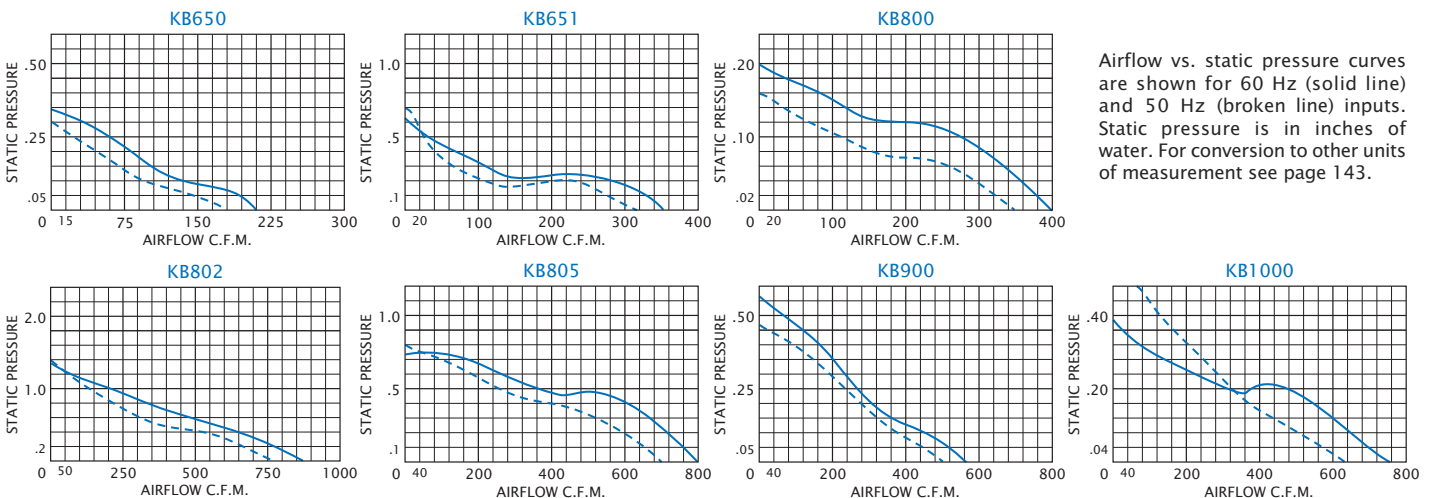
- 12-inch [300mm] (minimum) power and ground leads
- Capacities: 210 to 750 CFM
- Complete line of accessories
- Each model can pressurize or exhaust
- Extremely compact
- Rugged Construction with Baked Powder Finish
- UL/CSA ball-bearing motors
- Versatile mounting configurations

ACCESSORIES AND OPTIONS

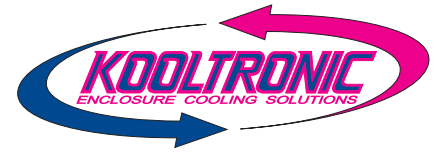
	Page
■ Automatic Speed Control	141
■ Filters	148
■ Filter Holders	148
■ Filter Recoating Adhesive	148
■ Grille	148
■ Guard	148
■ Mounting Sleeve	148
■ Special external paint finishes	♦
■ Special line cord or connectors	♦

♦ Contact KOOLTRONIC for information.

PERFORMANCE GRAPHS

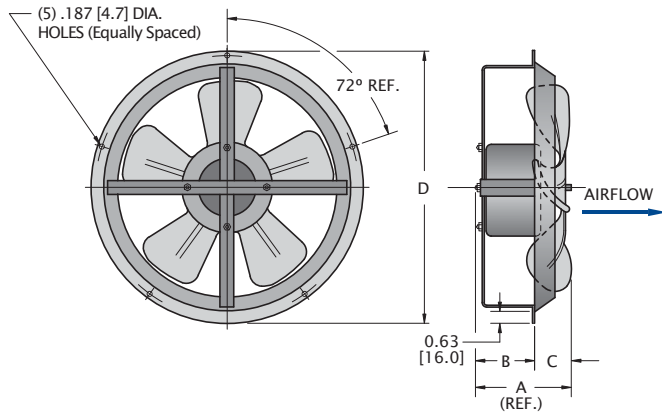


For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.

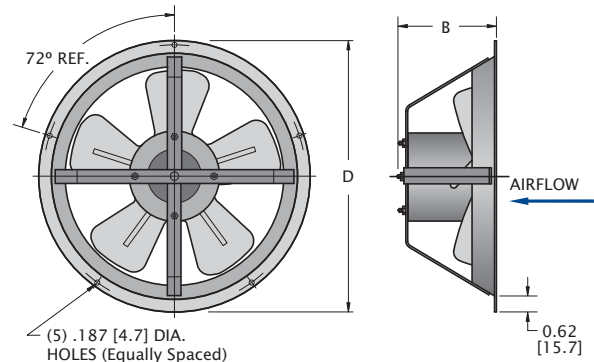


DIMENSIONS inches [mm]

B SERIES

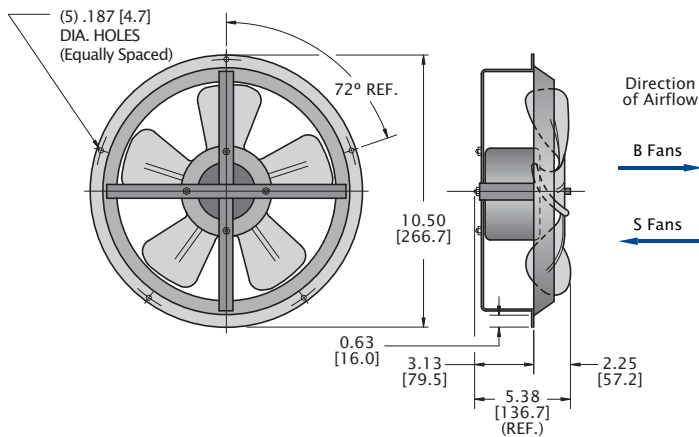


S SERIES



KB802 and KB1000 Fans: Motor mounting configuration is different, but falls within dimensional envelope.

MODEL KB802 FANS



KB802 B & S Series Blade Diameter: 8.00 [203.2]

KB802 Fans: Capacitor boot and bracket are shipped loose, for user mounting.

For illustration of mounting orientations, see Typical Accessory Combination and Mounting Orientations diagram on the next page.

CAUTION: We strongly recommend proper guarding of fans to prevent serious injury.

Model	A	B		C	D	Mounting		Blade Dia.
		B Fans	S Fans			Cutout	B.C.	
KB650 [▲]	3.63 [92.2]	2.00 [50.8]	3.50 [88.9]	1.63 [41.4]	8.50 [215.9]	7.38 [187.5]	8.00 [203.2]	6.50 [165.1]
KB651	3.88 [98.6]	2.38 [60.5]	4.13 [104.9]	1.50 [38.1]	8.50 [215.9]	7.38 [187.5]	8.00 [203.2]	6.50 [165.1]
KB800 [▲]	3.38 [85.9]	1.75 [44.5]	3.38 [85.9]	1.63 [41.4]	10.50 [266.7]	9.38 [238.3]	10.00 [254.0]	8.00 [203.2]
KB802	See above.	See above.	See above.	See above.	See above.	9.38 [238.3]	10.00 [254.0]	8.00 [203.2]
KB900	4.50 [114.3]	2.25 [57.2]	4.25 [108.0]	2.25 [57.2]	11.50 [292.1]	10.38 [263.7]	11.00 [279.4]	9.00 [228.6]
KB1000	4.75 [120.7]	2.50 [63.5]	4.63 [117.6]	2.25 [57.2]	12.50 [317.5]	11.38 [289.1]	12.00 [304.8]	10.00 [254.0]

Dimensions, inches [mm], are for reference only and subject to change.

TECHNICAL DATA*

Model (B&S)	Normally In Stock	CFM@ 0" S.P.	RPM Nominal	Amps		Watts	Weight	
				Run	L.R.		Lbs.	Kg.
KB650 [▲]	Yes	210	1600	0.35	0.4	30	4	1.8
KB651	Yes	350	3000	1.30	2.4	97	5	2.3
KB800 [▲]	Yes	400	1500	0.70	2.3	55	4	1.8
KB802	Yes	840	3100	1.90	3.1	225	7	3.2
KB900	Yes	560	1600	1.60	2.3	100	6	2.7
KB1000	Yes	750	1550	1.50	2.3	105	7	3.2

*115V, 60 Hz. operation

HOW TO ORDER

Specify model number, adding suffix B or S. Example: KB650S. For 230 VAC operation, add a 2 after the K. Example: K2B900S. **NOTE:** Some models (KB650 and KB800) unavailable in 230 VAC or minimum purchases may apply. Contact Kooltronic for availability of 230 VAC models.

THIN FANS

ACCESSORIES FOR THIN FANS

FILTERS: All KOOLTRONIC filters consist of a multi-layer grid of sturdy corrugated aluminum, securely held in a one-piece aluminum frame. Filters are required wherever air is drawn into an electronics enclosure. A non-drying adhesive coating traps a high percentage of particulate matter. These filters are reusable, they may be washed and recoated with the appropriate filter recoating adhesive. Replacements are available for those which become damaged or otherwise non-serviceable. See opposite page for dimensions.

FILTER HOLDERS: Separate models are available for easy internal or external filter mounting.

FILTER RECOATING ADHESIVE: This compound is a superior product for recoating filters after washing. The adhesives penetrate dirt layers to keep the filter surface tacky for longer effective performance between washings. Part No. A-16 - 10 ounce container.

GRILLE: Designed to provide flush-mounted, protective guarding. These painted, expanded metal grilles fit neatly over the blade side of S Series fans without adding depth. Used with mounting sleeves, they can provide an alternative to wire guards.

GUARD: Made of heavy-gauge corrosion-protected wire, these guards comply with OSHA and UL safety standards. Individual guards fully protect both blade and motor sides of all B Series fans, except models KB802B. In order to adequately protect the motor side of these and all S Series fans, a mounting sleeve is needed with the guard, to accommodate the fan's greater depth.

MOUNTING SLEEVE: Extends the fan's mounting flange, as needed for some installations, such as mounting the B Series fans on the outside of the cabinet. May also be used for guard attachment (see Guard), or with a grille to provide guarding. Made of sturdy formed and welded steel and painted to match the fan.

SPECIAL EXTERNAL PAINT FINISHES*

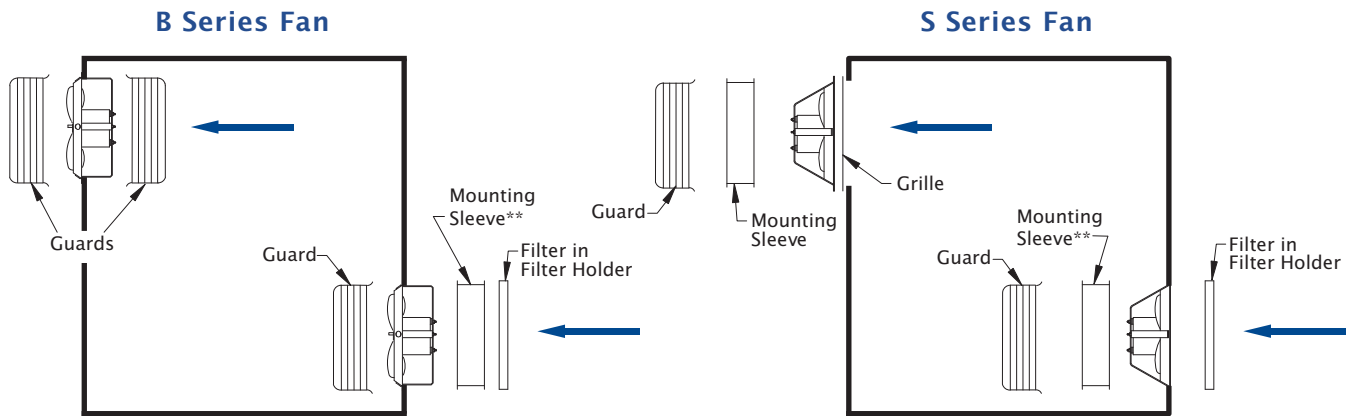
SPECIAL LINE CORD OR CONNECTORS*

*Contact KOOLTRONIC for information.

KOOLTRONIC also designs and manufactures a variety of Fans to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

TYPICAL ACCESSORY COMBINATIONS AND MOUNTING ORIENTATIONS

Arrows show direction of airflow. Boxes represent electronics/electrical enclosures, side view.



Upper fans exhaust cabinet. Lower fans pressurize cabinet. (Note that intake air is filtered.)

**B and S Series Fans when mounted in intake orientation may require an additional Mounting Sleeve. See chart below.

Protection to be mounted	Number of Mounting Sleeves Required											
	KB650B	KB650S	KB651B	KB651S	KB800B	KB800S	KB802B	KB802S	KB900B	KB900S	KB1000B	KB1000S
Guard (motor side)	0	1	0	1	0	1	1	2	0	1	0	1
Guard (blade side)	0	0	0	0	0	0	0	0	0	0	0	0
Grille/Filter Holder (motor side)	2	3	2	3	2	3	2	4	1	2	2	2
Grille/Filter Holder (blade side)	1	0	1	0	1	0	2	0	1	0	1	0

MODEL NUMBER AND DIMENSIONS FOR THIN FAN ACCESSORIES

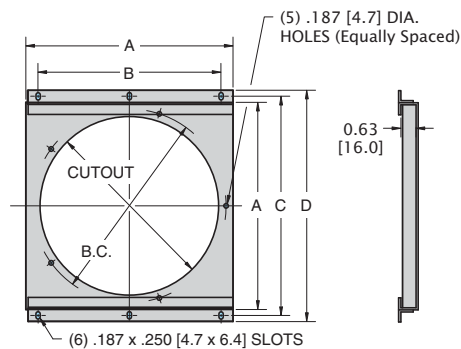
ACCESSORY	FAN MODEL (B or S):	KB650 / 651	KB800 / 802	KB900	KB1000
Filter Size (0.50" [12.7mm] thick)		650F 8.38 x 8.38 [212.9mm x 212.9mm]	800F 10.38 x 10.38 [263.7mm x 263.7mm]	900F 11.38 x 11.38 [289.1mm x 289.1mm]	1000F 12.38 x 12.38 [314.5mm x 314.5mm]
External Filter Holder (See dimensions below)		650H	800H	900H	1000H
Internal Filter Holder (See dimensions below)		650HF	800HF	900HF	1000HF
Grille Diameter		650X 8.50 [215.9mm]	800X 10.50 [266.7mm]	900X 11.50 [292.1mm]	1000X 12.50 [317.5mm]
Guard Diameter x Depth		655G 7.56 x 2.63 [192.0mm x 66.8mm]	805G 9.63 x 2.31 [244.6mm x 58.7mm]	905G 10.69 x 2.63 [271.5mm x 66.8mm]	1005G 11.63 x 2.63 [295.4mm x 66.8mm]
Mounting Sleeve (See dimensions below)		650M	800M	900M	1000M

All B Series fans using the filter holder, filter and grille combination must use mounting sleeve.

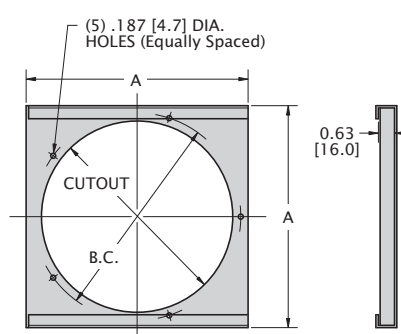
Dimensions, inches [mm], are for reference only and are subject to change.

DIMENSIONS (inches[mm])

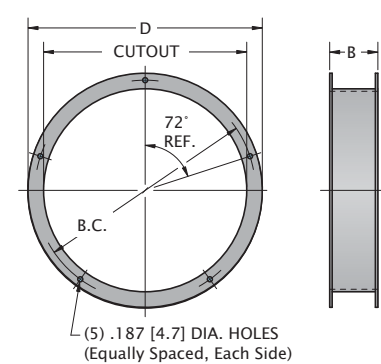
INTERNAL FILTER HOLDER



EXTERNAL FILTER HOLDER



MOUNTING SLEEVE



INTERNAL FILTER HOLDER (inches[mm])

Model	A	B	C	D	Mounting	
					Cutout	B.C.
650HF	8.56[217.4]	7.56[192.0]	9.19[233.4]	9.56[242.8]	7.38[187.5]	8.00[203.2]
800HF	10.56[268.2]	9.56[242.8]	11.19[284.2]	11.56[293.6]	9.38[238.3]	10.00[254.0]
900HF	11.56[293.6]	10.56[268.2]	12.19[309.6]	12.56[319.0]	10.38[263.7]	11.00[279.4]
1000HF	12.56[319.0]	11.56[293.6]	13.19[335.0]	13.56[344.4]	11.38[289.1]	12.00[304.8]

Dimensions, inches [mm], are for reference only and are subject to change.

EXTERNAL FILTER HOLDER (inches[mm])

Model	A	Mounting	
		Cutout	B.C.
650H	8.56 [217.4]	7.38 [187.5]	8.00 [203.2]
800H	10.56 [268.2]	9.38 [238.3]	10.00 [254.0]
900H	11.56 [293.6]	10.38 [263.7]	11.00 [279.4]
1000H	12.56 [319.0]	11.38 [289.1]	12.00 [304.8]

Dimensions, inches [mm], are for reference only and are subject to change.

MOUNTING SLEEVE (inches[mm])

Model	B	D	Mounting	
			Cutout	B.C.
650M	1.75 [44.5]	8.50[215.9]	7.38[187.5]	8.00[203.2]
800M	1.75 [44.5]	10.50[266.7]	9.38[238.3]	10.00[254.0]
900M	2.38 [60.5]	11.50[292.1]	10.25[260.4]	11.00[279.4]
1000M	2.38 [60.5]	12.50[317.5]	11.38[289.1]	12.00[304.8]

Dimensions, inches [mm], are for reference only and are subject to change.

HOW TO ORDER

Specify model number.

KOOLTRAY II



DESCRIPTION

Standard KoolTray II

The KOOLTRONIC **KoolTray II** delivers cooling air to hot spots by localizing fan placement to the heat generating area(s). With its 1¾-inch [44.5mm] single-U height it fits right under card racks or near heat-producing sources. Standard units are available in 1, 2, or 3 row models. 19-inch [482.6mm] unit width is standard.

Smart KoolTray II

In addition to specific cooling fan placement, the **Smart KoolTray II** provides two optional choices of component protection. The **X5** option sends both a visual and external alarm in the event of fan failure or low fan speed. The **X7** option varies the fan speed as temperature decreases or increases relative to the set point and sends an alarm for high temperature conditions. The **X6** option combines both the **X5** and **X7** options.

Filtered KoolTray II

For environments which require filtration of the ambient or cabinet air, KOOLTRONIC's **Filtered KoolTray 2** filters the air from the bottom side of the tray. Other filter location options are available. Filtered versions are available on both the **Standard** and **Smart KoolTray II**.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

STANDARD FEATURES

- 19-inch width in single U height (1¾")
- 6-foot power supply cord for DC versions
- 6-foot power cord with molded plug for AC versions
- Baked Powder Finish
- Integral OSHA/UL finger guards
- Low sound level
- On/off switch and fuse are accessible from faceplate
- Powered by 12, 24, or 48 VDC (brushless) or 115 or 230 VAC (50 & 60 Hz)
- Rugged heavy-duty Steel Construction
- Static pressure up to .34" of water
- UL/CSA/VDE/TUV ball bearing motors rated for -20°C to 70°C
- Up to 105 CFM per fan

ACCESSORIES AND OPTIONS

	Page
■ Brushed aluminum faceplate	♦
■ Custom painted faceplate	♦
■ Fan failure external alarm	151
■ Filtered Kooltray	♦
■ High Temperature external alarm	151
■ Longer cord lengths up to 10 feet	♦
■ Rear mounted IEC receptacle instead of power cord ▼	♦
■ Rear mounted terminal block instead of power cord	♦
■ Stainless steel faceplate	♦
■ X5, X6 and X7 options	151

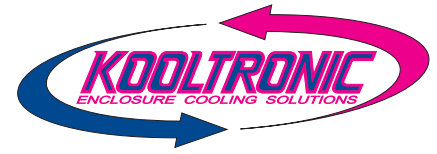
♦ Contact KOOLTRONIC for information.

▼ VAC units only.

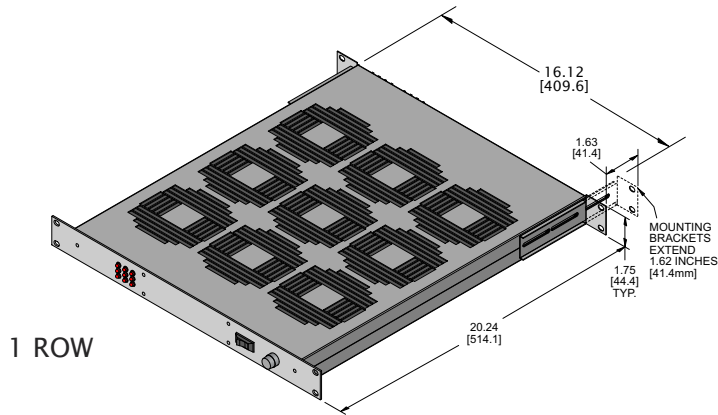
KOOLTRAY II MODEL NUMBER AND FEATURE SELECTION GUIDE

KT	I	F	X1	00
KT = 115 VAC, 50/60 Hz	1 = 3 fans (one row)	Filtered	X1 = Standard KoolTray	00 = With rear exit power cord
K2T = 230 VAC, 50/60 Hz	2 = 6 fans (two rows)	KoolTray	X5 = Smart KoolTray with single speed fans	01 = Externally rear-mounted terminal block for power instead of power cord
K6T = 12 VDC Brushless	3 = 9 fans (three rows)		X6 = Smart KoolTray with temperature sensitive variable speed fans	02 = IEC 60320 C-14 rear mounted power receptacle instead of power cord (VAC units only)
K7T = 24 VDC Brushless			X7 = Standard KoolTray with temperature sensitive variable speed fans	
K8T = 48 VDC Brushless				

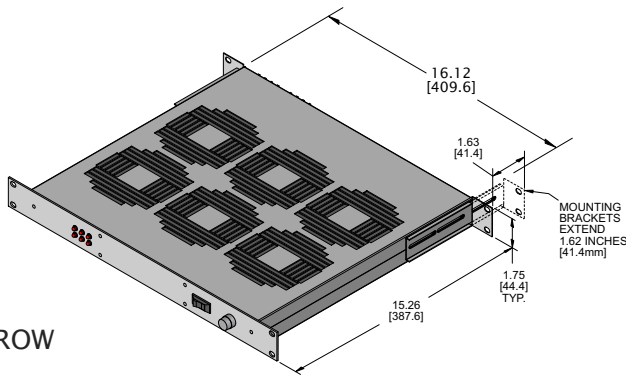
For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



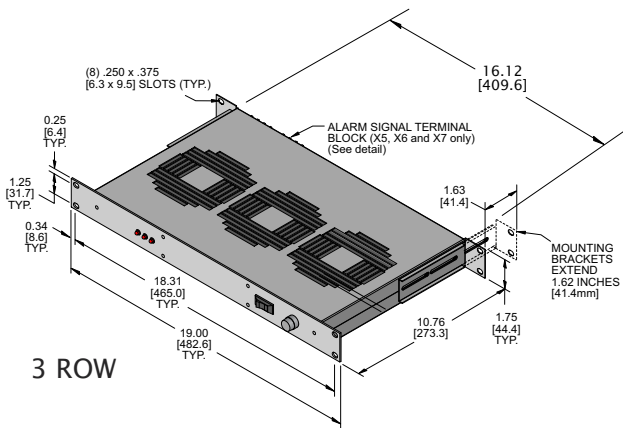
DIMENSIONS inches [mm]



1 ROW



2 ROW



3 ROW

OPTIONS FOR SMART KOOLTRAY II

The X5 option provides both a visual and external alarm for fan failure or low fan speed. The visual alarm is provided by L.E.D's corresponding to individual fans. The external alarm is provided by relay contact connection on the rear mounted terminal block for a remote warning device.

For X7 option provides variable speed fan control based on temperature (40°C setpoint). High temperature alarm relay contacts are provided by way of a rear mounted terminal block for a remote warning device.

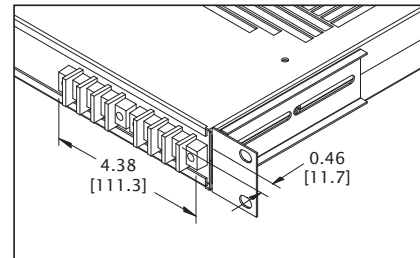
The X6 option incorporates both the X5 and X7 options.

OPTIONS:	X5	X6	X7
Individual Fan Sensors	x	x	
Variable Speed Fans		x	x
AC		x	x
DC	x	x	x
Alarm Types			
Low Fan Speed/Fan Failure	x	x	
High Temperature		x	x

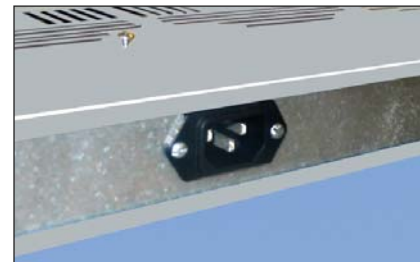
HOW TO ORDER

Specify model number. See previous page for Model Number and Features Selection Guide.

Alarm Signal Terminal Block Detail (X5, X6 and X7 options only)



02 - IEC Power Option Detail (VAC units only)



TECHNICAL DATA*

# Fans	CFM@ 0" S.P.	RPM Nominal	Amps		Watts	Approx. Weight	
			Run.	L.R.		Lbs.	Kg.
3	315	3050	0.5	0.8	40	11	5.0
6	630	3050	1.0	1.6	80	16	7.3
9	945	3050	1.5	2.4	120	21	9.5

* 115V, 60 Hz. operation

KOOLTRAY II

PACKAGED FANS



DESCRIPTION

TWIN AND TRIPLE FANS: In low static pressure applications, these fans provide high airflow in a very thin package. An exclusive KOOLTRONIC design provides exceptionally quiet operation in both intake and exhaust applications. Whether mounted horizontally or vertically, these minimum vibration fans require little internal cabinet space, leaving virtually the entire cabinet free for power supplies or other components. Both the KP500 (Triple) and KP875 (Twin) fans fit standard 19" equipment racks.

FILTER BOX FANS: High airflow with low noise operation makes these versatile packaged fans very popular in a wide range of applications, especially with their minimal internal cabinet depth requirement.

Reversible designs allow user to push or pull air through the enclosure. In addition, these fans can be installed internally or externally, vertically or horizontally, with or without a filter on either side. With the KOOLTRONIC special motor mount isolation system, these fans operate virtually vibration-free. Front and rear grilles can be adjusted to accommodate or omit filter. Filters are easily removable for cleaning and replacement.

See the following page for the four available mounting configurations of these easy-to-use fans.

General specifications common to all KOOLTRONIC Fans are on the first page of this section.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

STANDARD FEATURES

- All models can pressurize or exhaust
- Attractive Stainless Steel Grilles
- Capacities: 105 to 995 CFM
- Exceptionally quiet
- Filter
- Rugged Construction with Baked Powder Finish
- Twin, triple and filter box models
- UL/CSA ball-bearing motors
- Versatile mounting and adaptability

ACCESSORIES AND OPTIONS

All Packaged Fans

- | | |
|-----------------------------------|-----|
| ■ Automatic Speed Control | 141 |
| ■ Filters | 153 |
| ■ Filter Recoating Adhesive | 148 |
| ■ Special external paint finishes | ♦ |
| ■ Special line cord or connectors | ♦ |

KP40, KP60 and KP100

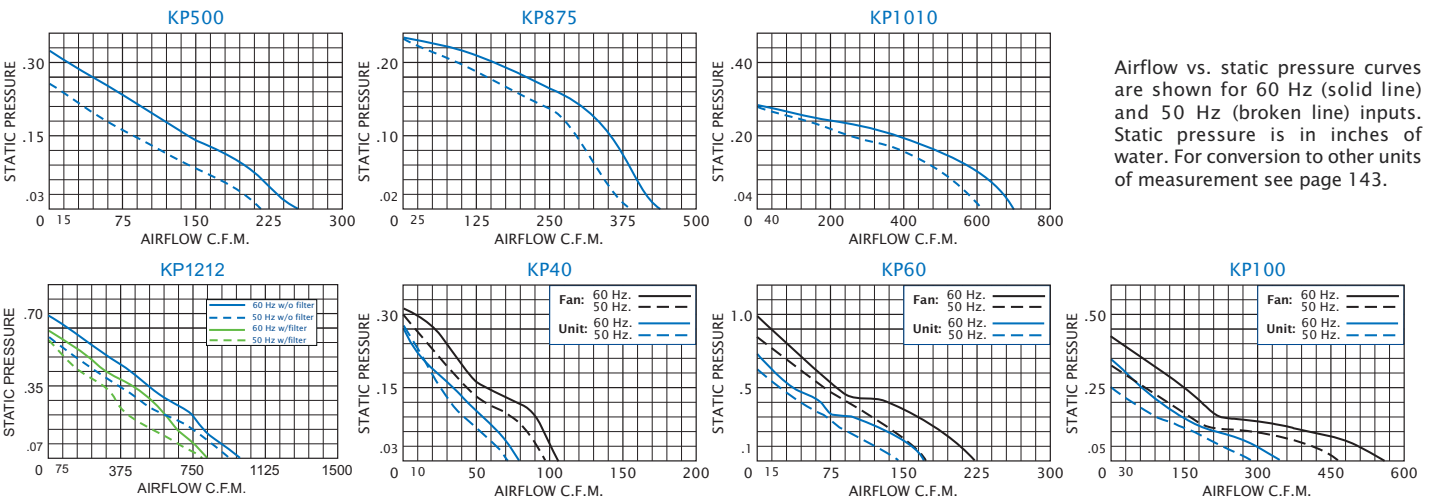
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| ■ Brushless DC motors | ♦ |
| ■ Filters | 154 |

KP500 and KP875

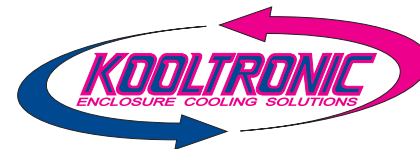
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| ■ Adapters | 153 |
| ■ Grille Assemblies | 153 |

♦ Contact KOOLTRONIC for information.

PERFORMANCE GRAPHS



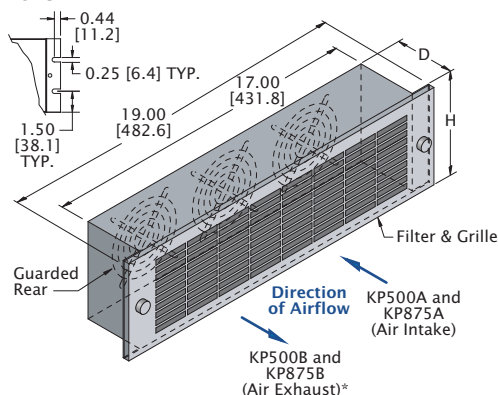
For assistance in model selection, refer to the Blower & Fan Selection Guides on pages 10 and 138, call KOOLTRONIC, or use one of our FREE design aid software programs.



DIMENSIONS inches [mm]

KP500 and KP875

EIA NOTCH DETAIL



*For exhaust applications, filter may be removed and used at air intake.

Model	Discharge Available	Height (H)	Depth (D)
KP500	A B	5.25 [133.4]	3.50 [88.9]
KP875	A B	8.75 [222.3]	4.25 [108.0]

See "Additional Specifications" below for other dimensional data.

Dimensions, inches [mm], are for reference only and subject to change.

