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COOLING SPECIFIER'S GUIDE

DESIGN WITH CONFIDENCE™

EQUIPMENT PROTECTION | MCLEAN IS NOW HOFFMAN COOLING

VOLUME 4

ADVANCING A HERITAGE OF LEADERSHIP

Pentair Equipment Protection is a global leader in safeguarding industrial controls, electrical components, and communications hardware. Its premier brand, Hoffman, provides a comprehensive range of standard, modified and custom engineered solutions. For more information, visit **pentairprotect.com**

Hoffman is a leading designer and manufacturer of systems to safely and reliably protect the electronic controls and mission critical electrical systems in industrial, data communications, commercial construction and government applications. Our product catalog features the wide array of enclosures, accessories and thermal management products.

We have developed significant vertical market expertise to help us understand and develop industry solutions to address your particular circumstances. Our extensive network of North American distributors and our global sales channel can help you obtain the products you need.

In addition to our broad line of standard enclosures, Hoffman has the expertise to deliver modified standard enclosures quickly and reliably as well as complicated co-developed and custom solutions.

Hoffman maintains a high standard of quality and operates under a global ISO 9000 certificate. We design and test our products in our in-house UL laboratory to ensure they meet stringent quality standards. Hoffman products comply with UL, NEMA, CSA and other international standards.

MCLEAN IS NOW HOFFMAN COOLING

Hoffman Cooling helps create optimal conditions for the reliable operation of electronic and electrical components in manufacturing controls, telecom equipment, data networks, and other vital systems. From V fan assemblies to air conditioners, to heat exchangers, to integrated cooling enclosures for a variety of applications, Hoffman assures maximum productivity and uptime while protecting the life cycles of controls and equipment. Flawless operation is the expectation of OEMs, engineers, and end-users alike. That's why choosing the most qualified cooling technology provider reaches far beyond the implications of product performance to include service and support benchmarks.

As a premier global provider with decades of experience in cooling industrial automation and electrical components, Hoffman remains unrivaled with an industry-leading portfolio of proven products, pre- and post-sale support, and comprehensive engineering and testing services.

For more information about Hoffman Cooling products visit **pentairprotect.com**

About Pentair Ltd.

Pentair (**pentair.com**) delivers industry-leading products, services and solutions for its customers in diverse needs in water and other fluids, thermal management and equipment protection. With 2012 pro forma revenues of approximately $8 billion, Pentair employs more than 30,000 people worldwide.

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QUICK REFERENCE

Use this handy table to match your electronic cooling requirements with the most effective Hoffman protective cooling solution.

	Air Conditioners						Heat Exchangers		TEC
	SPECTRACOOL™	SPECTRACOOL™ Narrow	SPECTRACOOL™ Compact	PROAIR™	T-SERIES™	Water-Cooled	CLIMAGUARD™ Indoor	CLIMAGUARD™ Outdoor	Thermoelectric
PAGE NUMBER	28	52	70	122	80	132	144	160	184
SYSTEM APPLICATION									
For indoor industrial	■	■	■	■	■	■	■		■
For harsh / corrosive environments	■	■		■		■		■	■
For washdown applications				■					■
For outdoor enclosures	■	■		■	■			■	■
For telecommunications shelters					■			■	
TEMPERATURE OF THE ELECTRONICS									
Cooler than outside the enclosure	■	■	■	■	■	■			■
Warmer than outside the enclosure							■	■	
AIR CONDITIONER Cooling CAPACITY									
1000-2000 BTU/Hr (300-700 Watts)			■	■	■				
4000-6000 BTU/Hr (1200-1800 Watts)	■	■		■	■	■			
8000-12000 BTU/Hr (2300-3500 Watts)	■	■		■	■	■			
20000 BTU/Hr (5900 Watts)	■				■				
2-ton 23500 BTU/Hr (6900 Watts)					■				
3-ton 42000 BTU/Hr (12300 Watts)					■				
5-ton 59000 BTU/Hr (17300 Watts)					■				
HEAT EXCHANGER Cooling CAPACITY									
Less than 20 Watts/°F (30 Watts/°C)							■		
20-60 Watts/°F (30-100 Watts/°C)							■	■	
More than 60 Watts/°F (100 Watts/°C)								■	
THERMOELECTRIC Cooling CAPACITY									
60 Watts (178 BTU/Hr.)									■
100 Watts (321 BTU/Hr.)									■
200 Watts (567 BTU/Hr.)									■
POWER INPUT									
115 & 230 AVC 50/60 Hz	■	■	■	■	■	■	■	■	
400 / 460 AVC 50/60 Hz 1-phase			■	■	■	■			
400 / 460 AVC 50/60 Hz 3-phase	■	■							
24 & 48 VAC								■	■
MOUNTING									
Side	■	■	■	■	■	■	■	■	■
Top									■
Rack				■		■			
CABINET PROTECTION									
Type 12	■	■	■	■	■	■	■	■	■
Type 3R	■	■		■	■		■	■	■
Type 4	■	■		■	■	■		■	■
Type 4X	■	■		■	■	■		■	■
CABINET DIMENSION									
Fits 8" / 203 mm					■		■		■
Fits 12" / 305 mm		■	■	■	■		■		■
Fits 16" / 406 mm		■	■	■	■	■	■	■	■
Fits 20" / 508 mm or larger	■	■	■	■	■	■	■	■	■

QUICK REFERENCE

Use this handy table to match your electronics cooling requirements with the most effective Hoffman Filter Fan.

	Side Mount									Roof Mount	
	SF04	SF05	SF09	ST10	SF10	ST13	SF13 376 CFM	SF13 473 CFM	SF13 571 CFM	SR16 280 CFM	SR16 459 CFM
PAGE NUMBER	215	218	220	233	222	235	224	226	229	238	240
18 F/10 C ΔT Cooling CAPACITY TYPE 12/IP54 60 Hz 2 Exhaust Grilles											
133 BTU's (39 Watts) .05" Static Pressure	■										
304 BTU's (89 Watts) .10" Static Pressure		■									
646 BTU's (198 Watts) .10" Static Pressure			■								
776 BTU's (315 Watts) .10" Static Pressure				■							
1,437 BTU's (421 Watts) .15" Static Pressure					■						
2,305 BTU's (676 Watts) .20" Static Pressure						■					
2,422 BTU's (710 Watts) .20" Static Pressure							■				
3,931 BTU's (1,152 Watts) .35" Static Pressure								■			
3,945 BTU's (1,156 Watts) .45" Static Pressure									■		
1,929 BTU's (565 Watts) .55" Static Pressure										■	
4,151 BTU's (1,216 Watts) .85" Static Pressure											■
36 F/20 C ΔT Cooling CAPACITY TYPE 12/IP54 60 Hz 2 Exhaust Grilles											
267 BTU's (78 Watts) .05" Static Pressure	■										
609 BTU's (178 Watts) .10" Static Pressure		■									
1,292 BTU's (379 Watts) .10" Static Pressure			■								
1,552 BTU's (632 Watts) .10" Static Pressure				■							
2,874 BTU's (842 Watts) .15" Static Pressure					■						
4,606 BTU's (1,350 Watts) .20" Static Pressure						■					
4,845 BTU's (1,420 Watts) .20" Static Pressure							■				
7,862 BTU's (2,304 Watts) .35" Static Pressure								■			
7,886 BTU's (2,311 Watts) .45" Static Pressure									■		
3,859 BTU's (1,131 Watts) .55" Static Pressure										■	
8,302 BTU's (2,432 Watts) .85" Static Pressure											■
18 F/10 C ΔT Cooling CAPACITY TYPE 12/IP55 60 Hz 2 Exhaust Grilles											
283 BTU's (83 Watts) .10" Static Pressure		■									
545 BTU's (220 Watts) .10" Static Pressure			■								
646 BTU's (290 Watts) .10" Static Pressure				■							
1,195 BTU's (350 Watts) .15" Static Pressure					■						
2,064 BTU's (605 Watts) .20" Static Pressure						■					
2,414 BTU's (707 Watts) .20" Static Pressure							■				
3,300 BTU's (967 Watts) .35" Static Pressure								■			
3,273 BTU's (959 Watts) .45" Static Pressure									■		
36 F/20 C ΔT Cooling CAPACITY TYPE 12/IP55 60 Hz 2 Exhaust Grilles											
565 BTU's (165 Watts) .10" Static Pressure		■									
1,090 BTU's (442 Watts) .10" Static Pressure			■								
1,292 BTU's (580 Watts) .10" Static Pressure				■							
2,390 BTU's (940 Watts) .15" Static Pressure					■						
4,128 BTU's (1,209 Watts) .20" Static Pressure						■					
4,828 BTU's (1,415 Watts) .20" Static Pressure							■				
6,600 BTU's (1,934 Watts) .35" Static Pressure								■			
6,547 BTU's (1,918 Watts) .45" Static Pressure									■		
POWER INPUT											
115 & 230 AC Volt	■	■	■	■	■	■	■	■	■		
400 / 460 AC Volt 3-Phase								■	■		
24 & 48 DC Volt	■	■	■	■	■	■	■		■		

* NOTE: Roof mount filter fan capacities assume two air intake grille kits.

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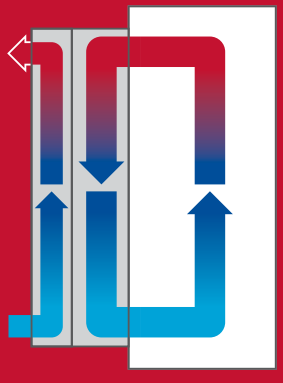
CHAPTER 1 SELECTING A COOLING SOLUTION

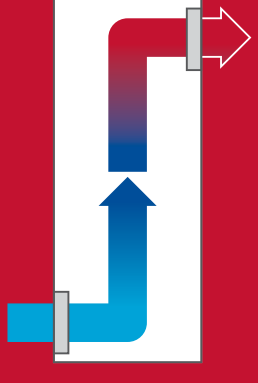
OVERVIEW

Keeping your electronics cool is essential to extending their life and keeping your business running. Heat can have a significant impact on electronics, causing damage and voiding manufacturers' warranties. Cooling sensitive electronics increases service life and reduces capital expenses.



SEALED ENCLOSURE COOLING

Sealed enclosure cooling, also known as a "closed-loop system", allows no outside elements inside the enclosure. It is generally required for applications operating in high temperatures—typically over 35°C/95°F—or when the enclosure is deployed in harsh environments, such as an outdoor telecom base, wastewater treatment plant, metal working, oil rig, paper mill, foundry and/or generates high heat from its own components.



FRESH AIR ENCLOSURE COOLING

Fresh air cooling, referred to as an "open-loop system", ventilates fresh air through the cabinet, exhausting heat away from hot electronics. Fresh air cooling is optimal when the electronics system is deployed in a relatively clean and cool environment, such as an office building, data networking center or light-duty factory.

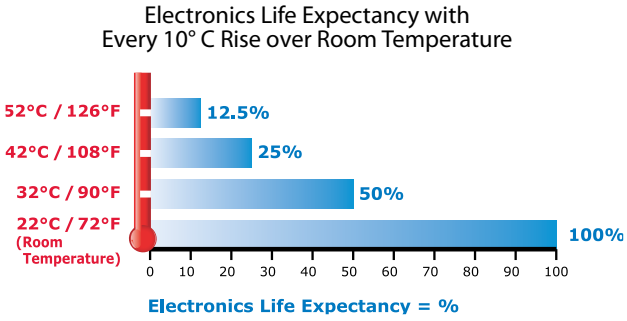
CHAPTER CONTENTS

WHY COOL ELECTRONICS IN THE FIRST PLACE?

Keeping your electronics cool is essential to extending their life and keeping your business running.

HEAT RUINS ELECTRONICS

The life expectancy of electronics is cut in half every 10 C / 18 F they operate above room temperature. Operating electronics above certain temperatures can void manufacturers' warranties, making proper cooling essential. Cooling vital electronics increases service life and reduces capital expenses over the long-term.



SOURCES OF HEAT

Damaging heat can come from a variety of sources. Inside the cabinet, heat can come from:

- AC power supplies
- Controllers, drives and servos
- Transformers and rectifiers
- Processors and server racks
- Radio equipment
- And other electronic components

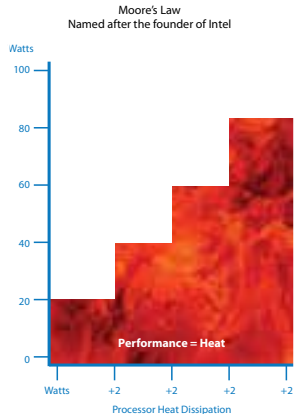
Heat also comes from sources outside the enclosure such as:

- Solar heat gain
- Welding processes
- Paint oven
- Blast furnace
- Foundry equipment

TREND TOWARD MORE DAMAGING HEAT

For the foreseeable future, the trend is toward increasing levels of heat in electronics, not less, because the market's thirst for more information processing capacity and speed continues to grow. This trend is known as "Moore's Law."

More powerful data-processing electronics generate extra heat with virtually every new system that is designed. There is no guarantee that an application which did not require much, if any, cooling in the past will not need cooling in the future. The new system likely has more functionality and will probably require some form of cooling as a result.



THE CONSEQUENCES OF DAMAGING HEAT

Heat build-up can adversely affect industrial controls and sensitive electronic systems as follows:

- De-rated drive performance
- I/C-based devices experience intermittent fluctuations
- MTBF decreases exponentially
- Catastrophic failure

The costs when a factory line or electronic system fails can include:

- Productivity losses
- Component replacement costs
- Late shipments
- Customer dissatisfaction
- Lost revenue
- Cell phone tower outage
- Breach in homeland security

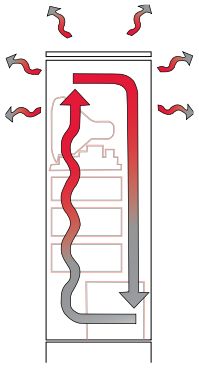
Direct costs to a business can be as much as $50,000 per hour of system downtime.

CONDUCTIVE ENCLOSURE COOLING

This is a passive way to cool electronics. It simply allows the heat to radiate through the cabinet walls.

Conductive enclosure cooling works well with electronics systems that have small heat loads (<50 W) and cool air around the enclosure (<78 F/25 C).

If heat is an issue, one option within this type of cooling is to increase cabinet size to create more surface area to speed the transfer of heat. However, growing cabinet size is often not a practical solution because of space limitations and the greater heat loads associated with today's high-power electronics.

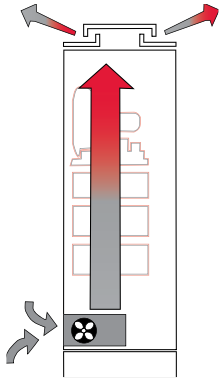


FRESH AIR ENCLOSURE COOLING

This is an active way to manage heat in electronics applications. This type of cooling ventilates fresh air through the cabinet, exhausting heat away from the hot components.

Fresh air enclosure cooling may be used when the electronics system is deployed in a relatively clean and cool environment such as an office building, data networking center or light-duty factory. Options for cooling electronic enclosures with fresh air include filter fans, fan trays, motorized impellers and packaged blowers.

Fresh air enclosure cooling is known as an "open-loop system" because no significant seal is maintained to protect electronic components from harmful elements such as dirt, water, metal filings and corrosive fumes.



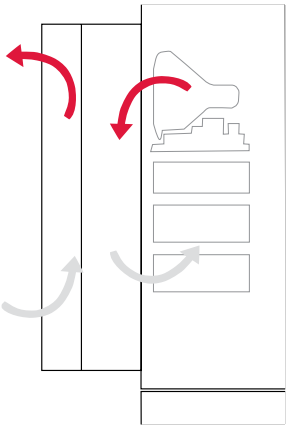
SEALED ENCLOSURE COOLING

This is another active way to cool electrical components. This type of cooling maintains the seal of the enclosure—using an air conditioner or heat exchanger as examples—to remove heat from inside the electronics cabinet.

Protective cooling is generally required when the electronics application:
(1) operates in high temperatures, typically over 95 F/35 C,
(2) is deployed in a harsh environment such as an outdoor telecom base station, wastewater treatment plant, metal working operation, oil rig platform, paper mill, foundry and/or
(3) generates a high heat load from its own components, usually more than 500 W.

Options for sealed enclosure cooling include air conditioners, air-to-air heat exchangers, air-to-water heat exchangers, thermoelectric coolers and vortex coolers.

Sealed enclosure cooling is known as a "closed-loop system" because the seal of the electrical cabinet is maintained, allowing no elements which can damage the electronics inside the enclosure.



SEALED VS. FRESH AIR ENCLOSURE COOLING

Since heat dissipation is often not a solution, we will limit our choices to sealed vs. fresh air enclosure cooling.

Use the environmental and electronic system criteria in the table below to determine whether sealed or fresh air enclosure cooling is most appropriate for your application.

Choosing Sealed vs. Fresh Air Enclosure Cooling

Specifying protective cooling that keeps your electronics components sealed from the outside environment versus using fresh air cooling to remove damaging heat depends on the following profile of your system application (check one side or the other for each of the six criteria):

	FRESH AIR	CRITERIA	SEALED	
Clean Air / Some Dust / Dripping Water	☐	**SYSTEM OPERATING ENVIRONMENT**	☐	Dirty / Wet / Metal Filings / Outdoors / Corrosive Fumes
Moderate to Low (typically under 35 C / 95 F)	☐	**TEMPERATURE OUTSIDE OF THE ENCLOSURE**	☐	Hot (typically over 35 C / 95 F)
Somewhat to Well-Above Ambient Temperature	☐	**TEMPERATURE RATING OF THE ELECTRONICS**	☐	Below to Somewhat Above Ambient Temperature
Moderate to Low	☐	**HUMIDITY OUTSIDE OF THE ENCLOSURE**	☐	High Relative Humidity
Wide	☐	**TEMPERATURE RANGE FOR THE ELECTRONICS**	☐	Narrow / Precise
Moderate to Low (typically under 3000 Watts)	☐	**SYSTEM POWER DRAW / HEAT LOAD**	☐	Moderate to High (typically over 3000 Watts)

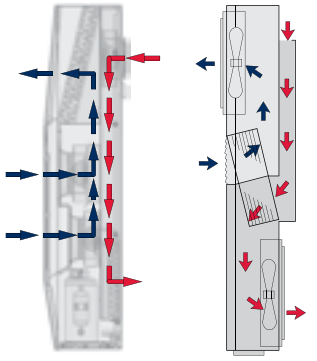
If most of your assessments fell on the fresh air side, then a filter fan, fan tray, motorized impeller or blower is probably the correct cooling solution for your application. However, if most of your assessments were on the protective side, then an air conditioner or heat exchanger is likely the right cooling solution for your electronics system.

INTRODUCTION

Assuming that sealed enclosure cooling is needed for the application, there are two basic choices—air conditioners or heat exchangers.

An air conditioner should be specified when:
- The temperature inside the enclosure must be maintained at or below the ambient temperature
- Humidity must be removed
- A moderate to high heat load is being produced by the electronic system

A heat exchanger can be used to transfer heat from inside the enclosure to the outside atmosphere when:
- The electronic components can operate at a temperature above the ambient air temperature
- Humidity is not a factor
- A low to moderate heat load is being produced by the electronic system



Air Conditioner Heat Exchanger

AIR CONDITIONER COOLING CAPACITY OVERVIEW

The cooling capacity of an air conditioner needs to match or exceed the amount of total heat load generated by the electronic system.

Total heat load comes from two sources:
(a) the electronic components themselves which is called "internal heat load" and
(b) the ambient heat outside the enclosure which is known as the "heat transfer load."

Most engineers and cooling suppliers determine internal heat load. However, the impact from the heat transfer load is easily overlooked. Heat transfer load can significantly add to the total heat load of the system, especially if the outside air temperature is high and/or the enclosure is located in the sun.

1

Thus, the **total heat load** to be removed from the electrical enclosure by the air conditioner is the sum of the **internal heat load** and the **heat transfer load.**

TOTAL HEAT LOAD = INTERNAL HEAT LOAD + HEAT TRANSFER LOAD

PART A: DETERMINE INTERNAL HEAT LOAD

The internal heat load comes from the amount of waste heat generated inside the enclosure by the electronic components and is expressed in Watts (W).

There are several methods to determine internal heat load, depending on data availability.

Method 1. Heat Load Data from Each Electronics Component Manufacturer
One way to estimate internal load is to gather heat load data from the manufacturers of the electronics components inside the cabinet. They may know the amount of heat their equipment is generating. If more than one control or other electronics components are inside the enclosure, it will be necessary to add together all the estimates of heat load to determine total internal heat load.

Method 2. Component Power – Component Efficiency

A second method is to establish the Watts of power used by each electronic component. Derive Watts of power by multiplying the amp draw of each device by its voltage. Then subtract the efficiency of each component from its estimated power use. Add up the outcomes to get the total internal heat load.

INTERNAL HEAT LOAD = COMPONENT POWER (W) - COMPONENT EFFICIENCY (for each electrical device)

For example:
An electronic system uses two components that draw 115 VAC at 15 amps. Each has a rated efficiency of 90%. Put another way, 10% of each device is inefficient. Unused power becomes generated heat. Thus the estimated internal heat load is:

Device Power = 115 x 15 = 1725 W
Total Power = 2 x 1725 = 3450
Less Efficiency = 3450 x (1 - .90)
Total Heat Load = 345 W

Method 3. Incoming – Outgoing Power
A third approach is to estimate the power going into the enclosure and the power coming out of it. The difference becomes the estimated amount of internal heat load. The amps and volts of each electrical line going in are multiplied to determine Watts, then they're added together. The same is done for the electrical line(s) coming out of the application. The outgoing Watts are then subtracted from the incoming Watts.

INTERNAL HEAT LOAD = INCOMING POWER (W) – OUTGOING POWER (W)

For example:
An enclosure has three input lines of 230 VAC at 11, 6 and 4 A. It has one output control line of 115 VAC at 9 A.

Incoming Power = (230 x 11) + (230 x 6) + (230 x 4) = 4830 W
Outgoing Power = 115 x 9 = 1035 W
Total Heat Load = 4830 – 1035 = 3795 W

Method 4. Automated Equipment Horsepower
This fourth method applies only to industrial automation equipment that operates with horsepower (hp) such as variable frequency drives (VFDs). 1 hp = 745.6 W. Thus, the internal heat load from a 3-hp VFD is 2237 W, less its efficiency which is typically 93-95%.

For example:
A cabinet has three 5-hp VFDs with 95% efficiency.

VFD Watts = 5 hp x 745.6 x 3 = 11184
Adjusted Watts = 11184 x (1 - .95) = 559
Total Heat Load = 559 x 1.25 = 699 W

1.25 is an assumed "safety" margin for other minor heat-producing components.

PART B: DETERMINING HEAT TRANSFER LOAD OVERVIEW

Heat transfer load is the ambient heat outside the enclosure conducting itself through the cabinet walls toward the electronics (heat energy travels from the hottest to coldest location).

When an air conditioner cools the enclosure temperature lower than the ambient air outside, additional heat load is drawn into the cabinet which the air conditioner needs to remove. The higher the ambient temperature and/or the presence of solar heat gain (the "greenhouse effect") on the enclosure, the more cooling capacity is required.

Determining heat transfer load requires that you know the **total surface area** of the cabinet, less any non-conductive surface area such as the enclosure side mounted to a wall. It also requires that you determine **ΔT**, which is the difference between maximum ambient temperature and the maximum temperature rating of the electronics components.

There are two methods for determining heat transfer load—the simple chart method and the equation method.

SIMPLE CHART METHOD

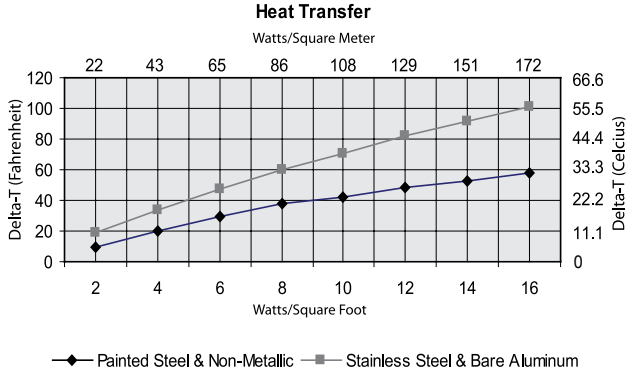
This method is reasonably accurate for most indoor industrial systems where there is no unusual air movement and insulation is not typically used inside the enclosure. The process also provides a ballpark result for outside plant and telecommunications applications, taking into account solar heat gain. However, it does not incorporate the impact of wind or cabinet insulation. If either is present, then the equation method is more precise.

Step A. Determine ΔT in °F or °C.
Step B. Find the heat transfer per ft.^{2} or m^2 on the chart below, using ΔT and the proper cabinet material curve.
Step C. Multiply the heat transfer per ft.^{2} or m^2 by the total surface area of the enclosure that will conduct heat. (Remember to exclude surfaces such as a side mounted to a wall.)

SURFACE AREA (ft.^{2}) = [2AB (in.) + 2BC (in.) + 2AC (in.)] ÷ 144

SURFACE AREA (m^2) =
[2AB (mm) + 2BC (mm) + 2AC (mm)] ÷ 1000000

Total Heat Transfer Load =
Heat Transfer per ft.^{2} or m^2 x Cabinet Surface Area

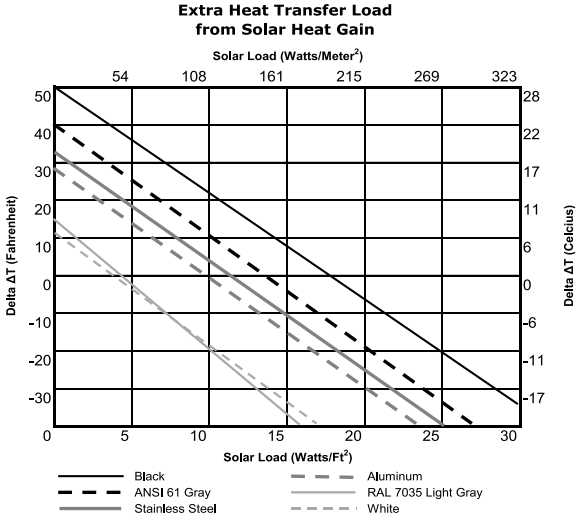


For example:
A painted steel cabinet has 80 ft.^{2} of surface area and will be located in a maximum ambient temperature of 95 F. The rated temperature of the electronics is 75 F.

ΔT = 95 - 75 = 20 F
Heat Transfer = 4 W/ft.^{2} (from chart)

Total Heat Transfer Load = 80 x 4 = 320 W

The estimate for heat transfer load ends here, unless the electronic system will be deployed outdoors. Then solar heat gain needs to be added to the total heat transfer load calculated above. Solar heat gain is determined much the same way as heat transfer per ft.^{2} or m^2, using a similar chart.



For example: The painted cabinet above is in ANSI 61 gray. Thus, 7 W/ft.^{2} need to be added to the heat transfer load which is 560 W (7 x 80 ft.^{2}). Total Heat Transfer Load consequently becomes 720 W.

The result does not include insulation which can significantly reduce heat transfer load.

EQUATION METHOD

Heat transfer load may also be determined by equation. This method should be used when at least one of the following criteria are found in the electronic system:

- Moderate to high airflow within the cabinet
- Outdoor applications that involve breezes or gusty winds
- Insulation used within the cabinet to offset the impact of solar heat gain

The governing equations for heat transfer load are:

English System (°F, inches and feet):
$q = (T_o - T_i) \div [(1/h_o) + (1/h_i) + R]$

Metric System (°C, millimeters and meters):
$(q = (T_o - T_i) \div [(1/h_o) + (1/h_i) + R] \times 5.67$

Definition of Variables—
q = Heat transfer load per unit of surface area
T_o = Maximum ambient temperature outside the enclosure
T_i = Maximum rated temperature of the electronics components
h_o = Convective heat transfer coefficient outside the cabinet
Still air: h = 1.6
Relatively calm day: h = 2.5
Windy day (approx. 15 mph): h = 6.0

h_i = Convective heat transfer coefficient inside the cabinet
Still air: h = 1.6
Moderate air movement: h = 2.0
Blower (approx. 8 $ft.^3$/sec.): h = 3.0

R = Value of insulation lining the interior of the enclosure walls
No insulation: R = 0.0
1/2 in. or 12 mm: R = 2.0
1 in. or 25 mm: R = 4.0
1-1/2 in. or 38 mm: R = 6.0
2 in. or 51 mm: R = 8.0

$q = (125 - 75) \div [(1/6) + (1/2) + 4]$
$q = (50) \div (.16 + .5 + 4)$
$q = 50 \div 4.66$
$q = 10.7$ BTU/hr./$ft.^2$

Total Heat Transfer Load
10.7 x 72 = 770 BTU/hr. or 770 ÷ 3.413 = 226 W

Since the cabinet is outdoors, and assuming it is painted ANSI 61 gray and located in the sun, extra solar load needs to be added to the outcome above which is 504 Watts (7 W per $ft.^2$ x 72 $ft.^2$).

Total Heat Transfer Load with Extra from Solar Heat Gain
226 + 504 = 730 W

DETERMINE TOTAL HEAT LOAD

Total heat load to be removed from the electrical enclosure by the air conditioner is the sum of **internal heat load** plus **heat transfer load**.

TOTAL HEAT LOAD (C) = INTERNAL HEAT LOAD (A) + HEAT TRANSFER LOAD (B)

Thus, one adds together the result from Part A to the outcome from Part B.

For example:

The internal heat load from one of the examples above was 3795 Watts. The heat transfer load from the other example above was 730 W. Therefore, total heat load is 3795 + 730 = 4525 W.

To convert Watts into BTU/hr. to determine air conditioner capacity in the English system, multiply by 3.413.
4525 W is then 15444 BTU/hr.

Power input, protection level and dimensions of the air conditioner also need to fit system requirements.

Caution! Do not simply match the nominal cooling capacity of the air conditioner model with the total heat load result above. Be sure to know the maximum ambient temperature outside the enclosure as well as the rated temperature of the electronic components. Apply these temperatures to the performance curves provided by the cooling manufacturer to select an appropriately sized air conditioner. Failure to do so may under-size your air conditioner as much as 20% - 25%, thereby under-cooling the electronics and making the application vulnerable to potential over-heating issues.

HEAT EXCHANGER COOLING CAPACITY OVERVIEW

Cooling with an air-to-air heat exchanger assumes the electronic components in your system are able to operate **above** the ambient temperature outside the enclosure. If this is not the case, then an air conditioner must be used.

Selecting a heat exchanger is similar to specifying an air conditioner in that the cooling capacity of the unit must remove the **internal heat load** from the electrical enclosure.

However, since the conductive cooling nature of the cabinet itself removes some of the heat from the system, **heat transfer** should be subtracted from internal heat load (versus added in the case of air conditioners).

Because the cooling capacity of heat exchangers is expressed in terms of Watts/°F or Watts/°C, an extra step is necessary to convert net heat load into a result used to select the appropriate heat exchanger. Divide the net heat load by the **ΔT** which is the difference between the maximum ambient temperature outside the enclosure and the maximum temperature rating of the electronic components.

HEAT EXCHANGER CAPACITY (C) = [INTERNAL HEAT LOAD (A) – HEAT TRANSFER (B)] / ΔT

DETERMINE INTERNAL HEAT LOAD

Internal heat load stems from the amount of waste heat generated inside the enclosure by the electronic components and is expressed in Watts.

To determine internal heat load, follow one of the four options outlined in the air conditioner "Determine Internal Heat Load" section on page 8.

DETERMINE HEAT TRANSFER

In air-to-air heat exchangers, heat transfer is actually cabinet heat loss because the heat inside the enclosure is conducting itself through the cabinet walls toward the cooler temperature outside the enclosure. That is why heat transfer is subtracted from internal heat load to arrive at total net heat load.

To determine heat transfer you need to know the **total surface area** of the cabinet, less any non-conductive surface area such as the enclosure side mounted to a wall. You must also determine **ΔT** which is the difference between maximum ambient temperature and the maximum temperature rating of the electronic components.

There are two methods to determine heat transfer—the **simple chart method** and the **equation method**. The simple chart method may be used for nearly all indoor heat exchanger applications. The equation method needs to be applied when air movement outside or inside the electrical enclosure is high, or for outdoor applications.

Here are the steps for the simple chart method:

Step A. Determine ΔT in °F or °C.
Step B. Find the heat transfer per $ft.^2$ or m^2 from the Heat Transfer graph on page 9, using ΔT and the proper cabinet material curve.
Step C. Multiply the heat transfer per $ft.^2$ or m^2 by the total surface area of the enclosure that will conduct heat. (Remember to exclude surfaces such as a side mounted to a wall.)

SURFACE AREA ($ft.^2$) = [2AB (in.) + 2BC (in.) + 2AC (in.)] ÷ 144

SURFACE AREA (m^2) = [2AB (mm) + 2BC (mm) + 2AC (mm)] ÷ 1,000,000

Heat Transfer (Cabinet Heat Loss) = Heat Transfer per $ft.^2$ or m^2 x Enclosure Surface Area

The estimate for heat transfer ends here, unless the electronic system will be deployed outdoors, or airflow inside or outside the enclosure is high. Then the equation method needs to be used to determine heat transfer (cabinet heat loss).

For the equation method, follow the steps on page 9 in the air conditioner selection section. The result will be a negative number; the negative sign should be ignored when deducting heat transfer from internal heat load.

Caution! If the result of the equation method is a positive number, then this means that you want the electronics temperature inside the cabinet to be lower than the temperature outside the enclosure. In this case, an air conditioner should be specified for the electronics system.

DETERMINE HEAT EXCHANGER CAPACITY

Air-to-air heat exchanger capacities are not provided in terms of Watts or BTUs/hr. of cooling like air conditioners. Instead, they are expressed in terms of Watts/°F or Watts/°C. Thus, the final step in determining heat exchanger capacity is to divide the total net heat load by ΔT. Then select the heat exchanger with the same or higher Watts/°F or Watts/°C as the outcome of this process.

—Indoor Industrial Example—

An electronic system uses two components that draw 230 VAC at 7.5 A. Each has a rated efficiency of 90%. They are protected in a painted steel cabinet that is 60 in. (1524 mm) tall, 36 in. (914 mm) wide and 18 in. (457 mm) deep. The system will be located in a maximum ambient temperature of 80 F (27 C). The rated temperature of the electronics is 95 F (35 C).

HEAT EXCHANGER CAPACITY (C) =
[INTERNAL HEAT LOAD (A) – HEAT TRANSFER (B)] ÷ ΔT

Internal heat load (A) may be determined using the "Component Power – Component Efficiency" method on page 8, given the available information. In this example, the estimated heat load is:

Device Power = 230 x 7.5 = 1725 W
Total Power = 2 x 1725 = 3450
Less Efficiency = 3450 x (1 - .90)
Internal Heat Load = 345 W

Heat transfer (B) is derived using the simple chart method, since this is an indoor industrial application. Both cabinet surface area and ΔT are needed to determine heat transfer. Cabinet surface area is 54 $ft.^2$ or 5.02 m^2 (from surface area formula on page 9). ΔT is 15 F (8 C)—the difference between ambient temperature and the rated temperature of the electronics.

Heat Transfer (Cabinet Heat Loss) =
Heat Transfer per $ft.^2$ or m^2 x Enclosure Surface Area

Using the painted steel curve on the Heat Transfer chart on page 9, heat transfer per $ft.^2$ or m^2 is 3 W/$ft.^2$ or 32.5 W/m^2.
Heat Transfer = 3 W/$ft.^2$ x 54 $ft.^2$ = 162 W

Now that we know internal heat load, heat transfer and ΔT, we can determine heat exchanger capacity as follows:

HEAT EXCHANGER CAPACITY (C) =
[345 WATTS (A) – 162 WATTS (B)] ÷ 15 F (or 8 C)

HEAT EXCHANGER CAPACITY (C) = 12 W/°F or 22 W/°C

The result is **minimum** heat exchanger capacity. If no heat exchanger model is similar to the result, choose the next largest size to ensure adequate electronics cooling.

Power input, protection level and dimensions of the heat exchanger also need to fit the system.

—Outdoor Example—

A telecom system draws a total of 5,000 W; its efficiency is 85%. It is protected in a steel cabinet that is 72 $ft.^2$ (6.69 m^2) and painted with RAL 7035 light-gray paint. The enclosure walls are lined inside with 1 in. (25 mm) of insulation. The application will be deployed in a maximum ambient outdoor temperature of 104 F (40 C) with occasional winds reaching 15+ mph. The rated temperature of the electronics is 114 F (46 C). Air circulation inside the cabinet is moderate.

HEAT EXCHANGER CAPACITY (C) =
[INTERNAL HEAT LOAD (A) – HEAT TRANSFER (B)] ÷ DELTA ΔT

Internal heat load (A) is determined using the "Component Power – Component Efficiency" method on page 8. In this example, the estimated heat load is as follows:

Total System Power = 5000 W
Less Efficiency = 5000 x (1 - .85)
Internal Heat Load = 750 W

Heat transfer (B) is derived using the equation method, since this is an outdoor application. For brevity, we will assume the English system (°F, inches and feet).

$q = (T_o - T_i) \div [(1/h_o) + (1/h_i) + R]$

"q" is heat transfer per surface area. For an explanation of the other variables, see "Equation Method" on page 10.

q = (104 - 114) ÷ [(1/6) + (1/2) + 4]

q = -2.14 W/$ft.^2$

Total Heat Transfer = 2.14 x 72 $ft.^2$ = 154 W
(negative sign is ignored)

ΔT is 10 F — the difference between ambient temperature and the rated temperature of the electronics.

HEAT EXCHANGER CAPACITY (C) =
[750 W (A) – 154 W (B)] ÷ 10 F

HEAT EXCHANGER CAPACITY (C) = 60 W/°F

As in the indoor industrial example, the above result is **minimum** heat exchanger capacity. If no heat exchanger model is similar to the result, choose the next largest size to ensure adequate electronics cooling.

Power input, protection level and dimensions of the heat exchanger also need to fit the system.

INTRODUCTION

There are many standard air movers for electronics cooling on the market today. Common options include:

Compact Axial Fans

Filter Fan

Server Rack Fan Tray

Motorized Impeller

Centrifugal Blower

As one may conclude by looking at the products, each fresh air cooling solution can vary in terms of:

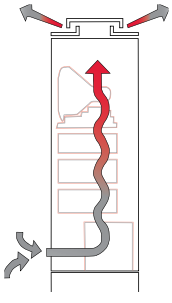
- General vs. concentrated airflow
- Amount of air volume (CFM or M^3/Hr.)
- Ability to overcome airflow restriction caused by electronics components (static pressure—Inches of H_2O or Pascals)
- Component price
- Power input (AC or DC volt)
- Ability to protect the electronics from dust and water

However, before we begin to briefly review the advantages and disadvantages of each air mover, we first need to understand two important concepts, airflow and static pressure, because each fresh air cooling solution can be quite different with these factors.

1

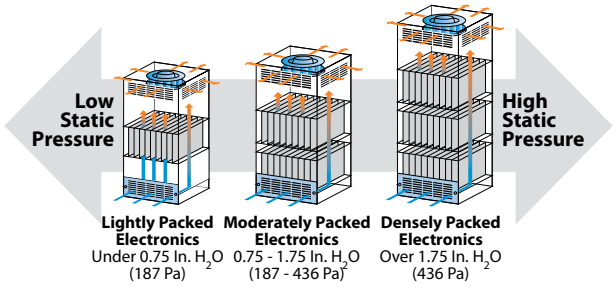
WHAT IS AIRFLOW?

Airflow is the volume of air that a fan, impeller or blower can move. In the English system, airflow is measured in cubic feet per minute or CFM. In the Metric system, airflow is defined as cubic meters per hour or M^3/Hr. Electronic systems with low heat loads (100 to 1000 Watts) require less airflow to cool the components. Cabinets with moderate to high heat loads (more than 1000 Watts) need more airflow.



WHAT IS STATIC PRESSURE?

Static pressure is air restriction created by the components inside the enclosure. In the English system, static pressure is expressed in Inches of Water or In. H_2O. In the Metric system, static pressure is Pascals or Pa. Systems with loosely packed components have low static pressure (0.24 to 0.50 In. H_2O) and use a smaller, less powerful air mover such as a tube axial fan or filter fan for cooling. However, cabinets that are moderately to densely packed with electronics (0.75 In. H_2O or more) require a larger, more powerful air mover or multiple air movers.

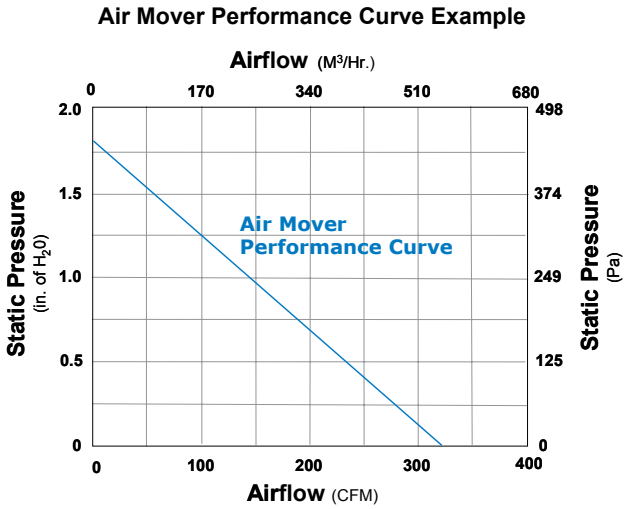


HOW IS PERFORMANCE CHARACTERIZED?

Each air mover is commonly rated based on its airflow and static pressure capability known as a "performance curve."

In a 0 static pressure electronics system, the air mover provides 325 CFM of airflow. Conversely, at 1.6 In. of H_2O static pressure (a moderately packed cabinet), the air mover provides 0 airflow.

Air mover manufacturers determine the performance curve for each of their products by placing the unit in a test chamber to determine its precise airflow and static pressure.



WHAT ARE THE CAPABILITIES OF EACH AIR MOVER?

Each air mover such as a tube axial fan, filter fan, fan tray, motorized impeller and centrifugal blower performs in a different way. A summary of the characteristics and applications for each of these popular fresh air cooling products is outlined in the table below.

Axial fans, filter fans and fan trays generally provide low to moderate airflow in electronic systems with low static pressure. Most are used with VAC applications. Filter fans provide an extra level of enclosure protection against dust infiltration (Type 12 or IP54) and water infiltration (Type 3R or IP55). With the exception of fan trays, tube axial fans and filter fans are relatively inexpensive.

Motorized impellers offer moderate to high airflow and work well in electronics cabinets with moderate to high static pressure. They often provide general cooling throughout an enclosure. Motorized impellers are available in VAC and VDC inputs and are reasonably priced

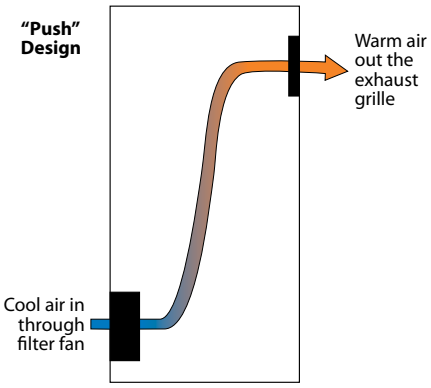
Centrifugal blowers deliver moderate to high airflow and overcome the system impedance that builds up in electronic cabinets with moderate to high static pressure. They're primarily available for VAC power input and are relatively higher priced.

Characteristics of Popular Air Movers

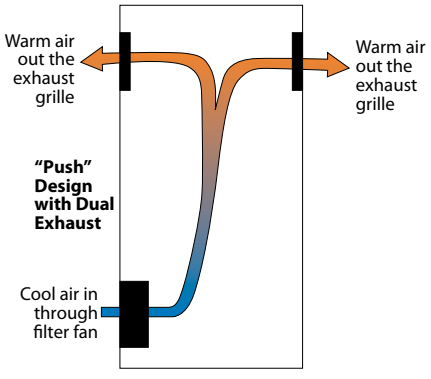
Characteristics	Axial Fans	Filter Fans	Fan Trays	Motorized Impellers	Centrifugal Blowers
Airflow	Low	Low - Moderate	Low - Moderate	Moderate - High	Moderate - High
Static Pressure	Low	Low	Low	Moderate - High	Moderate - High
Voltage Input	AC (some DC)	AC and DC	AC (some DC)	AC and DC	AC
Protection	None	Type 12 & 3R	None	None	None
Per Piece Price	Low	Moderate	High	Moderate	High
Typical Application	Spot electronics cooling	Industrial electrical cabinet cooling	Datacom card and server rack cooling	General cooling of moderate to high static pressure cabinets	Concentrated or general cooling of high static pressure systems

AIRFLOW DESIGN OPTIONS

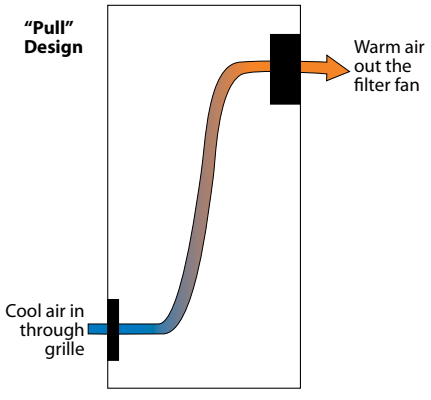
A typical air mover system design "pushes" cool air into the bottom of the electronics cabinet and exhausts the warm air out the top



To reduce exhaust grille static pressure and improve cool airflow, some engineers use two exhaust grilles in their airflow design.

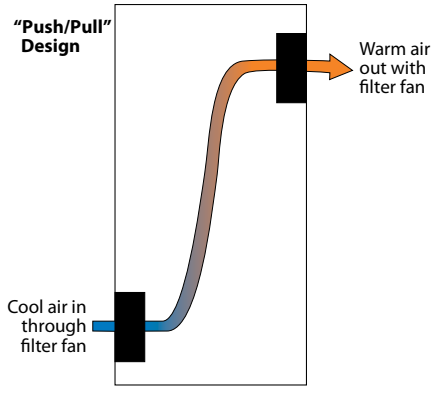


Another option is to use a reverse airflow fan and mount it high in the enclosure to "pull" cool air through the enclosure.

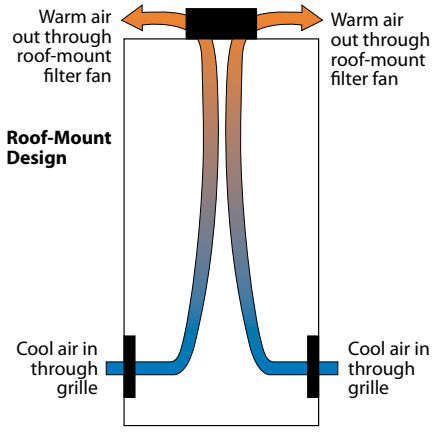


The "pull" approach is less desirable because it de-pressurizes the enclosure. If poor seals are in the cabinet at a door or modular panel, for example, damaging dust could be sucked inside and onto the electrical components. However, space constraints at the bottom of the enclosure may force the engineer to design a "pull" system.

For electrical systems with higher static pressure, filter fans are sometimes used in a "push/pull" approach. The reason is that two filter fans designed in "series" overcome twice the static pressure compared to one filter fan working alone with an exhaust grille.



Roof-mount air movers are also available. Engineers occasionally employ them due to space constraints lower in the enclosure or for other reasons. Two exhaust grilles are recommended to ensure adequate airflow through the enclosure.



Roof-mount air mover designs also pose the risk of pulling dust into the enclosure through poor seals.

CHOOSING AN AIR MOVER

Three overall considerations are applied when selecting a filter fan: voltage input, enclosure protection and airflow requirement.

POWER INPUT

Narrowing the choice of filter fans based on voltage input is quite simple. If the voltage available in the electronics system to power the filter fan is AC, then an VAC filter fan is chosen. If the voltage for the application is DC, then a VDC filter fan is specified.

The voltage level of the filter fan's power input also needs to be taken into consideration. For example, if the voltage input is 115 VAC, then a 115 VAC filter fan should be specified. If the voltage input is 24 VDC, then a 24 VDC impeller is required. Filter fans are commonly available in 115, 230 and 460 3-phase 50/60 Hz VAC as well as 24 VDC. Some manufacturers such as Pentair Technical Products offer 48 VDC due to the trend toward using this power input in some electronic systems.

ENCLOSURE PROTECTION

Another important consideration is selecting an air mover that maintains the protection level of the electrical enclosure.

U.S. standards of protection generally include:

Type 1 – For indoor use to protect against contact with the enclosed equipment
Type 12 - For indoor use to protect against dust, falling dirt and dripping non-corrosive liquid such as water
Type 3R – For outdoor use to protect against rain and sleet
Type 4 – For outdoor or indoor use to protect against windblown dust and rain, splashing water and hose-directed water
Type 4X – For outdoor or indoor use to protect against corrosion, windblown dust and rain, splashing water and hose-directed water

European standards of protection include:

IP54 – Dust must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact; water splashing against the enclosure from any direction shall have no harmful effect.
IP55 – Dust must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact; and water projected by a nozzle against enclosure from any direction shall have no harmful effects.
IP65 – No ingress of dust; complete protection against contact; and water projected by a nozzle against enclosure from any direction shall have no harmful effects.

AIRFLOW

Choosing a filter fan with the right airflow or cooling capacity is as important as voltage input and enclosure protection. However, the process is a little more involved.

Generally, smaller heat loads in the electronics system will require a filter fan with a lower airflow rate (CFM or M^3/Hr.). Moderate to high heat loads will need a larger, more powerful filter fan or multiple filter fans to move enough air to cool the electronics components.

The following 5-step process results in a filter fan specification that should generally work in your electronics system.

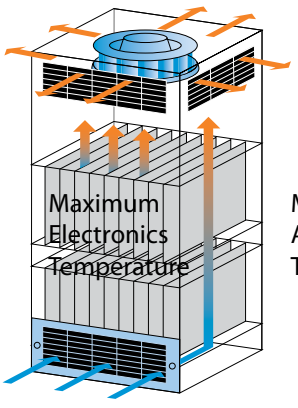
1. Determine Delta-T
2. Determine Internal Heat Load
3. Determine Free Airflow
4. Estimate System Impedance
5. Select Your Filter Fan

These five steps yield a ballpark result. A filter fan sample should always be tested in the actual electrical system itself to confirm that its performance provides adequate airflow.

The next section outlines the 5-step filter fan selection process in more detail.

STEP 1. DETERMINE DELTA-T (ΔT)

Delta-T is the difference between **maximum desired temperature for the electronics** and **maximum temperature outside the enclosure**. It is important to determine ΔT because cooler air will usually require less filter fan airflow whereas warmer air will typically require more airflow.



Maximum desired temperature for the electronics is identified by reviewing the component manufacturer's specifications. They will often indicate that the equipment should not operate above a certain temperature such as 35 C (95 F).

Maximum temperature **outside the enclosure** is determined by forecasting the highest potential temperature of the air around the electronics cabinet. If the application is in an indoor environment such as an air conditioned factory, the maximum temperature outside the enclosure is the temperature of the facility, such as 25 C (77 F). If the electronics system is outdoors, the maximum temperature around the cabinet is the hottest weather that the application experiences, which may be 45 C (116 F) if it's deployed on a roof top for example.

ΔT =
maximum temperature desired for the electronics -
maximum expected ambient temperature

For example:

ΔT =
35 C (95 F) [maximum electronics temperature] -
25 C [maximum ambient temperature]
ΔT = 10 C (18 F)

STEP 2. DETERMINE INTERNAL HEAT LOAD

Heat load stems from the amount of waste heat generated inside the enclosure by the electronic components and is expressed in Watts. There are several methods to determine internal heat load, depending on data availability.

A. Heat Load Data from Each Electronics Component Manufacturer
One way to estimate internal load is to gather heat load data from the manufacturers of the electronics components inside the cabinet. If more than one control or other components are inside the enclosure, it will be necessary to add together the multiple estimates of heat load to determine total internal heat load.

B. Component Power – Component Efficiency
A second method is to establish the Watts of power used by each electronic component. Derive Watts by multiplying the amp draw of each device with its voltage. Then subtract the efficiency of each component from its estimated power use, adding up the outcomes for total internal heat load.

INTERNAL HEAT LOAD = COMPONENT POWER (Watts) - COMPONENT EFFICIENCY (for each electrical device)
For example:
An electronic system uses two components that draw 115 VAC at 9.5 amps. Each has a rated efficiency of 90 percent (10 percent of each device is inefficient). Unused amounts of power become generated heat. Thus, the estimated internal heat load is:

Device Power = 115 x 9.5 = 1100 Watts
Total Power = 2 x 1100 = 2200
Less Efficiency = 2200 x (1 - .90)
Total Heat Load = 220 Watts

C. Incoming – Outgoing Power
A third approach is to estimate the power going into the enclosure and the power coming out of it. The difference is the estimated amount of internal heat load. Multiply the amps and volts of each electrical line going in to determine Watts and then add them together. Do the same for the electrical line(s) coming out of the application. The outgoing watts are subsequently subtracted from the incoming watts.

INTERNAL HEAT LOAD = INCOMING POWER (Watts) – OUTGOING POWER (Watts)
For example:
An enclosure has three input lines of 230 VAC at 11, 6 and 4 amps. It has one output control line of 115 VAC at 9 amps.
Incoming Power = (230 x 11) + (230 x 6) + (230 x 4) = 4830 Watts
Outgoing Power = (115 x 9) = 1035 Watts
Total Heat Load = 4830 – 1035 = 3795 Watts

D. Automated Equipment Horsepower
The fourth method applies only to industrial automation equipment that operates with horsepower such as variable frequency drives (VFDs). 1 horsepower = 745.6 Watts. Thus, the internal heat load from a 3 horsepower VFD is 2237 Watts, less its efficiency which is typically 93 – 95 percent.
For example:
A cabinet has three 5 Hp VFDs with 95% efficiency.
VFD Watts = 5 Hp x 745.6 x 3 = 11184
Adjusted Watts = 11184 x (1 - .95) = 559
Total Heat Load = 559 x 1.25 = 699 Watts

Note: 1.25 is an assumed "safety" margin for other minor heat-producing components.

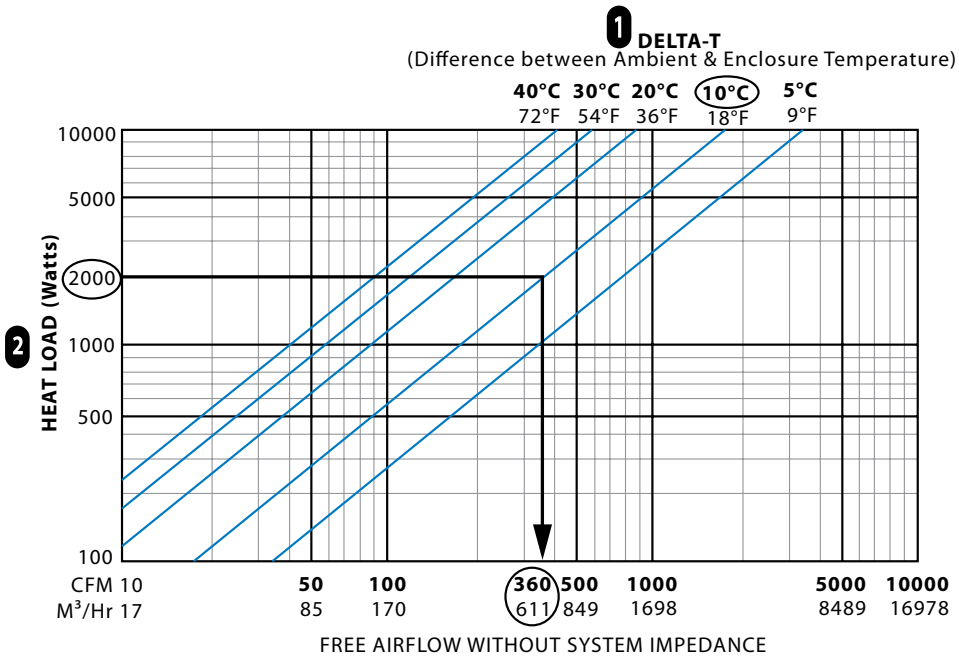
STEP 3. DETERMINE FREE AIRFLOW

Determining free airflow applies the results from steps 1 and 2 to the chart below. Recall that free airflow is the unimpeded airflow through the enclosure without any interference from electronics components or filter fan exhaust grilles.

Select the diagonal ΔT line that closely matches the ΔT of your electronics system. Using the example from step 1, ΔT is 10 C (18 F).

Then find your cabinet's heat load along the Y-axis of the chart. In the example from step 2, heat load is 2000 Watts.

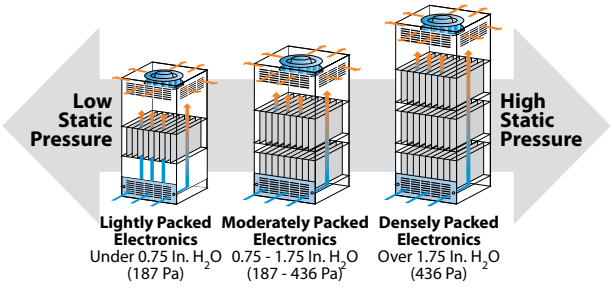
Find where heat load intersects with ΔT to determine free airflow on the X-axis. Continuing the example, free airflow in this case is 360 CFM or 611 M^3/Hr.



