Enclosure Climate Control

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.

*Our product offerings include an extensive array of units for virtually every type of application which customers can select from to address their enclosure ventilation or cooling requirement.

COOLING PRODUCT SELECTION
Our 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.

General Specifications for all Air Conditioners

CLOSED-LOOP COOLING: The enclosure interior airflow system is isolated from the ambient airflow 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 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 ensures 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.

FILTERS: Multi-layer grid of sturdy, corrugated aluminum in an aluminum frame. May be reused after washing off accumulations and spraying with 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 in many models. (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: Installation instructions, including mounting plan drawings, are included with each unit.

* See Guardian, Guardian 480 Volt for different specifications applicable.

Guardian Series, SlimKool Series, Compact Series, Compact Plus Series, and Advantage Series are brand names of KOOLTRONIC, Inc., Pennington, NJ

Climate Control

Air Conditioner Sizing and Selection
Climate Control

Cooling Electronic Control Cabinets
Most electronic control systems generate a substantial amount of heat during operation. This heat factor is intensified as electronic controls are made more compact, perform more functions and are placed in confined areas. Additional problems are encountered when the electronic process control system is located on-line in an industrial setting, rather than in a clean computer room. The factory environment can be hostile to the point that performance and effective life of the electronic components are materially reduced or the control system fails completely. Ambient temperature might be excessively high, as that found in a steel mill. Moisture-laden air and airborne particulate matter might be present to adversely affect the electronic components, as in the paper manufacturing industry. Air conditioners are designed to perform reliably under many of these harsh conditions and to provide the cooling and environmental protection required by sensitive electronic production control systems.

Factors Affecting Model Selection
This section is presented as a basic outline or checklist of the various application conditions to be considered when choosing a cooling unit. These are the factors which must be considered when selecting a cooling unit:

Internal Heat Load
This is the heat dissipated by the electronic controls. It is expressed in watts. One WATT equals 3.413 BTU/HR. Thus, to obtain the approximate cooling capacity required to remove a specific heat load, the following formula can be used: Watts x 3.413 - BTU/HR. For example, a heat load of 800 watts, require an air conditioner capable of removing at least 2,730 BTU/HR.

Resistance to Airflow in the Enclosure
Airflow is measured in cubic feet per minute (CFM). To create an air flow of any desired velocity requires that pressure be produced by the blower. Resistance to this blower-produced air flow is created by obstructions within the cabinet in the air flow path. The resistance itself is called static pressure (SP) and is measured in inches of water column. The effect of significant restrictions in the cabinet air flow path are as follows:
- the obstructions cause static pressure.
- static pressure results in a pressure drop, or differential, from the air velocity produced by the blower.
- this reduction in cool air flow will decrease the effective capacity of the cooling unit. Allowance must be made for static pressure.

Heat Load from the Surroundings
Ambient conditions can cause a heat gain in the enclosure. The rated capacity of the cooling unit must be sufficient to handle this heat gain. When evaluating the additional heat load gained from the surroundings there are two possible conditions:
- the cabinet is insulated and well sealed
- the cabinet is not insulated.

Cabinet Insulated - Normally, well-insulated cabinets do not gain sufficient heat from the surroundings to affect the air conditioner operation. BTU/HR ratings for Kooltronic air conditioners have been established at the maximum ambient operating temperature of 125°F. A substantial improvement in heat removal occurs when operating in ambient temperatures below 125°F.

Cabinet Not Insulated - Obviously, this design places more of a burden on the cooling unit. Heat is conducted to the cool side. Thus, high ambient heat will be readily transmitted into the cooler enclosure. To determine the additional capacity required of an air conditioner installed in an uninsulated cabinet, the surface area of the enclosure must be calculated to obtain the total effective heat transfer area. For this calculation, use the surface area of the sides, plus the area of the top and omit the bottom area of the cabinet.
Air movement outside the uninsulated cabinet will increase the heat conducted from the ambient into the enclosure. When there is little or no air circulation outside the cabinet, the layer of air immediately adjacent to the exterior cabinet walls acts as an insulating film. Exterior air movement dissipates this insulating layer of air in proportion to the velocity of the air flow. Substantial ambient air circulation will increase the transmitted heat load imposed on the cooling unit. If the cabinet being cooled is not air tight, high ambient relative humidity will adversely affect the cooling effectiveness of the air conditioner. When humid air infiltrates a poorly sealed enclosure, the air conditioner is required to use up valuable capacity just to condense the moisture from the internal air. Conversely, if the cabinet is well sealed, high ambient relative humidity has very little effect on the rated capacity of the air conditioner.
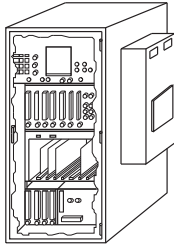
Climate Control Products

Air Conditioners Sizing & Selection
Climate Control

The proper selection of an air conditioner is determined by the following criteria:

1) Required cooling capacity BTU/HR.

2) Mounting requirements (top, side or internal mounting)
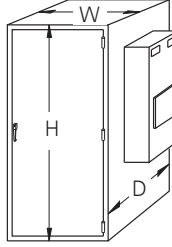
3) Dimensions of air conditioner & enclosure

To determine air conditioner capacity required:

First

1 Watt = 3.413 BTU/HR.
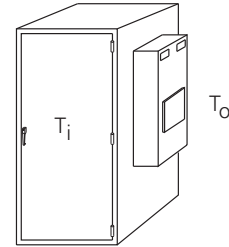Determine the internal Watts of heat to be dissipated.

Second

$1 M^2 = 10.76 ft^2$
Calculate the area of the enclosure which is exposed to the ambient air:

$$\frac{2H''\,(W''+ D'') + (D'' \times W'')}{144} = \text{Area (ft}^2)$$

Third

$1°C \Delta T = 1.8°F \Delta T$
Determine the temperature differential ΔT (°F) by subtracting the maximum allowable internal cabinet temperature (T_i) from the maximum ambient temperature outside of the enclosure (T_o): $T_o - T_i = \Delta T$

Fourth: (Watts x 3.413) + [1.25 x Area ft.² x Δ T (°F)] = BTU/HR.

Air Conditioner Accessories and Options
Climate Control

Factory Installed Options

Accessories & Options

- Adapter Plates
- Compressor Heater
- Condensate Evaporator Kit
- Deep Drain Pan Kit
- Enclosure Heater
- Filter Recoating Adhesive
- Internal Corrosion Protection
- Lifting Eyes
- Low Airflow Detector
- Low Ambient Kit

- Mounting Hinge
- Programmable Thermostat
- Replacement Filters
- Short Cycle Protector
- Special Motors, Line Cords, or Connectors
- Special Materials or Finishes
- Stainless or Aluminum Cabinet
- Temperature Alarm
- Weather Protection Kit

Some options may not be available on selected models.
Some options are available as standard features on selected models.

Notes: Data subject to change without notice. Consult factory for special requirements.

Guardian DP15
NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp.				Volts	* Hz	** Running Amps	Weight	
				°F		°C					lbs	kg
				Max.	Min.	Max.	Min.					
KNA4C1DP15L	4	1160	950	131	-20	55	-29	115/100	60/50	4.3	26	12
KNA4C1DP15LV	4X	1160	950	131	-20	55	-29	115/100	60/50	4.3	26	12

* 115V 60 Hz models perform at reduced capacity when operated at 100V 50 Hz.
** Rating shown 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 Coils
- Filter
- Heavy-duty Steel Shell
- Internal Corrosion Protection (NEMA 4X Models)
- Low Temperature Control Thermostat*
- NEMA 12, 3R and 4 Ratings Maintained (UL50)
- Six-Foot [1.8m] (Minimum) 3-Wire Power Cord
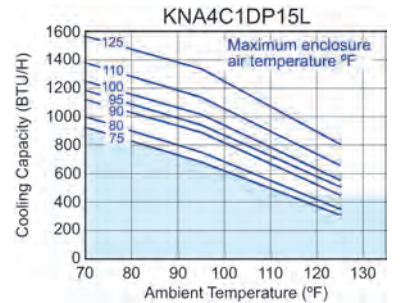- Stainless Steel Shell (NEMA 4X Models)
- UL/CUL Listed

* Transitioning to programmable controls

Accessories & Options

- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Remote Thermostat Relay
- Replacement Filters (P/N: 525F)
- Special Motors, Line Cords or Connectors
- Special Paint Finishes
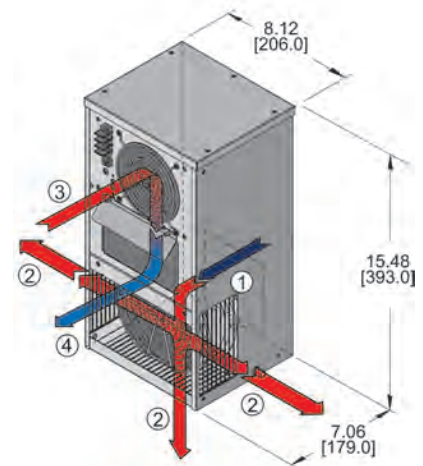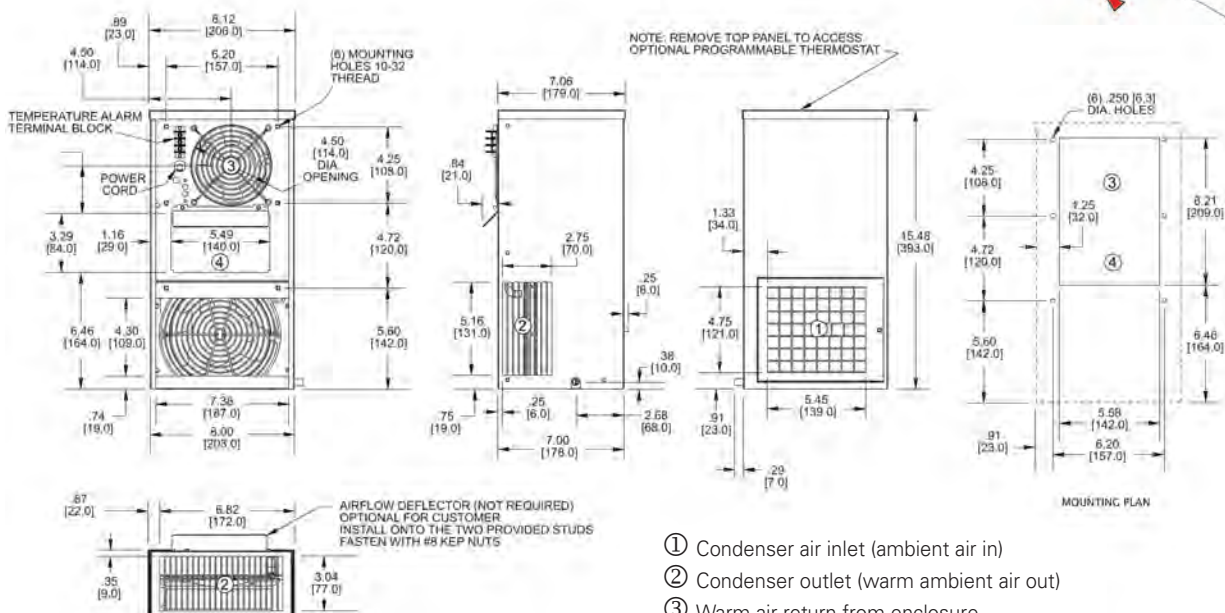- Stainless or Aluminum Shell

Transitioning to
ANSI 61 Gray finish

NEMA TYPE 4 OR 4X MAINTAINED

Performance

KNA4C1DP15L

Maximum enclosure air temperature °F

Operation within shaded area not recommended.

Drawings

NOTE: REMOVE TOP PANEL TO ACCESS OPTIONAL PROGRAMMABLE THERMOSTAT

MOUNTING PLAN

AIRFLOW DEFLECTOR (NOT REQUIRED) OPTIONAL FOR CUSTOMER INSTALL ONTO THE TWO PROVIDED STUDS FASTEN WITH #8 KEP NUTS

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control

Climate Control Products

Guardian DP21
NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp. °F Max.	°F Min.	°C Max.	°C Min.	Volts	* Hz	** Running Amps	Weight lbs	kg
KNA4C3DP21L	4	3000	2470	131	-20	55	-29	115/100	60/50	6.0/5.0	54	25
KNA4C3DP21LV	4X	3000	2470	131	-20	55	-29	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 for operation at maximum ambient temperature.
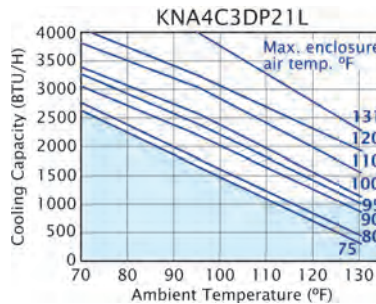
Standard Features

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

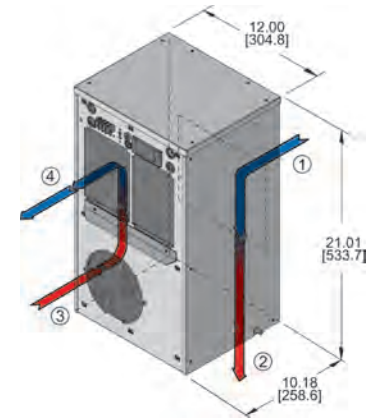* Transitioning to programmable controls

Accessories & Options

- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Remote Thermostat Relay
- Replacement Filters (P/N: 8388F)
- Special Motors, Line Cords or Connectors
- Special Paint Finishes
- Stainless or Aluminum Shell

Transitioning to ANSI 61 Gray finish
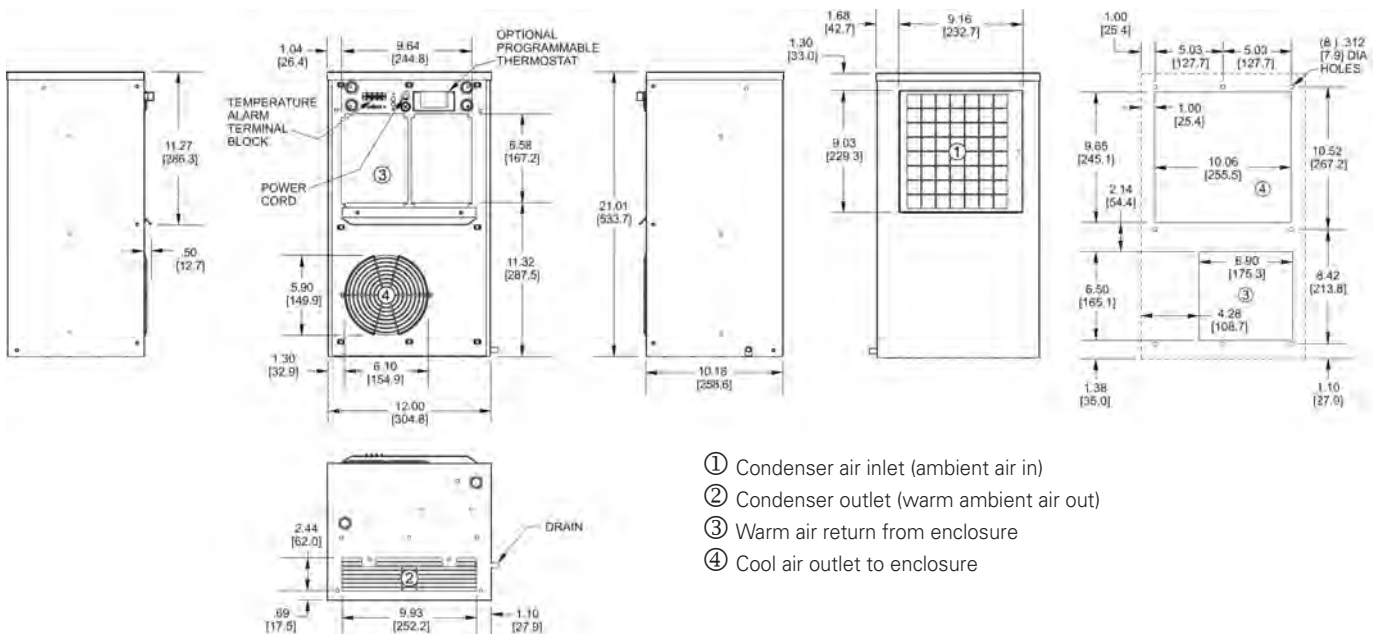
c(UL)us

NEMA TYPE 4 OR 4X MAINTAINED

Performance

Operation within shaded area not recommended.

Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Guardian DP33
NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp.				Volts	* Hz	** Running Amps	Weight	
				°F		°C					lbs	kg
				Max.	Min.	Max.	Min.					
KNA4C5DP33L	4	5000	4000	131	-20	55	-29	115/100	60/50	10.6/10.2	95	43
KNA4C5DP33LV	4X	5000	4000	131	-20	55	-29	115/100	60/50	10.6/10.2	95	43

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

Transitioning to
ANSI 61 Gray finish

NEMA
TYPE 4 OR 4X
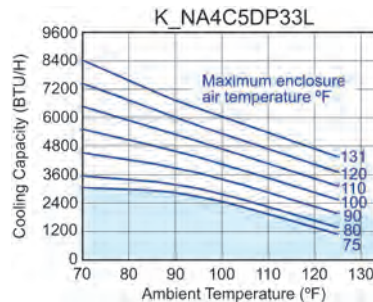**MAINTAINED**

Standard Features

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coils
- Filter
- Heavy-duty Steel Shell
- Internal Corrosion Protection (NEMA 4X Models)
- Low Temperature Control Thermostat*
- NEMA 4 or 4X Rating Maintained (UL50)
- Six-Foot [1.8m] (Minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X Models)
- UL/CUL Listed

* Transitioning to programmable controls
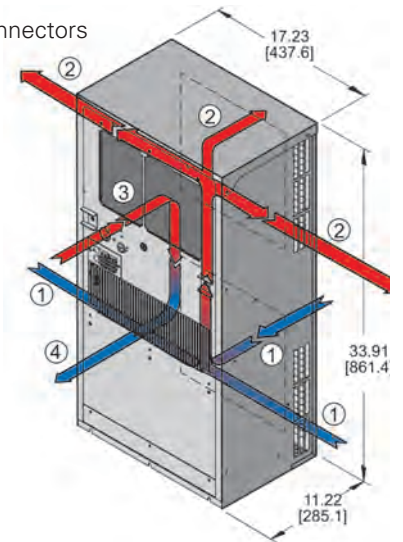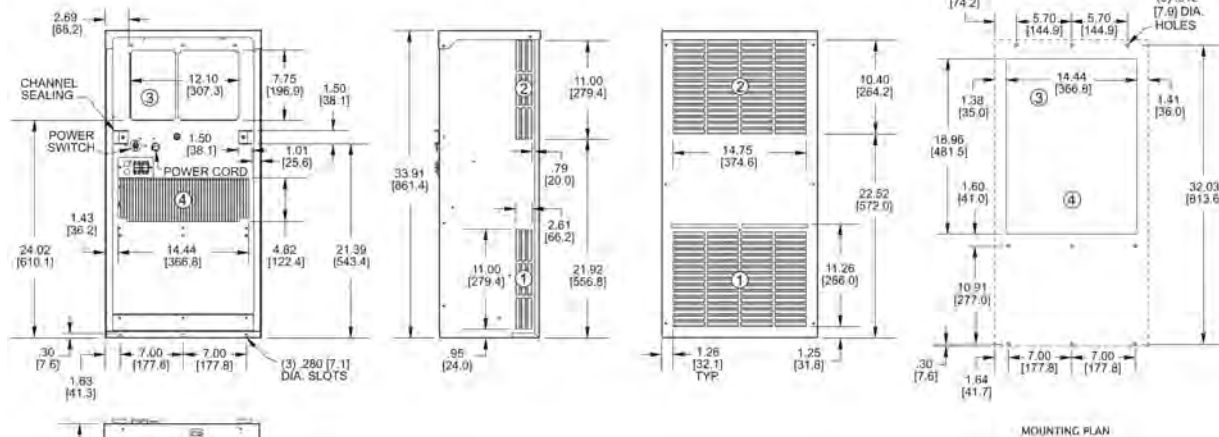
Accessories & Options

- Compressor Short Cycle Protector
- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Other Voltages and Frequencies
- Remote Thermostat Relay
- Replacement Filters (P/N: 9501F)
- Special Motors, Line Cords or Connectors
- Special Materials and Finishes
- Temperature Alarm
- Available in 230V Models

Performance

K_NA4C5DP33L

Operation within shaded area not recommended.

Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control

Climate Control Products

Guardian DP47
NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp.				Volts	* Hz	** Running Amps	Weight	
				°F		°C					lbs	kg
				Max.	Min.	Max.	Min.					
KNA4C9DP47L	4	9000	7400	131	-20	55	-29	115/100	60/50	19.2	135	61
KNA4C9DP47LV	4X	9000	7400	131	-20	55	-29	115/100	60/50	19.2	135	61

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

Transitioning to
ANSI 61 Gray finish

NEMA
TYPE 4 OR 4X
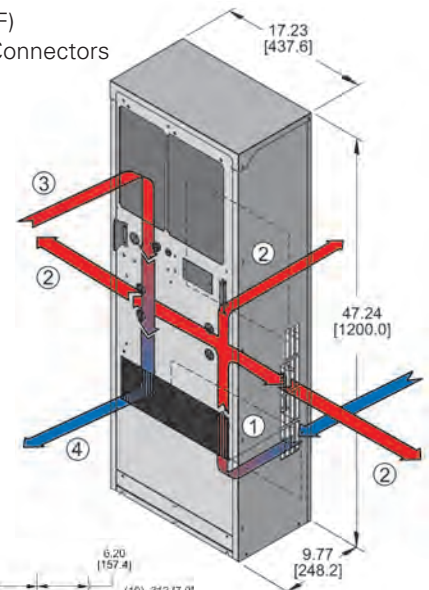**MAINTAINED**

Standard Features

- Baked Powder Finish
- Built-in Condensate Evaporator
- CFC-Free Refrigerant
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coils
- Filter
- Heavy-duty Steel Shell
- Internal Corrosion Protection (NEMA 4X Models)
- Low Temperature Control Thermostat*
- NEMA 4 or 4X Rating Maintained (UL50)
- Six-Foot [1.8m] (Minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X Models)
- UL/CUL Listed

* Transitioning to programmable controls
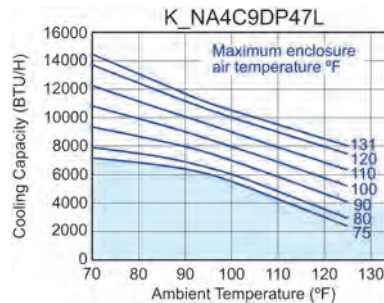
Accessories & Options

- Compressor Short Cycle Protector
- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Other Voltages and Frequencies
- Remote Thermostat Relay
- Replacement Filters (P/N: 8001F)
- Special Motors, Line Cords or Connectors
- Special Materials and Finishes
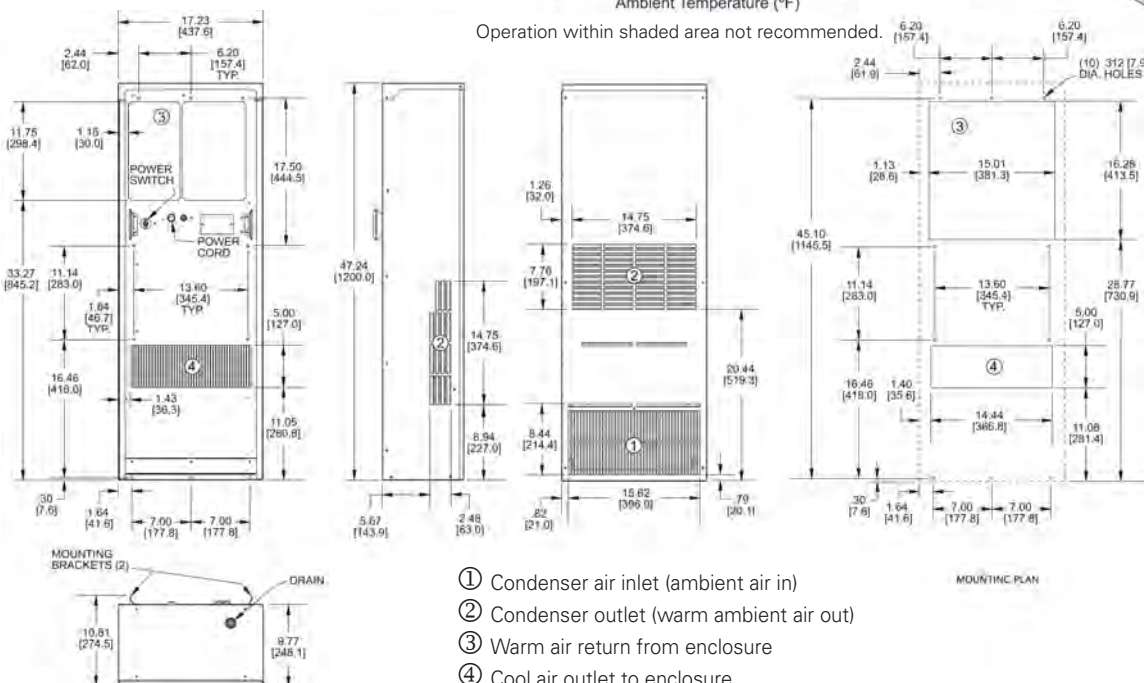- Temperature Alarm
- Available in 230V Models

Performance

Operation within shaded area not recommended.

Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Guardian DP50
NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp.				Volts	* Hz	** Running Amps	Weight	
				°F		°C					lbs	kg
				Max.	Min.	Max.	Min.					
K2NA6C14DP50L	4	14000	13000	131	-20	55	-29	230	60	13.5	207	94
K2NA6C14DP50LV	4X	14000	13000	131	-20	55	-29	230	60	13.5	207	94

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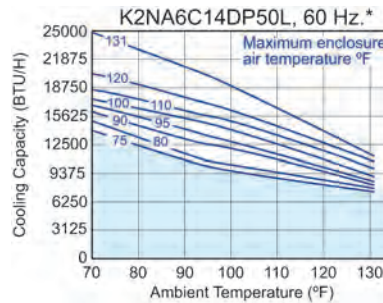
Standard Features

- Baked Powder Finish
- Built-In Condensate Evaporator
- Closed-Loop Cooling
- Condenser Blower Controller
- Epoxy-Coated Condenser Coils
- Filters (2)
- Heavy-duty Steel Shell
- Internal Corrosion Protection (NEMA 4X Models)
- Low Temperature Control Thermostat*
- NEMA 4 or 4X Rating Maintained (UL50)
- Six-Foot [1.8m] (Minimum) 3-Wire Power Cord
- Stainless Steel Shell (NEMA 4X Models)
- UL/CUL Listed
- Zero ODP Refrigerant

* Transitioning to programmable controls
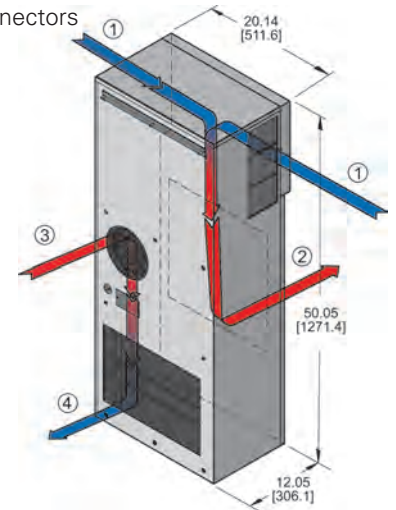
Accessories & Options

- Compressor Short Cycle Protector
- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Other Voltages and Frequencies
- Remote Thermostat Relay
- Replacement Filters (P/N: 13658F)
- Special Motors, Line Cords or Connectors
- Special Materials and Finishes
- Temperature Alarm

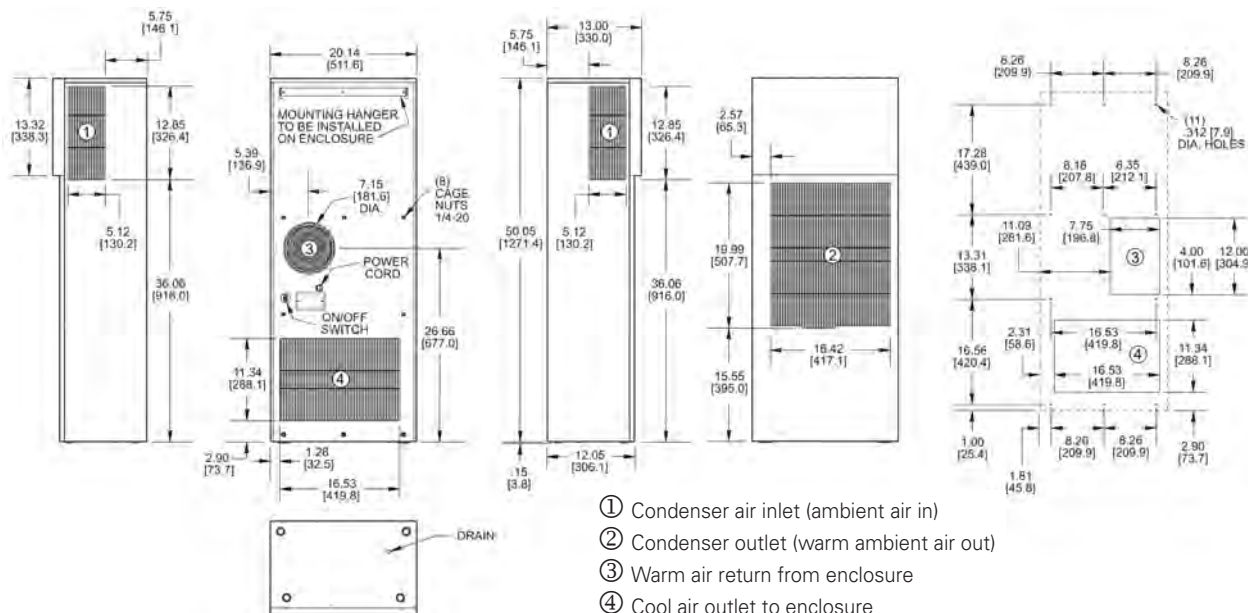Transitioning to ANSI 61 Gray finish

NEMA TYPE 4 OR 4X MAINTAINED

Performance

K2NA6C14DP50L, 60 Hz.*

Maximum enclosure air temperature °F

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

Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control

# Climate Control Products

Guardian Series DP24
480 Volt 1-Phase NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp. °F Max.	Ambient Temp. °F Min.	Ambient Temp. °C Max.	Ambient Temp. °C Min.	Volts	Hz	* Running Amps	Weight lbs	Weight kg
K3NA4C3DP24L	4	3000	2500	125	-20	52	-29	480/1	60	1.4	61	27
K3NA4C3DP24LV	4X	3000	2500	125	-20	52	-29	480/1	60	1.4	61	27

* Rating shown for operation at maximum ambient temperature.