FILTER PART NUMBERS

Model	Filter P/N
KP500	5251F-2
KP875	8751F
KP1010	10101F
KP1212	12121F

HOW TO ORDER

KP500 and KP875: Specify model number, adding discharge suffix A (intake) or B (exhaust). Example: KP875A. **NOTE:** KP877 models unavailable in 230 VAC.

KP1010 and KP1212: Specify model number, adding configuration suffix (A,B,C or D). Example: KP1212B. **NOTE:** KP1212 unavailable in 230 VAC.

For 230 VAC operation, add a 2 after the K. Example: K2P875A.

TECHNICAL DATA*

Model	Normally In Stock	CFM @ 0-inches	RPM Nominal	Amps		Watts	Approx. Weight	
				Run.	L.R.		Lbs.	Kg.
KP500	Yes	200	3000	0.6	0.9	55	9	4.1
KP875	Yes	420	1500	1.2	1.5	98	12	5.5
KP1010	Yes	640	1525	1.5	2.2	111	15	6.8
KP1212	Yes	825	1700	1.4	2.9	130	25	11.4

* 115V, 60 Hz. operation; A & B configuration for KP1010 & KP1212.

ADDITIONAL SPECIFICATIONS

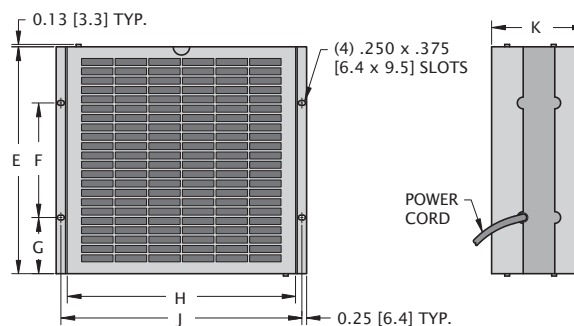
ENCLOSURES: Precision-engineered baked powder coated heavy-gauge steel construction. **KP500 and KP875:** 17 inches [431.8mm] wide. EIA-Notched flanges extend 17-inch [431.8mm] blower enclosure to 19-inch [482.6mm] panel width. **Filter Box Fans:** see dimensional data on the following page for sizes.

POWER CORD: 115V, 60 Hz. models of KP500, KP875, KP1010 and KP1212 include a 3-foot [0.9m] (minimum) type cord with molded plug, internally grounded and securely locked to case by strain relief bushing. 230 VAC, 50/60 Hz units are supplied without plugs. Models KP40, KP60 and KP100 include 12-inch power cords without plug.

GRILLE/GUARD: KP40, KP60, KP100, KP500 and KP875 each include a rear guard and an attractive stainless steel grille with knurled captive fasteners for easy removal. KP1010 and KP1212 include attractive stainless steel grilles on both front and rear. Grilles and guards comply with OSHA and UL safety standards.

FILTER: Furnished with each packaged fan.

KP1010 and KP1212



Model	Configurations*	E	F	G
KP1010	A B C D	12.12 [307.8]	6.12 [155.4]	3.00 [76.2]
KP1212	A B C D	15.12 [384.0]	9.00 [228.6]	3.06 [77.7]

Model	H	J	K A&B*	K C&D*
KP1010	12.18 [309.4]	12.87 [326.9]	5.06 [128.5]	4.50 [114.3]
KP1212**	15.18 [385.6]	15.87 [403.1]	6.68 [169.7]	6.12 [155.4]

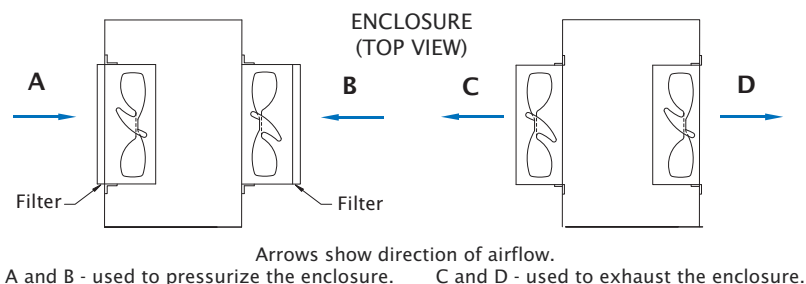
* See Configurations diagram below.

** NOTE: KP1212 unavailable in 230 VAC.

NOTE: Models KP875, KP1010 and KP1212 Fans feature neoprene vibration isolation mounts. Not required on KP500.

Dimensions, inches [mm], are for reference only and subject to change.

FILTER BOX FANS: CONFIGURATIONS

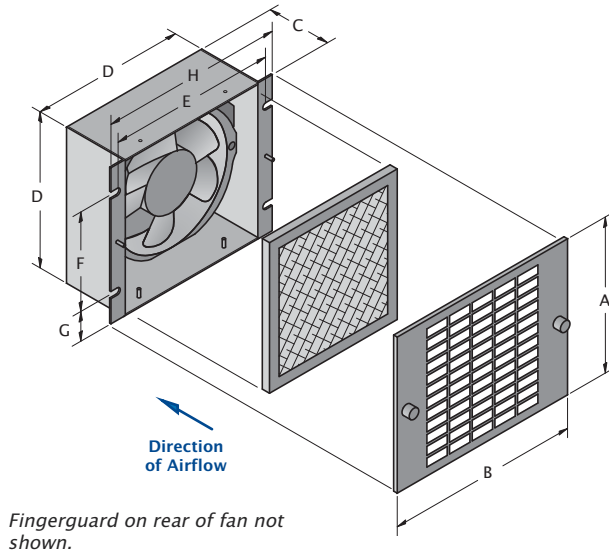


PACKAGED FANS

PACKAGED FANS (cont.)

DIMENSIONS (inches [mm])

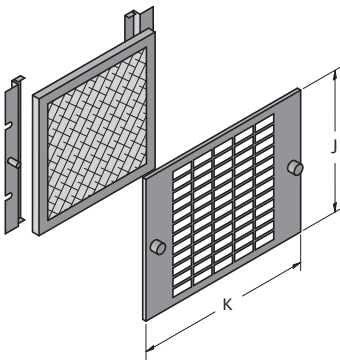
FAN ASSEMBLY



Model	A	B	C	D	E	F	G	H
KP40	6.12 [155.4]	7.37 [187.2]	2.37 [60.2]	5.62 [142.7]	6.37 [161.8]	4.12 [104.6]	0.75 [19.1]	7.00 [177.8]
KP60	7.62 [193.5]	8.87 [225.2]	3.00 [76.2]	7.12 [180.8]	7.87 [199.9]	4.50 [114.3]	1.31 [33.3]	8.50 [215.9]
KP100	11.62 [295.1]	13.00 [330.2]	4.56 [115.8]	11.12 [282.4]	11.87 [301.4]	6.87 [174.5]	2.12 [53.8]	12.50 [317.5]

Dimensions, inches [mm], are for reference only and are subject to change.

FILTER - GRILLE ASSEMBLY



FILTER PART NUMBERS

Model	Filter P/N
KP40	531F
KP60	681F
KP100	1081F

HOW TO ORDER

Specify model number.

Model	J	K
KFG40	6.13 [155.7]	7.38 [187.5]
KFG60	7.63 [193.8]	8.88 [225.6]
KFG100	11.63 [295.4]	13.00 [330.2]

Dimensions, inches [mm], are for reference only and are subject to change.

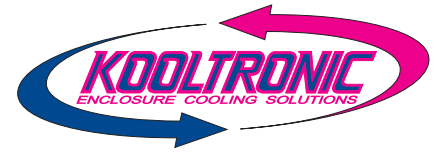
TECHNICAL DATA*

Model	Normally In Stock	Volts	CFM @ 0" S.P. Fan Only	RPM Nominal	Amps		Watts	Approx. Weight	
					Run.	L.R.		Lbs.	Kg.
KP40	Yes	115	105	3000	0.18	0.33	15	3	1.5
K2P40		230	105	3000	0.09	0.13	15	3	1.5
KP60	Yes	115	220	3300	0.29	0.53	33	4	1.8
K2P60		230	220	3300	0.15	0.27	33	4	1.8
KP100	Yes	115	550	1600	0.49	1.30	60	10	4.5
K2P100		230	550	1600	0.45	0.60	60	10	4.5

* 60 Hz. operation.

See "Additional Specifications" on previous page for more information.

ADVANTAGE SERIES KBFF FILTER FANS



DESCRIPTION

In response to industry demands for small, versatile cooling units, Kooltronic now offers the **Advantage Series Filter Fans**. Unique to the series is a clean, linear design, characterized by its extremely flat profile, which keeps the unit from protruding from the cabinet wall.

The **Advantage Series Filter Fans** offer convenience, versatility and reliability:

Fast Mounting: With elastic hooks and an integrated seal, the **Advantage Series Filter Fans** can be mounted easily into the opening provided on the panel. There is no need for extra screws or preparation.

Wide Range of Mounting Dimensions: The precise planning of the elastic hooks and gaskets allow the fans to be mounted in openings with a tolerance range of 0.059 inches [1.5mm] and a plate thickness of between 0.039 inches [1.0mm] and 0.098 inches [2.5 mm] (see individual units).

General specifications common to all KOOLTRONIC Fans are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of fans to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.



NEMA
TYPE 12
MAINTAINED

CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114

STANDARD FEATURES

- Mounts quickly and easily
- Attractive appearance
- Requires no mounting hardware
- Integral Finger-Guards
- Most assemblies are CE Approved
- Most units are Type 12 Maintained (if used with provided filter)
- UL shielded ball-bearing motors
- Integrated sealing gasket
- Washable Thermolinked Progressive Structure
- Electrical Connection: See individual units

ACCESSORIES AND OPTIONS

	Page
■ Grill Color: RAL 9005, Black	♦
■ Grill Assemblies	170
■ Replacement Filters	♦
■ Reversed airflow direction	♦
■ Other voltages, colors and reverse airflow*	♦

♦ Contact KOOLTRONIC for information.

* Reverse airflow may be available. Consult factory.

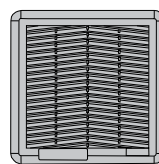
ADVANTAGE FILTER FANS



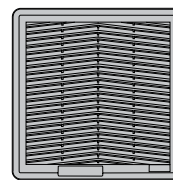
KBFF08
29.43 CFM*
4"H x 4"W x 3"D



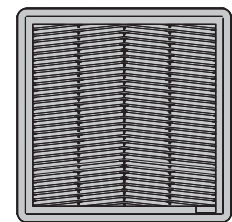
KBFF12
46.5 CFM*
6"H x 6"W x 3"D



KBFF13
76.5 CFM*
8"H x 8"W x 4"D



KBFF15
158.9 CFM*
10"H x 10"W x 5"D



KBFF20
341.4 CFM*
13"H x 13"W x 6"D

* Fan with grille airflow.

ADVANTAGE SERIES FILTER FANS KBFF08 MODELS

TECHNICAL DATA

Model	Normally In Stock	Voltage	Frequency Hz	Input mA	Input Watts	Max. Airflow CFM*	Static Pressure INCH. W.	Noise db(A)	Operating Temp. °F		Approx. Weight		Agency Approvals
									Min.	Max	Lbs.	Kg.	
KBFF08GAUF	Yes	115 VAC	50/60	0.145/0.127	12/10	13/15	0.16/0.23	37/42	14	131	1.19	0.54	1, 2, 5
K2BFF08GAUF	Yes	230 VAC	50/60	0.078/0.068	12/11	13/15	0.16/0.23	37/42	14	131	1.19	0.54	1, 2, 5

* Fan with grille airflow.

RAL 7035 (Light Grey) is standard color (designated by U in the model number). Fans are also available in RAL 9005 (Black). To order Black fan, substitute N for U in model number. Example: KBFF08GDUN for RAL 7035 (Light Grey) and KBFF08GDNN for RAL9005 (Black).

APPROVALS: 1. **NEMA TYPE 12 MAINTAINED** 2. **CE** 3. 4. **RU** 5. **RU US**



KBFF08GAUF

STANDARD FEATURES

- Mounts quickly and easily
- Attractive Appearance
- Requires no Mounting Hardware
- Integral Finger-Guards
- Most assemblies are CE Approved
- Type 12 Rating Maintained (if used with provided filter)
- UL Shielded Ball-Bearing Motors
- Integrated Sealing Gasket
- Washable Theremolinked Progressive Structure
- Electrical Connection: 12 inch leads.

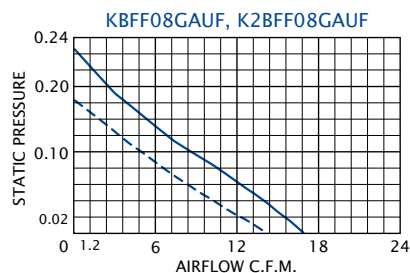
ACCESSORIES AND OPTIONS

- | | Page |
|--|------|
| ■ Grille Color: Ral 9005, Black | ♦ |
| ■ Grill Assembly (P/N: KBFA08U) | 170 |
| ■ Replacement Filters (P/N: KFM08) | ♦ |
| ■ Reversed Airflow Direction* | ♦ |
| ■ Other voltages, colors and reverse airflow | ♦ |

♦ Contact KOOLTRONIC for information.

* Reverse airflow may be available. Consult factory.

PERFORMANCE CHARTS

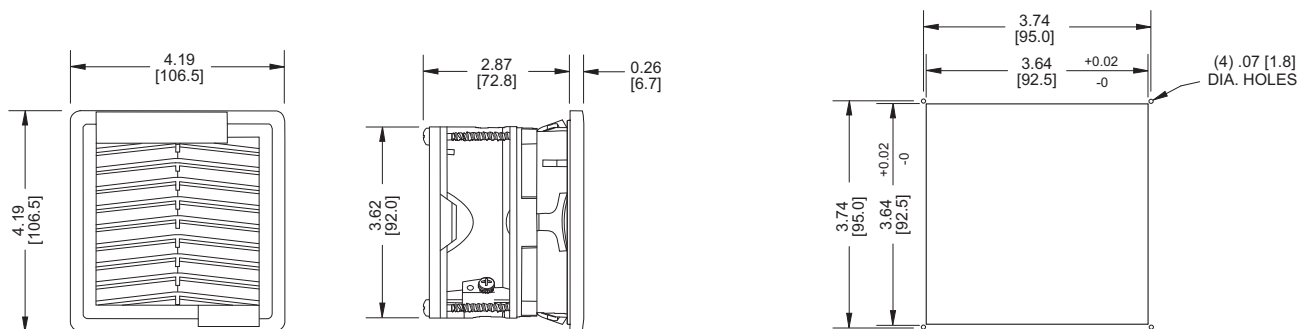


Airflow vs. static pressure curves for 115VAC and 230VAC models are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water.

HOW TO ORDER

Specify model number.

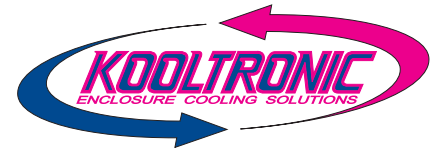
DRAWINGS (KBFF08GAUF)



MOUNTING PLAN

Dimensions, inches [mm], are for reference only and are subject to change.

ADVANTAGE SERIES FILTER FANS KBFF12 MODELS



TECHNICAL DATA

Model	Normally In Stock	Voltage	Frequency Hz	Input mA	Input Watts	Max. Airflow CFM*	Static Pressure INCH. W.	Noise db(A)	Operating Temp. °F		Approx. Weight		Agency Approvals
									Min.	Max	Lbs.	Kg.	
KBFF12AUN	Yes	115 VAC	50/60	.252/.220	19/17	35.4/46.5	.29/.35	40/44	14	131	1.8	0.8	1, 2, 5
K2BFF12AUN	Yes	230 VAC	50/60	.130/.100	18/16	35.4/46.5	.29/.35	40/44	14	131	1.8	0.8	1, 2, 5
K7BFF12DUN		24 VDC	-	.310	7.4	27.7	.22	42.5	14	131	1.1	0.5	1, 2, 5
K8BFF12DUN		48 VDC	-	.180	8.6	27.7	.22	42.5	14	131	1.1	0.5	1, 2, 5

* Fan with grille airflow.

NOTE: KBFF12AUN is cURus at 60 Hz only.

RAL 7035 (Light Grey) is standard color (designated by U in the model number). Fans are also available in RAL 9005 (Black). To order Black fan, substitute N for U in model number. Example: KBFF12AUN for RAL 7035 (Light Grey) and KBFF12ANN for RAL 9005 (Black).



STANDARD FEATURES

- Mounts Quickly and Easily
- Attractive Appearance
- Requires no Mounting Hardware
- Integral Finger-Guards
- Most Assemblies are CE Approved
- Type 12 Rating Maintained (if used with provided filter)
- UL Shielded Ball Bearing Motors
- Integrated Sealing Gasket
- Washable Thermolinked Progressive Structure Synthetic Filter
- Electrical Connection: 115 & 230V - Terminal block 2 poles L-N; 24 VDC & 48 VDC - UL 1007 AGW24 lead wires

ACCESSORIES AND OPTIONS

- | | |
|--|-----|
| Grille Color: Ral 9005, Black | ♦ |
| Grill Assembly (P/N: KBFA12U) | 170 |
| Replacement Filters (P/N: KFM12) | ♦ |
| Reversed Airflow Direction* | ♦ |
| Other voltages, colors and reverse airflow | ♦ |

♦ Contact KOOLTRONIC for information.

* Reverse airflow may be available. Consult factory.

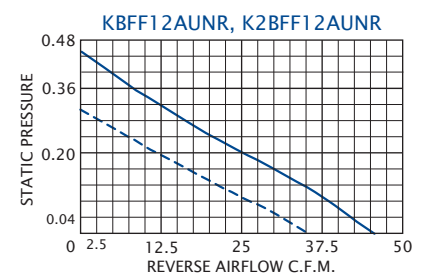
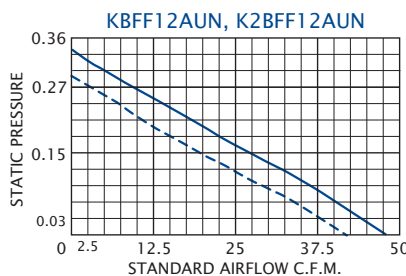


KBFF12AUN

HOW TO ORDER

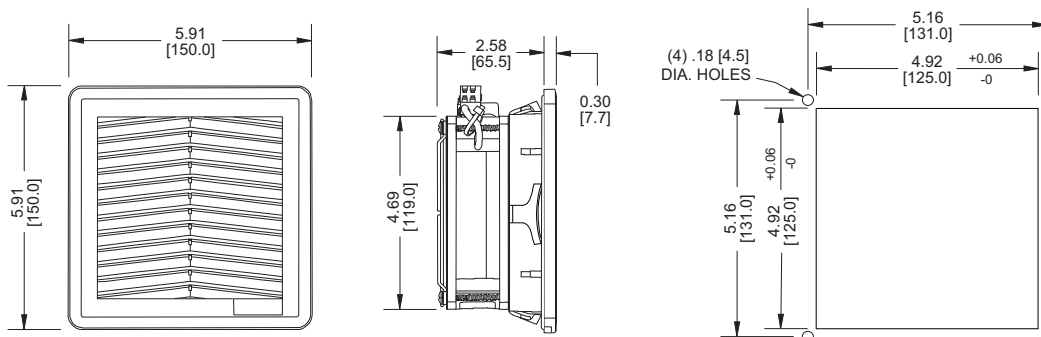
Specify model number.

PERFORMANCE CHARTS



Airflow vs. static pressure curves for 115VAC and 230VAC models are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water.

DRAWINGS (KBFF12AUN)



Dimensions, inches [mm], are for reference only and are subject to change.

MOUNTING PLAN

ADVANTAGE SERIES FILTER FANS

KBFF13 MODELS

TECHNICAL DATA

Model	Normally In Stock	Voltage	Frequency Hz	Input mA	Input Watts	Max. Airflow CFM*	Static Pressure INCH. W.	Noise db(A)	Operating Temp. °F		Approx. Weight		Agency Approvals
									Min.	Max	Lbs.	Kg.	
KBFF13PAUF	Yes	115 VAC	50/60	.213/.202	19/18	58.8/64.7	.22/.24	46/49	14	131	2.6	1.2	1, 2, 5
K2BFF13PAUF	Yes	230 VAC	50/60	.106/.100	18/18	58.8/64.7	.22/.24	48/54	14	131	2.6	1.2	1, 2, 5
KBFF13PAUN		115 VAC	50/60	.200/.180	16/15	64.7/76.5	.32/.40	40/44	14	131	2.6	1.2	1, 2, 5
K2BFF13PAUN		230 VAC	50/60	.126/.110	19/17	64.7/76.5	.32/.40	40/44	14	131	2.6	1.2	1, 2, 5
K7BFF13PDUN		24 VDC	-	.342	8.2	58.8	.24	42	14	131	1.9	0.9	1, 2, 5

* Fan with grille airflow.

RAL 7035 (Light Grey) is standard color (designated by U in the model number). Fans are also available in RAL 9005 (Black). To order Black fan, substitute N for U in model number. Example: KBFF13PAUF for RAL 7035 (Light Grey) and KBFF13PANF for RAL9005 (Black).

APPROVALS: 1. **NEMA TYPE 12 MAINTAINED** 2. **CE** 3. **SP** 4. **RU** 5. **CU US**



KBFF13PAUF

STANDARD FEATURES

- Mounts Quickly and Easily
- Attractive Appearance
- Requires no Mounting Hardware
- Integral Finger-Guards
- Most Assemblies are CE Approved
- Type 12 Rating Maintained (if used with provided filter)
- UL Shielded Ball Bearing Motors
- Integrated Sealing Gasket
- Washable Thermolinked Progressive Structure Synthetic Filter
- Electrical Connection: 115 & 230V - Terminal Block, 2 poles L-N; 24 VDC - Terminal block 2 poles plus and minus

ACCESSORIES AND OPTIONS

- | | Page |
|--|------|
| ■ Grille Color: Ral 9005, Black | ♦ |
| ■ Grill Assembly (P/N: KBFA13U) | 170 |
| ■ Replacement Filters (P/N: KFM13) | ♦ |
| ■ Reversed Airflow Direction* | ♦ |
| ■ Other voltages, colors and reverse airflow | ♦ |

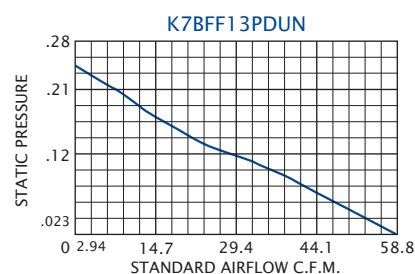
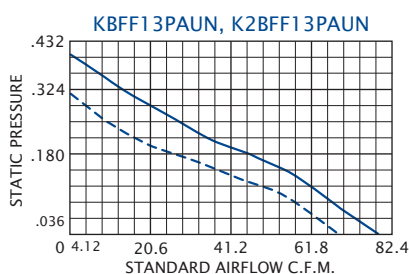
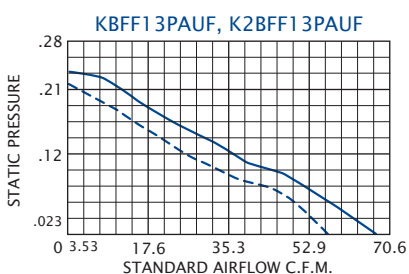
♦ Contact KOOLTRONIC for information.

* Reverse airflow may be available. Consult factory.

HOW TO ORDER

Specify model number.

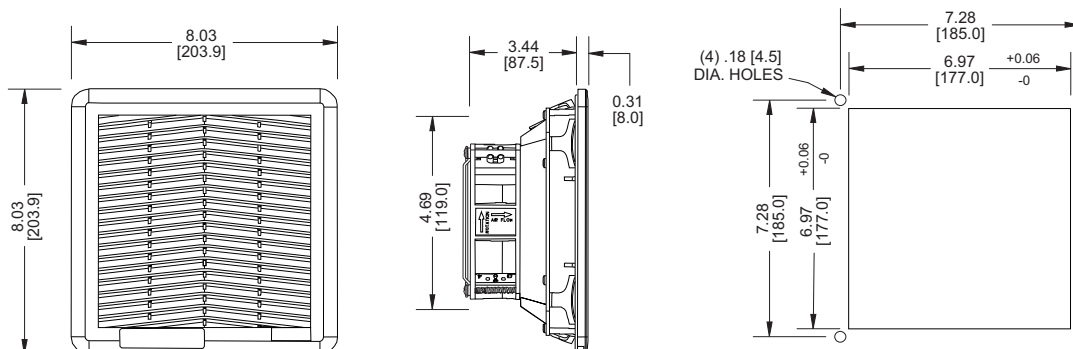
PERFORMANCE CHARTS



Airflow vs. static pressure curves for 115VAC and 230VAC models are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water.

Static pressure is in inches of water.

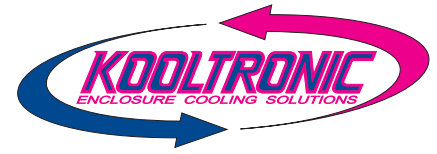
DRAWINGS (KBFF13PAUF)



MOUNTING PLAN

Dimensions, inches [mm], are for reference only and are subject to change.

ADVANTAGE SERIES FILTER FANS KBFF15 MODELS



TECHNICAL DATA

Model	Normally In Stock	Voltage	Frequency Hz	Input mA	Input Watts	Max. Airflow CFM*	Static Pressure INCH. W.	Noise db(A)	Operating Temp. °F		Approx. Weight		Agency Approvals
									Min.	Max	Lbs.	Kg.	
KBFF15AUF	Yes	115 VAC	50/60	.280/.270	31/31	135.4/158.9	.46/.62	50/55	14	131	3.3	1.5	1, 2, 5
K2BFF15AUF		230 VAC	50/60	.134/.160	32/36	134.4/158.9	.46/.62	50/55	14	131	3.3	1.5	1, 2, 5**
KBFF15PAUF		115 VAC	50/60	.210/.210	17/16	61.8/70.6	.22/.23	46/49	14	131	2.6	1.2	1, 2, 5
K2BFF15PAUF		230 VAC	50/60	.110/.100	18/17	61.8/70.6	.22/.23	48/54	14	131	2.6	1.2	1, 2, 5
K7BFF15PDUN		24 VDC	-	.320	7.6	82.4	.25	42.0	14	131	2.0	0.9	1, 2, 5
K8BFF15PDUN		48 VDC	-	.180	8.6	82.4	.25	42.5	14	131	2.0	0.9	1, 2, 5

* Fan with grille airflow.

** UL only at 60 Hz.

RAL 7035 (Light Grey) is standard color (designated by U in the model number). Fans are also available in RAL 9005 (Black). To order Black fan, substitute N for U in model number. Example: KBFF15AUF for RAL 7035 (Light Grey) and KBFF15ANF for RAL9005 (Black).



STANDARD FEATURES

- Mounts Quickly and Easily
- Attractive Appearance
- Requires no Mounting Hardware
- Integral Finger-Guards
- Most Assemblies are CE Approved
- Type 12 Rating Maintained (if used with provided filter)
- UL Shielded Ball Bearing Motors
- Integrated Sealing Gasket
- Washable Thermolinked Progressive Structure Synthetic Filter
- Electrical Connection: 115 & 230 V - Terminal block 3 poles L-N-PE; 24 & 48 VDC - Terminal block 2 poles plus and minus

ACCESSORIES AND OPTIONS

- | | |
|---|-----|
| ■ Grille Color: Ral 9005, Black | ♦ |
| ■ Grill Assembly (P/N: KBFA015) | 170 |
| ■ Replacement Filters (P/N: KFM15) | ♦ |
| ■ Reversed Airflow Direction* | ♦ |
| ■ Other voltages, colors and reverse airflow* | ♦ |

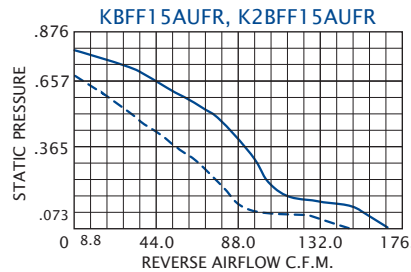
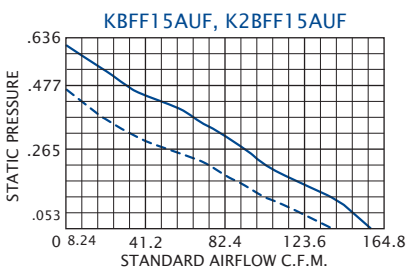
♦ Contact KOOLTRONIC for information.

* Reverse airflow may be available. Consult factory.



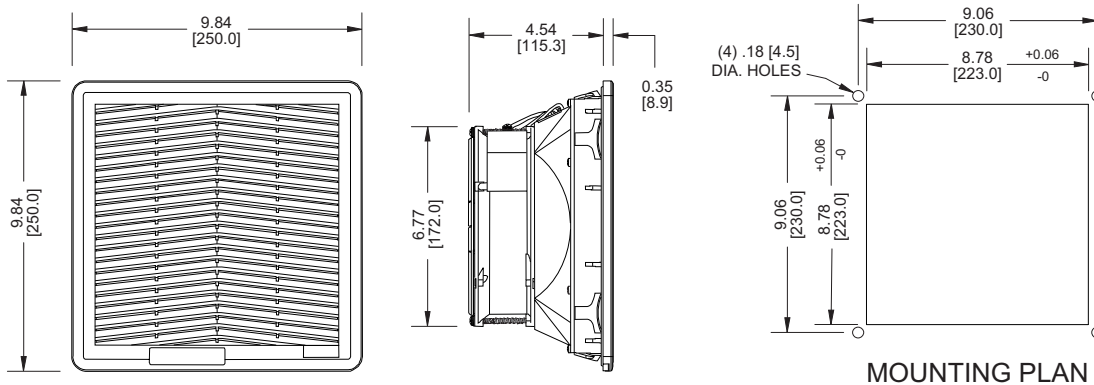
KBFF15AUF

PERFORMANCE CHARTS



Airflow vs. static pressure curves for 115VAC and 230VAC models are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water.

DRAWINGS (KBFF15AUF)



HOW TO ORDER

Specify model number.

ADVANTAGE SERIES FILTER FANS KBFF20 MODELS

TECHNICAL DATA

Model	Normally In Stock	Voltage	Frequency Hz	Input mA	Input Watts	Max. Airflow CFM*	Static Pressure INCH. W.	Noise db(A)	Operating Temp. °F		Approx. Weight		Agency Approvals
									Min.	Max.	Lbs.	Kg.	
KBFF20AUE1	Yes	115 VAC	50/60	.68/.73	74/83	306.0/341.4	.64/.76	66.0/79.2	14	131	6.8	3.1	1, 2, 5
K2BFF20AUE1	Yes	230 VAC	50/60	.310/.350	70/85	306.0/341.4	.64/.76	65.3/68.1	14	131	6.8	3.1	1, 2, 5

* Fan with grille airflow.

RAL 7035 (Light Grey) is standard color (designated by U in the model number). Fans are also available in RAL 9005 (Black). To order Black fan, substitute N for U in model number. Example: KBFF20AUE1 for RAL 7035 (Light Grey) and KBFF20ANE1 for RAL9005 (Black).

APPROVALS: 1.  2.  3.  4.  5. 