Now we need to account for system impedance, i.e., the amount of airflow interference created by the electronic components inside the cabinet. A filter fan with **more than** 360 CFM or 611 M^3/Hr. of free airflow will actually be needed for this system's design.

STEP 4. ESTIMATE SYSTEM IMPEDANCE

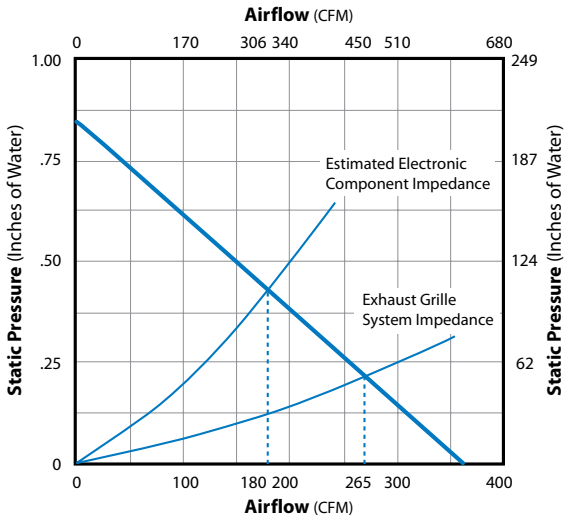
Static pressure or system impedance can impact the cooling performance of an air mover. Filter fans work well in electrical cabinets with low static pressure such as a large enclosure with a bare drive and few other components. They do not have enough force to push air through a cabinet with a moderate or high system impedance.



If your system design appears like the middle or right hand example, then a motorized impeller or blower is probably a better solution for the application than a filter fan.

Assuming a filter fan can cool your application, the exhaust grille and electrical components inside the enclosure will reduce airflow through the system. Filter fan manufacturers will show the effect of the exhaust grille on the performance curve. However, they do not indicate the impedance curve of the electronics system because filter fan makers do not know this information. Only the specifying electronics engineer or system designer can determine this. If it is not possible to measure the exact static pressure inside an electronics cabinet, you must make an estimate and draw an approximation.

Impact of System Impedance on Free Airflow of a 376 CFM (638 M³/Hr.) Filter Fan



In the example shown, the free airflow of a 376 CFM (638 M^3/Hr.) air mover decreases to 265 CFM with the exhaust grille kit and down to 180 CFM when used in an actual application. Thus, a model with a performance curve similar to the one in the next graph would be too small to keep our electrical system cool because our actual target airflow is 360 CFM.

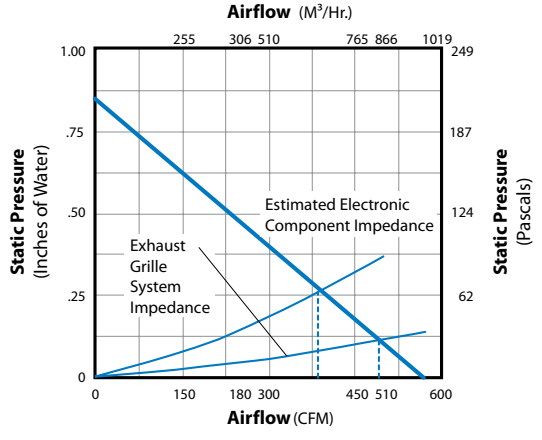
STEP 5. SELECT YOUR AIR MOVER

In this final step, we bring together the results of free airflow (step 3) and system impedance (step 4), using the air mover performance charts. Applying the example, we need to select a motorized impeller that delivers a minimum of 360 CFM (611 M^3/Hr.).

Identify alternative air mover models with free airflow ratings that are greater than the step 3 outcome of 360 CFM (611 M^3/Hr.) to compensate for airflow losses created by static pressure in the system. A judgmental system impedance curve is overlaid onto the performance charts of each of the optional models, and then the model with the CFM or M^3/Hr. closest to the target airflow is selected.

In the performance curve shown here, 571 CFM is commonly the largest filter fan in the electronics cooling industry. Based on the estimated electronic component impedance overlaid by our imaginary engineer, it should deliver the cooling performance required by the system.

Performance Curve of a 571 CFM (969 M³/Hr.) Filter Fan with Exhaust Grille and System Impedance



FRIENDLY REMINDER

This 5-step process for selecting an air mover yields a ballpark result. Be sure to test a sample of the air mover in the electrical system prototype at maximum ambient and heat load conditions to verify adequate cool airflow.

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CHAPTER 2 TECHNICAL INFORMATION

STANDARDS SUMMARY

To standardize enclosure performance, organizations like NEMA, UL, CSA, IEC and VDE use rating systems to identify an enclosure's ability to resist external environmental influences.

CE

For industrial control equipment, the CE Mark is not intended to be applied to empty enclosures because they are inactive components of a final assembly. With the CE marking, the manufacturer declares that the product conforms with the essential requirements of the applicable EU directives.

GOST-R

GOST

The GOST Standard, approved by ISO as a local standard in Russian Federation and CIS countries, covers general and technical specifications as well as safety requirements.

CHAPTER CONTENTS

c UL US

UL

The UL Listing Mark means that the product has met UL's safety requirements and is suitable for factory and field installation.

STANDARDS ORGANIZATION SUMMARY AND DIRECTORY OVERVIEW

What's in a Rating?

As a way of standardizing enclosure performance, organizations like NEMA, UL, CSA, IEC and VDE use rating systems to identify an enclosure's ability to resist external environmental influences. Resistance to everything from dripping liquid to hose-down to total submersion is defined by the ratings systems. While these ratings are all intended to provide information to help you make a safer, more-informed product choice, there are differences among them.

North American Standards Organizations

In North America, NEMA, UL and CSA are the commonly recognized standards organizations. Their ratings are based on similar application descriptions and expected performance. UL and CSA both require enclosure testing by qualified evaluators in their certified labs. They also send site inspectors to make sure a manufacturer adheres to prescribed manufacturing methods and material specifications. NEMA, on the other hand, does not require independent testing and leaves compliance completely up to the manufacturer.

North American enclosure rating systems also include a rating that indicates corrosion resistance. This rating is based on the enclosure's ability to withstand prolonged exposure to salt water spray.

While the corrosion resistance rating is a good indicator that an enclosure can resist corrosion, it does not provide information on how a specific corrosive agent will affect a given enclosure material. It is best to conduct a full analysis of the specific application and environment to determine the best enclosure choice.

International Standards Organizations

Like NEMA, IEC does not require independent testing and leaves compliance completely up to the manufacturer. Nevertheless, there are differences in how enclosure performance is interpreted. For example, UL and CSA test requirements specify that an enclosure fails the water-tight test if even a single drop of water enters the enclosure. In the IEC standards for each level of ingress protection (IP), a certain amount of water is allowed to enter the enclosure.

IEC 60529 IP ratings do not specify construction requirements or degrees of protection against corrosive atmospheres, risk of explosion or conditions such as moisture or corrosive vapors. NEMA Type ratings, on the other hand, do specify construction and performance requirements for most environmental conditions. For this reason, and because the tests and evaluations for other characteristics are not identical, the IEC enclosure classification designations cannot be exactly equated with NEMA enclosure Type numbers.

CE

For industrial control equipment, the CE Mark is not intended to be applied to empty enclosures because such enclosures are inactive components of a final assembly. The responsibility of ensuring compliance with all applicable EU directives and harmonized standards belongs with the final equipment manufacturer.

GOST

GOST Standard has been approved by ISO as a local standard in Russian Federation and CIS countries and is quite similar to the EN/CE standards. The GOST collection of standards covers general and technical specifications as well as safety requirements.

At the time of this printing, the following countries use GOST Standard with some individual additions: Russia, Belarus, Ukraine, Moldova, Kazakhstan, Azerbaijan, Armenia, Kyrgyzstan, Uzbekistan, Tajikistan, Georgia, Turkmenistan

GOST-R certification is required in order to gain customs clearance for products at the Russian borders. The GOST-R certificate indicates compliance with the Russian standards. GOST-R is valid only for Russian Federation and may not be accepted in CIS countries. There are similar, but independent regulations in each CIS country.

PROTECTION LEVELS

NEMA, UL and CSA Ratings **Enclosure Type Descriptions for Non-Hazardous Locations**

	Type	NEMA	UL	CSA
Indoor	Type 1	Enclosures are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment or locations where unusual service conditions do not exist.	Indoor use primarily to provide protection against contact with the enclosed equipment and against a limited amount of falling dirt.	General purpose enclosure. Protects against accidental contact with live parts.
Indoor	Type 12	Enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt and dripping noncorrosive liquids.	Indoor use to provide a degree of protection against dust, dirt, fiber flyings, dripping water and external condensation of noncorrosive liquids.	Indoor use; provides a degree of protection against circulating dust, lint, fibers and flyings; dripping and light splashing of non-corrosive liquids; not provided with knockouts.
Indoor	Type 12K	Enclosures with knockouts are intended for indoor use primarily to provide a degree of protection against dust, falling dirt and dripping noncorrosive liquids.	Indoor use to provide a degree of protection against dust, dirt, fiber flyings, dripping water and external condensation of noncorrosive liquids.	Indoor use; provides a degree of protection against circulating dust, lint, fibers and flyings; dripping and light splashing of noncorrosive liquids; not provided with knockouts.
Indoor	Type 13	Enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil and noncorrosive coolant.	Indoor use to provide a degree of protection against lint, dust seepage, external condensation and spraying of water, oil and noncorrosive liquids.	Indoor use; provides a degree of protection against circulating dust, lint, fibers and flyings; seepage and spraying of non-corrosive liquids, including oils and coolants.
Outdoor	Type 3	Enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain and sleet; undamaged by the formation of ice on the enclosure.	Outdoor use to provide a degree of protection against windblown dust and windblown rain; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain, snow and windblown dust; undamaged by the external formation of ice on the enclosure.
Outdoor	Type 3R	Enclosures are intended for outdoor use primarily to provide a degree of protection against falling rain and sleet; undamaged by the formation of ice on the enclosure.	Outdoor use to provide a degree of protection against falling rain; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain and snow; undamaged by the external formation of ice on the enclosure.
Outdoor	Type 3RX	Enclosures are intended for outdoor use primarily to provide a degree of protection against corrosion, falling rain and sleet; undamaged by the formation of ice on the enclosure.	Not specifically defined.	Not specifically defined.
Outdoor	Type 4	Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water and hose directed water; undamaged by the formation of ice on the enclosure.	Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water and hose-directed water; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain, snow, windblown dust, splashing and hose-directed water; undamaged by the external formation of ice on the enclosure.
Outdoor	Type 4X	Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water and hose-directed water; undamaged by the formation of ice on the enclosure.	Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water and hose-directed water; undamaged by the formation of ice on the enclosure; resists corrosion.	Indoor or outdoor use; provides a degree of protection against rain, snow, windblown dust, splashing and hose-directed water; undamaged by the external formation of ice on the enclosure; resists corrosion.
Outdoor	Type 6	Enclosures are intended for use indoors or outdoors where occasional submersion is encountered; limited depth; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use to provide a degree of protection against entry of water during temporary submersion at a limited depth; undamaged by the external formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against the entry of water during temporary submersion at a limited depth. Undamaged by the external formation of ice on the enclosure; resists corrosion.

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- This material is reproduced with permission from Underwriters Laboratories Inc. Enclosures for Electrical Equipment, UL 50, 50E and Industrial Control Panels, UL 508A.
- This material is reproduced with permission from the Canadian Standards Association.
- Underwriters Laboratories Inc. (UL) shall not be responsible for the use of or reliance upon a UL Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon a UL Standard.
- Some enclosures may have multiple ratings. For instance: 4, 12—Outdoor use; able to be used indoors with modifications; 4X, 3RX—Outdoor use; able to be used indoors with modifications; 4, 9—Can be used in both hazardous and non-hazardous locations

IP Rating Descriptions **Example Rating**

If 1st IP number is...	and the 2nd IP number is...	Then the IP rating is
2	3	IP23
(protection against solid objects)	(protection against liquids)	An enclosure with this designation provides protection against touch with a finger, penetration of solid objects greater than 12 mm and spraying water.

First Numeral (Solid Objects and Dust)

IP	Protection of Persons	Protection of Equipment
0	No Protection	No Protection
1	Protected against contact with large areas of the body (back of hand)	Protected against objects over 50 mm in diameter
2	Protected against contact with fingers	Protected against solid objects over 12 mm in diameter
3	Protected against tools and wires over 2.5 mm in diameter	Protected against solid objects over 2.5 mm in diameter
4	Protected against tools and wires over 1 mm in diameter	Protected against solid objects over 1 mm in diameter
5	Protected against tools and wires over 1 mm in diameter	Protected against dust (limited ingress, no harmful deposit)
6	Protected against tools and wires over 1 mm in diameter	Totally protected against dust

2

Second Numeral (Liquid)

IP	Protection of Equipment
0	No Protection
1	Protected against vertically falling drops of water, e.g. condensation
2	Protected against direct sprays of water up to 15 degrees from vertical
3	Protected against sprays up to 60 degrees from vertical
4	Protected against water sprayed from all directions (limited ingress permitted)
5	Protected against low-pressure jets of water from all directions (limited ingress permitted)
6	Protected against strong jets of water
7	Protected against the effects of immersion between 15 cm and 1 m
8	Protected against long periods of immersion under pressure

SCCR REQUIREMENTS PER UL (CONDENSED VERSION)

Article 409 of the 2008 National Electric Code (NFPA 70) requires industrial control panels to be marked with a short circuit current rating. As specified in the National Electric Code, UL508A-2001 Supplement SB, the Standard of Safety for Industrial Control Equipment, provides an accepted method for determining the short-circuit current rating of the control panel.

The SCCR rating for our air conditioners and heat exchangers has a default value of 5 kA.

You may use a 5 or 10 kVA isolation transformer between the customer's panel and our air conditioner and not have an effect on the customer's 65 kA rating.

You may use a fuse or circuit breaker with a 5 kA short circuit rating on the line side of the ACU and its branch circuit protective device and not have an effect on the customer's 65 kA rating.

The current limiting fuse or circuit breaker used on the line side of the branch circuit protection for the ACU must have a SCCR equal to or greater than that of the panel rating. Additionally, for a current limiting fuse, the customer would need to verify that the let-through current (Ip * 10^3) of the fuse is less than or equal to 5KA by referencing table SB4.2 of UL 508A. If a circuit breaker is used as feeder protection, it **must** be marked Current Limiting type from the manufacturer, and the panel builder would need to verify based on the manufacturers published curves that the let-through current is less than or equal to 5kA. Examples of these curves are included in UL 508A supplement SB.

You can run separate circuits for the panel and the air conditioner as long as each is labeled with their individual SCCR ratings. (5 kA and 65 kA)

If the customer does not implement one of the options above, then the resulting SCCR rating would be the 5 kA rating of the ACU, if that is the lowest rated component in the panel.

Testing represents another option; however, if the customer does not implement these options, then the resulting short circuit rating of the panel is based on the lowest short circuit current rating of all power circuit components installed in the panel.

Notes

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CHAPTER 3 SEALED ENCLOSURE COOLING

FEATURED PRODUCTS

SPECTRACOOL™ AIR CONDITIONERS

Designed to deliver vital cooling to sensitive electronics within enclosures, SPECTRACOOL™ air conditioners provide energy-efficient, reliable cooling in rugged indoor and outdoor environments. With a variety of cooling capacities and sizes, air conditioners are ideal for applications ranging from low-profile cabinet cooling to large cabinet cooling.

CLIMAGUARD™ HEAT EXCHANGERS

CLIMAGUARD™ heat exchangers are an efficient, maintenance-free and low-noise solution for cooling enclosures in industrial applications. With a unique, double-seal design and small to large cooling capacities, heat exchangers protect vital electronics by effectively transferring heat and preventing damaging dirt and dust.

CHAPTER CONTENTS

EASY SWAP ADAPTOR PLENUMS

When existing air conditioners are damaged or have reached end-of-life, Easy Swap Adaptor Plenums provide a quick and easy means for attaching new SPECTRACOOL air conditioners to the enclosure with no modifications required.

THERMOELECTRIC COOLERS

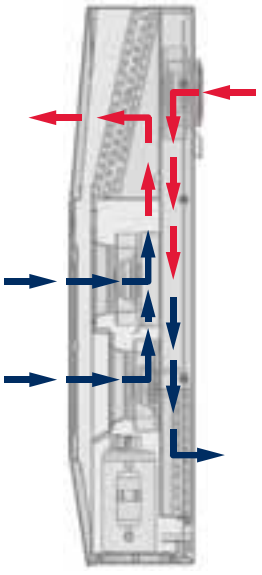
A compact design, with no refrigerant, compressors or filters required, Thermoelectric Coolers provide reliable cooling for small indoor and outdoor enclosures. With Peltier effect cooling capacities, Thermoelectric Coolers efficiently remove heat around critical electronics within an enclosure.

SPECTRACOOL™ INDOOR/OUTDOOR

G57
20000 BTU/Hr.
5861 Watt

G52
8000/12000 BTU/Hr.
2300/3500 Watt

G28
4000/6000 BTU/Hr.
1172/1758 Watt



INDUSTRY STANDARDS

UL/cUL Listed; Type 12, 3R, 4; 4X optional; File No. SA6453

CE
GOST
IP 56 Internal Loop
IP 34 on External Loop
Telcordia GR-487 capable (Outdoor)

APPLICATION

- Industrial automation
- Telecommunications equipment
- Waste water treatment systems
- Package handling equipment
- Security and defense systems
- And more

FEATURES

- Energy-efficient rotary compressor on most models
- R407c and R134a earth-friendly refrigerants
- 115, 230 and 400/460 VAC 3-phase power input on most models
- UL Listed to save customers time and money with agency approvals
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C
- Exterior and partially recessed mounting options
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat on enclosure side of the unit; indoor air conditioner models include digital display on ambient side
- Dual condenser-side air movers for performance redundancy on G52 and G57 models
- Galvanized sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cut-out adapter options for enclosures with GENESIS™ and T-Series air conditioners, enable users to easily transition to the new unit
- Dust-resistant condenser coil allows the unit to be run filterless in most applications
- Cleanable, reusable aluminum mesh filter protects coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Indoor Air Conditioner models also include:
  - Active condensate management with heater strip
  - Power-off relay for door switch and other system requirements
  - Malfunction switch
- Standard Outdoor Air Conditioner models also include:
  - Telcordia GR-487 capable
  - Corrosion-resistant components
  - Malfunction switch
  - Compressor heater
  - Head pressure control
  - Up to 2000 Watt (G28, G52) and 3000 Watt (G57) enclosure heater

SPECIFICATIONS

- Nominal cooling capacity:
  G28 4000 & 6000 BTU/Hr. (1172 and 1758 W)
  G52 8000 & 12000 BTU/Hr. (2344 and 3516 W)
  G57 20000 BTU/Hr. (5861 W)
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint
- Other colors and textures available

NOTES

Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

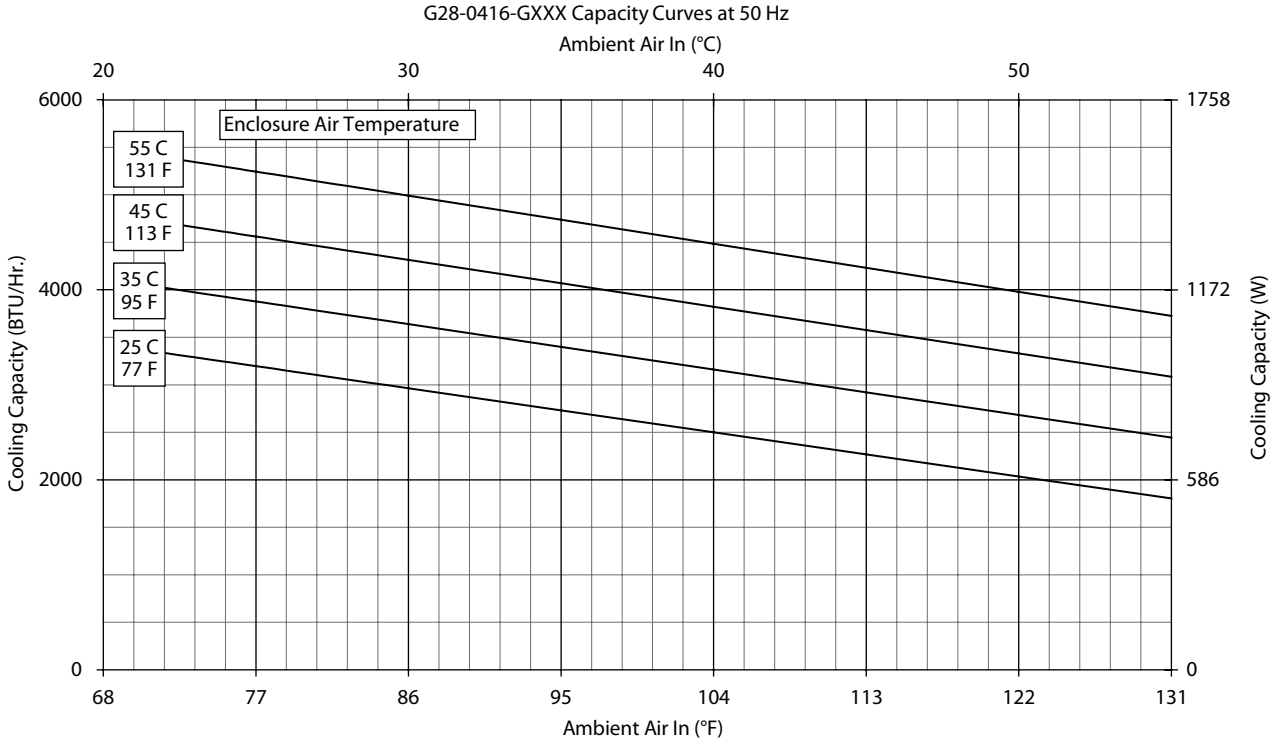
ODVA
EtherNet/IP™
conformance tested

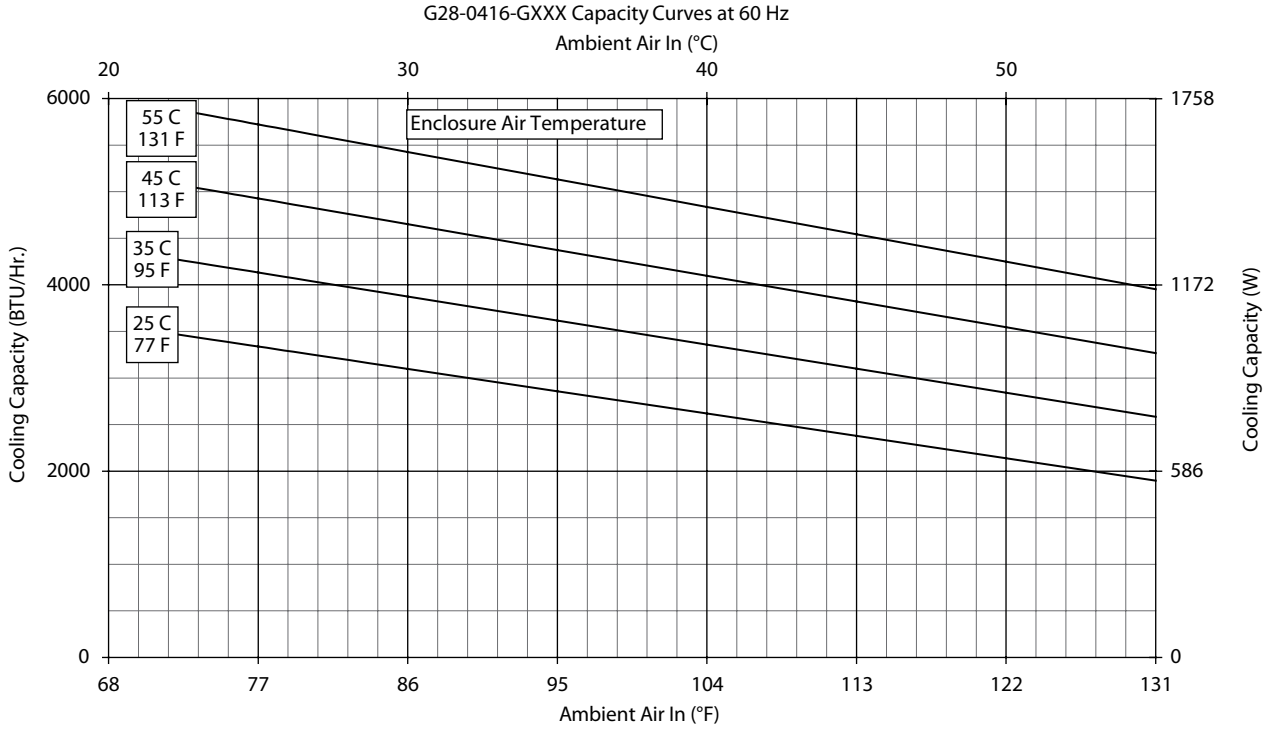
Performance Data **G28 Models 4000/6000 BTU/Hr. (1172/1758 Watt)**

CATALOG NUMBER						
Indoor Model	G280416G050	G280426G050	G280446G050	G280616G050	G280626G050	G280646G050
Indoor Model Stainless Steel Type 4X	G280416G051	G280426G051	G280446G051	G280616G051	G280626G051	G280646G051
Indoor Model with Remote Access Control*	G280416G060	G280426G060	G280446G060	G280616G060	G280626G060	G280646G060
Outdoor Model without Heat Pkg.	G280416G100	G280426G100	G280446G100	G280616G100	G280626G100	G280646G100
Outdoor Model Partial Recessed Mount	G280416G101	G280426G101	G280446G101	G280616G101	G280626G101	G280646G101
Outdoor Model without Heat Pkg. Stainless Steel Type 4X	G280416G102	G280426G102	G280446G102	G280616G102	G280626G102	G280646G102
Outdoor Model with Heat Pkg.	G280416G150	G280426G150	—	G280616G150	G280626G150	—
Outdoor Model with Heat Pkg. Stainless Steel Type 4X	G280416G151	G280426G151	—	G280616G151	G280626G151	—
COOLING PERFORMANCE						
Nominal:						
BTU/Hr.	**4600/4900**	**4600/4900**	**4600/4900**	**6000/6400**	**6000/6400**	**5400/6000**
Watts	**1347/1435**	**1347/1435**	**1347/1435**	**1757/1874**	**1757/1874**	**1581/1757**
At 131 F/131 F (55 C/55 C):						
BTU/Hr. (50/60 Hz)	4600/4900	4600/4900	4600/4900	6000/6400	6000/6400	5400/6000
W (50/60 Hz)	1347/1435	1347/1435	1347/1435	1757/1874	1757/1874	1581/1757
At 95 F/95 F (35 C/35 C):						
BTU/Hr. (50/60 Hz)	4300/4600	4300/4600	4324/4655	5600/6000	5600/6000	5054/5685
W (50/60 Hz)	1260/1364	1260/1364	1267/1364	1641/1758	1641/1758	1481/1666
Refrigerant	R407C	R407C	R134A	R407C	R407C	R134A
Refrigerant Charge (ounces/grams)	20/567	20/567	16/454	20/567	20/567	16/454
Operating Temperature Range:						
Maximum (°F/°C)	131 F/55 C	131 F/55 C	131 F/55 C	131 F/55 C	131 F/55 C	131 F/55 C
Minimum (°F/°C)	-40 F/-40 C	-40 F/-40 C	-40 F/-40 C	-40 F/-40 C	-40 F/-40 C	-40 F/-40 C
Air Flow at 0 Static Pressure:						
Internal loop 50 Hz (CFM / m^3/hr.)	189/321	189/321	189/321	189/321	189/321	189/321
External loop 50 Hz (CFM / m^3/hr.)	291/494	291/494	291/494	291/494	291/494	291/494
Internal loop 60 Hz (CFM / m^3/hr.)	221/375	221/375	221/375	221/375	221/375	221/375
External loop 60 Hz (CFM / m^3/hr.)	300/509	300/509	300/509	300/509	300/509	300/509
Max. Heater W (Outdoor Models)	2000	2000		2000	2000	
ELECTRICAL DATA						
Rated Voltage	**115**	**230**	**400/460 3~**	**115**	**230**	**400/460 3~**
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1138.5/1311	1058/1334	680/874	1138.5/1311	1058/1334	680/874
Max. Nominal Current (A at 50/60 Hz)	9.9/11.4	4.6/5.8	1.7/1.9	9.9/11.4	4.6/5.8	1.7/1.9
Starting Current (A)	36.2	17.7	7.7	36.2	17.7	7.7
Agency Approvals	cUL Listed CE GOST					
Power Input Description	Terminal Block					
ENCLOSURE PROTECTION						
UL Type	Type 12, 3R, 4 Standard Type 4X Stainless Steel Optional					
CONTROLLER						
Description	Basic Mechanical Thermostat					
Thermostat Location	Enclosure Side on All Base Models					
Factory Thermostat Setting (°F/°C)	80/27	80/27	80/27	80/27	80/27	80/27
SOUND LEVEL						
At 1.5 Meters	68dB(A)					
UNIT CONSTRUCTION						
Material	Galvanized Sheet Metal Standard (Optional: Stainless Steel)					
Finish	Powder Coat RAL 7035 Light Gray Standard					
ACCESSORIES						
EASYSWAP Adaptor Plenum (GENESIS™ M28)	Enables SPECTRACOOL to be mounted to GENESIS M28 air conditioner cutout Catalog Number PLM28G28					
EASYSWAP Adaptor Plenum (T-Series T29)	Enables SPECTRACOOL to be mounted to T-Series T29 air conditioner cutout Catalog Number PLT29G28					
UNIT DIMENSIONS						
Height (in./mm)	28.55/725.1					
Width (in./mm)	16.97/431.1					
Depth (in./mm)	10.10/256.6					
Weight (lb./kg)	84/38	84/38	84/38	84/38	84/38	84/38

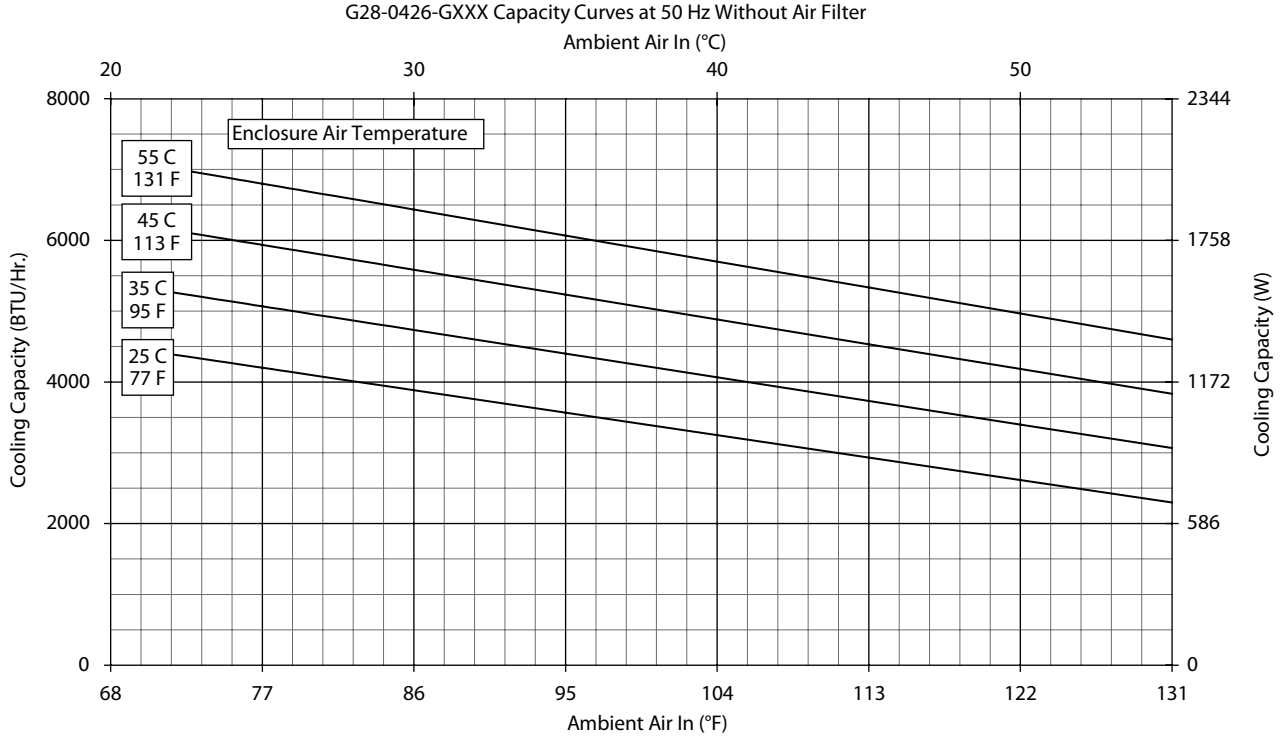
*Units with Remote Access Control utilize a digital controller and communicate via EtherNet/IP, Modbus TCP/IP and SNMP over ethernet or modbus RTU over USB.

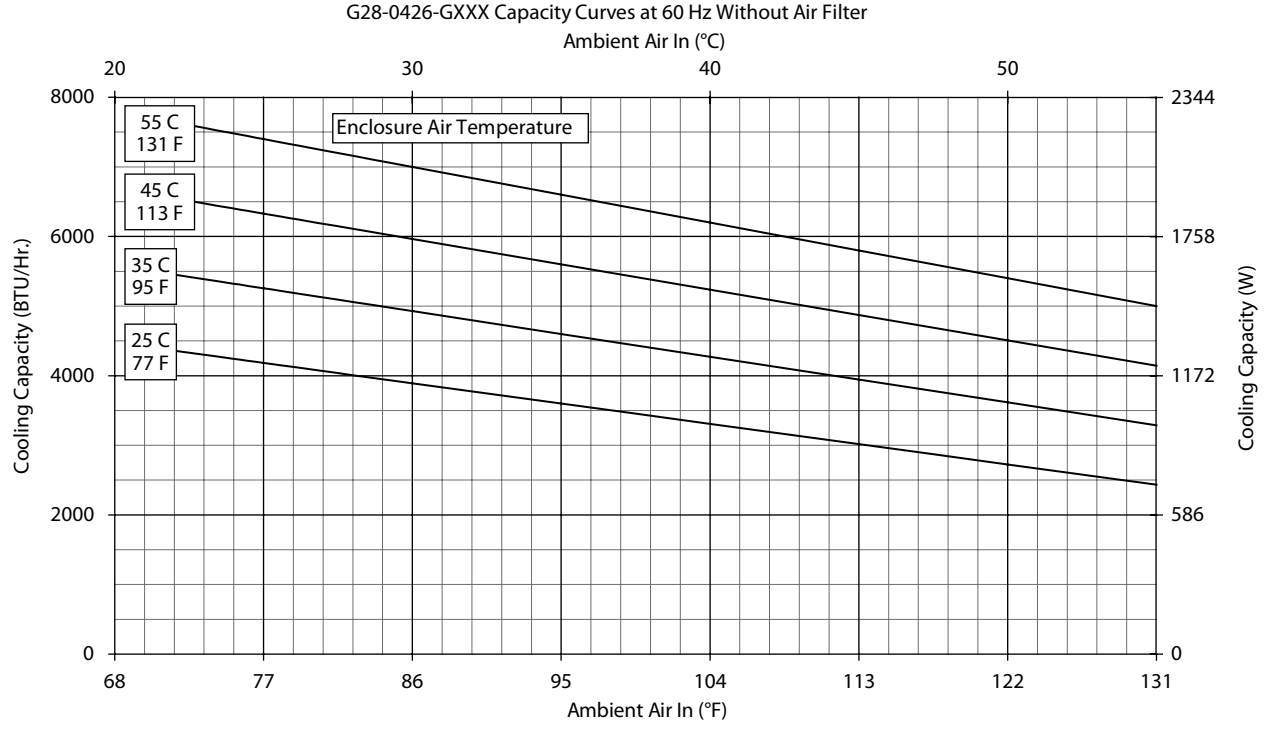
Performance Curves for G28 Models 4000 BTU/Hr. (1347/1435 Watt)





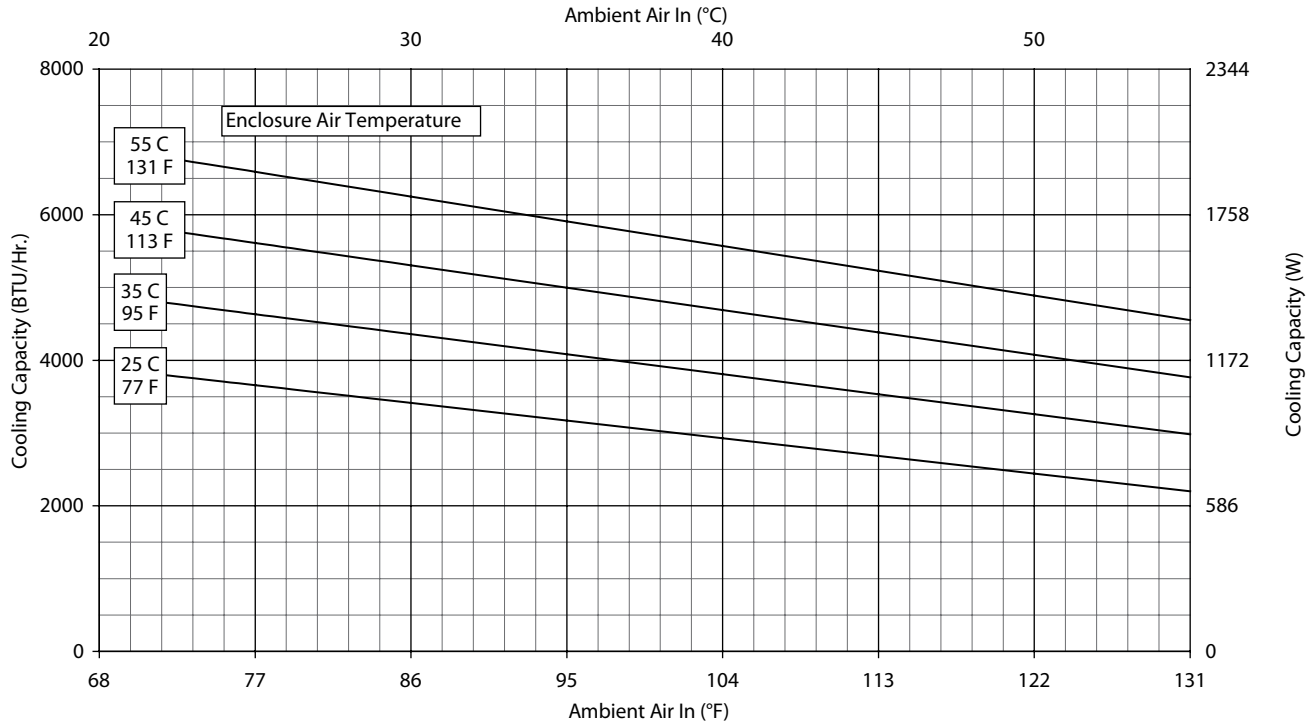
Performance Curves for G28 Models 4000 BTU/Hr. (1347/1435 Watt)



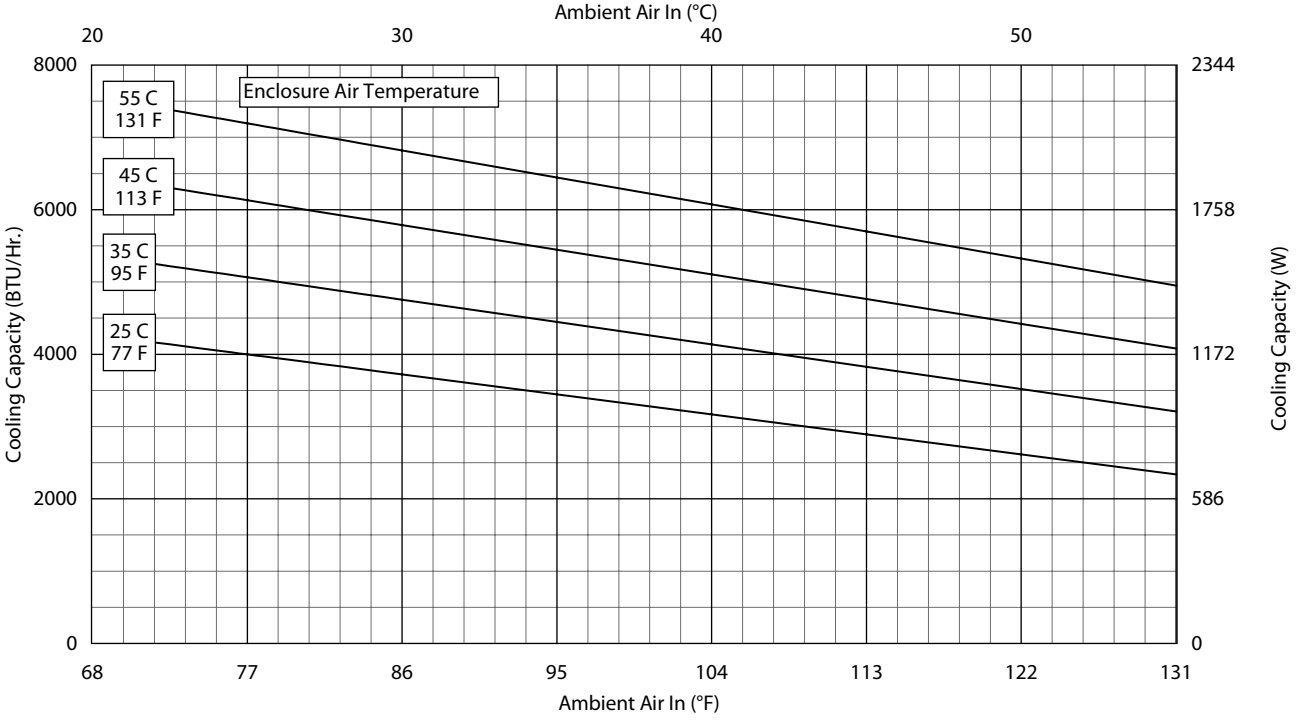


Performance Curves for G28 Models 4000 BTU/Hr. (1347/1435 Watt)

G28-0446-GXXX- Capacity Curves at 50 Hz; Without Filter

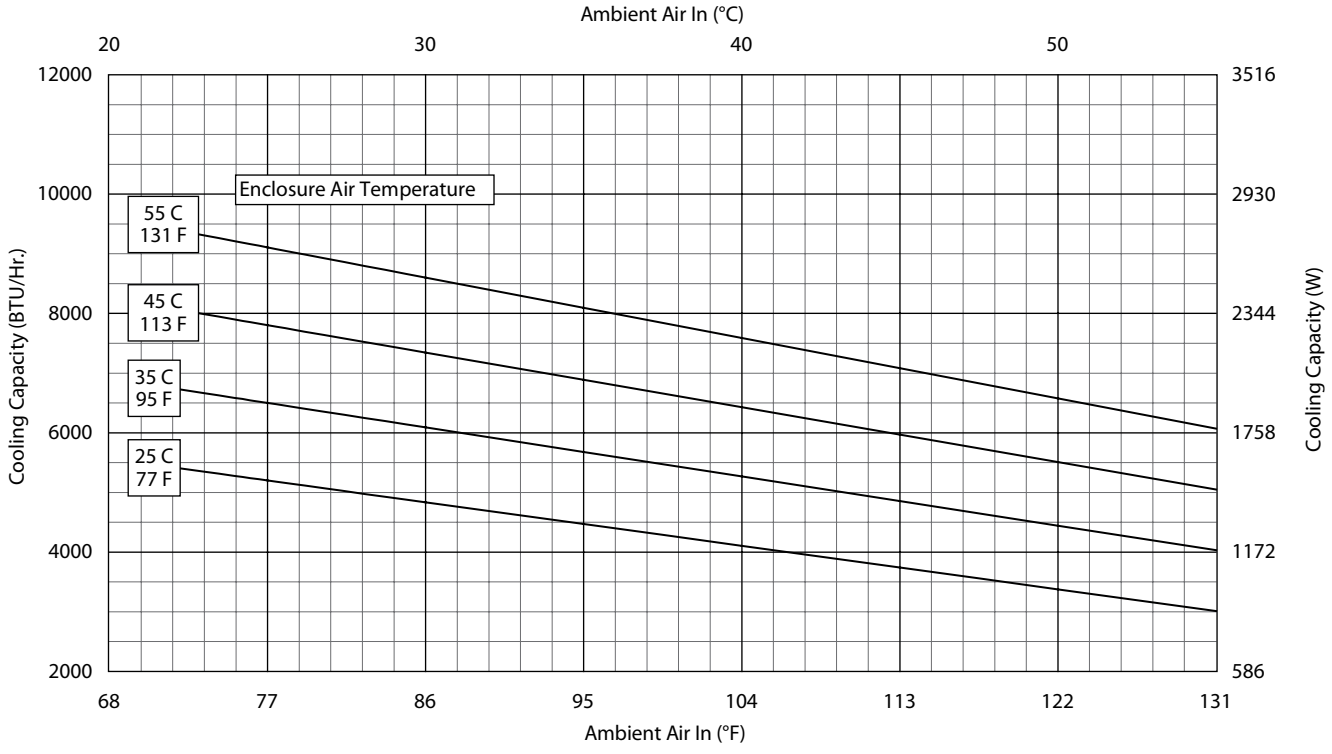


G28-0446-GXXX- Capacity Curves at 60 Hz; Without Filter

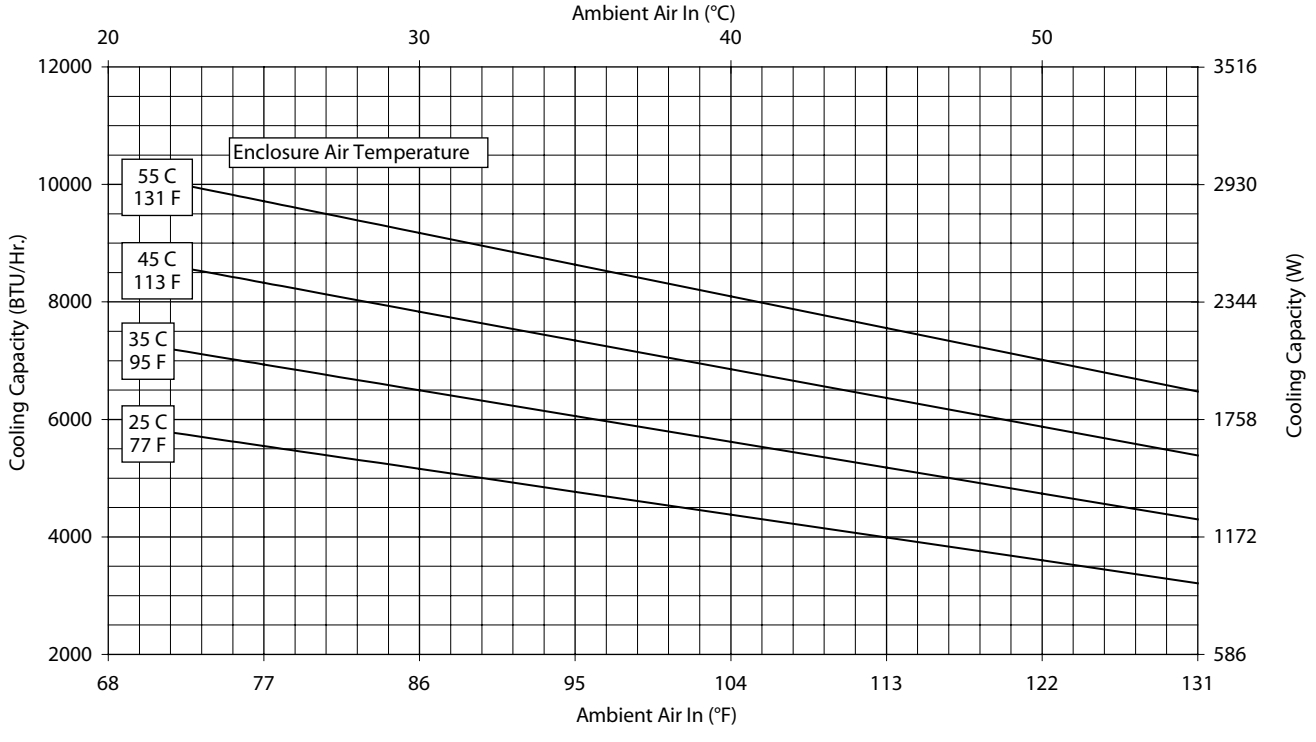


Performance Curves for G28 Models 4000/6000 BTU/Hr. (1172/1758 Watt)

G28-06(1/2)6-GXXX Capacity Curves at 50 Hz Without Filter

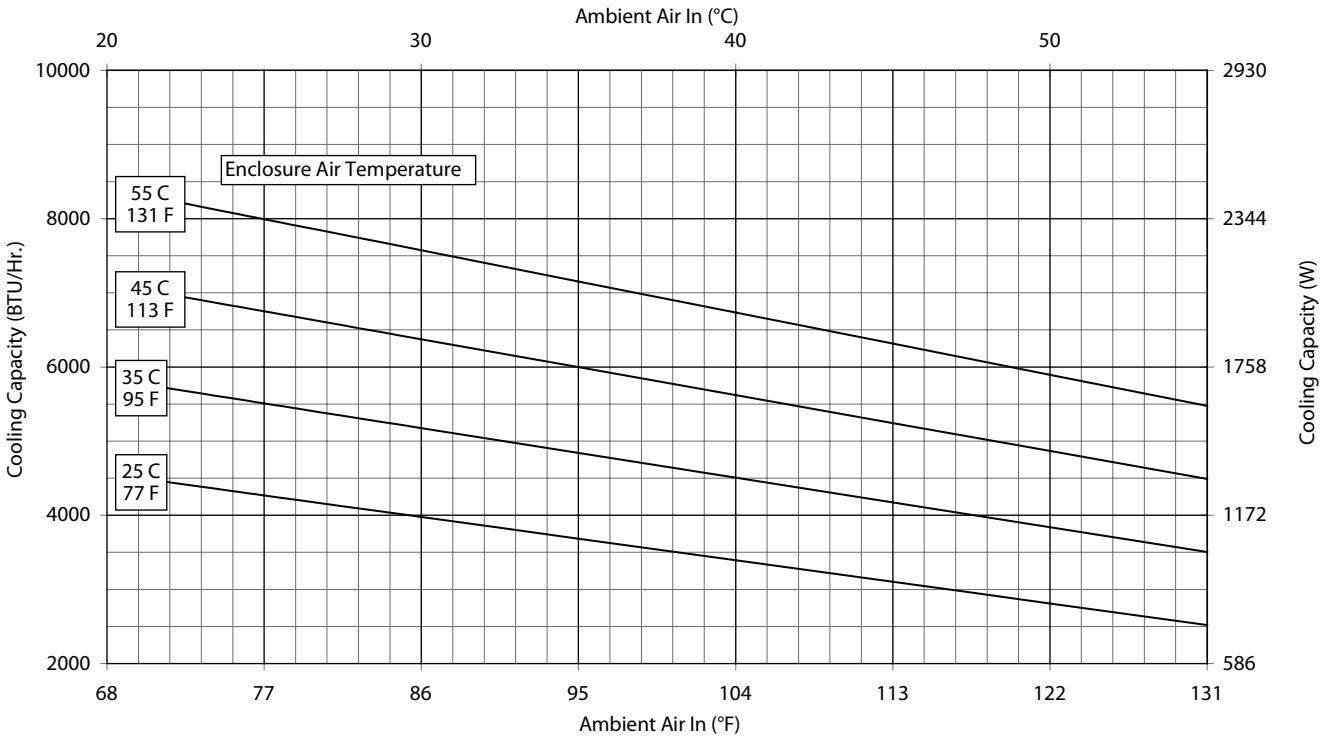


G28-06(1/2)6-G002-P#2 Capacity Curves at 60 Hz Without Filter

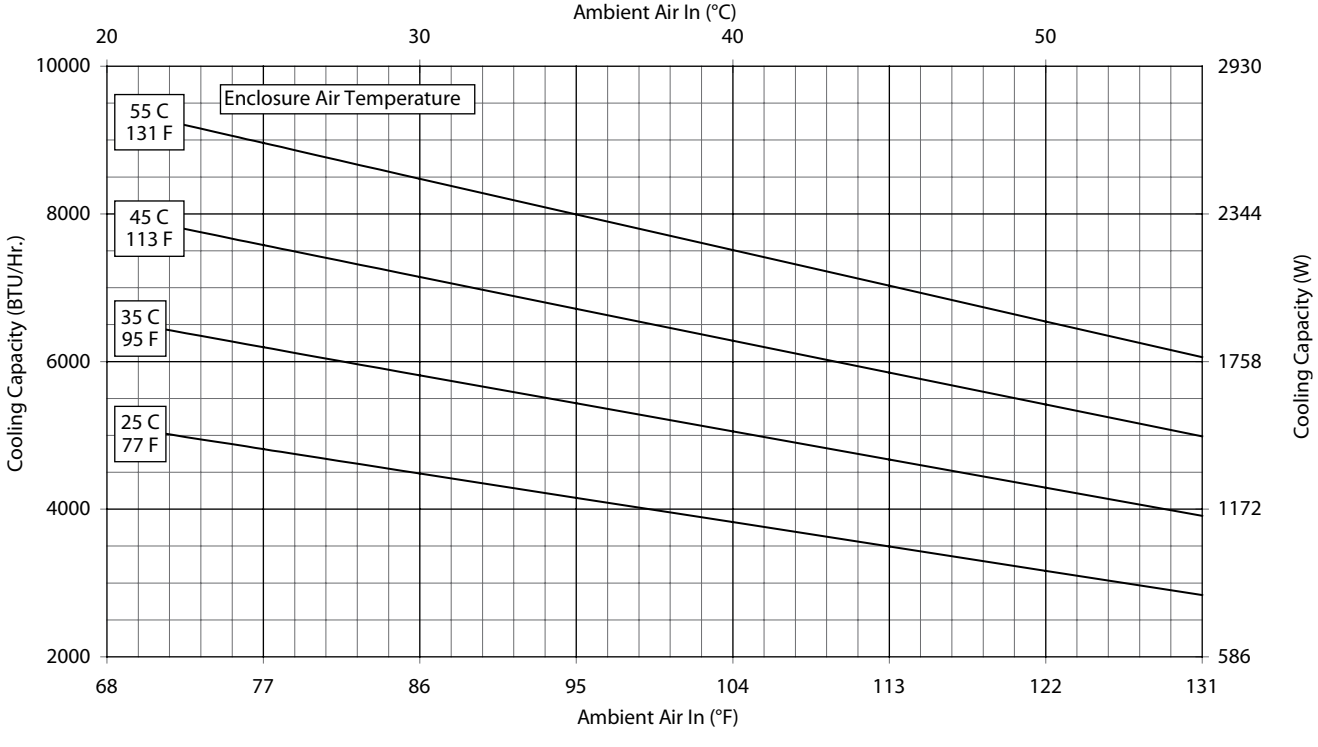


Performance Curves for G28 Models 6000 BTU/Hr. (1758 Watt)