Transitioning to ANSI 61 Gray finish

NEMA
TYPE 4 OR 4X
MAINTAINED
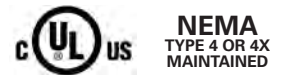
Standard Features

- Baked Powder Finish
- 480 Volt 1-Phase
- Built-In Condensate Evaporator
- CFC - Free Refrigerant
- Closed-Loop Cooling
- Compressor Short Cycle Protector
- Condenser Blower Controller
- Epoxy-Coated Condenser Coils
- Filter
- Heavy-duty Steel Shell
- Internal Corrosion Protection (NEMA 4X Models)
- Low Temperature Control Thermostat*
- NEMA 4 or 4X Rating Maintained (UL50)
- Stainless Steel Shell (NEMA 4X Models)
- UL/CUL Listed
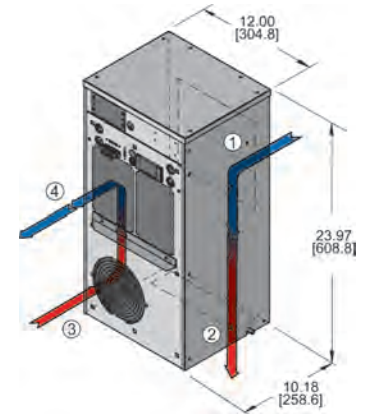
* Transitioning to programmable controls

Accessories & Options

- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Remote Thermostat Relay
- Replacement Filters (P/N: 8388F)
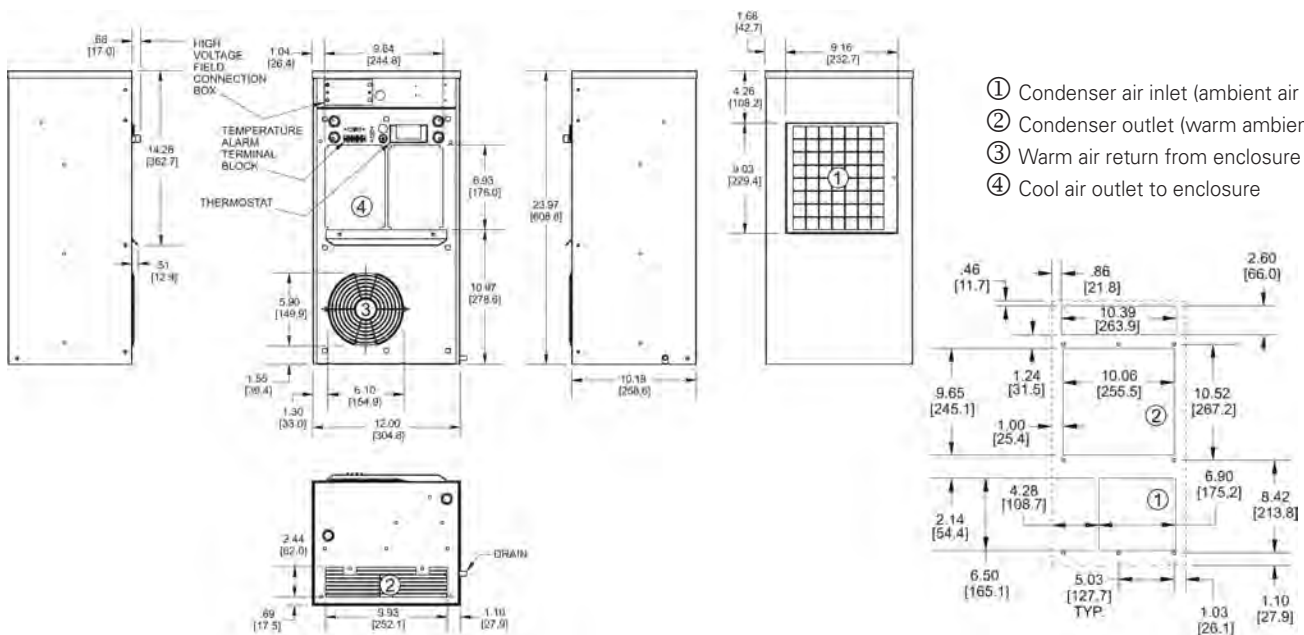- Special Materials and Finishes
- Stainless or Aluminum Shell

Performance
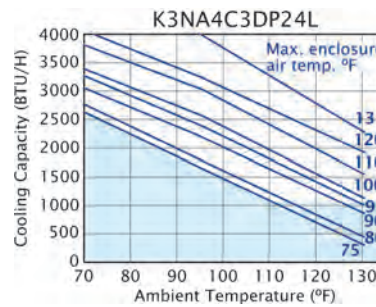
Operation within shaded area not recommended.

① 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

Drawings

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Guardian Series DP38
480 Volt 3-Phase NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp. °F Max.	Ambient Temp. °F Min.	Ambient Temp. °C Max.	Ambient Temp. °C Min.	Volts	Hz	* Running Amps	Weight lbs	Weight kg
K3NA4C5DP38L	4	5000	4800	131	0	55	-18	480	60	2.0	115	52
K3NA4C5DP38LV	4X	5000	4800	131	0	55	-18	480	60	2.0	115	52

* Rating shown for operation at maximum ambient temperature.

Transitioning to ANSI 61 Gray finish

NEMA TYPE 4 OR 4X MAINTAINED

Standard Features

- Baked Powder Finish
- Built-In Condensate Evaporator
- CFC - Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coils
- External Junction Box for Permanent Wiring Connections
- Filter
- Heavy-duty Steel Shell
- Internal Corrosion Protection (NEMA 4X Models)
- Low Temperature Control Thermostat*
- NEMA 4 or 4X Rating Maintained (UL50)
- Phase Sequence/Phase Loss Detector/ Under Voltage Monitor
- Stainless Steel Shell (NEMA 4X Models)
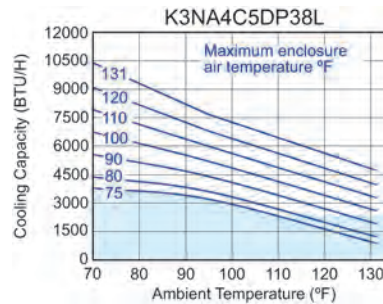- UL/CUL Listed

* Transitioning to programmable controls

Accessories & Options

- Compressor Short Cycle Protector
- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Remote Thermostat Relay
- Replacement Filters (P/N: 9501F)
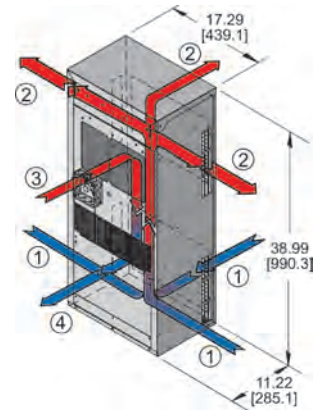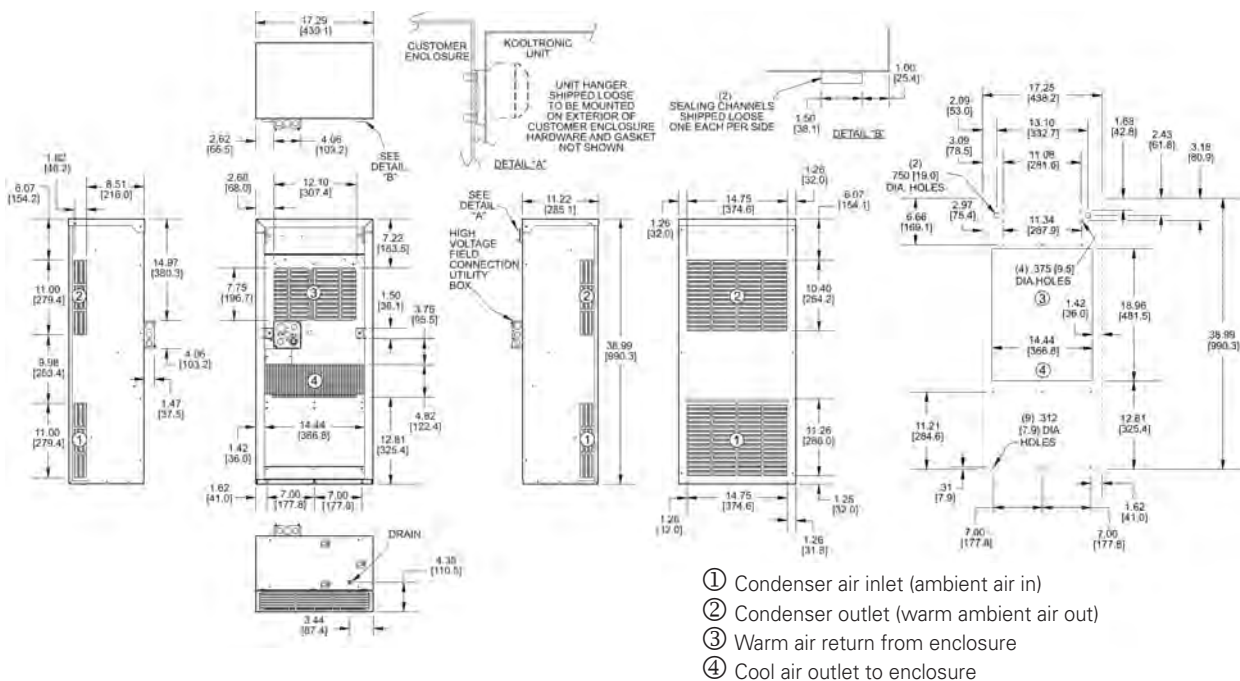- Special Paint Finishes
- Temperature Alarm

Performance

K3NA4C5DP38L

Maximum enclosure air temperature °F

Operation within shaded area not recommended.

Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control

Climate Control Products

Guardian Series DP52
480-Volt 3-Phase NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp.				Volts	Hz	* Running Amps	Weight	
				°F		°C					lbs	kg
				Max.	Min.	Max.	Min.					
K3NA4C7DP52L	4	7000	6300	131	0	55	-18	480	60	3.0	160	72
K3NA4C7DP52LV	4X	7000	6300	131	0	55	-18	480	60	3.0	160	72
K3NA4C9DP52L	4	9000	8100	131	0	55	-18	480	60	4.0	164	75
K3NA4C9DP52LV	4X	9000	8100	131	0	55	-18	480	60	4.0	164	75

* Rating shown for operation at maximum ambient temperature.

Transitioning to ANSI 61 Gray finish

cULus

NEMA
TYPE 4 OR 4X
MAINTAINED

Standard Features

- Baked Powder Finish
- Built-In Condensate Evaporator
- CFC - Free Refrigerant
- Closed-Loop Cooling
- Condenser Impeller Speed Controller
- Epoxy-Coated Condenser Coils
- External Junction Box for Permanent Wiring Connections
- Filter
- Heavy-duty Steel Shell
- Internal Corrosion Protection (NEMA 4X Models)
- Low Temperature Control Thermostat*
- NEMA 4 or 4X Rating Maintained (UL50)
- Phase Sequence/Phase Loss Detector/ Under Voltage Monitor
- Stainless Steel Shell (NEMA 4X Models)
- UL/CUL Listed

* Transitioning to programmable controls

Accessories & Options

- Compressor Short Cycle Protector
- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Remote Thermostat Relay
- Replacement Filters (P/N: 8001F)
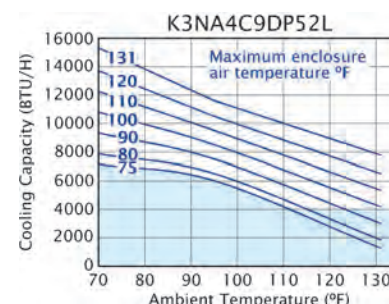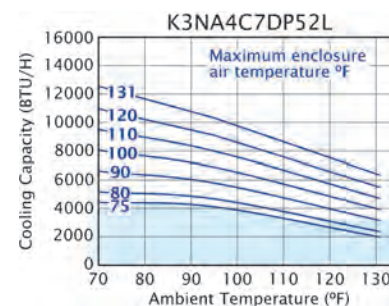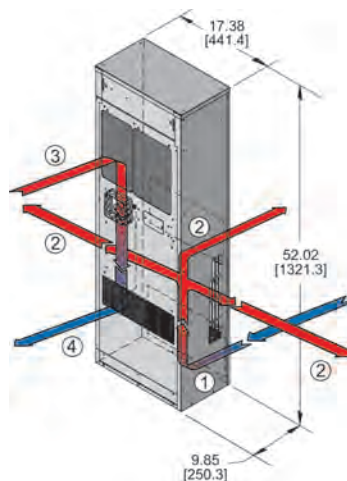- Special Paint Finishes
- Temperature Alarm

Performance

K3NA4C7DP52L
Maximum enclosure air temperature °F

K3NA4C9DP52L
Maximum enclosure air temperature °F

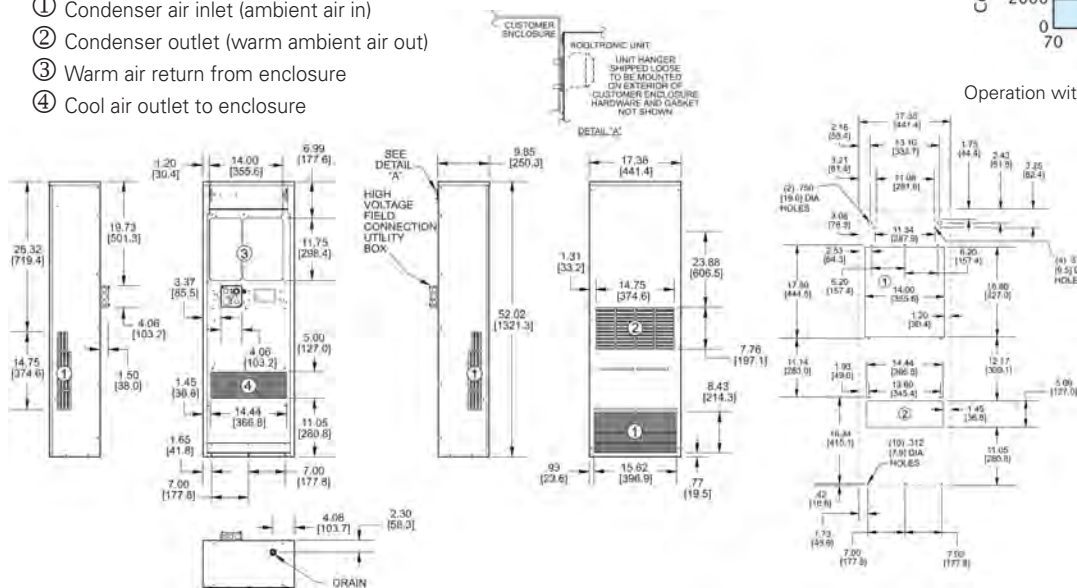Operation within shaded area not recommended.

Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

SlimKool Series (narrow width) SP28
NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp.				Volts	Hz	* Running Amps	Weight	
				°F		°C						
				Max.	Min.	Max.	Min.				lbs	kg
KNA4C4SP28L	4	4000	3700	131	-20	55	-29	115/100	60/50	8.3	85	38.5
KNA4C4SP28LV	4X	4000	3700	131	-20	55	-29	115/100	60/50	8.3	85	38.5

* Rating shown for operation at maximum ambient temperature.