KBFF20AUE1

STANDARD FEATURES

- Mounts Quickly and Easily
- Attractive Appearance
- Requires no Mounting Hardware
- Integral Finger-Guards
- Most Assemblies are CE Approved
- Type 12 Rating Maintained (if used with provided filter)
- UL Shielded Ball Bearing Motors
- Integrated Sealing Gasket
- Washable Thermolinked Progressive Structure Synthetic Filter
- Electrical Connection: 115 & 230V - Terminal block 3 poles L-N-PE; 400V - Terminal block 4 poles L1-L2-L3-PE

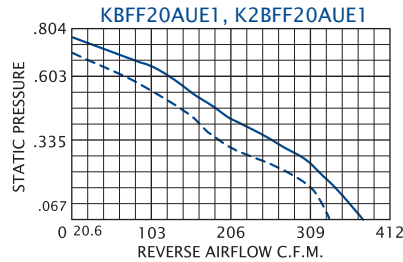
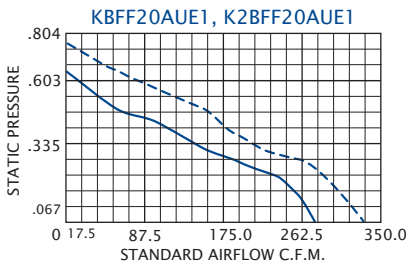
ACCESSORIES AND OPTIONS

	Page
■ Grille Color: Ral 9005, Black	♦
■ Grill Assembly (P/N: KBFA21U)	170
■ Replacement Filters (P/N: KFM20)	♦
■ Reversed Airflow Direction*	♦
■ Other voltages, colors and reverse airflow*	♦

♦ Contact KOOLTRONIC for information.

* Reverse airflow may be available. Consult factory.

PERFORMANCE CHARTS

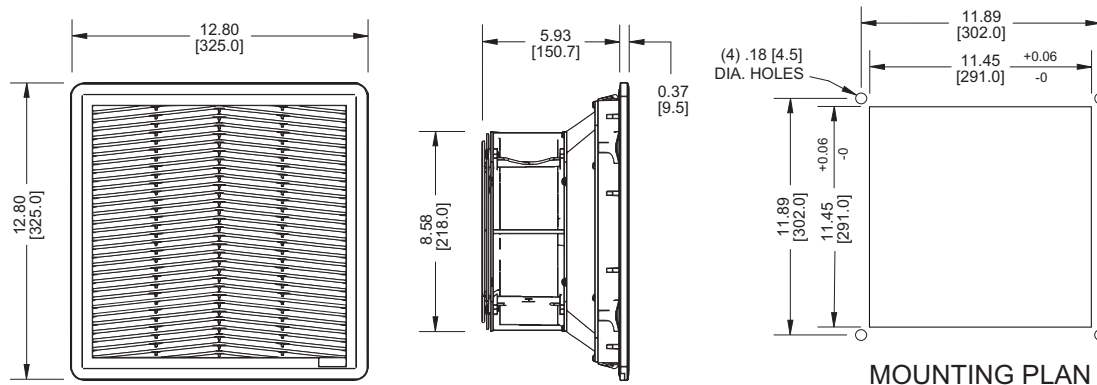


Airflow vs. static pressure curves for 115VAC and 230VAC models are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water.

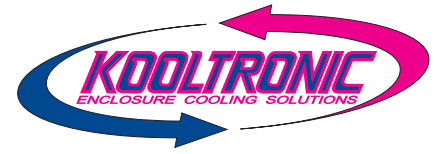
HOW TO ORDER

Specify model number.

DRAWINGS (KBFF20AUE1)



ADVANTAGE SENTRY SERIES FILTER FANS



Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.
Recommended replacement: See *Advantage Series Filter Fans*

DESCRIPTION

Kooltronic has expanded its **Advantage Series** line of filter fans to include models offering the versatility and security of indoor or outdoor use. The **Advantage Sentry Series Filter Fans** have a **NEMA 3R** Rating and are a perfect choice for dissipating high heat loads economically. These filter fans are also available in a variety of sizes, voltages and protection levels.

The **Advantage Sentry Series Indoor/Outdoor Filter Fans** offer the same convenience, versatility and reliability as the **Advantage Series Filter Fans**, with the added protection of a **NEMA 3R** Rating, making these models an excellent choice for the food service industry, telecommunications, and other outdoor applications.

General specifications common to all KOOLTRONIC Fans are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of fans to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.



CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114



NEMA
TYPE 3R
MAINTAINED

STANDARD FEATURES

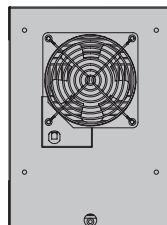
- Integrated Fan Guards
- Integrated Sealing Gasket
- NEMA 3R Rating Maintained (If used with provided filter)
- Secure Mounting
- Baked Powder Finish
- UL/CSA Shielded Ball-bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

ACCESSORIES AND OPTIONS

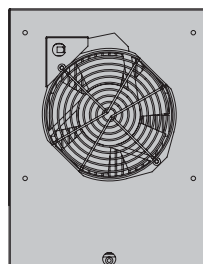
	Page
■ Grille Assembly	171
■ IP54 & IP55 Filter Protection	✦
■ Other voltages, both AC & DC	✦
■ Replacement Filter	✦
■ Reversed Airflow Direction*	✦

✦ Contact KOOLTRONIC for information.

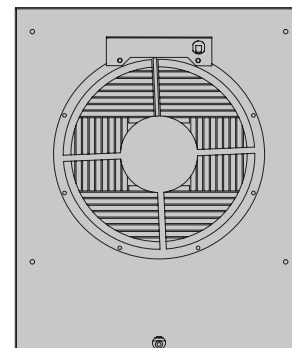
* To order reversed airflow direction, add "R" after series number. Example: KNP40RF.



KNP40F
102 CFM*
11"H x 8"W x 5"D



KNP60F
212 CFM*
12"H x 9"W x 5"D



KNP100F
405 CFM*
16"H x 14"W x 8"D

* Fan airflow without filter.

SENTRY FILTER FANS

ADVANTAGE SENTRY SERIES NEMA 3R FILTER FANS KNP40F

Products in red are legacy products. Legacy products are no longer in normal production. Consult factory for availability.

Recommended replacement: See *Advantage Series Filter Fans*



TECHNICAL DATA

Model	Normally In Stock	Voltage	Frequency Hz	Input mA	Input Watts	Fan Airflow CFM*	Fan w/Grille Airflow CFM**	Noise db(A)	Operating Temp. °F		Approx. Weight	
									Min.	Max.	Lbs.	Kg.
KNP40F	Yes	115 VAC	50/60	.22/.22	18/17	88/102	60/69	45/47.5	14	158	5.0	2.2
K2NP40F	Yes	230 VAC	50/60	.10/.11	15/17	88/102	50/51	45/47.5	14	158	5.0	2.2
K6NP40F		12 VDC	-	0.4	4.8	125	52	45/47.5	14	140	5.0	2.2
K7NP40F		24 VDC	-	0.3	7.2	100	51	45/47.5	14	140	5.0	2.2
K8NP40F		48 VDC	-	<.1	-	100	57	45/47.5	14	158	5.0	2.2

* Fan airflow without filter.

** NEMA Rated if installed with provided filter.

STANDARD FEATURES

- Integrated Fan Guards
- Integrated Sealing Gasket
- NEMA 3R Rating Maintained (if used with provided filter)
- Secure Mounting
- Baked Powder Finish
- UL/CSA Shielded Ball Bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

ACCESSORIES AND OPTIONS

	Page
■ Grille Assembly (P/N: KNPA40F)	171
■ IP54 & IP55 Filter Protection	♦
■ Other voltages, both AC & DC	♦
■ Replacement Filters (P/N: 531F)	♦
■ Reversed Airflow Direction*	♦

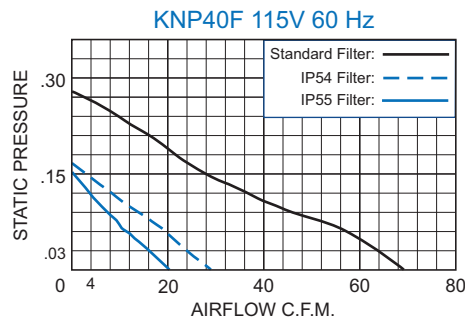
♦ Contact KOOLTRONIC for information.

* To order reversed airflow direction, add "R" after series number. Example: KNP40RF.



NEMA
TYPE 3R
MAINTAINED

PERFORMANCE CHART

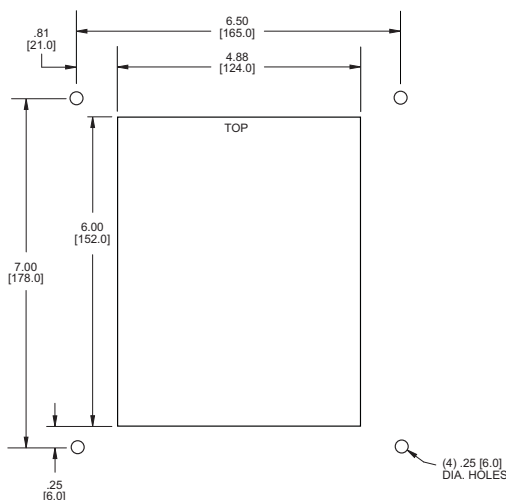


Airflow vs. static pressure curve is shown for 60 Hz inputs. Static pressure is in inches of water.

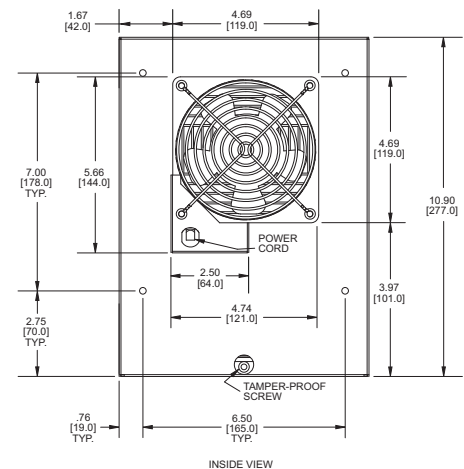
HOW TO ORDER

Specify model number.

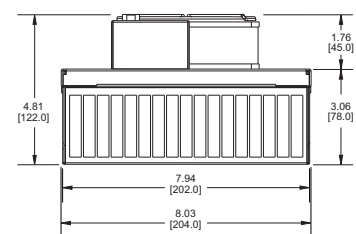
DRAWINGS



MOUNTING PLAN



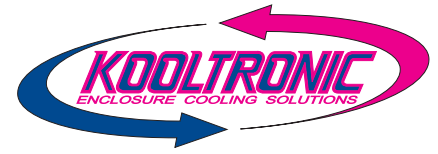
INSIDE VIEW



BOTTOM VIEW

Dimensions, inches [mm], are for reference only and are subject to change.

ADVANTAGE SENTRY SERIES NEMA 3R FILTER FANS KNP60F



Products in **red** are legacy products. Legacy products are no longer in normal production. Consult factory for availability.
Recommended replacement: See *Advantage Series Filter Fans*

TECHNICAL DATA

Model	Normally In Stock	Voltage	Frequency Hz	Input mA	Input Watts	Fan Airflow CFM*	Fan w/Grille Airflow CFM**	Noise db(A)	Operating Temp. °F		Approx. Weight	
									Min.	Max.	Lbs.	Kg.
KNP60F	Yes	115 VAC	50/60	.27/.32	31/37	183/212	116/134	57/61	-40	158	6.5	2.9
K2NP60F	Yes	230 VAC	50/60	.12/.15	28/34	183/212	111/133	57/61	-40	158	6.5	2.9
K8NP60F		48 VDC	-	0.4	19.2	230	132	57/61	14	158	6.5	2.9

* Fan airflow without filter.

** NEMA Rated if installed with provided filter.



STANDARD FEATURES

- Integrated Fan Guards
- Integrated Sealing Gasket
- NEMA 3R Rating Maintained (if used with provided filter)
- Secure Mounting
- Baked Powder Finish
- UL/CSA Shielded Ball Bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

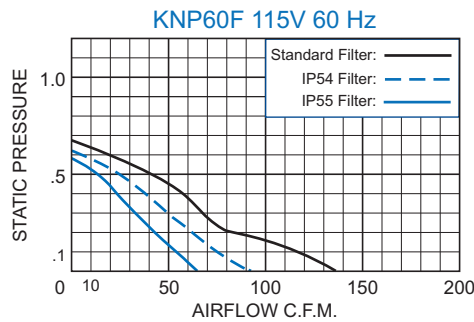
ACCESSORIES AND OPTIONS

	Page
■ Grille Assembly (P/N: KNPA60F)	171
■ IP54 & IP55 Filter Protection	♦
■ Other voltages, both AC & DC	♦
■ Replacement Filters (P/N: 681F)	♦
■ Reversed Airflow Direction*	♦

♦ Contact KOOLTRONIC for information.



PERFORMANCE CHART



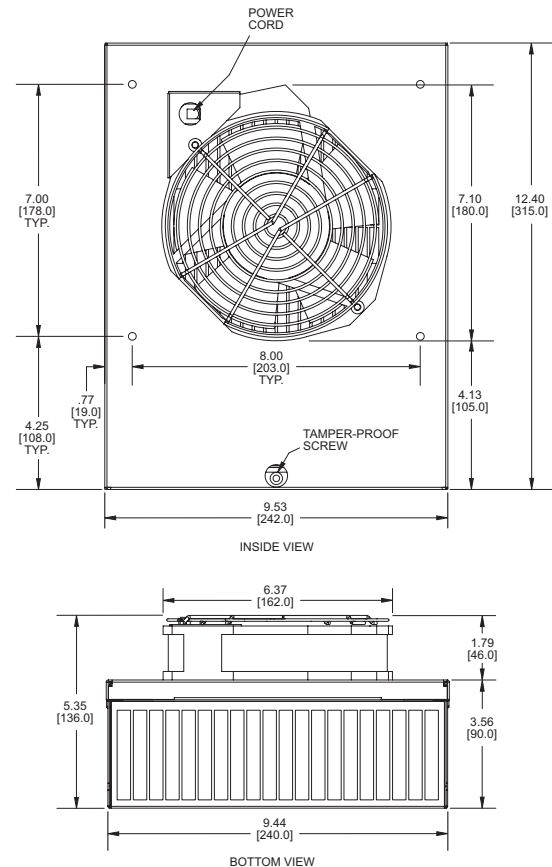
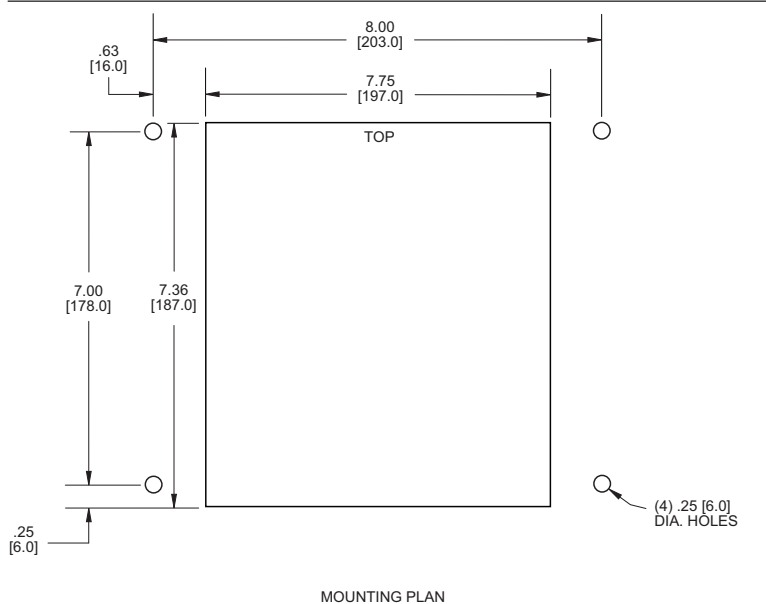
Airflow vs. static pressure curve is shown for 60 Hz inputs. Static pressure is in inches of water.

* To order reversed airflow direction, add "R" after series number. Example: KNP60RF.

HOW TO ORDER

Specify model number.

DRAWINGS



SENTRY FILTER FANS

Dimensions, inches [mm], are for reference only and are subject to change.

ADVANTAGE SENTRY SERIES NEMA 3R FILTER FANS KNP100F

TECHNICAL DATA



Model	Normally In Stock	Voltage	Frequency Hz	Input mA	Input Watts	Fan Airflow CFM*	Fan w/Grille Airflow CFM**	Noise db(A)	Operating Temp. °F		Approx. Weight	
									Min.	Max.	Lbs.	Kg.
KNP100F	Yes	115 VAC	50/60	.35/.38	36/38	338/405	141/172	55/58	-40	158	12.5	5.6
K2NP100F	Yes	230 VAC	50/60	.50/.45	64/62	338/405	151/188	55/58	-40	158	12.5	5.6

* Fan airflow without filter.

** NEMA Rated if installed with provided filter.

STANDARD FEATURES

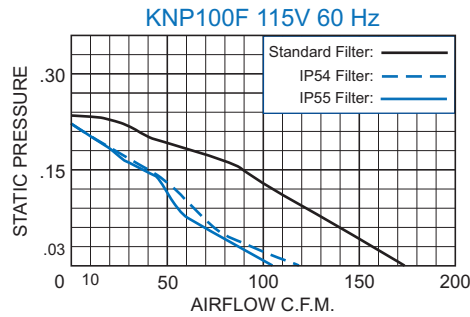
- Integrated Fan Guards
- Integrated Sealing Gasket
- NEMA 3R Rating Maintained (if used with provided filter)
- Secure Mounting
- Baked Powder Finish
- UL/CSA Shielded Ball Bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

ACCESSORIES AND OPTIONS

- | | Page |
|------------------------------------|------|
| ■ Grille Assembly (P/N: KNPA100F) | 171 |
| ■ IP54 & IP55 Filter Protection | ♦ |
| ■ Other voltages, both AC & DC | ♦ |
| ■ Replacement Filters (P/N: 1081F) | ♦ |
| ■ Reversed Airflow Direction | ♦ |

♦ Contact KOOLTRONIC for information.

PERFORMANCE CHART



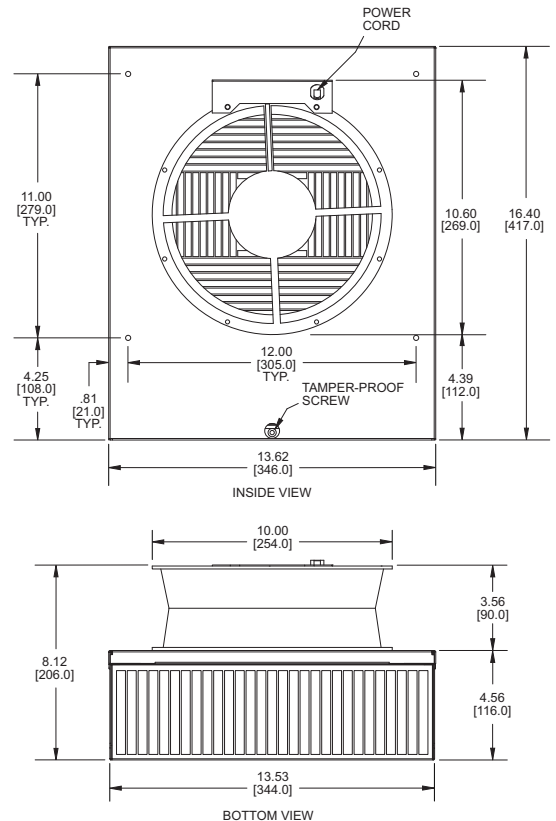
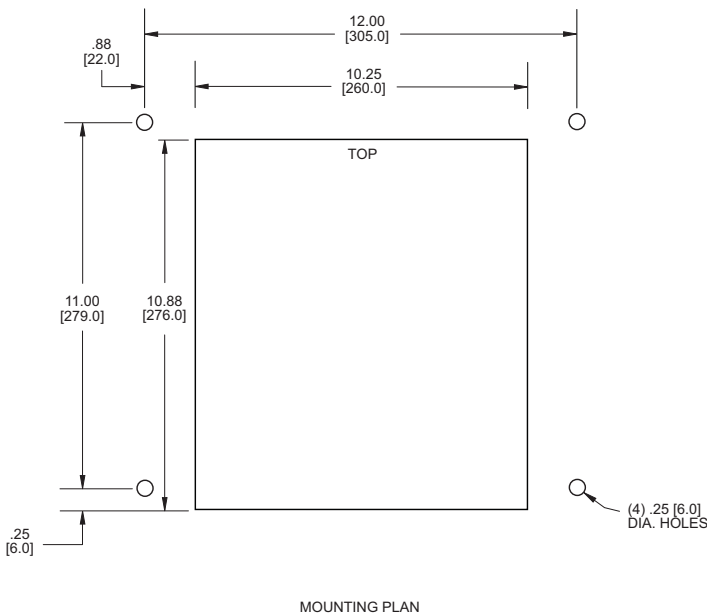
Airflow vs. static pressure curve is shown for 60 Hz inputs. Static pressure is in inches of water.

* To order reversed airflow direction, add "R" after series number. Example: KNP100RF.

HOW TO ORDER

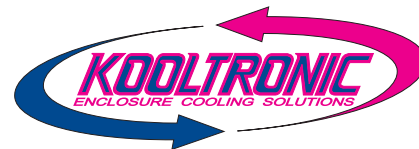
Specify model number.

DRAWINGS



Dimensions, inches [mm], are for reference only and are subject to change.

GUARDIAN/GUARDIANX SERIES NEMA 4 OR 4X FILTER FANS



DESCRIPTION

Kooltronic has expanded its line of filter fans to include models offering the security of **NEMA 4** or **4X** Ratings together with the versatility of indoor or outdoor use. All **Guardian Series Filter Fans** have a **NEMA 4** Rating. The **GuardianX Series Filter Fans**, with a **NEMA 4X** Rating, are offered with a Stainless Steel shell. The **Guardian/GuardianX Series Indoor/Outdoor Filter Fans** are a perfect choice for dissipating high heat loads economically.

The **Guardian/GuardianX Series Indoor/Outdoor Filter Fans** offer the same convenience, versatility and reliability as the **Advantage** and **Sentry Series Filter Fans** with the added protection of a **NEMA 4** or **4X** Rating, making these models an excellent choice for washdown, telecommunication, and the food service industry.

General specifications common to all KOOLTRONIC Fans are on the first page of this section.

KOOLTRONIC also designs and manufactures a variety of fans to meet **unique** specifications. We invite your inquiries about our modification and custom-design capabilities.



NEMA
TYPE 4 OR 4X
MAINTAINED

For general ventilating use only. Do not use these fans to exhaust hazardous or explosive material and vapors.

NOT ALL SYSTEMS ARE SUITABLE FOR UTILIZING OUTSIDE AIR. To protect sensitive components against condensation an enclosure heater or closed-loop cooling is recommended. To protect sensitive components against corrosive elements closed-loop cooling is recommended.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

* Fan airflow without filter.

STANDARD FEATURES

- Baked Powder Finish
- Integrated Fan Guards
- Integrated Sealing Gasket
- IP55 Filter Protection
- NEMA 4 or 4X Rating Maintained (if used with provided filter)
- Secure Mounting
- Stainless Steel Shell (NEMA 4X models)
- UL/CSA Shielded Ball-bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

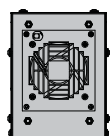
ACCESSORIES AND OPTIONS

	Page
■ Filter-Hood Assembly (Recommended)*	176
■ Other voltages, both AC & DC	♦
■ Replacement Filters	♦
■ Reversed Airflow Direction**	♦

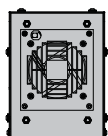
♦ Contact KOOLTRONIC for information.

* See individual units for part number.

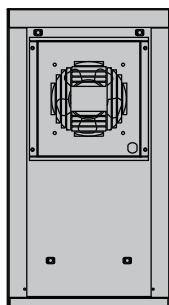
** To order reversed airflow direction, add "R" after series number. Example: KNP40RFL.



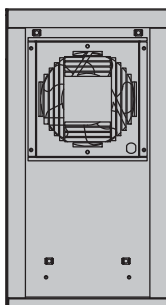
KNP32FL
20 /27 CFM*
8"H x 6"W x 5"D



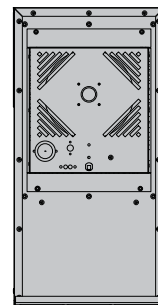
KNP36FL
26 /26 CFM*
8"H x 6"W x 5"D



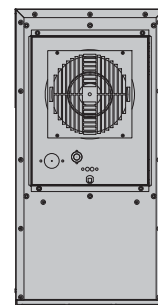
KNP40FL
40 /45 CFM*
18"H x 10"W x 5"D



KNP60FL
84 / 92 CFM*
18"H x 10"W x 5"D



KNP180FL
177 / 179 CFM*
23"H x 12"W x 10"D



KNP225FL
350 / 444 CFM*
23"H x 12"W x 10"D

* Fan airflow without filter.

GUARDIAN/GUARDIANX SERIES NEMA 4 OR 4X FILTER FANS KNP32FL



Model	Nema Rating	Airflow Direction	Voltage	Input Amps	Input Watts	Max Airflow CFM*	Unit Airflow CFM**	Noise db(A)	Operating Temp. °F		Approx. Weight	
									Min.	Max	Lbs.	Kg.
KNP32FL	4	Intake	115	0.09	2.9	30	20	53	-40	158	3.8	1.7
KNP32RFL	4	Exhaust	115	0.09	2.9	37	27	53	-40	158	3.8	1.7
K2NP32FL	4	Intake	230	0.09	2.9	30	20	53	-40	158	3.8	1.7
K2NP32RFL	4	Exhaust	230	0.09	2.9	37	27	53	-40	158	3.8	1.7
KNP32FLV	4X	Intake	115	0.09	2.9	30	20	53	-40	158	3.8	1.7
KNP32RFLV	4X	Exhaust	115	0.09	2.9	37	27	53	-40	158	3.8	1.7
K2NP32FLV	4X	Intake	230	0.09	2.9	30	20	53	-40	158	3.8	1.7
K2NP32RFLV	4X	Exhaust	230	0.09	2.9	37	27	53	-40	158	3.8	1.7

* Fan airflow without filter.
** NEMA Rated if installed with provided filter.



**NEMA
TYPE 4 OR 4X
MAINTAINED**

STANDARD FEATURES

- Baked Powder Finish
- Integrated Fan Guards
- Integrated Sealing Gasket
- IP55 Filter Protection
- NEMA 4 or 4X Rating Maintained (if used with provided filter)
- Secure Mounting
- Six-foot [1.8m] (minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X models)
- UL/CSA Shielded Ball-bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

ACCESSORIES AND OPTIONS

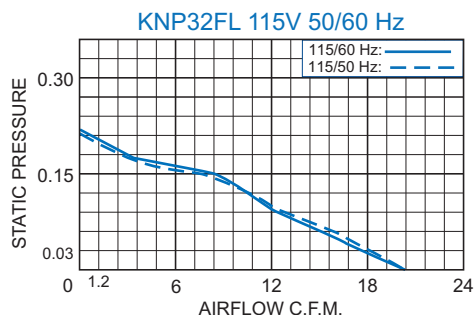
- Filter-Hood Assembly (Recommended)* †
- Other voltages, both AC & DC †
- Replacement Filters (P/N: 0429-02-06) †
- Reversed Airflow Direction** †

† Contact KOOLTRONIC for information.

* Part Number: KNPA36FL(V). Example: KNPA36FL. For GuardianX, add V. Example: KNPA36FLV.

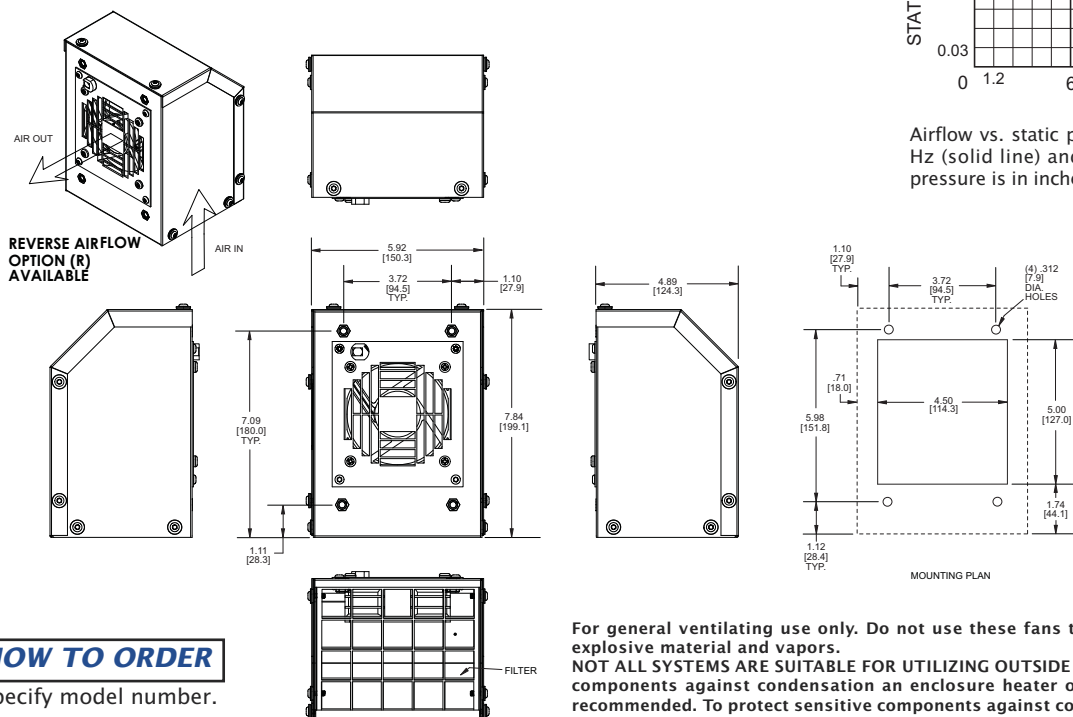
** To order reversed airflow direction, add "R" after series number. Example: KNP32RFL.

PERFORMANCE CHART



Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water.

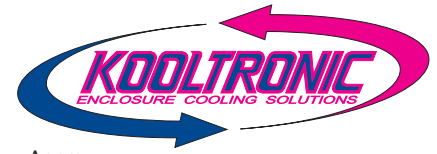
DRAWINGS



For general ventilating use only. Do not use these fans to exhaust hazardous or explosive material and vapors. NOT ALL SYSTEMS ARE SUITABLE FOR UTILIZING OUTSIDE AIR. To protect sensitive components against condensation an enclosure heater or closed-loop cooling is recommended. To protect sensitive components against corrosive elements closed-loop cooling is recommended.

Dimensions, inches [mm], are for reference only and are subject to change.

GUARDIAN/GUARDIANX SERIES NEMA 4 OR 4X FILTER FANS KNP36FL



**NEMA
TYPE 4 OR 4X
MAINTAINED**

Model	Nema Rating	Airflow Direction	Voltage	Input Amps	Input Watts	Max Airflow CFM*	Unit Airflow CFM**	Noise db(A)	Operating Temp. °F		Approx. Weight	
									Min.	Max.	Lbs.	Kg.
KNP36FL	4	Intake	115	0.08	4.3	47	26	54	-40	158	3.7	1.7
KNP36RFL	4	Exhaust	115	0.08	4.3	52	26	55	-40	158	3.7	1.7
K2NP36FL	4	Intake	230	0.08	4.3	47	26	54	-40	158	3.7	1.7
K2NP36RFL	4	Exhaust	230	0.08	4.3	52	26	55	-40	158	3.7	1.7
KNP36FLV	4X	Intake	115	0.08	4.3	47	26	54	-40	158	3.7	1.7
KNP36RFLV	4X	Exhaust	115	0.08	4.3	52	26	55	-40	158	3.7	1.7
K2NP36FLV	4X	Intake	230	0.08	4.3	47	26	54	-40	158	3.7	1.7
K2NP36RFLV	4X	Exhaust	230	0.08	4.3	52	26	55	-40	158	3.7	1.7

* Fan airflow without filter.
** NEMA Rated if installed with provided filter.