G28-0646-GXXX Performance Curve 400VAC/50Hz Without Air Filter

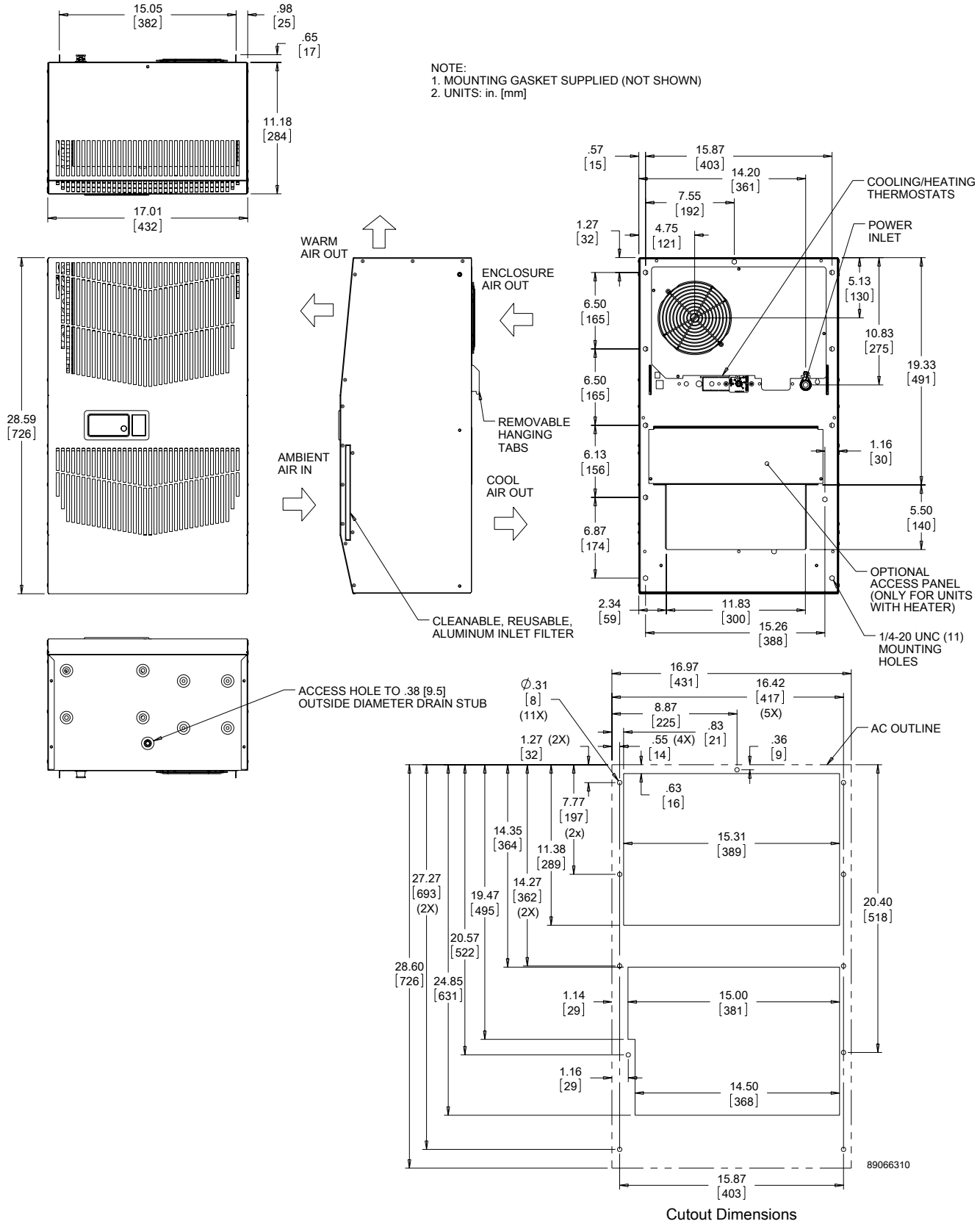


G28-0646-GXXX Performance Curve 460VAC/60Hz Without Air Filter



3

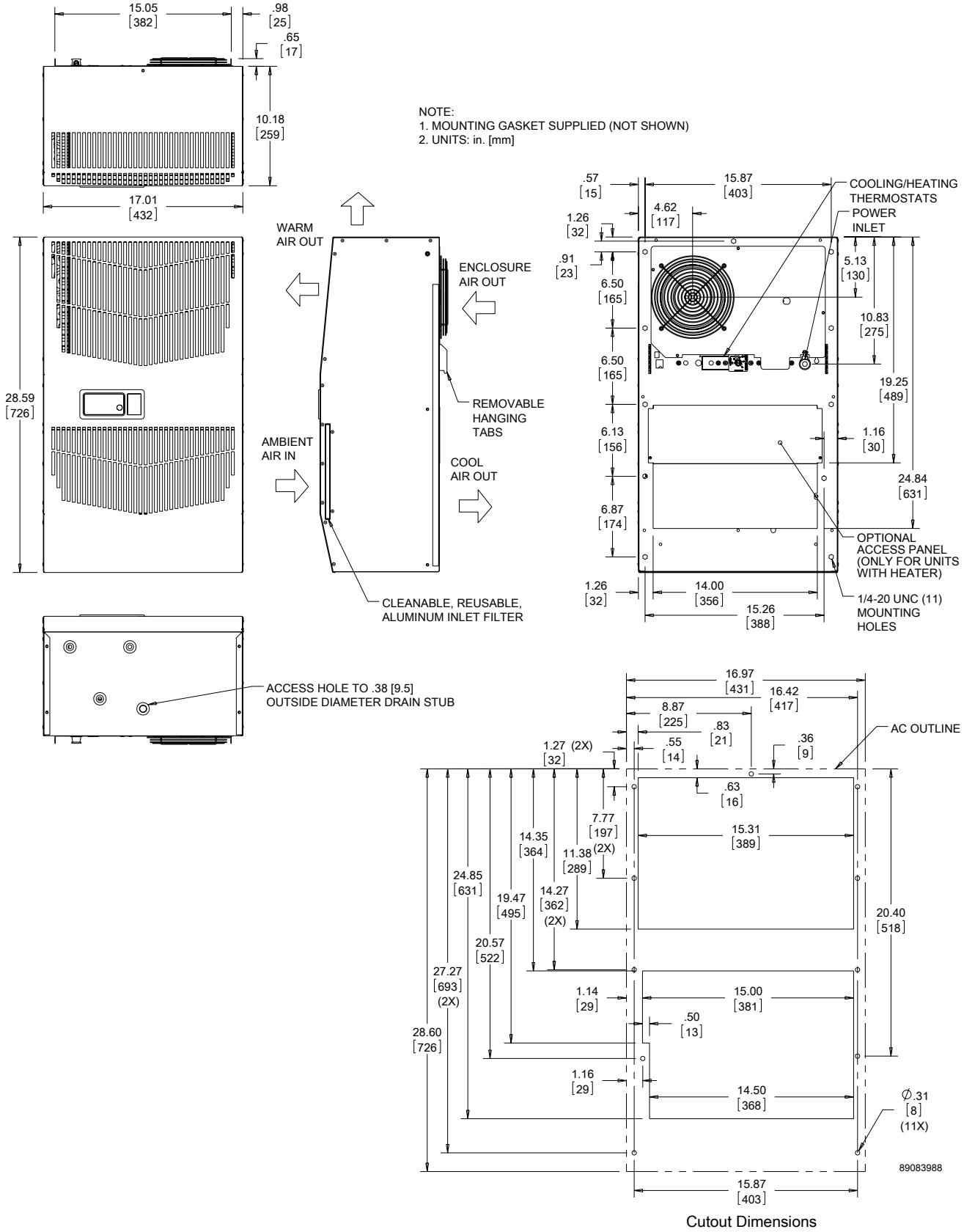
G28 Models 4000 BTU/Hr. 115 V (1172 Watt)



Cutout Dimensions

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

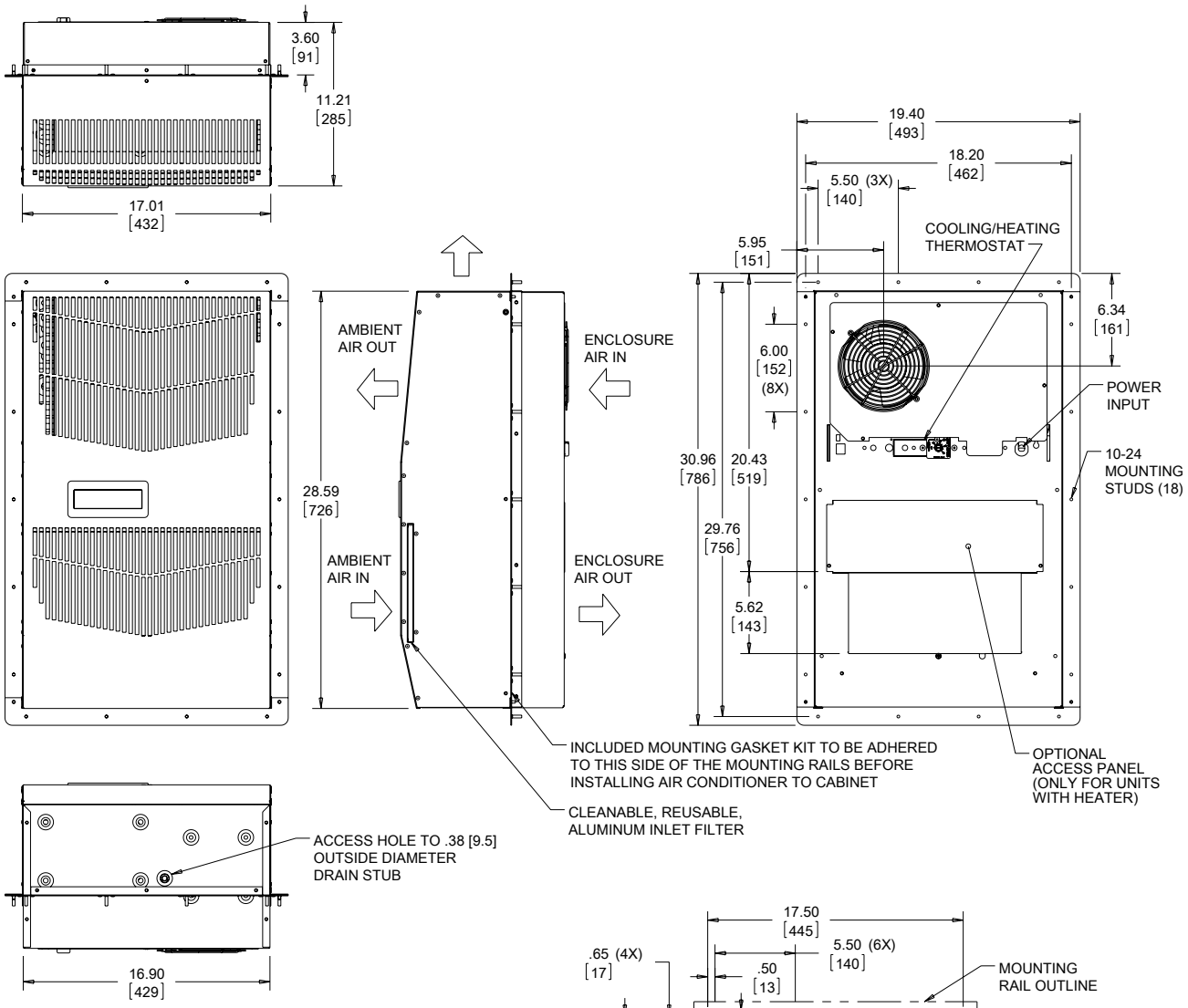
G28 Models 4000 BTU/Hr. 230/460 V, 6000 BTU/Hr. 115/230/460 V (1172/1757 Watt)

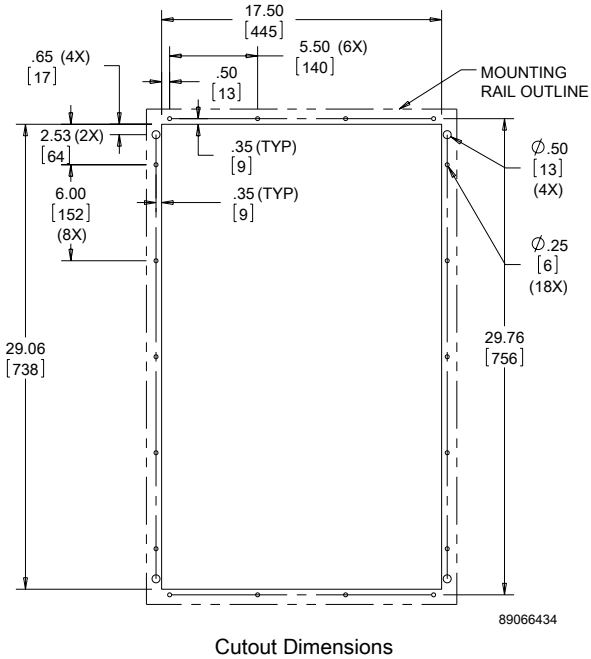


Cutout Dimensions

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

G28 Models 4000 BTU/Hr. 115 V (1172 Watt) Partial Recess

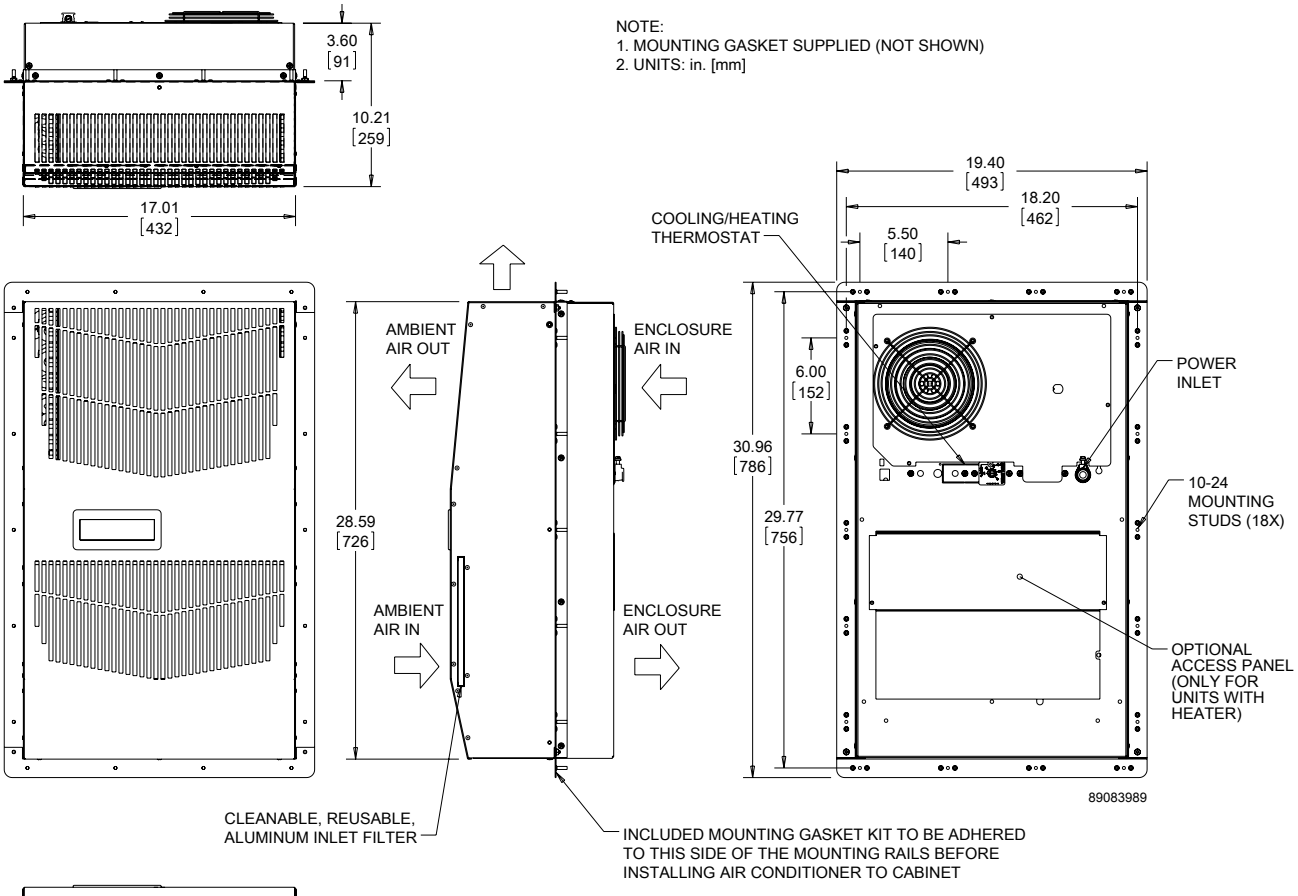




Cutout Dimensions

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

G28 Model 4000 BTU/Hr. 230/460 V, 6000 BTU/Hr. 115/230/460 V (1172/1758 Watt) Partial Recess



Cutout Dimensions

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

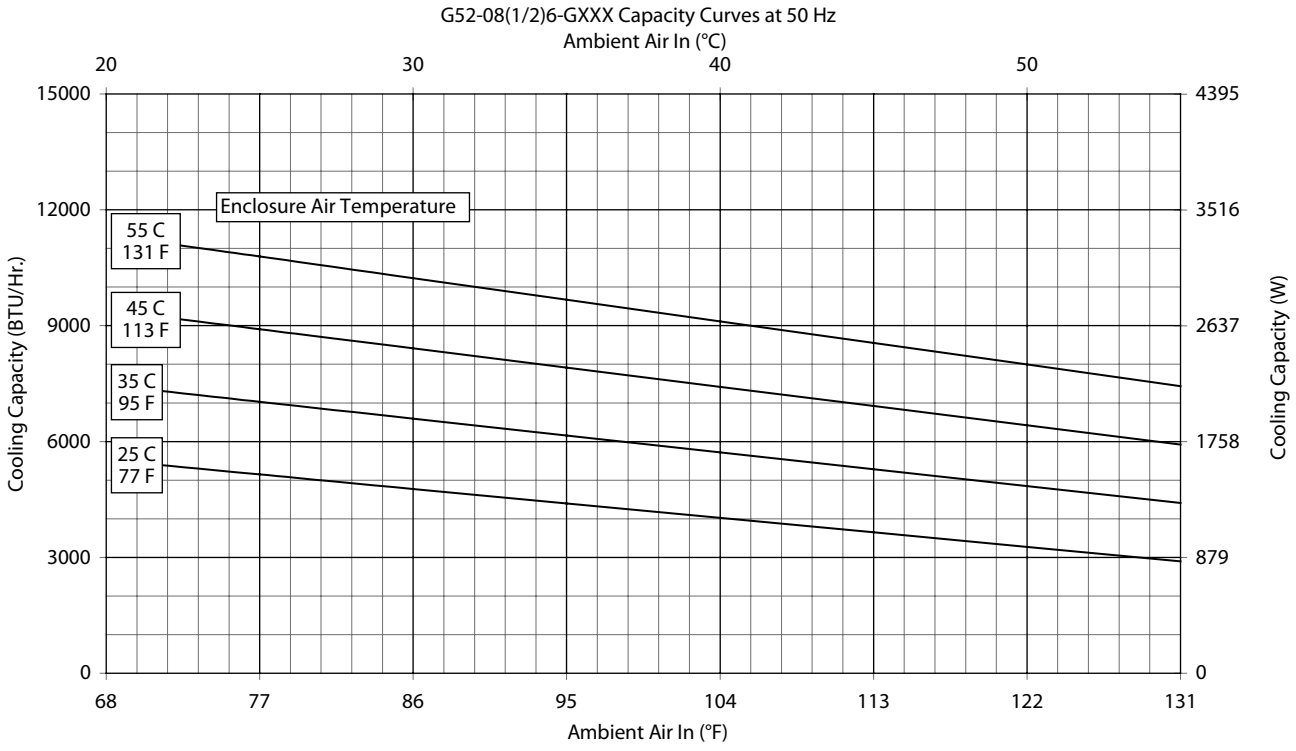
Performance Data **G52 Models 8000/12000 BTU/Hr. (2300/3500 Watt)**

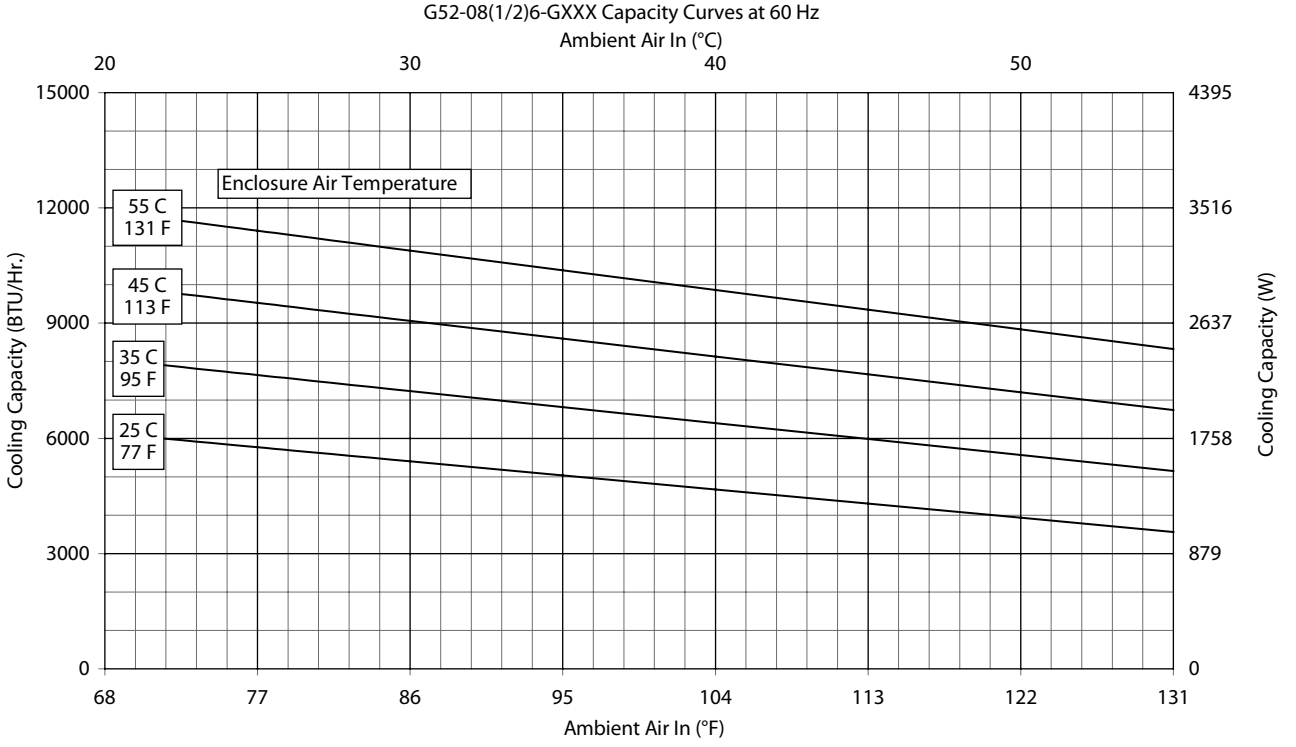
CATALOG NUMBER						
Indoor Model	G520816G050	G520826G050	G520846G050	G521216G050	G521226G050	G521246G050
Indoor Model Stainless Steel Type 4X	G520816G051	G520826G051	G520846G051	G521216G051	G521226G051	G521246G051
Indoor Model with Remote Access Control*	G520816G060	G520826G060	G520846G060	G521216G060	G521226G060	G521246G060
Outdoor Model without Heat Pkg.	G520816G100	G520826G100	G520846G100	G521216G100	G521226G100	G521246G100
Outdoor Model Partial Recessed Mount	G520816G101	G520826G101	G520846G101	G521216G101	G521226G101	G521246G101
Outdoor Model without Heat Pkg. Stainless Steel Type 4X	G520816G102	G520826G102	G520846G102	G521216G102	G521226G102	G521246G102
Outdoor Model with Heat Pkg.	G520816G150	G520826G150	G520846G150	G521216G150	G521226G150	G521246G150
Outdoor Model with Heat Pkg. Stainless Steel Type 4X	G520816G151	G520826G151	G520846G151	G521216G151	G521226G151	G521246G151
COOLING PERFORMANCE						
Nominal:						
BTU/Hr.	**8000**	**8000**	**8000**	**12000**	**12000**	**12000**
Watts	**2300**	**2300**	**2300**	**3500**	**3500**	**3500**
At 131 F/131 F (55 C/55 C):						
BTU/Hr.	7300/8200	7300/8200	8800/9800	12000/12500	12000/12500	11100/12000
Watts	2139/2403	2139/2403	2578/2871	3516/3662	3516/3662	3252/3516
At 95 F/95 F (35 C/35 C):						
BTU/Hr.	6000/6800	6000/6800	7400/8200	9900/10700	9900/10700	9900/10700
Watts	1758/1992	1758/1992	2168/2402	2900/3135	2900/3135	2900/3135
Refrigerant	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant Charge (ounces/grams)	24/680	24/680	24/680	38/1077	38/1077	38/1077
Operating Temperature Range:						
Maximum (ºF/ºC)	131/55	131/55	131/55	131/55	131/55	131/55
Indoor Minimum (ºF/ºC)	50/10	50/10	50/10	50/10	50/10	50/10
Outdoor Minimum (ºF/ºC)	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:						
Internal loop 50 Hz (CFM / m^3/hr.)	285/484	285/484	285/484	287/487	287/487	287/487
External loop 50 Hz (CFM / m^3/hr.)	650/1104	650/1104	650/1104	635/1078	635/1078	635/1078
Internal loop 60 Hz (CFM / m^3/hr.)	310/527	310/527	310/527	305/518	305/518	305/518
External loop 60 Hz (CFM / m^3/hr.)	700/1189	700/1189	700/1189	650/1104	650/1104	650/1104
Max. Heater W (Outdoor Models):	2000	2000	NA	2000	2000	NA
ELECTRICAL DATA						
Rated Voltage	**115**	**230/208-230**	**400/460 3~**	**115**	**230/208-230**	**400/460 3~**
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W)	1250/1415	1250/1415	806/957**	2100/2427	1830/2130	910/1106**
Max. Nominal Current (A)	11.2/12.3	5.6/7.0-6.2	3.1/3.2	16.1/21.0	9.1/10.6-9.5	3.6/3.5
Starting Current (A)	48	27	16	57	38	16
Agency Approvals	cUL Listed CE GOST Others available upon request					
Power Input Description	Terminal Block					
ENCLOSURE PROTECTION						
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional					
International Rating	IP56 internal loop IP34 external loop					
CONTROLLER						
Description	Basic mechanical thermostat with digital display					
Thermostat Location	Enclosure side on all base models					
Digital Display Location:						
Indoor Models	Ambient side					
Outdoor Models	Enclosure side					
Factory Thermostat Setting (F/C)	80/27					
SOUND LEVEL						
At 1.5 Meters	68 dB(A)					
UNIT CONSTRUCTION						
Material	Galvanized sheet metal standard Stainless steel optional					
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard Other colors available					
ACCESSORIES						
Cleanable Re-usable Filter	Aluminum mesh Part #101000103					
EASYSWAP Adaptor Plenum (GENESIS™ M52)	Enables SPECTRACOOL to be mounted to a GENESIS M52 air conditioner cutout Catalog Number PLM52G52					
UNIT DIMENSIONS						
Height (in./mm)	52.69/1338					
Width (in./mm)	17.12/435					
Depth (in./mm)	11.66/296					
Weight (lb./kg)	128/58.1	128/58.1	138/62.6	131/59.4	131/59.4	141/64.0

*Units with Remote Access Control utilize a digital controller and communicate via EtherNet/IP, Modbus TCP/IP and SNMP over ethernet or modbus RTU over USB.

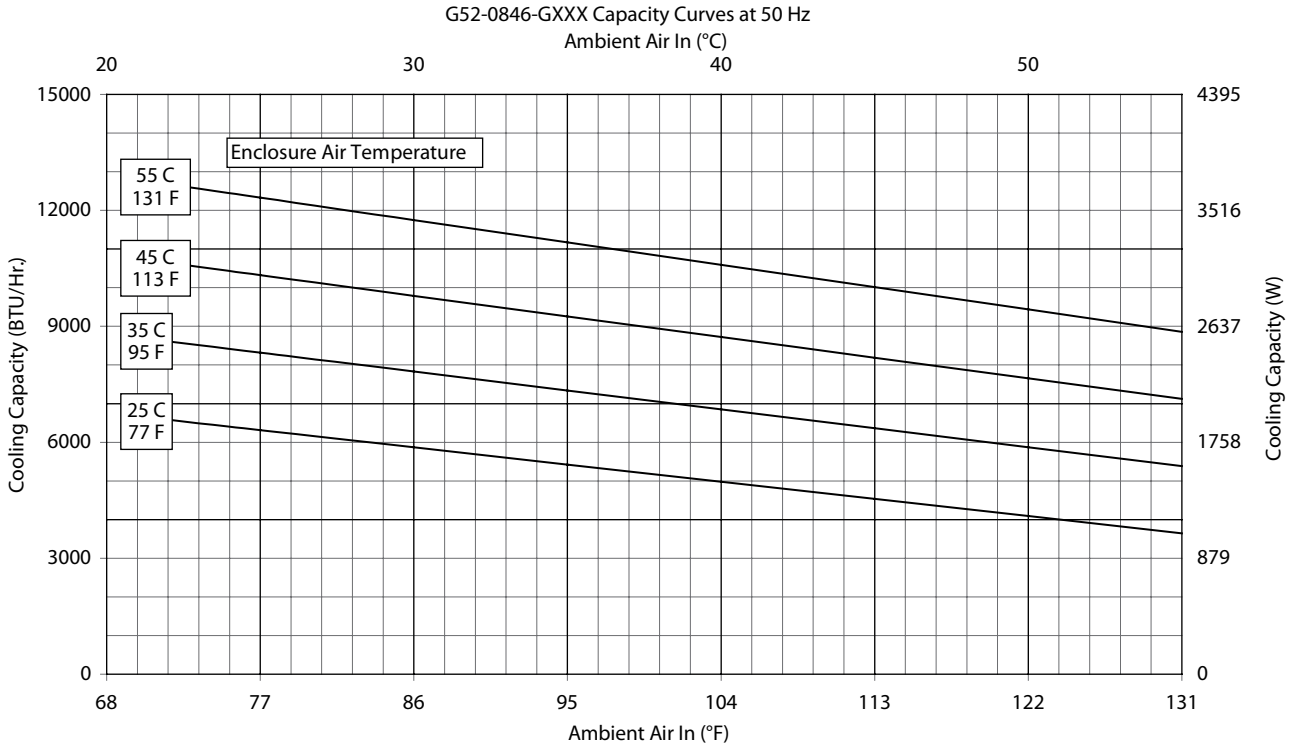
**Watts based on .65 power factor.

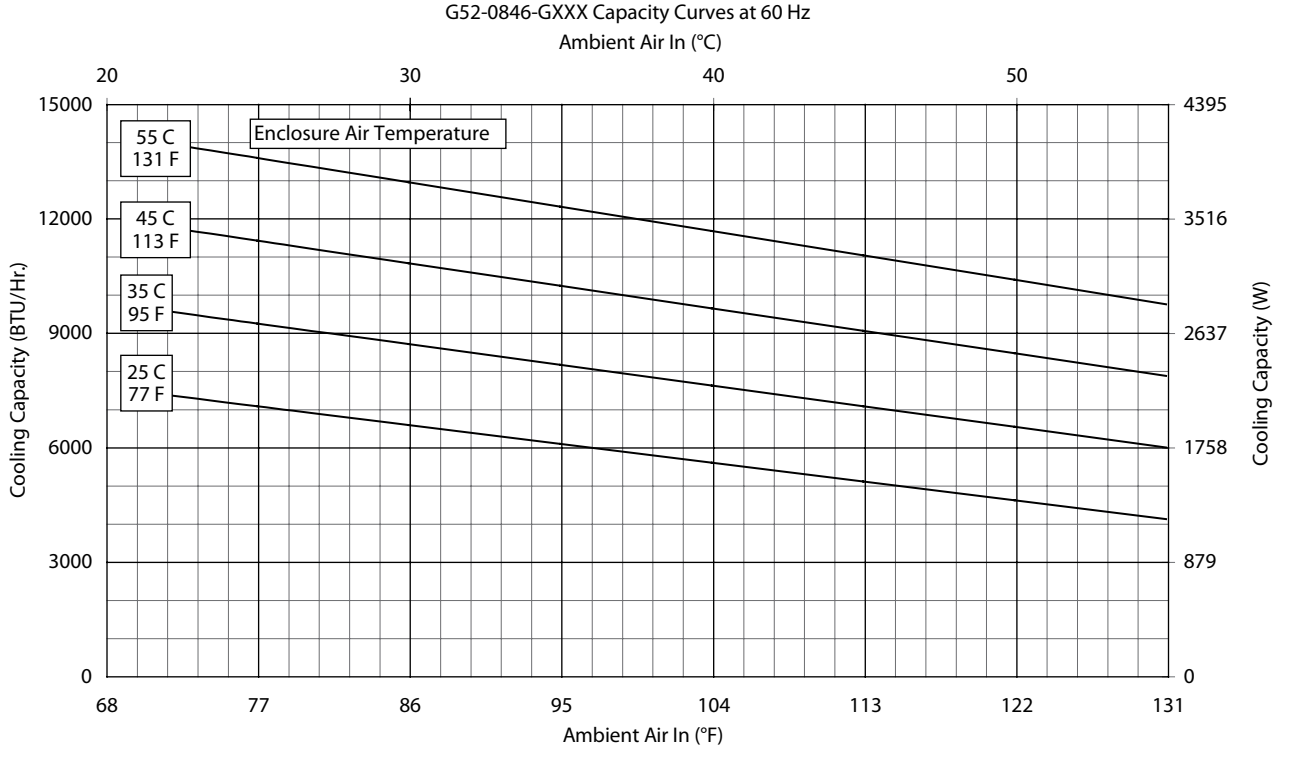
Performance Curves for G52 Models 8000 BTU/Hr. (23 Watt)



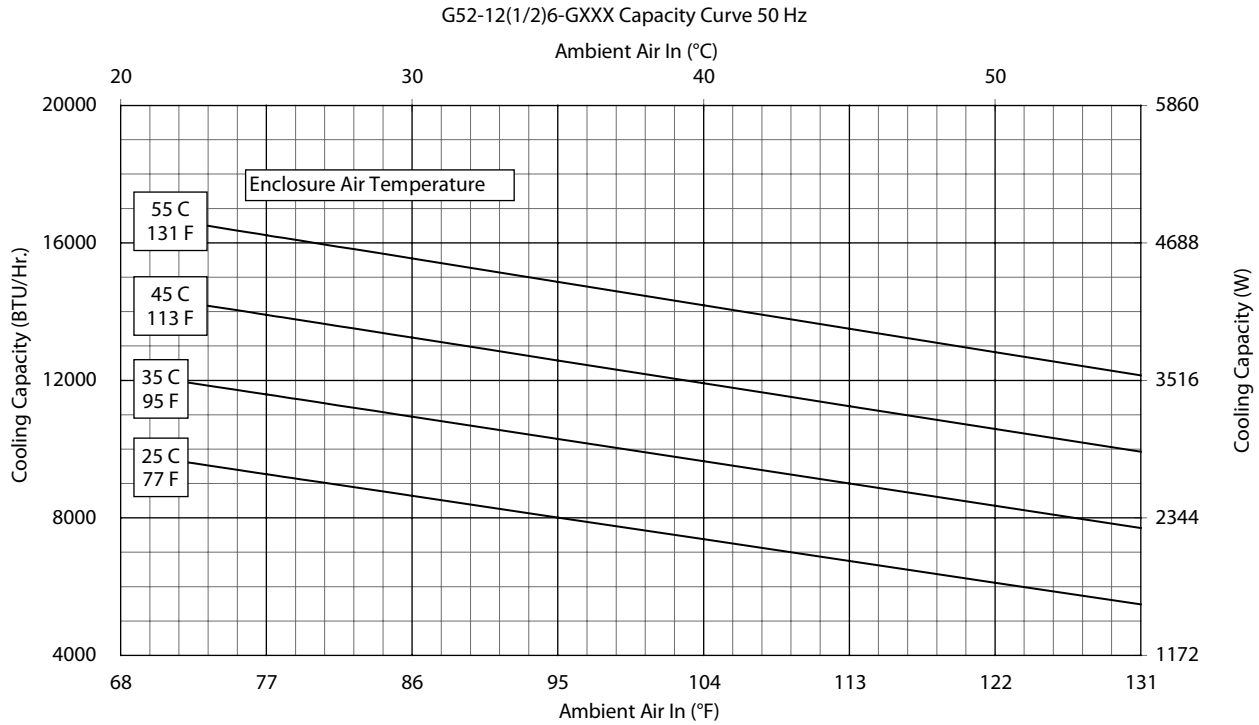


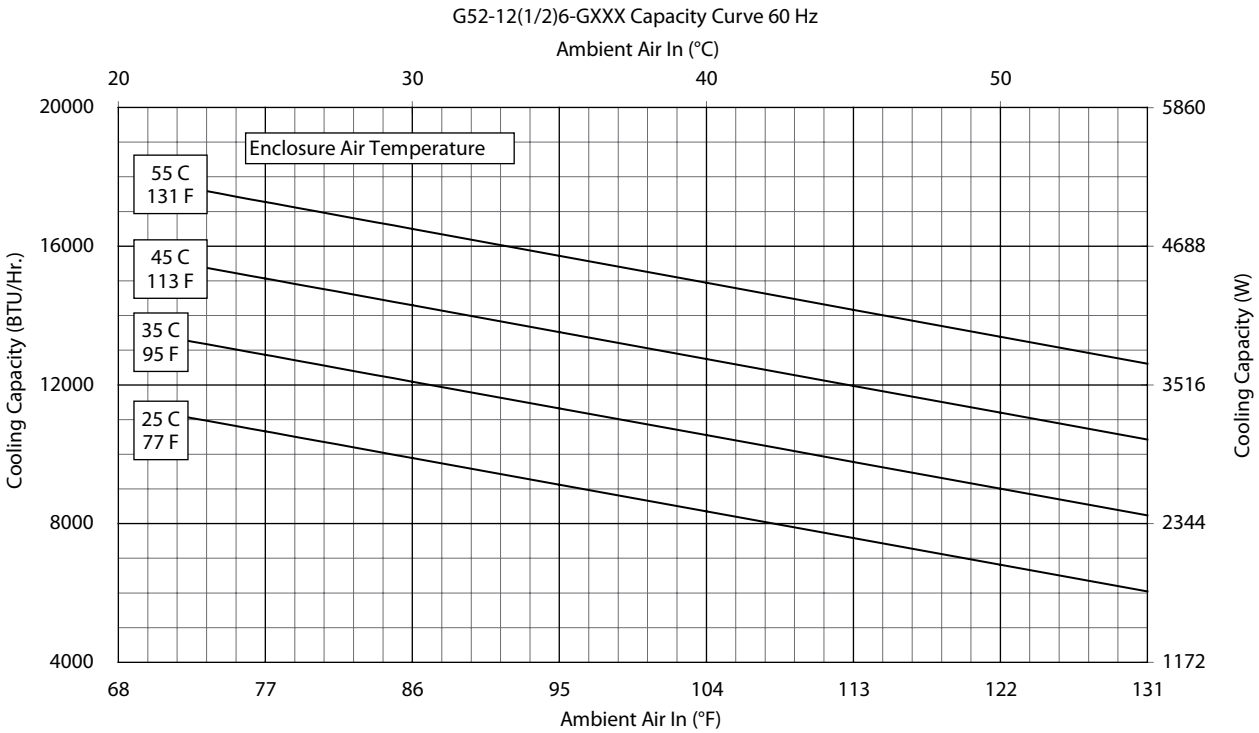
Performance Curves for G52 Models 8000 BTU/Hr. (2300 Watt)



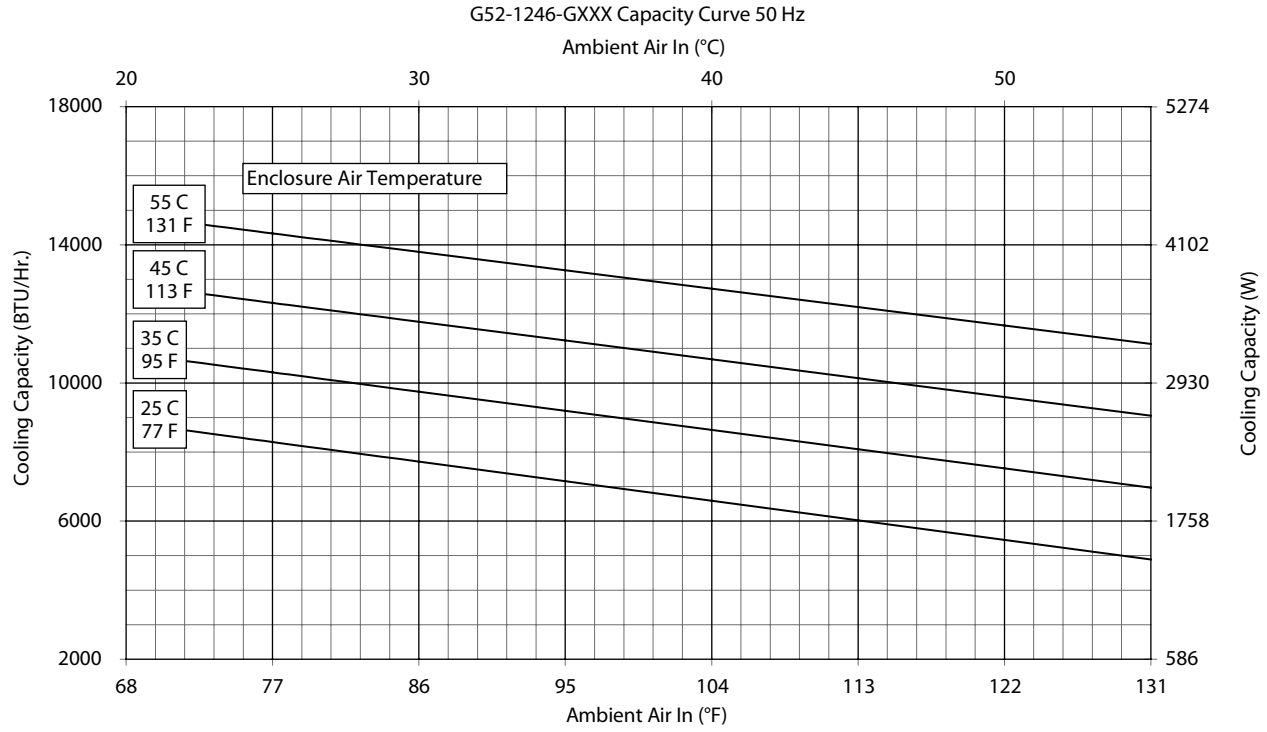


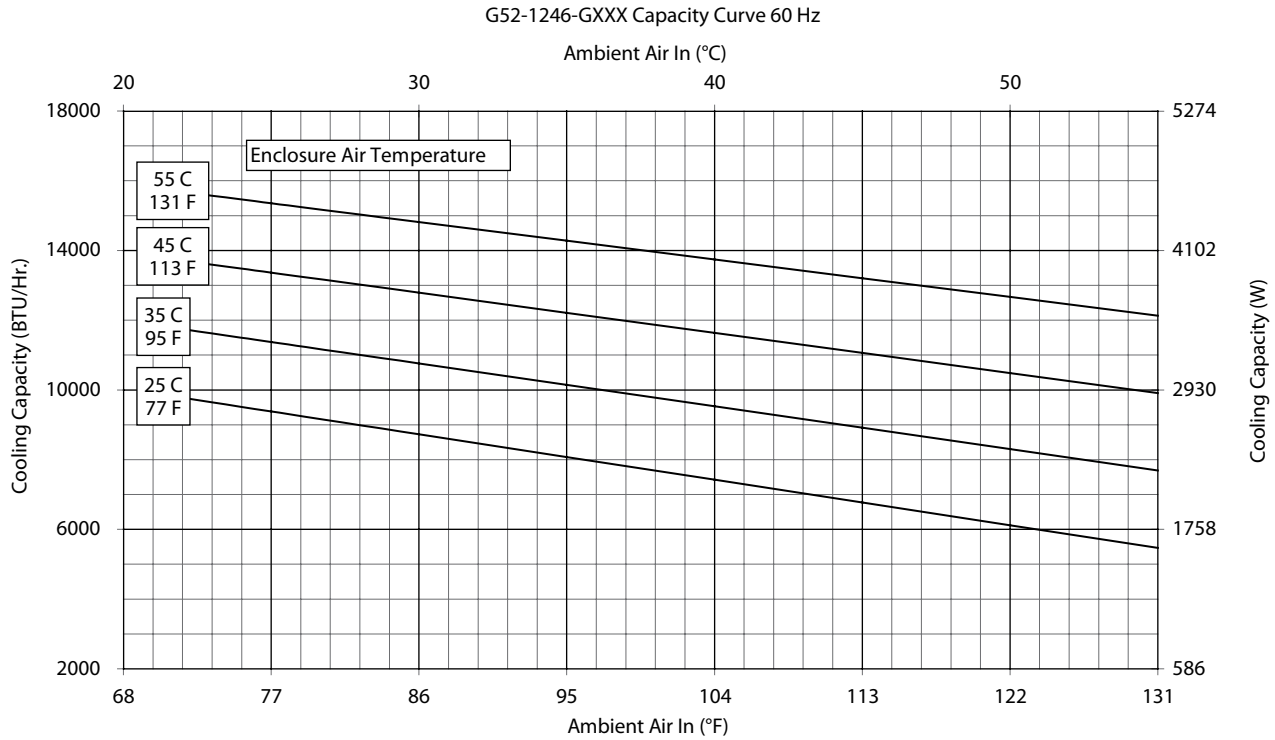
Performance Curves for G52 Models 12000 BTU/Hr. (3500 Watt)



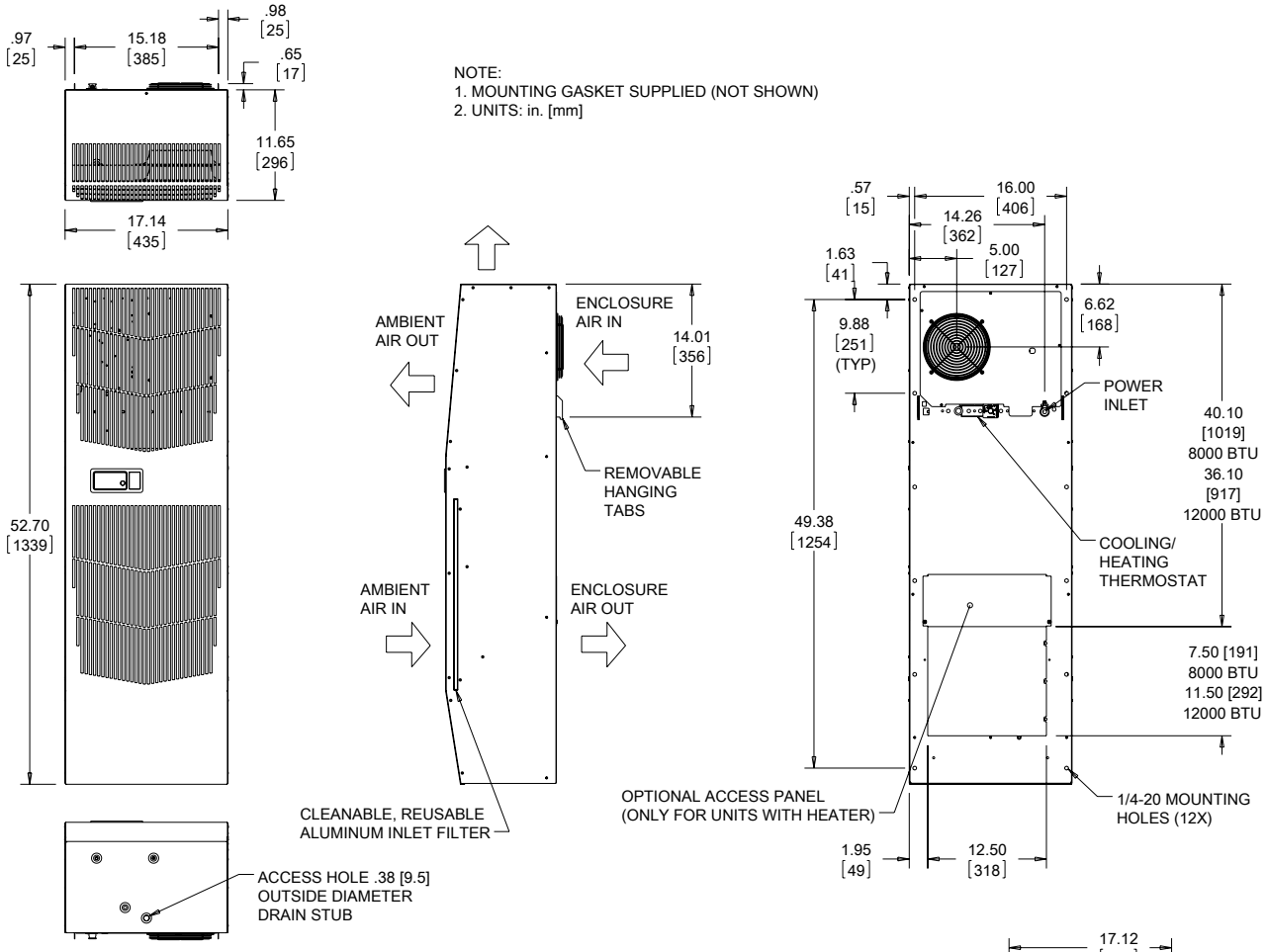


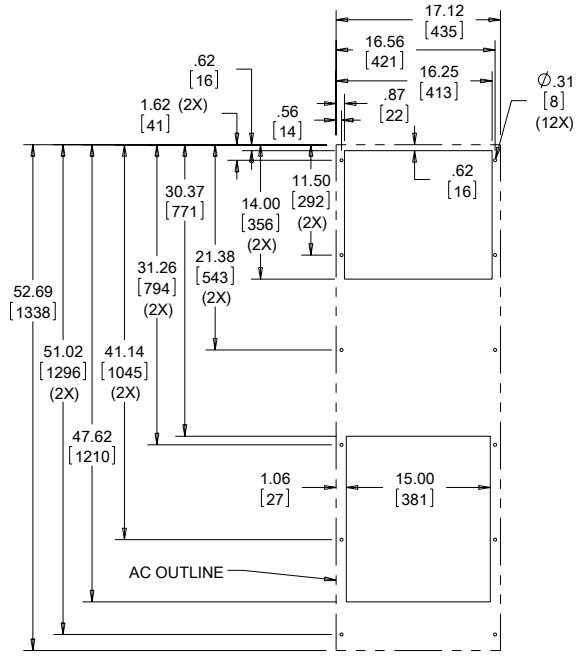
Performance Curves for G52 Models 12000 BTU/Hr. (3516 Watt)



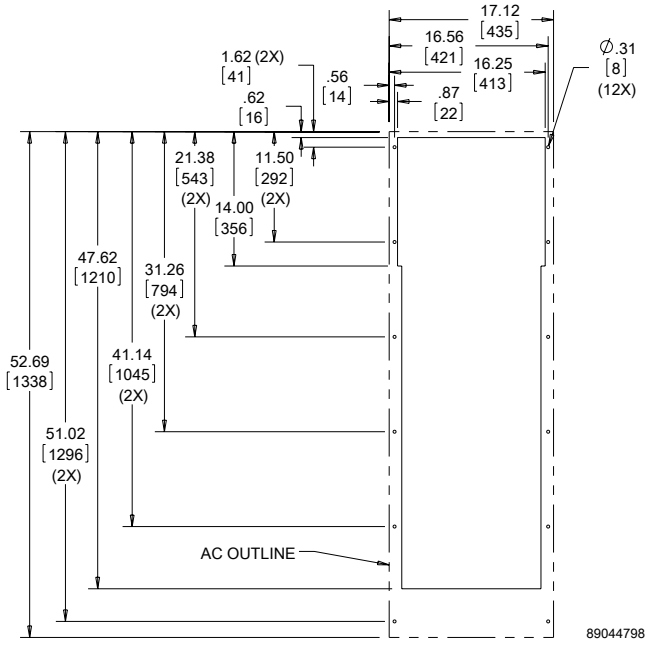


G52 Models 8000/12000 BTU/Hr. (2300/3500 Watt)





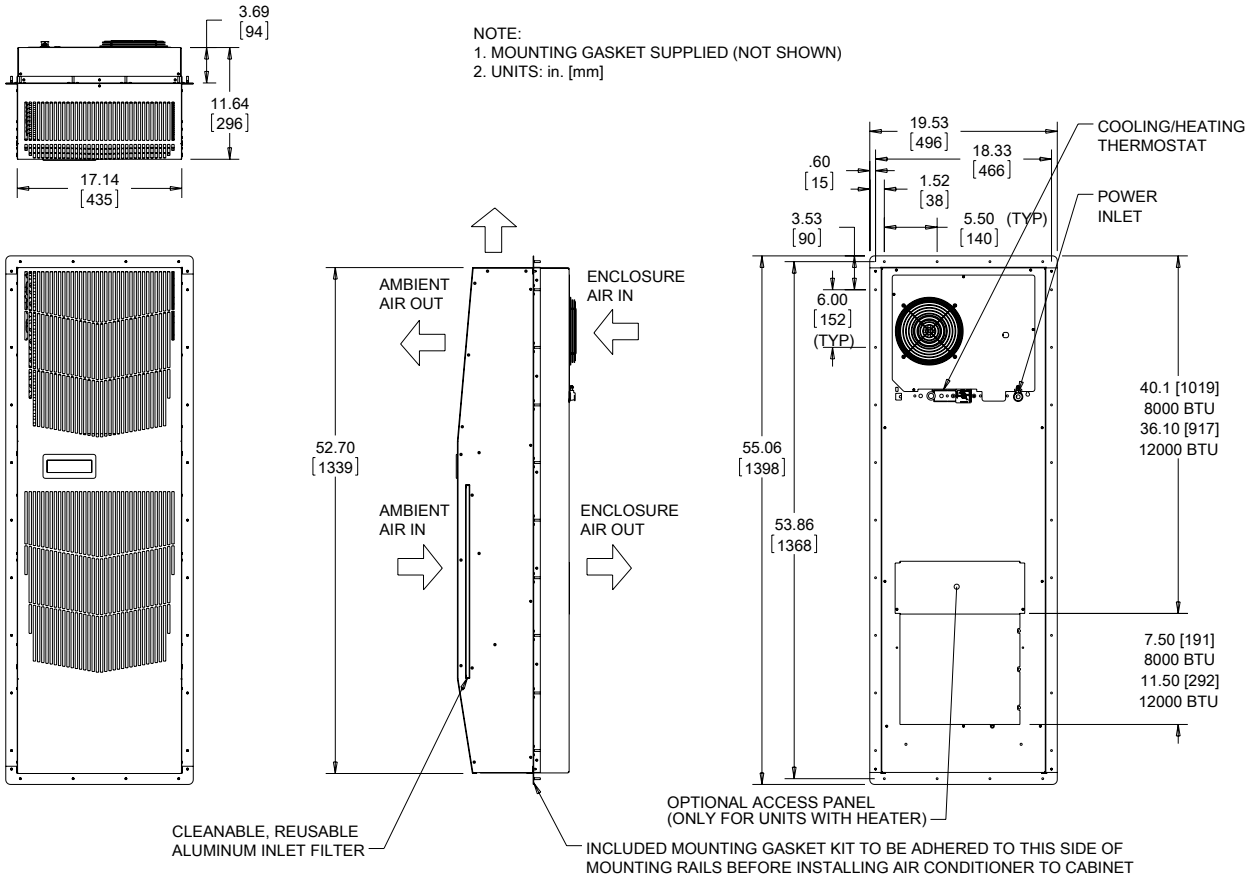
Cutout Dimensions (Standard)

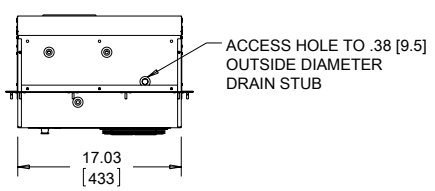


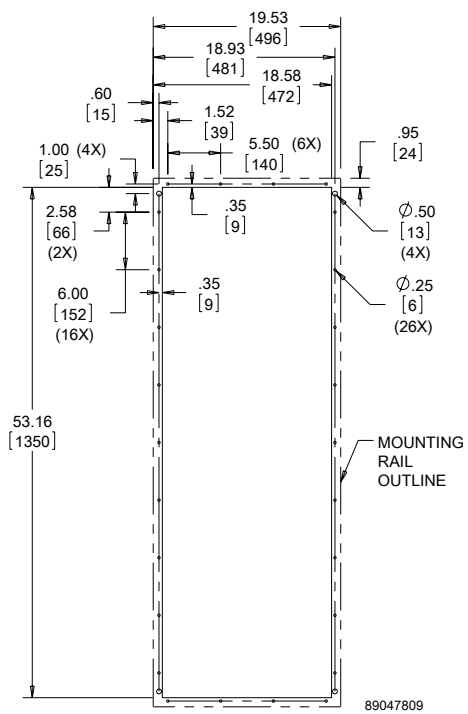
Cutout Dimensions (G520846G150, G520846G151, G521246G150, G521246G151 only)

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

G52 Models 8000/12000 BTU/Hr. (2344/3516 Watt) with Partial Recess







Cutout Dimensions

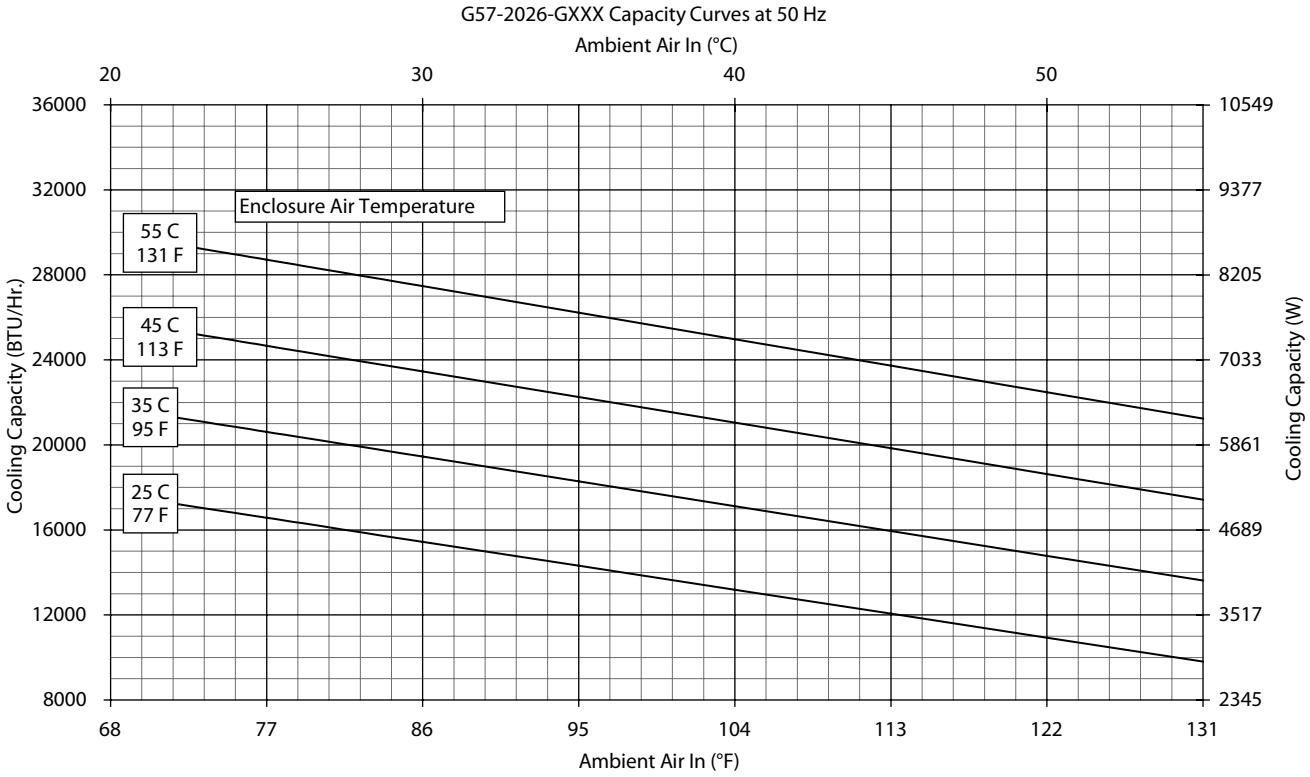
Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