Standard Features

- Built-In Condensate Evaporator
- CFC - Free Refrigerant
- Closed-Loop Cooling
- Compact Design/Slim Mounting Footprints
- Compressor Short Cycle Protector
- Condenser Impeller Cycling Controller
- Epoxy-Coated Evaporator & Condenser Coils
- Filter
- Heavy-duty Steel Shell with ANSI Gray Polyester Powder Coating
- Internal Corrosion Protection
- NEMA 12, 3R, and 4 Ratings Maintained (UL50) (4X Optional)
- Programmable Temperature Alarm
- Programmable Thermostat
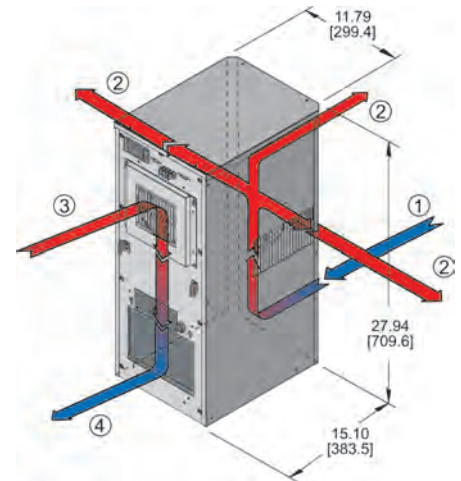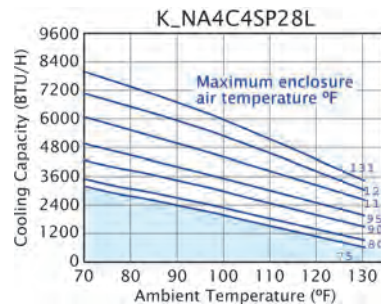- Stainless Steel Shell (NEMA 4X Models)
- UL/CUL Listed

Accessories & Options

- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Mounting Adapter Plates
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters (P/N: 9501F)
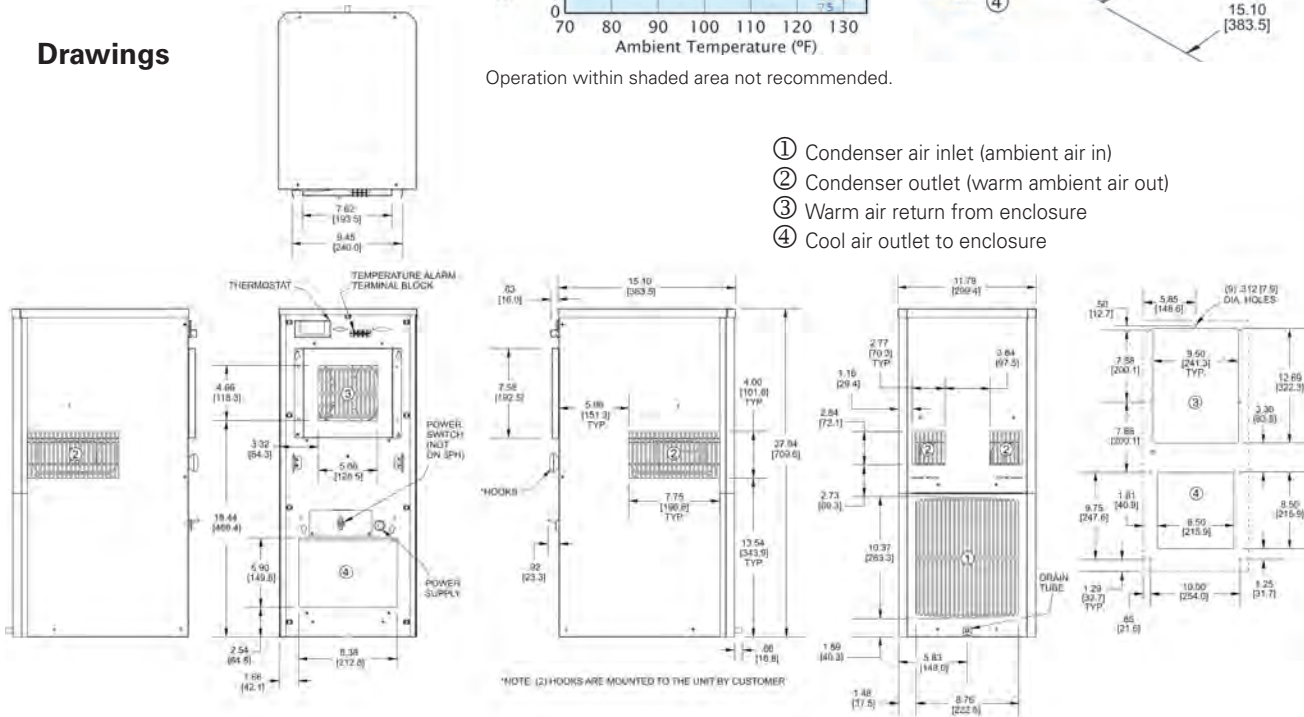- Available in 230V and 480V Models

NEMA
TYPE 12, 3R, & 4 MAINTAINED (4X OPTIONAL)

Performance

K_NA4C4SP28L

Cooling Capacity (BTU/H) vs Ambient Temperature (°F)
Maximum enclosure air temperature °F

Operation within shaded area not recommended.

Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control Products

SlimKool Series (narrow width) SP36
NEMA 4 or 4X Air Conditioners

| Model | NEMA Rating | BTU/H Capacity | 95/95 Rating BTU/H | Ambient Temp. | | | | Volts | Hz | * Running Amps | Weight | |
| | | | | °F | | °C | | | | | | |
				Max.	Min.	Max.	Min.				lbs	kg
KNA4C6SP36L	4	6000	5600	131	-20	55	-29	115/100	60/50	9.6	100	45.3
KNA4C6SP36LV	4X	6000	5600	131	-20	55	-29	115/100	60/50	9.6	100	45.3
KNA4C8SP36L	4	8000	7500	131	-20	55	-29	115/100	60/50	14.4	100	45.3
KNA4C8SP36LV	4X	8000	7500	131	-20	55	-29	115/100	60/50	14.4	100	45.3

* Rating shown for operation at maximum ambient temperature.

Standard Features

- Built-In Condensate Evaporator
- CFC - Free Refrigerant
- Closed-Loop Cooling
- Compact Design/Slim Mounting Footprints
- Compressor Short Cycle Protector
- Condenser Impeller Cycling Controller
- Epoxy-Coated Evaporator & Condenser Coils
- Filter
- Heavy-duty Steel Shell with ANSI Gray Polyester Powder Coating
- Internal Corrosion Protection
- NEMA 12, 3R, and 4 Ratings Maintained (UL50) (4X Optional)
- Programmable Temperature Alarm
- Programmable Thermostat
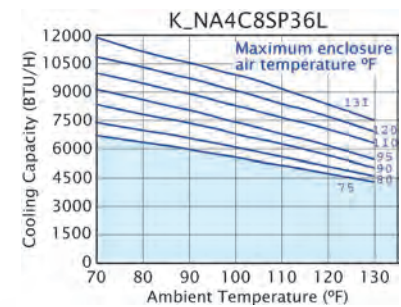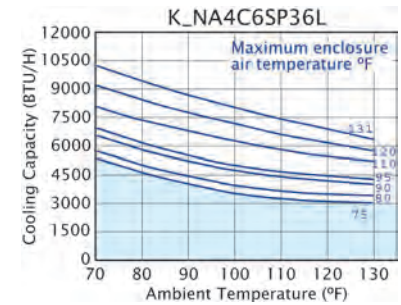- Stainless Steel Shell (NEMA 4X Models)
- UL/CUL Listed

Accessories & Options

- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Mounting Adapter Plates
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters (P/N: 9502F)
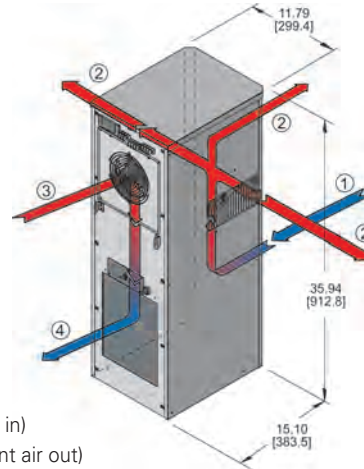- Available in 230V Models

NEMA
TYPE 12, 3R, & 4 MAINTAINED (4X OPTIONAL)

Performance

K_NA4C6SP36L

K_NA4C8SP36L
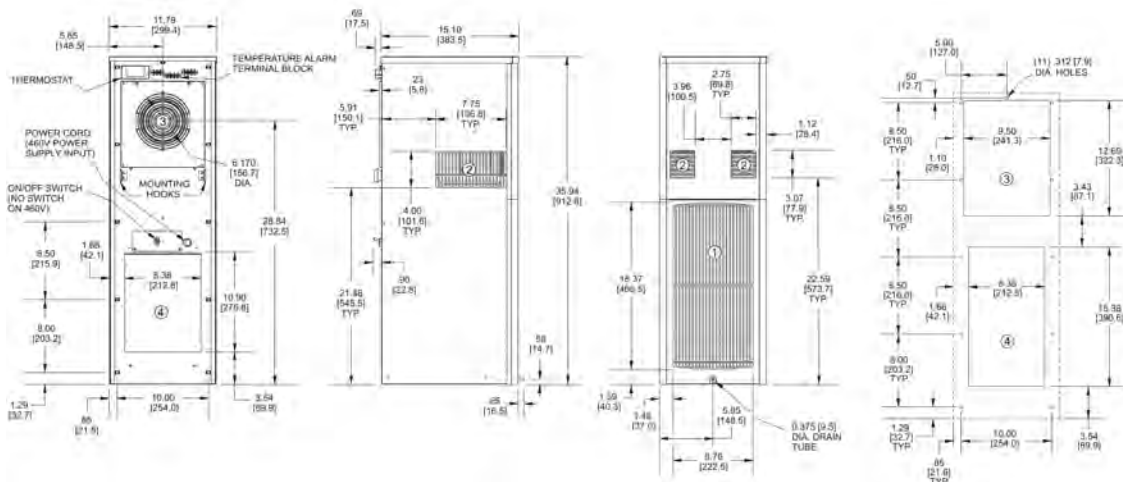
Operation within shaded area not recommended.

Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control

SlimKool Series (narrow width) SP43
NEMA 4 or 4X Air Conditioners

Model	NEMA Rating	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp.				Volts	Hz	* Running Amps	Weight	
				°F		°C					lbs	kg
				Max.	Min.	Max.	Min.					
KNA4C11SP43L	4	11000	9300	131	-20	55	-29	115/100	60/50	20.0/19.5	115	52
KNA4C11SP43LV	4X	11000	9300	131	-20	55	-29	115/100	60/50	20.0/19.5	115	52

* Rating shown for operation at maximum ambient temperature.

Standard Features

- Built-In Condensate Evaporator
- CFC - Free Refrigerant
- Closed-Loop Cooling
- Compact Design/Slim Mounting Footprints
- Compressor Short Cycle Protector
- Condenser Impeller Cycling Controller
- Epoxy-Coated Evaporator & Condenser Coils
- Filter
- Heavy-duty Steel Shell with ANSI Gray Polyester Powder Coating
- Internal Corrosion Protection
- NEMA 12, 3R, and 4 Ratings Maintained (UL50) (4X Optional)
- Programmable Temperature Alarm
- Programmable Thermostat
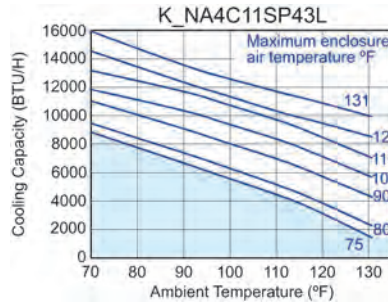- Stainless Steel Shell (NEMA 4X Models)
- UL/CUL Listed

Accessories & Options

- Enclosure Heater
- Filter Recoating Adhesive
- Lead-Lag Controller
- Mounting Adapter Plates
- Remote Monitoring
- Remote Thermostat Relay
- Replacement Filters (P/N: 9503F)
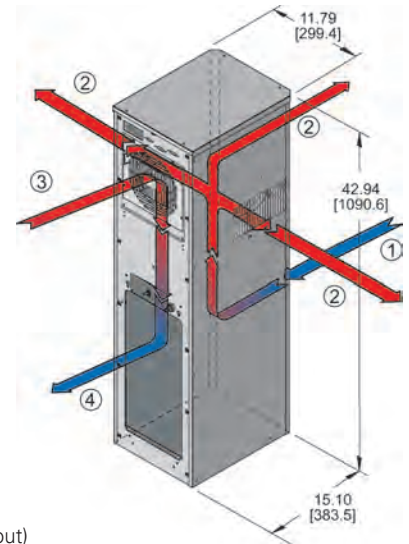- Available in 230V and 480V Models

NEMA
TYPE 12, 3R, & 4 MAINTAINED (4X OPTIONAL)
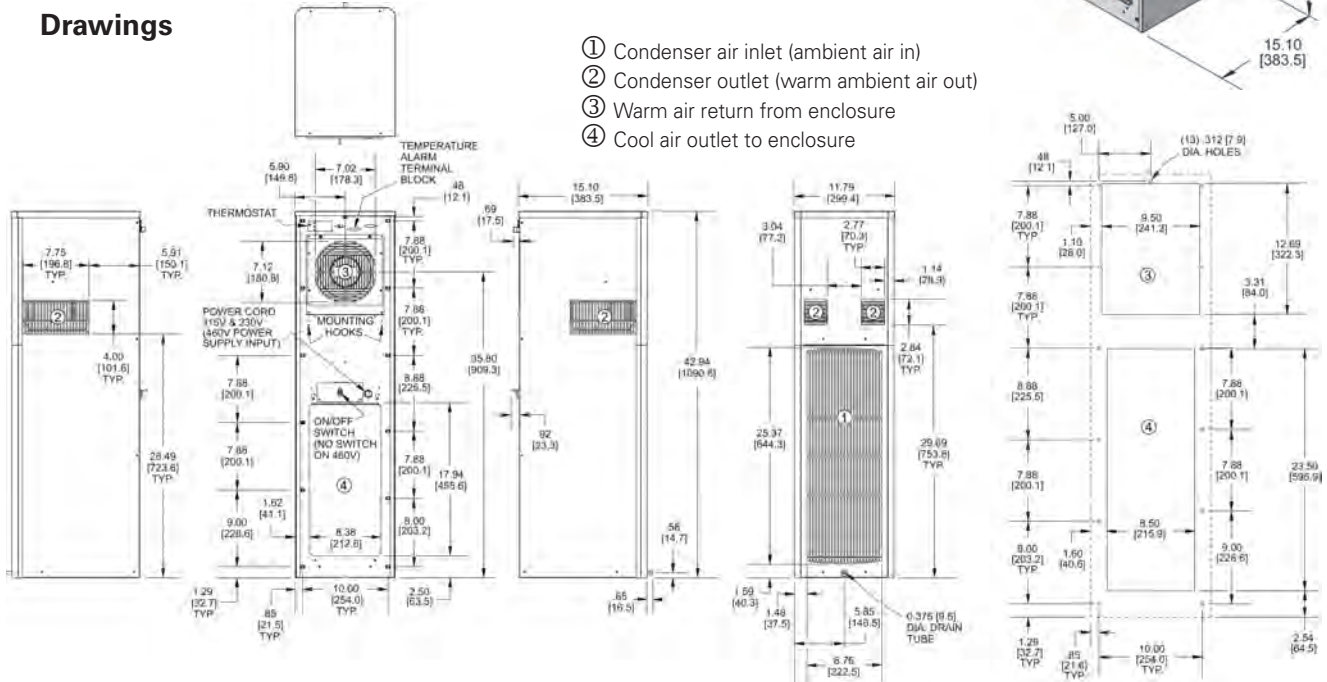
Performance

K_NA4C11SP43L
Maximum enclosure air temperature °F

Operation within shaded area not recommended.

Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control Products

Compact Series Horizontal
Top-Mounted Air Conditioners

Model	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp.				Volts	Hz	* Running Amps	Weight	
			°F		°C					lbs	kg
			Max.	Min.	Max.	Min.					
KA4C4HTL	4000	2250	125	50	52	10	115/100	60/50	13.1	85	38

* Rating shown for operation at maximum ambient temperature.

Standard Features

- Built-In Condensate Evaporator
- CFC - Free Refrigerant
- Filter
- Low Temperature Control Thermostat
- UL/CUL Listed

Performance

KA4C4HTL

Operation within shaded area not recommended.