STANDARD FEATURES

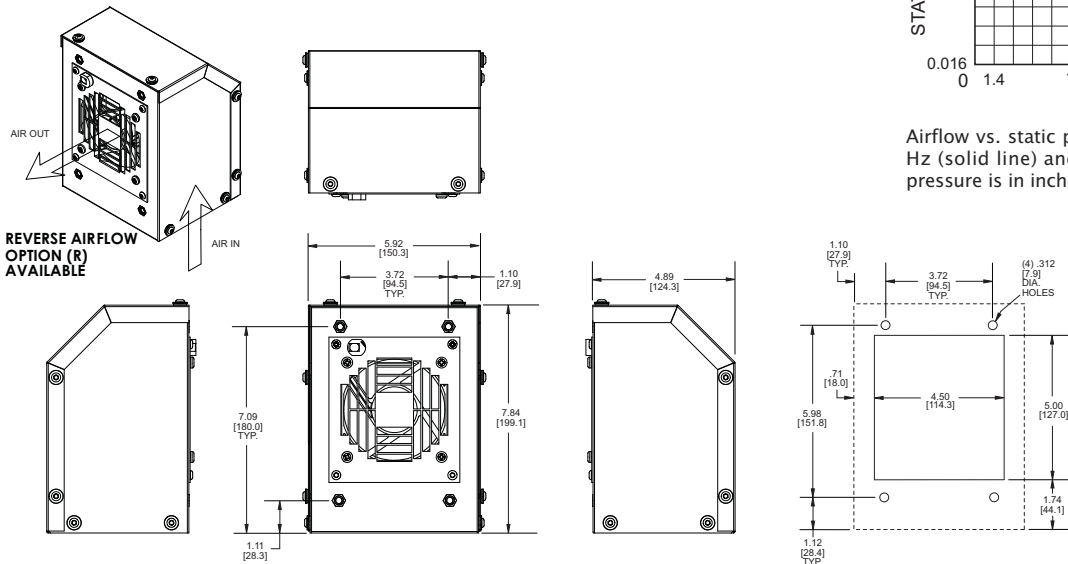
- Baked Powder Finish
- Integrated Fan Guards
- Integrated Sealing Gasket
- IP55 Filter Protection
- NEMA 4 or 4X Rating Maintained (if used with provided filter)
- Secure Mounting
- Stainless Steel Shell (NEMA 4X models)
- UL/CSA Shielded Ball-bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

ACCESSORIES AND OPTIONS

- Filter-Hood Assembly (Recommended)*
 - Other voltages, both AC & DC
 - Replacement Filters (P/N:0429-02-06)
 - Reversed Airflow Direction**
- ◆ Contact KOOLTRONIC for information.
- * Part Number: KNPA36FL(V): Example: KNPA36FL. For GuardianX, add V. Example: KNPA36FLV.
- ** To order reversed airflow direction, add "R" after series number. Example: KNP36RFL.

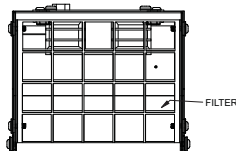
Page

DRAWINGS



HOW TO ORDER

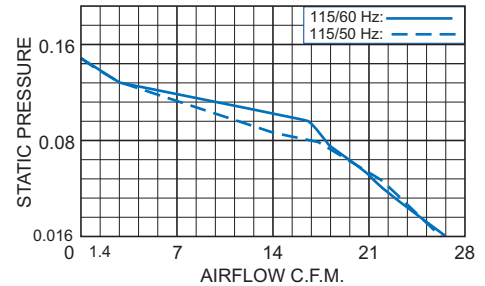
Specify model number.



For general ventilating use only. Do not use these fans to exhaust hazardous or explosive material and vapors. NOT ALL SYSTEMS ARE SUITABLE FOR UTILIZING OUTSIDE AIR. To protect sensitive components against condensation an enclosure heater or closed-loop cooling is recommended. To protect sensitive components against corrosive elements closed-loop cooling is recommended.

PERFORMANCE CHART

KNP36FL 115V 50/60 Hz

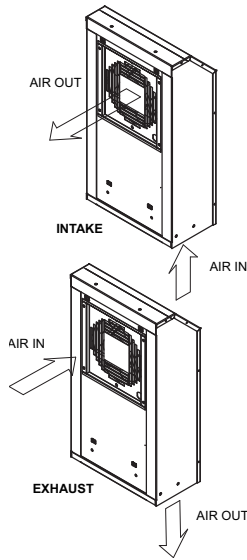
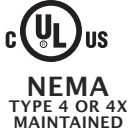


Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water.

GUARDIAN FILTER FANS

Dimensions, inches [mm], are for reference only and are subject to change.

GUARDIAN/GUARDIANX SERIES NEMA 4 OR 4X FILTER FANS KNP40FL



For general ventilating use only. Do not use these fans to exhaust hazardous or explosive material and vapors. NOT ALL SYSTEMS ARE SUITABLE FOR UTILIZING OUTSIDE AIR. To protect sensitive components against condensation an enclosure heater or closed-loop cooling is recommended. To protect sensitive components against corrosive elements closed-loop cooling is recommended.

Model	Airflow Direction	NEMA Rating	Voltage	Input Amps	Input Watts	Max. Airflow CFM*	Unit Airflow CFM**	Noise db(A)	Operating Temp. °F		Approx. Weight	
									Min.	Max.	Lbs.	Kg.
KNP40FL	Intake	4	115/60	0.19	13	106	45	55	-40	158	10	4.5
KNP40RFL	Exhaust	4	115/60	0.19	13	106	45	55	-40	158	10	4.5
KNP40FL	Intake	4	115/50	0.22	14	90	40	52	-40	158	10	4.5
KNP40RFL	Exhaust	4	115/50	0.22	14	90	40	52	-40	158	10	4.5
K2NP40FL	Intake	4	230/60	0.11	12	106	44	55	-40	158	10	4.5
K2NP40RFL	Exhaust	4	230/60	0.11	12	106	44	55	-40	158	10	4.5
K2NP40FL	Intake	4	230/50	0.13	14	90	39	52	-40	158	10	4.5
K2NP40RFL	Exhaust	4	230/50	0.13	14	90	39	52	-40	158	10	4.5
K6NP40FL	Intake	4	12 VDC	0.43	5.1	100	27	43	14	158	10	4.5
K6NP40RFL	Exhaust	4	12 VDC	0.43	5.1	100	27	43	14	158	10	4.5
K7NP40FL	Intake	4	24 VDC	0.1	2.4	108	41	45	14	158	10	4.5
K7NP40RFL	Exhaust	4	24 VDC	0.1	2.4	108	41	45	14	158	10	4.5
K8NP40FL	Intake	4	48 VDC	0.11	5.3	108	30	43	14	158	10	4.5
K8NP40RFL	Exhaust	4	48 VDC	0.11	5.3	108	30	43	14	158	10	4.5
KNP40FLV	Intake	4X	115/60	0.19	13	106	45	55	-40	158	10	4.5
KNP40RFLV	Exhaust	4X	115/60	0.19	13	106	45	55	-40	158	10	4.5
KNP40FLV	Intake	4X	115/50	0.22	14	90	40	52	-40	158	10	4.5
KNP40RFLV	Exhaust	4X	115/50	0.22	14	90	40	52	-40	158	10	4.5
K2NP40FLV	Intake	4X	230/60	0.11	12	106	45	55	-40	158	10	4.5
K2NP40RFLV	Exhaust	4X	230/60	0.11	12	106	45	55	-40	158	10	4.5
K2NP40FLV	Intake	4X	230/50	0.13	14	90	40	52	-40	158	10	4.5
K2NP40RFLV	Exhaust	4X	230/50	0.13	14	90	40	52	-40	158	10	4.5
K6NP40FLV	Intake	4X	12 VDC	0.43	5.1	100	27	43	14	158	10	4.5
K6NP40RFLV	Exhaust	4X	12 VDC	0.43	5.1	100	27	43	14	158	10	4.5
K7NP40FLV	Intake	4X	24 VDC	0.1	2.4	108	41	45	14	158	10	4.5
K7NP40RFLV	Exhaust	4X	24 VDC	0.1	2.4	108	41	45	14	158	10	4.5
K8NP40FLV	Intake	4X	48 VDC	0.11	5.3	108	30	43	14	158	10	4.5
K8NP40RFLV	Exhaust	4X	48 VDC	0.11	5.3	108	30	43	14	158	10	4.5

* Fan airflow without filter.
** UL Rated if installed with provided filter.

STANDARD FEATURES

- Integrated Fan Guards
- Integrated Sealing Gasket
- IP55 Filter Protection
- NEMA 4 or 4X Rating Maintained (if used with provided filter)
- Secure Mounting
- Stainless Steel Shell (NEMA 4X models)
- Baked Powder Finish
- UL/CSA Shielded Ball-bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

HOW TO ORDER

Specify model number.

ACCESSORIES AND OPTIONS

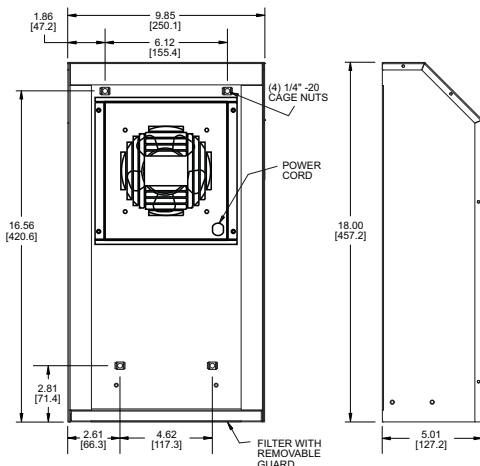
- Filter-Hood Assembly (Recommended)* 176
- Other voltages, both AC & DC †
- Replacement Filters (P/N: 0429-01-01) †
- Reversed Airflow Direction** †

† Contact KOOLTRONIC for information.

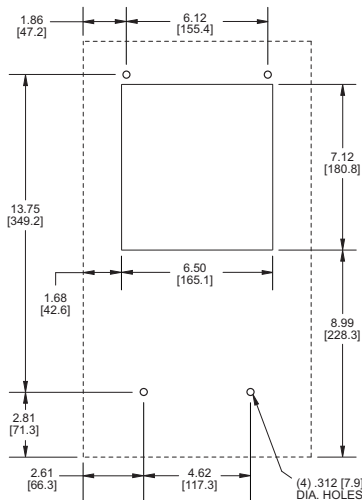
* Part Number: KNPA60FL(V). Example: KNPA60FL. For GuardianX, add V. Example: KNPA60FLV.

** To order reversed airflow direction, add "R" after series number. Example: KNP40RFL.

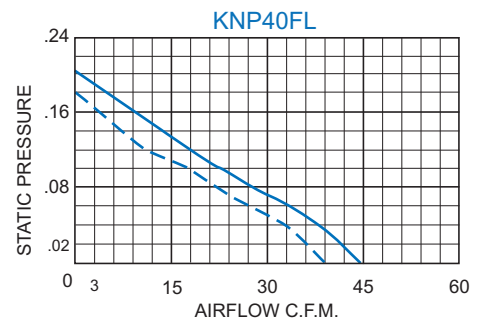
DRAWINGS



MOUNTING PLAN



PERFORMANCE CHART

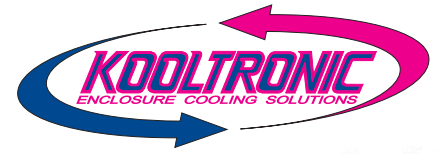


Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water.

Dimensions, inches [mm], are for reference only and are subject to change.

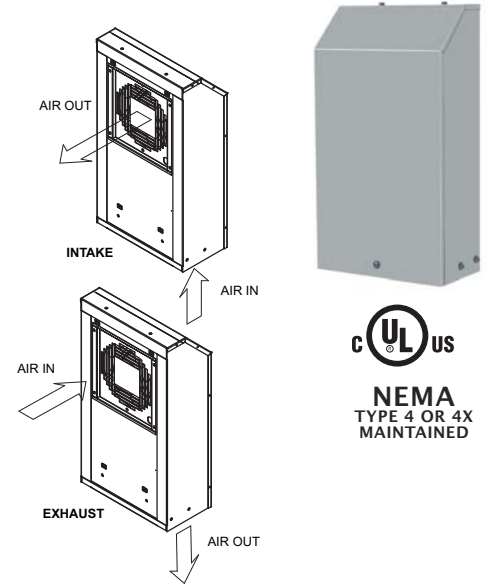
GUARDIAN FILTER FANS

GUARDIAN/GUARDIANX SERIES NEMA 4 OR 4X FILTER FANS KNP60FL



Model	Airflow Direction	NEMA Rating	Voltage	Input Amps	Input Watts	Max. Airflow CFM*	Unit Airflow CFM**	Noise db(A)	Operating Temp. °F		Approx. Weight	
									Min.	Max.	Lbs.	Kg.
KNP60FL	Intake	4	115/60	0.34	37	290	92	61	-40	158	11.3	5.1
KNP60RFL	Exhaust	4	115/60	0.34	37	290	92	61	-40	158	11.3	5.1
KNP60FL	Intake	4	115/50	0.42	43	270	84	59	-40	158	11.3	5.1
KNP60RFL	Exhaust	4	115/50	0.42	43	270	84	59	-40	158	11.3	5.1
K2NP60FL	Intake	4	230/60	0.17	36	290	80	61	-40	158	11.3	5.1
K2NP60RFL	Exhaust	4	230/60	0.17	36	290	80	61	-40	158	11.3	5.1
K2NP60FL	Intake	4	230/50	0.2	37	270	70	59	-40	158	11.3	5.1
K2NP60RFL	Exhaust	4	230/50	0.2	37	270	70	59	-40	158	11.3	5.1
K6NP60FL	Intake	4	12 VDC	0.52	6.2	225	72	67	-40	167	11.3	5.1
K6NP60RFL	Exhaust	4	12 VDC	0.52	6.2	225	72	67	-40	167	11.3	5.1
K7NP60FL	Intake	4	24 VDC	0.6	14.4	230	72	54	-40	158	11.3	5.1
K7NP60RFL	Exhaust	4	24 VDC	0.6	14.4	230	72	54	-40	158	11.3	5.1
K8NP60FL	Intake	4	48 VDC	0.36	16.8	240	40	58	-40	158	11.3	5.1
K8NP60RFL	Exhaust	4	48 VDC	0.36	16.8	240	40	58	-40	158	11.3	5.1
KNP60FLV	Intake	4X	115/60	0.34	37	290	92	61	-40	158	11.3	5.1
KNP60RFLV	Exhaust	4X	115/60	0.34	37	290	92	61	-40	158	11.3	5.1
KNP60FLV	Intake	4X	115/50	0.42	43	270	84	59	-40	158	11.3	5.1
KNP60RFLV	Exhaust	4X	115/50	0.42	43	270	84	59	-40	158	11.3	5.1
K2NP60FLV	Intake	4X	230/60	0.17	36	290	80	61	-40	158	11.3	5.1
K2NP60RFLV	Exhaust	4X	230/60	0.17	36	290	80	61	-40	158	11.3	5.1
K2NP60FLV	Intake	4X	230/50	0.2	37	270	70	59	-40	158	11.3	5.1
K2NP60RFLV	Exhaust	4X	230/50	0.2	37	270	70	59	-40	158	11.3	5.1
K6NP60FLV	Intake	4X	12 VDC	0.52	6.2	225	72	67	-40	167	11.3	5.1
K6NP60RFLV	Exhaust	4X	12 VDC	0.52	6.2	225	72	67	-40	167	11.3	5.1
K7NP60FLV	Intake	4X	24 VDC	0.6	14.4	230	72	54	-40	158	11.3	5.1
K7NP60RFLV	Exhaust	4X	24 VDC	0.6	14.4	230	72	54	-40	158	11.3	5.1
K8NP60FLV	Intake	4X	48 VDC	0.36	16.8	240	40	58	-40	158	11.3	5.1
K8NP60RFLV	Exhaust	4X	48 VDC	0.36	16.8	240	40	58	-40	158	11.3	5.1

* Fan airflow without filter.
** UL Rated if installed with provided filter.



For general ventilating use only. Do not use these fans to exhaust hazardous or explosive material and vapors. NOT ALL SYSTEMS ARE SUITABLE FOR UTILIZING OUTSIDE AIR. To protect sensitive components against condensation an enclosure heater or closed-loop cooling is recommended. To protect sensitive components against corrosive elements closed-loop cooling is recommended.

STANDARD FEATURES

- Integrated Fan Guards
- Integrated Sealing Gasket
- IP55 Filter Protection
- NEMA 4 or 4X Rating Maintained (if used with provided filter)
- Secure Mounting
- Stainless Steel Shell (NEMA 4X models)
- Baked Powder Finish
- UL/CSA Shielded Ball-bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

HOW TO ORDER

Specify model number.

ACCESSORIES AND OPTIONS

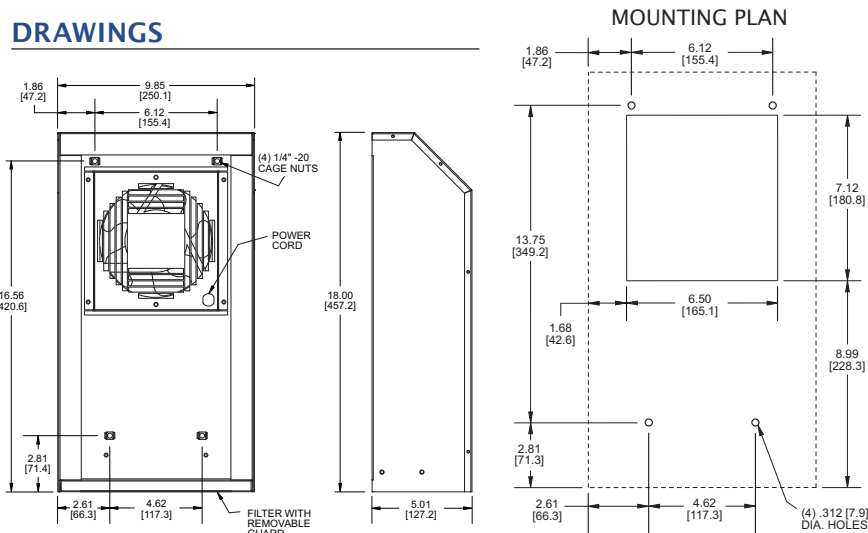
- | | |
|--|----------|
| ■ Filter-Hood Assembly (Recommended)* | Page 176 |
| ■ Other voltages, both AC & DC | ♦ |
| ■ Replacement Filters (P/N:0429-01-01) | ♦ |
| ■ Reversed Airflow Direction** | ♦ |

♦ Contact KOOLTRONIC for information.

* Part Number: KNPA60FL(V). Example: KNPA60LF. For GuardianX, add V. Example: KNPA60FLV.

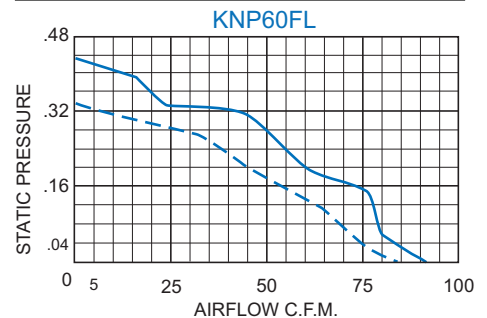
** To order reversed airflow direction, add "R" after series number. Example: KNP60RFL.

DRAWINGS



Dimensions, inches [mm], are for reference only and are subject to change.

PERFORMANCE CHART



Airflow vs. static pressure curves are shown for 60 Hz (solid line) and 50 Hz (broken line) inputs. Static pressure is in inches of water.

GUARDIAN/GUARDIANX SERIES

NEMA 4 OR 4X FILTER FANS KNP180FL



Model	Airflow Direction	NEMA Rating	Voltage	Input Amps	Input Watts	Max Airflow CFM*	Unit Airflow CFM**	Noise db(A)	Operating Temp. °F		Approx. Weight	
									Min.	Max	Lbs.	Kg.
KNP180FL	Intake	4	115/60	0.48	53	221	179	61.9	-40	122	23.5	10.7
KNP180RFL	Exhaust	4	115/60	0.48	53	220	177	61.9	-40	122	23.5	10.7
K2NP180FL	Intake	4	230/60	0.27	61	221	179	61.9	-40	140	23.5	10.7
K2NP180RFL	Exhaust	4	230/60	0.27	61	220	177	61.9	-40	158	23.5	10.7
K7NP180FL	Intake	4	24VDC	2.52	47	221	179	61.9	-4	158	23.5	10.7
K7NP180RFL	Exhaust	4	24VDC	2.52	47	220	177	61.9	-4	158	23.5	10.7
K8NP180FL	Intake	4	48 VDC	1.1	53	221	179	61.9	-4	158	23.5	10.7
K8NP180RFL	Exhaust	4	48 VDC	1.1	53	220	177	61.9	-4	158	23.5	10.7
KNP180 FLV	Intake	4X	115/60	0.48	53	221	179	61.9	-40	158	23.5	10.7
KNP180 RFLV	Exhaust	4X	115/60	0.48	53	220	177	61.9	-40	158	23.5	10.7
K2NP180FLV	Intake	4X	230/60	0.27	61	221	179	61.9	-40	158	23.5	10.7
K2NP180RFLV	Exhaust	4X	230/60	0.27	61	220	177	61.9	-40	158	23.5	10.7
K7NP180FLV	Intake	4X	24VDC	2.52	47	221	179	61.9	-4	158	23.5	10.7
K7NP180RFLV	Exhaust	4X	24VDC	2.52	47	220	177	61.9	-4	158	23.5	10.7
K8NP180FLV	Intake	4X	48 VDC	1.1	53	221	179	61.9	-4	158	23.5	10.7
K8NP180RFLV	Exhaust	4X	48 VDC	1.1	53	220	177	61.9	-4	158	23.5	10.7

* Fan airflow without filter and grille.

** NEMA Rated if installed with provided filter.

STANDARD FEATURES

- Baked Powder Finish
- Integrated Fan Guards
- Integrated Sealing Gasket
- IP55 Filter Protection
- NEMA 4 or 4X Rating Maintained (if used with provided filter)
- Secure Mounting
- Six foot [1.8m] (minimum) 3-wire power cord
- Stainless Steel Shell (NEMA 4X models)
- UL Shielded Ball-bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

ACCESSORIES AND OPTIONS

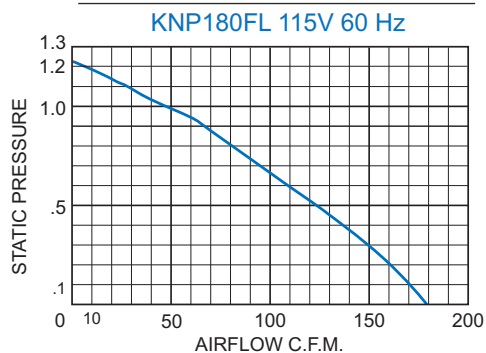
- | | |
|--|---|
| ■ Filter-Hood Assembly (Recommended)* | ◆ |
| ■ Other voltages, both AC & DC | ◆ |
| ■ Replacement Filters for all models (P/N: 0429-01-06) | ◆ |
| ■ T-Temperature Control (90°F) (AC units only) | ◆ |
| ■ B-Temperature Alarm (130°) | ◆ |
| ■ Reversed Airflow Direction** | ◆ |

◆ Contact KOOLTRONIC for information.

* Part Number: KNPA225FL(V). Example: KNPA225FL. For GuardianX, add V. Example: KNPA225FLV.

** To order reversed airflow direction, add "R" after series number. Example: KNP180RFL.

PERFORMANCE CHART

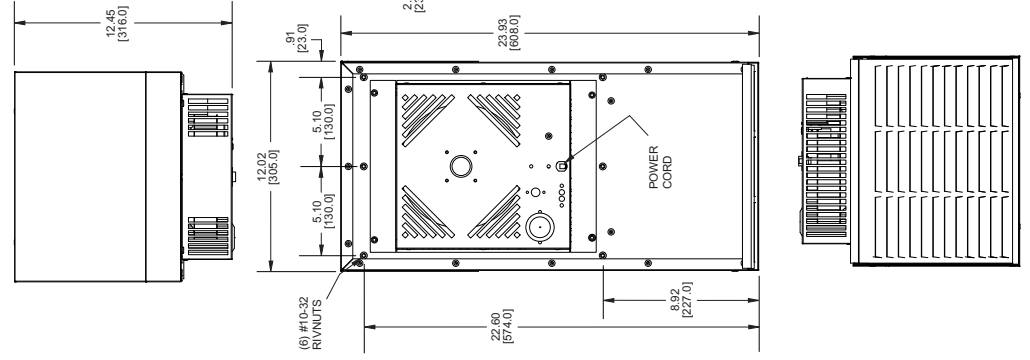
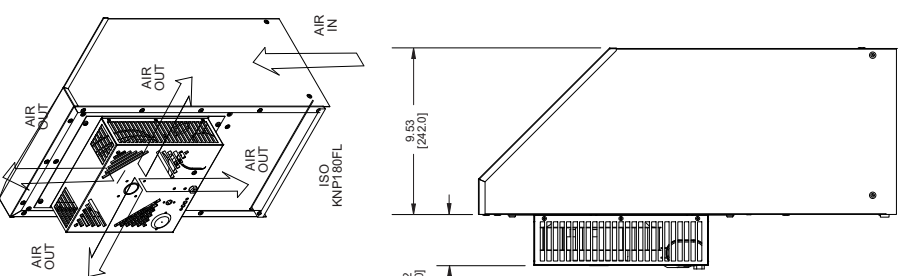
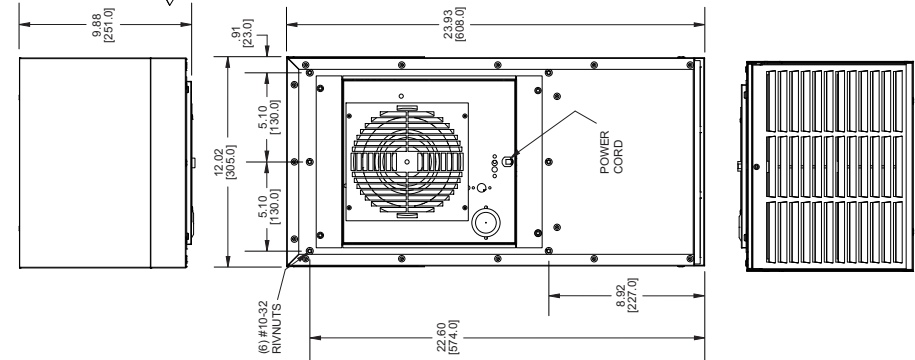
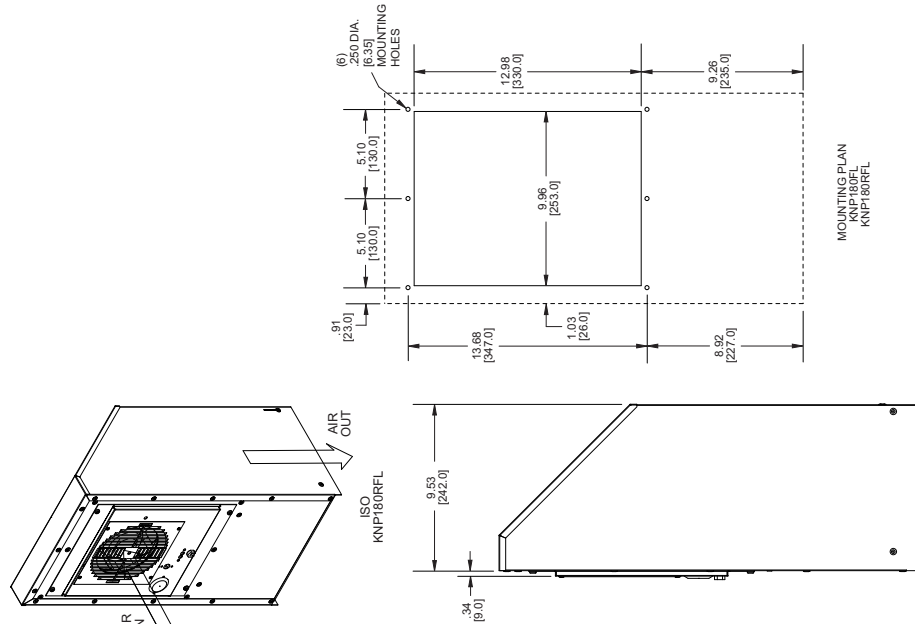
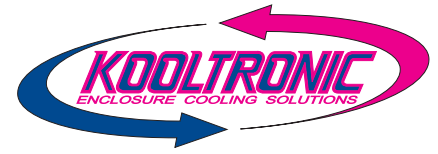


Airflow vs. static pressure curve is shown for 60 Hz (solid line) inputs. Static pressure is in inches of water.

For general ventilating use only. Do not use these fans to exhaust hazardous or explosive material or vapors.

NOT ALL SYSTEMS ARE SUITABLE FOR UTILIZING OUTSIDE AIR. To protect sensitive components against condensation an enclosure heater or closed-loop cooling is recommended. To protect sensitive components against corrosive elements closed-loop cooling is recommended.

GUARDIAN/GUARDIANX SERIES NEMA 4 OR 4X FILTER FANS KNP180FL



GUARDIAN FILTER FANS

GUARDIAN/GUARDIANX SERIES

NEMA 4 OR 4X FILTER FANS KNP225FL



Model	Airflow Direction	NEMA Rating	Voltage	Input Amps	Input Watts	Max Airflow CFM*	Unit Airflow CFM**	Noise db(A)	Operating Temp. °F		Approx. Weight	
									Min.	Max	Lbs.	Kg.
KNP225FL	Intake	4	115	1.85	210	444	350	69.1	-40	122	23.5	10.7
KNP225RFL	Exhaust	4	115	1.85	210	444	350	69.1	-40	122	23.5	10.7
K2NP225FL	Intake	4	230	0.93	213	444	350	69.1	-40	140	23.5	10.7
K2NP225RFL	Exhaust	4	230	0.93	213	444	350	69.1	-40	140	23.5	10.7
K8NP225FL	Intake	4	48 VDC	2.43	116	444	350	69.1	-4	158	23.5	10.7
K8NP225RFL	Exhaust	4	48 VDC	2.43	116	444	350	69.1	-4	158	23.5	10.7
KNP225 FLV	Intake	4X	115	1.85	210	444	350	69.1	-40	122	23.5	10.7
KNP225 RFLV	Exhaust	4X	115	1.85	210	444	350	69.1	-40	122	23.5	10.7
K2NP225FLV	Intake	4X	230	0.93	213	444	350	69.1	-40	140	23.5	10.7
K2NP225RFLV	Exhaust	4X	230	0.93	213	444	350	69.1	-40	140	23.5	10.7
K8NP223FLV	Intake	4X	48 VDC	2.43	116	444	350	69.1	-4	158	23.5	10.7
K8NP223RFLV	Exhaust	4X	48 VDC	2.43	116	444	350	69.1	-4	158	23.5	10.7

* Fan airflow without filter and grille.

** NEMA Rated if installed with provided filter.



STANDARD FEATURES

- Baked Powder Finish
- Integrated Fan Guards
- Integrated Sealing Gasket
- IP55 Filter Protection
- NEMA 4 or 4X Rating Maintained (if used with provided filter)
- Secure Mounting
- Six foot [1.8m] (minimum) 3-wire power cord
- Stainless Steel Shell (NEMA 4X models)
- UL Shielded Ball-bearing Motors
- UL/CUL Listed
- Washable, Reuseable Filter

ACCESSORIES AND OPTIONS

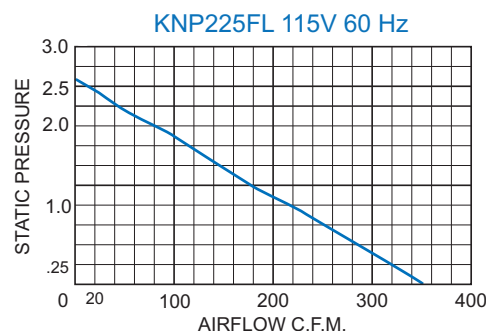
	Page
■ Filter-Hood Assembly (Recommended)*	♦
■ Other voltages, both AC & DC	♦
■ Replacement Filters for all models (P/N: 0429-01-06)	♦
■ T-Temperature Control (90°F) (AC units only)	♦
■ B-Temperature Alarm (130°)	♦
■ Reversed Airflow Direction**	♦

♦ Contact KOOLTRONIC for information.