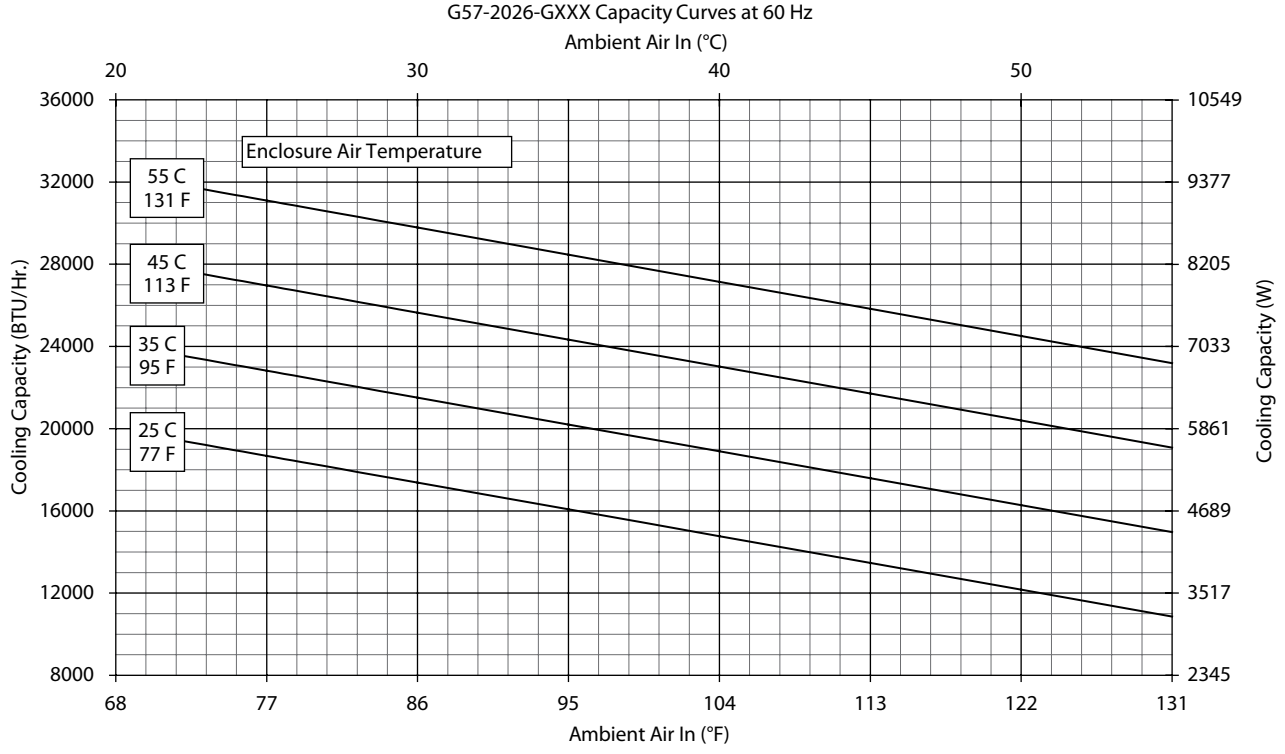
Performance Data **G57 Models 20000 BTU/Hr. (5861 Watt)**

CATALOG NUMBER		
Indoor Model	G572026G050	G572046G050
Indoor Model Stainless Steel Type 4X	G572026G051	G572046G051
Indoor Model with Remote Access Control*	G572026G060	G572046G060
Outdoor Model without Heat Pkg.	G572026G100	G572046G100
Outdoor Model Partial Recessed Mount	G572026G101	G572046G101
Outdoor Model with Heat Pkg.	G572026G150	G572046G150
Outdoor Model without Heat Pkg. Stainless Steel Type 4X	G572026G102	G572046G102
Outdoor Model with Heat Pkg. Stainless Steel Type 4X	G572026G151	G572046G151
COOLING PERFORMANCE		
Nominal:		
BTU/Hr.	**20000**	**20000**
Watts	**5861**	**5861**
At 131 F/131 F (55 C/55 C):		
BTU/Hr. (50/60 Hz)	17500/19600	21400/23400
W (50/60 Hz)	5129/5744	6272/6857
At 95 F/95 F (35 C/35 C):		
BTU/Hr. (50/60 Hz)	16000/18000	19300/21400
W (50/60 Hz)	4689/5275	5656/6272
Refrigerant	R407c	R407c
Refrigerant Charge (ounces/grams)	50/1417	48/1361
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Indoor Minimum (°F/°C)	50/10	50/10
Outdoor Minimum (°F/°C)	-40/-40	-40/-40
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	513/872	513/872
External loop 50 Hz (CFM / m^3/hr.)	919/1562	919/1562
Internal loop 60 Hz (CFM / m^3/hr.)	587/998	587/998
External loop 60 Hz (CFM / m^3/hr.)	1055/1794	1055/1794
Max. Heater W (Outdoor Models)	3000	3000
ELECTRICAL DATA		
Rated Voltage	**230/230**	**400/460 3~**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consuption (W at 50/60 Hz)	4508/5106	2400/3128
Max. Nominal Current (A at 50/60 Hz)	19.6/22.2	6.0/6.8
Starting Current (A)	63	27
Agency Approvals	cUL Listed CE GOST Others available upon request	
Power Input Description	Terminal Block	
ENCLOSURE PROTECTION		
UL Type	Type 12, 3R, 4 standard Type 4X stainless steel optional	
International Rating	IP56 internal loop IP34 external loop	
CONTROLLER		
Description	Basic mechanical thermostat with digital display	
Thermostat Location	Enclosure side on all base models	
Digital Display Location:		
Indoor Models	Ambient side	
Outdoor Models	Enclosure side	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	74.1 dB(A)	
UNIT CONSTRUCTION		
Material	Galvanized sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
ACCESSORIES		
Cleanable Re-usable Filter	Aluminum mesh part #101000103 BA	
EASYSWAP Adaptor Plenum (T-Series T53)	Enables SPECTRACOOL to be mounted to a T-Series T53 air conditioner cutout part #57721601SP	
UNIT DIMENSIONS		
Height (in./mm)	57.69/1465.4	
Width (in./mm)	20.87/530.1	
Depth (in./mm)	15.28/388.1	
Weight (lb./kg)	197/89	

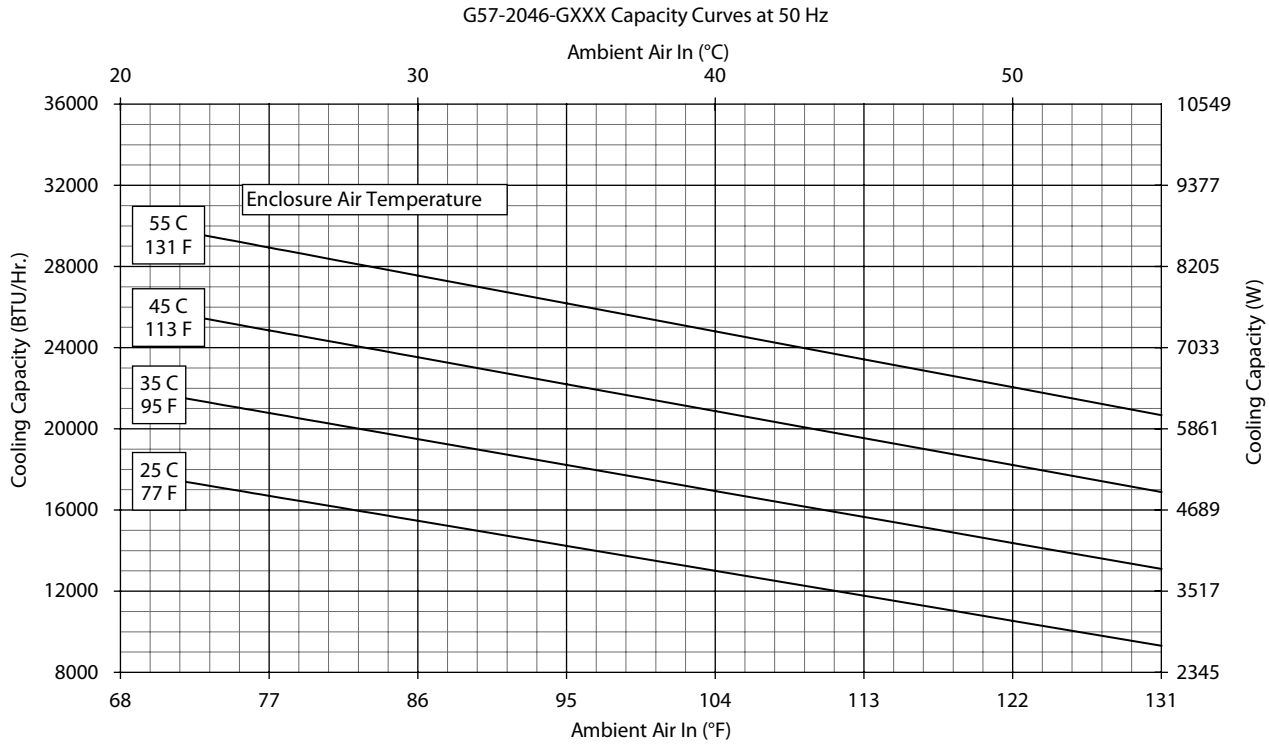
*Units with Remote Access Control utilize a digital controller and communicate via EtherNet/IP, Modbus TCP/IP and SNMP over ethernet or modbus RTU over USB.

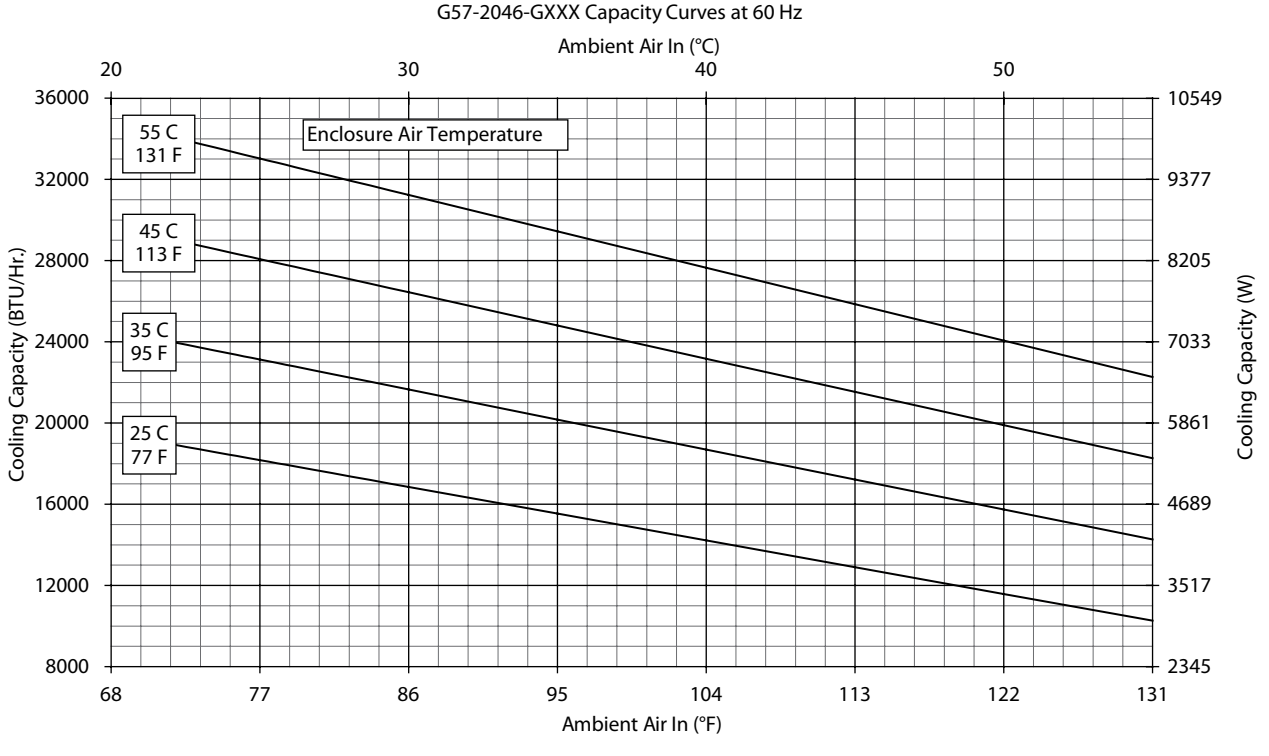
Performance Curves for G57 Models 20000 BTU/Hr.



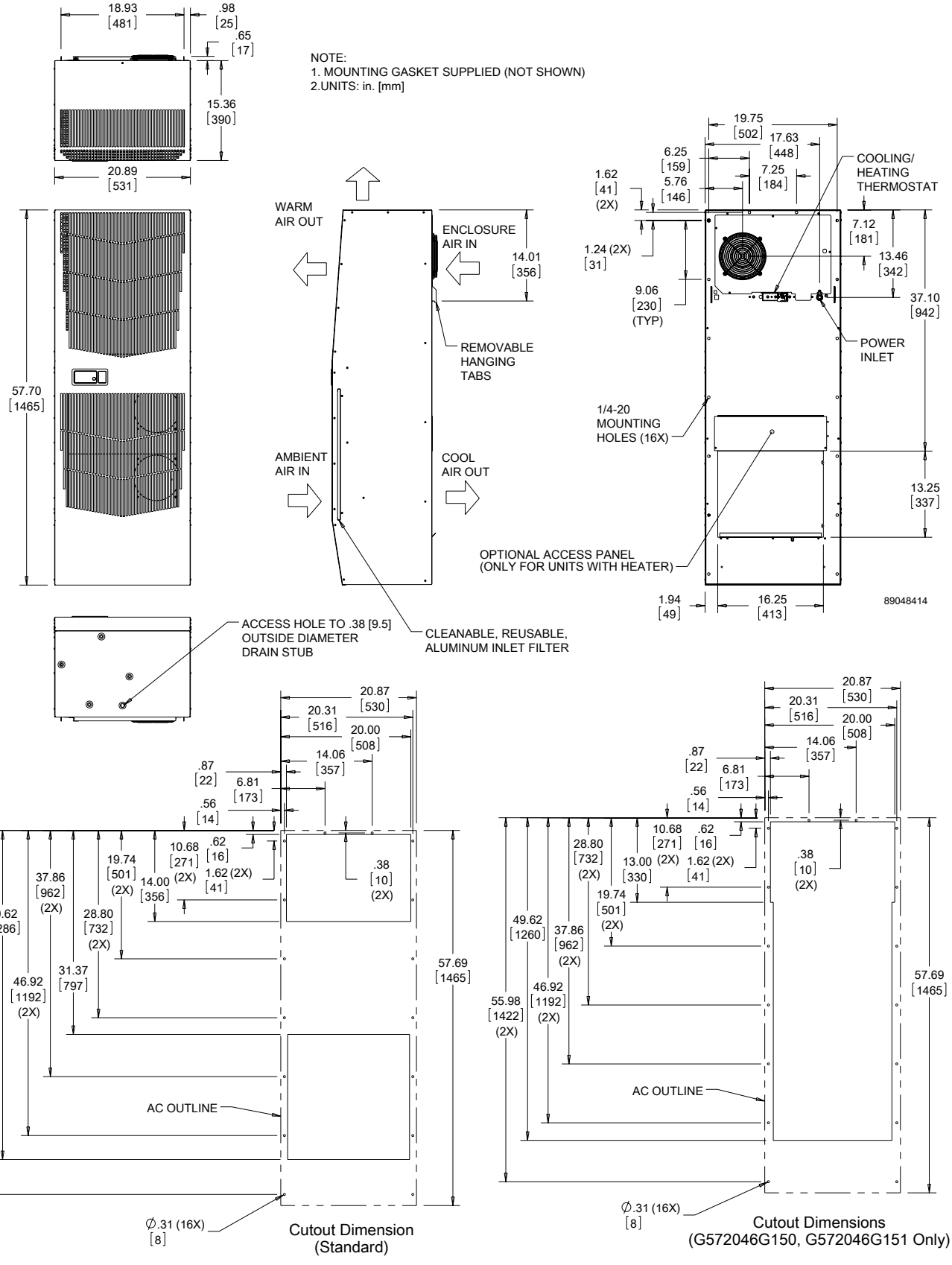


Performance Curves for G57 Models 20000 BTU/Hr.





G57 Models 20000 BTU/Hr. (5861 Watt)



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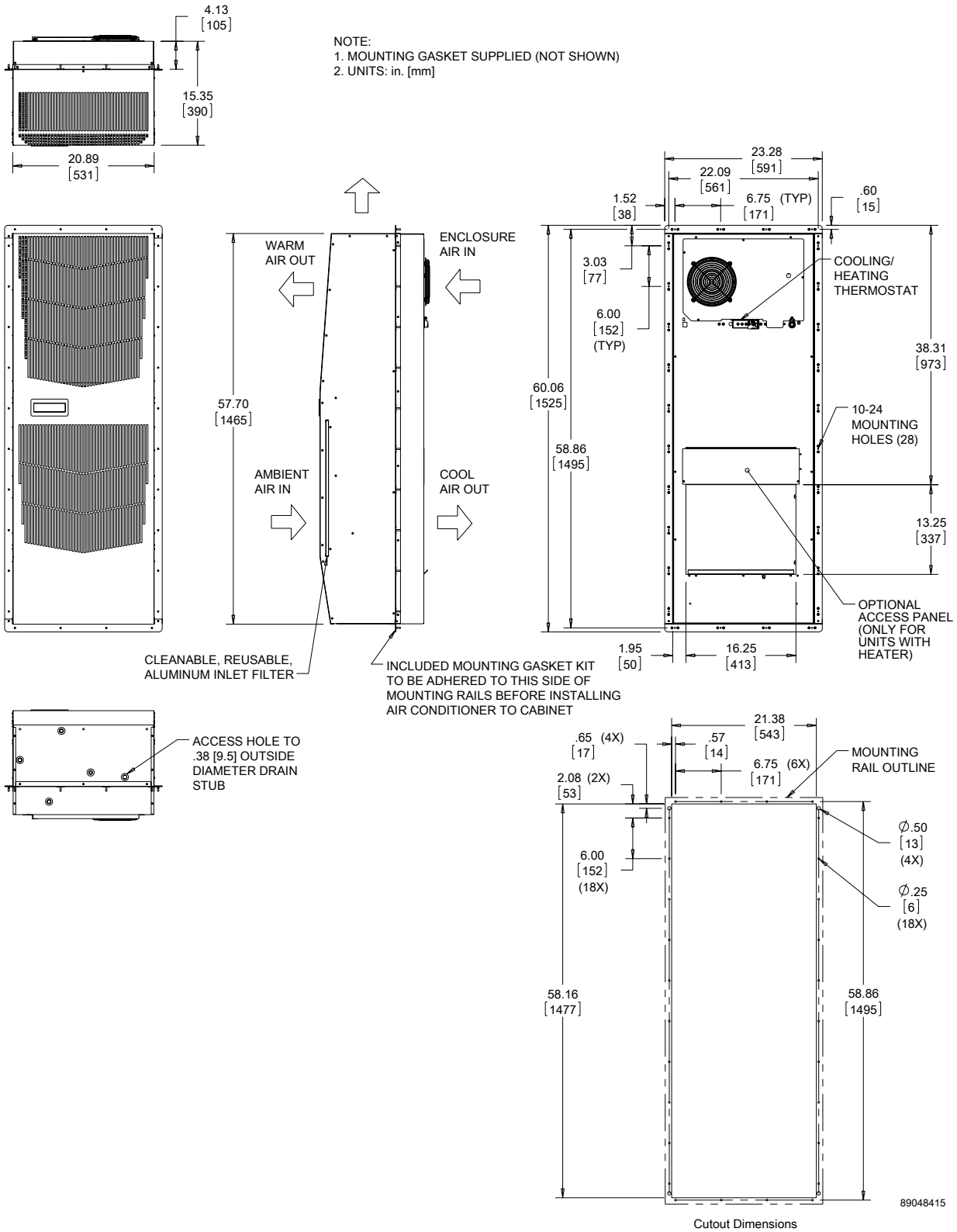
G57 Models 20000 BTU/Hr. (5861 Watt) With Partial Recess



Cutout Dimensions

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Notes

SPECTRACOOL™ NARROW INDOOR/OUTDOOR

N43	N36	N28
11000 BTU/Hr.	6000/8000 BTU/Hr.	4000 BTU/Hr.
3223 Watt	1758/2344 Watt	1172 Watt

INDUSTRY STANDARDS

UL/cUL Listed; Type 12, 3R, 4; 4X optional; File No. SA6453

CE
IP 56 Internal Loop
IP 34 on External Loop
Telcordia GR-487 capable (Outdoor)

APPLICATION

- Industrial automation
- Waste water treatment systems
- Package handling equipment
- Security and defense systems

FEATURES

- Narrow design accommodates 12-in. (300-mm) deep cabinets
- Energy efficient rotary compressor
- R407c and R134a earth-friendly refrigerants
- Models for 115, 230 and 400/460 3-phase VAC power input
- UL Listed to save customers time and money with agency approvals
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C (125 F/52 C on N28 Series)
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat on enclosure side of the unit; indoor Air Conditioner models include digital display on ambient side
- Galvanized sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cut-out adapter options for enclosures with GENESIS® air conditioners enable users to easily transition to the new unit
- Dust-resistant condenser coil allows the unit to be run filterless in most applications
- Cleanable, reusable aluminum mesh filter protects coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Indoor Air Conditioner models also include:
  - Active condensate management with heater strip
  - Power-off relay for door switch and other system requirements
  - Malfunction switch
- Standard Outdoor Air Conditioner models also include:
  - Telcordia GR-487 capable
  - Corrosion-resistant components
  - Malfunction switch
  - Compressor heater
  - Head pressure control
  - 1300 W enclosure heater

SPECIFICATIONS

- Nominal cooling capacity:
  N28 4000 BTU/Hr. (1172 W)
  N36 6000 & 8000 BTU/Hr. (1758 and 2344 W)
  N43 11000 BTU/Hr. (3223 W)
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C (125 F/52 C on N28 Series)

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint
- Other colors and textures available

NOTES

Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

ODVA
EtherNet/IP™ conformance tested

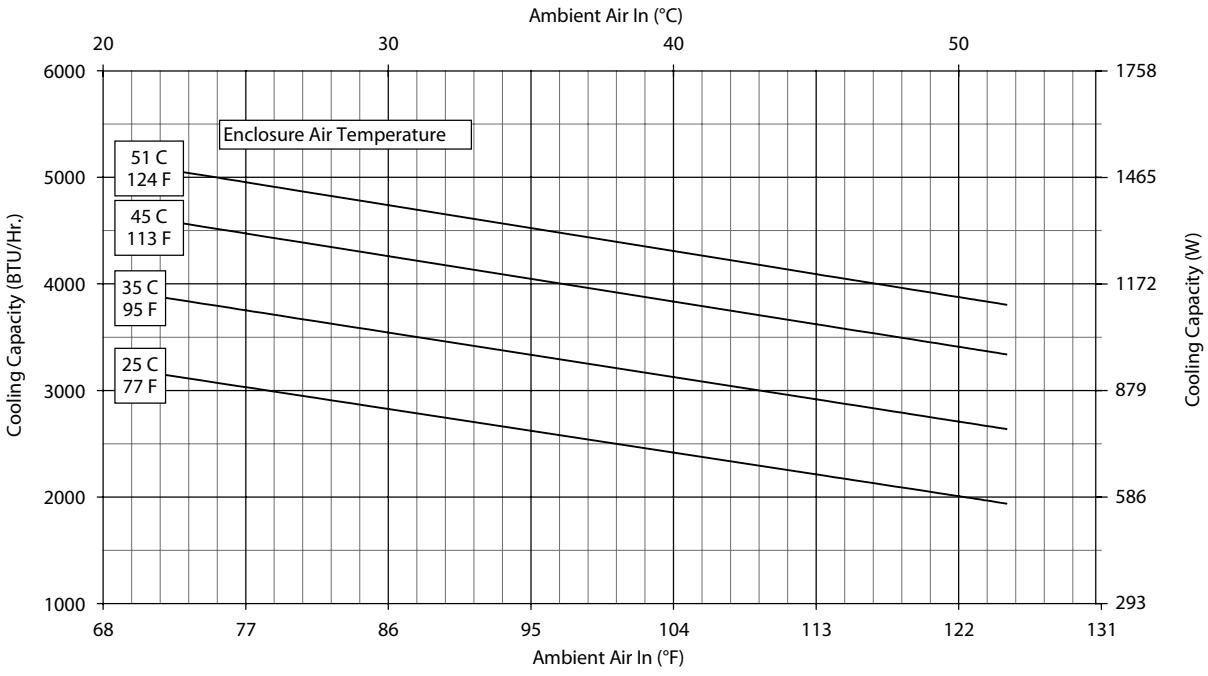
Performance Data **N28 4000 BTU/Hr. (1172 Watt)**

CATALOG NUMBER				
Indoor Model	N280416G050	N280426G050	N280425G050	N280446G050
Indoor Model Stainless Steel Type 4X	N280416G051	N280426G051	N280425G051	N280446G051
Indoor Model with Remote Access Control*	N280416G060	N280426G060	N280425G060	N280446G060
Outdoor Model without Heat Pkg.	N280416G100	N280426G100	N280425G100	N280446G100
Outdoor Model without Heat Pkg. Stainless Steel Type 4X	N280416G102	N280426G102	N280425G102	N280446G102
Outdoor Model with Heat Pkg.	N280416G150	N280426G150	N280425G150	N280446G150
Outdoor Model with Heat Pkg. Stainless Steel Type 4X	N280416G151	N280426G151	N280425G151	N280446G151
COOLING PERFORMANCE				
Nominal:				
BTUs/Hr.	**3800 / 4000**	**4000**	**3800**	**4000**
Watts	**1114 / 1172**	**1172**	**1114**	**1172**
At 125 F / 125 F (50 C / 50 C):				
BTU/Hr. (50 / 60 Hz)	3805 / 4162	4394	3818	4394
Watts (50 / 60 Hz)	1115 / 1220	1288	1119	1288
At 95 F / 95 F (35 C / 35 C):				
BTU/Hr. (50 /60 Hz)	3589 / 3974	3690	3298	3690
Watts (50 / 60 Hz)	1052 / 1165	1081	967	1081
Refrigerant	R134a	R134a	R134a	R134a
Refrigerant Charge (ounces/grams)	11 / 312	11 / 312	11 / 312	11 / 312
Operating Temperature Range:				
Maximum (°F / °C)	125/52	125/52	125/52	125/52
Minimum (°F / °C)	-40/-40	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:				
Internal loop 50 Hz (CFM / M^3/Hr)	138 / 234	N/A	138 / 234	N/A
External loop 50 Hz (CFM / M^3/Hr)	268 / 455	N/A	268 / 455	N/A
Internal loop 60 Hz (CFM / M^3/Hr)	143 / 362	143 / 243	N/A	143 / 243
External loop 60 Hz (CFM / M^3/Hr)	288 / 728	288 / 489	N/A	288 / 489
Max. Heater W (Outdoor Models)	1300	1300	1300	1300
ELECTRICAL DATA				
Rated Voltage	**110 / 115**	**230**	**230**	**460**
Frequency (Hz)	50 / 60	60	50	60
Operating Range	+/-10%	+/-10%	+/-10%	+/-10%
Max. Power Consumption (Watts at 50 / 60 Hz)	1039 / 1191	1250	1111	1250
Max. Nominal Current (Amps at 50 / 60 Hz)	11.6-11.2	6.5	5.8	3.3
Starting Current (Amps)	40	24.5	24.5	12.5
Agency Approvals	cUL Listed CE Others available upon request			
Power Input Description	Terminal Block			
ENCLOSURE PROTECTION				
UL Type	Type 12, 3R, 4 Standard Type 4X Stainless Steel Optional			
CONTROLLER				
Description	Basic Mechanical Thermostat			
Thermostat Location	Enclosure Side			
Factory Thermostat Setting (°F / °C)	80 / 27			
SOUND LEVEL				
At 1.5 Meters	66.1 dBA	65.5 dBA	65.5 dBA	65.5 dBA
UNIT CONSTRUCTION				
Material	Galvanized sheet metal standard Stainless steel optional			
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard Other colors available			
ACCESSORIES				
EASYSWAP Adaptor Plenum (GENESIS™ M33)	Enables SPECTRACOOL to be mounted to a GENESIS M33 air conditioner cutout Catalog Number PLM33N28			
UNIT DIMENSIONS				
Height (in / mm)	28 / 711.2			
Width (in / mm)	11.50 / 292.1			
Depth (in / mm)	14.00 / 355.6			
Weight (lb / kg)	84/38	84/38	92/41.7	92/41.7

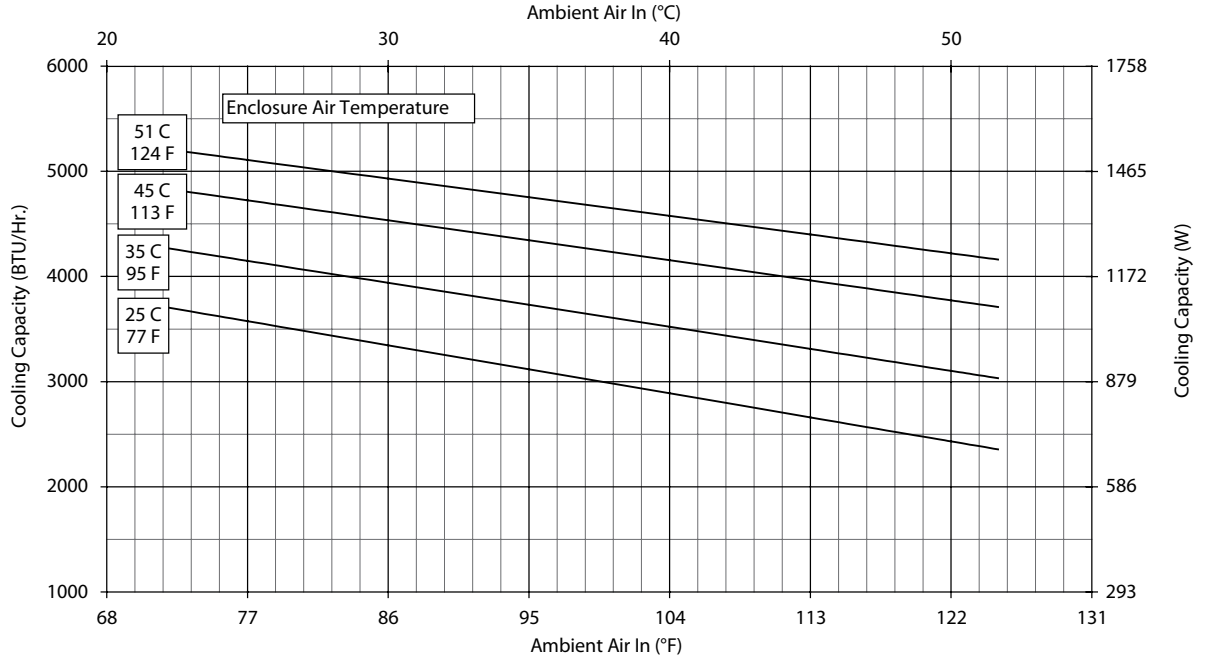
*Units with Remote Access Control utilize a digital controller and communicate via EtherNet/IP, Modbus TCP/IP and SNMP over ethernet or modbus RTU over USB.

Performance Curves for N28 Models 4000 BTU/Hr. (1172 Watt)

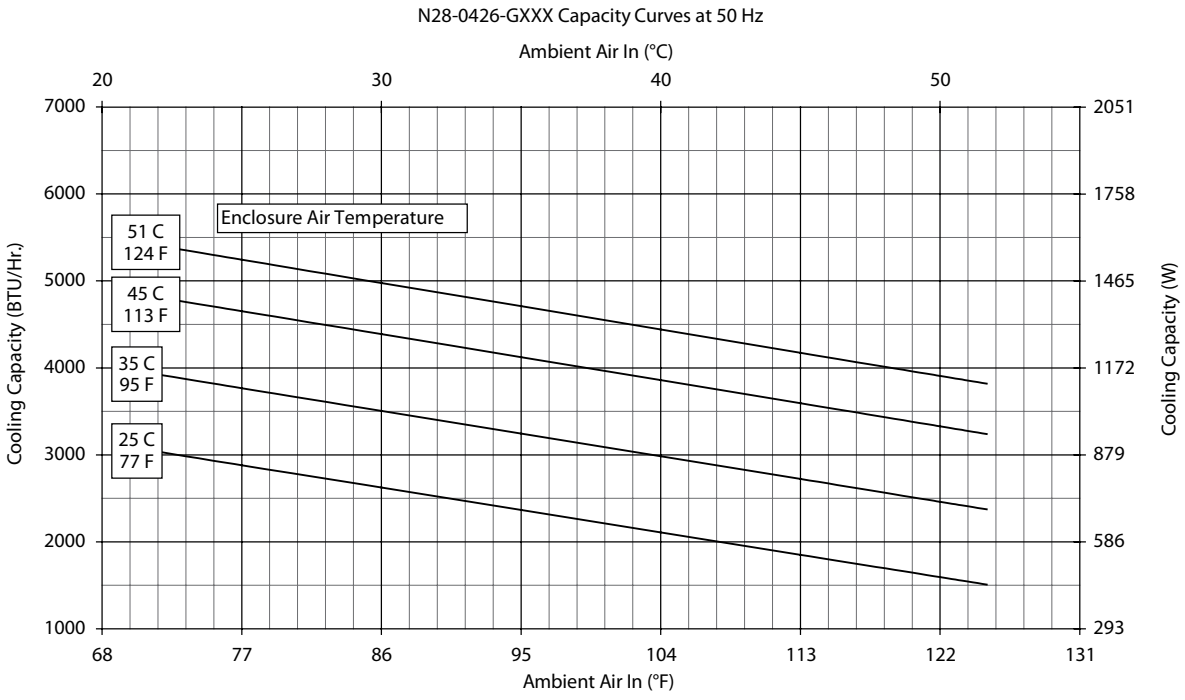
N28-0416-GXXX Capacity Curves at 50 Hz

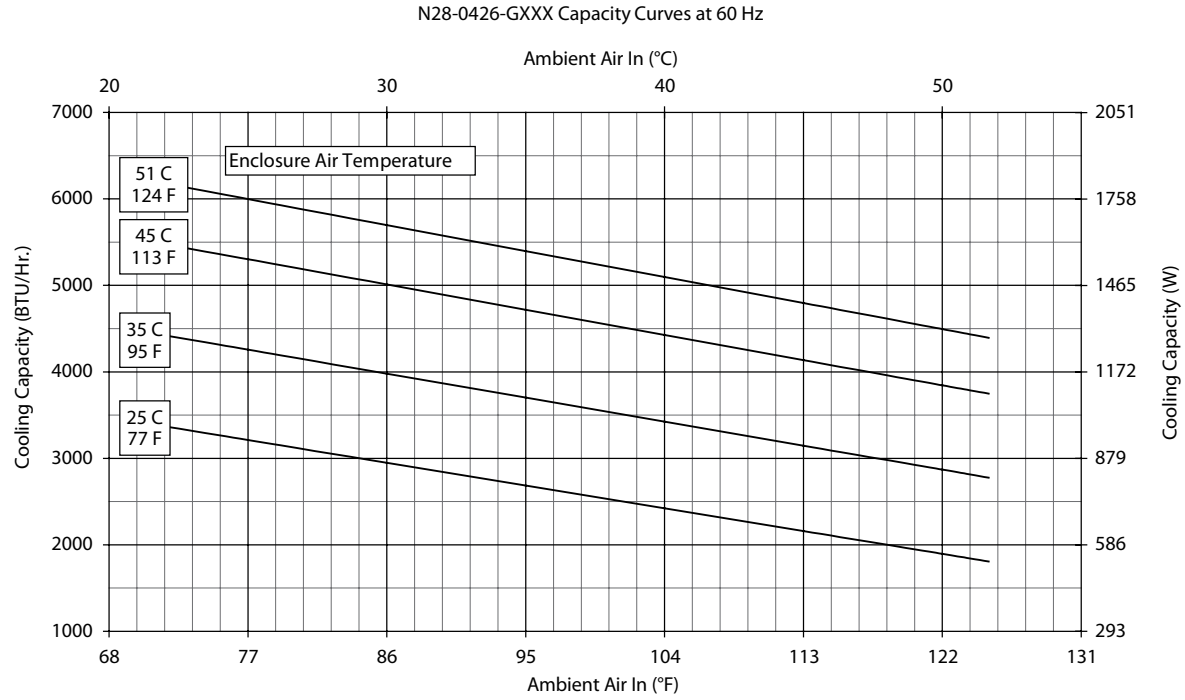


N28-0416-GXXX Capacity Curves at 60 Hz

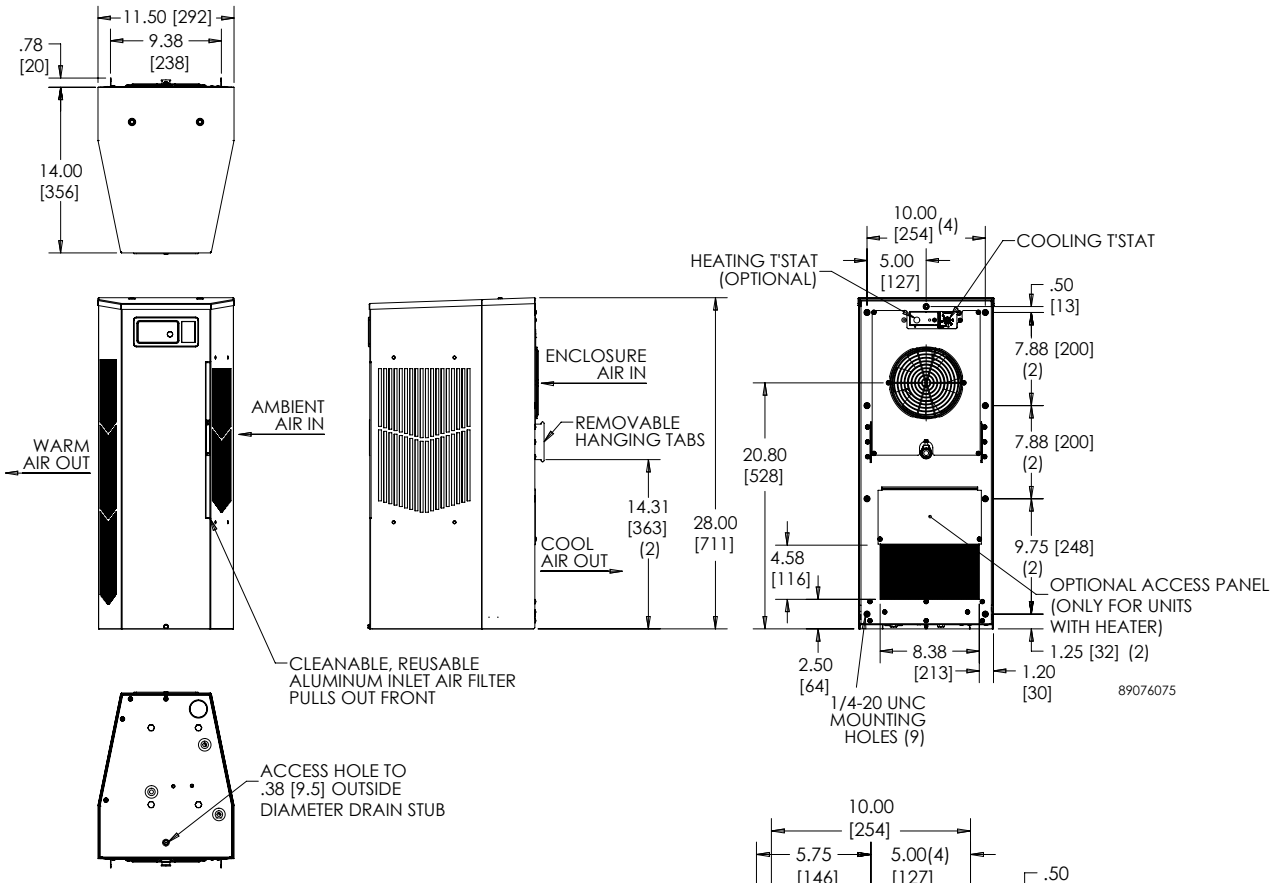


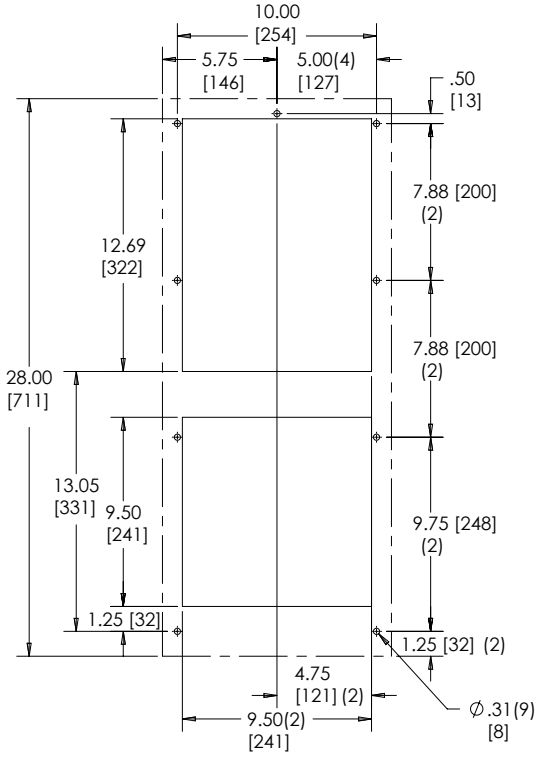
Performance Curves for N28 Models 4000 BTU/Hr. (1172 Watt)





N28 Models 4000 BTU/Hr. (1172 Watt)





Cutout Dimensions

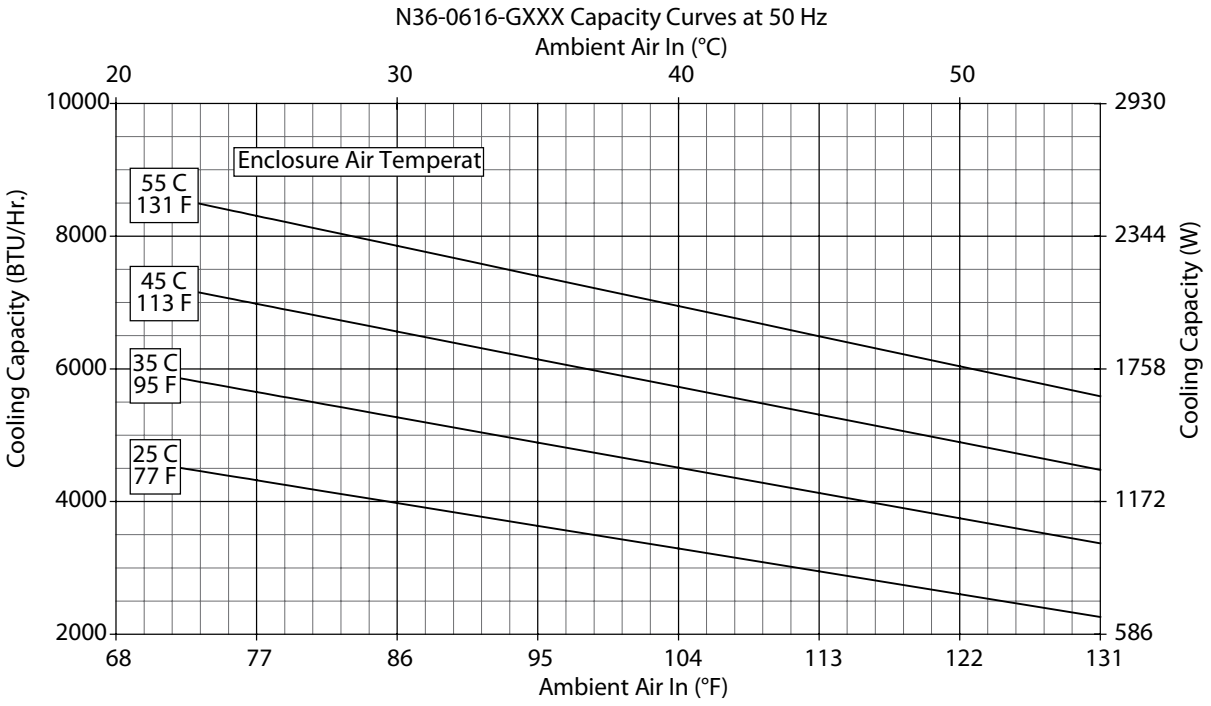
Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

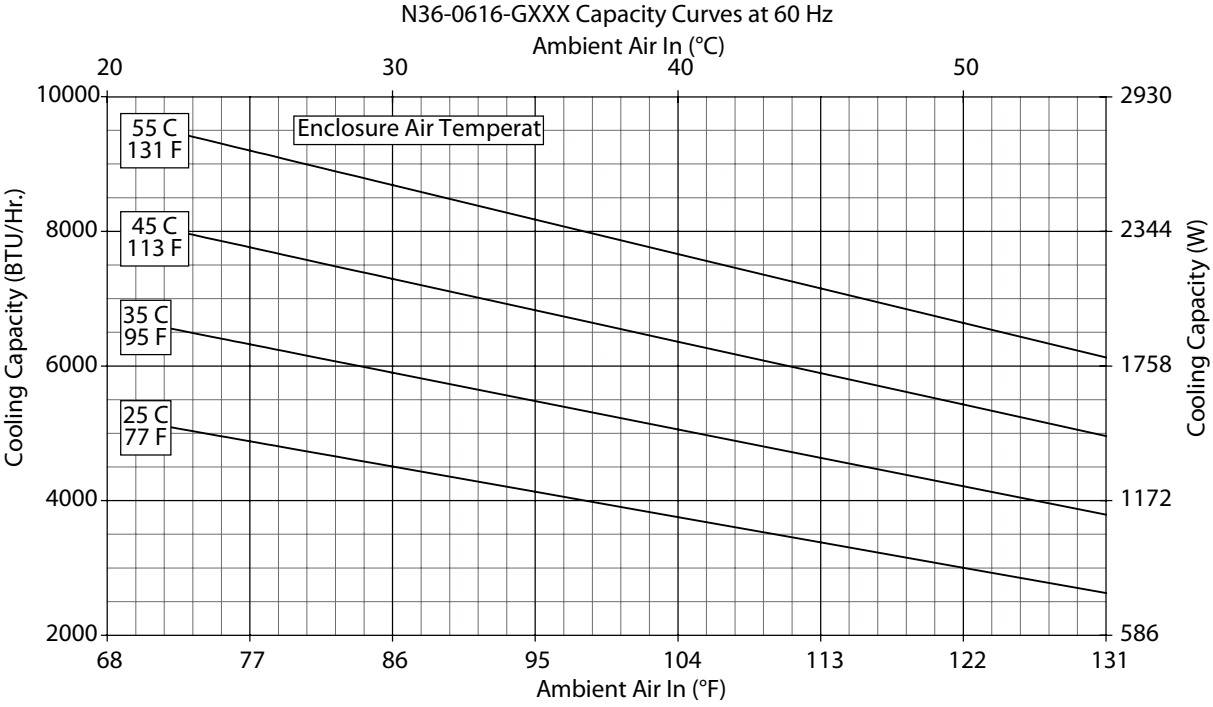
Performance Data **N36 6000/8000 BTU/Hr. (1758/2344 Watt)**

CATALOG NUMBER						
Indoor Model	N360616G050	N360626G050	N360646G050	N360816G050	N360826G050	N360846G050
Indoor Model Stainless Steel Type 4X	N360616G051	N360626G051	N360646G051	N360816G051	N360826G051	N360846G051
Indoor Model with Remote Access Control*	N360616G060	N360626G060	N360646G060	N360816G060	N360826G060	N360846G060
Outdoor Model without Heat Pkg.	N360616G100	N360626G100	N360646G100	N360816G100	N360826G100	N360846G100
Outdoor Model without Heat Pkg. Stainless Steel Type 4X	N360616G102	N360626G102	N360646G102	N360816G102	N360826G102	N360846G102
Outdoor Model with Heat Pkg.	N360616G150	N360626G150	N360646G150	N360816G150	N360826G150	N360846G150
Outdoor Model with Heat Pkg. Stainless Steel Type 4X	N360616G151	N360626G151	N360646G151	N360816G151	N360826G151	N360846G151
COOLING PERFORMANCE						
Nominal:						
BTU/Hr.	**5400 / 6000**	**5400 / 6000**	**5400 / 6000**	**8250 / 8500**	**8250 / 8500**	**8250 / 8500**
Watts	**1581 / 1757**	**1581 / 1757**	**1581 / 1757**	**2416 / 2489**	**2313 / 2635**	**2284 / 2401**
At 131 F / 131 F (55 C / 55 C):						
BTU/Hr. (50 / 60 Hz)	5585 / 6180	5469 / 5965	5300 / 6089	8213 / 8453	7874 / 8063	7777 / 8166
Watts (50 / 60 Hz)	1637 / 1811	1603 / 1748	1553 / 1785	2405 / 2475	2306 / 2361	2277 / 2391
At 95 F / 95 F (35 C / 35 C):						
BTU/Hr. (50 /60 Hz)	4909 / 5485	5159 / 5621	5572 / 6026	7028 / 7626	6660 / 7411	6877 / 7525
Watts (50 / 60 Hz)	1439 / 1607	1512 / 1647	1633 / 1766	2058 / 2233	1950 / 2170	2014 / 2203
Refrigerant	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant Charge (ounces/grams)	20 / 567	22 / 624	16 / 454	36 / 1021	36 / 1021	36 / 1021
Operating Temperature Range:						
Maximum (°F / °C)	131 / 55	131 / 55	131 / 55	131 / 55	131 / 55	131 / 55
Minimum (°F / °C)	-40 / -40	-40 / -40	-40 / -40	-40 / -40	-40 / -40	-40 / -40
Air Flow at 0 Static Pressure:						
Internal loop 50 Hz (CFM / M^3/Hr.)	251 / 426	250 / 425	250 / 425	250 / 425	245 / 416	243 / 413
External loop 50 Hz (CFM / M^3/Hr.)	284 / 483	338 / 574	338 / 574	313 / 532	347 / 589	365 / 620
Internal loop 60 Hz (CFM / M^3/Hr.)	261 / 443	261 / 443	261 / 443	263 / 447	258 / 439	254 / 432
External loop 60 Hz (CFM / M^3/Hr.)	311 / 528	356 / 605	356 / 605	338 / 574	382 / 648	394 / 669
Max. Heater W (Outdoor Models)	1300	1300	1300	1300	1300	1300
ELECTRICAL DATA						
Rated Voltage	**115**	**230**	**400 / 460 3~**	**115**	**230**	**400 / 460 3~**
Frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Operating Range	+/-10%	+/-10%	+/-10%	+/-10%	+/-10%	+/-10%
Max. Power Consumption (Watts at 50 / 60 Hz)	911 / 1108	908 / 1073	697 / 895	1334 / 1530	1265 / 1403	572 / 628
Max. Nominal Current (Amps at 50 / 60 Hz)	9.1 / 10.1	4.5 / 4.7	1.59 / 1.69	11.6 / 13.3	5.5/6.1	2.9/3.0
Starting Current (Amps)	39.2	23	8.1	48.3	27	16
Agency Approvals	cUL Listed CE Others available upon request					
Power Input Description	Terminal Block					
ENCLOSURE PROTECTION						
UL Type	Type 12, 3R, 4 Standard Type 4X Stainless Steel Optional					
CONTROLLER						
Description	Basic Mechanical Thermostat					
Thermostat Location	Enclosure Side					
Factory Thermostat Setting (°F / °C)	80 / 27					
SOUND LEVEL						
At 1.5 Meters	66.9 dBA	66.7 dBA	68.2 dBA	66.0 dBA	66.0 dBA	66.0 dBA
UNIT CONSTRUCTION						
Material	Galvanized sheet metal standard Stainless steel optional					
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard Other colors available					
ACCESSORIES						
EASYSWAP Adaptor Plenum (GENESIS™ M36)	Enables SPECTRACOOL to be mounted to a GENESIS M36 air conditioner cutout Catalog Number PLM36N36					
UNIT DIMENSIONS						
Height (in. / mm)	36.00 / 914.4					
Width (in. / mm)	11.50 / 292.1					
Depth (in. / mm)	14.00 / 355.6					
Weight (lb. / kg)	100 / 45	100 / 45	104 / 47	106 / 48	106 / 48	114 / 52

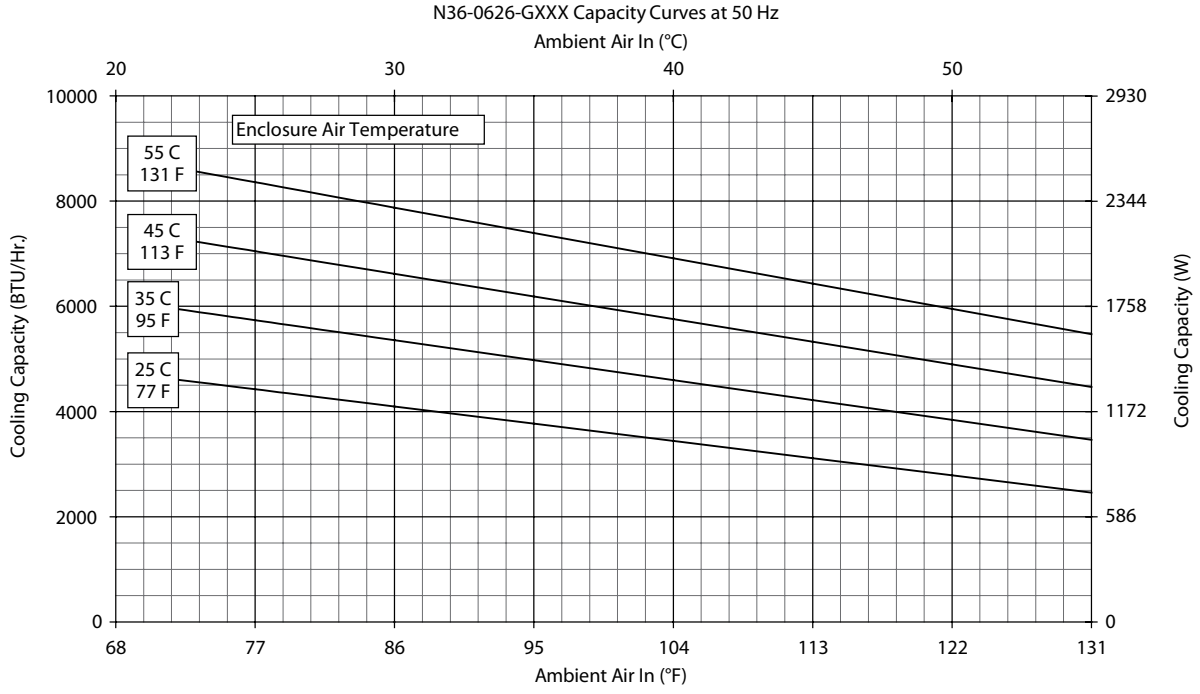
*Units with Remote Access Control utilize a digital controller and communicate via EtherNet/IP, Modbus TCP/IP and SNMP over ethernet or modbus RTU over USB.