Accessories & Options

- Compressor Short Cycle Protector
- Enclosure Heater
- Filter Recoating Adhesive
- Internal Corrosion Protection
- Lead-Lag Controller
- Lifting Eyes
- Low Airflow Detector
- Low Ambient Kit
- Remote Thermostat Relay
- Replacement Filters (P/N: 240F)
- Special Controls or Indicators
- Special Materials or Finishes
- Special Motors, Line Cords, or Connectors
- Stainless or Aluminum Shell
- Temperature Alarm
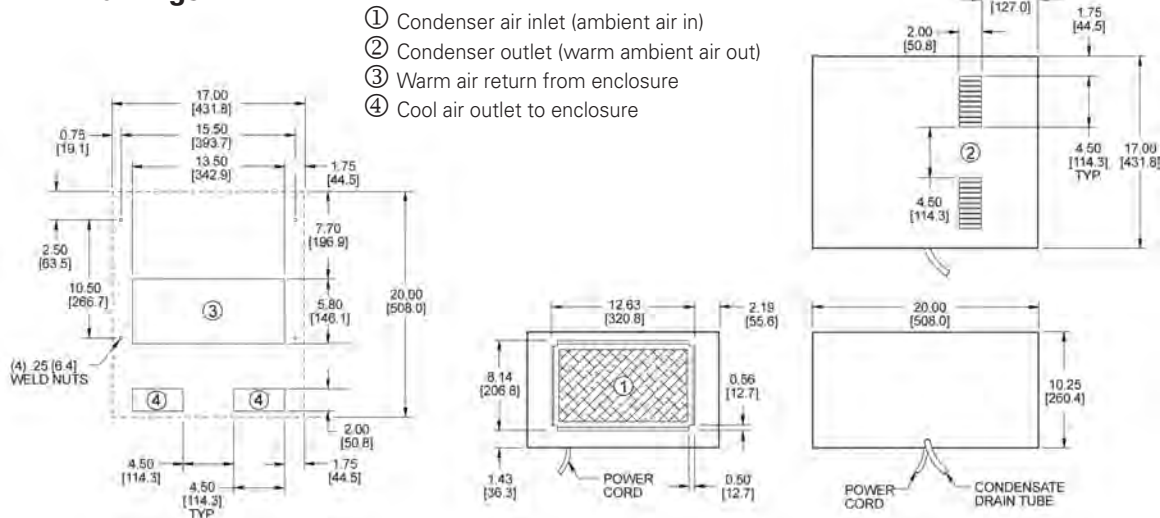- Available in 230V Models
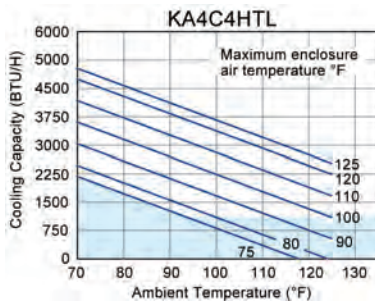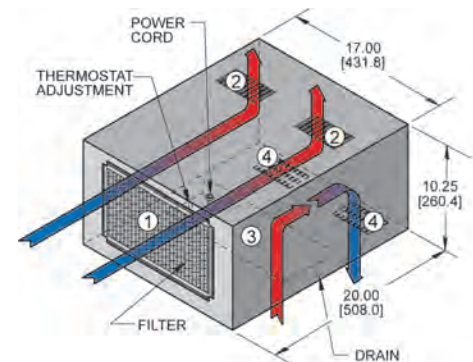
Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Compact Plus Series Horizontal Top-Mounted Air Conditioners

Model	BTU/H Capacity	95/95 Rating BTU/H	Ambient Temp.				Volts	Hz	* Running Amps	Weight	
			°F		°C					lbs	kg
			Max.	Min.	Max.	Min.					
KA4C5.0H5R	5000	3500	125	50	52	10	115/100	60/50	16.5	95	43

* Rating shown for operation at maximum ambient temperature.
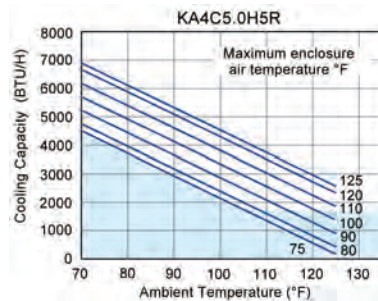
Standard Features

- CFC - Free Refrigerant
- Filter
- Low Temperature Control Thermostat
- Reversible Condenser Outlet Blower
- UL Recognized

Accessories & Options

- Compressor Short Cycle Protector
- Brackets for Rack Mounting
- Enclosure Heater
- Filter Recoating Adhesive
- Internal Corrosion Protection
- Lead-Lag Controller
- Lifting Eyes
- Low Airflow Detector
- Low Ambient Kit
- Remote Thermostat Relay
- Replacement Filters (P/N: 4811F)
- Special Controls or Indicators
- Special Materials or Finishes
- Special Motors, Line Cords, or Connectors
- Stainless or Aluminum Shell
- Temperature Alarm
- Available in 230V Models

Recognized

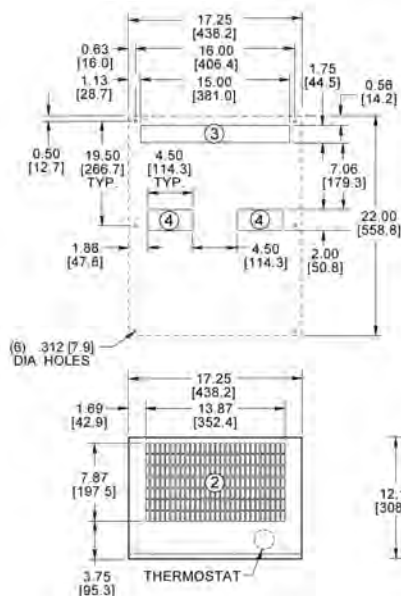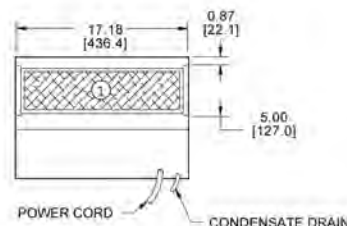### Performance

Operation within shaded area not recommended.
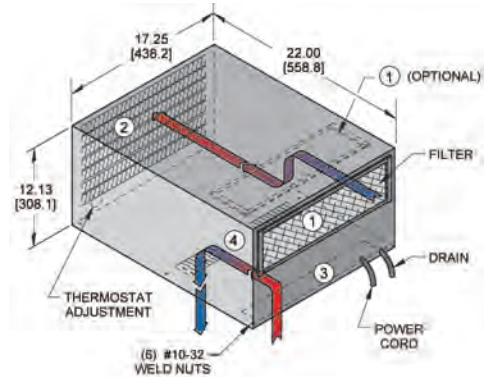
Drawings

① 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

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control

Climate Control Products

Filter Fans
NEMA 1 Box Fan

Description
High airflow with low noise operations makes these versatile packaged fans very popular in a wide range of applications. Reversible mounting brackets 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. Utilizing the special motor-mount isolation system, these fans operate virtually vibration-free. Front and rear grilles can be adjusted to accommodate or omit filter. Filter slides in and out easily for cleaning and replacement.

Accessories
All Packaged Fans
- Filter Recoating Adhesive
- Replacement Filters
  (531F for KP40, 681F for KP60, 1081F for KP100)
- Special Materials or External finishes
- Special Motors, Line Cords or Connectors
- Variable Speed Control
- Adapters
- Grille Assemblies (KFG40, KFG60, KFG100) Includes Filter

Features
- Exceptionally Quiet
- Versatile Mounting and Adaptability
- Heavy-Gauge Steel Construction
- UL/CSA Ball-Bearing Motors
- Attractive Stainless Steel Grilles
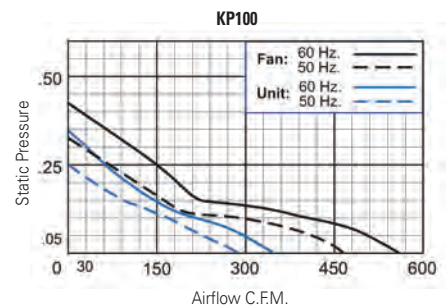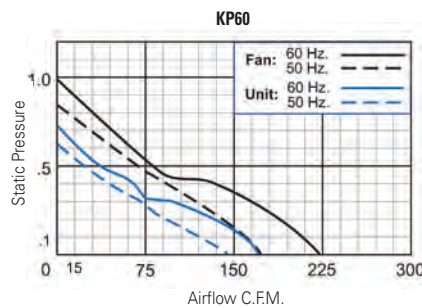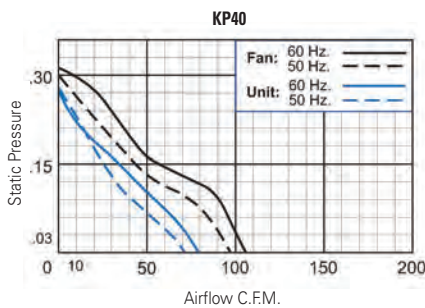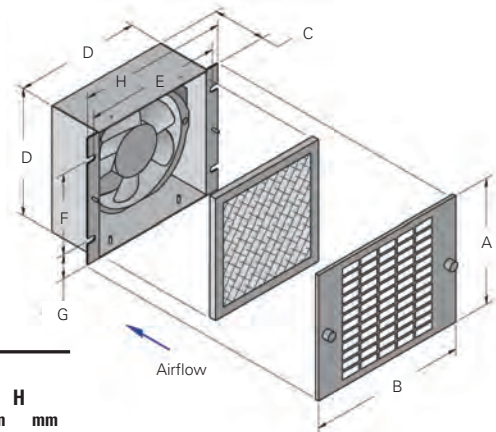- All models Can Pressurize or Exhaust
- Accessories and Options

Technical Data

Catalog Number	CFM@ 0-inches	RPM nominal	Running Amps Run.	Running Amps L.P.	Watts	Volts	Weight Lbs	Weight kg
KP40	105	3000	0.18	0.33	15	115†	3.0	1.36
KP60	220	3300	0.29	0.35	33	115†	4.0	1.81
KP100	550	1600	0.49	1.30	60	115†	10.0	4.53

Dimensions Inches (mm)

Catalog Number	A in	A mm	B in	B mm	C in	C mm	D in	D mm	E in	E mm	F in	F mm	G in	G mm	H in	H mm
KP40	6.13	156	7.38	187	2.37	60	5.62	143	6.37	162	4.12	04	.75	19	7.00	178
KP60	7.63	194	8.87	225	3.00	76	7.12	181	7.87	200	4.50	114	1.31	33	8.50	216
KP100	11.63	295	13.00	330	4.56	116	11.12	282	11.87	310	6.87	174	2.12	54	12.50	317

† For 230 volt models add a "2" after the "K" in the catalog number.

KP40

Static Pressure vs Airflow C.F.M. — Fan: 60 Hz., 50 Hz.; Unit: 60 Hz., 50 Hz.

KP60

Static Pressure vs Airflow C.F.M. — Fan: 60 Hz., 50 Hz.; Unit: 60 Hz., 50 Hz.

KP100

Static Pressure vs Airflow C.F.M. — Fan: 60 Hz., 50 Hz.; Unit: 60 Hz., 50 Hz.

Additional Specifications

Permanent Filter: Furnished with each packaged fan.

Grille/Guard: KP40, KP60 and KP100 each include a rear guard and an attractive stainless steel grille and knurled captive fasteners for easy removal. Grilles and guards comply with OSHA and UL safety standards.

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Advantage Sentry Series NEMA 3R
Filter Fans KNP100F

Model	Voltage	Frequency Hz	Input mA	Input Watts	Fan Airflow CFM*	Fan w/Grille Airflow CFM**	Noise db(A)	Operating Temp. °F Min.	°F Max.	°C Min.	°C Max.	Approx. Weight lbs	kg
BLKNP100F	115 VAC	50/60	.35/.38	36/38	338/405	141/172	55/58	-40	158	-40	70	12.5	5.6

* Fan airflow without filter or grille.
** NEMA Rated if installed with provided filter.

Standard Features

- Baked Powder Finish
- Integrated Fan Guards
- Integrated Sealing Gasket
- Most Assemblies are UL/cUL Listed
- NEMA 3R Rating Maintained (if used with provided filter)
- Secure Mounting
- UL/CSA Shielded Ball Bearing Motor
- Washable, Reuseable Filter

Accessories & Options

- Grille Assembly (P/N: KNPA100F)
- IP54 & IP55 Filter Protection Available
- Other Voltages, Both AC & DC
- Replacement Filters (P/N: 1081F)
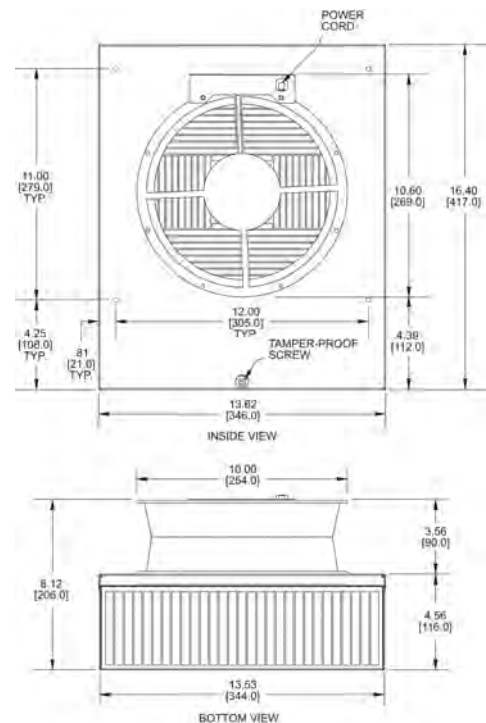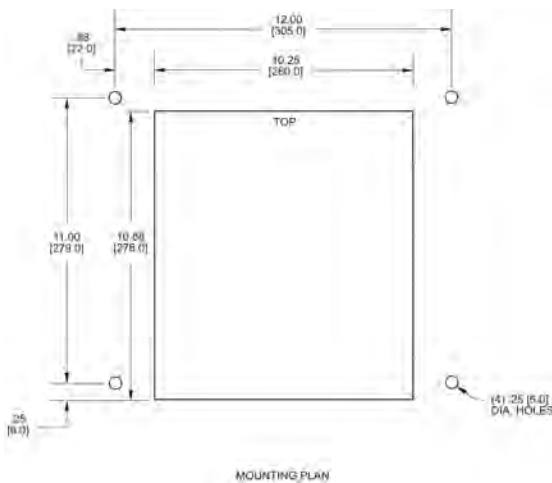- Available with Reversed Airflow Direction

Transitioning to ANSI 61 Gray finish

NEMA TYPE 3R MAINTAINED

Performance
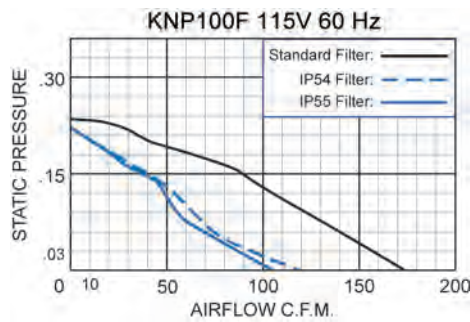
Drawings

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control Products

Advantage Sentry Series
Filter Fans Filter-Grille Assemblies

Model

BLKNPA100F

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.
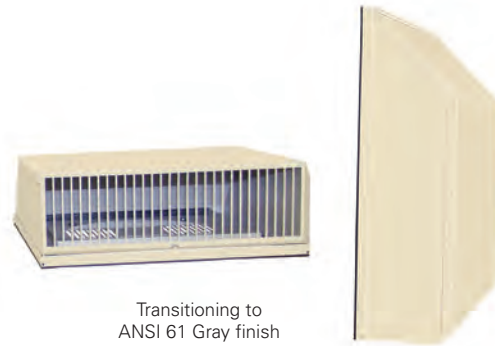
Transitioning to
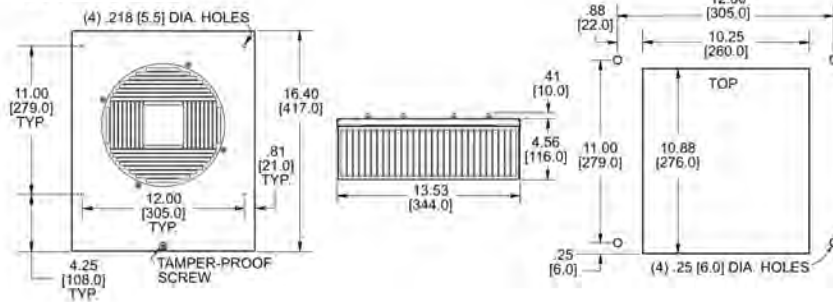ANSI 61 Gray finish

Standard Features

- Integrated Sealing Gasket
- Surface Mounting
- Baked Powder Finish
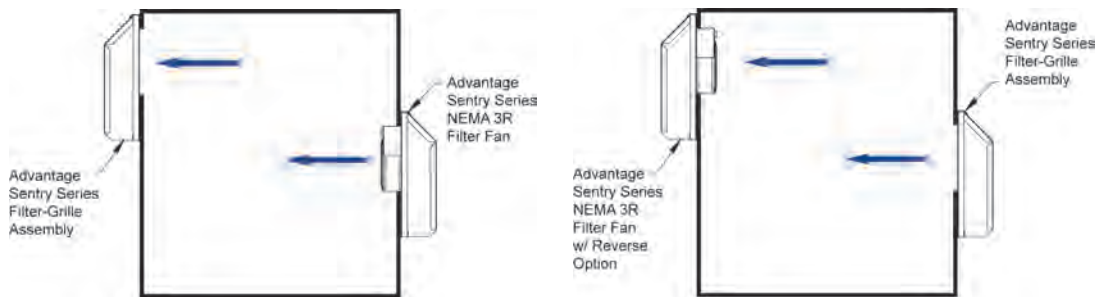- Washable, Reuseable Filter

Accessories & Options

- Replacement Filter (P/N: 1081F)

Drawings

(4) .218 [5.5] DIA. HOLES

11.00 [279.0] TYP.