* Part Number: KNPAP225FL(V). Example: KNPA225FL. For GuardianX, add V. Example: KNPA225FLV.

** To order reversed airflow direction, add "R" after series number. Example: KNP225RFL.

PERFORMANCE CHART

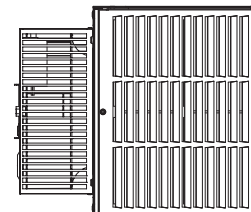
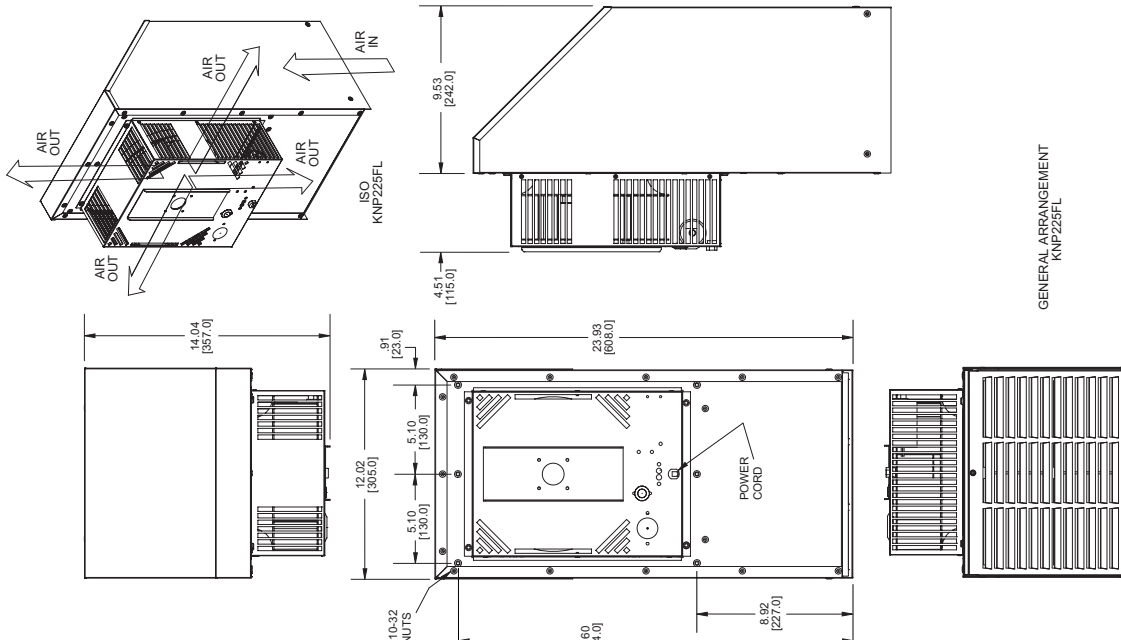
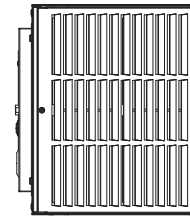
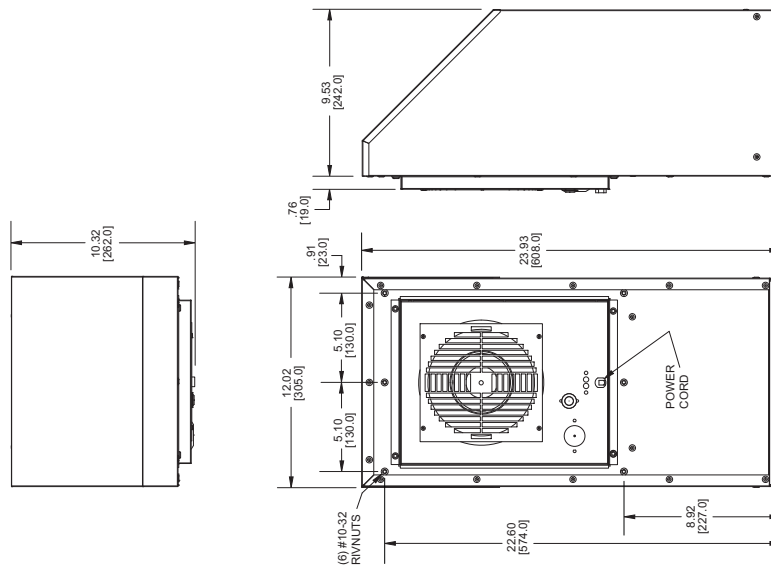
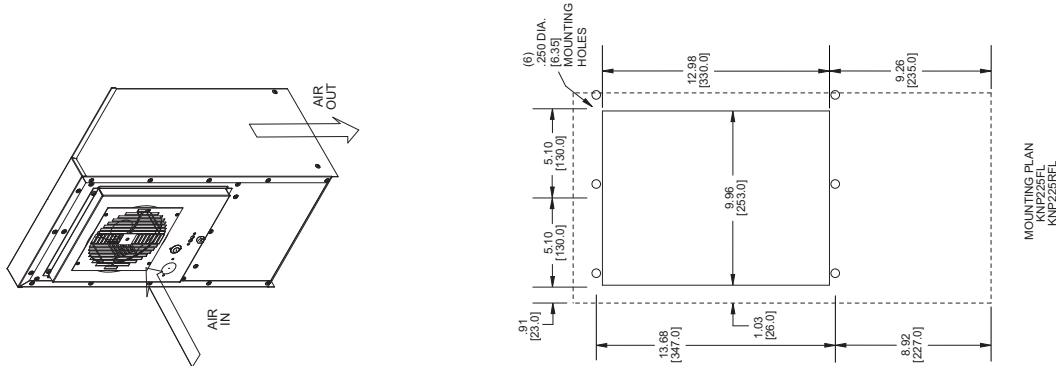
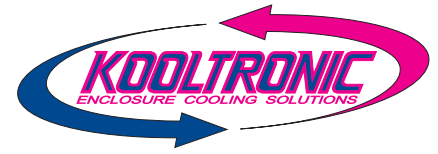


Airflow vs. static pressure curve is shown for 60 Hz (solid line) inputs. Static pressure is in inches of water.

For general ventilating use only. Do not use these fans to exhaust hazardous or explosive material or vapors.

NOT ALL SYSTEMS ARE SUITABLE FOR UTILIZING OUTSIDE AIR. To protect sensitive components against condensation an enclosure heater or closed-loop cooling is recommended. To protect sensitive components against corrosive elements closed-loop cooling is recommended.

GUARDIAN/GUARDIANX SERIES NEMA 4 OR 4X FILTER FANS KNP225FL



ADVANTAGE SERIES KBFF FILTER FANS FILTER-GRILLE ASSEMBLIES



TYPE 12
MAINTAINED

STANDARD FEATURES

- Mounts Quickly and Easily
- Attractive Appearance
- Requires No Mounting Hardware
- Integral Finger-Guards
- Type 12 Maintained
- Integrated Sealing Gasket
- Washable Filter Media (about ten times)

CHARACTERISTICS

All materials can be recycled.

Mounting hardware is not required when using the "snap-in" method which utilizes elastic hooks.

The plastic enclosure with integral finger guards consists of an ABS/PC alloy (Blend) and is self-extinguishing according to UL94V-0.

The standard filter media consists of thermolinked, progressive structure synthetic fiber.

Filters are stable up to 100°C and 100% rh.

Filters guarantee a continuously high level of protection according to EU4, with a 94% separation efficiency according to DIN 24185 Standard.

Dust capacity is particularly high (620 g/m²), which reduces maintenance.

Plate thickness: KBFA08U from .039 to .079, KBFA12U & KBFA21U from .039 to .083, KBFA21U & KBFA21U from .059 to .098.

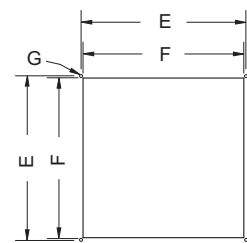
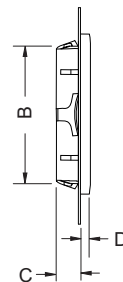
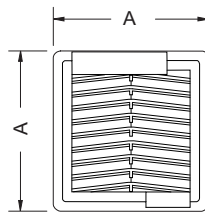
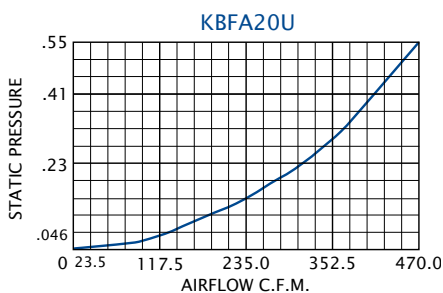
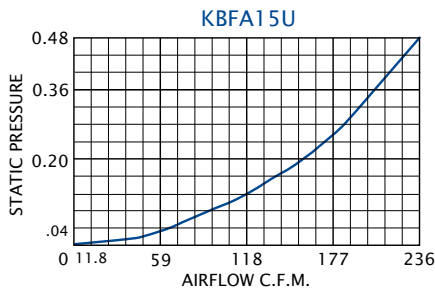
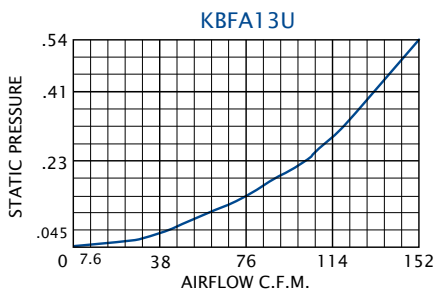
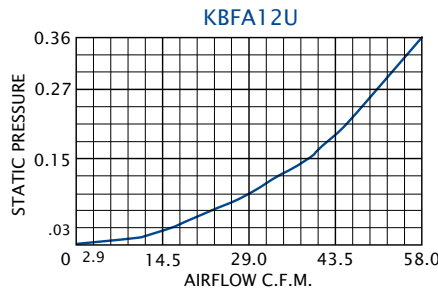
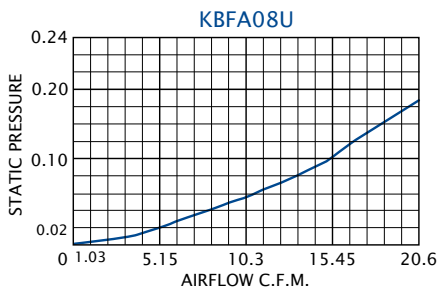
ACCESSORIES AND OPTIONS

- RAL 9005, Black (See How to Order) Filter

HOW TO ORDER

Specify model number. Example: KBFA08U. RAL 7035 (Light Grey) is standard color. Grille Assemblies are also available in RAL 9005 (Black). To order Black Grille, substitute N for U in model number.

Example: KBFA08U for Light Grey Grille, KBFA08N for Black Grille.



MOUNTING PLAN

Model	A	B	C	D	E	F	G	Cross section free without media	Approx. Weight	Approvals	
	IN. [mm]	IN. [mm]	IN. [mm]	IN. [mm]	IN. [mm]	IN. [mm]					Tolerance
KBFA08U	4.19 [106.5]	3.60 [91.5]	.65 [16.5]	.26 [6.7]	3.74 [95.0]	3.64 [92.5]	+0.06/-0	.07 [1.8]	4.65	0.15 0.07	1,2,5
KBFA12U	5.91 [150.0]	4.92 [125.0]	.85 [21.5]	.30 [7.7]	5.16 [131.0]	4.92 [125.0]	+0.06/-0	.18 [4.5]	9.14	0.40 0.18	1,2,5
KBFA21U	8.03 [203.9]	6.93 [176.0]	.85 [21.5]	.32 [8.0]	7.28 [185.0]	6.97 [177.0]	+0.06/-0	.18 [4.5]	20.77	0.57 0.26	1,2,5
KBFA21U	9.84 [250.0]	8.78 [223.0]	.98 [24.9]	.35 [8.9]	9.06 [230.0]	8.78 [223.0]	+0.06/-0	.18 [4.5]	32.09	0.93 0.42	1,2,5
KBFA21U	12.79 [325.0]	11.45 [291.0]	.97 [24.5]	.37 [9.5]	11.89 [302.0]	11.46 [291.0]	+0.06/-0	.18 [4.5]	59.37	1.32 0.60	1,2,5

HOW TO ORDER

Specify model number.

APPROVALS: 1.



2.



3.



4.

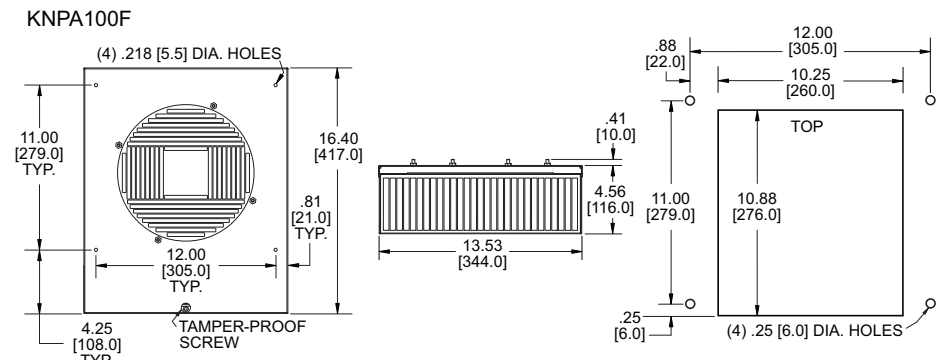
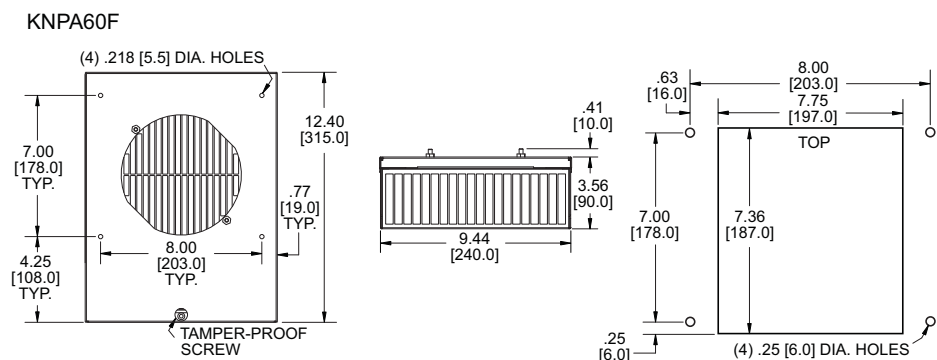
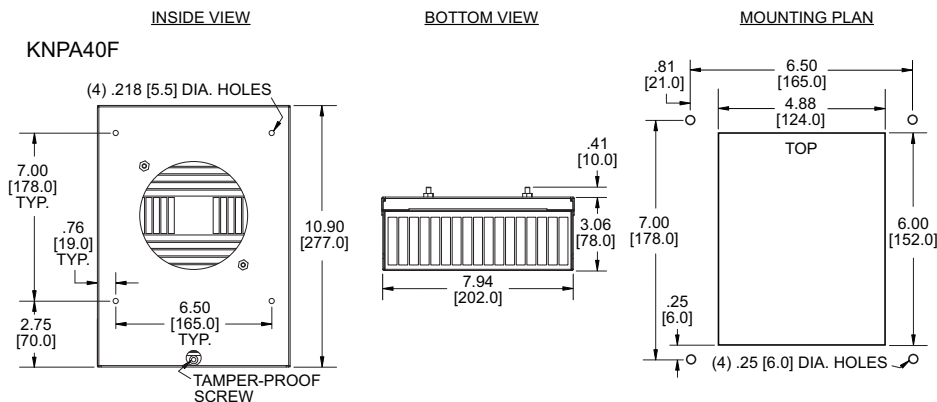
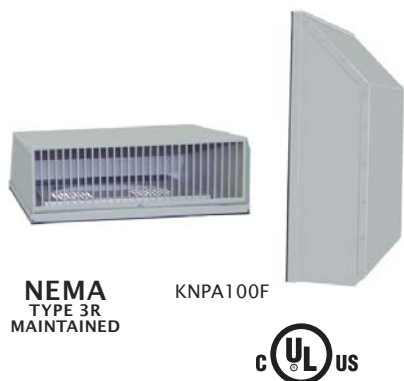
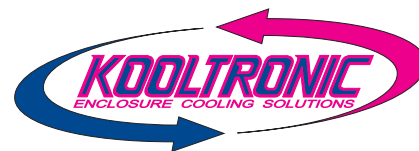


5.



ADVANTAGE FILTER GRILLES

ADVANTAGE SENTRY SERIES FILTER FANS FILTER-GRILLE ASSEMBLIES



DESCRIPTION

These Filter-Grille Assemblies can be used in conjunction with the Advantage Sentry Series Filter Fans for enclosure cooling. In a typical mounting orientation the motorized Filter Fan pulls air into an enclosure while the Filter-Grille Assembly functions as an outlet. Alternatively, if the reverse airflow option is chosen for the filter fan, the fan exhausts the enclosure and the Filter-Grille Assembly functions as an intake. These Filter-Grille Assemblies feature filters that are easily removed for cleaning or replacement.

STANDARD FEATURES

- Integrated Sealing Gasket
- Secure Mounting
- Baked Powder Finish
- UL/CUL Listed
- Washable, Reuseable Filter

ACCESSORIES AND OPTIONS

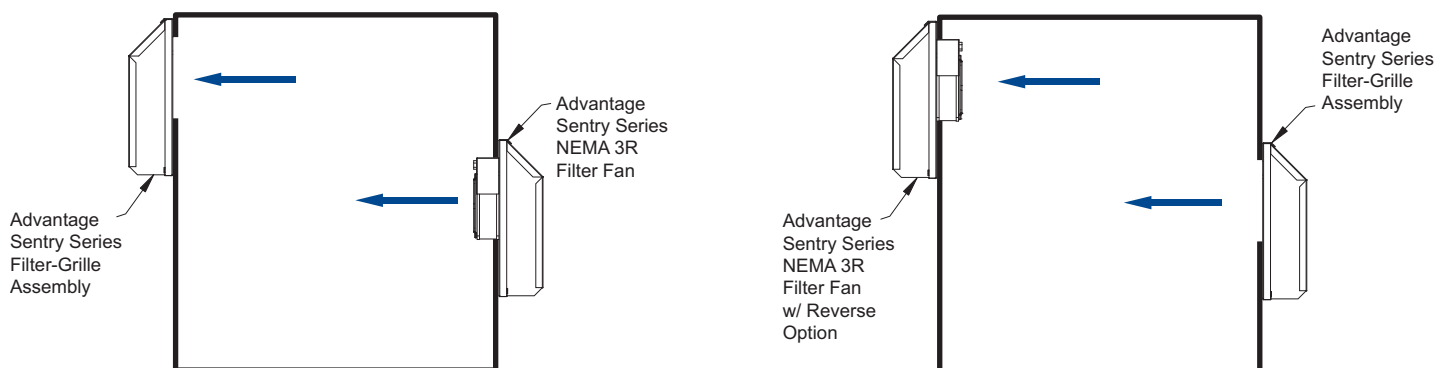
- Custom Grille Colors
- Filters (Optional filters guarantee a high level of protection according to EU4, with a 94% separation efficiency according to DIN 24185 Standard)

HOW TO ORDER

Specify model number.

TYPICAL MOUNTING ORIENTATIONS

(Left) Filter Fan pressurizes cabinet. Filter-Grille Assembly exhausts cabinet. (Right) Filter Fan with Reverse Option chosen. Blue arrows show direction of airflow. Boxes represent side view of electronics/electrical enclosure.

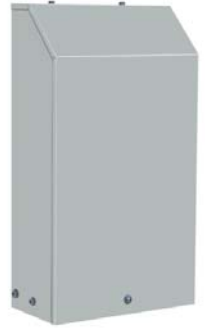


SENTRY SERIES FILTER GRILLES

GUARDIAN/GUARDIANX SERIES FILTER FANS FILTER-HOOD ASSEMBLIES

DESCRIPTION (P/N: KNPA60FL(V))

These Filter-Hood Assemblies can be used in conjunction with the Guardian/GuardianX Series Filter Fans for enclosure cooling. In a typical mounting orientation the motorized Filter Fan pulls air into an enclosure while the Filter-Hood Assembly functions as an outlet. Alternatively, if the reverse airflow option is chosen for the filter fan, the fan exhausts the enclosure and the Filter-Hood Assembly functions as an intake. These Filter-Hood Assemblies feature filters that are easily removed for cleaning or replacement.

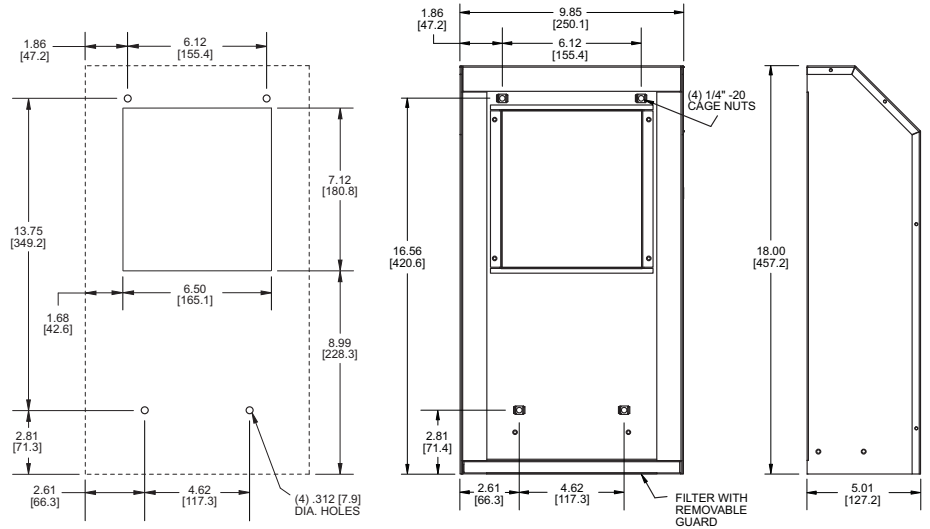


KNPA60FL(V)

STANDARD FEATURES

- Baked Powder Finish
- Filter
- Integrated Sealing Gasket
- IP55 Filter Protection
- NEMA 4 or 4X Rating Maintained (If used with provided filter)
- Secure Mounting
- Stainless Steel Shell (NEMA 4X models)
- UL/CUL Listed
- Washable, Reuseable Filter

NEMA TYPE 4 OR 4X MAINTAINED



MOUNTING PLAN

KNPA60FL(V)

ACCESSORIES AND OPTIONS

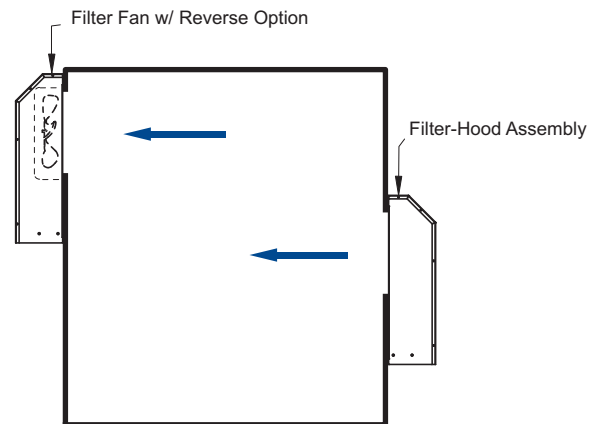
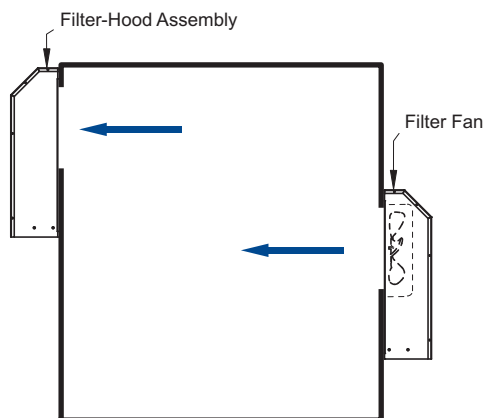
- Replacement Filters (P/N: 0429-01-01)

HOW TO ORDER

Specify model number. For GuardianX, add V.
Example: KNPA60FLV.

TYPICAL MOUNTING ORIENTATIONS

(Left) Filter Fan pressurizes cabinet. Filter-Hood Assembly exhausts cabinet. (Right) Filter Fan with Reverse Option chosen. Blue arrows show direction of airflow. Boxes represent side view of electronics/electrical enclosure.



HAVING TROUBLE KEEPING YOUR COOL?

Guardian/GuardianX Series
NEMA 4/4X Panel-Mounted
Air Conditioners

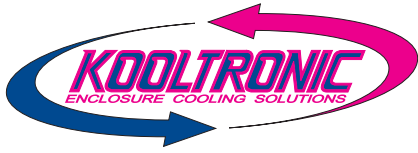


Perfect for
harsh
environments!



800 321-KOOL (5665)
www.kooltronic.com

Guardian/GuardianX Series NEMA 4 or 4X
Rated Air Conditioners Page 26



ENCLOSURE ACCESSORIES

ENCLOSURE ACCESSORIES

KOOLTRONIC offers Enclosure Accessories that control temperature and humidity as well as help to organize space in electrical enclosures. Suitable for any application, this selection of accessories includes **heaters, thermostats, hygrotherms, hygrometers, lights, electronic relays and mounting aids.**

Maintaining consistent enclosure temperatures is the key to prolonging the life of sensitive electronics and avoiding costly system failures. Both indoor and outdoor applications are subject to temperature and humidity changes that can lead to formation of condensation. When the relative humidity rises above 60% condensation will begin to form on the electronics housed in an enclosure. In order to prevent this dangerous build-up, KOOLTRONIC offers a selection of **enclosure heaters** that help maintain consistent temperatures and prolong the life of sensitive electronics. Several models of both **high performance fan heaters** and **compact PTC heaters** are available. All models are DIN rail mountable.

The heating and cooling devices used in enclosure climate control must themselves be monitored and regulated to assure the appropriate temperature and humidity conditions necessary for trouble-free operation. KOOLTRONIC **Enclosure Accessory Controls** can help achieve the ideal operating conditions even in the harshest environments. KOOLTRONIC offers an assortment of **thermostats** (Mechanical, Small and Dual Function) designed to control the air temperature inside of enclosures and control panels. **Hygrometers** are designed to control the relative air humidity inside of enclosures. **Electronic hygrotherms** sense the ambient temperature and relative air humidity. Depending on which contact combination is chosen, they then turn on or off a connected device if either the temperature is below or the humidity above a set point. **Electronic relays (24 VDC & 48 VDC)** are designed to switch high powered DC operated equipment up to 16 Amps. The 16 Amp relay contact will be closed once a pilot contact of a connected switch, i.e. a thermostat (not provided), is closed. KOOLTRONIC also offers a selection of **compact enclosure lights** designed for use in industrial enclosures and control panels. These lights offer simple and quick installation, and the flexibility of various mounting positions. KOOLTRONIC also offers **small accessories** designed to aid in the organization of electronic cabinets and control panels. The **enclosure receptacles** offer quick connection, are available with or without fuse and are DIN rail mountable. **KSDR/FIX** makes the mounting of smaller DIN rail mountable components easier.

ENCLOSURE ACCESSORIES: THERMOSTATS



DESCRIPTION

These thermostats work to maintain the proper enclosure climate for the safe operation of electronic components. The heating and cooling devices used in enclosure climate control must be monitored and regulated to assure the appropriate temperature and humidity conditions necessary for trouble-free operation. KOOLTRONIC **thermostats** can help achieve the ideal operating conditions even in the harshest environments.

Dual Thermostats: Dual Thermostats house two separate thermostats, allowing the independent control of heating, cooling or other equipment.

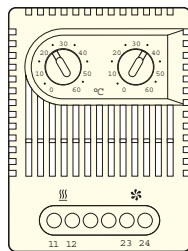
Small Thermostats: Compact design makes these thermostats perfect for densely packed electronic enclosures.

Mechanical Thermostats: Designed to control the air temperature inside of enclosures and control panels, these thermostats can be used for enclosure heaters, cooling equipment, (e.g. filter fans), or signal devices.

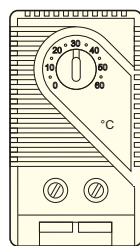
24 VDC Thermostats: Designed to switch the potentially high loads (amps) of DC 24 V operated equipment.

KOOLTRONIC also designs and manufactures a variety of cooling units to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

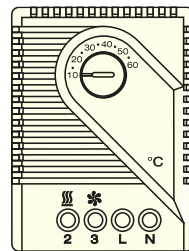
**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**



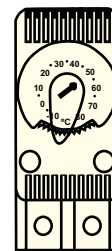
**Dual
Thermostat**
2.6"H x 1.9"W x 1.8"D



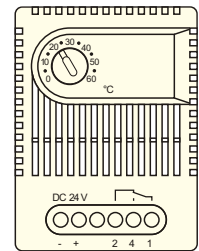
**Small
Thermostat**
2.3"H x 1.3"W x 1.7"D



**Mechanical
Thermostat**
2.6"H x 1.9"W x 1.5"D

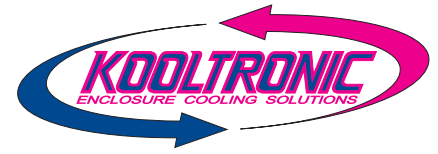


**Mechanical
Thermostat**
2.6"H x 1.1"W x 1.7"D



**24 VDC
Thermostat**
2.6"H x 1.9"W x 1.8"D

DUAL THERMOSTAT



The KSDT Dual Thermostat houses two separate thermostats, allowing the independent control of heating and cooling or other equipment. Both thermostats offer wide adjustment ranges and are color coded for easy function recognition. Patent pending.



STANDARD FEATURES

- Two thermostats in one unit
one Normally Closed (NC) & one Normally Open (NO)
or two Normally Open (NO)
- Each with wide adjustable temperature range
- Available with °F or °C Scale
- DIN rail mountable

Model No.	NC (Red)	NO (Blue)	Model No.	NO (Blue)	NO (Blue)
KSDT72	0 - 60°C	0 - 60°C	KSDT76	0 - 60°C	0 - 60°C
KSDT75	-10 - 50°C	20 - 80°C	KSDT76F	32 - 140°F	32 - 140°F
KSDT72F	32 - 140°F	32 - 140°F			
KSDT75F	14 - 122°F	68 - 176°F			

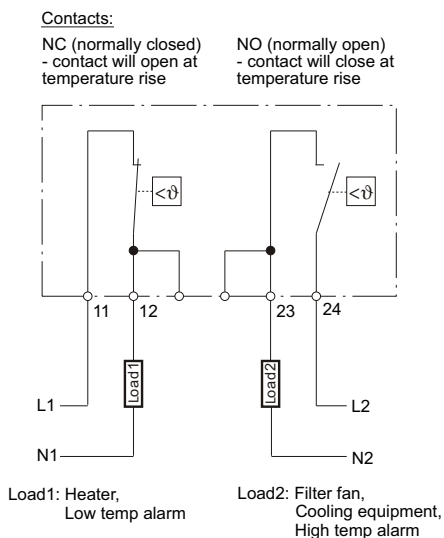


TECHNICAL DATA

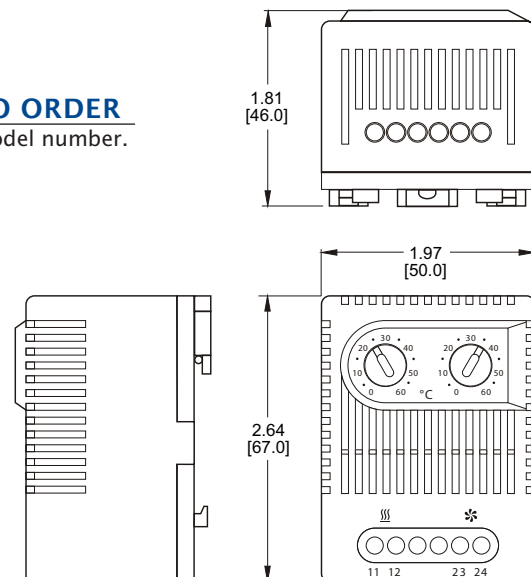
Sensor element:	Thermostatic bi-metal
Maximum tolerance:	± 7.2°F (4K)
Switching difference (hysteresis):	12.6°F ± 5.4°F (7°C ± 3K)
Switching capacity (max. Load):	NC: 10A resistive/2A inductive @ 250 VAC NO: 5A resistive/2A inductive @ 250 VAC DC 30 W EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
EMI/EMC compliance:	
Connections:	4-pole terminal for AWG 14 max. (2.5 mm ²)
Mounting:	Clip for 35mm DIN rail (EN 50022)
Housing:	Plastic, UL94V-0
Weight:	3.2 oz (90 g)
Protection type:	IP 20
Operating/storage temperature:	-49 to 158°F (-45 to 70°C)

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



HOW TO ORDER
 Specify model number.