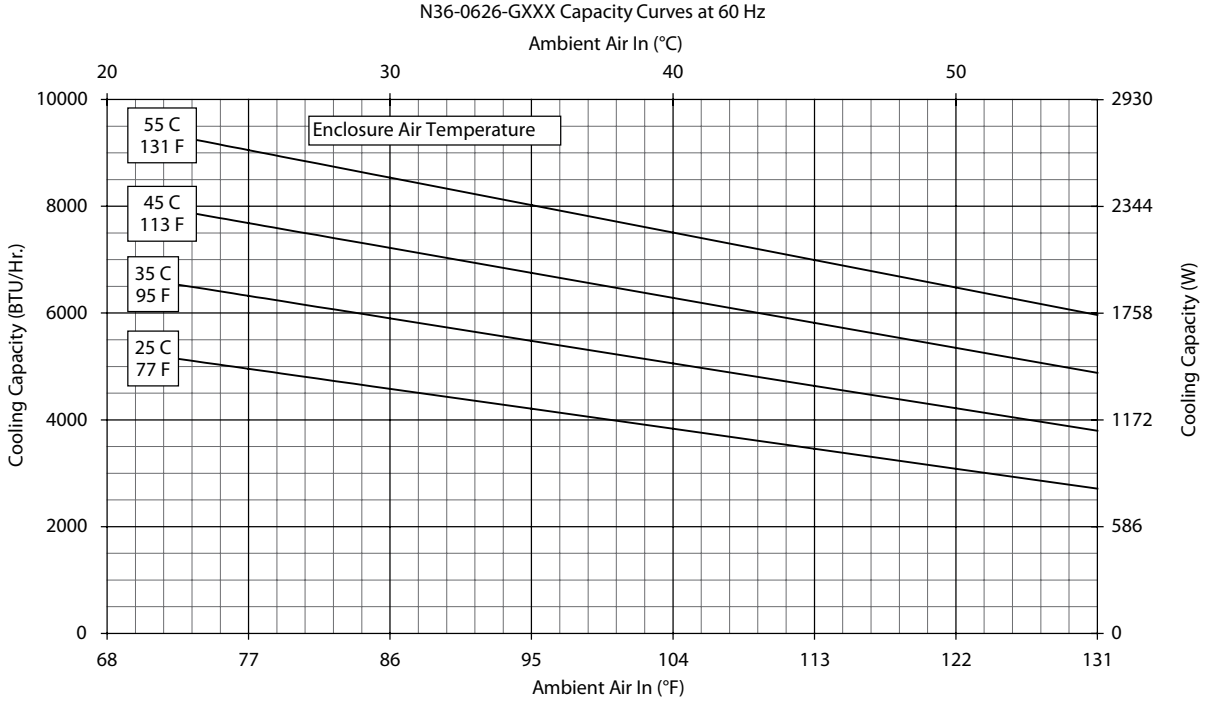
Performance Curves for N36 Models 6000 BTU/Hr. (1758 Watt)



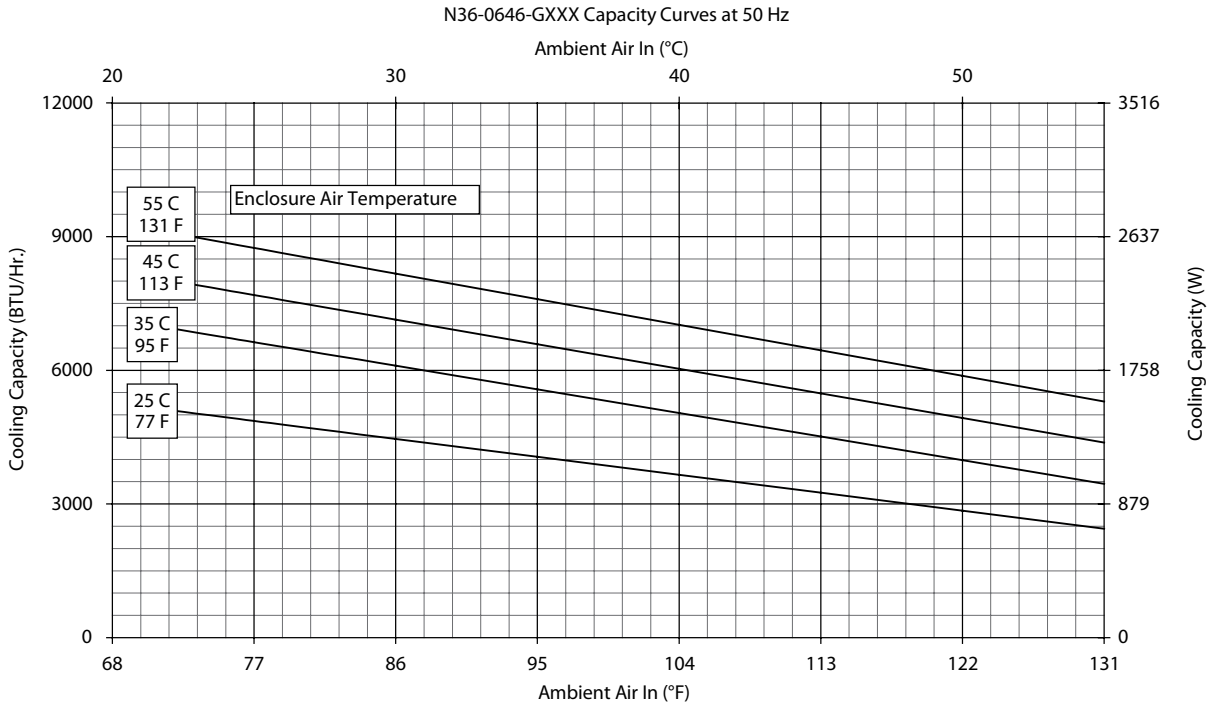


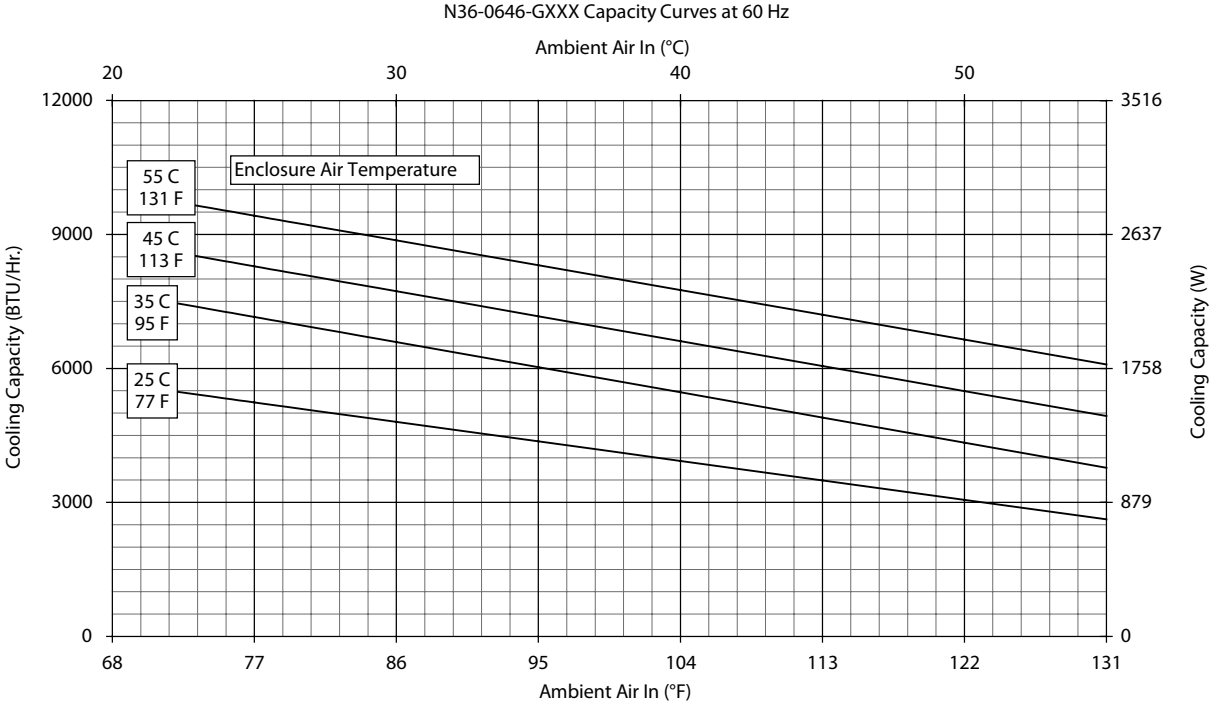
Performance Curves for N36 Models 6000 BTU/Hr. (1758 Watt)



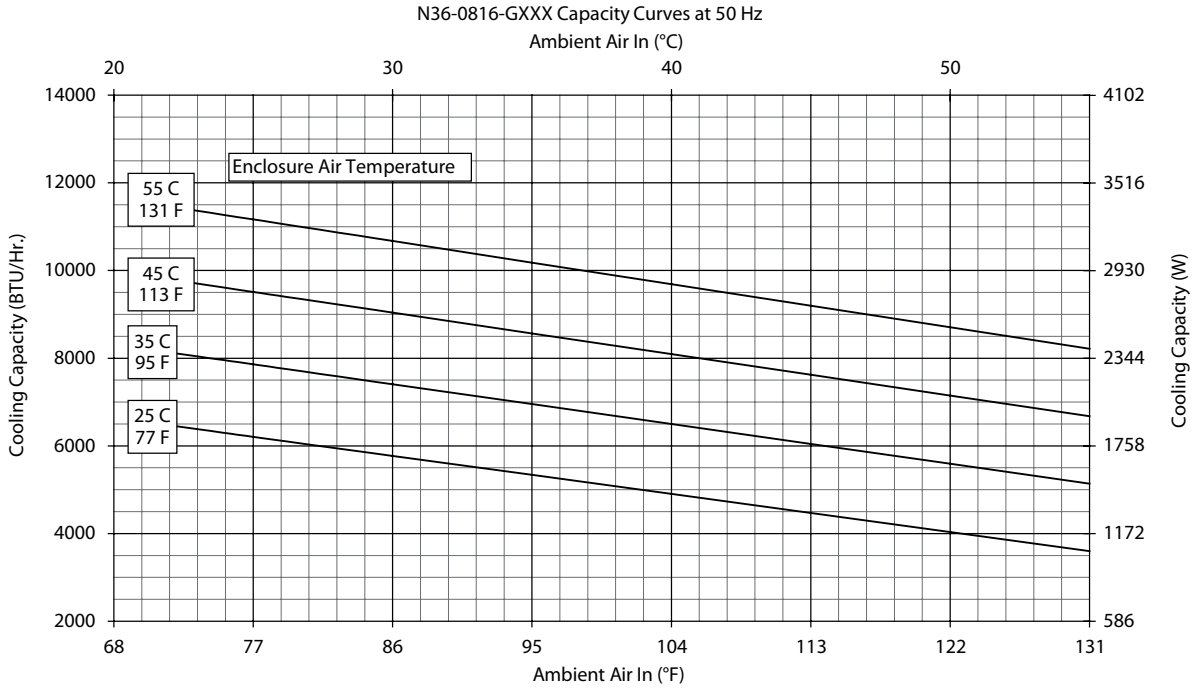


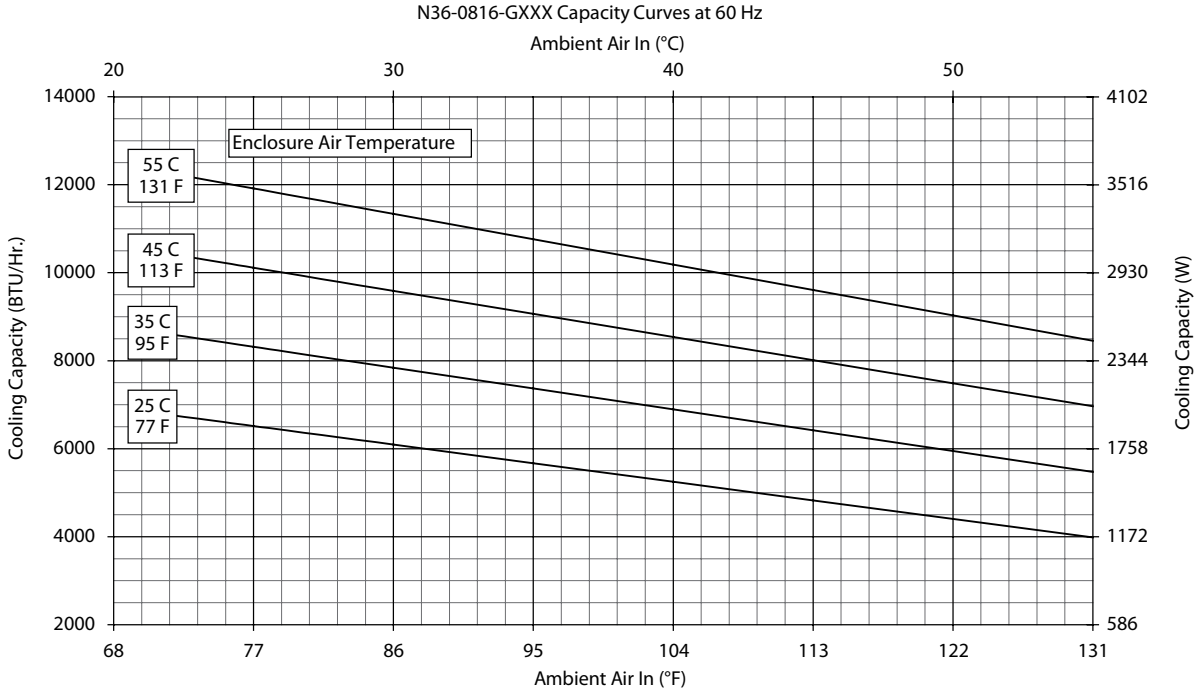
Performance Curves for N36 Models 6000 BTU/Hr. (1758 Watt)



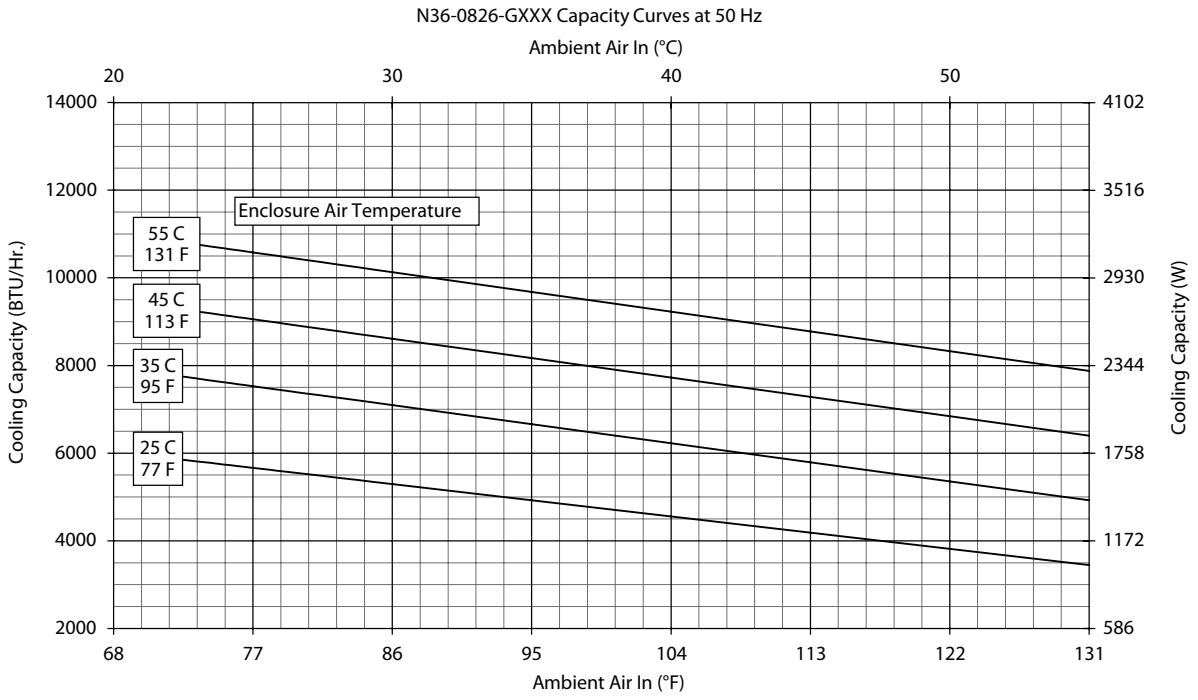


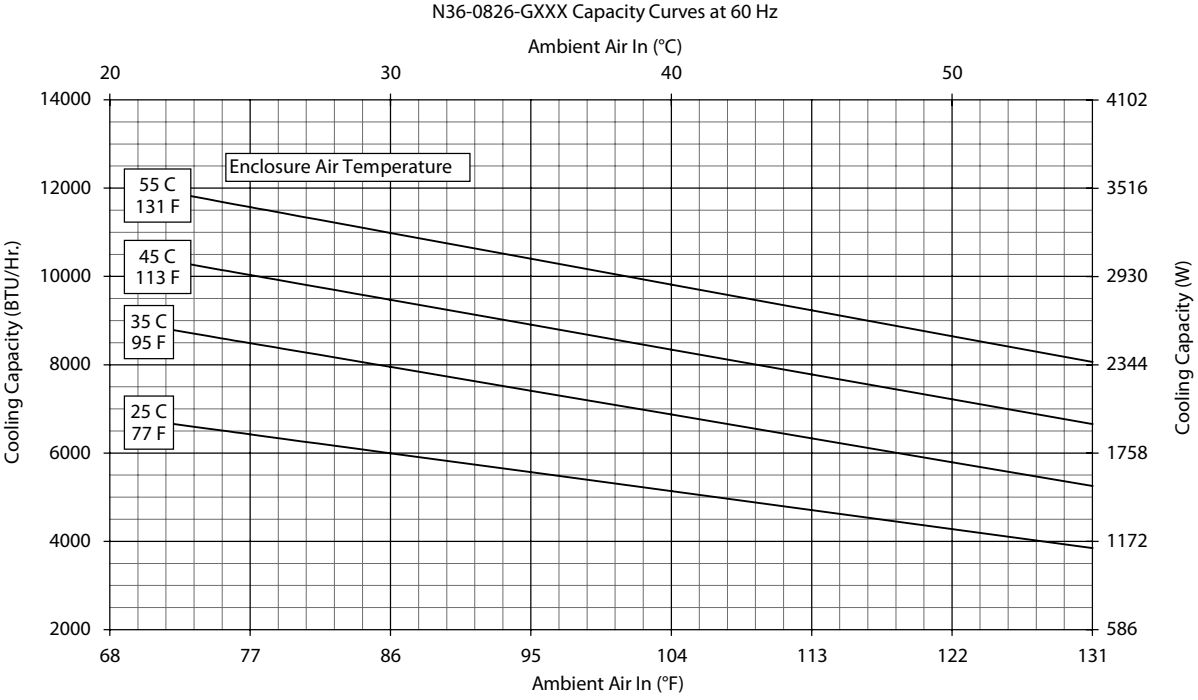
Performance Curves for N36 Models 8000 BTU/Hr. (2344 Watt)



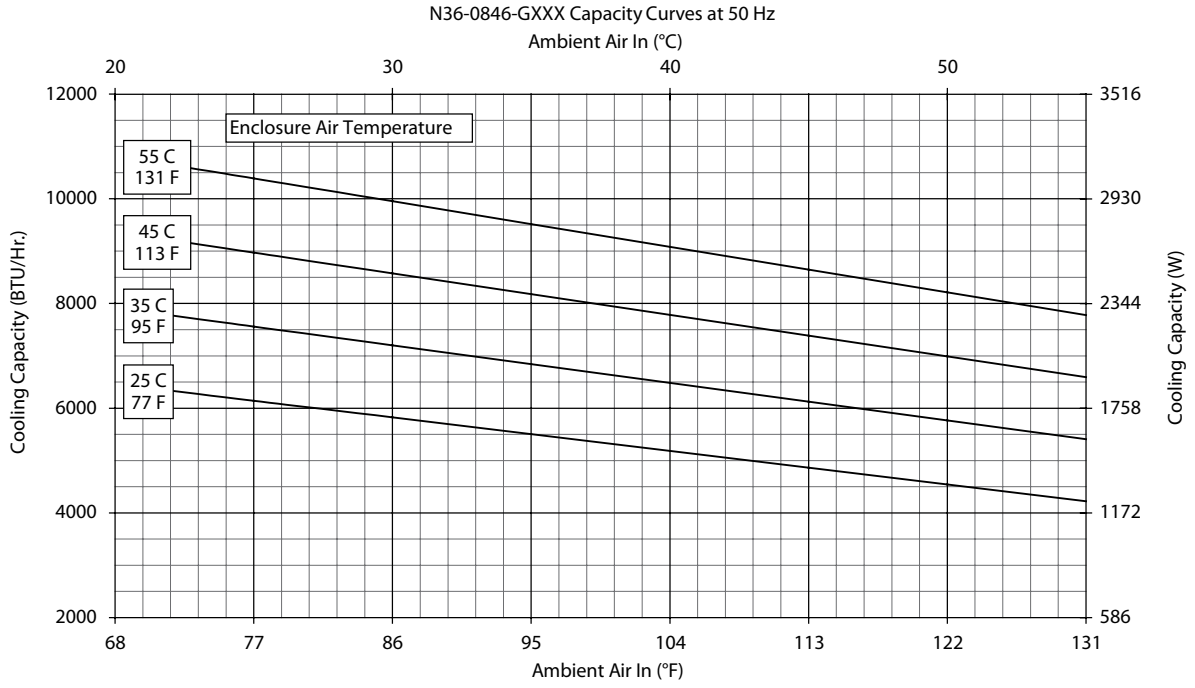


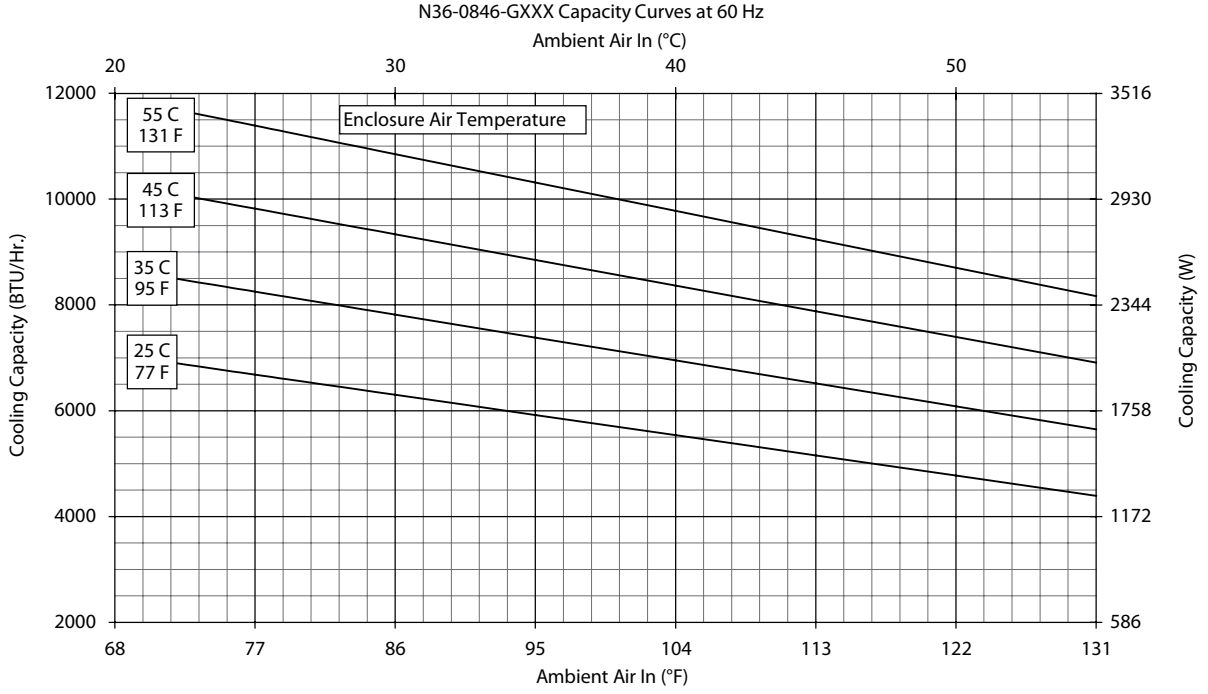
Performance Curves for N36 Models 8000 BTU/Hr. (2344 Watt)



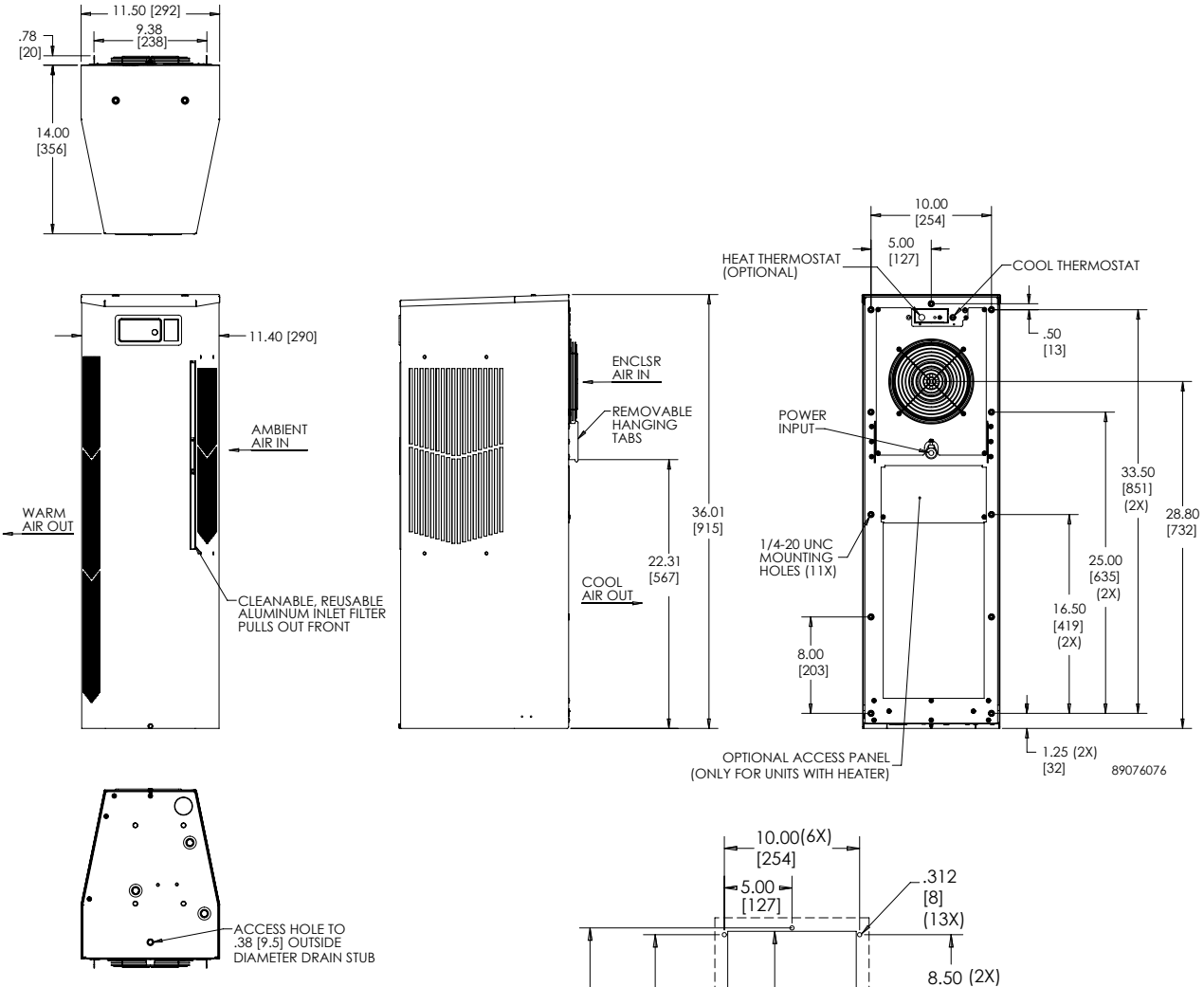


Performance Curves for N36 Models 8000 BTU/Hr. (2344 Watt)





N36 6000/8000 BTU/Hr. (1758/2344 Watt)



Cutout Dimensions

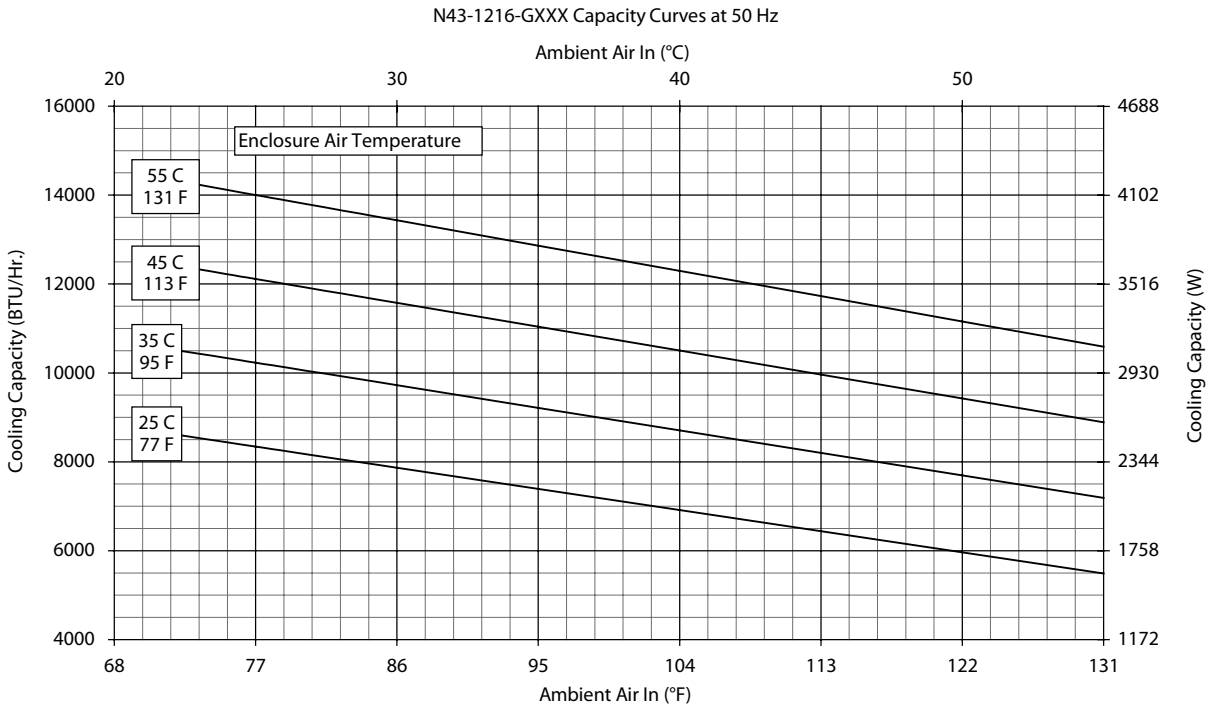
Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

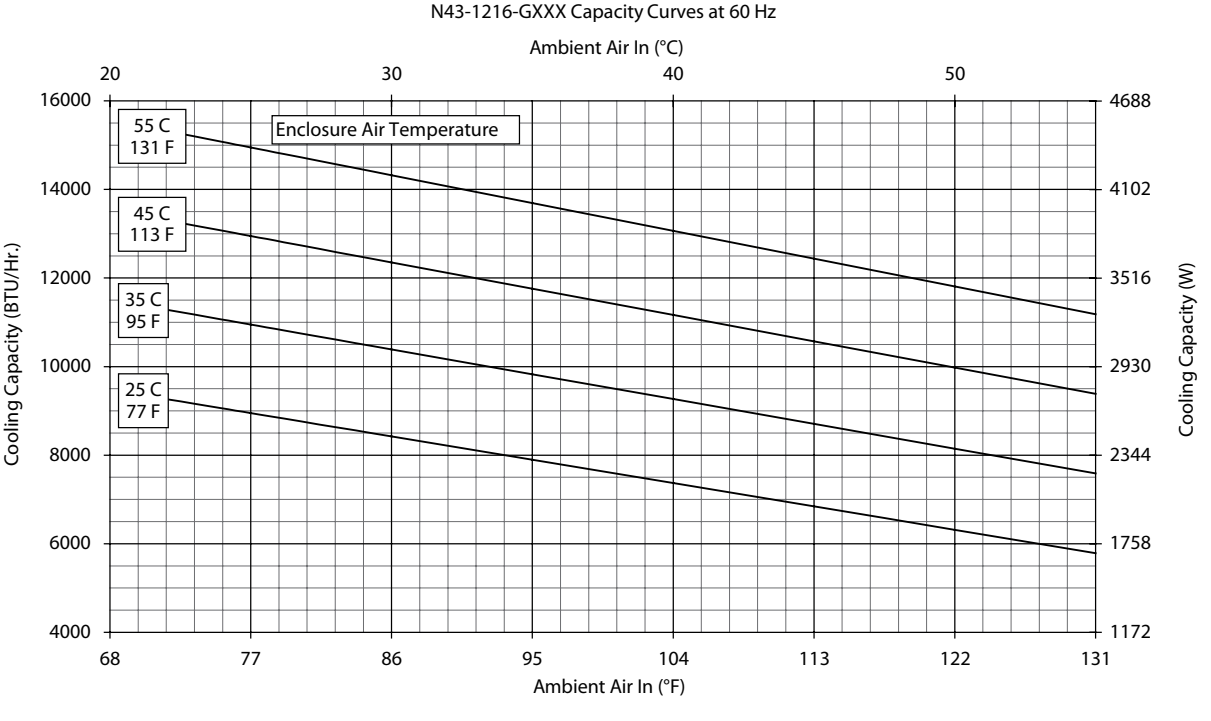
Performance Data **N43 11000 BTU/Hr. (3223 Watt)**

CATALOG NUMBER			
Indoor Model	N431216G050	N431226G050	N431246G050
Indoor Model Stainless Steel Type 4X	N431216G051	N431226G051	N431246G051
Indoor Model with Remote Access Control*	N431216G060	N431226G060	N431246G060
Outdoor Model without Heat Pkg.	N431216G100	N431226G100	N431246G100
Outdoor Model without Heat Pkg. Stainless Steel Type 4X	N431216G102	N431226G102	N431246G102
Outdoor Model with Heat Pkg.	N431216G150	N431226G150	N431246G150
Outdoor Model with Heat Pkg. Stainless Steel Type 4X	N431216G151	N431226G151	N431246G151
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**10400 / 11000**	**10400 / 11000**	**10400 / 11000**
Watts	**3047 / 3223**	**2900 / 3223**	**2900 / 3223**
At 131 F / 131 F (55 C / 55 C):			
BTU/Hr. (50 / 60 Hz)	10588 / 11180	9946 / 11052	10048 / 10797
Watts (50 / 60 Hz)	3103 / 3277	2915 / 3239	2945 / 3164
At 95 F / 95 F (35 C / 35 C):			
BTU/Hr. (50 /60 Hz)	9475 / 10023	8967 / 9644	8587 / 9559
Watts (50 / 60 Hz)	2777 / 2937	2628 / 2826	2517 / 2801
Refrigerant	R134a	R134a	R134a
Refrigerant Charge (ounces/grams)	36 / 1021	38 / 1077	41 / 1162
Operating Temperature Range:			
Maximum (°F / °C)	131 / 55	131 / 55	131 / 55
Minimum (°F / °C)	-40 / -40	-40 / -40	-40 / -40
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / M^3/Hr)	239 / 406	259 / 440	254 / 432
External loop 50 Hz (CFM / M^3/Hr)	494 / 839	489 / 831	341 / 579
Internal loop 60 Hz (CFM / M^3/Hr)	250 / 425	267 / 454	260 / 442
External loop 60 Hz (CFM / M^3/Hr)	528 / 897	525 / 892	564 / 958
Max. Heater W (Outdoor Models)	1300	1300	1300
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**400 / 460 3~**
Frequency (Hz)	50 / 60	50 / 60	50 / 60
Operating Range	+/-10%	+/-10%	+/-10%
Max. Power Consumption (Watts at 50 / 60 Hz)	1802 / 2446	1802 / 2446	1283 / 1644
Max. Nominal Current (Amps at 50 / 60 Hz)	16.6 / 22.0	8.7 / 9.1	3.1 / 3.3
Starting Current (Amps)	57	38	16
Agency Approvals		cUL Listed CE Others available upon request	
Power Input Description		Terminal Block	
ENCLOSURE PROTECTION			
UL Type		Type 12, 3R, 4 Standard Type 4X Stainless Steel Optional	
CONTROLLER			
Description		Basic Mechanical Thermostat	
Thermostat Location		Enclosure Side	
Factory Thermostat Setting (°F / °C)		80 / 27	
SOUND LEVEL			
At 1.5 Meters	68.4 dBA	68.4 dBA	69.6 dBA
UNIT CONSTRUCTION			
Material		Galvanized sheet metal standard Stainless steel optional	
Finish		RAL 7035 light-gray, semi-textured powder-coat paint standard Other colors available	
UNIT DIMENSIONS			
Height (in / mm)		43.00 / 1092.2	
Width (in / mm)		11.50 / 292.1	
Depth (in / mm)		14.00 / 355.6	
Weight (lb / kg)	127/57.6	127/57.6	138/62.6

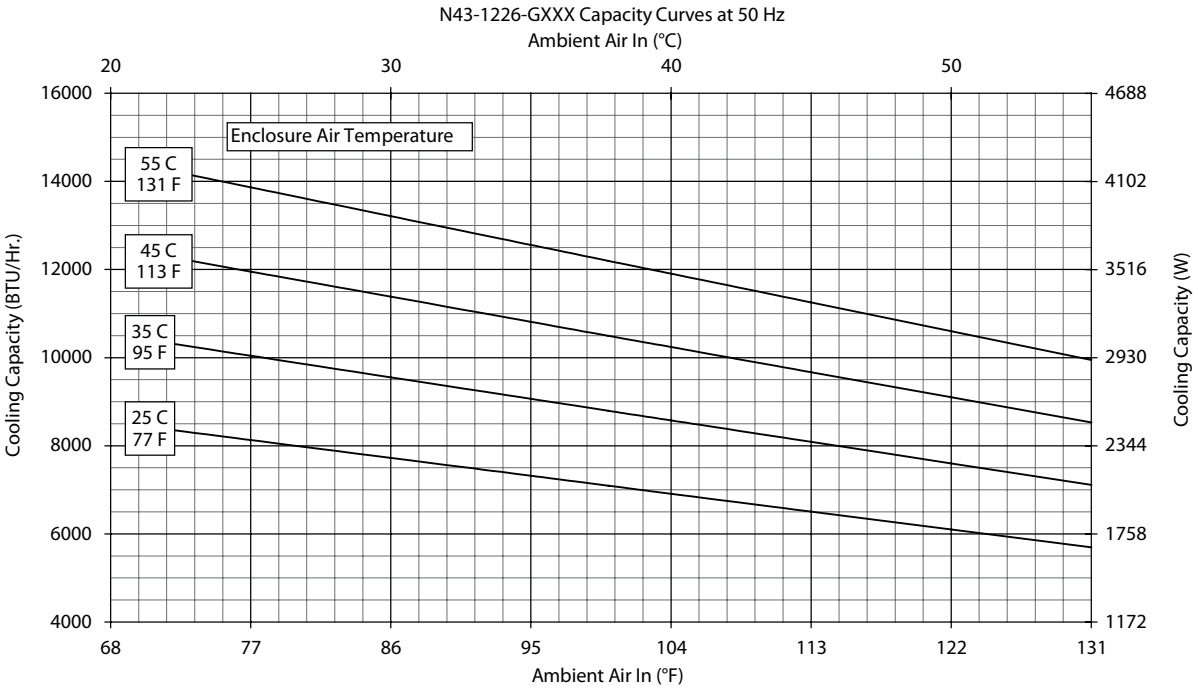
*Units with Remote Access Control utilize a digital controller and communicate via EtherNet/IP, Modbus TCP/IP and SNMP over ethernet or modbus RTU over USB.

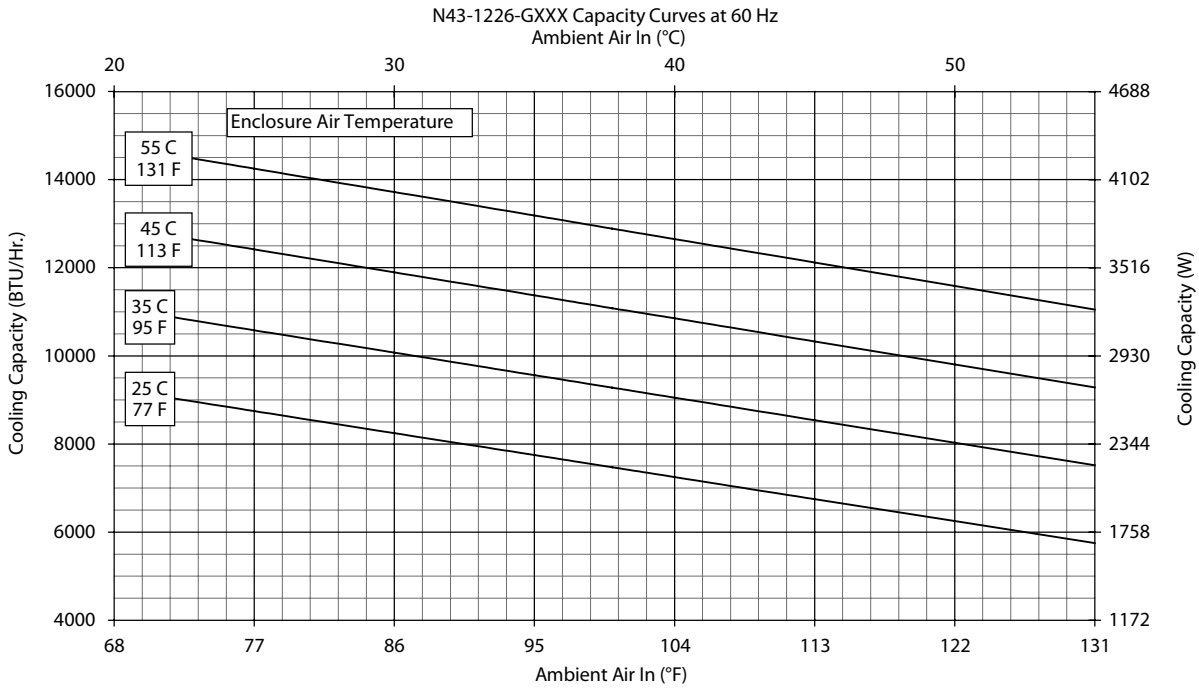
Performance Curves for N43 Models 11000 BTU/Hr. (3223 Watt)



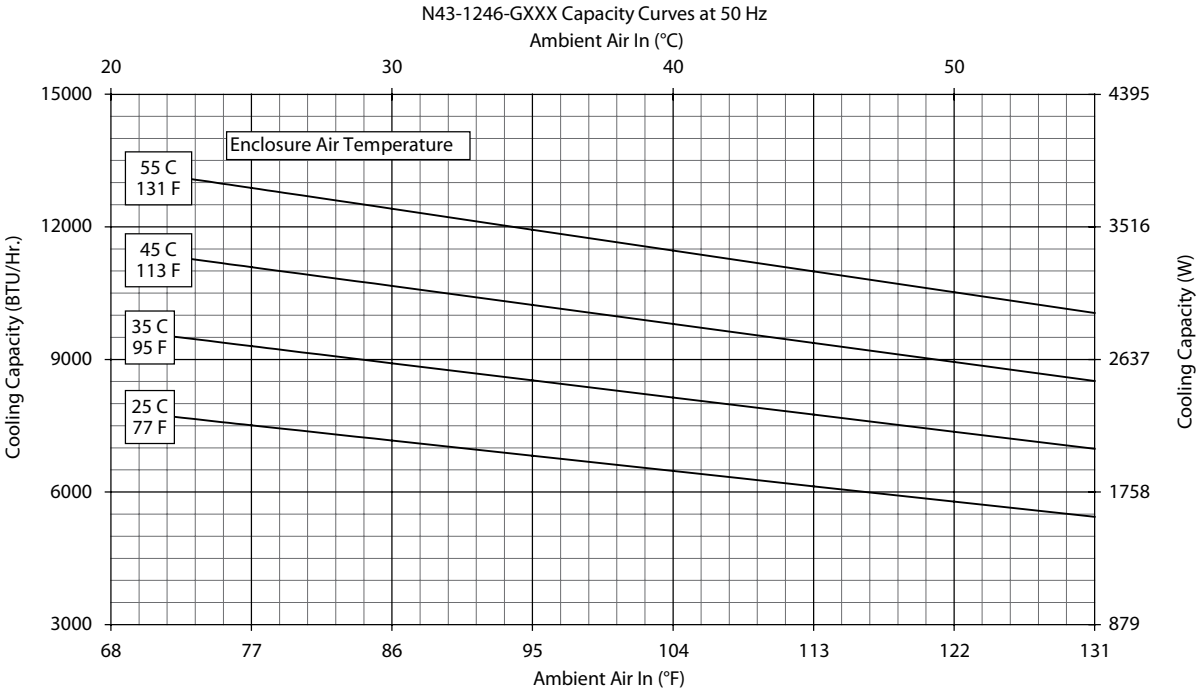


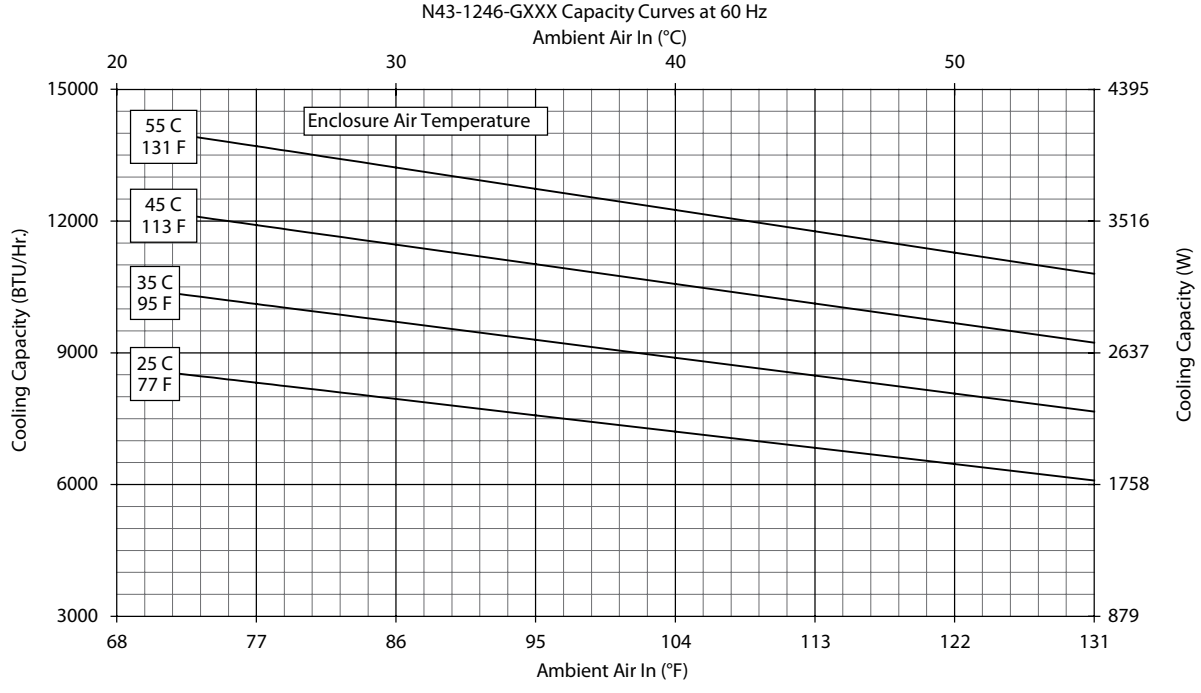
Performance Curves for N43 Models 11000 BTU/Hr. (3223 Watt)



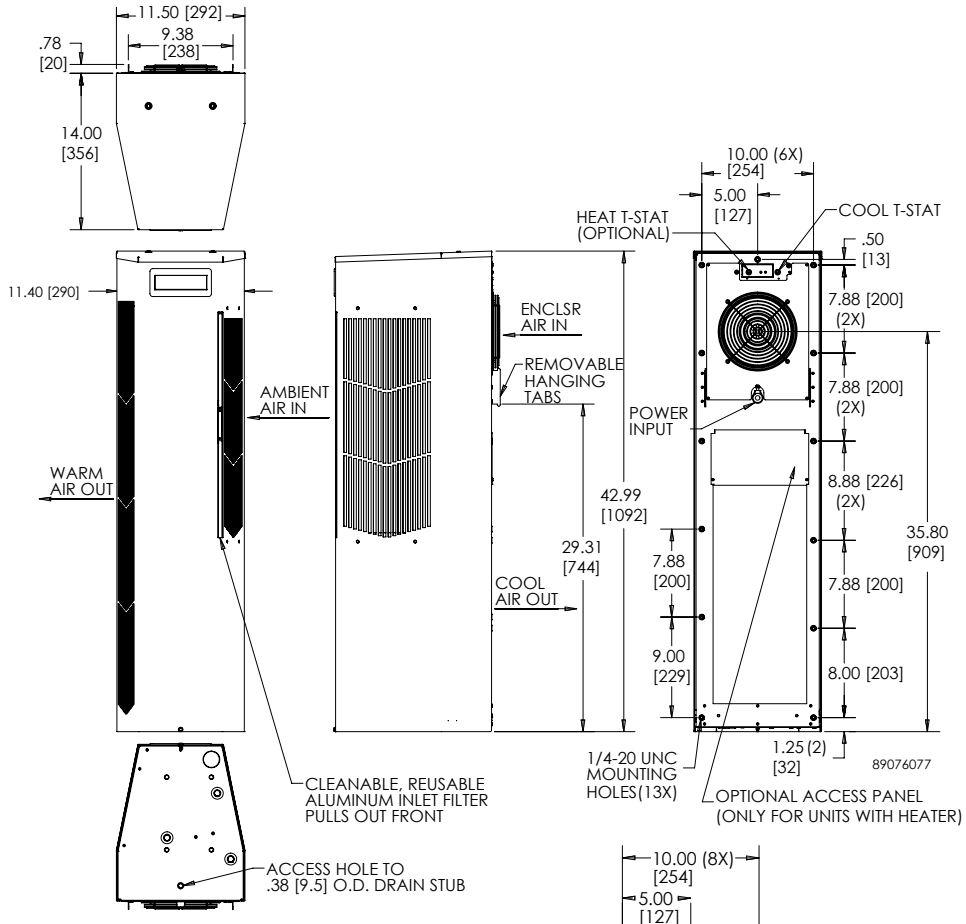


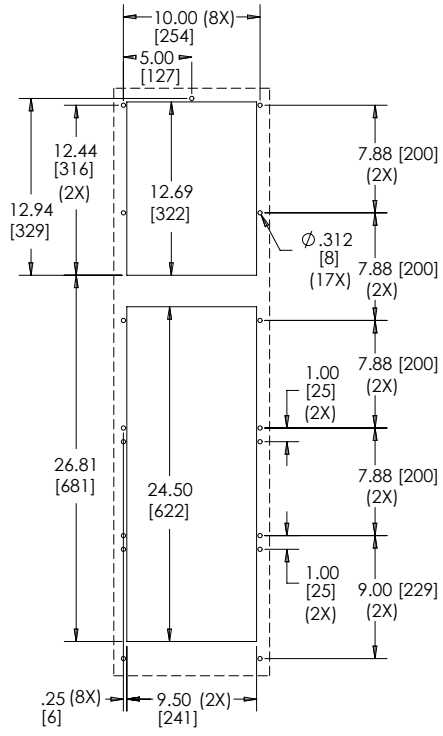
Performance Curves for N43 Models 11000 BTU/Hr. (3223 Watt)





N43 12000 BTU/Hr. (3516 Watt)





CUTOUT INSTRUCTIONS

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

SPECTRACOOL™ COMPACT INDOOR

N17 115/230 Volt
1000 BTU/Hr.
293 Watt

N17 460 Volt
1800 BTU/Hr.
527 Watt

INDUSTRY STANDARDS

UL/cUL Listed; Type 12; File No. SA6453

CE
IP 54 Internal Loop
IP 34 on External Loop

APPLICATION

- Industrial automation
- Package handling equipment
- Security and defense systems

FEATURES

- Narrow design accommodates 12-in. deep cabinets
- R134a earth-friendly refrigerants
- Models for 115, 230 and 400/460 VAC power input
- UL Listed to save customers time and money with agency approvals
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat is located behind the cover of the unit; Air Conditioner models include digital display on ambient side
- Galvanized sheet-metal cover for rugged factory environments
- Easy-mount flanges for simple installation
- Cut-out adapter options for enclosures with GENESIS® air conditioners enable users to easily transition to the new unit
- Dust-resistant condenser coil allows the unit to be run filterless in most applications
- Cleanable, reusable aluminum mesh filter protects coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Indoor Air Conditioner models also include:
  - Active condensate management
  - Power-off relay for door switch and other system requirements
  - Malfunction switch

SPECIFICATIONS

- Nominal cooling capacity:
  N17 1000 BTU/Hr. (293 W)
  N17 1800 BTU/Hr. (527 W)
- Operating temperature range from 50 F/10 C to 125 F/52 C

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint
- Other colors and textures available

NOTES

Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

ODVA
EtherNet/IP conformance tested

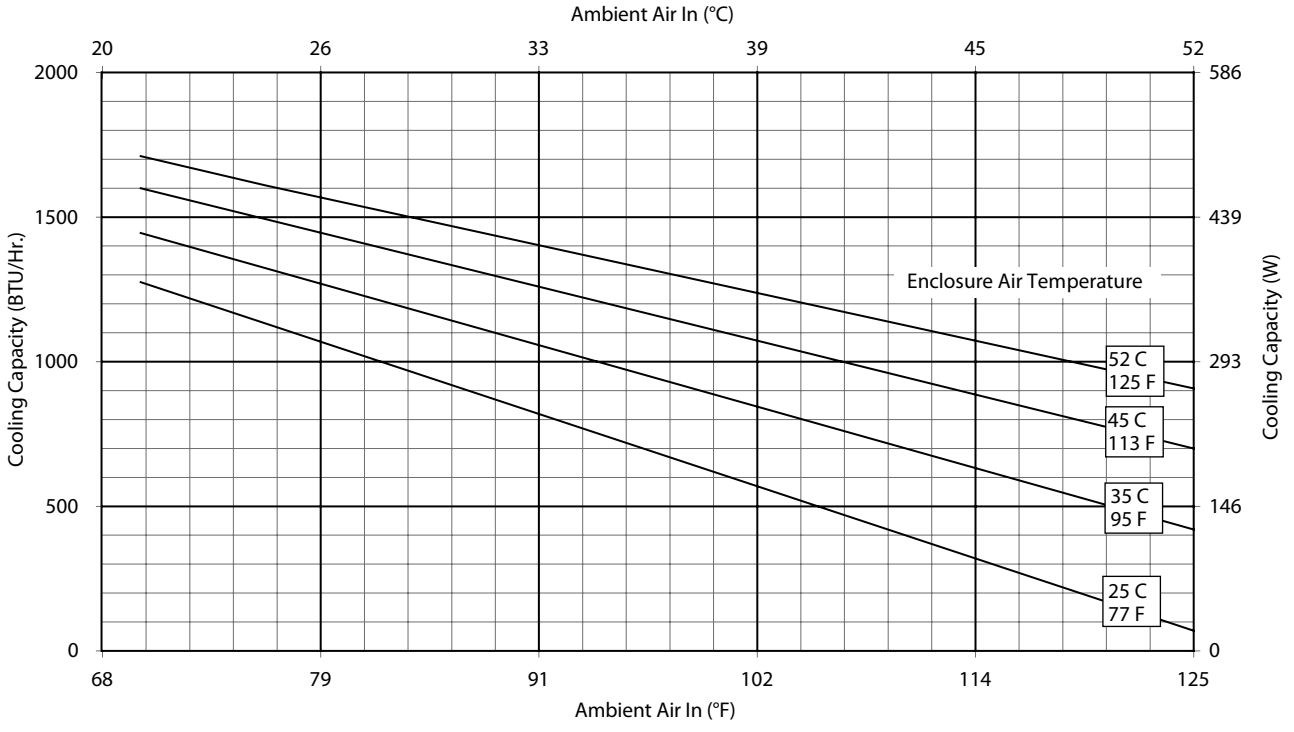
Performance Data **N17 Models 1000/1800 BTU/Hr. (300/527 Watt)**

CATALOG NUMBER						
Indoor Model	N170116G010	N170126G010	N170146G010	N170216G010	N170226G010	N170246G010
Indoor Model with Remote Access Control*	N170116G020	N170126G020	N170146G020	N170216G020	N170226G020	N170246G020
COOLING PERFORMANCE						
Nominal:						
BTU/Hr.	**908/1025**	**908/1025**	**908/1025**	**1500/1800**	**1500/1800**	**1500/1800**
Watts	**266/300**	**266/300**	**266/300**	**440/527**	**440/527**	**440/527**
Refrigerant	R-134a	R-134a	R-134a	R-134a	R-134a	R-134a
Refrigerant Charge (ounces/grams)	5/142	5/142	5/142	5.5/156	5.5/156	5.5/156
Operating Temperature Range:						
Maximum (°F/°C)	125/52	125/52	125/52	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10	50/10	50/10	50/10
Airflow at 0 Static Pressure:						
Internal loop 50 Hz (CFM / m^3/hr.)	57/97	57/97	57/97	61/104	61/104	61/104
External loop 50 Hz (CFM / m^3/hr.)	96/163	96/163	96/163	98/167	98/167	98/167
Internal loop 60 Hz (CFM / m^3/hr.)	67/114	67/114	67/114	72/122	72/122	72/122
External loop 60 Hz (CFM / m^3/hr.)	114/194	114/194	114/194	118/200	118/200	118/200
ELECTRICAL DATA						
Rated Voltage	**110/115**	**220/208-230**	**400/460**	**110/115**	**220/208-230**	**400/460**
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	337/356	375/407	345/376	642/728	639/667	543/603
Max. Nominal Current (A at 50/60 Hz)	4.4/3.9	2.3/2.1	1.2/1.2	7.0/7.1	4.0/3.5	2.0/2.0
Starting Current (A)	18	8.5	4.25	28	14.4	7.2
Agency Approvals	UL/cUL Listed CE					
Power Input Description	Terminal Block					
ENCLOSURE PROTECTION						
UL Type	Type 12					
IP	IP 54					
CONTROLLER (...G010 Models)						
Thermostat Location	Behind Cover, Right Side					
Factory Thermostat Setting (°F/°C)	80/27					
CONTROLLER (...G020 Models)						
Thermostat Location	Ambient Side					
Factory Thermostat Setting (°F/°C)	80/27					
SOUND LEVEL						
At 1.5 Meters	65.0 dBA					
UNIT CONSTRUCTION						
Material	Galvanized sheet metal standard					
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard Other colors available					
ACCESSORIES						
EASYSWAP Adaptor Plenum (GENESIS™ M13)	Enables SPECTRACOOL to be mounted to a GENESIS M13 air conditioner cutout Catalog Number PLM13N17 NOTE: EASYSWAP adaptor plenum not required for M17. It is the same cutout as N17.					
UNIT DIMENSIONS						
Height (in./mm)	17.64/448.1	17.64/448.1	22.14/562.4	17.64/448.1	17.64/448.1	22.14/562.4
Width (in./mm)	12.0/304.8	12.0/304.8	12.0/304.8	12.0/304.8	12.0/304.8	12.0/304.8
Depth (in./mm)	8.4/213.4	8.4/213.4	8.4/213.4	8.4/213.4	8.4/213.4	8.4/213.4
Weight (lb./kg)	50/23	50/23	66/30	54/25	54/25	73/33

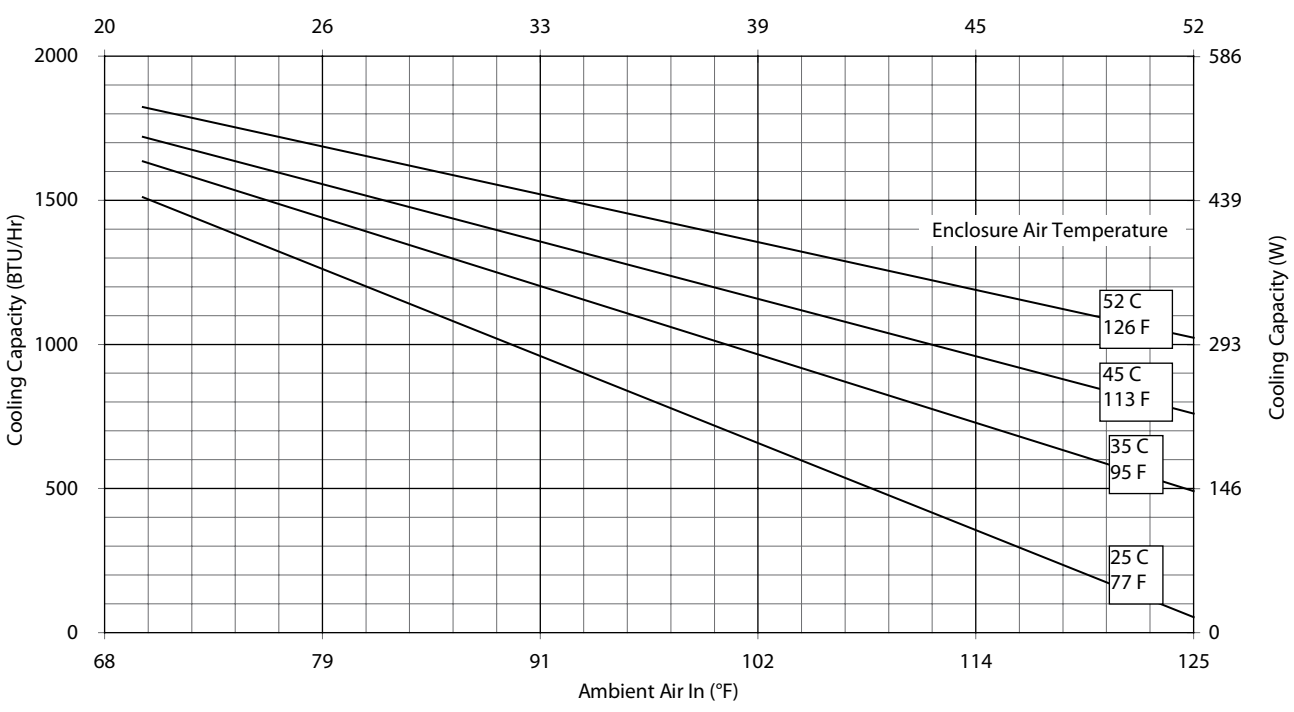
*Units with Remote Access Control utilize a digital controller and communicate via SNMP over ethernet or modbus RTU over USB.