16.40 [417.0]

.81 [21.0] TYP.

12.00 [305.0] TYP.

4.25 [108.0] TYP.

TAMPER-PROOF SCREW

41 [10.0]

4.56 [116.0]

13.53 [344.0]

.88 [22.0]

12.00 [305.0]

10.25 [260.0]

TOP

11.00 [279.0]

10.88 [276.0]

.25 [6.0]

(4) .25 [6.0] DIA. HOLES

Typical Mounting Orientations

Blue arrows show direction of airflow. Boxes represent side view of electronics/electrical enclosure.

Advantage Sentry Series NEMA 3R Filter Fan

Advantage Sentry Series Filter-Grille Assembly

Advantage Sentry Series Filter-Grille Assembly

Advantage Sentry Series NEMA 3R Filter Fan w/ Reverse Option

(Left) Filter Fan pressurizes cabinet. Filter-Grille Assembly exhausts cabinet.

(Right) Filter Fan with reverse option chosen.

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Guardian Series
NEMA 4 or 4X Filter Fans

Model	NEMA Rating	Voltage	Frequency Hz	Input mA	Input Watts	Fan Airflow CFM*	Fan w/Grille Airflow CFM**	Noise db(A)	Operating Temp. °F		Operating Temp. °C		Approx. Weight	
									Min.	Max.	Min.	Max.	lbs	kg
BLKNP40FL	4	115 VAC	50/60	.22/.19	14/13	90/106	40/45	52/55	-40	158	-40	70	10	4.5
BLKNP40FLV	4X	115 VAC	50/60	.22/.19	14/13	90/106	40/45	52/55	-40	158	-40	70	10	4.5

* Fan airflow without filter or grille.
** NEMA Rated if installed with provided filter.

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.

Transitioning to ANSI 61 Gray finish

Standard Features

- Baked Powder Finish
- Integrated Fan Guards
- Integrated Sealing Gasket
- IP55 Filter Protection
- Most Assemblies are UL/cUL Approved
- NEMA 4 or 4X Rating Maintained (if used with provided filter)
- Secure Mounting
- Stainless Steel Shell (NEMA 4X Models)
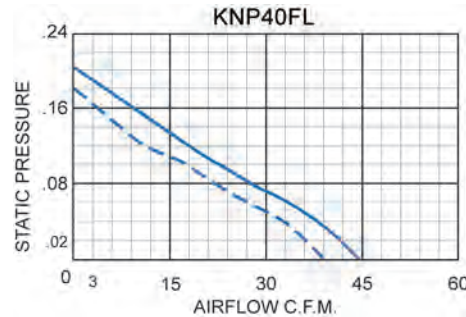- UL/CSA Shielded Ball Bearing Motors
- Washable, Reuseable Filter

Accessories & Options

- Filter-Hood Assembly (Recommended) (P/N: BLKNPA60FL, BLKNPA60FLV)
- Other Voltages, Both AC & DC
- Replacement Filters (P/N: 0429-01-01)
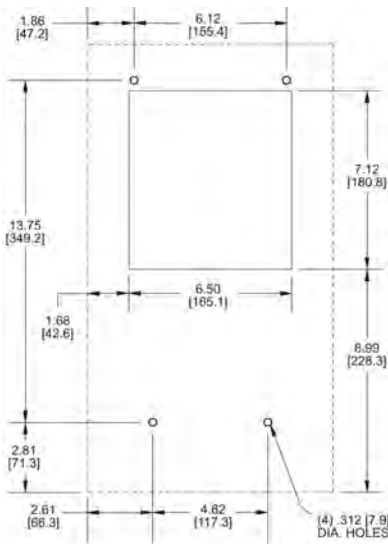- Available with Reversed Airflow Direction
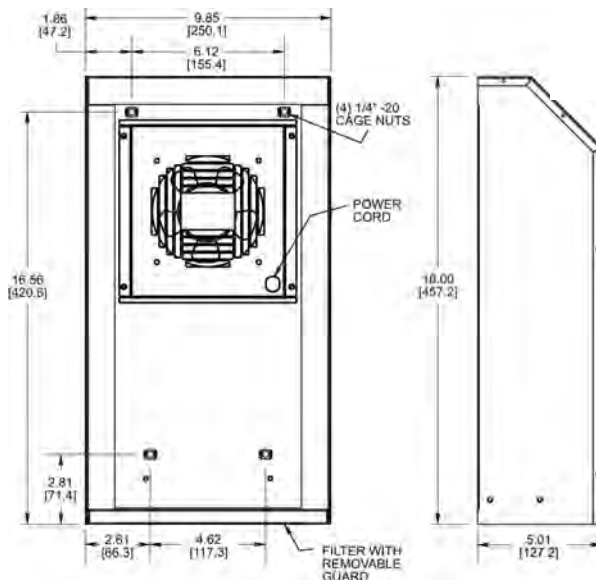
Performance

KNP40FL

Airflow vs. static pressure curves are shown for 60 HZ and 50 HZ (broken line) inputs.

Drawings

Mounting Plan

AIR OUT

AIR IN

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Guardian Series
NEMA 4 or 4X Filter Fans

Model	NEMA Rating	Voltage	Frequency Hz	Input mA	Input Watts	Fan Airflow CFM*	Fan w/Grille Airflow CFM**	Noise db(A)	Operating Temp. °F Min.	Max.	°C Min.	Max.	Approx. Weight lbs	kg
BLKNP60FL	4	115 VAC	50/60	.42/.34	43/37	270/290	84/92	59/61	-40	158	-40	70	11.3	5.1
BLKNP60FLV	4X	115 VAC	50/60	.42/.34	43/37	270/390	84/92	59/61	-40	158	-40	70	11.3	5.1

* Fan airflow without filter or grille.
** NEMA Rated if installed with provided filter.

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.

Transitioning to ANSI 61 Gray finish

Standard Features

- Baked Powder Finish
- Integrated Fan Guards
- Integrated Sealing Gasket
- IP55 Filter Protection
- Most Assemblies are UL/cUL Approved
- NEMA 4 or 4X Rating Maintained (if used with provided filter)
- Secure Mounting
- Stainless Steel Shell (NEMA 4X Models)
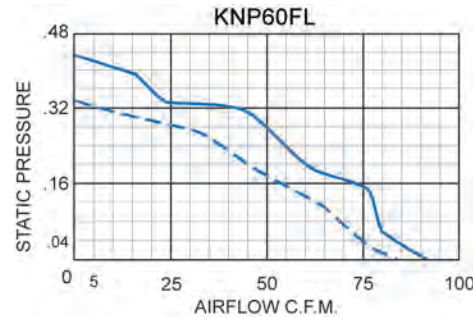- UL/CSA Shielded Ball Bearing Motors
- Washable, Reuseable Filter

Accessories & Options

- Filter-Hood Assembly (Recommended) (P/N: BLKNPA60FL, BLKNPA60FLV)
- Other Voltages, both AC & DC
- Replacement Filters (P/N: 0429-01-01)
- Available with Reversed Airflow Direction
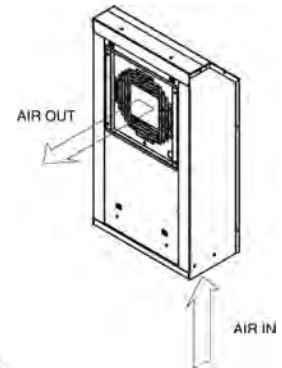
c(UL)us

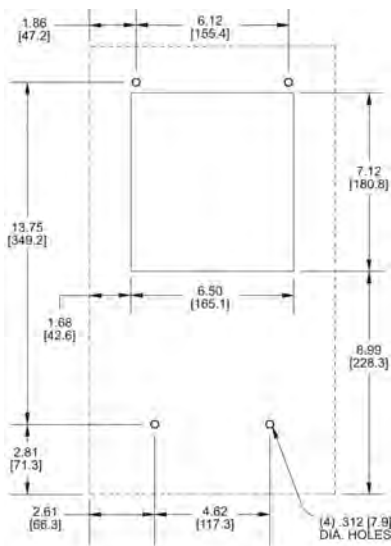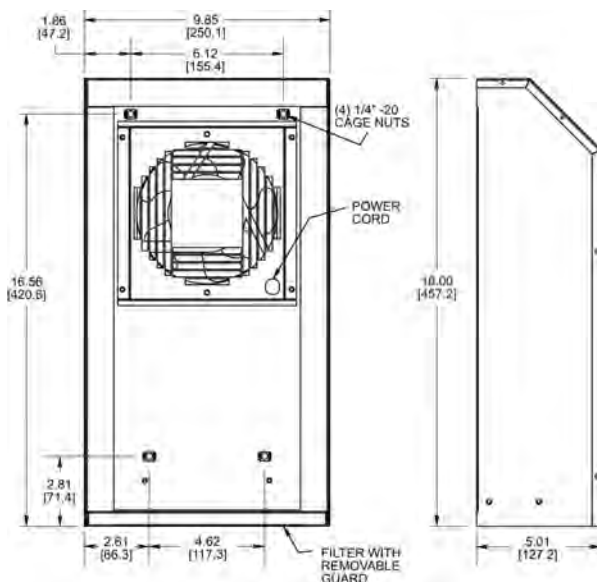**NEMA**
TYPE 4 or 4X
MAINTAINED

Performance

Airflow vs. static pressure curves are shown for 60 HZ and 50 HZ (broken line) inputs.
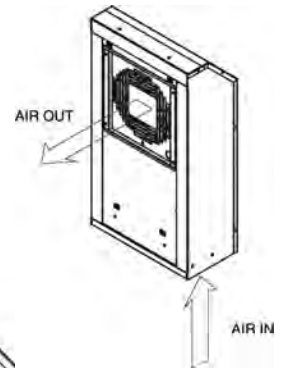
Drawings

Mounting Plan

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Eaton   **392**   B-Line series electrical enclosures

Guardian Series
Filter Fans Filter-Hood Assemblies

Model	NEMA Rating
BLKNPA60FL	4
BLKNPA60FLV	4X

Description

These Filter-Hood Assemblies can be used in conjunction with the Guardian 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.
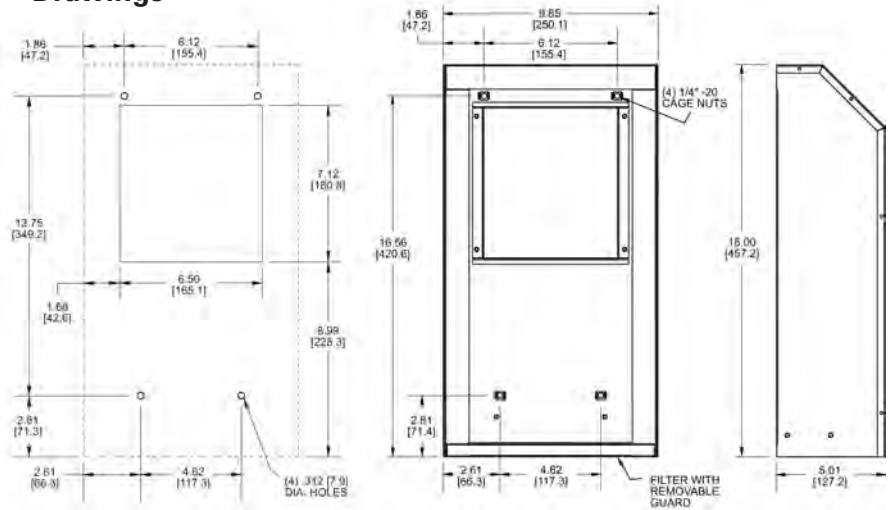
Transitioning to
ANSI 61 Gray finish

Standard Features

- 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)
- Baked Powder Finish
- Washable, Reuseable Filter

Drawings

Accessories & Options
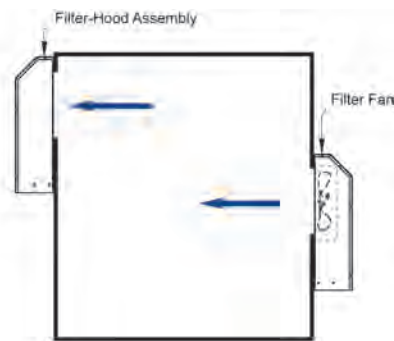
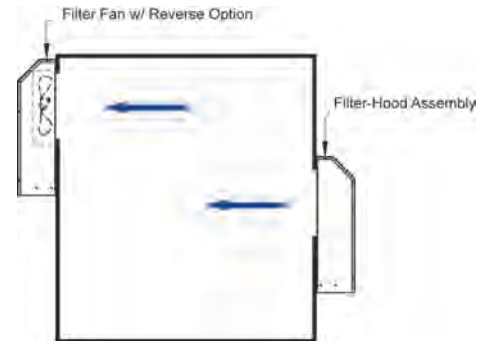- Replacement Filters (P/N: 0429-01-01)

Typical Mounting Orientations

Blue arrows show direction of airflow. Boxes represent side view of electronics/electrical enclosure.

(Left) Filter Fan pressurizes cabinet.
Filter-Hood Assembly exhausts cabinet.

(Right) Filter Fan with reverse option chosen.

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in [ ] are for reference only.

Climate Control Products

NEMA 12 Filter Fans

Applications

- Industrial and Process Automation
- Packaging and Logistical Systems
- Energy (Solar, Wind, Water and Petrochemical)
- Telecommunications
- Defense Systems

Standards

- UL Recognized
- CSA Listed
- IP54 Rated
- IP55 Capable with Optional Filter
- Type 12

Product Options

- 5 Different Size Footprints for Flexibility
- CFM Range of 21 CFM - 585 CFM
- Voltage : 115VAC *
- Operating Temperature: 14°F (-10°C) to 140°F (60°C)
- All Models UV Resistant ABS blend; RAL 7035
- MTBF of 40,000 Hours
- All Units Functionally Tested Before Shipment
- New thinner profile increases equipment space
- All Units are reversible from a push to pull setup

  * 230VAC, 460VAC, 12VDC, 24VDC, 48VDC
    are also available in most model numbers

Construction

- Snap in mounting that does not require hardware
- Simple adjustment of airflow reversal; push/pull
- Retention clips designed to accept wide range of enclosures
- Hinged cover design for easy filter replacement
- Spring loaded terminal blocks for reliable electrical connection
- Gasketing and user manuals provided

Accessories
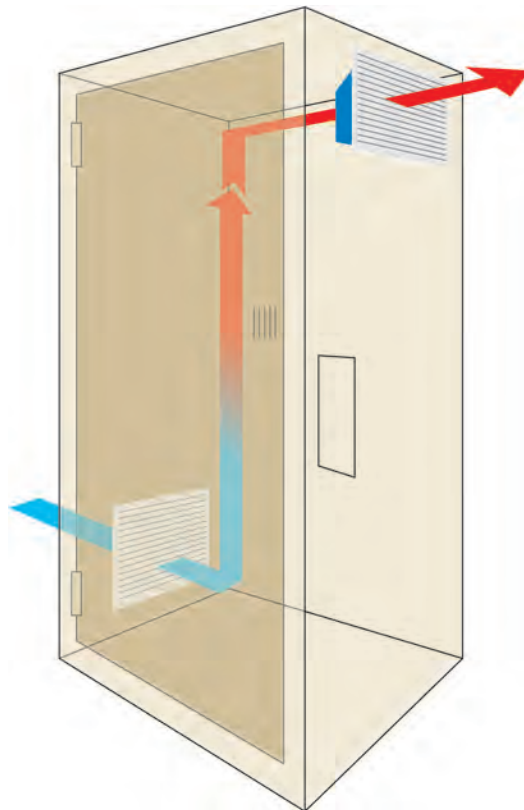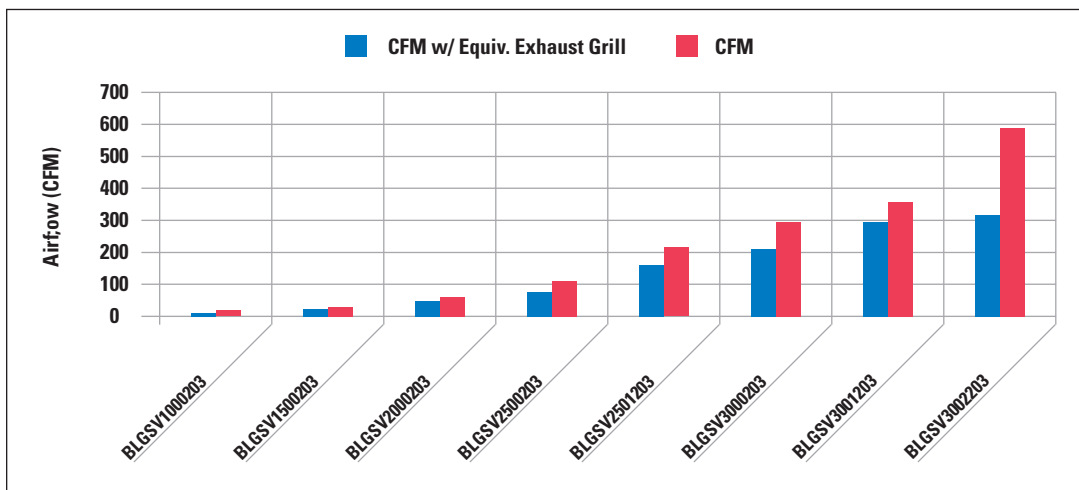
- Grills
- Replacement filters

Illustration shows reverse/pull set-up.
Standard ambient set-up will push cooler
outside air into the enclosure.