THERMOSTATS

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

SMALL THERMOSTAT



STANDARD FEATURES

- Compact design
- Wide adjustment range
- Available with °F or °C scale
- Color coded temperature dials
- DIN rail mountable

Thermostat “NC” (normally closed): Thermostat opens at temperature rise. Comes with a **red** temperature dial.

Thermostat “NO” (normally open): Thermostat closes at temperature rise. Comes with a **blue** temperature dial.

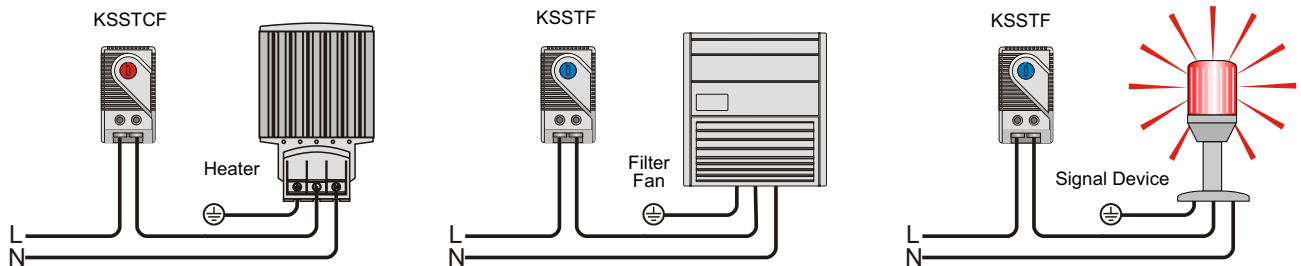
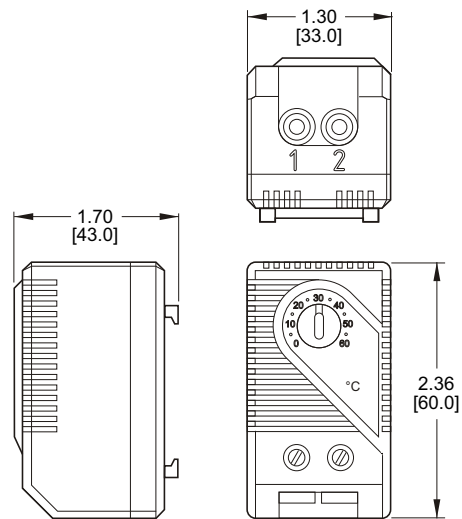
Model No.	Contact type	Scale
KSSTF	normally open	30-140°F
KSSTCF	normally closed	30-140°F

TECHNICAL DATA

Sensor element:	Thermostatic bi-metal
Maximum tolerance:	±7.2°F (4K)
Switching difference (hysteresis):	12.6°F ± 5.4°F (7°C ± 3K)
Service life:	100,000 cycles
Switching capacity (max. load):	15A resistive/2A inductive @ 120 VAC 10A resistive/2A inductive @ 250 VAC DC 30W
EMI/EMC compliance:	EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connections:	2-pole terminal for AWG 14 max. (2.5 mm ²)
Mounting:	Clip for 35 mm DIN rail (EN 50022)
Housing:	Plastic, UL94V-0
Weight:	1.27 oz (36 g)
Protection type:	IP 20
Operating/storage temperature:	-49 to 158°F (-45 to 70°C)

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



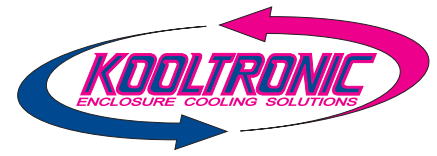
Wiring examples

HOW TO ORDER

Specify model number.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

MECHANICAL THERMOSTAT



The KSMT Mechanical Thermostat is designed to control the air temperature inside of enclosures and control panels. It can be used for enclosure heaters, cooling equipment (e.g. filter fans), or signal devices.

An integrated resistor (RF) can be connected to increase accuracy when these units are used with an enclosure heater.*

STANDARD FEATURES

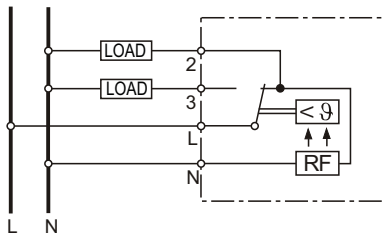
- Wide adjustable range
- Available with °F or °C Scale
- Change-over contact
- High switching capacity
- DIN rail mountable

Model No.	Voltage	Adjustment range
KSMTF	120 VAC	50-140°F
KSMT	120 VAC	10-60°C
K2SMTF	230 VAC	50-140°F
K2SMT	230 VAC	10-60°C

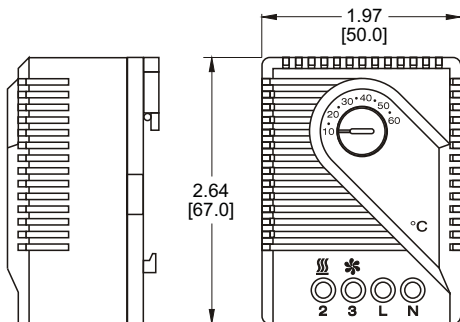
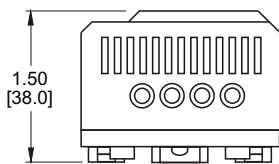


DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



Connections:
 L + 2 = heating
 L + 3 = cooling
 N = temperature compensation



TECHNICAL DATA

Sensor element:	Thermostatic bi-metal
Switching difference:	Approx. 4K (7.2°F), 0.5K (1°F) with RF
Contact type:	Change-over, snap-action contact
Contact resistance:	<10mΩ
Maximum switching capacity:	Break contact 10A res./4A ind. @ 250 VAC Make contact 5A res./2A ind. @ 250 VAC
EMI/EMC conformity:	EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connections:	4-pole terminal for AWG 14 max. (2.5 mm ²)
Mounting:	Clip for 35 mm DIN rail (EN 50022)
Housing:	Plastic, UL94V-0
Weight:	3.5 oz (100 g)
Protection type:	IP 20
Operating/storage temperature:	-49 to 158°F (-45 to 70°C)

* Optional connection of terminal "N" will cause the RF heating resistor to work, thus reducing the difference between actual enclosure temperature and the temperature reading inside the thermostat (switch-off temperature).

HOW TO ORDER

Specify model number.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

MECHANICAL THERMOSTAT



The KFST Mechanical Thermostat is designed to control the air temperature inside of enclosures and control panels. It can be used for enclosure heaters, cooling equipment (e.g. filter fans), or signal devices.



STANDARD FEATURES

- Wide adjustable range
- Available with °F or °C Scale
- Change-over contact
- High switching capacity
- DIN rail mountable

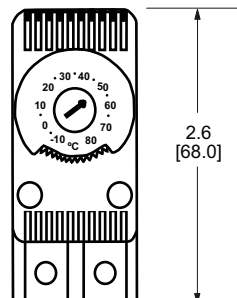
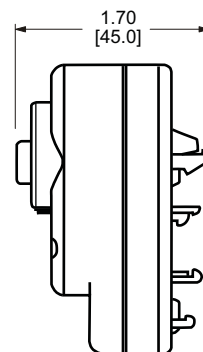
Model No.	Calibration: Fahrenheit or Celsius	Voltage	Control Type	Dial Color	Adjustment range
KFSTF	Fahrenheit	110-250 VAC	Normally Open	Blue	-14 - +176°F
KFSTCF	Fahrenheit	110-250 VAC	Normally Closed	Red	-14 - +176°F
KFST	Celsius	110-250 VAC	Normally Open	Blue	-10 - +80°C
KFSTC	Celsius	110-250 VAC	Normally Closed	Red	10 - +80°C

TECHNICAL DATA

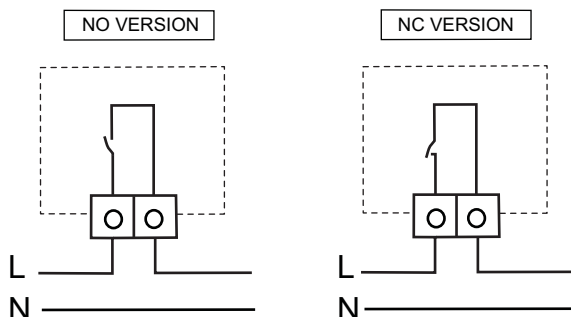
Sensor element:	Thermostatic bi-metal
Contact type:	Change-over, snap-action contact
Connections:	Screw terminal for AWG 14 max. (2.5 mm ²)
Mounting:	Snap on 35 mm DIN rail (EN 50022)
Housing:	PA66 - self extinguishing UL94V-0
Protection type:	IP - 20 EN 60529
Operating/storage temperature:	-40 to 194°F (-40 to 90°C)
Rated Current:	10A
Contact Current Carrying Capacity:	15A
Accuracy:	± 3°C
Differential:	NC: - 3°C NO: +4 if A ≤ 5 / +7 if A ≥ 5

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



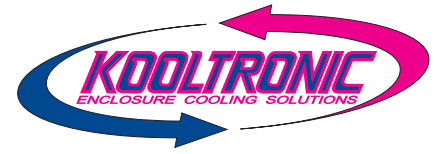
WIRING DIAGRAMS



HOW TO ORDER

Specify model number.

24VDC ELECTRONIC THERMOSTAT



The KS7ET is an electronic thermostat designed to switch the potentially high loads (amps) of DC 24 V operated equipment. With its potential-free change-over contact, a wide variety of products can be switched, i.e. heating/cooling equipment as well as signal devices.

A relatively small hysteresis sets the KS7ET Thermostat apart from less accurate mechanical thermostats.

STANDARD FEATURES

- 16 Amp DC switching capacity
- Low hysteresis
- Adjustable temperature
- Available in °F or °C scale
- Change-over contact
- DIN rail mountable



Model No.	Temperature range
KS7ET	0-60°C
KS7ETF	32-140°F

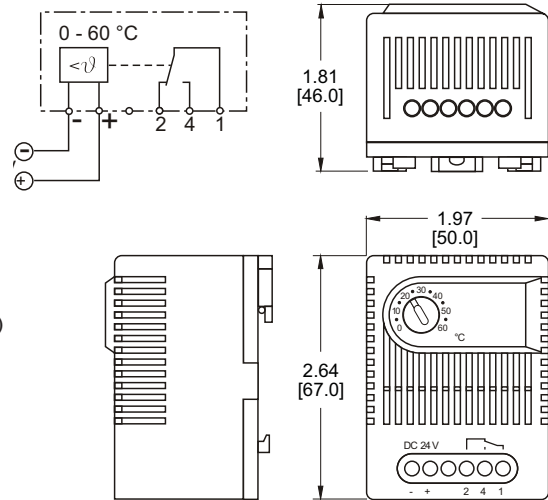
DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.

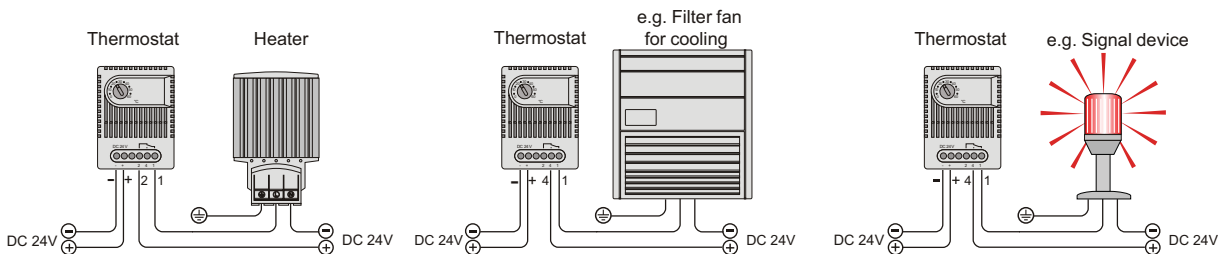
TECHNICAL DATA

Switching difference (hysteresis): Approx. 5.4°F (3K)
 Sensor element: PTC
 Contact type: Change-over
 Contact resistance: < 10mΩ
 Service life: > 100,000 cycles
 Max. switching capacity: 16A @ DC 28 V (resistive load)
 Minimum current required: 20mA
 EMI/EMC compliance: EN 55014-1-2, EN 61000-3-2, EN 61000-3-3

Connection: 5-pole terminal for AWG 14 max. (2.5 mm²)
 Mounting: Clip for 35 mm DIN rail (EN 50022)
 Housing: Plastic, UL94V-0
 Weight: Approx. 2.8 oz. (80 g)
 Mounting position: Vertical
 Operating/storage temperature: -49 to 158°F (-45 to 70°C)
 Protection type: IP 20



THERMOSTATS



Wiring examples

HOW TO ORDER
Specify model number.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

ENCLOSURE ACCESSORIES: HYGROSTATS

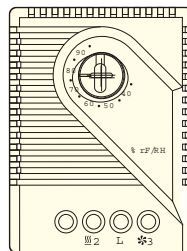


DESCRIPTION

These electronic hygrostats are designed to control the relative humidity inside of enclosures. When connected to an enclosure heater, (de-humidifier), they will turn the heater on at a set humidity level in order to raise the dew point. These units can be also be used to control cooling fans, warning lights or other devices.

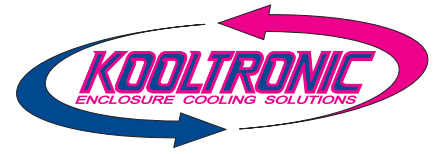
KOOLTRONIC also designs and manufactures a variety of cooling units to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**



Mechanical
Hygrostat
2.6"H x 1.9"W x 1.5"D

MECHANICAL HYGROSTAT, CHANGE-OVER CONTACT



The KSMH is designed to control the relative air humidity inside of enclosures. When connected to an enclosure heater, (de-humidifier), it will turn the heater on at the set humidity level in order to raise the dew point. This helps prevent damage and malfunction of electronic components caused by condensation and corrosion.¹⁾ The KSMH can also be used to control cooling fans, warning lights or other devices.

STANDARD FEATURES

- Adjustable relative humidity range
- High switching capacity
- DIN rail mountable

¹⁾ The critical relative humidity for most components is 65%. Above 65% RH, condensation can cause malfunction of electronic equipment. Long-term, this can lead to corrosion and permanent damage of electronic components and systems.

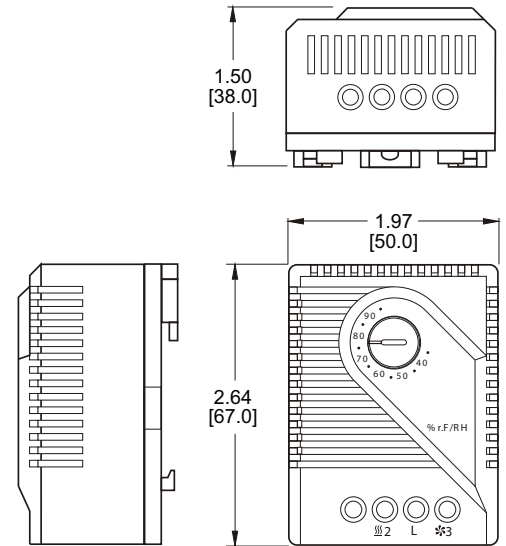


TECHNICAL DATA

Model Number:	KSMH
Adjustment range:	35 - 95% ($\pm 3.0\%$) relative humidity
Switching difference (hysteresis):	Approx. 4% RH @ 50% relative humidity
Permissible air velocity:	50 ft/sec (15 m/s)
Maximum switching voltage:	250 VAC (NOTE: 250 V should only be switched in a non-condensing environment!)
Contact type:	Change-over contact
Contact resistance:	<10m Ω
Service life:	50,000 cycles
Minimum switching capacity:	100mA @ AC/DC 20 V
Maximum switching capacity:	5A @ AC 230 V (resistive load) 0.2A @ AC 230 V (inductive load at $\cos \phi = 0.8$) DC 20W
EMI/EMC compliance:	EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection:	3-pole terminal, 3 x AWG 14 max. (2.5 mm ²)
Mounting:	Clip for 35 mm DIN rail (EN 50022)
Housing:	Plastic, UL94V-0
Weight:	2 oz. (60 g)
Operating temperature:	32 to 140°F (0 to 60°C)
Storage temperature:	-4 to 176°F (-20 to 80°C)
Protection type:	IP 20
Application examples:	Electrical & Electronic enclosures Telecommunication systems Display panels Ticket dispensers Automatic teller machines (ATM's) Access & Parking control systems

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



HYGROSTATS

HOW TO ORDER

Specify model number.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

ENCLOSURE ACCESSORIES: ELECTRONIC HYGROTHERM

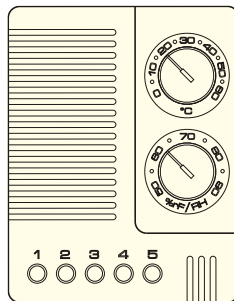


DESCRIPTION

The KSHTC Hygrotherm senses the ambient temperature and relative air humidity. Depending on which contact combination is chosen, it then turns on or off a connected device if either the temperature is below, or the humidity is above the set point. The integrated LED in each adjustment knob is lit indicating the active function.

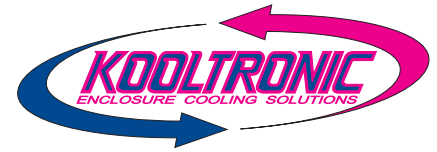
KOOLTRONIC also designs and manufactures a variety of cooling units to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**



Electronic
Hygrotherm
3.0"H x 2.3"W x 1.7"D

ELECTRONIC HYGROTHERM



The KSHTC Hygrotherm senses the ambient temperature and relative air humidity. Depending on which contact combination is chosen, it then turns on or off a connected device if either the temperature is below, or the humidity above the set point. The integrated LED in each adjustment knob is lit indicating the active function.

STANDARD FEATURES

- Controls both temperature and humidity
- Optical function displays
- High switching capacity
- DIN rail mountable

Model	Power	Scale
KSHTCF	120-230 VAC, 50/60 Hz	°F / % RH
K2SHTC	120-230 VAC, 50/60 Hz	°C / % RH
K7SHTC	24-48 VDC	°C / % RH

TECHNICAL DATA

Temperature range:	32-140°F (0-60°C) adjustable
Humidity range:	50-90% RH adjustable
Switching difference (temperature):	approximately 3.6°F (2K) ± 1K tolerance
Switching difference (humidity):	approximately 4% RH ± 1% tolerance
Response time:	approximately 5 sec.
Contact type:	Change-over contact
Relay output (max. switching capacity):	10 A resistive / 1.6 A inductive @ AC 240 V
Max. inrush current	0.6 A @ DC 60 V ¹
Service life:	AC 30 A for 10 sec.
Function control light:	>30,000 cycles
Connections:	LED
Mounting:	5-pole terminal for AWG 14 max (2.5 mm) ²
Housing:	Clip for 35 mm DIN rail (EN 60715)
Weight:	Plastic, UL94V-0
Mounting position:	Approx. 3.5 oz (100g)
Operating temperature:	Vertical
Storage temperature:	-40 to 140°F (-40 to 60°C)
Protection type:	-40 to 140°F (-40 to 60°C)
	IP 20

¹Not UL confirmed.

²When connecting with stranded wires, wire end ferrules must be used.

Input: Contacts 1 & 2: Supply voltage (120 VAC or 230 VAC)
Relay output: Contacts 3 & 5 and contacts 4 & 5 (see table below)

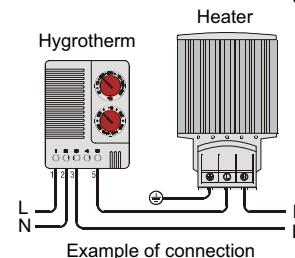
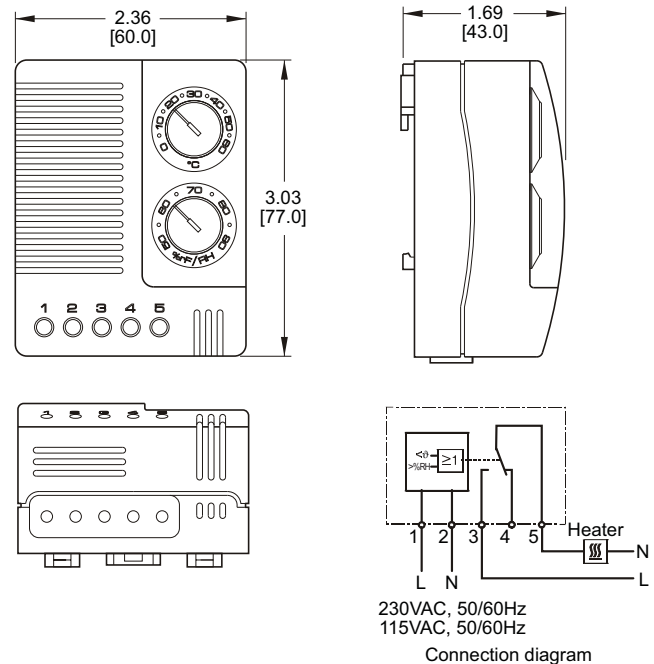
Contacts	close at ...	open at ...	use for
3 and 5	humidity rise or temperature drop	humidity drop or temperature rise	heaters de-humidifiers low-temp alarms
4 and 5	humidity drop or temperature rise	humidity rise or temperature drop	cooling humidifiers high-temp alarms

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.



DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



HOW TO ORDER
 Specify model number.

ENCLOSURE ACCESSORIES: FAN HEATERS



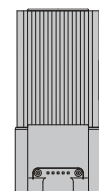
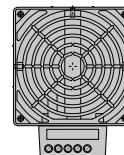
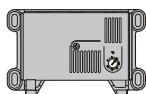
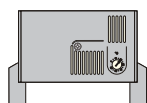
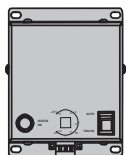
DESCRIPTION

These Fan Heaters offer from 100 - 950 Watts. Compact PTC Fan Heaters offer from 400 - 650 Watts.

KOOLTRONIC also designs and manufactures a variety of cooling units to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**

FAN HEATERS



Extruded Aluminum
Compact Fan Heater
7.2"H x 3.9"W x 3.1"D
8.7"H x 3.9"W x 3.1"D

Foot Mount
Fan Heater
3.9"H x 5.7"W x 6.6"D

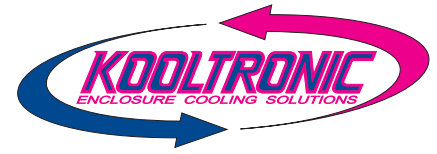
Panel Mount
Fan Heater
3.9"H x 6.3"W x 7.7"D

Compact PTC
Fan Heater
5.0"H x 3.9"W x 6.5"D

Compact
Fan Heater
1.8"H x 4.6"W x 5.9"D
1.8"H x 3.1"W x 4.4"D

Extruded Aluminum
Compact Fan Heater
7.2"H x 3.9"W x 3.1"D
8.7"H x 3.9"W x 3.1"D

KSEHT ELECTRIC FAN HEATER WITH THERMOSTAT



The compact high-performance fan heater prevents formation of condensation and provides an evenly distributed interior air temperature in outdoor enclosures and control cabinets - especially under extreme climatic conditions. The foot mounting capability allows installation on the base panel of enclosures.

These heaters feature brushed metal housings and include an auto fan control switch to prolong motor life. A pilot light indicates "Heat On" condition.



Model	Voltage	Hz.	Heating		Dimensions		Weight lbs.
			Power (Watts)*	Airflow CFM**	(HxWxD) (Inches)		
KSEHT125	115	50/60	125	16	5.5x4.0x4.5		1.8
KSEHT200	115	50/60	200	16	5.5x4.0x4.5		1.8
KSEHT400	115	50/60	400	26	7.5x4.0x4.5		3.0
KSEHT800	115	50/60	800	26	7.5x4.0x4.5		3.0
K2SEHT125	230	50/60	125	16	5.5x4.0x4.5		1.8
K2SEHT200	230	50/60	200	16	5.5x4.0x4.5		1.8
K2SEHT400	230	50/60	400	26	7.5x4.0x4.5		3.0
K2SEHT800	230	50/60	800	26	7.5x4.0x4.5		3.0

* At 50°F.

** Free blowing.

TECHNICAL DATA

Overheat protection:	Built-in temperature limiter
Operating Temperature Range:	-4°F to 104°F
Housing:	Brushed metal housing
Connection:	3-pole terminal, AWG 14 max. (2.5 mm ²)
Mounting:	Screws (not included)
Mounting position:	Vertical

APPLICATIONS

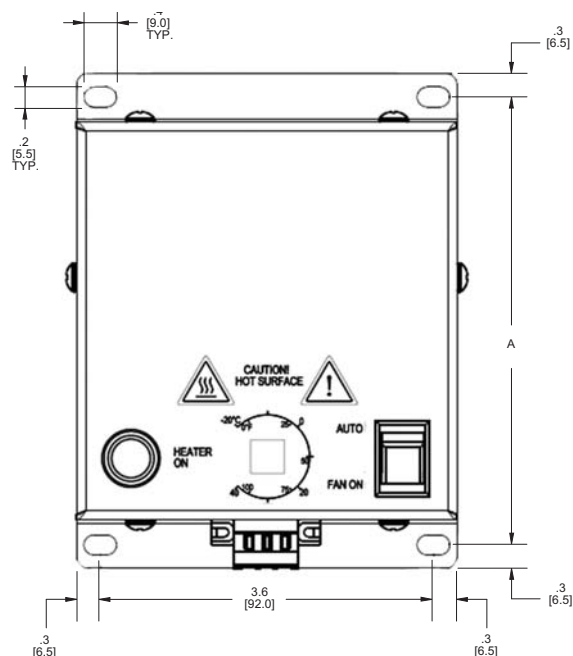
Electrical & Electronic enclosures
 Telecommunications systems
 Display panels
 Personnel environmental booths
 Automatic teller machines (ATM)
 Access & Parking control systems
 Ticket dispensers

STANDARD FEATURES

- Designed to prevent condensation or maintain a minimum temperature inside an electrical enclosure
- Built-in thermostat (settings from 0°F to 100°F)
- Brushed metal housing
- Includes an auto fan control switch to prolong motor life
- Low weight and low maintenance
- Designed for easy panel mounting
- Pilot light for "Heat On" indication
- Integrated overheat protection

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



DIMENSIONS		Inches, [mm]
A	KSHET 125/200	5 [127.0]
	KSHET 400/800	7 [177.8]

HOW TO ORDER
 Specify model number.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

FAN HEATERS

FOOT-MOUNT HIGH PERFORMANCE FAN HEATER

The compact high-performance fan heater prevents formation of condensation and provides an evenly distributed interior air temperature in outdoor enclosures and control cabinets - especially under extreme climatic conditions. The foot mounting capability allows installation on the base panel of enclosures.

The plastic enclosure provides double insulation which acts as protection against contact. These Fan Heaters include an integrated thermostat or hygrosstat for temperature or humidity control.



Model No.	Operating Voltage	Heating Capacity	Setting Range
K2SFH950AT	230 V, 50/60 Hz	950W	0 - 60°C
K2SFH950FHS	230 V, 50/60 Hz	950W	65% RH



TECHNICAL DATA

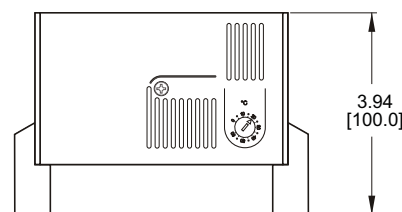
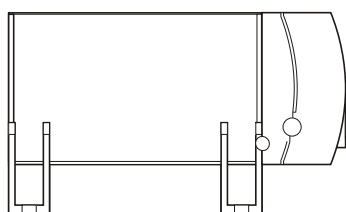
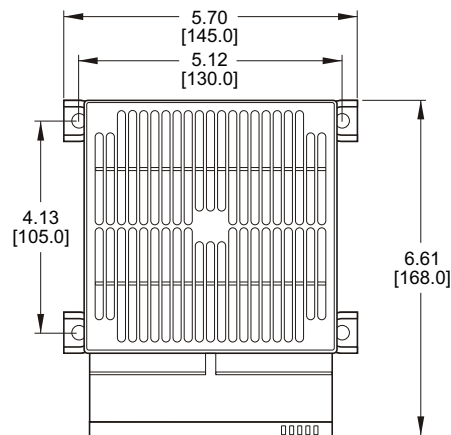
Heating power:	See above	Wiring compartment:	Plastic, UL94V-0, black
Heating element:	High performance cartridge heater	Weight:	3.1 lbs. (1.4 kg)
Heat sink:	Extruded aluminum profile	Mounting:	M5 screws (not included)
Overheat protection:	Built-in temperature limiter	Position:	Preferably horizontal
Axial fan:	Ball bearing	Operating/storage temperature:	-49 to 158°F (-45 to 70°C)
	Service life 50,000h at 77°F (25°C)	Protection class:	II (double insulated)
Airflow, free blowing:	94 cfm (160 m ³ /h)	Protection type:	IP 20
Connection:	2-pole terminal, AWG 14 max. (2.5 mm ²) with integral strain relief		

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.

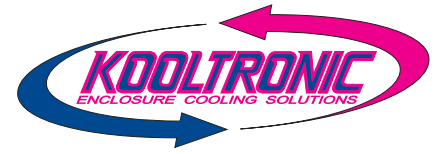
HOW TO ORDER

Specify model number.



Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

PANEL-MOUNT HIGH PERFORMANCE FAN HEATER



The compact high-performance fan heater prevents formation of condensation and provides an evenly distributed interior air temperature in outdoor enclosures and control cabinets - especially under extreme climatic conditions. These fan heaters offer easy panel or DIN rail mounting with a single versatile rear bracket.

The plastic enclosure provides double insulation which acts as protection against contact. These units include an integrated thermostat or hygrosat for temperature or humidity control.