Performance Curves for N17 Models 1000 BTU/Hr. (293 Watt)

N17-0116-GXXX Capacity Curves at 50 Hz

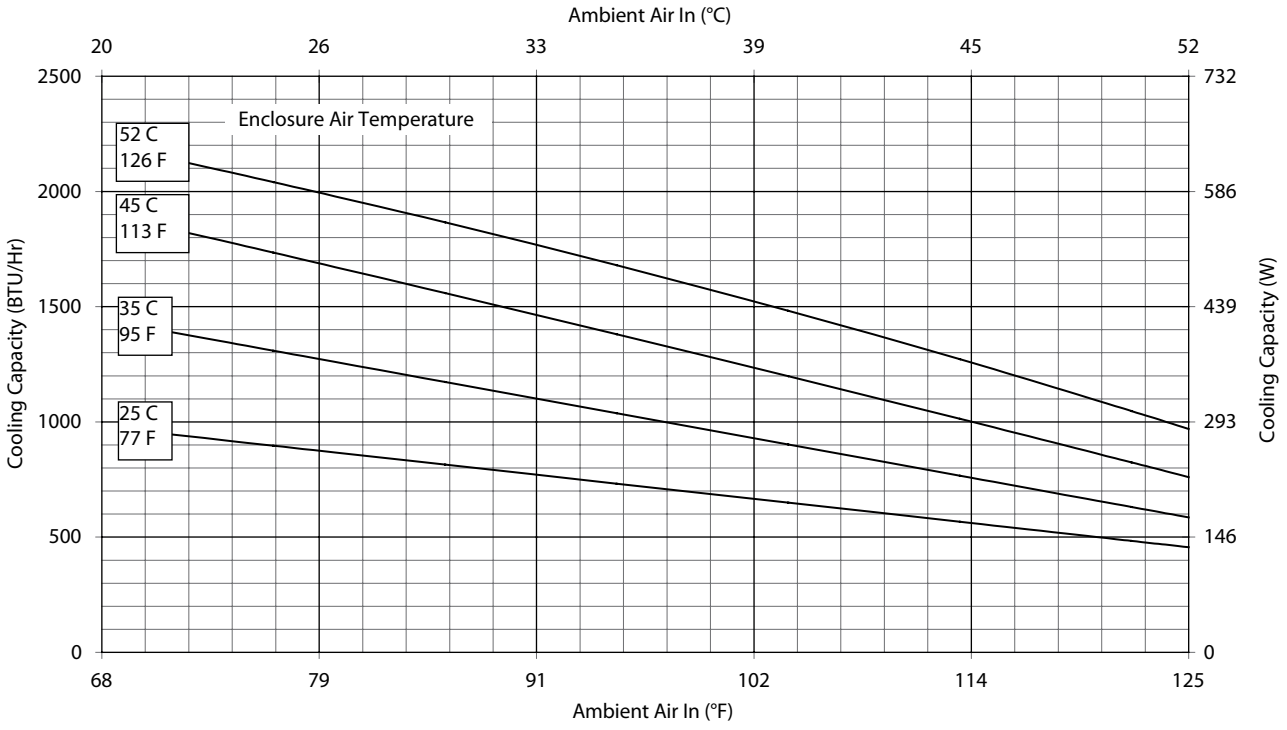


N17-0116-GXXX Capacity Curves at 60 Hz

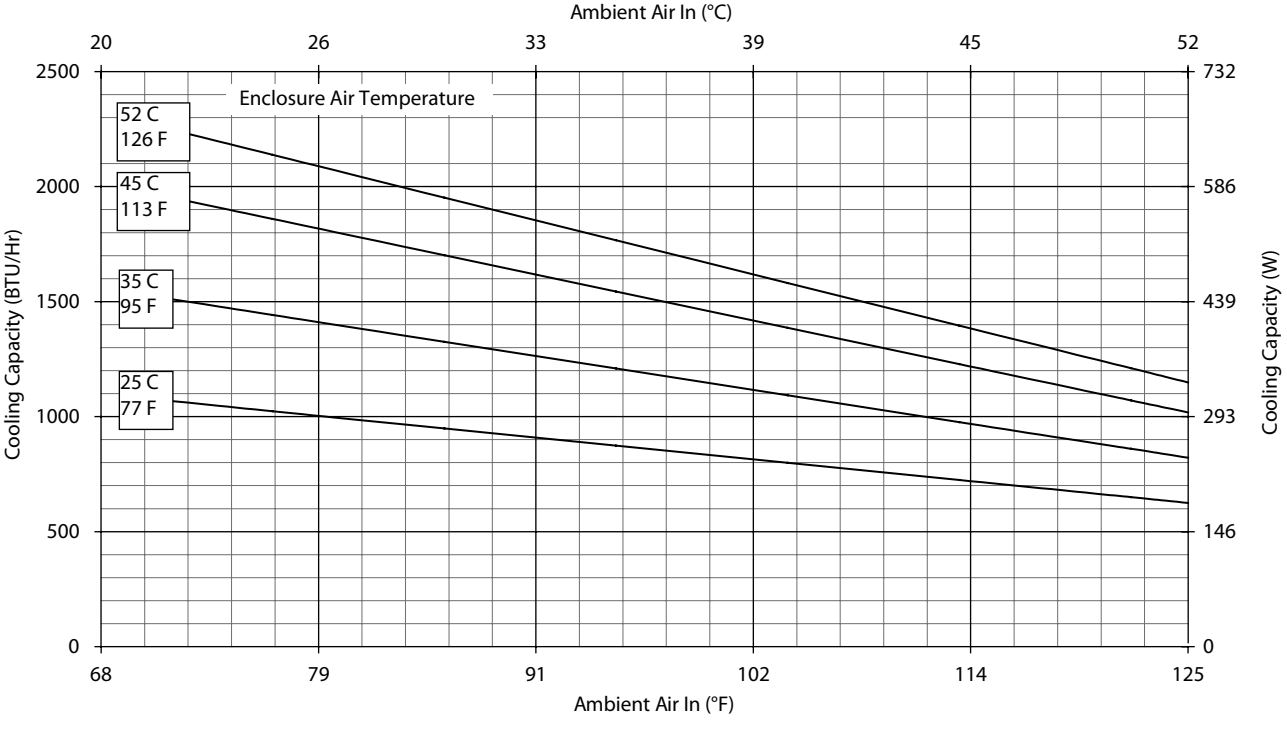


Performance Curves for N17 Models 1000/2000 BTU/Hr. (293/585 Watt)

N17-01(2/4)6-GXXX Capacity Curves at 50 Hz

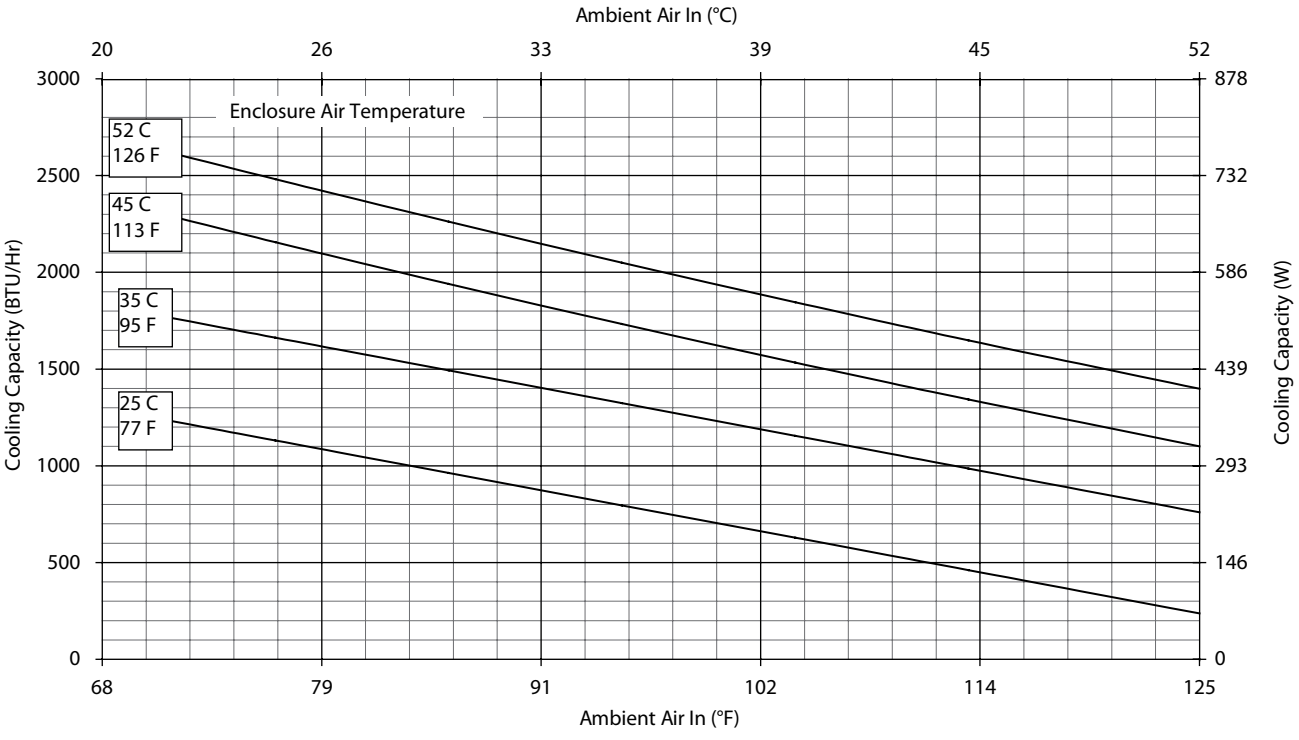


N17-01(2/4)6-GXXX Capacity Curves at 60 Hz

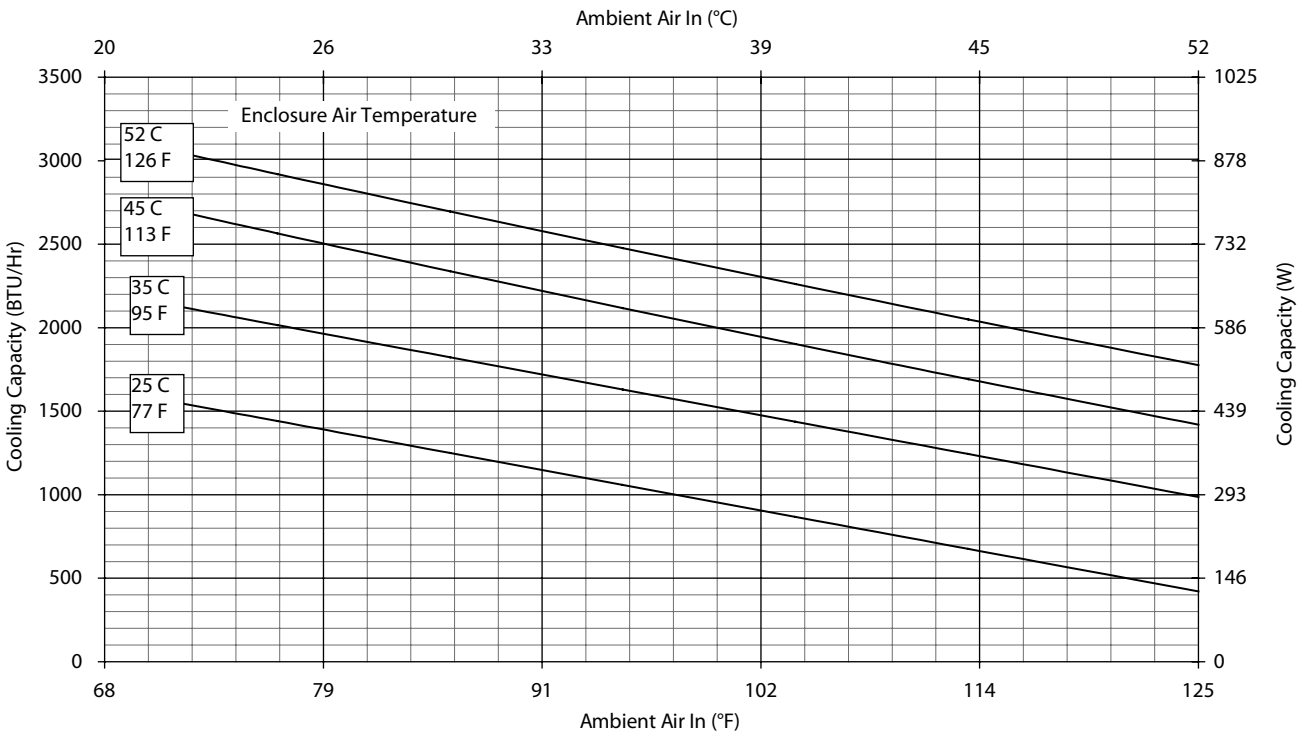


Performance Curves for N17 Models 1000 BTU/Hr. (293 Watt)

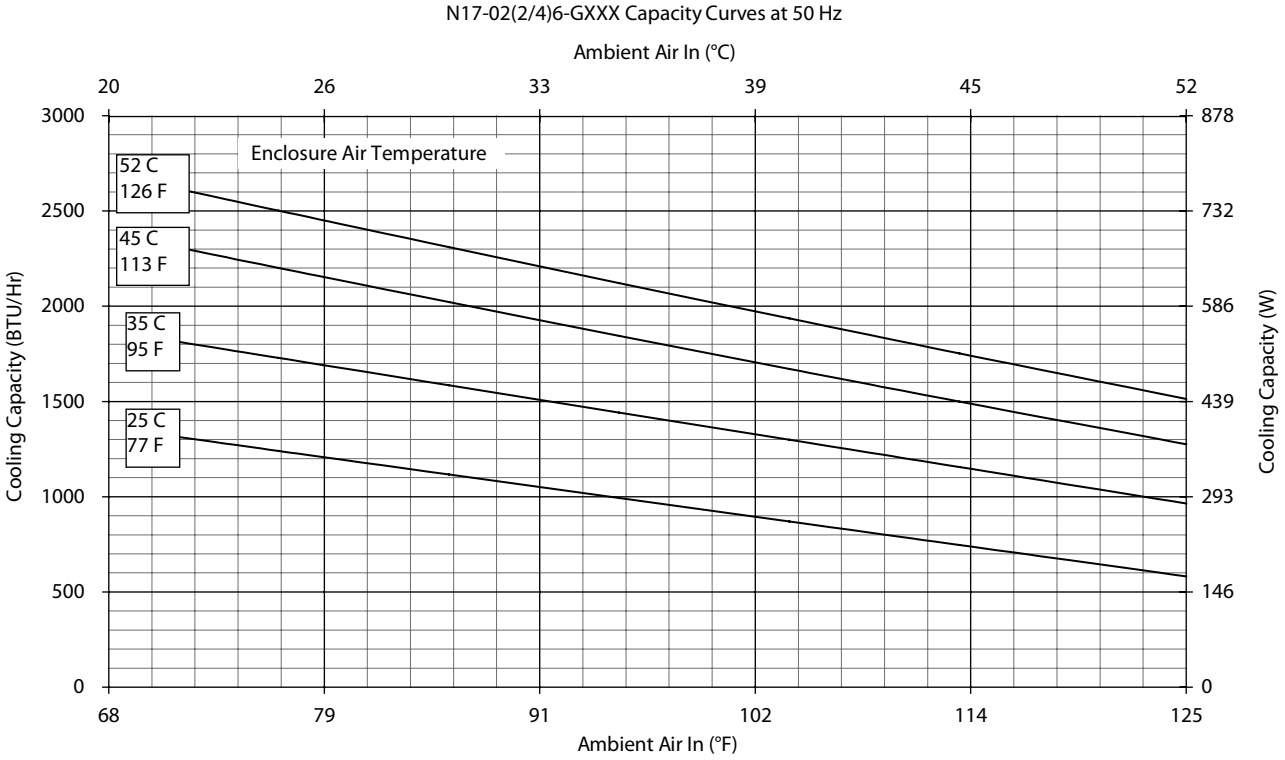
N17-0216-GXXX Capacity Curves at 50 Hz

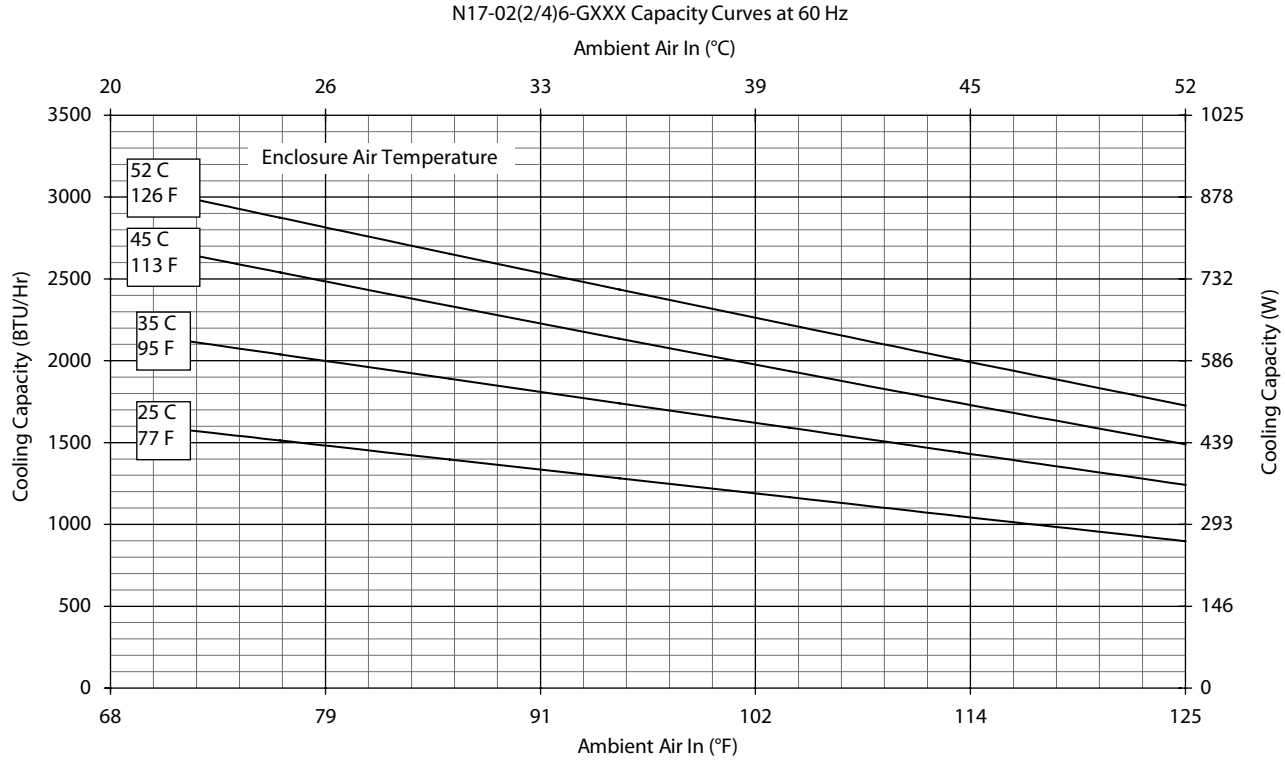


N17-0216-GXXX Capacity Curves at 60 Hz

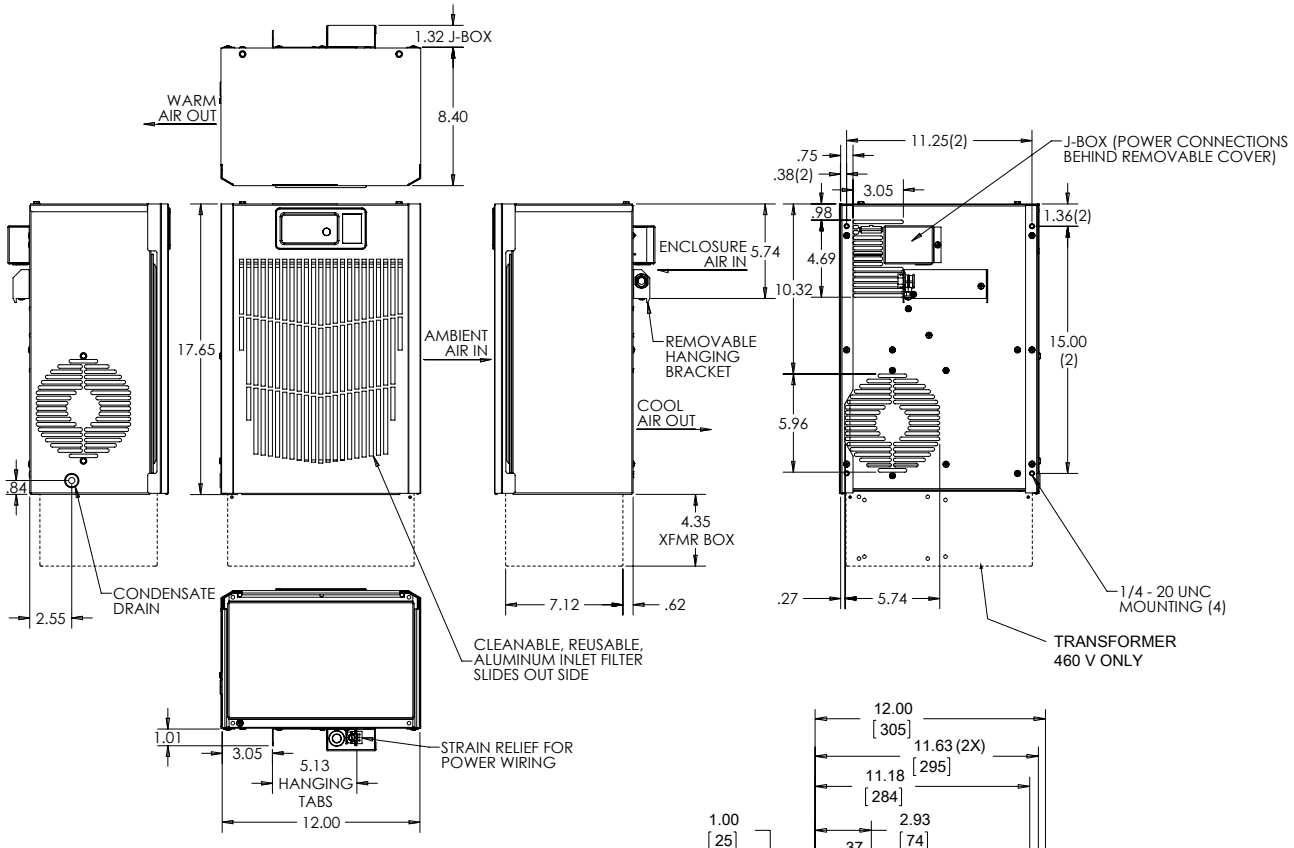


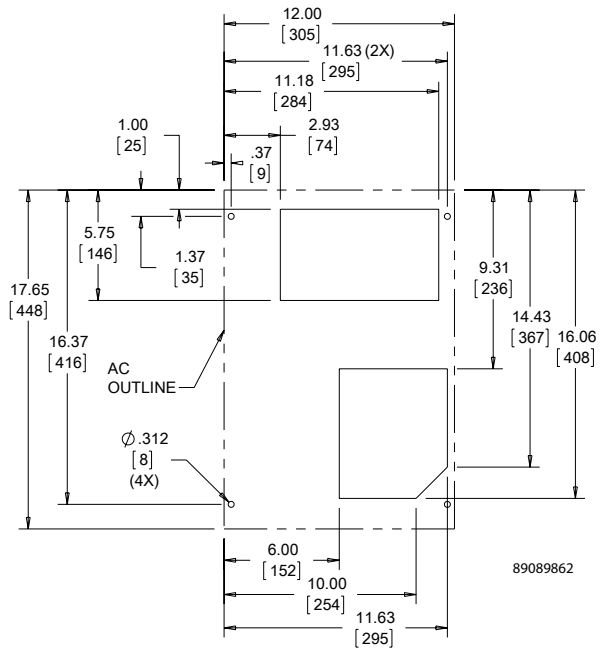
Performance Curves for N17 Models 1000/2000 BTU/Hr. (293/585 Watt)





N17 Models 1000/1800 BTU/Hr. (300/527 Watt)



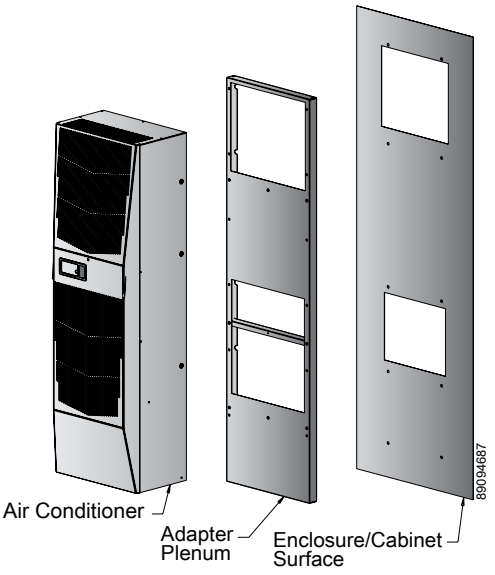


Cutout Dimensions

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Notes

EASY SWAP ADAPTOR PLENUMS FOR AIR CONDITIONERS



3

INDUSTRY STANDARDS

Maintains NEMA Type 12 rating when properly installed on a Type 12 enclosure.
NEMA Type 12
IP 54

APPLICATION

When existing air conditioners are damaged or have reached end-of-life, EASY SWAP Adaptor Plenums provide a quick and easy means for attaching newer Hoffman® air conditioners to the cut-out left on the enclosure.

FEATURES

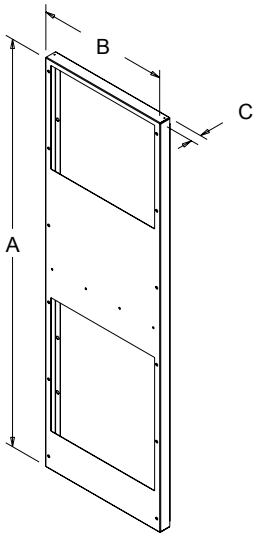
- No modification of the enclosure required - designed to match the enclosure cut-out and mounting holes of the air conditioner being replaced
- Plenum design allows for optimum air flow (vs. a flat plate that can block the air intake and air outtake left by the older air conditioner)
- Gasket included

SPECIFICATIONS

- 18 gauge steel

FINISH

- Painted to match the standard Hoffman air conditioner color (light gray)
- Other colors available upon request



EASY SWAP Adaptor Plenum Cross Reference

Air Conditioner Manufacturer To Replace	Air Conditioner Series To Replace	Air Conditioner Part Number To Replace	Use This Hoffman Air Conditioner Catalog Number	With This Adaptor Plenum Catalog Number	Adaptor Plenum Dimensions AxBxC* (in./mm)
Hoffman/McLean	Genesis	M130116G014	**N170116G010**	**PLM13N17**	17.65x14.25x1.50 448x362x38
Hoffman/McLean	Genesis	M130126G1008	**N170126G010**	**PLM13N17**	17.65x14.25x1.50 448x362x38
Hoffman/McLean	Genesis	M130146G1400	**N170146G010**	**PLM13N17**	17.65x14.25x1.50 448x362x38
Hoffman/McLean	Genesis	M170216G009	**N170216G010**	Not Required	---
Hoffman/McLean	Genesis	M170226G004	**N170226G010**	Not Required	---
Hoffman/McLean	Genesis	M170246G400	**N170246G010**	Not Required	---
Hoffman/McLean	Genesis	M280216G013	**N170216G010**	**PLM28N17**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	Genesis	M280226G004	**N170226G010**	**PLM28N17**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	Genesis	M280246G400	**N170246G010**	**PLM28N17**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	Genesis	M280416G007	**G280416G050**	**PLM28G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	Genesis	M280426G032	**G280426G050**	**PLM28G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	Genesis	M280446G400	**G280446G050**	**PLM28G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	Genesis	M280616G005	**G280616G050**	**PLM28G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	Genesis	M280626G005	**G280626G050**	**PLM28G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	Genesis	M280646G400	**G280646G050**	**PLM28G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	Genesis	M330416G010	**N280416G050**	**PLM33N28**	34.31x12.00x1.50 871x305x38
Hoffman/McLean	Genesis	M330426G009	**N280426G050**	**PLM33N28**	34.31x12.00x1.50 871x305x38
Hoffman/McLean	Genesis	M330446G400	**N280446G050**	**PLM33N28**	34.31x12.00x1.50 871x305x38
Hoffman/McLean	Genesis	M360616G307	**N360616G050**	**PLM36N36**	38.75x15.00x1.50 984x381x38
Hoffman/McLean	Genesis	M360626G306	**N360626G050**	**PLM36N36**	38.75x15.00x1.50 984x381x38
Hoffman/McLean	Genesis	M360646G400	**N360646G050**	**PLM36N36**	38.75x15.00x1.50 984x381x38
Hoffman/McLean	Genesis	M520816032	**G520816G050**	**PLM52G52**	52.56x17.03x1.50 1335x433x38
Hoffman/McLean	Genesis	M520826015	**G520826G050**	**PLM52G52**	52.56x17.03x1.50 1335x433x38
Hoffman/McLean	Genesis	M520846G002	**G520846G050**	**PLM52G52**	52.56x17.03x1.50 1335x433x38
Hoffman/McLean	Genesis	M521046G002	**G521246G050**	**PLM52G52**	52.56x17.03x1.50 1335x433x38
Hoffman/McLean	Genesis	M521216017	**G521216G050**	**PLM52G52**	52.56x17.03x1.50 1335x433x38
Hoffman/McLean	Genesis	M521226034	**G521226G050**	**PLM52G52**	52.56x17.03x1.50 1335x433x38
Hoffman/McLean	T-Series	T290416G100	**G280416G050**	**PLT29G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	T-Series	T290416G150	**G280416G150**	**PLT29G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	T-Series	T290426G100	**G280426G050**	**PLT29G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	T-Series	T290426G150	**G280426G150**	**PLT29G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	T-Series	T290446G400	**G280446G050**	**PLT29G28**	28.50x17.00x1.50 724x432x38
Hoffman/McLean	HC52	HC52 SERIES	**G57XXXXXXXX**	**PLHC52G57**	57.60x22.97x1.50 1463x583x38
Hoffman/McLean	HC52	HC52 SERIES	**T53XXXXXXXX**	**PLHC52T53**	52.85x23.00x1.50 1342x584x38

*Prior to ordering, ensure Adaptor Plenum dimensions do not exceed available space on the enclosure mounting surface.
Please contact Customer Service for support in finding an appropriate cross for older Hoffman/McLean models not shown above.

For a list of EASY SWAP Adaptor Plenums to fit other manufacturers' air conditioners, please visit www.hoffmanonline.com

T-SERIES COMPACT OUTDOOR

T15
800 BTU/Hr.
234 Watts

T20
2000 BTU/Hr.
586 Watts

INDUSTRY STANDARDS

UL/cUL Listed; Type 12, 3R, 4; 4X optional; File No. SA6453
UR/cUR Recognized

UR/cUR Recognized on select models, reference performance data tables.
CE
GOST
Telcordia GR-487 capable

APPLICATION

- Industrial automation
- Telecommunications equipment
- Package handling equipment
- Security and defense systems
- And more

FEATURES

- Stock models equipped with head pressure control for low-ambient operation, compressor heater, coated condenser coil, malfunction switch, thermostat and heater package
- R134A earth-friendly refrigerant
- Models for 115, 230 and 460 VAC power input
- UL Listed to save customers time and money with agency approvals (some models UL recognized)
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C
- Exterior and fully recessed mounting options on many models
- Compact footprint to minimize real estate and maximize capacity
- Reliable mechanical thermostat on enclosure side of the unit
- Dual condenser-side air movers for performance redundancy
- Painted galvanized sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cleanable, reusable aluminum mesh filter protects coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Outdoor Air Conditioner models also include:
  - Telcordia GR-487 capable
  - Thermostat
  - Corrosion-resistant components
  - Malfunction switch
  - Compressor heater
  - Head pressure control
  - Enclosure heater

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint
- Other colors and textures available

OPTIONS

- Thermostat Malfunction Package
- Special Voltage Package
- Outdoor Package
- Harsh Environment Package*
- Stainless Steel Package*
- Heater Package

  * PROAIR A/C may be more appropriate. Refer to PROAIR A/C Chapter. Consult the Factory for availability and catalog number.

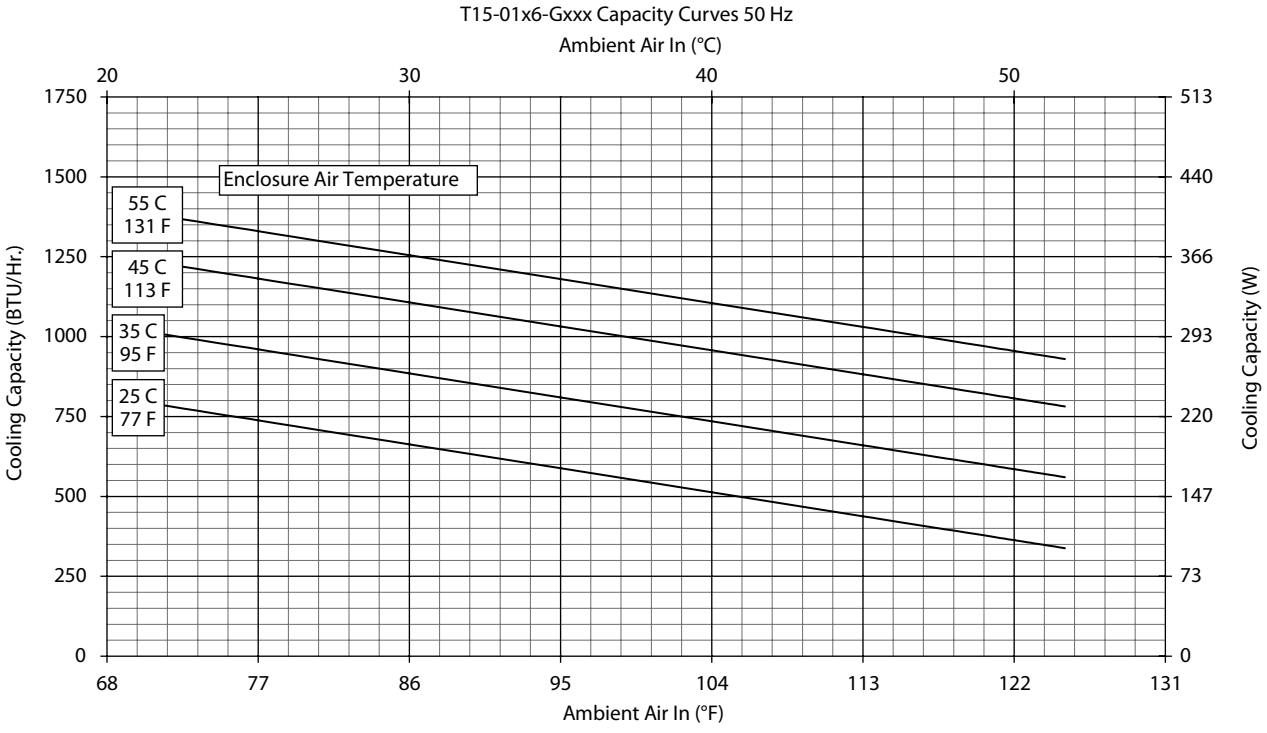
NOTES

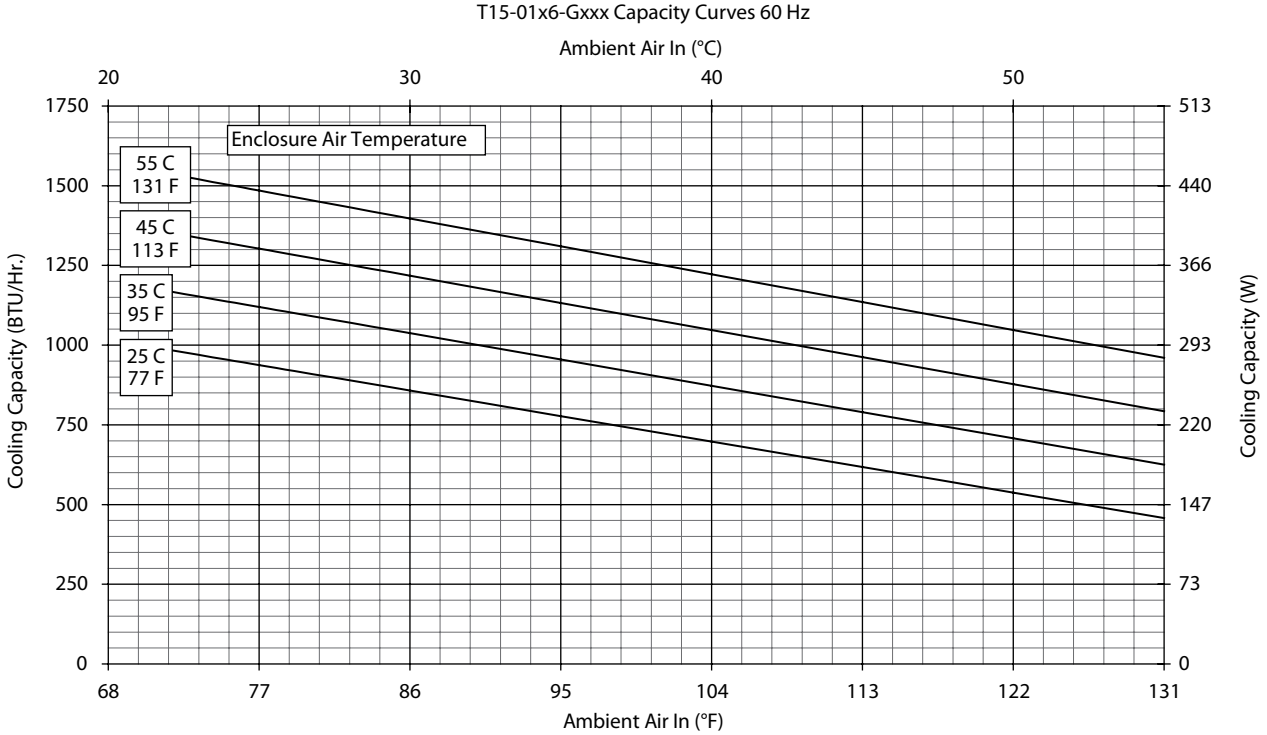
Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **T15 800 BTU/Hr. (234 Watt) Models**

CATALOG NUMBER		
Indoor Model	T150116G120	T150126G120
Outdoor Model without Heat Pkg.	T150116G100	T150126G100
Outdoor Model with Heat Pkg.	T150116G150	T150126G150
Outdoor Model/SST/Corrosion/4X	T150116G152	T150126G104
Outdoor Model/SST/Corrosion/4X/Heater	T150116G151	—
COOLING PERFORMANCE		
Nominal:		
BTU/Hr.	**800/800**	**800/900**
Watts	**235/235**	**235/264**
At 131 F/131 F (55 C/55 C):		
BTU/Hr. (50/60 Hz)	819	920/960
W (50/60 Hz)	240	270/281
At 95 F/95 F (35 C/35 C):		
BTU/Hr. (50 /60 Hz)	948	810/955
W (50/60 Hz)	278	237/280
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	4/113	3.8/107
Operating Temperature Range:		
Maximum (°F/°C)	131/55	125/131/52/55
Minimum (°F/°C)	-40/-40	-40/-40
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	25/42	25/42
External loop 50 Hz (CFM / m^3/hr.)	48/82	48/82
Internal loop 60 Hz (CFM / m^3/hr.)	30/51	30/51
External loop 60 Hz (CFM / m^3/hr.)	53/90	53/90
Max. Heater W (Outdoor Models)	150	150
ELECTRICAL DATA		
Rated Voltage	**100/115**	**220/230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	360/403	330/345
Max. Nominal Current (A at 50/60 Hz)	3.6/3.5	1.5/1.5
Starting Current (A)	8.0/9.2	3.3/3.1
Agency Approvals	cUL Listed CE GOST Others available upon request	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional	
CONTROLLER		
Description	Basic mechanical thermostat	
Thermostat Location	Enclosure behind front panel	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	63 dB(A)	
UNIT CONSTRUCTION		
Material	Galvanized sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	15.75/400	
Width (in./mm)	7.5/191	
Depth (in./mm)	6.3/160	
Weight (lb./kg)	27/12	

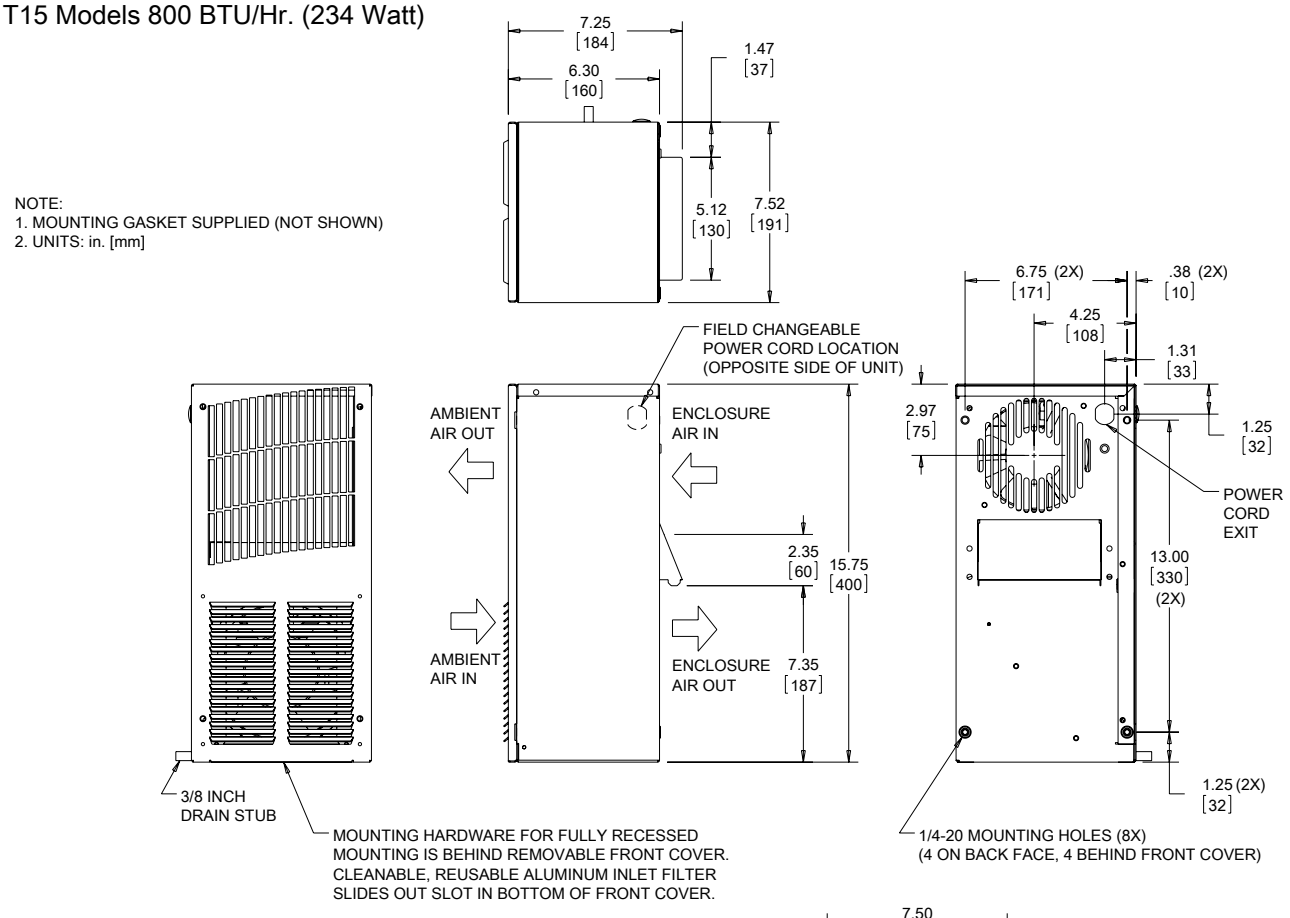
Performance Curves for T15 Models 800 BTU/Hr. (234 Watt)

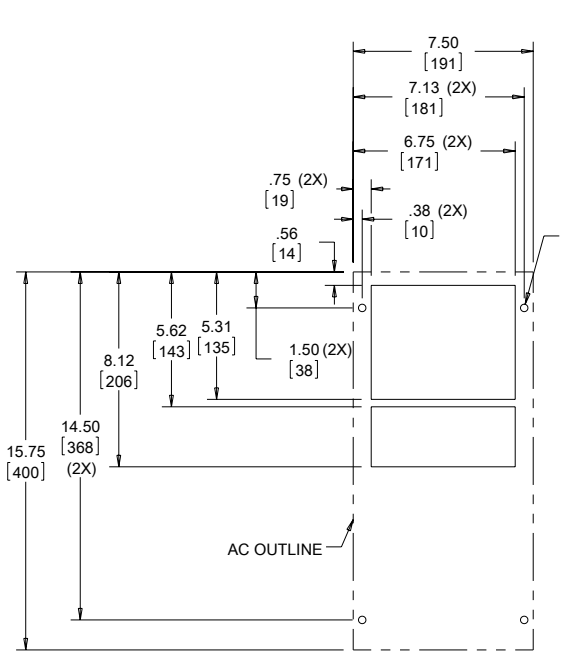




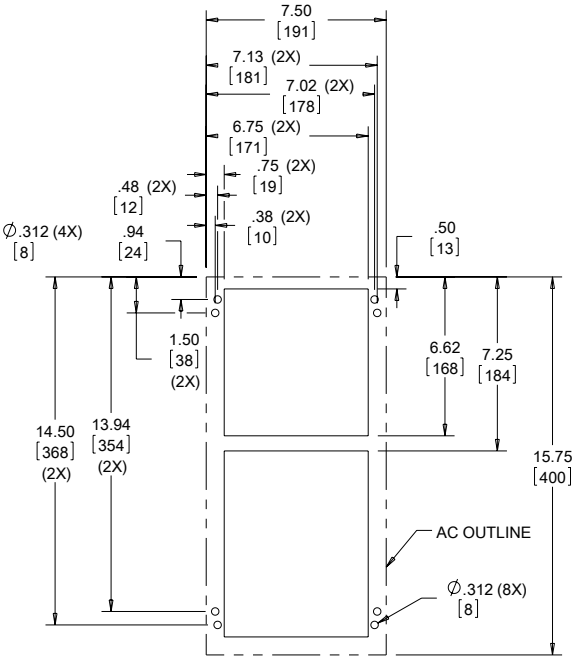
T15 Models 800 BTU/Hr. (234 Watt)

NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]





Cutout Dimensions (Externally Mounted)



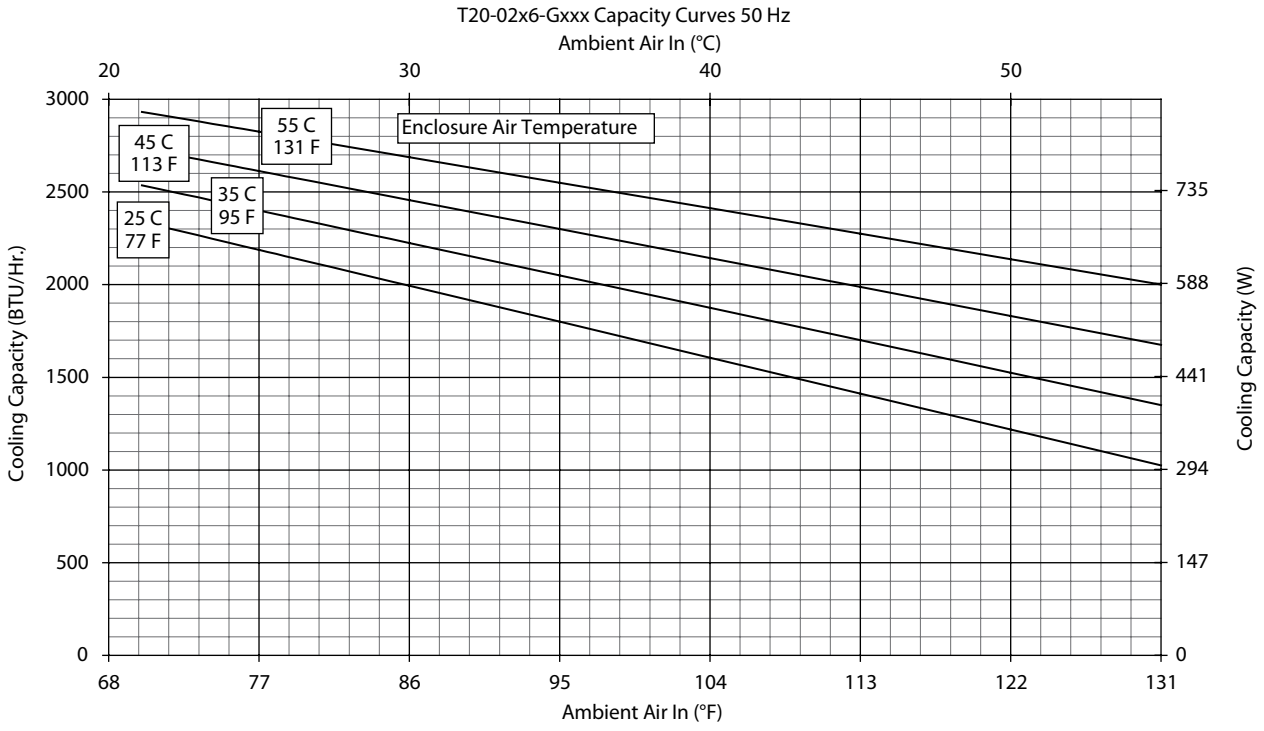
Cutout Dimensions (Internally Mounted)

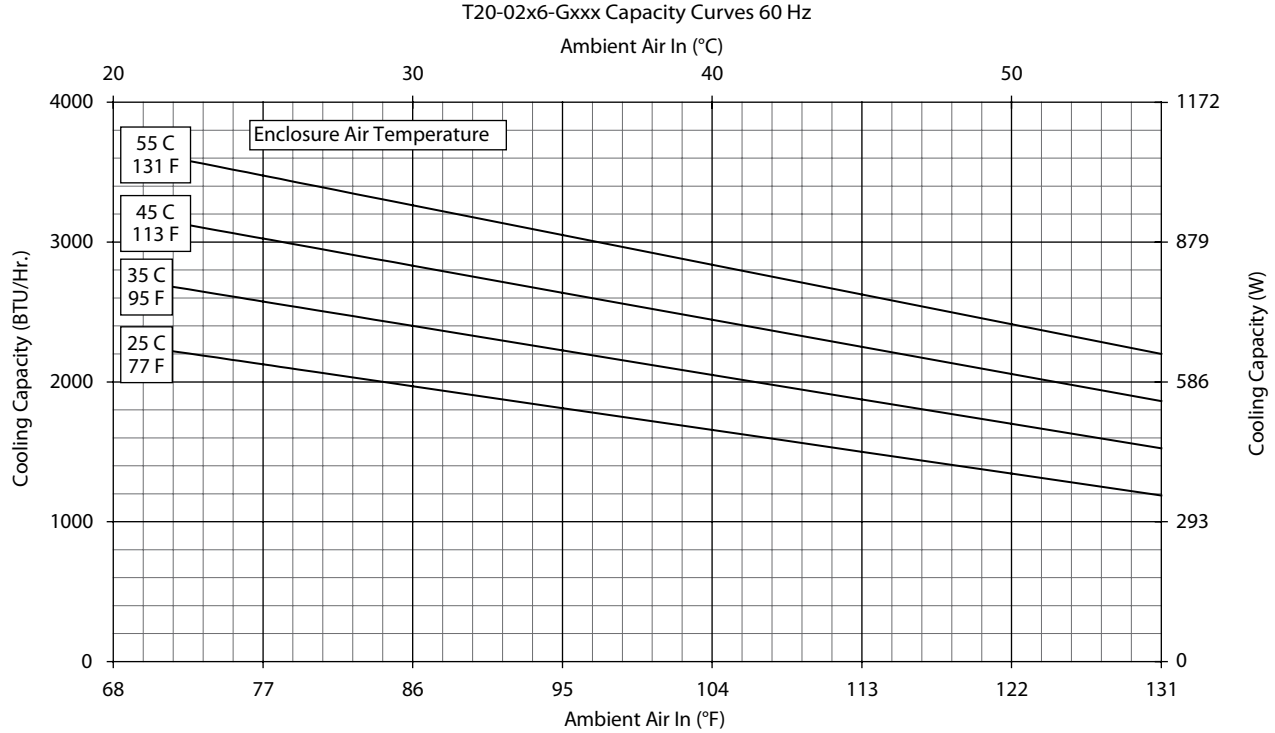
Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **T20 2000 BTU/Hr. (586 Watt) Models**