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.

NEMA 12 Filter Fans

Model	CFM w/ Equiv. Exhaust Grill	CFM	Rating	Description
BLGSV1000203	14	21	NEMA 12	$4^1/2$" Filter Fan 115VAC
BLGSV1500203	29	39	NEMA 12	6" Filter Fan 115VAC
BLGSV2000203	44	64	NEMA 12	8" Filter Fan 115VAC
BLGSV2500203	77	112	NEMA 12	10" Filter Fan 115VAC
BLGSV2501203	124	159	NEMA 12	10" Filter Fan 115VAC
BLGSV3000203	224	295	NEMA 12	$12^1/2$" Filter Fan 115VAC
BLGSV3001203	353	412	NEMA 12	$12^1/2$" Filter Fan 115VAC Ambient
BLGSV3002203	353	500	NEMA 12	$12^1/2$" Filter Fan 115VAC Ambient

NEMA 12 Grills

Model	Rating	Description
BLGSF10	NEMA 12	$4^1/2$" Filter Grill
BLGSF15	NEMA 12	6" Filter Grill
BLGSF20	NEMA 12	8" Filter Grill
BLGSF25	NEMA 12	10" Filter Grill
BLGSF30	NEMA 12	$12^1/2$" Filter Grill

NEMA 12 Replacement Filters

| Model	Rating	Description
BLAVAFAGS10	NEMA 12	$4^1/2$" Replacement Filter (packed 10)
BLAVAFAGS15	NEMA 12	6" Replacement Filter (packed 10)
BLAVAFAGS20	NEMA 12	8" Replacement Filter (packed 10)
BLAVAFAGS25	NEMA 12	10^1" Replacement Filter (packed 10)
BLAVAFAGS30	NEMA 12	$12^1/2$" Replacement Filter (packed 10)

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.
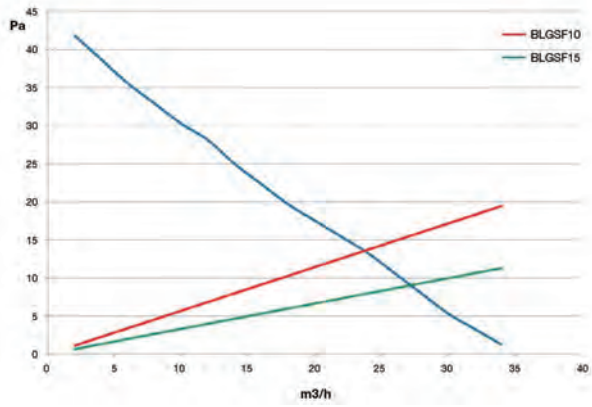
Climate Control

Climate Control Products

NEMA 12 Filter Fans

Model	Description
BLGSV1000203	4¹/₂" Filter Fan 115VAC

4.687 (119) 2.281 (58)

4.687 (119)

3.625 (92)

3.625 (92) Cut-Out Dimensions
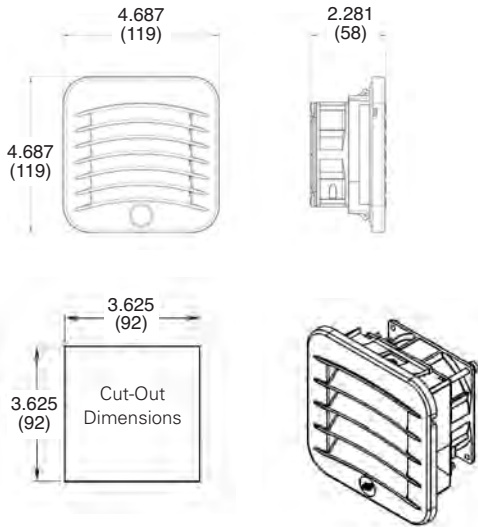
BLGSV1000203 - Performance Chart

Model	Description
BLGSV1500203	6" Filter Fan 115VAC

6.000 (152) 2.969 (75)

6.000 (152)

4.921 (125)

4.921 (125) Cut-Out Dimensions
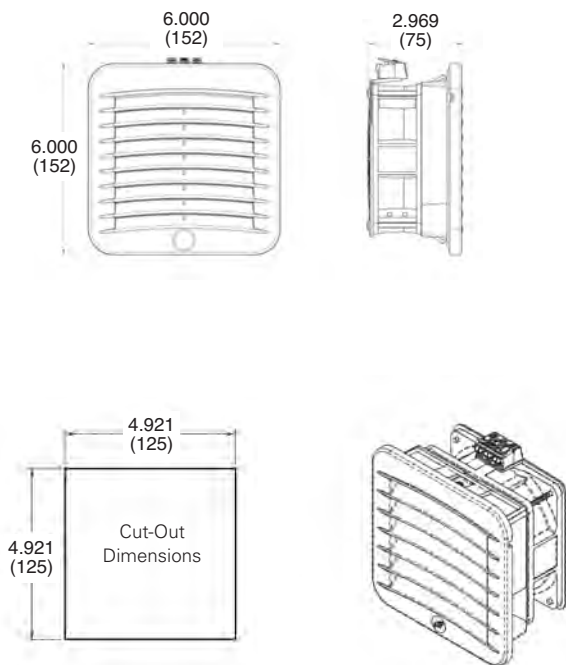
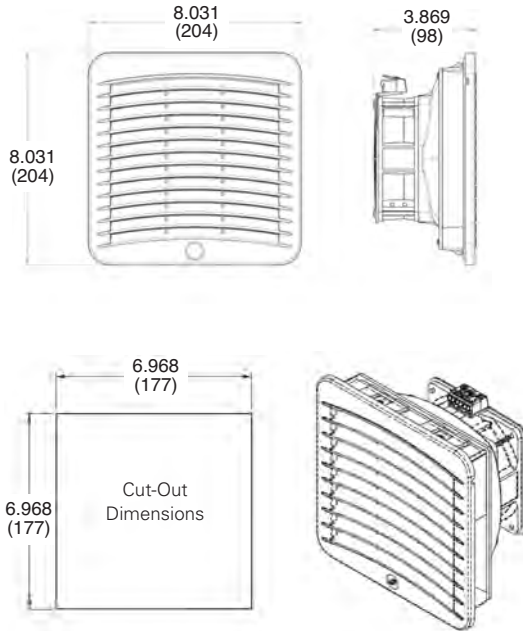BLGSV1500203 - Performance Chart
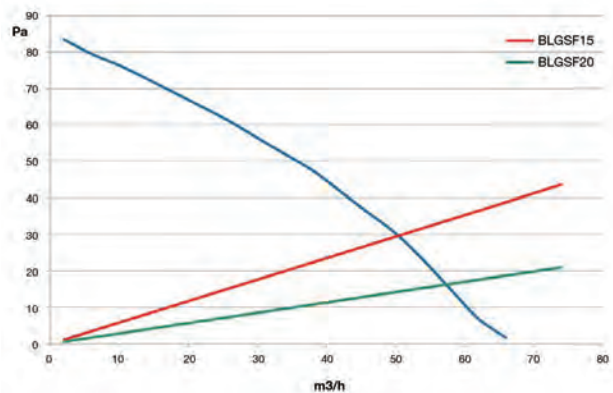
Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.
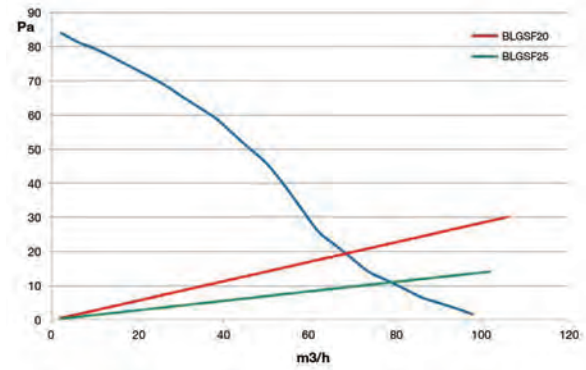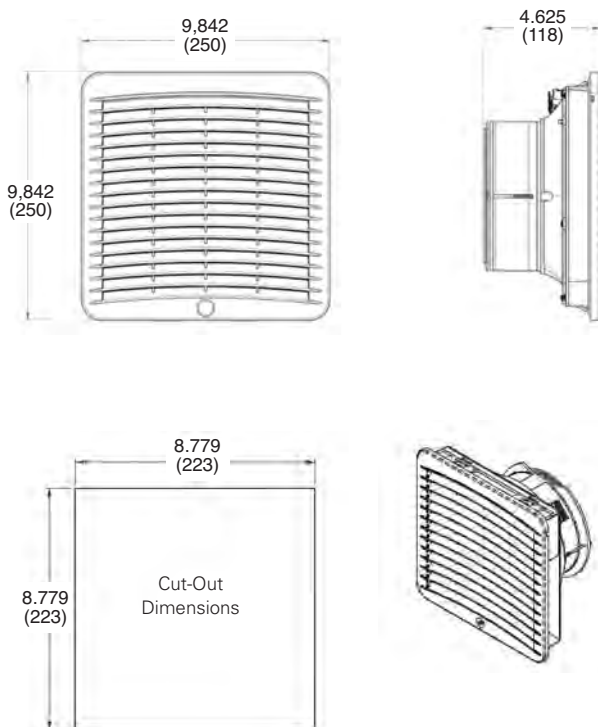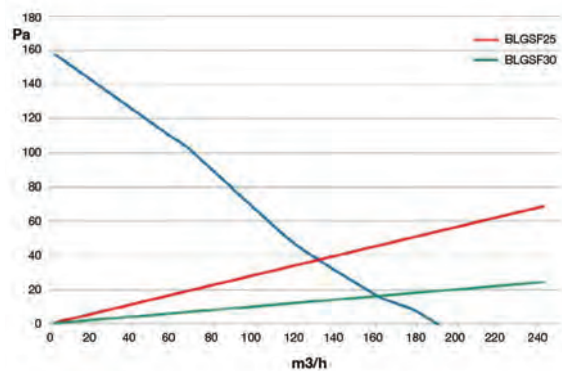
NEMA 12 Filter Fans

Model	Description
BLGSV2000203	8" Filter Fan 115VAC

8.031 (204)   3.869 (98)

8.031 (204)

6.968 (177)

Cut-Out Dimensions

6.968 (177)

BLGSV2000203 - Performance Chart

Pa / m3/h — BLGSF20, BLGSF25

Model	Description
BLGSV2500203	10" Filter Fan 115VAC

9,842 (250)   4.625 (118)

9,842 (250)

8.779 (223)

Cut-Out Dimensions

8.779 (223)

BLGSV2500203 - Performance Chart
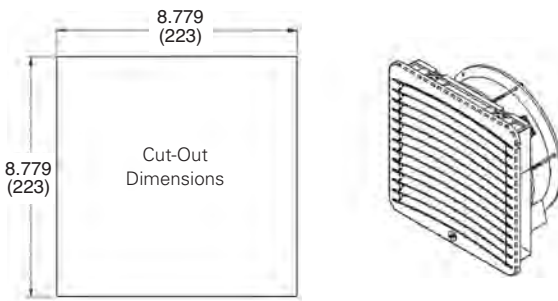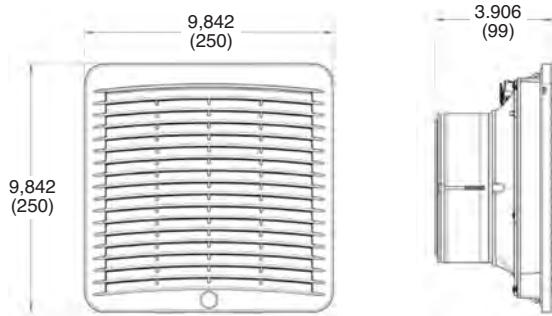
Pa / m3/h — BLGSF25, BLGSF30

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.

Climate Control Products

NEMA 12 Filter Fans

Model	Description
BLGSV2501203	10" Filter Fan 115VAC

9,842
(250)

3.906
(99)

9,842
(250)

8.779
(223)

Cut-Out
Dimensions

8.779
(223)

BLGSV2501203 - Performance Chart
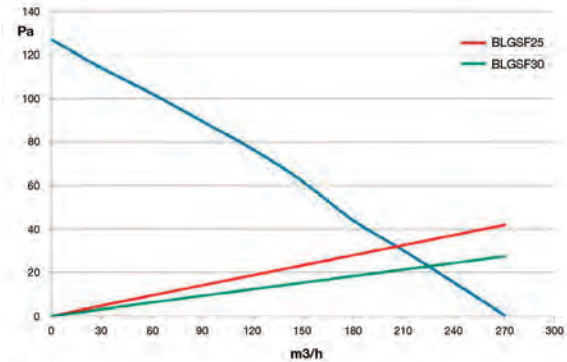
Model	Description
BLGSV3000203	12.5" Filter Fan 115VAC
BLGSV3001203	12.5" Filter Fan 115VAC Ambient
BLGSV3002203	12.5" Filter Fan 115VAC Ambient

12.519
(318)

BLGSV3000203 - 5.469 (139)
BLGSV3001203 - 5.312 (135)
BLGSV3002203 - 6.312 (161)

12.519
(318)

11.456
(291)

Cut-Out
Dimensions

11.456
(291)

BLGSV3000203 - Performance Chart
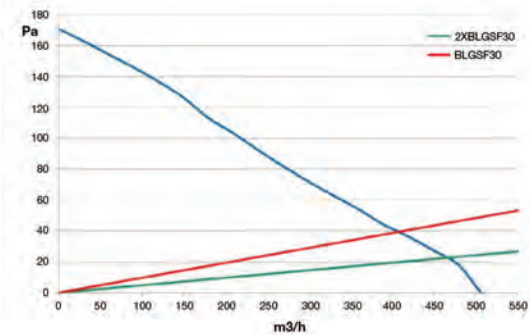
BLGSV3001203 - Performance Chart
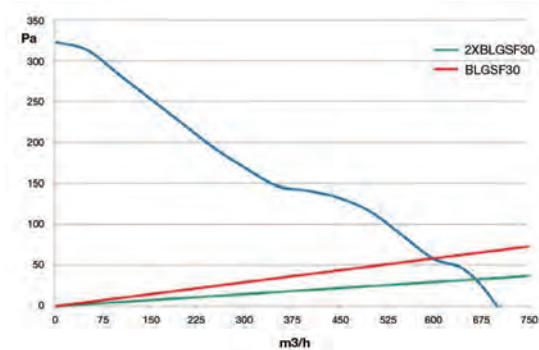
BLGSV3002203 - Performance Chart

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.
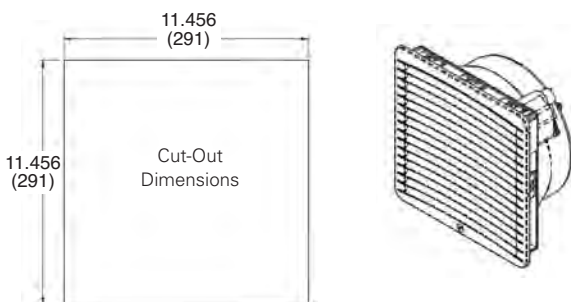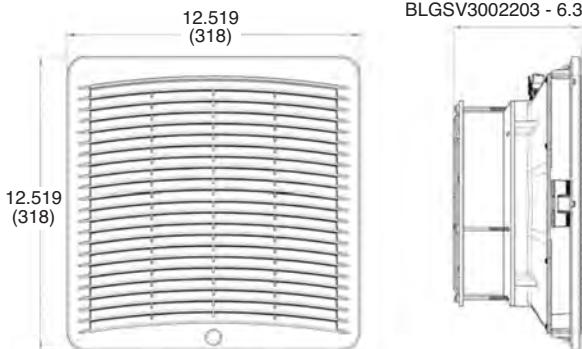
Heater Calculation Sheet
Climate Control

Enclosure Heaters are used to maintain minimum operating temperatures and to help prevent failure of electronic components caused by condensation and corrosion.