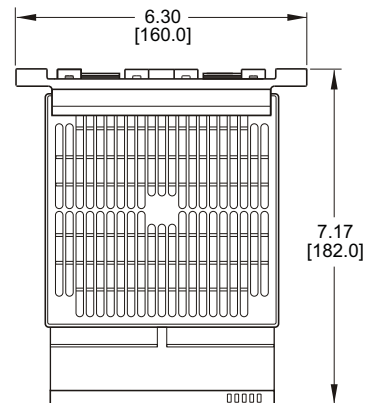
Model No.	Operating Voltage	Heating Capacity	Setting Range
K2SFHP950AT	230 V, 50/60 Hz	950W	0 - 60°C
K2SFHP950FHS	230 V, 50/60 Hz	950W	65% RH

TECHNICAL DATA

Heating power:	See above	Wiring compartment:	Plastic, UL94V-0, black
Heating element:	High performance cartridge heater	Weight:	3.1 lbs. (1.4 kg)
Heat sink:	Extruded aluminum profile	Mounting:	Clip for 35 mm DIN rail (EN 50022) or screw mount
Overheat protection:	Built-in temperature limiter	Position:	Preferably horizontal
Axial fan:	Ball bearing	Operating/storage temperature:	-49 to 158°F (-45 to 70°C)
Airflow, free blowing:	94 cfm (160 m ³ /h)	Protection class:	II (double insulated)
Connection:	2-pole terminal, AWG 14 max. (2.5 mm ²) with integral strain relief	Protection type:	IP 20

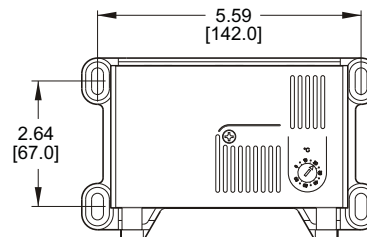
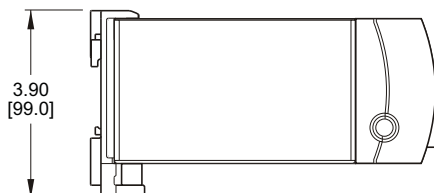
DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



HOW TO ORDER

Specify model number.



Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

PTC FAN HEATER



STANDARD FEATURES

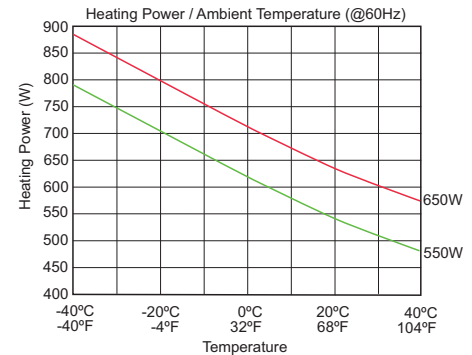
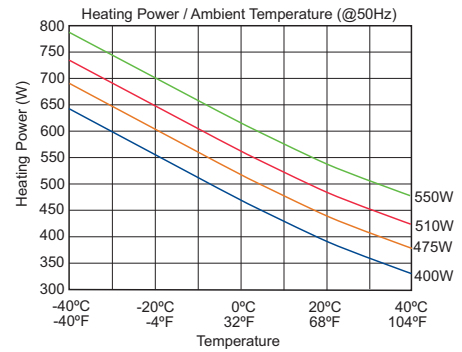
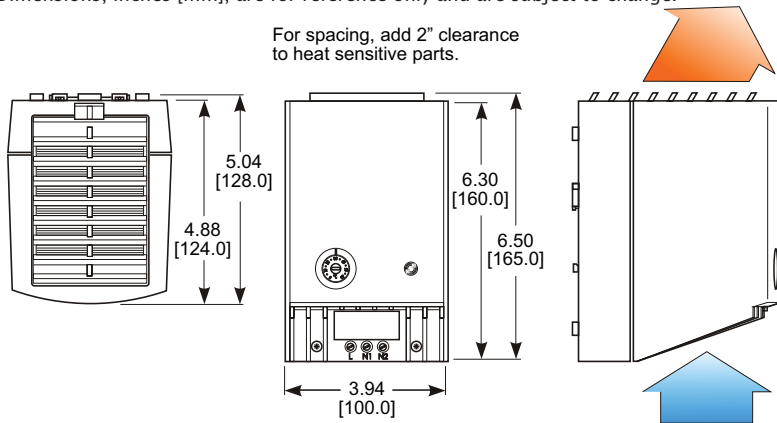
- Compact fan heater in PTC technology
 - Maintains minimum operating temperatures in enclosures
 - Helps to prevent failure of electronic components caused by condensation and corrosion
- Heating power adjusts to ambient temperature
- Integrated adjustable thermostat and control light
- DIN rail mountable

Model No.	Voltage	Heating capacity (@ 50Hz)*	Heating capacity (@ 60Hz)*	Max. current (inrush)	Axial Fan (ball bearing)	Thermostat range	Weight
KSFH550AT	100-120VAC	400W	550W	14A	20 cfm (35 m ³ /h)	32 - 140°F	2 lbs/0.9 kg
KSFH650AT	100-120VAC	510W	650W	15A	26 cfm (45 m ³ /h)	32 - 140°F	2.4 lbs/1.1 kg
K2SFH400AT	220-240VAC	475W	550W	11A	20 cfm (35 m ³ /h)	0 - 60°C	2 lbs/0.9 kg
K2SFH550AT	220-240VAC	550W	650W	13A	26 cfm (45 m ³ /h)	0 - 60°C	2.4 lbs/1.1 kg

*at 68°F (20°C) ambient temperature.

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



TECHNICAL DATA

Heating element:	PTC-semiconductor/resistor, self-regulating with changing ambient temperature (see graph below)
Overheat protection:	Built-in temperature limiter in case of fan failure
Function control light:	LED
Housing:	Plastic, UL94V-0
Connection:	2-pole terminal, AWG 14 max. (2.5 mm ²)
Mounting:	Clip for 35mm DIN rail (EN 50022)
Protection class:	II (double insulated)
Protection type:	IP 20

Applications:

- Access & Parking control systems
- Display panels
- Personnel Environmental booths
- Ticket dispensers
- Automatic teller machines (ATM's)
- Electrical & Electronic enclosures
- Telecommunications systems

HOW TO ORDER

Specify model number.

Determining the required heater size:

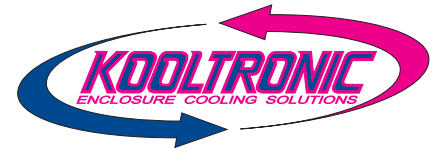
$$P_H = (A \times \Delta T \times k) - P_V$$

- P_H = Required heating power for your application in Watts (W)
- P_V = Heating power generated by existing components (e.g. a transformer) in Watts (W)
- A = Exposed enclosure surface area in square meters (m²)
- ΔT = Temperature differential between the desired minimum interior temperature and the lowest possible external temperature of the enclosure in Kelvin (K), 1.8°F = 1°C = 1K
- k = Heat transmission coefficient of the enclosure material used:
 - Painted steel: 5.5W/m²K
 - Stainless steel: 3.7W/m²K
 - Aluminum: 12W/m²K
 - Polyester/Plastic: 3.5W/m²K

For outdoor applications it is recommended to double the heating power.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

COMPACT FAN HEATER



STANDARD FEATURES

- Small, compact size fan heater
Maintains minimum operating temperatures in enclosures
Helps to prevent failure of electronic components caused by condensation and corrosion
- Built-in overheat protection
- Heater can be purchased separately for OEM use*
- DIN rail mountable

Model Number

Watts	Complete Fan Heater		Heater Only	
	120 VAC	230 VAC	120 VAC	230 VAC
100W	KSFHL100	K2SFHL100	KSEHV100	K2SEHV100
150W	KSFHL150	K2SFHL150	KSEHV150	K2SEHV150
200W	KSFHL200	K2SFHL200	KSEHV200	K2SEHV200
300W	KSFHL300	K2SFHL300	KSEHV300	K2SEHV300
400W	KSFHL400	K2SFHL400	KSEHV400	K2SEHV400

Applications:

Electrical & Electronics enclosures
Telecommunications systems
Display panels
Personnel Environmental booths
Automatic teller machines (ATM's)
Access & Parking control systems
Ticket dispensers

TECHNICAL DATA

Heating element: Resistance type cartridge heater
Heat sink: Die-cast aluminum, glass bead finish
Required fan size: 100/150W: 80 x 80 x 25 mm
(included with KSFHL heaters) min. air flow: 20 cfm (35 m³/h)
200/300/400W: 120 x 120 x 25 mm
min. air flow: 63 cfm (108 m³/h)

Overheat protection: Built-in temperature limiter
Air exit temperature: Approx. 113°F (45°C) 2"(50 mm) above heater
Wiring compartment: Plastic UL 94V-0
Connection (heater): 3-pole terminal, AWG 14 max. (2.5 mm²)
Connection (axial fan): 2-pole terminal (L2/N2), AWG 14 max. (2.5 mm²)
Mounting: Clip for 35 mm DIN rail (EN 50022)
Protection class: I (grounded)
Protection type: IP 20
Weight: 100/150W: 0.6 lbs (240 g) without fan
200/300/400W: 1.1 lbs (490 g) without fan

Determining the required heater size:

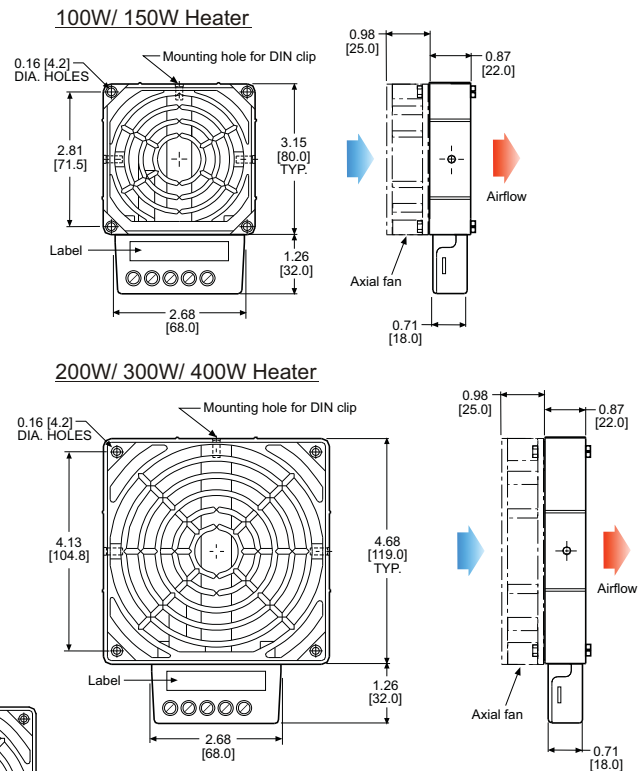
$$P_H = (A \times \Delta T \times k) - P_V$$

P_H = Required heating power for your application in Watts (W)
 P_V = Heating power generated by existing components (e.g. a transformer) in Watts (W)
 A = Exposed enclosure surface area in square meters (m²)
 ΔT = Temperature differential between the desired minimum interior temperature and the lowest possible external temperature of the enclosure in Kelvin (K), 1.8°F = 1°C = 1K
 k = Heat transmission coefficient of the enclosure material used:
Painted steel: 5.5W/m²K
Stainless steel: 3.7W/m²K
Aluminum: 12W/m²K
Polyester/Plastic: 3.5W/m²K

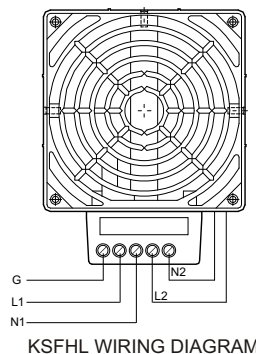
For outdoor applications it is recommended to double the heating power.

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



*Caution: Heater may only be operated with fan!



HOW TO ORDER
Specify model number.

FAN HEATERS

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

EXTRUDED ALUMINUM COMPACT FAN HEATER

STANDARD FEATURES

- Compact fan heater for increased heat output
Maintains minimum operating temperatures in enclosures
Helps to prevent failure of electronic components caused by condensation and corrosion
- Built-in overheat protection
- DIN rail mountable

Model No.	Operating voltage	Heating capacity	Length (L)	Weight (approx.)
KSFH250	AC 120 V, 50/60 Hz	250W	7.2" (182 mm)	2.4 lbs (1.1 kg)
KSFH400	AC 120 V, 50/60 Hz	400W	8.7" (222 mm)	3.1 lbs (1.4 kg)
K2SFH250	AC 230 V, 50/60 Hz	250W	7.2" (182 mm)	2.4 lbs (1.1 kg)
K2SFH400	AC 230 V, 50/60 Hz	400W	8.7" (222 mm)	3.1 lbs (1.4 kg)

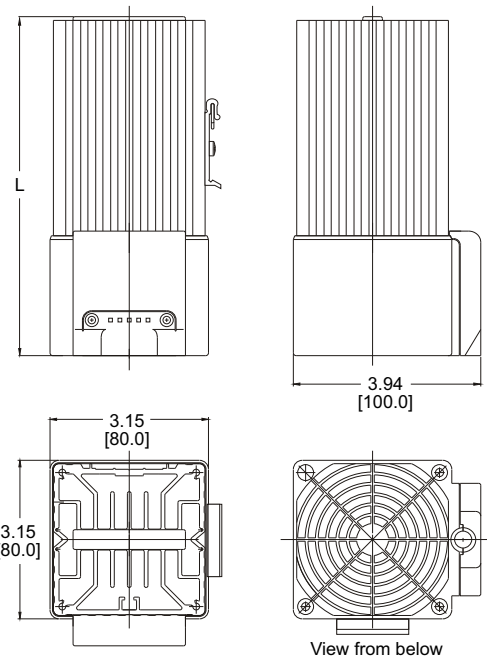
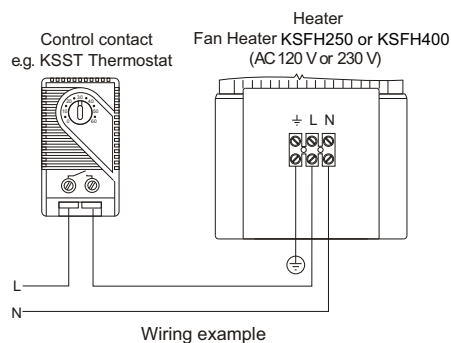


TECHNICAL DATA

Heating element:	Resistance type heater (micanite)
Heat sink:	Extruded aluminum profile, silver anodized
Surface temperature:	Max. 167°F (75°C) - 400W heater
Overheat protection:	Built-in temperature limiter
Axial fan:	Ball bearing, 50,000h at 77°F (25°C)
Air flow, free blowing:	26 cfm (45 m ³ /h) - 50 Hz; 32 cfm (54 m ³ /h) - 60Hz
Connection:	Internal term. AWG 16 max (1.5 mm ²), w/strain relief
Mounting:	Clip for 35 mm DIN rail (EN 50022)
Operating/storage temperature:	-49 to 158°F (-45 to 70°C)
Protection class:	I (grounded)
Protection type:	IP 20

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.

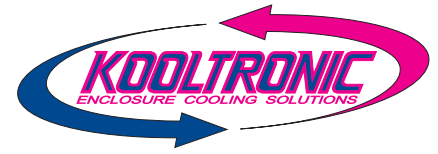


HOW TO ORDER

Specify model number.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

ENCLOSURE ACCESSORIES: PTC HEATERS

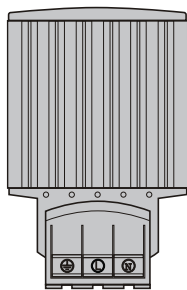


DESCRIPTION

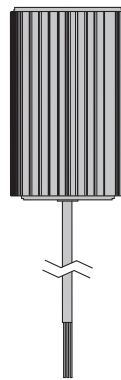
These compact PTC Heaters offer from 10 - 150 Watts.

KOOLTRONIC also designs and manufactures a variety of cooling units to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

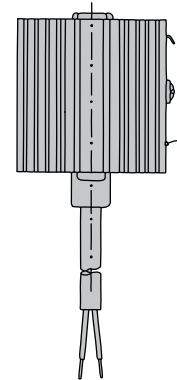
**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**



KSEH
PTC Heater
2.6"H x 2.7"W x 2.3"D
5.5"H x 2.7"W x 2.3"D
8.7"H x 2.7"W x 2.3"D



KFEHK
PTC Heater
4.1"H x 2.4"W x 2.5"D
6.1"H x 2.4"W x 2.5"D
9.1"H x 2.4"W x 2.5"D



KSEHK
PTC Heater
2.0"H x 1.9"W x .98"D
2.8"H x 1.9"W x .98"D
4.0"H x 1.9"W x .98"D
2.4"H x 1.9"W x .98"D

PTC HEATER

STANDARD FEATURES

- Compact heater in PTC technology
 - Maintains minimum operating temperatures in enclosures
 - Helps to prevent failure of electronic components caused by condensation and corrosion
- Heating power adjusts to ambient temperature
- Push connectors for quick and easy wiring
- DIN rail mountable
- CUR/US, CE



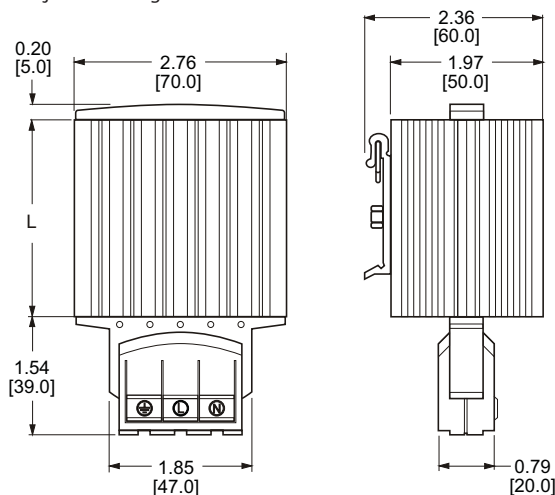
Model Number	Power*	Rated Current	Max. Current**	Length (L)	Weight
120-240VAC					
KSEH15	15W	0.08A	1.5A	2.6"/65 mm	0.66 lbs (0.3 kg)
KSEH30	30W	0.15A	3.0A	2.6"/65 mm	0.66 lbs (0.3 kg)
KSEH45	45W	0.23A	3.5A	2.6"/140 mm	0.66 lbs (0.3 kg)
KSEH60	60W	0.30A	2.5A	5.5"/140 mm	1.10 lbs (0.5 kg)
KSEH75	75W	0.38A	4.0A	5.5"/140 mm	1.10 lbs (0.5 kg)
KSEH100	100W	0.50A	4.5A	5.5"/140 mm	1.10 lbs (0.5 kg)
KSEH150	150W	0.75A	9.0A	8.7"/220 mm	1.76 lbs (0.8 kg)

12-36VDC	Power*	Max. Current**	Length (L)	Weight	
K7SEH15	15W	0.63A	9A	2.6"/65 mm	0.66 lbs (0.3 kg)▼
K7SEH30	30W	1.25A	14A	2.6"/65 mm	0.66 lbs (0.3 kg)▼
K7SEH45	45W	1.88A	8A	2.6"/65 mm	0.66 lbs (0.3 kg)▼
K7SEH60	60W	2.50A	10A	5.5"/140 mm	0.88 lbs (0.4 kg)▼
K7SEH75	75W	3.13A	14A	5.5"/140 mm	1.10 lbs (0.5 kg)▼
K7SEH100	100W	4.17A	16A	5.5"/140 mm	1.10 lbs (0.5 kg)▼
K7SEH150	150W	6.25A	23A	8.7"/220 mm	1.65 lbs (.75 kg)▼

* At 68°F (20°C) ambient temperature
 ** Inrush current
 ▼ Not CUR/US OR VDE Approved

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



TECHNICAL DATA

Operating voltage: AC: 120 - 240V / DC: 12 - 36VDC (other voltages also available)

Heating element: PTC resistor, self-regulating

Heating body: Anodized extruded aluminum

Protection class: I, test voltage 1600 V

Protection type: IP 20

Connection: Push-type terminals for stranded and solid wire 3 x AWG 20-16 (0.5-1.5 mm²)

Mounting: Clip for 35 mm DIN rail (EN 50022)

Determining the required heater size:

$$P_H = (A \times \Delta T \times k) - P_V$$

P_H = Required heating power for your application in Watts (W)

P_V = Heating power generated by existing components (e.g. a transformer) in Watts (W)

A = Exposed enclosure surface area in square meters (m²)

ΔT = Temperature differential between the desired minimum interior temperature and the lowest possible external temperature of the enclosure in Kelvin (K), 1.8°F = 1°C = 1K

k = Heat transmission coefficient of the enclosure material used:

Painted steel:	5.5W/m ² K
Stainless steel:	3.7W/m ² K
Aluminum:	12W/m ² K
Polyester/Plastic:	3.5W/m ² K

For outdoor applications it is recommended to double the heating power.

HOW TO ORDER

Specify model number.

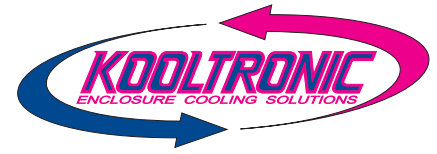
Applications:

- Electrical & Electronic enclosures
- Telecommunications systems
- Display panels
- Automatic teller machines (ATM's)
- Access & Parking control systems
- Ticket dispensers



Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

KFEHK PTC HEATER



STANDARD FEATURES

- Compact heater in PTC technology
Maintains minimum operating temperatures in enclosures
Helps to prevent failure of electronic components caused by condensation and corrosion
- Heating power adjusts to ambient temperature
- DIN rail mountable

KFEHK Heaters are UL approved when used in conjunction with a KFST Thermostat.

Model Number	Rated Power*	Rated Current**	Length (L)	Weight
110-250VAC KFEHK45	45W	0.20A	4.1"/105 mm	0.61 lbs (280 g)
KFEHK100	100W	0.47A	6.1"/155 mm	0.88 lbs (400 g)
KFEHK150	150W	0.77A	9.1"/230 mm	1.30 lbs (590 g)

* At 68°F (20°C) ambient temperature

** Inrush current

TECHNICAL DATA

Operating voltage: AC/DC 110 - 250 V (other voltages also available)
 Heating element: PTC resistor, self-regulating
 Heating body: Anodized extruded aluminum
 Protection class: I, appliance
 Protection type: IP 44
 Mounting: Clip for 35 mm DIN rail (EN 50022)

Applications:

Electrical & Electronic enclosures
 Telecommunications systems
 Display panels
 Automatic teller machines (ATM's)
 Access & Parking control systems
 Ticket Dispensers

Determining the required heater size:

$$P_H = (A \times \Delta T \times k) - P_V$$

P_H = Required heating power for your application in Watts (W)

P_V = Heating power generated by existing components (e.g. a transformer) in Watts (W)

A = Exposed enclosure surface area in square meters (m²)

ΔT = Temperature differential between the desired minimum interior temperature and the lowest possible external temperature of the enclosure in Kelvin (K), 1.8°F = 1°C = 1K

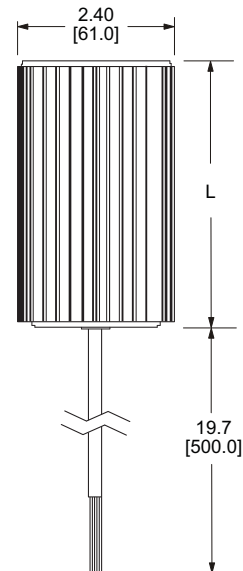
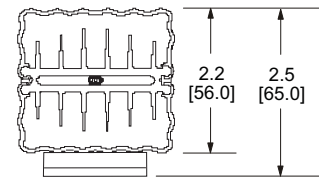
k = Heat transmission coefficient of the enclosure material used:

Painted steel: 5.5W/m²K
 Stainless steel: 3.7W/m²K
 Aluminum: 12W/m²K
 Polyester/Plastic: 3.5W/m²K

For outdoor applications it is recommended to double the heating power.

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



PTC HEATERS

HOW TO ORDER

Specify model number.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

SMALL PTC HEATER

STANDARD FEATURES

- Compact heater in PTC technology
 - Maintains minimum operating temperatures in enclosures
 - Helps to prevent failure of electronic components caused by condensation and corrosion
- Heating power adjusts to ambient temperature
- Push connectors for quick and easy wiring
- DIN rail mountable



Model No.	Voltage	Power*	Max. Amps**	Length	VDE	CUR/US
KSEHK10	110-120 VAC	10W	1.0A	2.0" (50 mm)		✓
KSEHK20	110-120 VAC	20W	1.5A	2.8" (70 mm)		✓
KSEHK30	110-120 VAC	30W	1.5A	4.0" (100 mm)		✓
K2SEHK10	140-240 VAC	10W	1.0A	2.0" (50 mm)	✓	
K2SEHK20	140-240 VAC	20W	2.5A	2.4" (60 mm)	✓	
K2SEHK30	140-240 VAC	30W	3.0A	2.8" (70 mm)	✓	

* At 68°F (20°C) ambient temperature

** Inrush

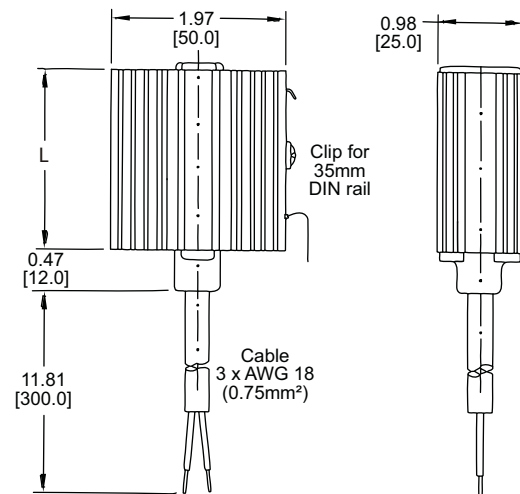


TECHNICAL DATA

Heating element:	PTC resistor, self regulating
Heat sink:	Anodized extruded aluminum
Protection class:	I (grounded)
Protection type:	IP 54
Connection:	3 x AWG 20 (0.5 mm ²), 12" (300 mm) length
Mounting:	Clip for 35 mm DIN rail (EN 50022)
Weight (approx.):	4 oz. (120g)

DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



Applications:

- Electrical & Electronic enclosures
- Telecommunications systems
- Display panels
- Personnel Environmental booths
- Automatic teller machines (ATM's)
- Access & Parking control systems
- Ticket dispensers

Determining the required heater size:

$$P_H = (A \times \Delta T \times k) - P_V$$

P_H = Required heating power for your application in Watts (W)

P_V = Heating power generated by existing components (e.g. a transformer) in Watts (W)

A = Exposed enclosure surface area in square meters (m²)

ΔT = Temperature differential between the desired minimum interior temperature and the lowest possible external temperature of the enclosure in Kelvin (K), 1.8°F = 1°C = 1K

k = Heat transmission coefficient of the enclosure material used:

Painted steel:	5.5W/m ² K
Stainless steel:	3.7W/m ² K
Aluminum:	12W/m ² K
Polyester/Plastic:	3.5W/m ² K

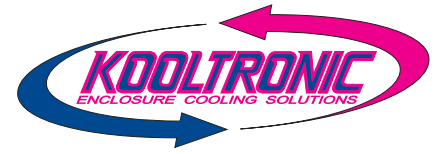
For outdoor applications it is recommended to double the heating power.

HOW TO ORDER

Specify model number.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

ENCLOSURE ACCESSORIES: LIGHTS



DESCRIPTION

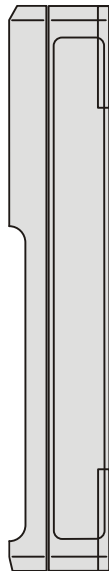
Compact Enclosure Light: The Compact Enclosure Light was designed for use in industrial enclosures and control cabinets. A strong magnet allows simple and quick installation and flexibility for various mounting positions.

Slimline Light: The Slimline Light was designed to fit into tight spaces in enclosures. It features an integrated receptacle, so that electrical devices (e.g. power tools) can be easily plugged in when needed. The standard light can be screw mounted in a variety of positions, or the light can be fitted with an optional magnet mount. The motion sensor was designed so it can be used in enclosures with glass doors and not activated by movement outside the enclosure.

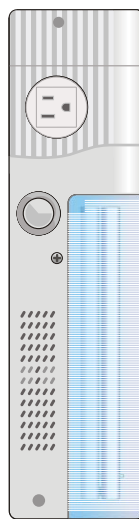
LED Enclosure Light: The LED Enclosure Light is also offered with either an on/off switch, or a motion sensor. The power output allows up to 10 lights to be connected to each other (daisy chain) with both the input and output plugs snap-locking into place.

KOOLTRONIC also designs and manufactures a variety of cooling units to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

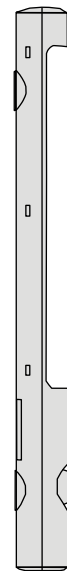
**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**



Compact
Enclosure Light
13.9"H x 2.5"W x 2.5"D



Slimline
Enclosure Light
13.5"H x 1.5"W x 3.5"D



LED Enclosure Light
KSLED
15.6"H x 2.6"W x 3.9"D

COMPACT ENCLOSURE LIGHT

The KSCL Compact Enclosure Light was designed for use in industrial enclosures and control cabinets. A strong magnet allows simple and quick installation and flexibility for various mounting positions.

STANDARD FEATURES

- Magnet or DIN rail mounting
- Energy-saving lamp
- Integrated receptacle
- On/Off switch

Model No.	Voltage	Power
KSCL9/R	120 VAC	9W (~60W incandescent bulb)
K2SCL11/RS	230 VAC	11W (~75W incandescent bulb)

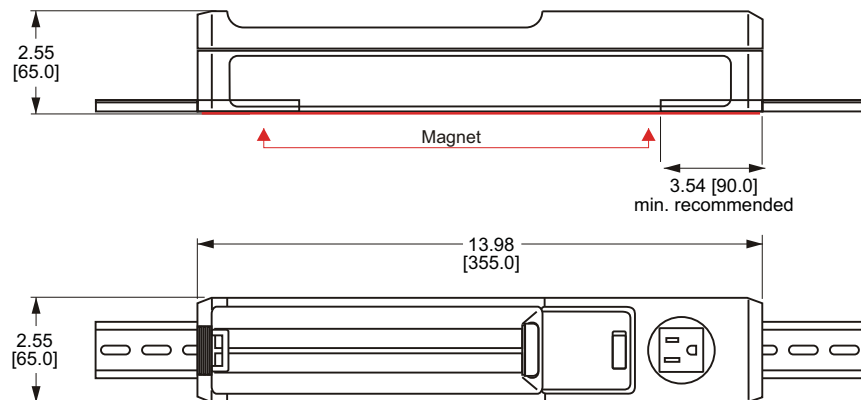
TECHNICAL DATA

Lamp:	Compact fluorescent lamp
Luminosity:	900 Lm
Service life:	5000 hours
Radio interference suppression grade:	In compliance with VDE 0712 IEC 82
Switch:	On /off light switch
Receptacle:	AC 120V: US receptacle and protective cover AC 230V: Schuko receptacle and protective cover
Connections:	3-pole terminal for AWG 14 max. (2.5 mm ²)
Mounting:	Magnet mounting on painted steel surfaces Holding power approx. 20 kp (on 2 mm sheet metal)
Housing:	Plastic
Protection class:	I (grounded)
Protection type:	IP 20
Operating/storage temperature:	-4 to 122°F (-20 to 50°C)



DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.

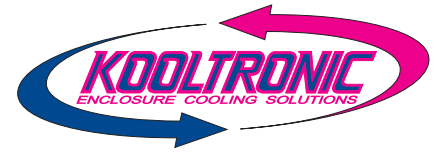


HOW TO ORDER
Specify model number.

Drawing shows mounting on two 7 inch long pieces of 35mm DIN rail.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

SLIMLINE LIGHT



Light with Motion Sensor



The Slimline Light was designed to fit in tight spaces in enclosures. It features an integrated receptacle, so that electrical devices (e.g. power tools) can be easily plugged in when needed. The standard light can be screw-mounted in a variety of positions, or the light can be fitted with an optional magnet mount. The motion sensor was designed so it can be used in enclosures with glass doors and not be activated by movement outside the enclosure.