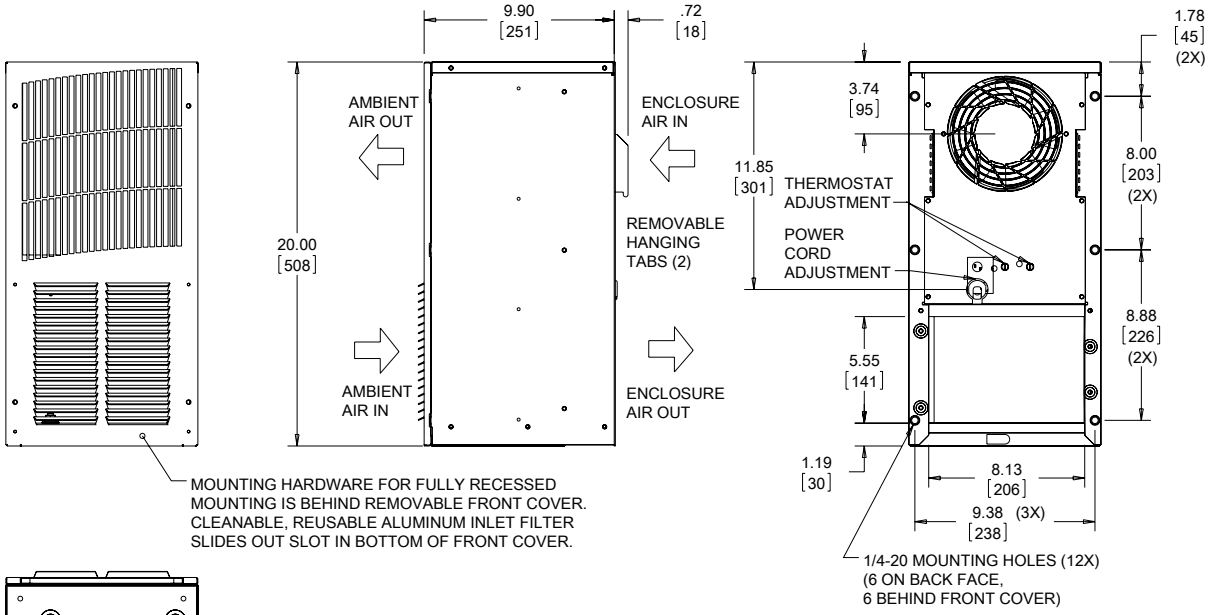
CATALOG NUMBER			
Outdoor Model without Heat Pkg.	T200216G100	T200226G100	T200246G400
Outdoor Model with Heat Pkg.	T200216G150	T200226G150	—
Outdoor Model/SST/Corrosion/4X	T200216G155	T200226G103	T200246G401
Outdoor Model/SST/Corrosion/4X/Heater	T200216G157	T200226G158	—
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**1800/2000**	**1800/2000**	**1800/2000**
Watts	**528/586**	**528/586**	**528/586**
At 131 F/131 F (55 C/55 C):			
BTU/Hr. (50/60 Hz)	2000/2175	2000/2175	2000/2175
W (50/60 Hz)	586/637	586/637	586/637
At 95 F/95 F (35 C/35 C):			
BTU/Hr. (50/60 Hz)	1950/2200	1950/2200	1950/2200
W (50/60 Hz)	571/645	571/645	571/645
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	6.7/190	6.7/190	6.7/190
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / m^3/hr.)	77/131	77/131	77/131
External loop 50 Hz (CFM / m^3/hr.)	150/255	150/255	150/255
Internal loop 60 Hz (CFM / m^3/hr.)	91/155	91/155	91/155
External loop 60 Hz (CFM / m^3/hr.)	165/280	165/280	165/280
Max. Heater W (Outdoor Models)	500	500	500
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	700/805	805	874
Max. Nominal Current (A at 50/60 Hz)	7.0/7.0	3.5/3.5	1.9
Starting Current (A)	28	14.4	7.2
Agency Approvals	cUL Listed CE GOST Others available upon request		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional		
CONTROLLER			
Description	Basic mechanical thermostat		
Thermostat Location	Enclosure side on all base models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	66 dB(A)		
UNIT CONSTRUCTION			
Material	Galvanized sheet metal standard Stainless steel optional		
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		
UNIT DIMENSIONS			
Height (in./mm)	20/508	20/508	24.25/615.95
Width (in./mm)	10/254	10/254	10/254
Depth (in./mm)	9.9/251	9.9/251	9.9/251
Weight (lb./kg)	56/25	56/25	66/30

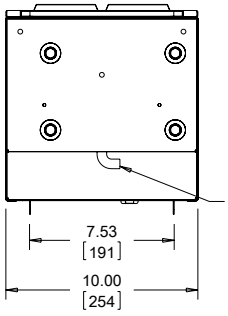
Performance Curves for T20 Models 2000 BTU/Hr. (586 Watt)



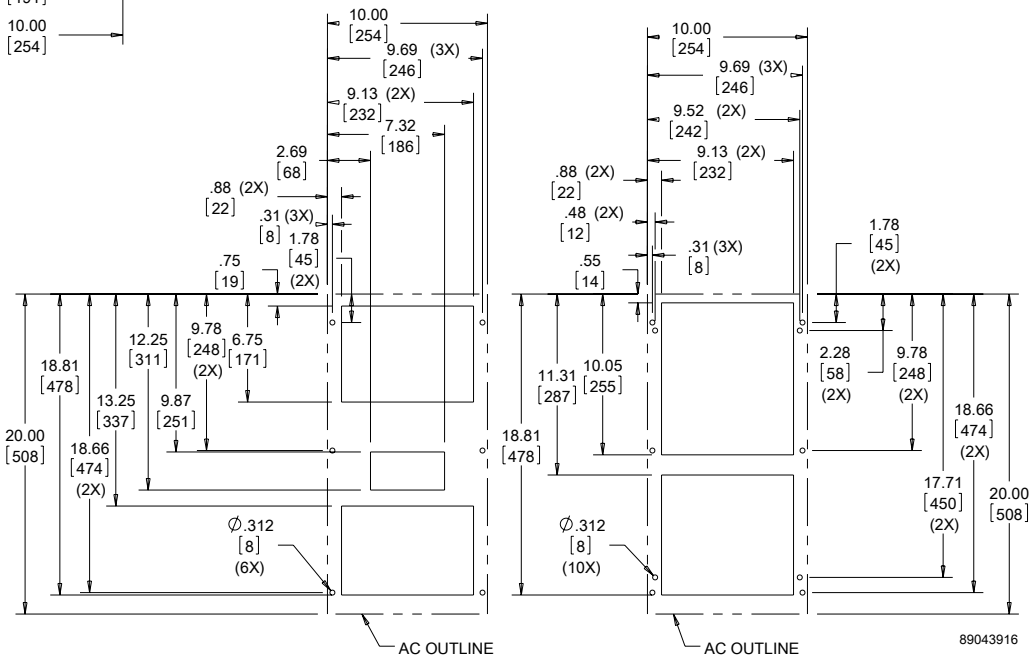


T20 Models 2000 BTU/Hr. (586 Watt)





NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]



Cutout Dimensions (Externally Mounted)

Cutout Dimensions (Internally Mounted)

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Notes

T-SERIES MID-SIZE OUTDOOR

T29
4000 BTU/Hr.
1173 Watts

T43
6000, 8000, 10000 BTU/Hr.
1758, 2344, 2930 Watts

T50
12000 BTU/Hr.
3516 Watts

T53
19000 BTU/Hr.
5567 Watts

INDUSTRY STANDARDS

UL/cUL Listed; Type 12, 3R, 4; 4X optional; File No. SA6453
UR/cUR Recognized

UR/cUR Recognized on select models, reference performance data tables.
CE
GOST
Telcordia GR-487 capable

APPLICATION

- Industrial automation
- Telecommunications equipment
- Package handling equipment
- Security and defense systems
- And more

FEATURES

- Stock models equipped with head pressure control for low-ambient operation, compressor heater, coated condenser coil, malfunction switch, thermostat and heater package
- R134A or R-407C earth-friendly refrigerant
- Models for 115, 230 and 460 VAC power input
- UL Listed to save customers time and money with agency approvals (some models UL recognized)
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C
- Exterior and fully recessed mounting options on many models
- Compact footprint to minimize real estate and maximize capacity
- Reliable mechanical thermostat on enclosure side of the unit
- Dual condenser-side air movers for performance redundancy
- Painted galvanized sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cleanable, reusable aluminum mesh filter protects coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Outdoor Air Conditioner models also include:
  - Telcordia GR-487 capable
  - Thermostat
  - Corrosion-resistant components
  - Malfunction switch
  - Compressor heater
  - Head pressure control
  - Enclosure heater

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint
- Other colors and textures available

OPTIONS

- Thermostat Malfunction Package
- Special Voltage Package
- Outdoor Package
- Harsh Environment Package*
- Stainless Steel Package*
- Heater Package

* PROAIR Harsh Environment air conditioner may be more appropriate. Refer to PROAIR Harsh Environment air conditioner catalog section. Consult the Factory for availability and catalog number.

NOTES

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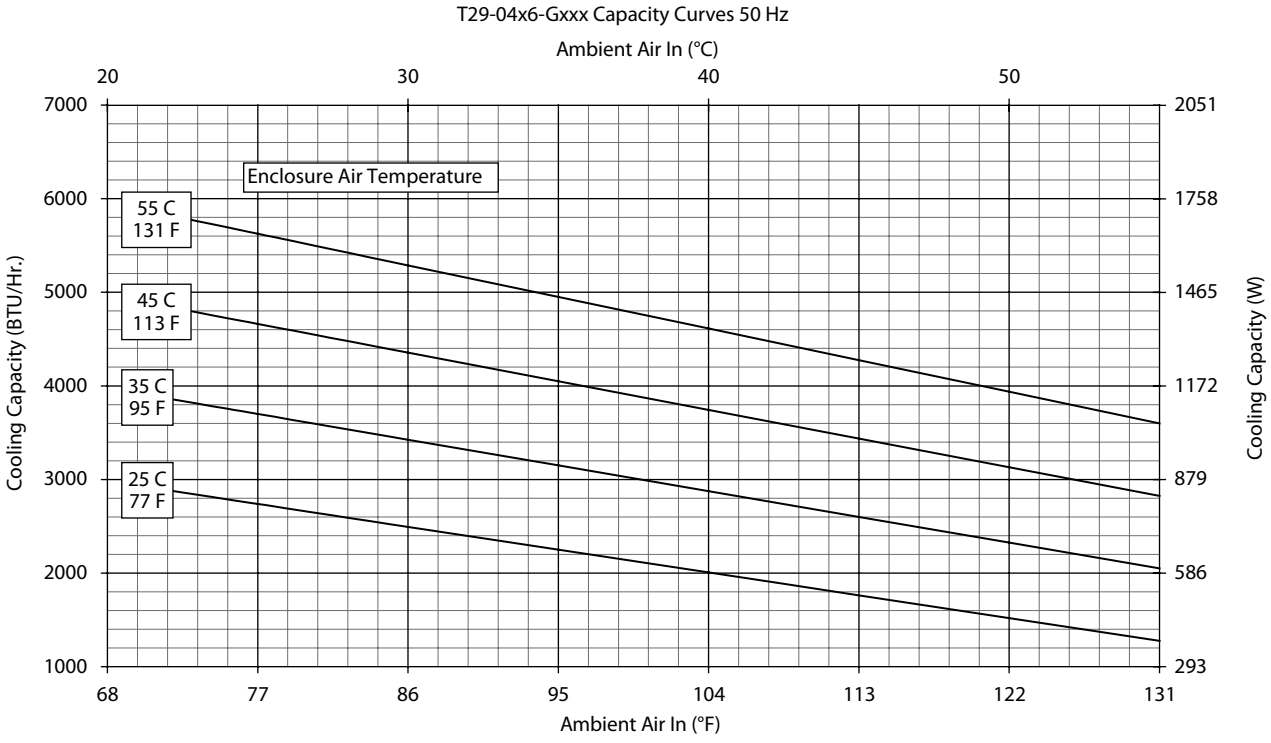
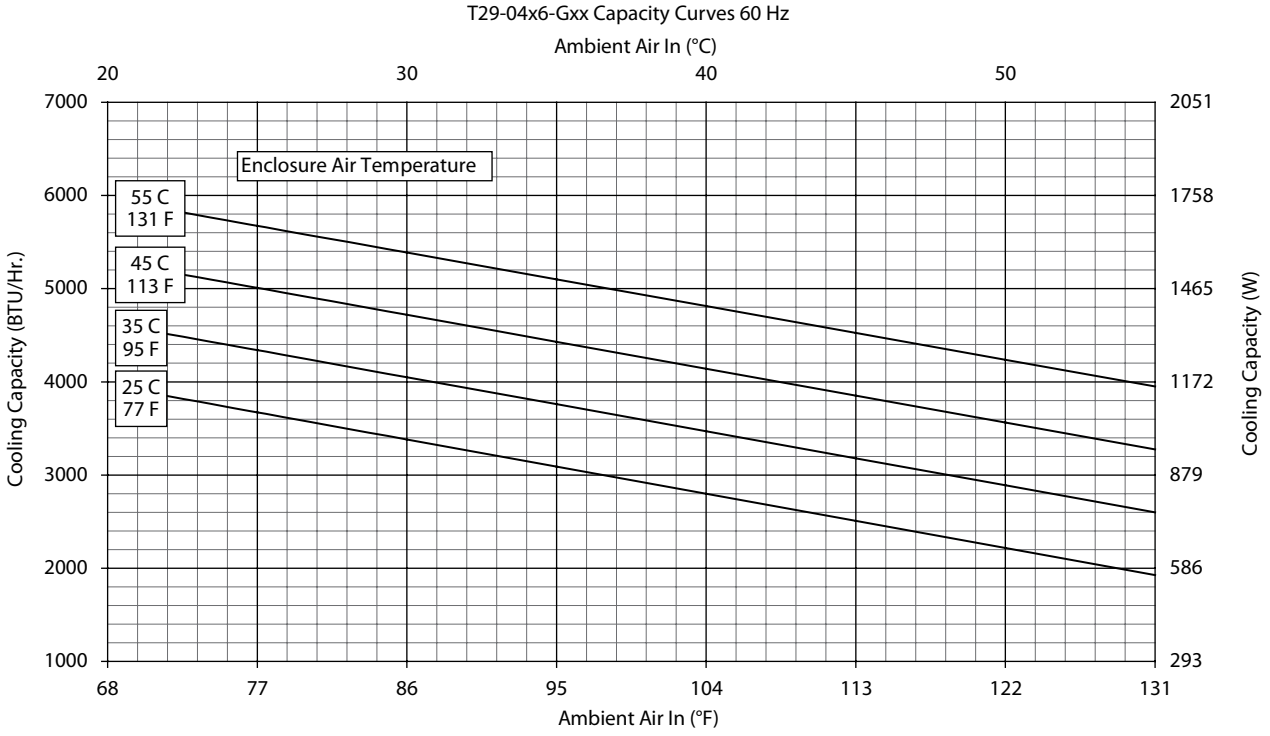
Performance Data **T29 4000 BTU/Hr. (1173 Watt) Models**

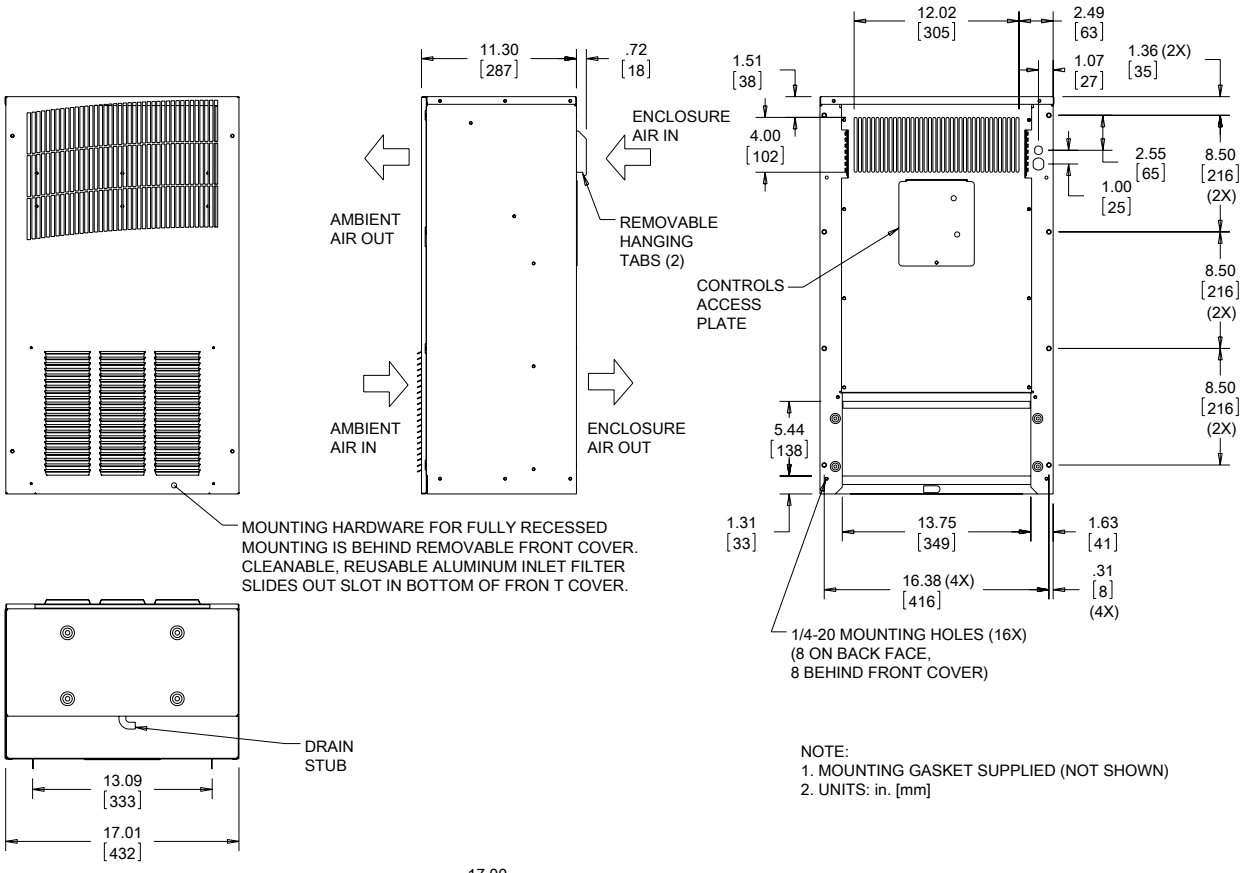
CATALOG NUMBER			
Outdoor Model without Heat Pkg.	T290416G100	T290426G100	T290446G400
Outdoor Model with Heat Pkg.	T290416G150	T290426G150	—
Outdoor Model/SST/Corrosion/4X	T290416G159	T290426G161	—
Outdoor Model/SST/Corrosion/4X/Heater	T290416G156	T290426G160	T290446G403
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**3600/4000**	**3600/4000**	**3600/4000**
Watts	**1055/1172**	**1055/1172**	**1055/1172**
At 131 F/131 F (55 C/55 C):			
BTU/Hr. (50/60 Hz)	3950/4250	3950/4250	3950/4250
W (50/60 Hz)	1157/1245	1157/1245	1157/1245
At 95 F/95 F (35 C/35 C):			
BTU/Hr. (50 /60 Hz)	3500/3900	3500/3900	3500/3900
W (50/60 Hz)	1025/1143	1025/1143	1025/1143
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	12.5/354	14.3/404	14.3/404
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / m^3/hr.)	172/292	172/292	172/292
External loop 50 Hz (CFM / m^3/hr.)	195/331	195/331	195/331
Internal loop 60 Hz (CFM / m^3/hr.)	205/348	205/348	205/348
External loop 60 Hz (CFM / m^3/hr.)	235/399	235/399	235/399
Max. Heater W (Outdoor Models)	1000	1000	
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1163/1222	1587/1564	1748
Max. Nominal Current (A at 50/60 Hz)	13.8/12.8	6.9/6.8	3.8
Starting Current ()	48	23	12
Agency Approvals	cUL Listed CE GOST Others available upon request		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-20 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional		
CONTROLLER			
Description	Basic mechanical thermostat		
Thermostat Location	Enclosure side on all base models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	67 dB(A)		
UNIT CONSTRUCTION			
Material	Galvanized sheet metal standard Stainless steel optional		
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		
UNIT DIMENSIONS			
Height (in./mm)	29/737		29/737
Width (in./mm)	17/432		17/432
Depth (in./mm)	11.3/287		11.3/287
Weight (lb./kg)	107/48.6		127/58

Performance Curves for T29 Models 4000 BTU/Hr. (1173 Watt)

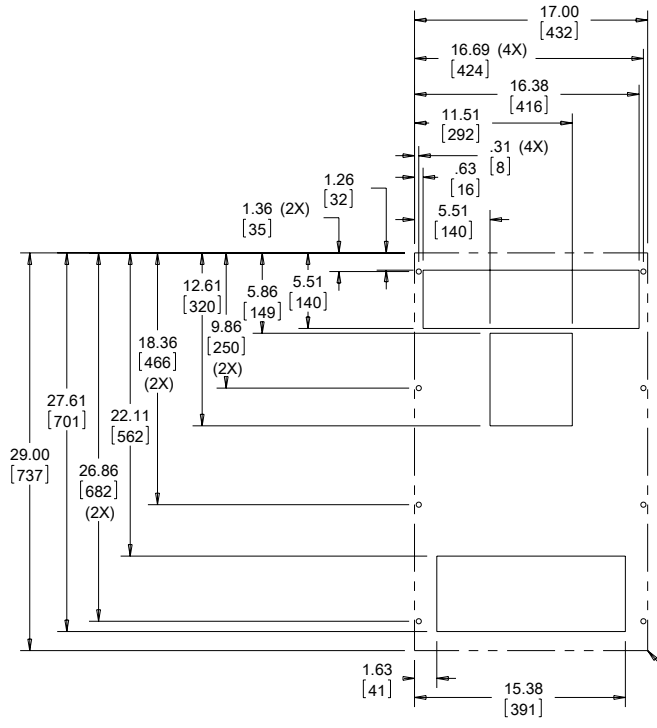




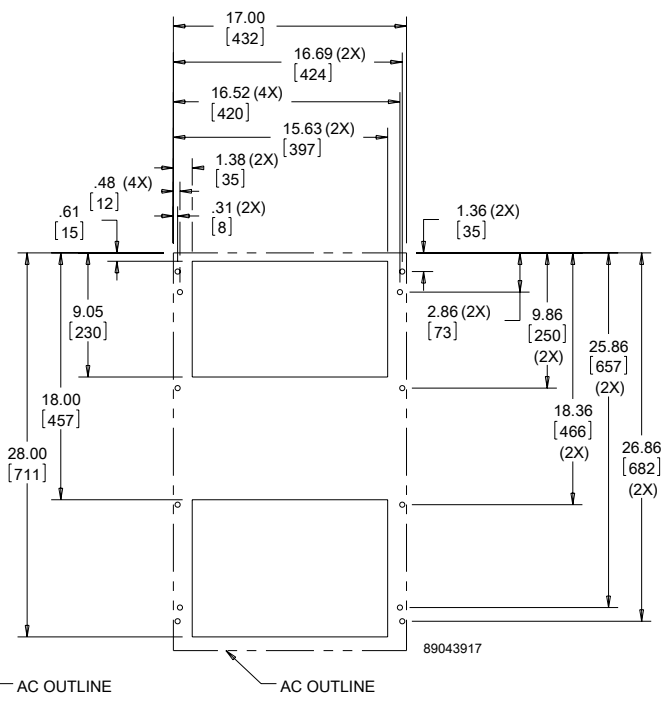
T29 Models 4000 BTU/Hr. (1173 Watt)



NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]



Cutout Dimensions
(Externally Mounted)



Cutout Dimensions
(Internally Mounted)

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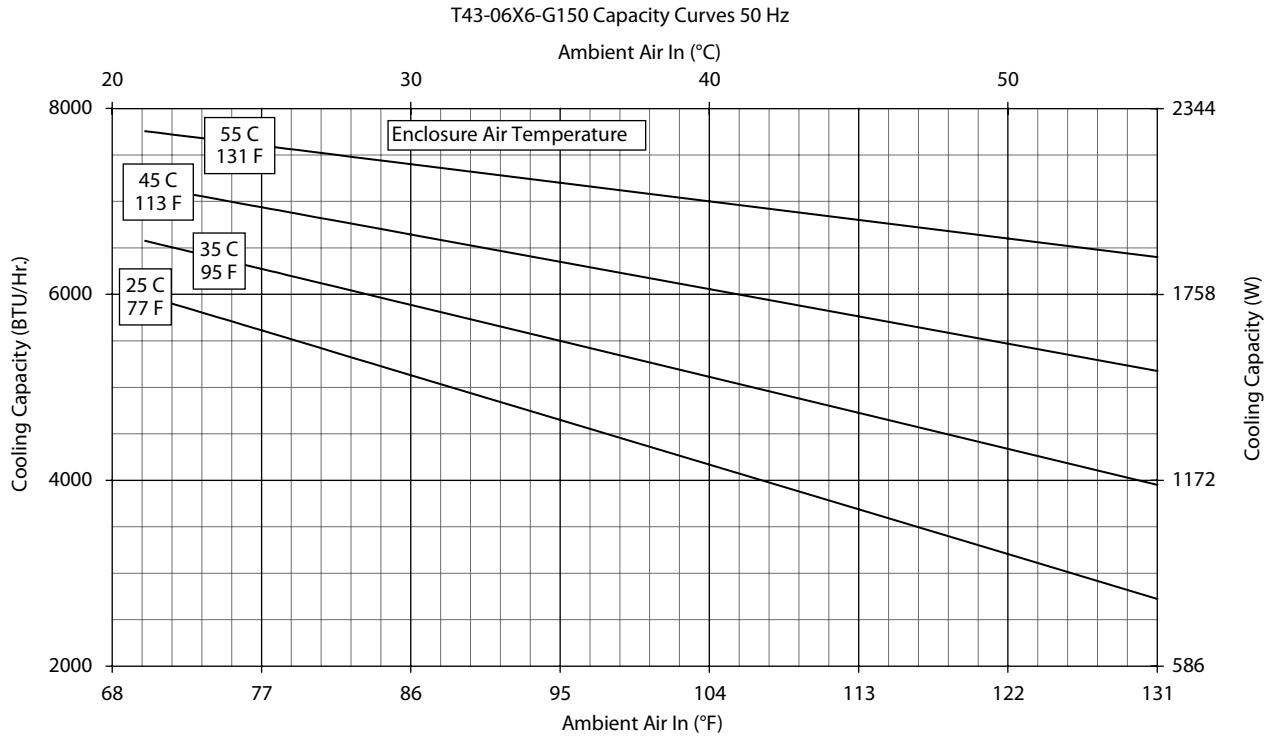
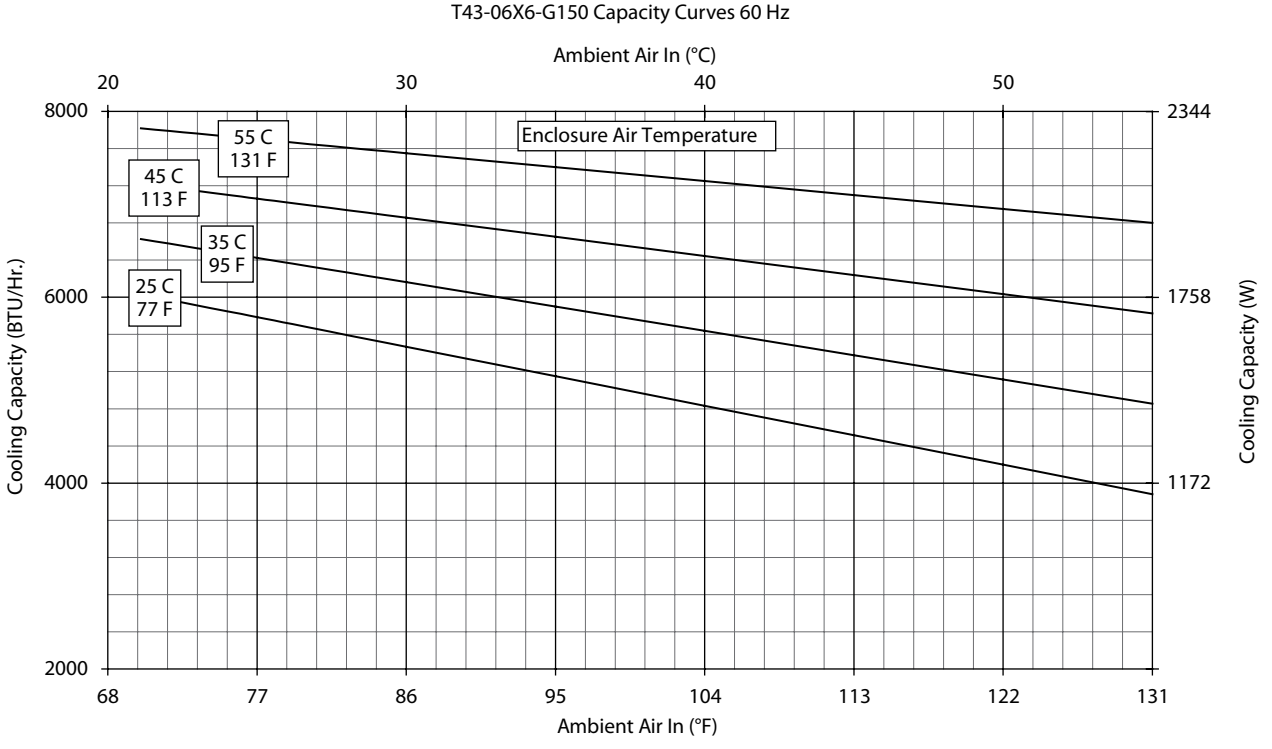
Performance Data **T43 6000 BTU/Hr. (1758 Watt) Models**

CATALOG NUMBER			
Outdoor Model without Heat Pkg.	T430616G100	T430626G100	T430646G400
Outdoor Model with Heat Pkg.	T430616G150	T430626G150	T430646G153
Outdoor Model/SST/Corrosion/4X	T430616G102	T430626G159	—
Outdoor Model/SST/Corrosion/4X/Heater	—	—	—
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**6310/6680**	**6520/6770**	**6520/6770**
Watts	**1848/1958**	**1910/1985**	**1910/1985**
At 131 F/131 F (55 C/55 C):			
BTU/Hr. (50/60 Hz)	6400/6680	6520/6774	6520/6774
W (50/60 Hz)	1875/1957	1910/1985	1910/1985
At 95 F/95 F (35 C/35 C):			
BTU/Hr. (50 /60 Hz)	5500/5900	5461/5846	5461/5846
W (50/60 Hz)	1611/1729	1600/1713	1600/1713
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	30/850	30/850	30/850
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / m^3/hr.)	310/527	310/527	310/527
External loop 50 Hz (CFM / m^3/hr.)	345/586	345/586	345/586
Internal loop 60 Hz (CFM / m^3/hr.)	320/544	320/544	320/544
External loop 60 Hz (CFM / m^3/hr.)	355/603	355/603	355/603
Max. Heater W (Outdoor Models)	1000	1000	N/A
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1058/989	1012/874	1104/966
Max. Nominal Current (A at 50/60 Hz)	9.2/8.6	4.4/3.8	2.4/2.1
Starting Current (A)	57.2	27	14
Agency Approvals	cUL Listed CE GOST Others available upon request		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-20 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional		
International Rating	IP56 on the internal loop; IP34 on the external loop		
CONTROLLER			
Description	Basic mechanical thermostat		
Thermostat Location	Enclosure side on all base models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	65.7 dB(A)		
UNIT CONSTRUCTION			
Material	Galvanized sheet metal standard Stainless steel optional		
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		
UNIT DIMENSIONS			
Height (in./mm)	43/1092		
Width (in./mm)	15.75/400		
Depth (in./mm)	10.9/279		
Weight (lb./kg)	125/57		

Performance Curves for T43 Models 6000 BTU/Hr. (1758 Watt)



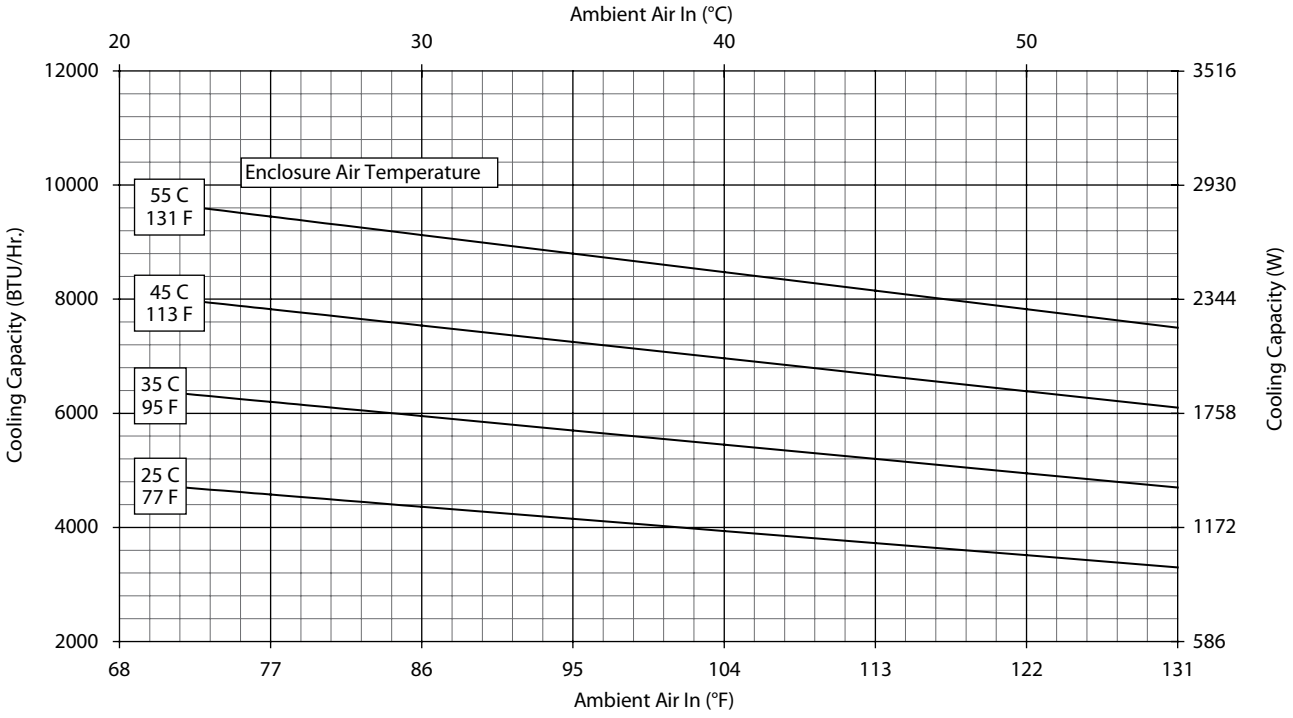


Performance Data **T43 8000 BTU/Hr. (2344 Watt) Models**

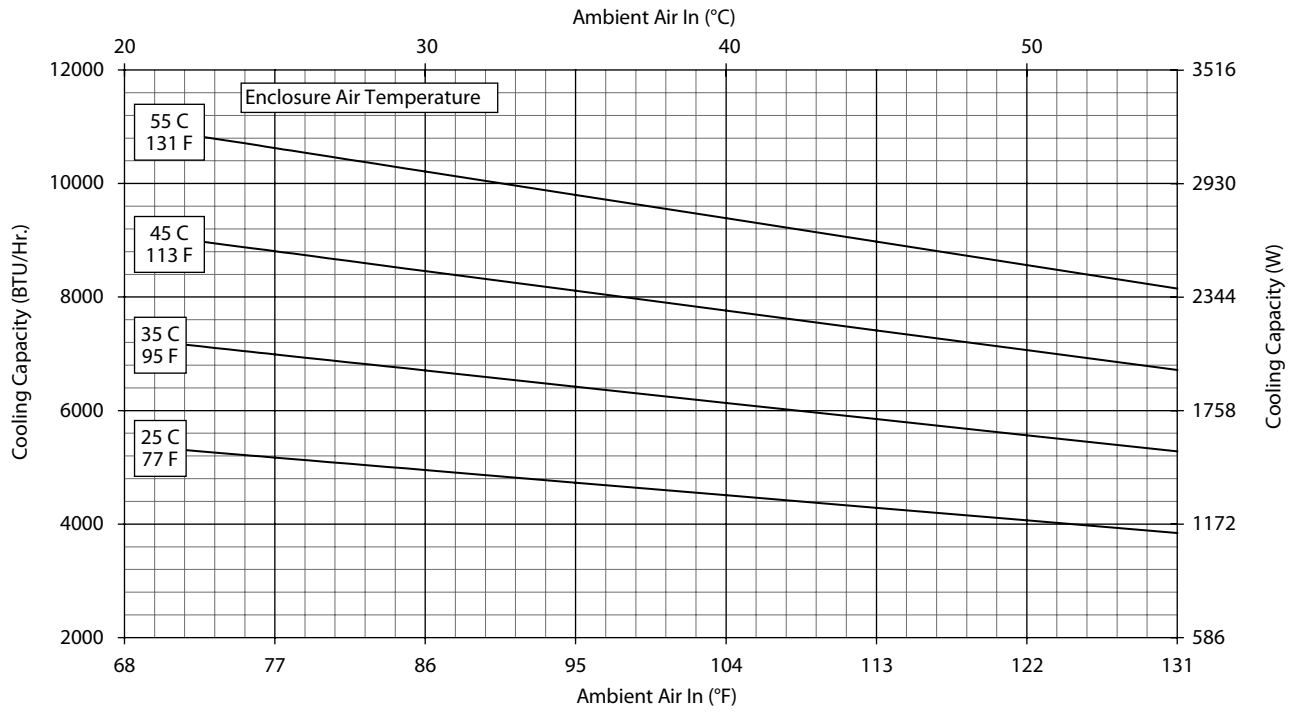
CATALOG NUMBER			
Outdoor Model without Heat Pkg.	T430816G100	T430826G100	T430846G400
Outdoor Model with Heat Pkg.	T430816G150	T430826G150	T430846G403
Outdoor Model/SST/Corrosion/4X	T430816G153	T430826G108	T430846G402
Outdoor Model/SST/Corrosion/4X/Heater	—	—	—
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**7900/8600**	**7400/8200**	**7400/8200**
Watts	**2310/2500**	**2160/2400**	**2160/2400**
At 131 F/131 F (55 C/55 C):			
BTU/Hr. (50/60 Hz)	7937/8629	7484/8215	7484/8215
W (50/60 Hz)	2326/2528	2193/2407	2193/2407
At 95 F/95 F (35 C/35 C):			
BTU/Hr. (50 /60 Hz)	6401/7100	5940/6705	5940/6705
W (50/60 Hz)	1875/2080	1740/1965	1740/1965
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	36/1022	36/1022	36/1022
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / m^3/hr.)	273/464	273/464	273/464
External loop 50 Hz (CFM / m^3/hr.)	310/527	310/527	310/527
Internal loop 60 Hz (CFM / m^3/hr.)	290/493	290/493	290/493
External loop 60 Hz (CFM / m^3/hr.)	315/535	315/535	315/535
Max. Heater W (Outdoor Models)	1000	1000	N/A
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1196/1288	1196/1242	1334/1380
Max. Nominal Current (A at 50/60 Hz)	10.4/11.2	5.2/5.4	2.9/3.0
Starting Current (A)	48.3	27	14
Agency Approvals	cUL Listed CE GOST Others available upon request		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-20 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional		
International Rating	IP56 on the internal loop; IP34 on the external loop		
CONTROLLER			
Description	Basic mechanical thermostat		
Thermostat Location	Enclosure side on all base models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	65.7 dB(A)		
UNIT CONSTRUCTION			
Material	Galvanized sheet metal standard Stainless steel optional		
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		
UNIT DIMENSIONS			
Height (in./mm)	43/1092		
Width (in./mm)	15.75/400		
Depth (in./mm)	10.9/279		
Weight (lb./kg)	125/57		

Performance Curves for T43 Models 8000 BTU/Hr. (2344 Watt)

T43-08X6-G150 Capacity Curves 50 Hz



T43-08X6-G150 Capacity Curves 60 Hz

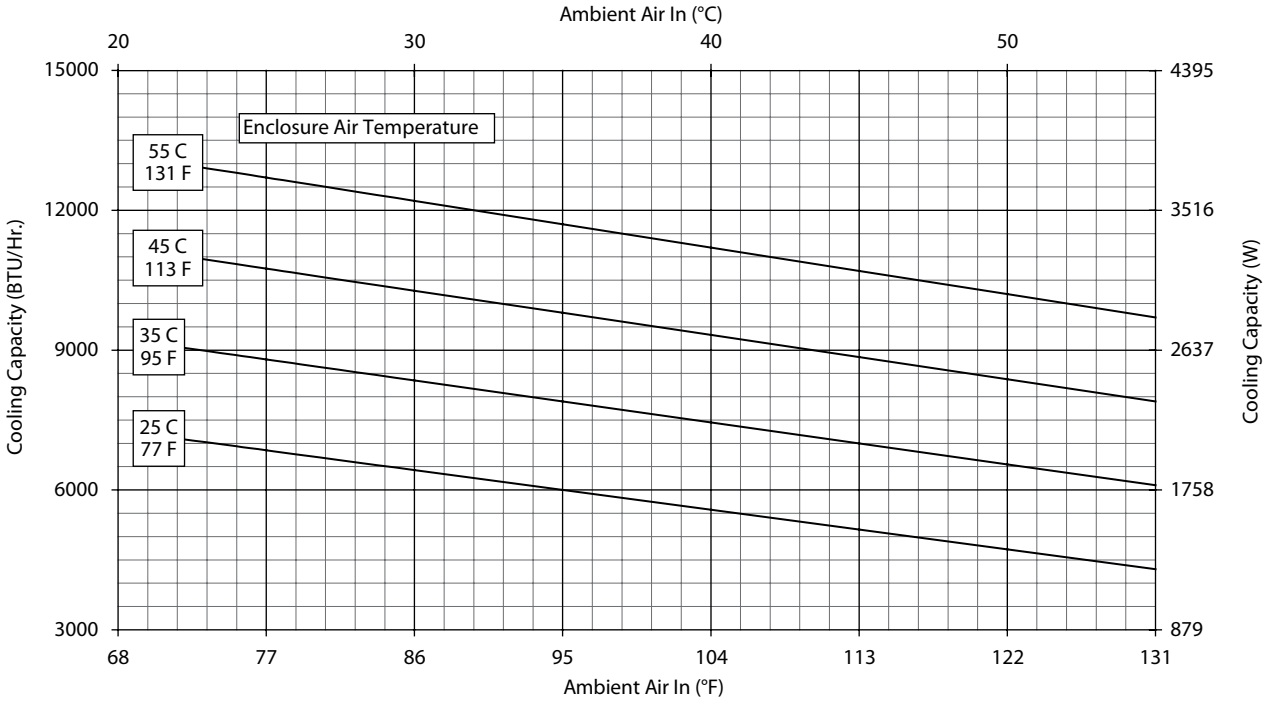


Performance Data **T43 10000 BTU/Hr. (2930 Watt) Models**

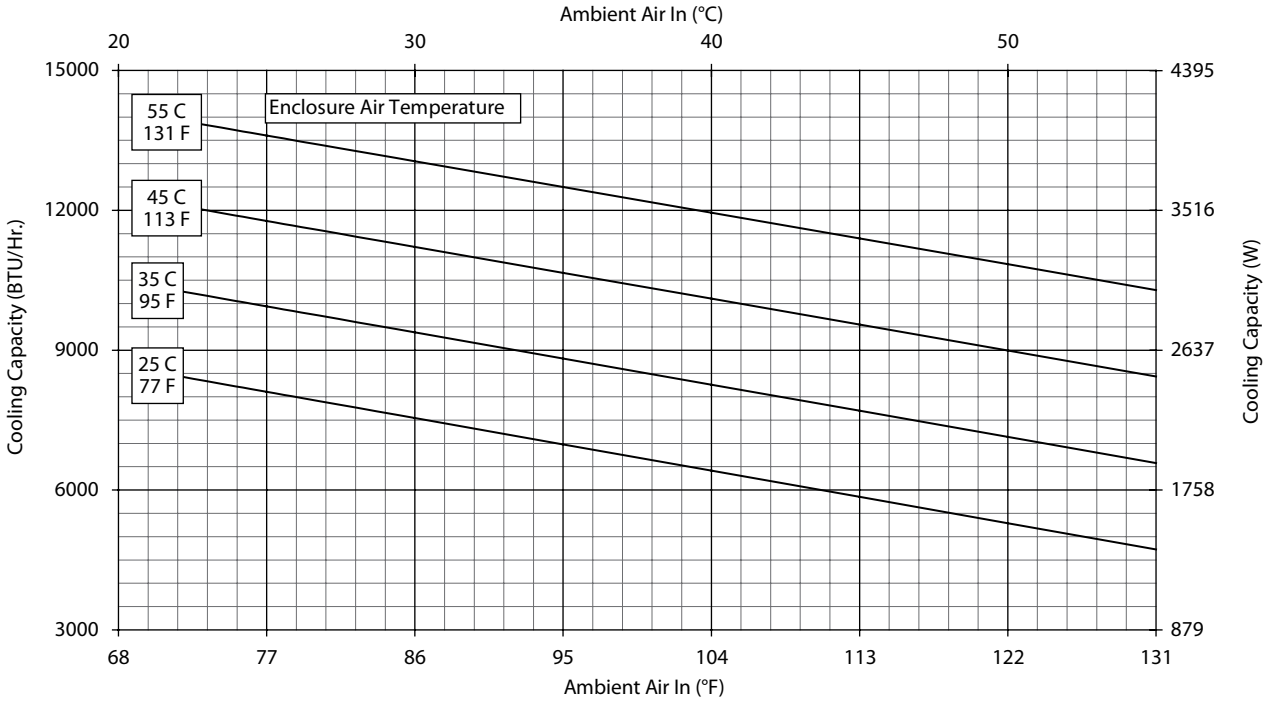
CATALOG NUMBER			
Outdoor Model without Heat Pkg.	T431016G100	T431026G100	T431046G400
Outdoor Model with Heat Pkg.	T431016G150	T431026G150	—
Outdoor Model/SST/Corrosion/4X	T431016G102	T431026G104	T431046G406
Outdoor Model/SST/Corrosion/4X/Heater	T431016G153	T431026G152	—
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**9670/10300**	**10100/10500**	**10100/10500**
Watts	**2831/3016**	**2957/3075**	**2957/3075**
At 131 F/131 F (55 C/55 C):			
BTU/Hr. (50/60 Hz)	9667/10290	10039/10669	10039/10669
W (50/60 Hz)	2832/3015	2941/3126	2941/3126
At 95 F/95 F (35 C/35 C):			
BTU/Hr. (50/60 Hz)	7663/8397	8458/8837	8458/8837
W (50/60 Hz)	2245/2460	2478/2589	2478/2589
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	32/907	32/907	32/907
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / m^3/hr.)	272/462	320/544	320/544
External loop 50 Hz (CFM / m^3/hr.)	510/866	568/965	568/965
Internal loop 60 Hz (CFM / m^3/hr.)	290/493	330/561	330/561
External loop 60 Hz (CFM / m^3/hr.)	565/960	636/1081	636/1081
Max. Heater W (Outdoor Models)	1000	1000	N/A
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1828.5/2288.5	2070	1334/1380
Max. Nominal Current (A at 50/60 Hz)	15.9/19.9	9	5
Starting Current (A)	57	38	20
Agency Approvals	cUL Listed CE GOST Others available upon request		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-30 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional		
International Rating	IP56 on the internal loop; IP34 on the external loop		
CONTROLLER			
Description	Basic mechanical thermostat		
Thermostat Location	Enclosure side on all base models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	73.3 dB(A)		
UNIT CONSTRUCTION			
Material	Galvanized sheet metal standard Stainless steel optional		
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		
UNIT DIMENSIONS			
Height (in./mm)	43/1092		
Width (in./mm)	15.75/400		
Depth (in./mm)	10.9/279		
Weight (lb./kg)	125/57		

Performance Curves for T43 Models 10000 BTU/Hr. (2930 Watt)

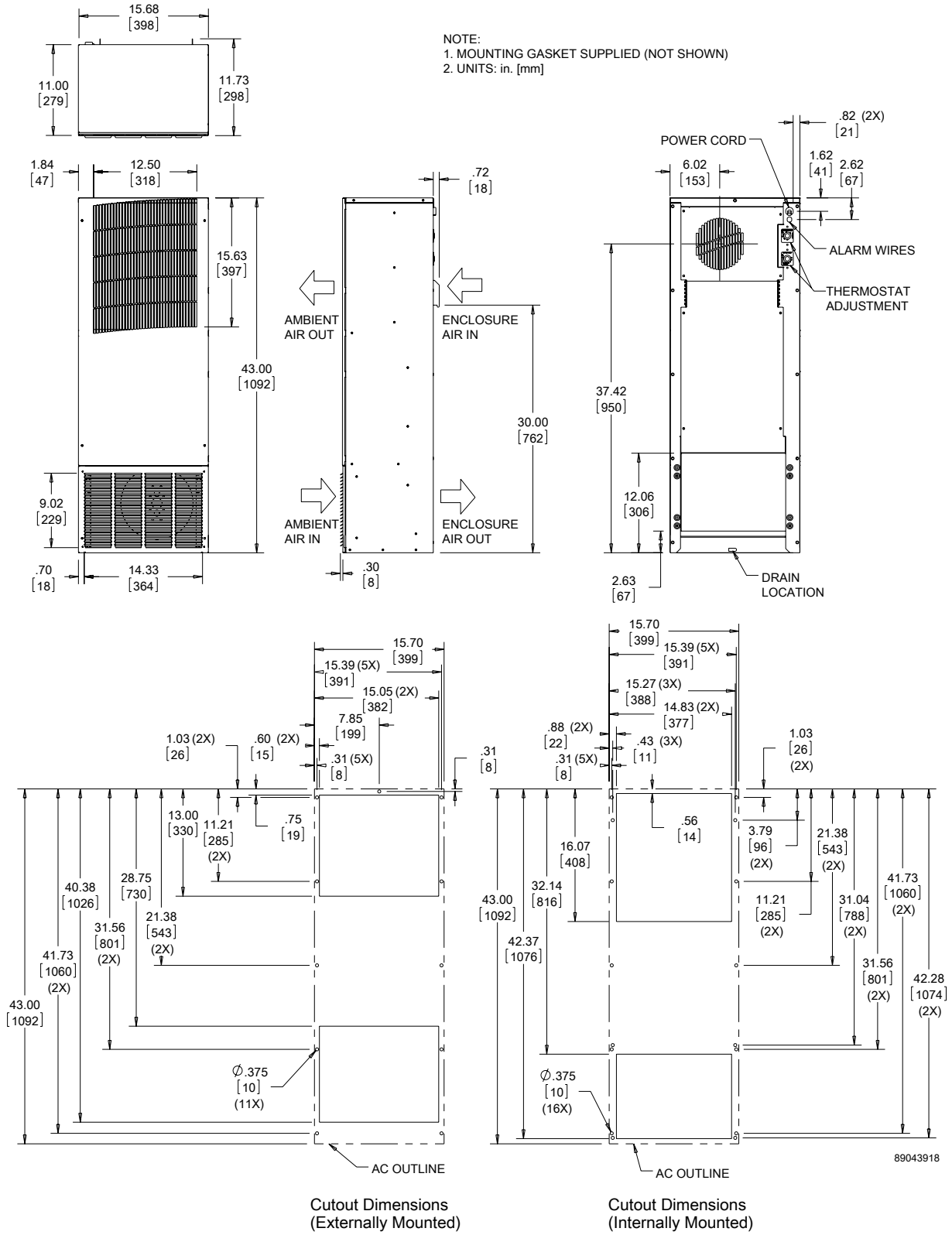
T43-10X6-G150 Capacity Curves 50 Hz



T43-10X6-G150 Capacity Curves 60 Hz



T43 6000-10000 Models BTU/HR. (1758 - 2930 Watt)



Cutout Dimensions (Externally Mounted)

Cutout Dimensions (Internally Mounted)

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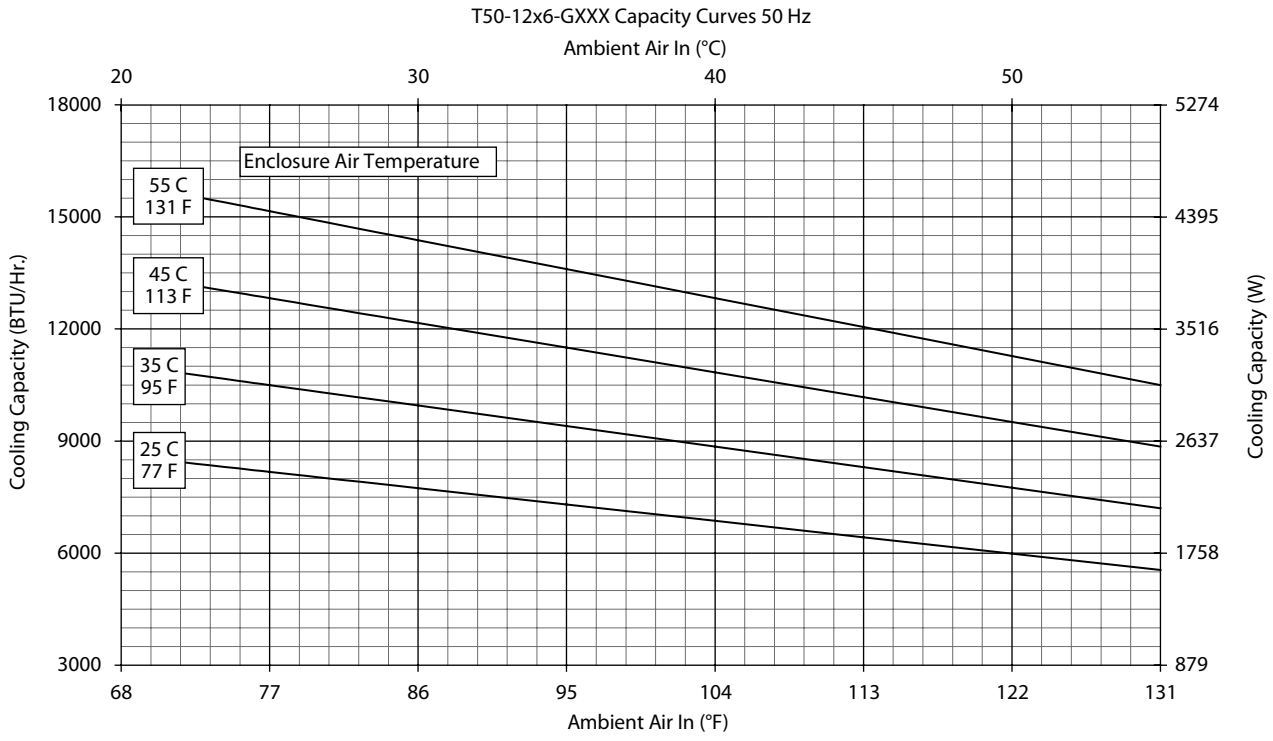
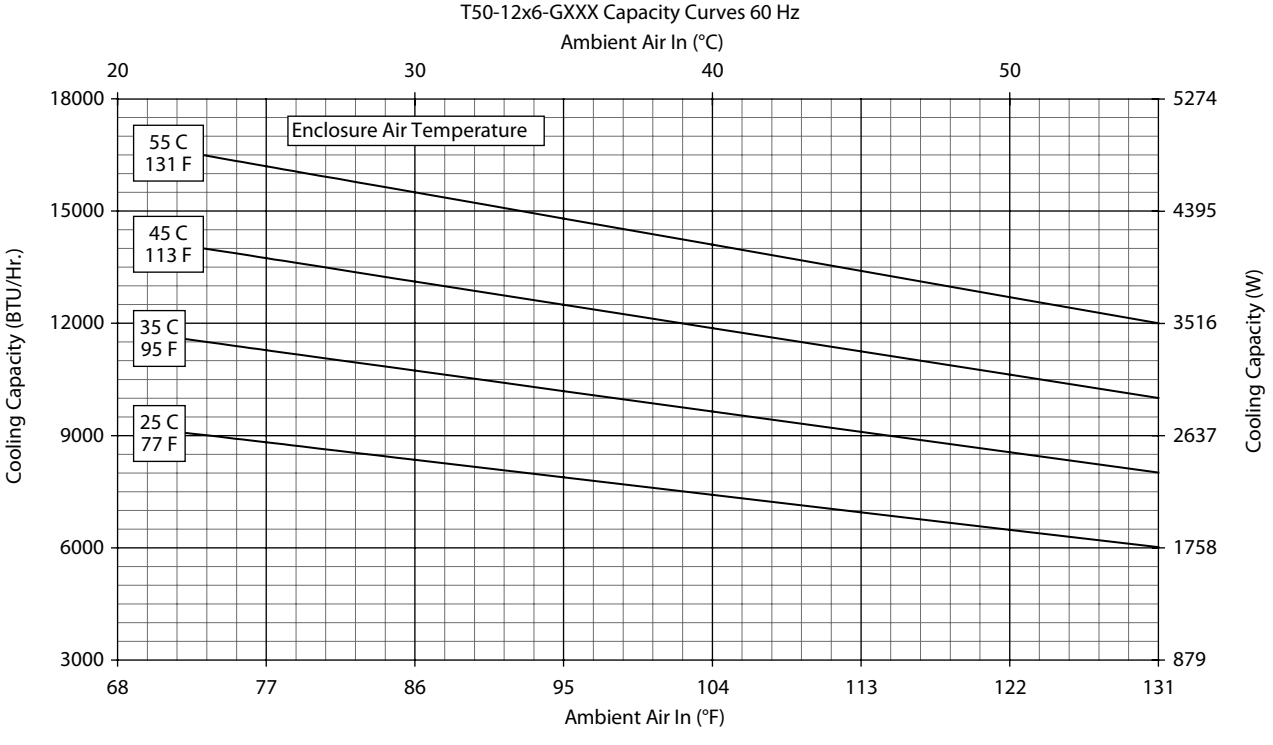
Performance Data **T50 12000 BTU/Hr. (3516 Watt) Models**