Follow steps 1-5 to determine the heating requirement of an enclosure (US units - left column, metric - right column)

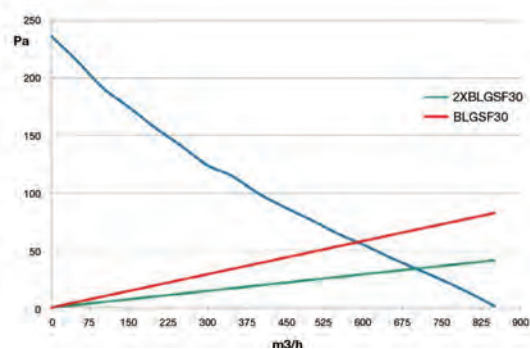### STEP 1: Determine Surface Area (A) exposed to open air

Enclosure Dimensions: height = _____feet _____meters
width = _____feet _____meters
depth = _____feet _____meters

Assuming a free-standing enclosure ⇒ A = 2 (Height x Width) + 2 (Height x Depth) + 2 (Width x Depth)

$A =$ _____ ft²   or   _____ m²

STEP 2: Choose the Heat Transmission Coefficient (k) for your enclosure

painted steel = 0.511 W/(ft² • K) 5.5 W/(m² • K)
stainless steel = 0.344 W/(ft² • K) 3.7 W/(m² • K)
aluminum = 1.115 W/(ft² • K) 12 W/(m² • K)
plastic (or insulated stainless) = 0.325 W/(ft² • K) 3.5 W/(m² • K)

$k =$ _____ W/(ft² • K)   or   _____ W/(m² • K)

STEP 3: Determine the Temperature Differential (ΔT)

Desired interior temperature = _____ °F _____ °C
Lowest ambient temperature = _____ °F _____ °C
Temperature differential = _____ °F _____ °C = K
⇓

Calculation requires ΔT to be in Kelvin (K)

Divide ΔT (°F) by 1.8 for $\Delta T =$ _____ K   or   _____ K

STEP 4: Determine Heating Power (P_V), if any

P_V = components in the enclosure which generates heat (i.e. transformers, power supplies, etc.)

$P_V =$ _____ W   or   _____ W

STEP 5: Calculating the Required Heating Power (P_H)

If enclosure is located inside: $P_H = (A \times k \times \Delta T) - P_V =$ _____ W

If enclosure is located outside: $P_H = 2 \times (A \times k \times \Delta T) - P_V =$ W _____

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.

Climate Control Products

Heaters
PTC Fan Heaters
Climate Control

Description

PTC fan heaters are designed to help prevent failure of electronic components caused by condensation, corrosion and low temperatures. Integrated thermostat stabilizes enclosure temperature, improves performance and extends the life of critical components. EFHT series fan heaters are designed for larger applications with high power requirements.

Features

- Compact fan heater in PTC technology
- PTC (Positive Temperature Coefficient) heating element
- Maintains minimum operating temperatures in enclosures
- Helps prevent failure of electronic components caused by condensation and corrosion
- Heating power adjusts to ambient temperature
- Integrated adjustable thermostat and control light
- 35 mm DIN rail mountable
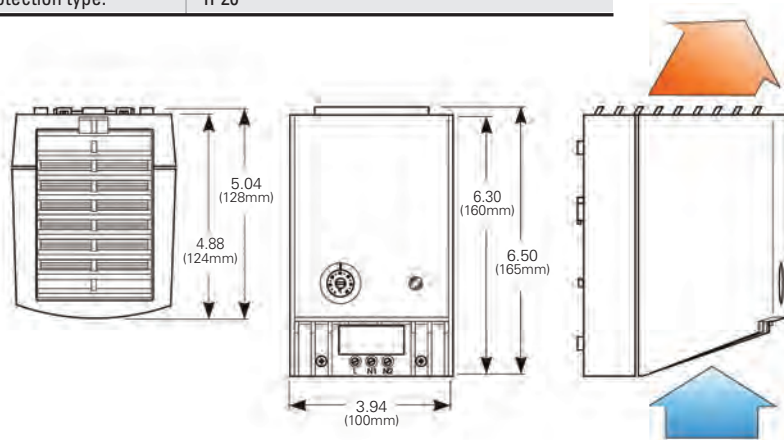- UL, VDE, and CE

Discount Schedule: C2

Subclass: TG0

Catalog Number	Voltage	Power	Max. current (inrush)	Axial Fan (ball bearing)	Thermostat range	Weight	
						lbs	kg
EFHT550F-120	110-120 VAC	550 W (60 Hz)	14 A	20 cfm (35 m³/h)	32-140°F	2	0.9
EFHT650F-120	110-120 VAC	650 W (60 Hz)	15 A	26 cfm (45 m³/h)	32-140°F	2.4	1.1

For spacing, add 2" clearance to heat sensitive parts.

Technical Data	
Heating element:	PTC-Semiconductor/resistor. Self regulating with changing ambient temperature (see graph below)
Overheat protection:	Temperature limitor in case of fan failure
Function control light:	LED
Housing:	Plastic, rated UL94V-0
Dimensions (HxWxD):	6.5x3.94x5" (165x100x128 mm)
Connection:	2 pole terminal, AWG 14, max. (2.5 mm²)
Mounting:	Clip for 35 mm DIN rail, EN 50022
Protection class:	II (double insulated)
Protection type:	IP20

Heating Power / Ambient Temperature at 60Hz

650W

550W

Heating Power (W)

Ambient Temperature

5.04 (128mm)

4.88 (124mm)

6.30 (160mm)

6.50 (165mm)

3.94 (100mm)

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.

Heaters
PTC Heater
Climate Control

Description

PTC heaters are designed to help prevent failure of electronic components caused by condensation, corrosion and low temperatures. EH15 series feature PTC technology and are designed for smaller enclosure applications with lower wattage requirements.

Features

- Compact heater in PTC technology
- PTC (Positive Temperature Coefficient) heating element
- Maintains minimum operating temperatures in enclosures
- Helps to prevent failure of electronic components caused by condensation and corrosion
- Push connectors for quick and easy wiring
- 35 mm DIN rail mountable
- UL, VDE, and CE

Discount Schedule: C2

Subclass: TG0

Pending

Catalog Number	Power[1]	Max. Current[2]	L		Weight	
			in.	mm	lbs	kg
EH15	15W	0.5A	2.6	65	0.66	0.3
EH30	30W	1.0A	2.6	65	0.66	0.3
EH45	45W	1.0A	2.6	65	0.66	0.3
EH60	60W	1.5A	5.5	140	1.10	0.5
EH75	75W	1.8A	5.5	140	1.10	0.5
EH100	100W	2.4A	5.5	140	1.10	0.5
EH150	150W	4.5A	8.7	220	1.76	0.8

[1] At 68°F (20°C) ambient temperature.   [2] Inrush current

Technical Data	
Operating voltage:	AC/DC 110-250V
Heating element:	PTC resistor, self regulating
Heating body:	Anodized extruded aluminum
Protection class:	I, test voltage 1600V
Protection type:	IP20
Connection:	Push type terminals for stranded and rigid wire 3 x AWG 20-AWG 16 (0.5-2.5 mm²)
Mounting:	Clip for 35 mm DIN rail, EN 50022
Agency approvals:	UL, VDE

Easy wiring by using push-type terminals
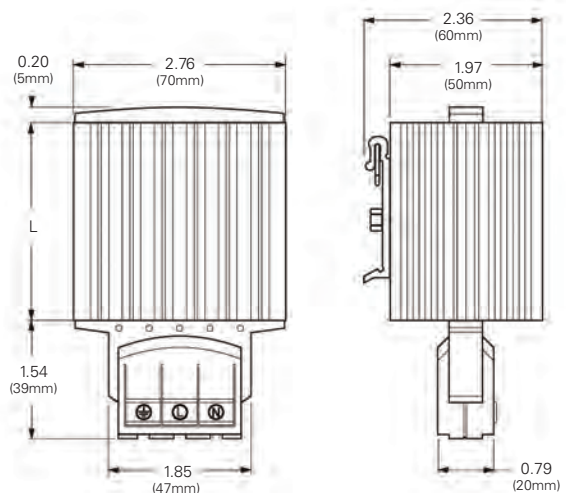
Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.

Climate Control

Climate Control Products

Heaters
Fan Heaters
Climate Control

Climate Control

Shown: EFH100

Description

Fan heaters are designed to help prevent failure of electronic components caused by condensation, corrosion and low temperature. EFH100-120 series feature a wide wattage range for maximum versatility in a small compact design.

Features

- Small compact size fan heater
- Maintains minimum operating temperatures in enclosures
- Helps prevent failure of electronic components caused by condensation and corrosion
- Built-in overheat protection
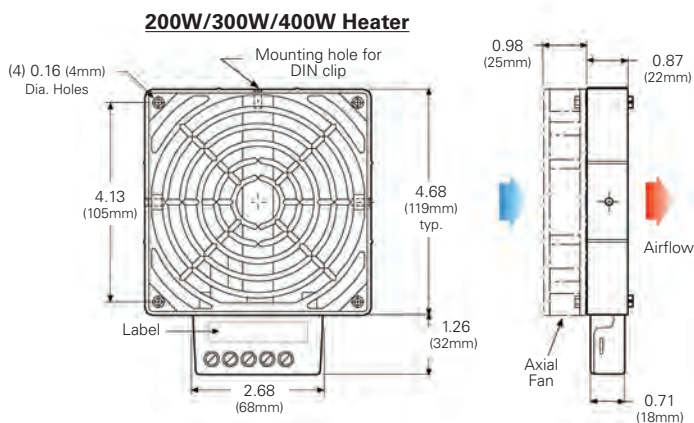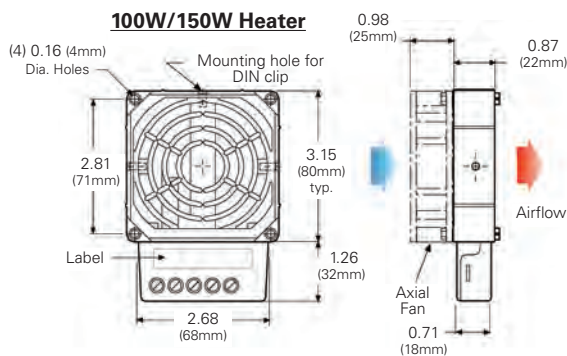- 35 mm DIN rail mountable

Discount Schedule: C2

Subclass: TG0

cRUus CE

Catalog Number	Power	Voltage	Air Flow	
			cfm min.	m³/h min.
EFH100-120	100W	110-120 VAC	20	35
EFH150-120	150W	110-120 VAC	20	35
EFH200-120	200W	110-120 VAC	63	108
EFH300-120	300W	110-120 VAC	63	108
EFH400-120	400W	110-120 VAC	63	108

100W/150W Heater

0.98 (25mm)

0.87 (22mm)

(4) 0.16 (4mm) Dia. Holes

Mounting hole for DIN clip

2.81 (71mm)

3.15 (80mm) typ.

Airflow

Label

1.26 (32mm)

2.68 (68mm)

Axial Fan

0.71 (18mm)

200W/300W/400W Heater

0.98 (25mm)

0.87 (22mm)

(4) 0.16 (4mm) Dia. Holes

Mounting hole for DIN clip

4.13 (105mm)

4.68 (119mm) typ.

Airflow

Label

1.26 (32mm)

2.68 (68mm)

Axial Fan

0.71 (18mm)

	Technical Data
Heating element:	Resistance type heater
Heat sink:	Die-cast aluminum, glass bead finish
Overheat protection:	Built-in temperature limitor
Air exit temperature:	Approx. 113°F (45°C) 2" (50 mm) above heater
Wiring compartment:	Plastic UL94V-0
Wiring of axial fan:	2 pole terminal (L2/N2), AWG14 max. (2.5 mm²)
Mounting:	Clip for 35 mm DIN rail, EN 50022
Protection type/class:	IP44/I (grounded)
Weight:	100/150W: 0.6 lbs. (240 kg) without fan 200/300/400W: 1.1 lbs. (490 kg) without fan
Agency approvals:	UL

G

L1

N1

N2

L2
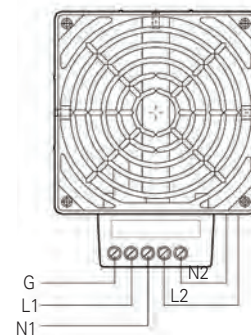
Caution: Heater may only be operated with fan.

Notes: Data subject to change without notice.
Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.

Temperature & Humidity Controls
Small Thermostat
Climate Control

ESTNC-F

ESTNO-F

Description

Small thermostats are easy to install and designed to regulate the air temperature inside enclosures. Thermostats increase operating life of fans, heaters and heat exchangers. ESTNC-F (normally closed) thermostat opens at temperature rise and is used to control heaters and low temperature alarms. ESTNO-F (normally open) thermostat closes at temperature rise and is used to control cooling fans, air conditioners and high temperature alarms.

Features

- Compact design
- Wide adjustment range
- Color coded temperature dials
- 35 mm DIN rail mountable
- Tolerance ±7.2°F (4K)
- 2-pole terminal for AWG 14 max.
- Protection type: IP30
- Plastic housing UL94V-0

Discount Schedule: C2
Subclass: TG0

Catalog Number	Contact Type	Switching Capacity @ 120 VAC	Switching Capacity @ 250 VAC	Housing Scale	Dimensions in	mm
ESTNC-F	Normally closed	15A resistive/1A inductive	10A resistive/1A inductive	30-140°F	2.4x1.3x1.4	60x33x35
ESTNO-F	Normally opened	15A resistive/1A inductive	10A resistive/1A inductive	30-140°F	2.4x1.3x1.4	60x33x35

Electronic Humidity and Temperature Control

Description

Electronic humidity and temperature control regulates the air temperature and relative humidity inside enclosures. Depending on which contact combination is chosen, the control turns on or off a connected device if either the temperature is below, or the humidity is above the set point.

Features

- Controls both temperature and humidity
- High switching capacity
- Optical function display
- 35 mm DIN rail mountable
- Tolerance ±3.6°F (2k)
- 5-pole terminal for AWG 14 max.
- Protection type: IP20
- Plastic housing UL94V-0

Discount Schedule: C2
Subclass: TG0

Catalog Number	Temperature Range	Humidity Range	Voltage	Hz	Switching Capacity @ 120 VAC	Switching Capacity @ 240 VAC	Dimensions in.	mm
EHTC120-F	32-140°F adjustable	50-90% RH adjustable	120 VAC	50/60	8A Resistive 7 FLA/45 LRA	8A Resistive 5 FLA/30 LRA	2.6x2.0x1.5	67x50x39

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

Notes: Data subject to change without notice. Consult factory for special requirements. Dimensions are in inches. Millimeters shown in ( ) are for reference only.

Climate Control

Climate Control Products