Light with On/Off Switch

STANDARD FEATURES

- Compact design
- Energy-saving lamp
- Integrated receptacle
- On/Off switch or Motion Sensor

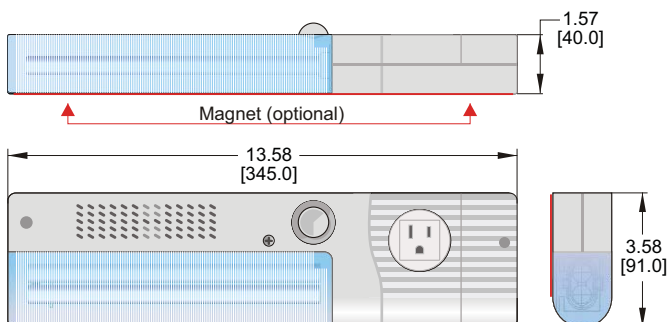
TECHNICAL DATA

Light bulb:	Compact fluorescent light bulb
Power:	11W (~75W incand.), Base: 2G7, electronic ballast
Luminosity:	900 Lm
Service life:	5000 hours
Switch:	On/off switch (for light only)
Motion sensor:	PIR = Passive Infrared (see note below)
Receptacle:	max. AC 250 V / 16A (Schuko)
Connection:	3-pole screw terminal for AWG 14 max. (2.5 mm ²) (includes cable strain relief)
Mounting:	M5 screws (not included), 11.8" (300 mm) hole distance or optional attached magnet (see model numbers)
Housing:	Plastic, UL94V-0
Weight (approx.):	14.1 oz. (400 g), 1.3 lbs. (600 g) with magnet
Protection type:	IP 20



DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



HOW TO ORDER

Specify model number.

A Passive Infrared (PIR) motion sensor detects the motion of the enclosure door being opened and automatically turns on the light. The sensor is factory pre-set to turn the light off 5 minutes after all motion ceases. The motion sensor does not detect movement through glass or fiberglass, thus allowing installation in enclosures with glass doors.

Receptacle	Model Number With On/Off Switch	Model Number With Motion Sensor
USA/Canada (AC 120 V):	KSLS/R	KSLM/R
w/ magnet mounting:	KSLS/RM	KSLM/RM
No receptacle (AC 120 V):	KSLS	KSLM
w/ magnet mounting:	KSLS/M	KSLM/M
No receptacle (AC 230 V):	K2SLS	K2SLM
w/ magnet mounting:	K2SLS/M	K2SLM/M

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

KSLED LED ENCLOSURE LIGHTS

Light Kit with Input Connector	Light Only	Description	Voltage*	Mounting	Switch Type**	Weight
KSLEDSMC	KSLEDSM	LED Light	100-240 VAC	magnet	on/off switch	4.8 oz. [135g]
KSLEDSC	KSLEDS	LED Light	100-240 VAC	screw	on/off switch	4.8 oz. [135g]
K7SLEDSMC	K7SLEDSM	LED Light	24-48 VDC	magnet	on/off switch	4.8 oz. [135g]
K7SLEDSC	K7SLEDS	LED Light	24-48 VDC	screw	on/off switch	4.8 oz. [135g]
KSLEDM/MC	KSLEDM/M	LED Light	100-240 VAC	magnet	PIR motion sensor	5.0 oz. [140g]
KSLEDMC	KSLEDM	LED Light	100-240 VAC	screw	PIR motion sensor	5.0 oz. [140g]
K7SLEDM/MC	K7SLEDM/MM	LED Light	24-48 VDC	magnet	PIR motion sensor	5.0 oz. [140g]
K7SLEDMC	K7SLEDM	LED Light	24-48 VDC	screw	PIR motion sensor	5.0 oz. [140g]

*AC 100-240 V, 50/60 Hz (min. AC 90 V, max. AC 265 V); DC 24-48 V, (min. DC 20 V, max. DC 60 V).

**Passive Infrared (PIR) motion sensor is factory pre-set to turn the light off 6 minutes after all motion ceases.

TECHNICAL DATA

Power consumption: max. 5 W (~75 W incandescent bulb)
 Luminosity: 290 Lm
 Lamp type: LED, 120° angle of radiation
 light color - daylight, color temperature - 6,500 K
 Service life: 60,000 hours at 68°F (20°C)
 Connection: 2-pole plug with snap lock
 AC: max. 2.5 A / AC 240 V, white cable
 DC: max. 2.5 A / DC 60 V, blue cable
 Housing: plastic, transparent
 Mounting: magnet or M5 screw (not included), 9.8" (250mm) centers;
 screw torque 2 Nm max.
 Operating temperature: -22 to 140°F (-30 to 60°C)
 Storage temperature: -40 to 185°F (-40 to 85°C)
 Dimensions: magnet mount - 13.8 x 1.3 x 1.3" (351 x 34 x 32mm)
 screw mount - 13.8 x 1.4 x 1.3" (351 x 36 x 32mm)
 Protection type: IP 20
 Protection class: II (double insulated)
 Accessories: input and output plug, cable for supply or connection*
 Approvals: UL, VDE
 Weight: models with on/off switch - 4.8 oz. (135 g)
 models with motion sensor - 5.0 oz. (140 g)

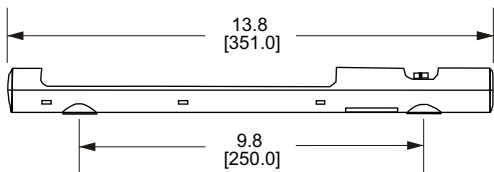


ENCLOSURE LIGHTS

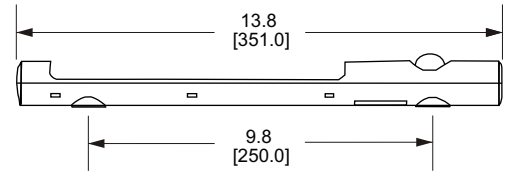
* NOTE: Connectors and cables for electrical connection are not included in the delivery of KSLED Series LED lights. These parts must be ordered separately, or as part of a kit. See KSLED accessories on next page.

DRAWINGS

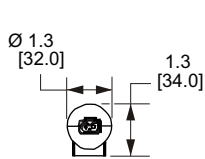
Dimensions, inches [mm], are for reference only and are subject to change.



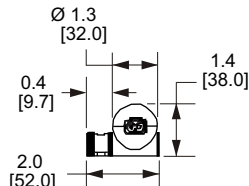
On/off switch light w/ magnet mount



Motion sensor light w/ magnet mount

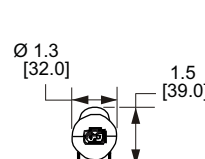


Magnet mount end view

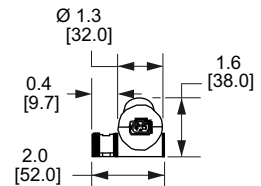


Screw mount end view

HOW TO ORDER
Specify model number.



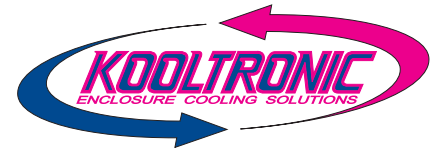
Magnet mount end view



Screw mount end view

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

KSLED LIGHT ACCESSORIES



Connection cable with input connector and wire leads:

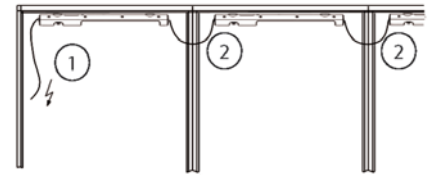


NOTE: Connectors and cables for electrical connection are not included in the delivery of KSLED Series LED lights. These parts must be ordered separately.

Connection cable, Part No. KSLEDAC

Part Number	Model	Length (ft) [m]	Voltage	Color	Approvals
KSLEDAC	connection cable 2 x AWG 16 w/ input connector	(6.5) [2]	AC	connector: white - cable: white	UL, VDE
KSLEDDC	connection cable 2 x AWG 16 w/ input connector	(6.5) [2]	DC	connector: blue - cable: white	UL, VDE

Extention cable with 2 connectors for daisy chain (input & output) connection:



Connection example: Up to 10 lights can be daisy-chained together via quick connection plugs or extension cables.

Connection cable, Part No. KSLEDACE

Part Number	Model	Length (ft) [m]	Voltage	Color	Approvals
KSLEDACE	connection cable 2 x AWG 16 w/ 2 connectors	(3.2) [1]	AC	connectors: white - cable: white	UL, VDE
KSLEDDCE	connection cable 2 x AWG 16 w/ 2 connectors	(3.2) [1]	DC	connectors: blue - cable: white	UL, VDE

Input / output connectors:



Input connector
Part No. KSICAC



Output connector
Part No. KSOCAC

Part Number	Model	Voltage	Color	Approvals
KSICAC	input connector	AC	white	UL, VDE
KSOCAC	output connector	AC	white	UL, VDE
KSICDC	input connector	DC	blue	UL, VDE
KSOCDC	output connector	DC	blue	UL, VDE

HOW TO ORDER
Specify model number.

Light kit with input connector included:

Part Number magnet mount	Part Number screw mount	Operating Voltage	Switch type	Weight
KSLEDSCM	KSLEDSC	AC 100-240 V, 50/60 Hz (min. AC 90V, max. AC 265 V)	on/off switch	4.8 oz. [140g]
K7SLEDSCM	K7SLEDSC	DC 24-48 V, (min. DC 20 V, max. DC 60 V)	on/off switch	4.8 oz. [140g]
KSLEDM/MC	KSLEDMC	AC 100-240 V, 50/60 Hz (min. AC 90 V, max. AC 265 V)	PIR motion sensor*	5.0 oz. [140g]
K7SLEDM/MC	K7SLEDMC	DC 24-48 V, (min. DC 20V, max. DC 60 V)	PIR motion sensor*	5.0 oz. [140g]

*Passive Infrared (PIR) motion sensor is factory pre-set to turn the light off 6 minutes after all motion ceases.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

ENCLOSURE ACCESSORIES: MISCELLANEOUS

DESCRIPTION

These small accessories were designed to aid in the organization of electronic cabinets and control panels.

KSDR Fix: Makes the mounting of smaller DIN rail mountable components easier.

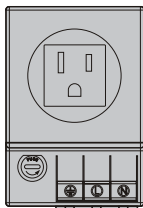
Enclosure Receptacle: Offers quick connections, is available with or without fuse and is DIN rail mountable.

KOOLTRONIC also designs and manufactures a variety of cooling units to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.

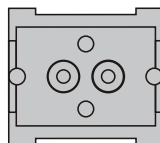
**CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114**



MISCELLANEOUS

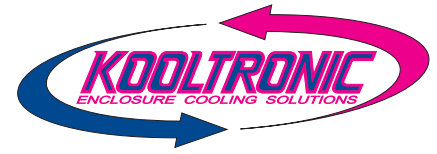


**KSDR
Enclosure Receptacle**
3.6"H x 2.4"W x 1.8"D



**KSDR/FIX
Mounting Aid**
13.5"H x 1.5"W x 3.5"D

ENCLOSURE RECEPTACLE



STANDARD FEATURES

- Quick connections
- Available with or without fuse
- DIN rail mountable



Model No.	Voltage	Fuse
KSDR/RF	120 VAC	6.3A / 250 VAC max.
KSDR/R	120 VAC	None

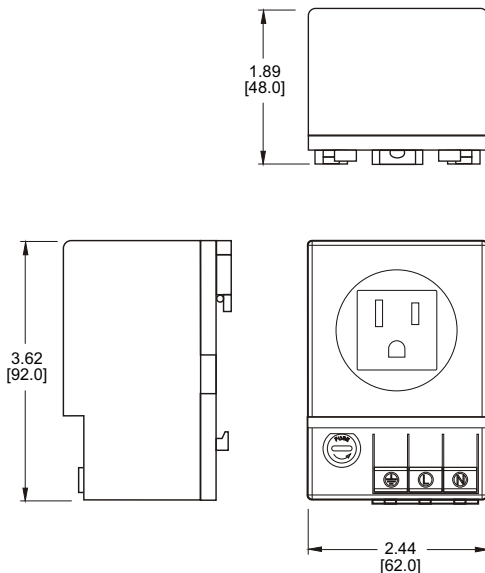
TECHNICAL DATA

Maximum ratings:	With fuse: 6.3 A at AC 250 V Without fuse: 15 A at AC 125 V
Fuse size:	Ø 5 x 20 mm, rated 6.3 A
Service life:	5000 hours
Connection:	3 x AWG 20-16 (0.5-1.5 mm ²) push type terminals for stranded or rigid wire
Mounting:	Clip for 35 mm DIN rail
Dimensions:	3.6 x 2.4 x 1.9" (92 x 62 x 48 mm)
Housing:	Plastic, UL94V-0
Protection class:	IP 20
Protection type:	I (grounded)
Operating/storage temperature:	-49 to 158°F (-45 to 70°C)



DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



HOW TO ORDER

Specify model number.

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

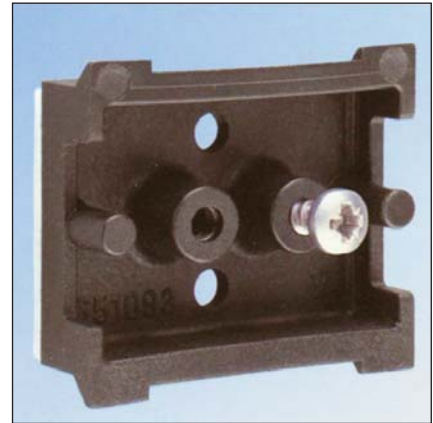
SELF-ADHESIVE MOUNTING AID

The KSDR/FIX is a small aid specially designed to make mounting of smaller DIN rail mountable components easier. It can be used whenever the installation of a DIN rail is impractical, or when there is not enough space left in an enclosure.

Because of its industrial grade self-adhesive it can be installed much easier and quicker than a conventional DIN rail, without the effort of hole drilling and screw mounting. This is especially practical for subsequent changes or additions in an already equipped enclosure.

The KSDR/FIX can hold components up to 1.1 lbs in weight. Some of the many applications include the mounting of timing relays, series terminals, thermostats, cable channels and even small heaters. In addition, DIN rails can be mounted simply by using several KSDR/FIX units.

If the weight of attached components exceeds the load limit, or if a more secure mounting is desired, (e.g. on rough surfaces), it can also be screw-mounted. All that is necessary to install KSDR/FIX is a smooth and clean surface. The initial adhesive power is 40%, and after 24 hours, it has its full holding power of 1.1 lbs.



Application example

TECHNICAL DATA

Model Number:	KSDR/FIX
Application:	Direct attachment of small components and 35 mm DIN rails (EN 50022)
Capacity:	7 oz (200 g) initially 1.1 lb (500 g) after 24 hour waiting period
Mounting surface:	All smooth surfaces, e.g. metals, lacquered surfaces, plastics other than polyethylene, polypropylene and rubber. Mounting surface must be dry and free from dust, oil, separating agents and other contamination.
Dimensions:	1.7 x 1.5 x 0.55" (43 x 38 x 14 mm)
Hole pattern:	0.5" distance, Ø 0.14" (12.8 mm; Ø 3.6 mm)
Material:	polyamide (rated UL94V-0) with non-deteriorating high-performance adhesive
Temperature range:	-49 to 158°F (-45 to 70°C)
Included:	mounting screw for perforated DIN rail

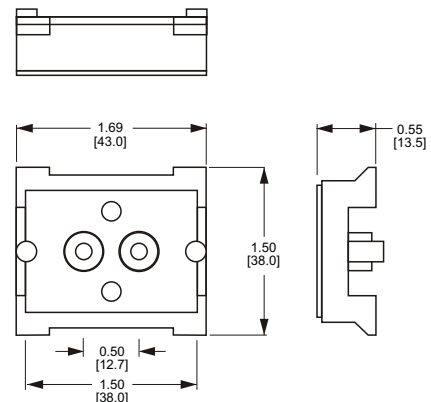
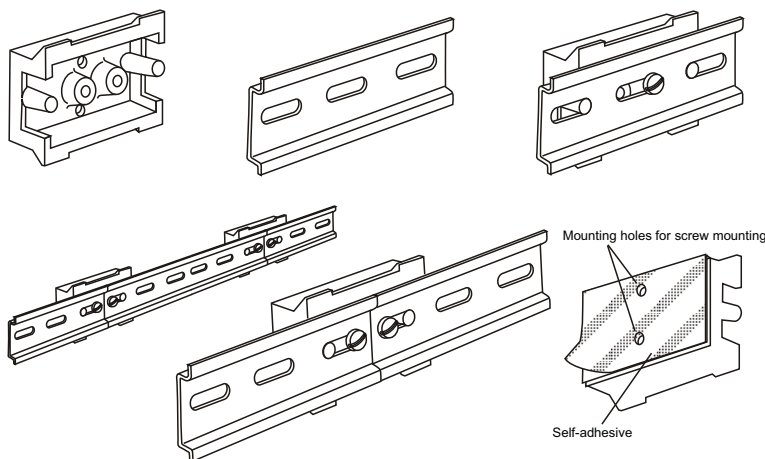
HOW TO ORDER

Specify model number.



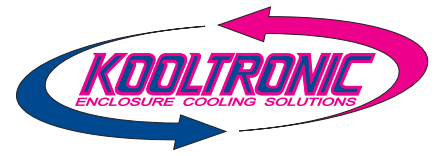
DRAWINGS

Dimensions, inches [mm], are for reference only and are subject to change.



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ENCLOSURE ACCESSORIES: OUTDOOR FILTER FAN AND EXHAUST PACKAGE



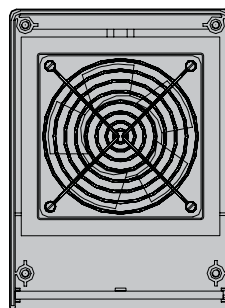
DESCRIPTION

These indoor/outdoor Filter Fan and Exhaust Packages are used in enclosures to dissipate heat harmful to sensitive electronic components. These fans feature a filter that is easily changed by opening the lockable door of the outdoor hood. IP55 protection is reached by the specially-designed hood and the use of special filters. The plastic casing is impact-resistant, weatherproof and UV resistant.

KOOLTRONIC also designs and manufactures a variety of cooling units to meet *unique* specifications. We invite your inquiries about our modification and custom-design capabilities.



CALL 1-800-321-KOOL (5665)
or FAX 609-466-1114



KSFF Outdoor Filter Fan
and Exhaust Package
8.8"H x 6.5"W x 1.6"D

FILTER FAN

OUTDOOR FILTER FAN AND EXHAUST PACKAGE



These indoor/outdoor Filter Fan and Exhaust Packages are used in enclosures to dissipate heat harmful to sensitive electronic components. The fans feature a filter that is easily changed by opening the lockable door of the outdoor hood. IP55 protection is reached by the specially-designed hood and the use of special filters. The plastic casing is impact-resistant, weather-proof and UV resistant.



Model No.	Filter Fan	Exhaust Filter	Voltage	Hz	Current Consumption	Power Consumption
KSFF	✓		120 VAC	60	180mA	15W
K2SFF	✓		230 VAC	50	100mA	15W
KS7FF	✓		24 VDC		0.21A	5.04W
KS8FF	✓		48 VDC		0.16A	7.68W
KSEF		✓				

TECHNICAL DATA

FILTER FANS

- Filter mat: Fine Grade 360g/m², filtering degree 98% particle Ø > 10 µm, F5 (EN779)
- Airflow - free blowing: 11.8 cfm (20 m³/h)
- Note: Airflow increases by approximately 15% for 120 V/60 Hz models**
- Average noise level at 3 ft. (DIN EN ISO 9614-2): 40 dB (A)
- Mounting depth: 2.4 in (62.0mm)
- Enclosure cut-out: 4.9 x 4.9 in (125 x 125mm + 0.4)
- Approx. weight: 2.6 lbs (1.2kg)
- Protection type: IP 55
- Axial fan: Ball bearing, aluminum frame, plastic impeller - UL 94V-0
- Filter fan housing: Plastic ASA, UL 94HB, light grey, temperature resistant -31 to 194°F.
- Mounting frame: Double-sided industrial adhesive tape for affixing to the outside of enclosures
- Agency Approvals: CUR/US, CE

EXHAUST FILTER

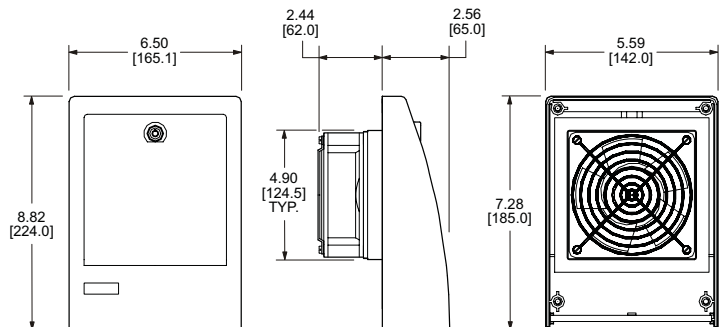
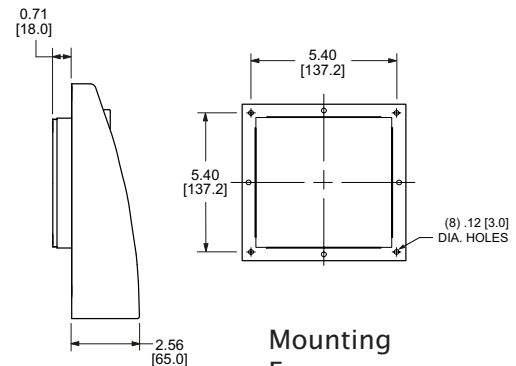
- Filter Mat: Fine grade 360 g/m², filtering degree 98% particle Ø > 10 µm, F5 (EN779)
- Mounting depth: 2.4 in (62.0mm)
- Enclosure cut-out: 4.9 x 4.9 in (125 x 125mm + 0.4)
- Approx. weight: 2.1 lbs (0.95kg)
- Protection type: IP 55

HOW TO ORDER
Specify model number.

Replacement filter:
Filter Mat (F5) 122 x 122mm Fine Grade:
Part Number: **KS481F** (package of 3)

DRAWINGS

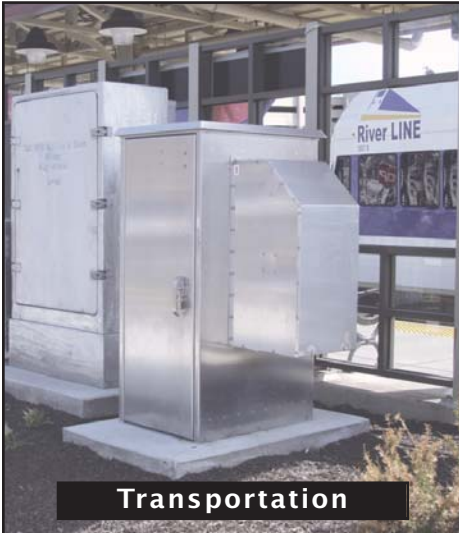
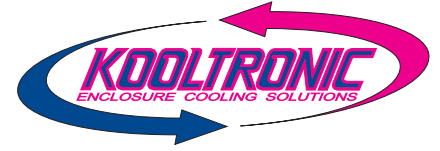
Dimensions, inches [mm], are for reference only and are subject to change.



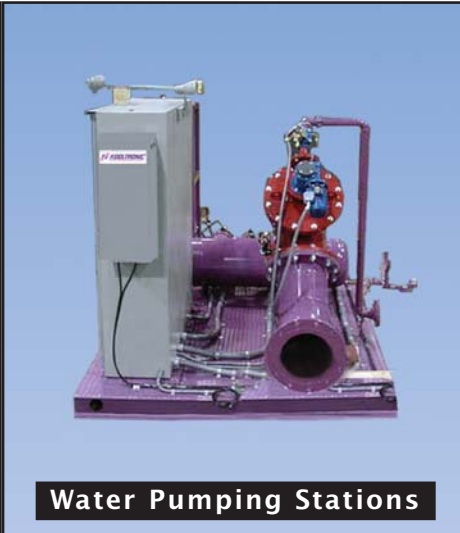
Filter Fan

Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.

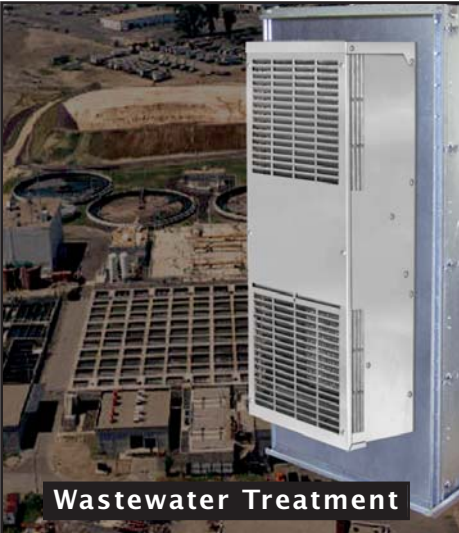
APPLICATIONS



Transportation



Water Pumping Stations



Wastewater Treatment



Industrial

As the industry leader in electronics enclosure cooling, KOOLTRONIC offers products covering a wide range of applications.



Food & Beverage



Medical



Oil Pumping Stations



Telecommunications

APPLICATIONS

KOOLTRONIC STANDARD WARRANTY

KOOLTRONIC products are warranted to be free of defects in workmanship, materials and components. The following warranty periods apply from date of shipment:

- Air moving devices/components and hermetic system components: 1 year
- Spare parts, except filters: 90 days

The above warranty applies when the equipment is operated under the following conditions:

- Ambient temperature not in excess of 125°F (52°C) in normal atmosphere or as stated on product nameplate
- Voltage variation no greater than $\pm 10\%$ from nameplate rating
- Frequency variation no greater than $\pm 3\text{Hz}$ from nameplate rating
- Maximum cooling load no higher than air conditioner nameplate rating
- Waiting five minutes before restarting air conditioner after intentional or accidental shutoff
- Compliance to all other installation, maintenance and operating instructions, as supplied
- The purchaser assumes the responsibility of grounding the unit and installing it in accordance with local electrical and safety codes, as well as the National Electric Code (NEC) and OSHA

KOOLTRONIC cannot assume responsibility for misapplication of its products or the erroneous selection of an inappropriate product by a non-authorized KOOLTRONIC representative. Our applications engineers will gladly assist in the selection of the proper product, provided all required details of the application are furnished.

THIS WARRANTY CONSTITUTES THE ENTIRE WARRANTY WITH RESPECT TO THE PRODUCT AND IS IN LIEU OF ALL OTHERS, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY AND WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND IN NO EVENT IS KOOLTRONIC RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER.

RETURN AUTHORIZATION (RA) PROCEDURE

- All returns require a Return Authorization number whether the return is for warranty or non-warranty repair, rotation of stock, damage or any other reason. Returns without an RA number will be refused.
- Customer must call KOOLTRONIC After Sale Kare (ASK), Pennington, New Jersey (609 · 466 · 3400) to obtain an RA number, or email ask@kooltronic.com.
- The following information is required when an RA is requested:
 - Original customer Purchase Order number and date
 - Date product was received by customer
 - Number of parts to be returned
 - Product description, model and serial number
 - Reason for return
 - Action requested
 - Contact name, telephone, FAX numbers and e-mail address
- Pack unit in a suitable container for shipment, preferably the original packaging if available. All Air Conditioners

KOOLTRONIC assumes no liability beyond the repair or replacement of its own product. This Warranty does not cover:

- Labor or reimbursement of labor for evaluation, removal, installation, repair or cost of any warranted part, except at the KOOLTRONIC factory in Pennington, NJ
- Use of equipment for other than its designed purpose or operating conditions
- Operation in harsh, oily, corrosive or other abnormal environmental conditions, without the proper filtration, sealing, protective coatings and/or weather protection
- Damage to hermetic system resulting from continuous operation with dirty or clogged air filters or improper or negligent maintenance
- Use of refrigerant other than designated
- Customer modification or abuse
- Shipping damage or other accident (Claims for shipping damage are the responsibility of the customer. Timely claims must be filed by the customer with the freight carrier)
- Cracked or broken hermetic tubing, brazed joints or other internal damage caused by shipping or mishandling
- Damage caused by shipping units attached to an enclosure
- Any and all conditions resulting from noncompliance with the preceding operating conditions
- Returned freight must be paid by customer
- **This standard warranty does not apply to custom products. Consult your KOOLTRONIC representative for limitations**

must be returned in an upright position properly secured to a pallet. **Improper packaging may void warranty claim.** If an Air Conditioner is received laying down or shipped via UPS or similar small parcel service the warranty will be void.

- Mark carton prominently with KOOLTRONIC's Return Authorization Number.
- Enclose all pertinent documents.
- Freight charges on all products returned to KOOLTRONIC shall be paid by the customer. Unauthorized collect shipments will be refused.
- If a unit is repaired under Warranty, KOOLTRONIC will pay the freight charges both ways within the Continental USA at KOOLTRONIC's negotiated rates. Warranty repaired units will be returned to customer at KOOLTRONIC expense only within the Continental USA.
- All authorized returns are subject to a restocking fee.

GENERAL TERMS AND CONDITIONS OF SALE

HOW TO ORDER

Please order by model number as described in the applicable product sections.

Telephone orders will be accepted and processed immediately. However, manufacturing and shipment may be deferred until a written confirming order is received, either by a standard purchase order or other acceptable form. All orders **MUST** include:

- Purchase order number
- Shipping and billing address
- KOOLTRONIC model number, full description, electrical specifications, quantity and unit price
- Delivery date desired, subject to acknowledgement
- Name of authorized purchasing department representative
- Method of shipment desired
- Amount of insurance on shipment, if required
- Sales/use tax status of order and exemption number, if exempt

MINIMUM ORDERS

All orders are subject to acceptance, dependent on quantity, availability of parts and other factors.

PAYMENT AND CREDIT

Payment terms are Net 30 Days after shipment, subject to prior credit approval. Major credit cards are accepted. Credit card payments are processed at the time of shipment. If a customer has open terms and a credit card is used after shipment, payment will be subject to a 3% surcharge. New accounts must provide necessary credit references. Until credit is established, payment in full may be required with order. All prices are FOB point of origin and include packing to good commercial practice. Sales outside the USA may be subject to Letter of Credit or other acceptable payment arrangements.

SOURCE INSPECTION CHARGE

A surcharge may apply on orders requiring inspection at the factory.

SHIPMENT

The acknowledged shipment date is based on our anticipated production schedule on the date the order is accepted. It is subject to our timely receipt of all information necessary to complete the order. We assume no liability for delays caused by circumstances beyond our control.

24-hour emergency shipment service is available.

CANCELLATION OR DEFERRED DELIVERY

Orders may be cancelled only upon the written approval of KOOLTRONIC. Cancellation may be subject to payment of reasonable charges to cover the cost of materials, labor and all direct and indirect expenses incurred by us in connection with the order.

Deferred or rescheduled delivery may, at our option, cause price adjustment and/or other appropriate charges.

REPAIR SERVICE

Units to be repaired must be returned to us freight prepaid after receipt of a KOOLTRONIC Return Authorization. Customer must contact the Customer Service Department for Return Authorization procedure and number prior to returning units (see previous page).

If warranty repair is applicable, the unit will be repaired and returned freight-prepaid, FOB destination. If warranty repair is not applicable, the customer will be advised of the repair charges. Authorization to proceed will be required before any costs are incurred. Non-warranty repairs will be returned FOB Pennington, NJ. Collect shipments or unauthorized returns may be refused by our Receiving Department.

SPECIFICATIONS, TERMS AND PRICE CHANGES; LIABILITY

KOOLTRONIC reserves the right to discontinue any item, and to make changes in the specifications, terms and conditions or prices at any time without notice. KOOLTRONIC assumes no liability for the consequences of erroneous selection or misapplication of any of its products by a non-authorized Kooltronic representative. Application and selection assistance are available by simply calling the KOOLTRONIC Sales Department.

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K500 (11/21)
(CDR: 20380)