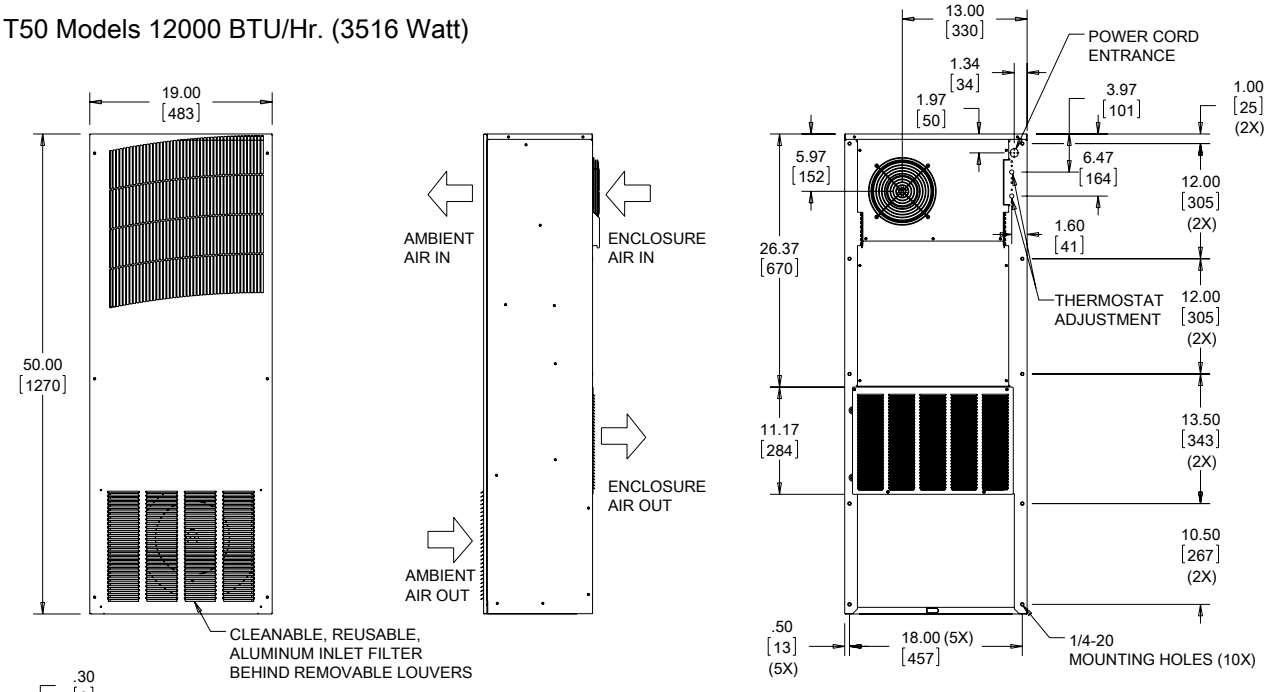
CATALOG NUMBER		
Outdoor Model without Heat Pkg.	T501226G100	T501246G400
Outdoor Model with Heat Pkg.	T501226G150	—
Outdoor Model/SST/Corrosion/4X	T501226G125	T501246G401
Outdoor Model/SST/Corrosion/4X/Heater	T501226G156	—
COOLING PERFORMANCE		
Nominal:		
BTU/Hr.	**11000/12000**	**11000/12000**
Watts	**3223/3516**	**3223/3516**
At 131 F/131 F (55 C/55 C):		
BTU/Hr. (50/60 Hz)	10030/12000	10030/12000
W (50/60 Hz)	2939/3516	2939/3516
At 95 F/95 F (35 C/35 C):		
BTU/Hr. (50 /60 Hz)	9300/10050	9300/10050
W (50/60 Hz)	2725/2945	2725/2945
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	46/1300	46/1300
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	300/510	300/510
External loop 50 Hz (CFM / m^3/hr.)	520/883	520/883
Internal loop 60 Hz (CFM / m^3/hr.)	368/626	368/626
External loop 60 Hz (CFM / m^3/hr.)	625/1062	625/1062
Max. Heater W (Outdoor Models)	1500	1500
ELECTRICAL DATA		
Rated Voltage	**220/230**	**460V 1PH**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1804/2139	2070/2346
Max. Nominal Current (A at 50/60 Hz)	8.2/9.3	4.5/5.1
Starting Current (A)	38	20
Agency Approvals	cUL Listed CE GOST	cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION		
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional	
CONTROLLER		
Description	Basic mechanical thermostat	
Thermostat Location	Enclosure side on all base models	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	68 dB(A)	
UNIT CONSTRUCTION		
Material	Galvanized sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	50/1270	
Width (in./mm)	19/483	
Depth (in./mm)	11.05/281	
Weight (lb./kg)	164/75	

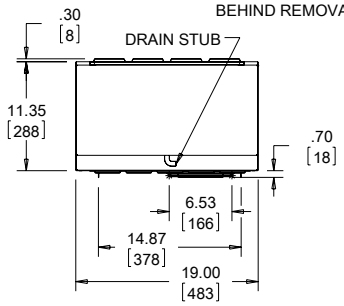
Performance Curves for T50 Models 12000 BTU/Hr. (3516 Watt)



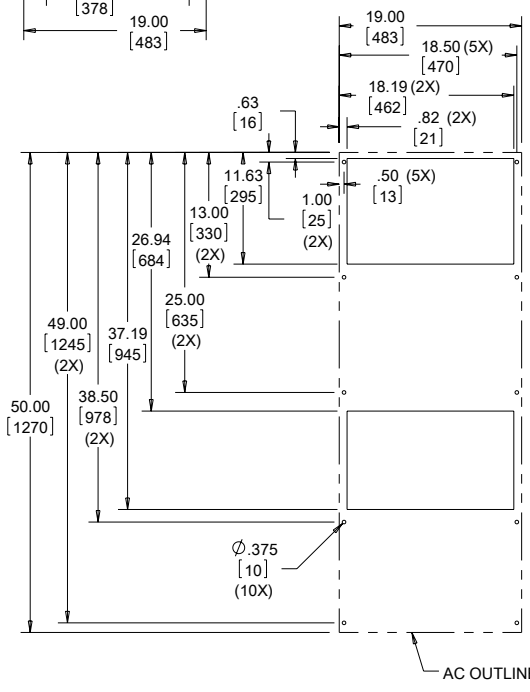


T50 Models 12000 BTU/Hr. (3516 Watt)

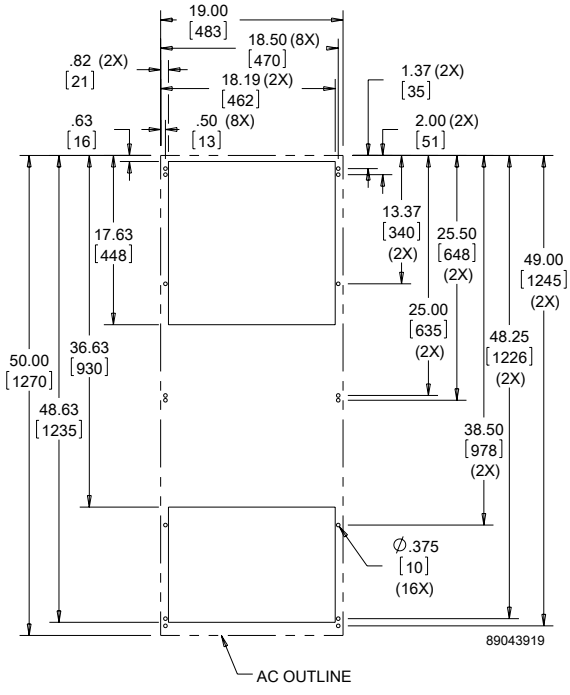




NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]



Cutout Dimensions (Externally Mounted)



Cutout Dimensions (Internally Mounted)

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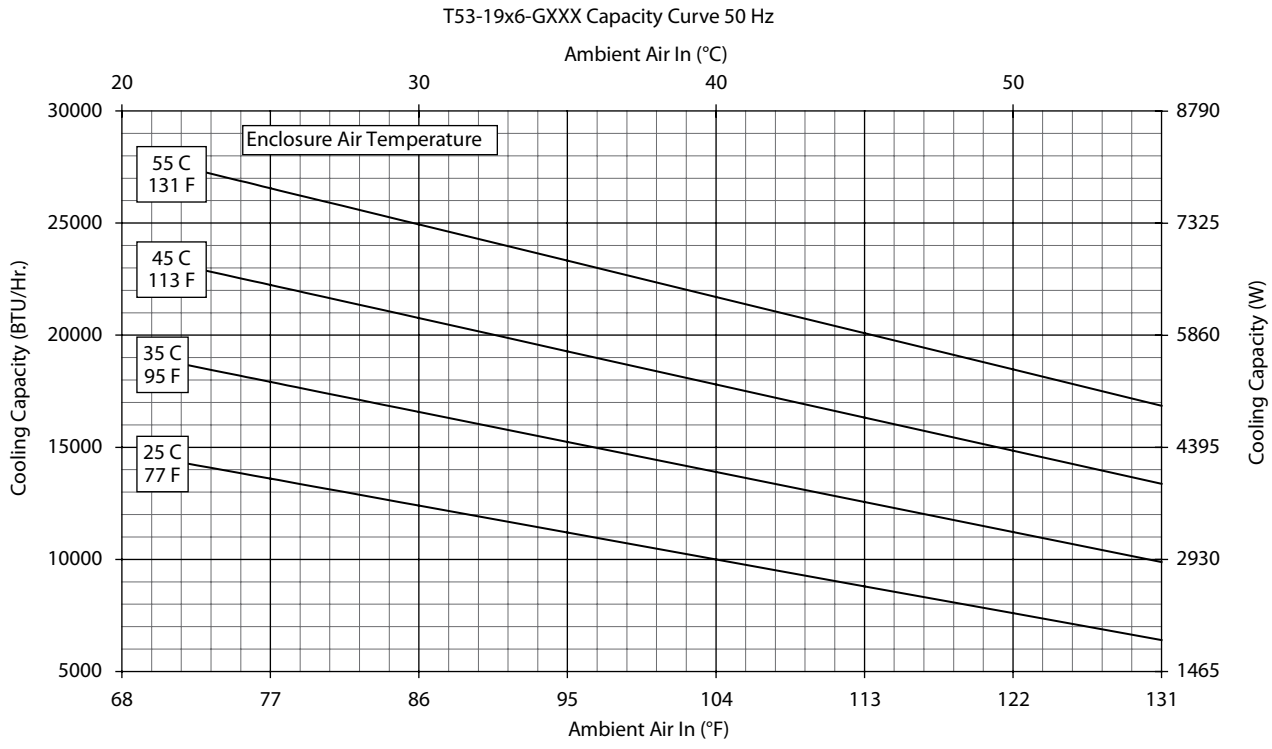
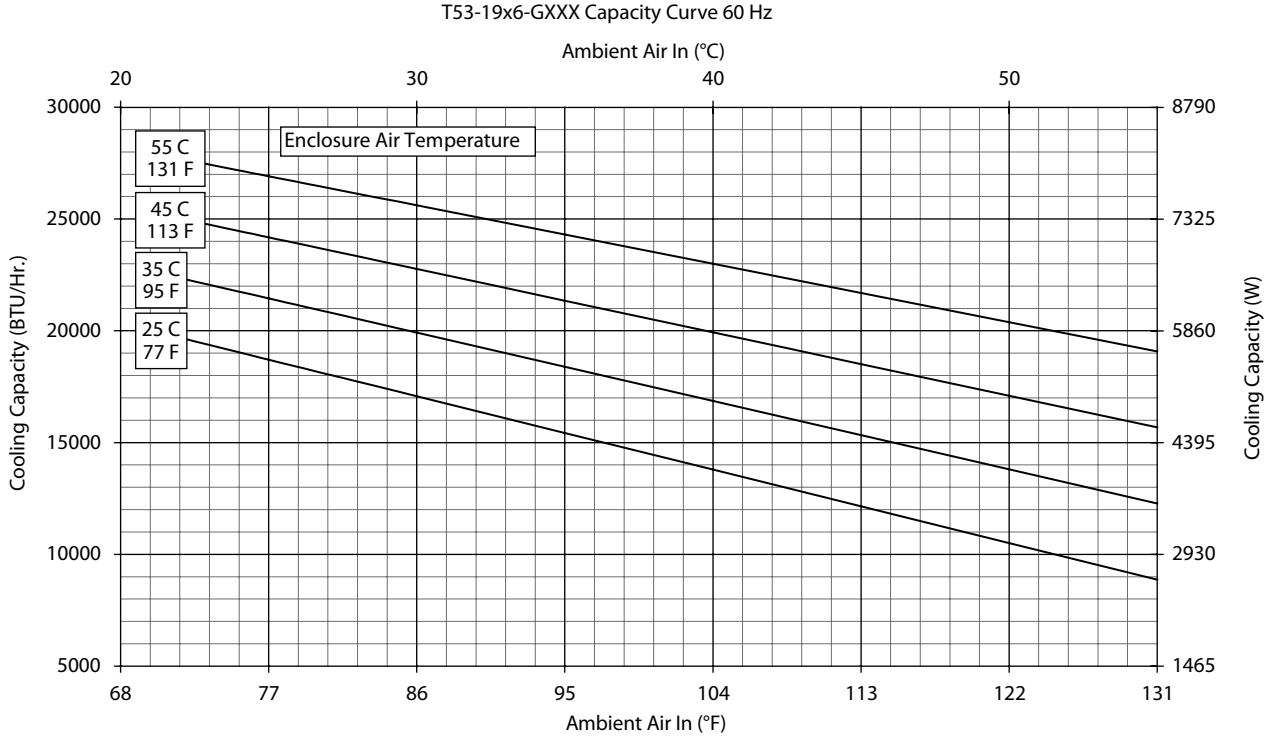
Performance Data **T53 19000 BTU/Hr. (5567 Watt) Models**

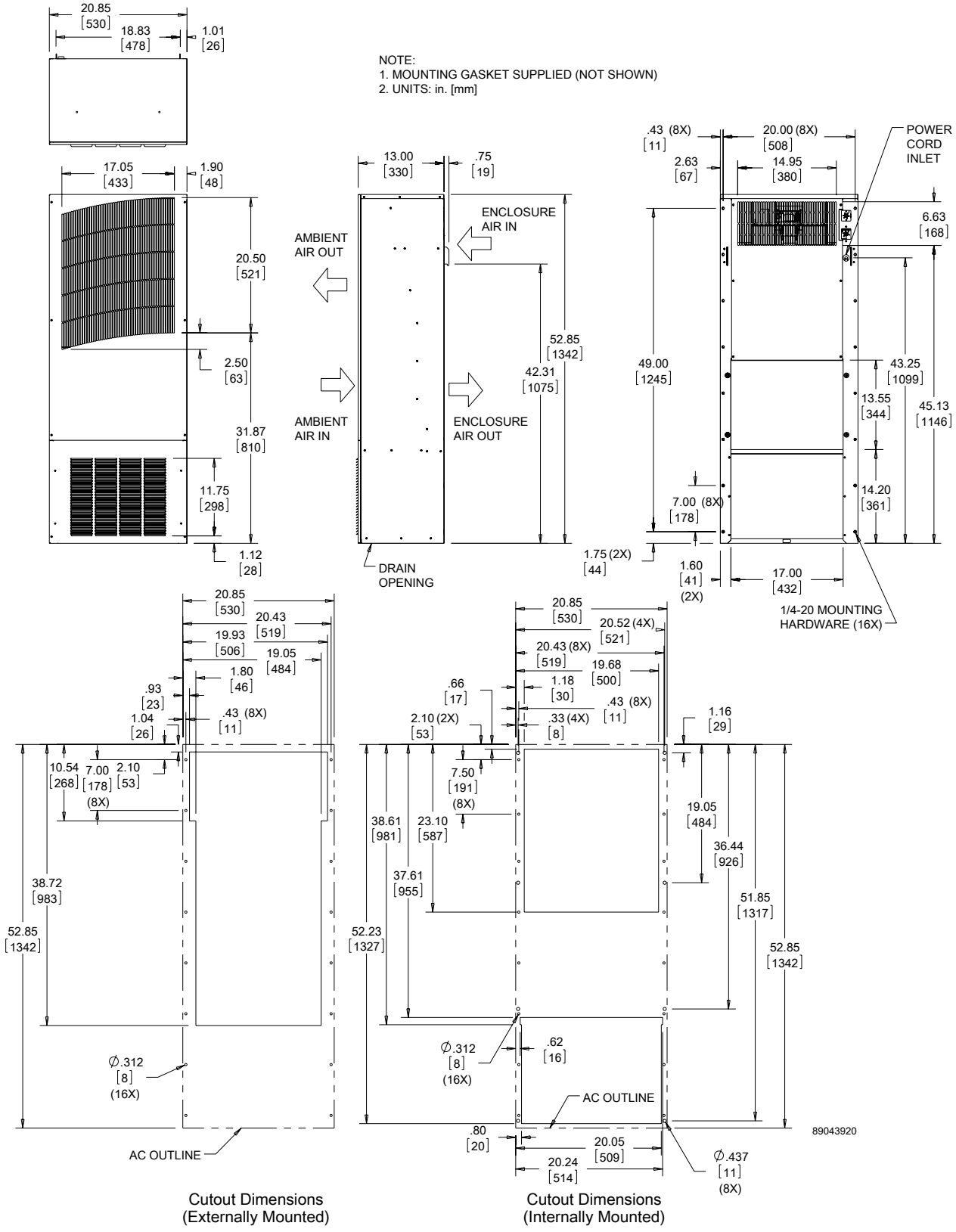
CATALOG NUMBER		
Outdoor Model without Heat Pkg.	T531926G100	T531946G400
Outdoor Model with Heat Pkg.	T531926G150	—
Outdoor Model/SST/Corrosion/4X	T531926G109	—
Outdoor Model/SST/Corrosion/4X/Heater	—	—
COOLING PERFORMANCE		
Nominal:		
BTU/Hr.	**16800/19000**	**16800/19000**
Watts	**4922/5567**	**4922/5567**
At 131 F/131 F (55 C/55 C):		
BTU/Hr. (50/60 Hz)	16854/19081	16854/19081
W (50/60 Hz)	4939/5592	4939/5592
At 95 F/95 F (35 C/35 C):		
BTU/Hr. (50 /60 Hz)	15240/19815	15240/19815
W (50/60 Hz)	4466/5807	4466/5807
Refrigerant	410A	410A
Refrigerant Charge (ounces/grams)	40/1132	40/1132
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	449/763	449/763
External loop 50 Hz (CFM / m^3/hr.)	1204/2046	1204/2046
Internal loop 60 Hz (CFM / m^3/hr.)	519/882	519/882
External loop 60 Hz (CFM / m^3/hr.)	1300/2209	1300/2209
Max. Heater W (Outdoor Models)	3000	
ELECTRICAL DATA		
Rated Voltage	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	3979/4669	4370/5152
Max. Nominal Current (A at 50/60 Hz)	17.3/20.3	9.5/11.2
Starting Current (A)	54	28
Agency Approvals	cUL Listed CE GOST	cUR Recognized CE GOST
Power Input Description	Terminal block	
ENCLOSURE PROTECTION		
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional	
CONTROLLER		
Description	Basic mechanical thermostat	
Thermostat Location	Enclosure side on all base models	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	76 dB(A)	
UNIT CONSTRUCTION		
Material	Galvanized sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	53.0/1346.2	
Width (in./mm)	21.0/533.4	
Depth (in./mm)	13.0/330.2	
Weight (lb./kg)	197/90	237/108

Performance Curves for T53 Models 19000 BTU/Hr. (5567 Watt)





T53 Models 19000 BTU/Hr. (5567 Watt)



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Notes

T-SERIES LARGE CAPACITY OUTDOOR

T62
20000 BTU/Hr.
5860 Watts

T70-36
36000 BTU/Hr.
10548 Watts

T70-60
59000 BTU/Hr.
17287 Watts

INDUSTRY STANDARDS

UL/cUL Listed; Type 12, 3R, 4; 4X optional; File No. SA6453
UR/cUR Recognized

UR/cUR Recognized on select models, reference performance data tables.
CE
GOST
Telcordia GR-487 capable

APPLICATION

- Industrial automation
- Telecommunications equipment
- Package handling equipment
- Security and defense systems
- And more

FEATURES

- Stock models equipped with head pressure control for low-ambient operation, compressor heater, coated condenser coil, malfunction switch, thermostat and heater package
- R-407C earth-friendly refrigerant
- Models for 230 and 460 VAC power input
- UL Listed to save customers time and money with agency approvals (some models UL recognized)
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C
- Exterior and fully recessed mounting options on many models
- Compact footprint to minimize real estate and maximize capacity
- Reliable mechanical thermostat on enclosure side of the unit
- Dual condenser-side air movers for performance redundancy
- Painted galvanized sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cleanable, reusable aluminum mesh filter protects coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Outdoor Air Conditioner models also include:
  - Telcordia GR-487 capable
  - Thermostat
  - Corrosion-resistant components
  - Malfunction switch
  - Compressor heater
  - Head pressure control
  - Enclosure heater

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint
- Other colors and textures available

OPTIONS

- Thermostat Malfunction Package
- Special Voltage Package
- Outdoor Package
- Harsh Environment Package*
- Stainless Steel Package*
- Heater Package

* PROAIR A/C may be more appropriate. Refer to PROAIR A/C Chapter. Consult the Factory for availability and catalog number.

NOTES

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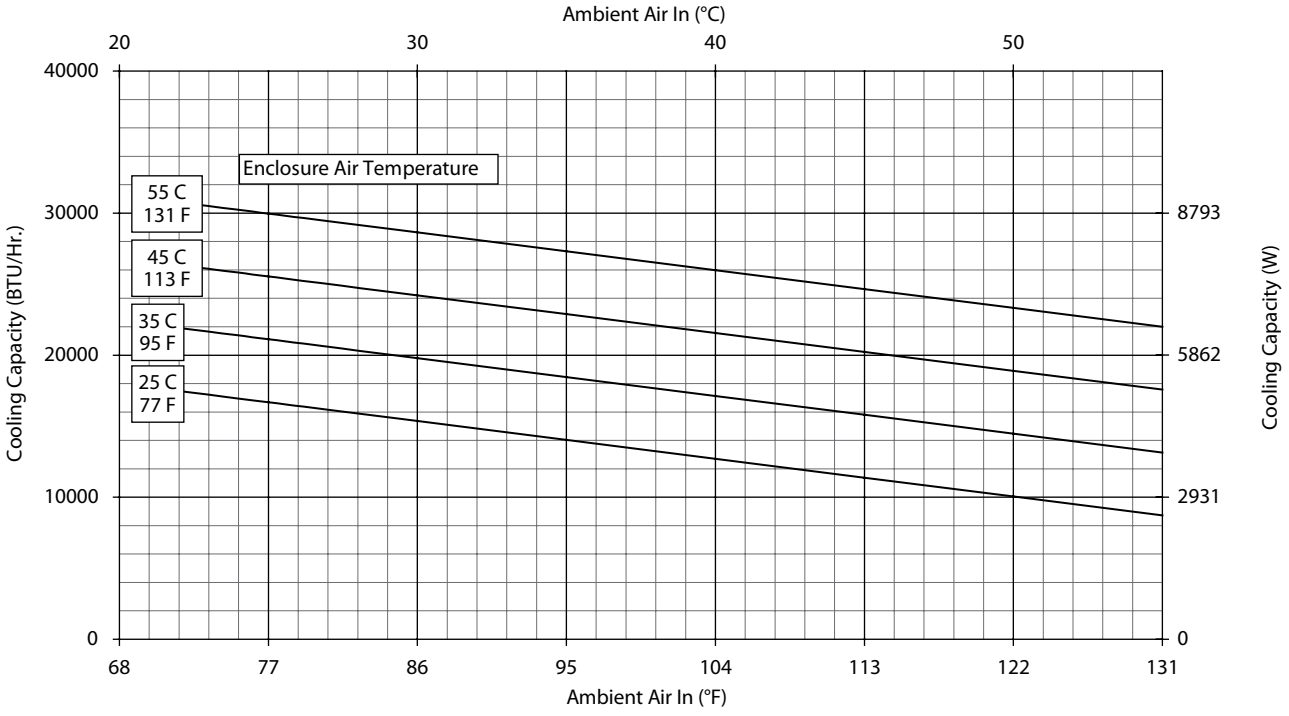
Performance Data **T62 20000 BTU/Hr. (5860 Watt) Models**

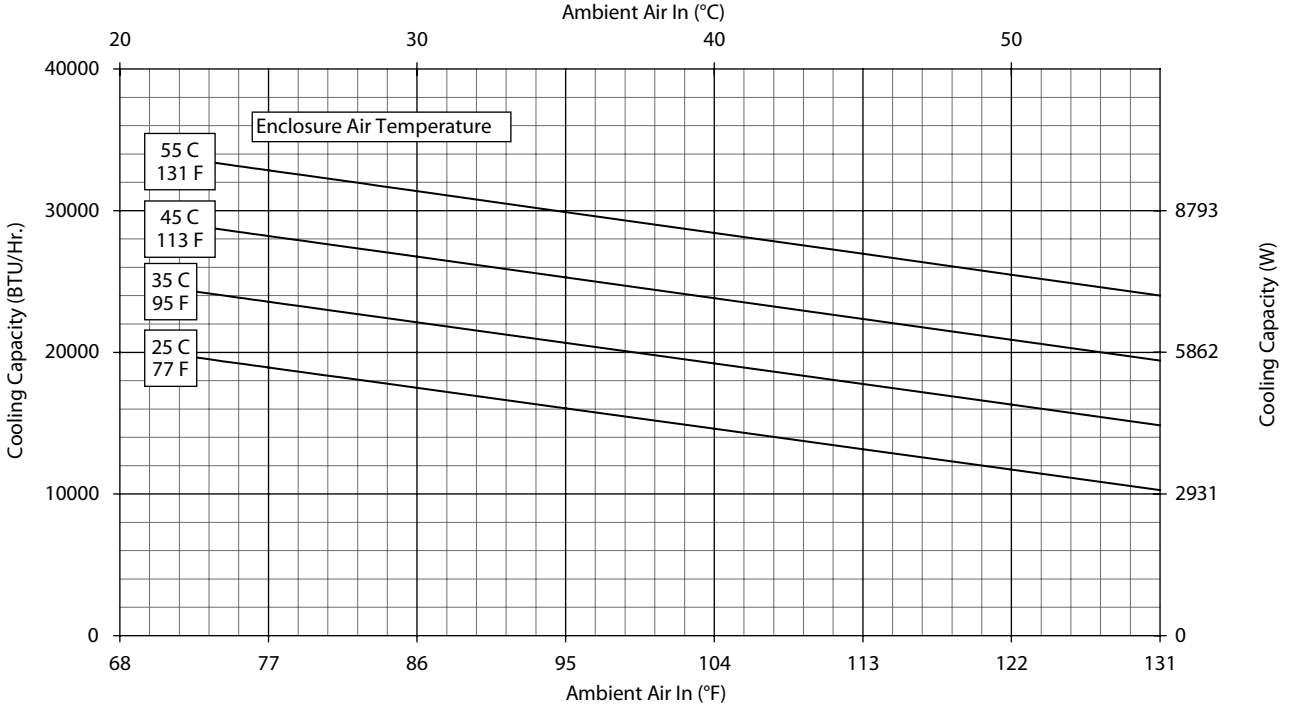
CATALOG NUMBER		
	T622226G150	T622246G400
COOLING PERFORMANCE		
Nominal:		
BTU/Hr.	**20500/23500**	**20500/23500**
Watts	**6007/6886**	**6007/6886**
At 131 F/131 F (55 C/55 C):		
BTU/Hr. (50/60 Hz)	20860/23927	20860/23927
W (50/60 Hz)	6113/7012	6113/7012
At 95 F/95 F (35 C/35 C):		
BTU/Hr. (50 /60 Hz)	18258/20256	18258/20256
W (50/60 Hz)	5351/5936	5351/5936
Refrigerant	R-407C	
Refrigerant Charge (ounces/grams)	42/1300	42/1300
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	570/968	570/968
External loop 50 Hz (CFM / m^3/hr.)	1443/2452	1443/2452
Internal loop 60 Hz (CFM / m^3/hr.)	673/1143	673/1143
External loop 60 Hz (CFM / m^3/hr.)	1797/3053	1797/3053
Max. Heater W (Outdoor Models)	2000	Up to 3000 (Optional)
ELECTRICAL DATA		
Rated Voltage	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	4370/5060	7000/9200
Max. Nominal Current (A at 50/60 Hz)	19/22	10.5/12
Starting Current (A)	60	30
Agency Approvals	cUL Listed CE GOST	cUR Recognized CE GOST
Power Input Description	Terminal block	Terminal block
ENCLOSURE PROTECTION		
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional	
CONTROLLER		
Description	Basic mechanical thermostat	
Thermostat Location	Enclosure ide on all base models	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	71 dB(A)	
UNIT CONSTRUCTION		
Material	Galvanized sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	61.77/1568.96	61.77/1568.96
Width (in./mm)	19.91/505.71	19.91/505.71
Depth (in./mm)	17.36/440.94	17.36/440.94
Weight (lb./kg)	218/99.1	258/117

Performance Curves for T62 Models 20000 BTU/Hr. (5860 Watt)

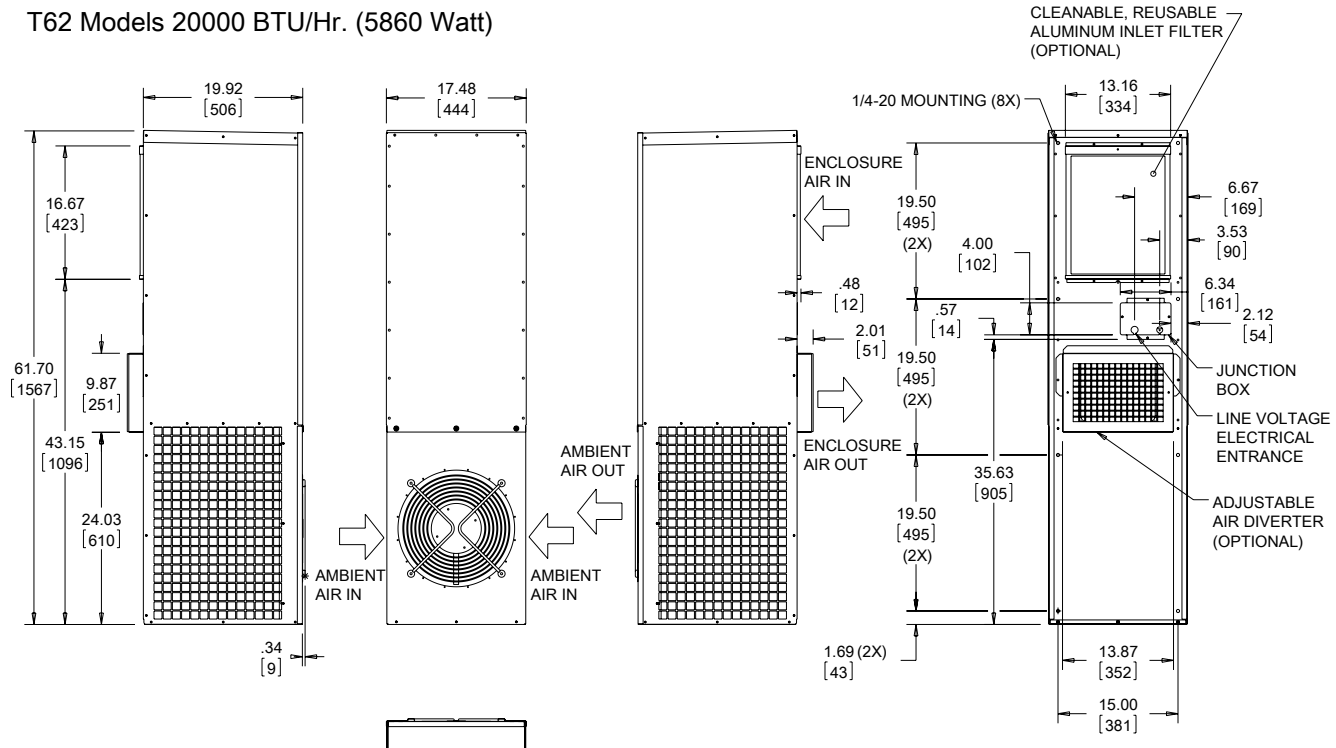
T62-22x6-GXXX R-407c Capacity Curves 50 Hz

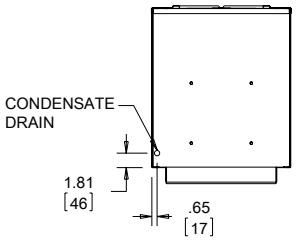


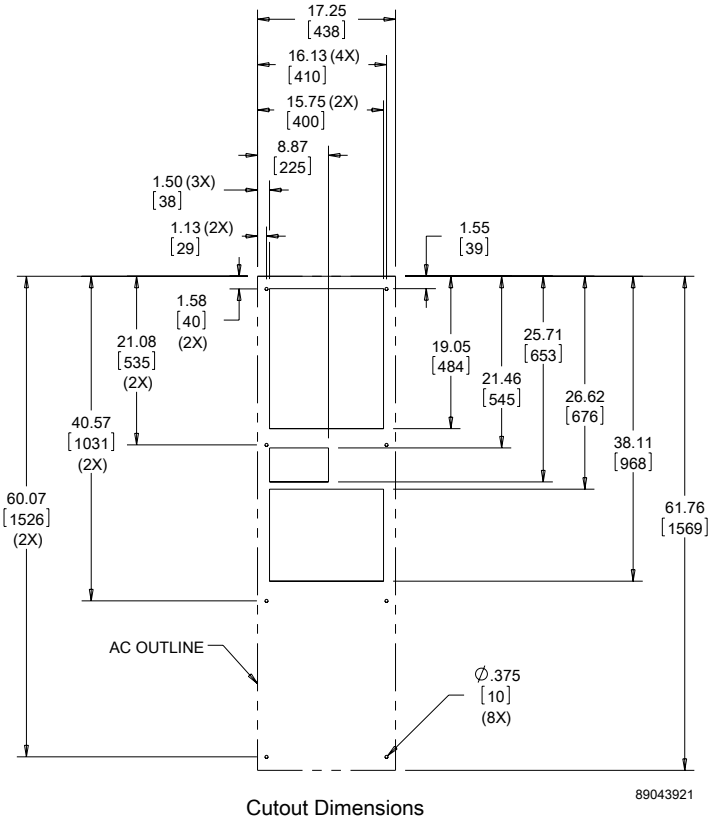
T62-22x6-GXXX R-407c Capacity Curves 60 Hz



T62 Models 20000 BTU/Hr. (5860 Watt)







NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN.
2. UNITS: in. [mm]

Cutout Dimensions

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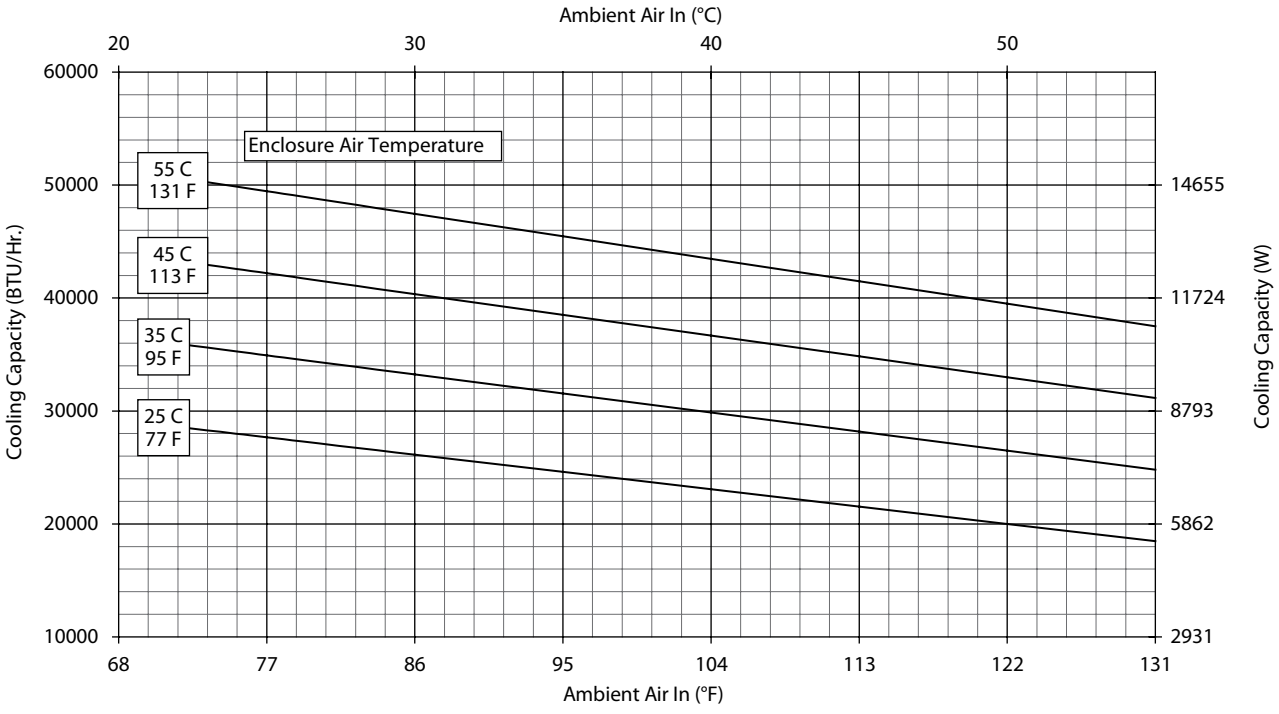
Performance Data **T70-36 36000 BTU/Hr. (10548 Watt) Models**

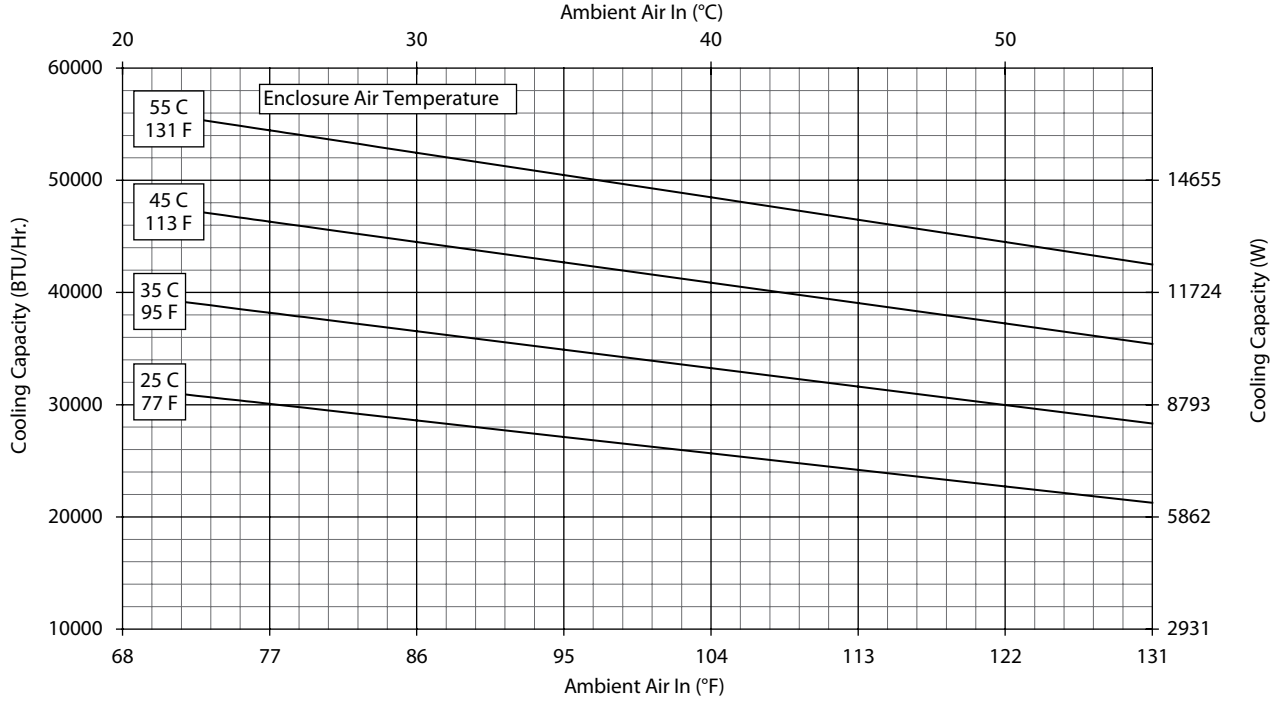
CATALOG NUMBER	T703626G150	T703646G400
COOLING PERFORMANCE		
Nominal:		
BTU/Hr.	**39000/43000**	
Watts	**11430/12602**	
At 131 F/131 F (55 C/55 C):		
BTU/Hr. (50/60 Hz)	38613/42930	
W (50/60 Hz)	11316/12570	
At 95 F/95 F (35 C/35 C):		
BTU/Hr. (50 /60 Hz)	31364/36130	
W (50/60 Hz)	9192/10579	
Refrigerant	R-407C	
Refrigerant Charge (ounces/grams)	110/3118	
Operating Temperature Range:		
Maximum (°F/°C)	131/55	
Minimum (°F/°C)Minimum (°F/°C)	-40/-40	
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	1085/1843	
External loop 50 Hz (CFM / m^3/hr.)	2176/3697	
Internal loop 60 Hz (CFM / m^3/hr.)	1171/1989	
External loop 60 Hz (CFM / m^3/hr.)	2347/3987	
Max. Heater W (Outdoor Models)	2000 Standard (5000 Optional)	
ELECTRICAL DATA		
Rated Voltage	**230**	**460**
Frequency (Hz)	50/60	60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	8280	8280
Max. Nominal Current (A at 50/60 Hz)	36	18
Starting Current (A)	104	52
Agency Approvals	cUL Listed CE GOST Others available upon request	
Power Input Description	Terminal block	
ENCLOSURE PROTECTION		
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional	
International Rating	UL/cUL Listed	
CONTROLLER		
Description	Basic mechanical thermostat	
Thermostat Location	Enclosure side on all base models	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	66 dB(A)	
UNIT CONSTRUCTION		
Material	Galvanized sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	69.8/1772	
Width (in./mm)	22.8/578	
Depth (in./mm)	20.94/532	
Weight (lb./kg)	260/118	

Performance Curves for T70 Models 36000 BTU/Hr. (10548 Watt)

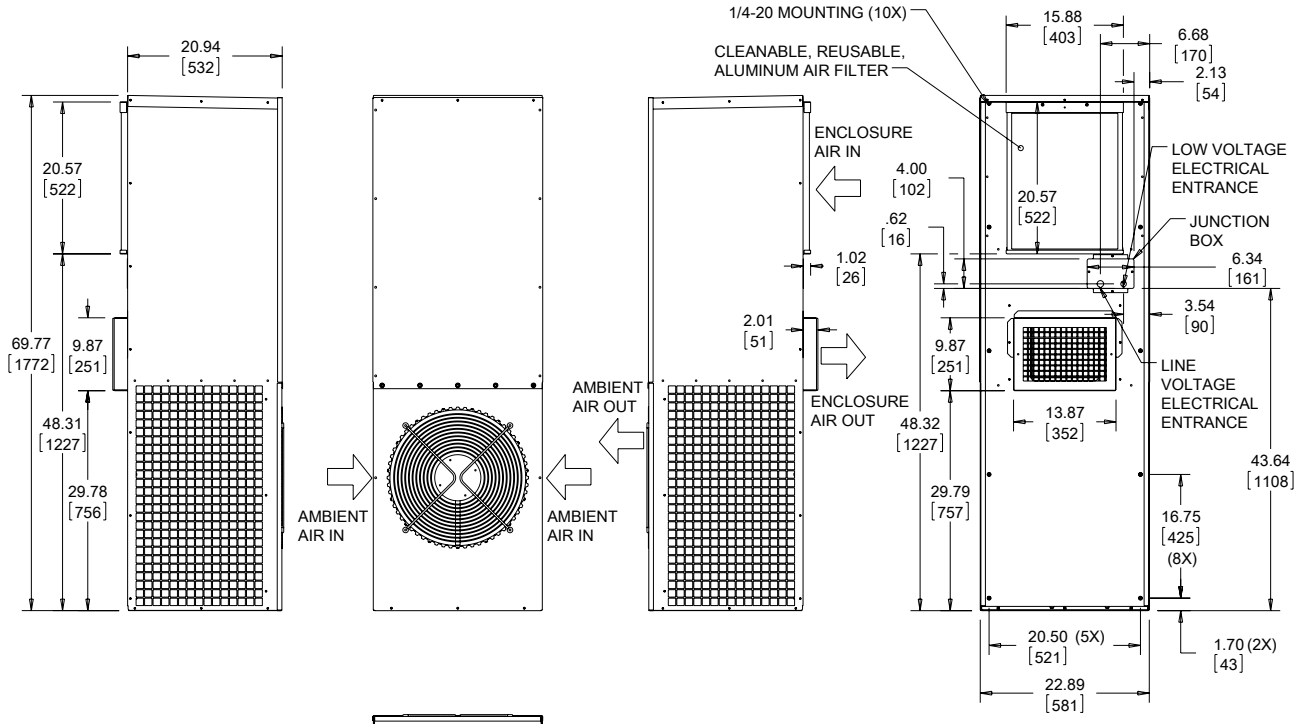
T70-36X6-GXXX R-407c Capacity Curves 50 Hz

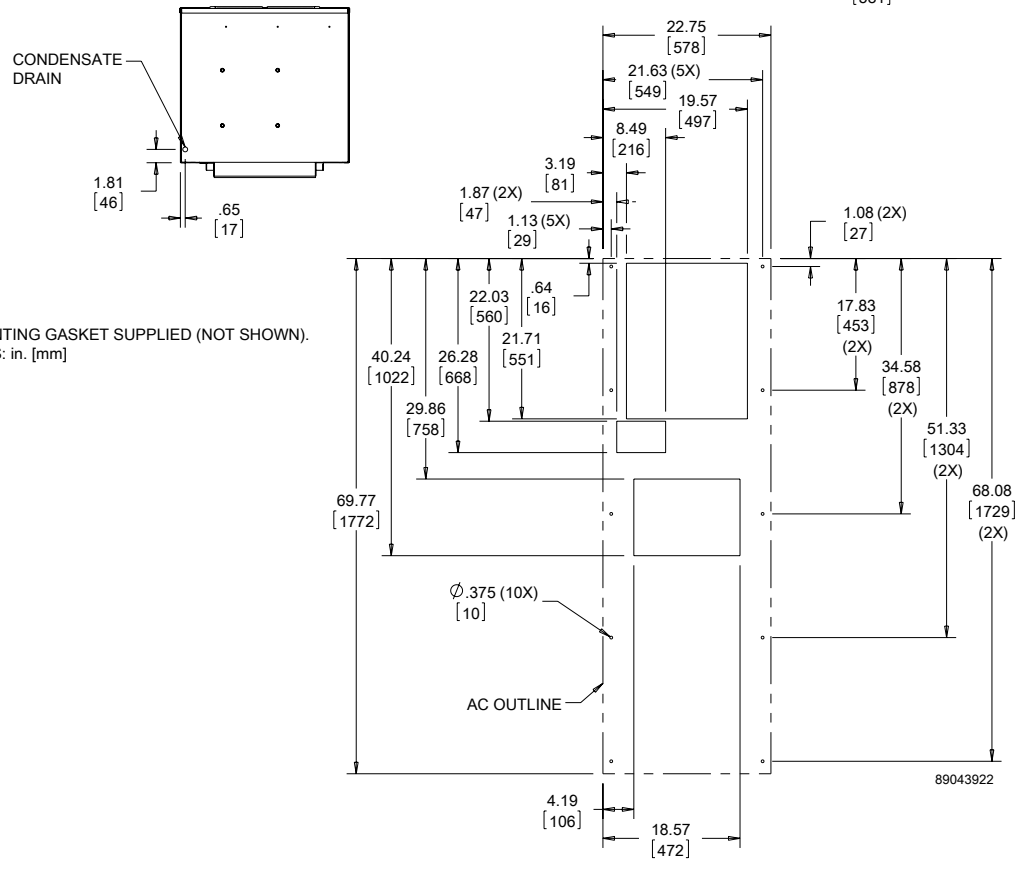


T70-36X6-GXXX R-407c Capacity Curves 60 Hz



T70 Models 36000 BTU/Hr. (10548 Watt)





NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN).
2. UNITS: in. [mm]

Cutout Dimensions

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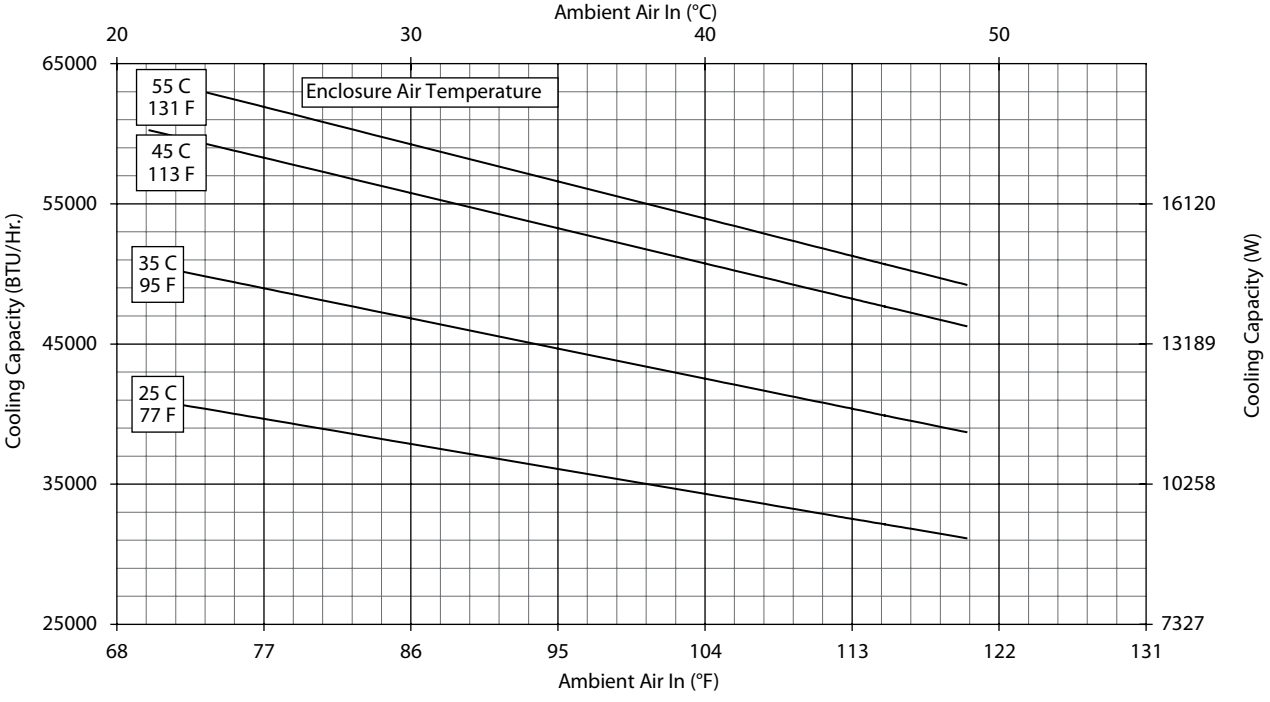
Performance Data **T70-60 59000 BTU/Hr. (17287 Watt) Models**

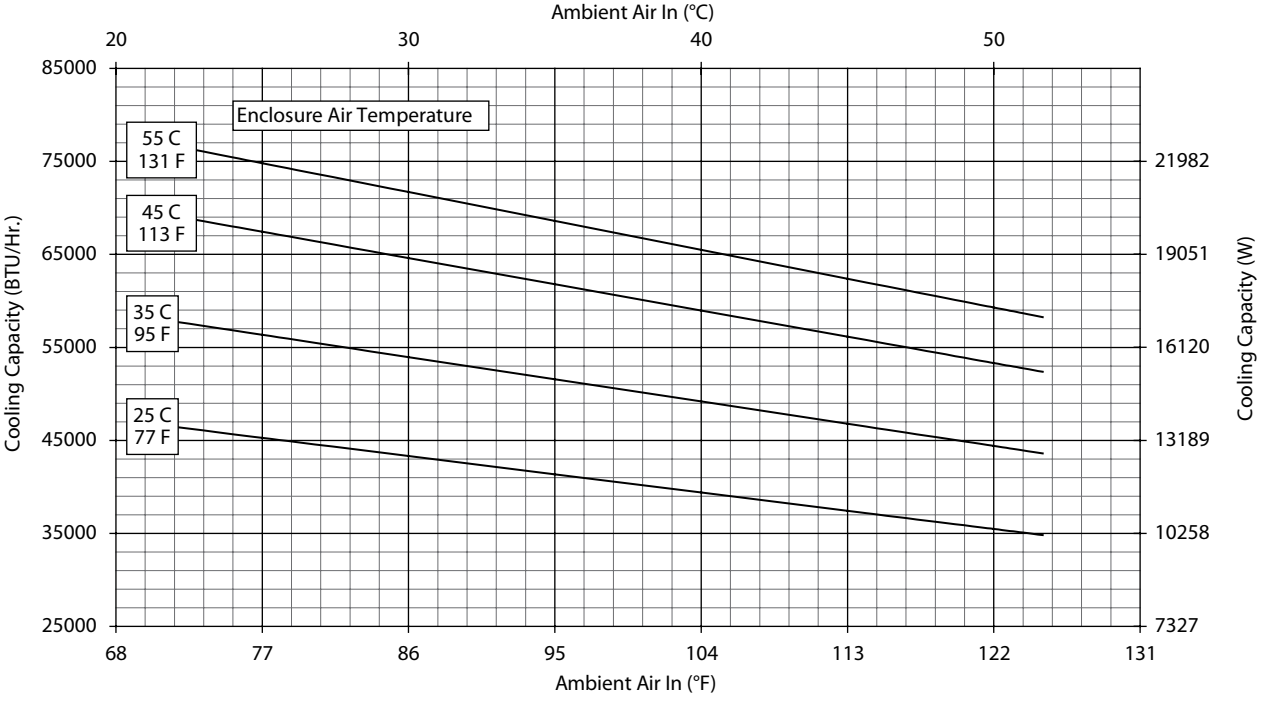
CATALOG NUMBER	T706026G150	T706046G400
COOLING PERFORMANCE		
Nominal:		
BTU/Hr.	**51900/60000**	
Watts	**15210/17584**	
At 122 F/122 F (50 C/50 C):		
BTU/Hr. (50/60 Hz)	51900/60000	
W (50/60 Hz)	15210/17584	
At 95 F/95 F (35 C/35 C):		
BTU/Hr. (50 /60 Hz)	47122/54500	
W (50/60 Hz)	13810/15972	
Refrigerant	R-407C	
Refrigerant Charge (ounces/grams)	150/4252	
Operating Temperature Range:		
Maximum (°F/°C)	122/50	
Minimum (°F/°C)	-40/-40	
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	1510/2565	
External loop 50 Hz (CFM / m^3/hr.)	2716/4614	
Internal loop 60 Hz (CFM / m^3/hr.)	1629/2767	
External loop 60 Hz (CFM / m^3/hr.)	2931/4979	
Max. Heater W (Outdoor Models)		
ELECTRICAL DATA		
Rated Voltage	**200/230**	**420/460**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	7000/9200	6426/7038
Max. Nominal Current (A at 50/60 Hz)	35/40	15.3
Starting Current (A)	144	144
Agency Approvals	cUL Listed CE GOST Others available upon request	
Power Input Description	Terminal block	
ENCLOSURE PROTECTION		
UL Type	Type 12, 3R, 4 standard Type 4X Stainless steel optional	
International Rating	IP56 on the internal loop; IP34 on the external loop	
Description	Basic mechanical thermostat	
CONTROLLER		
Thermostat Location	Enclosure side on all base models	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	66 dB(A)	
UNIT CONSTRUCTION		
Material	Galvanized sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	69.77/1772	
Width (in./mm)	35.86/911	
Depth (in./mm)	22.94/583	
Weight (lb./kg)	419/190.5	

Performance Curves for T70 Models 59000 BTU/Hr. (17287 Watt)

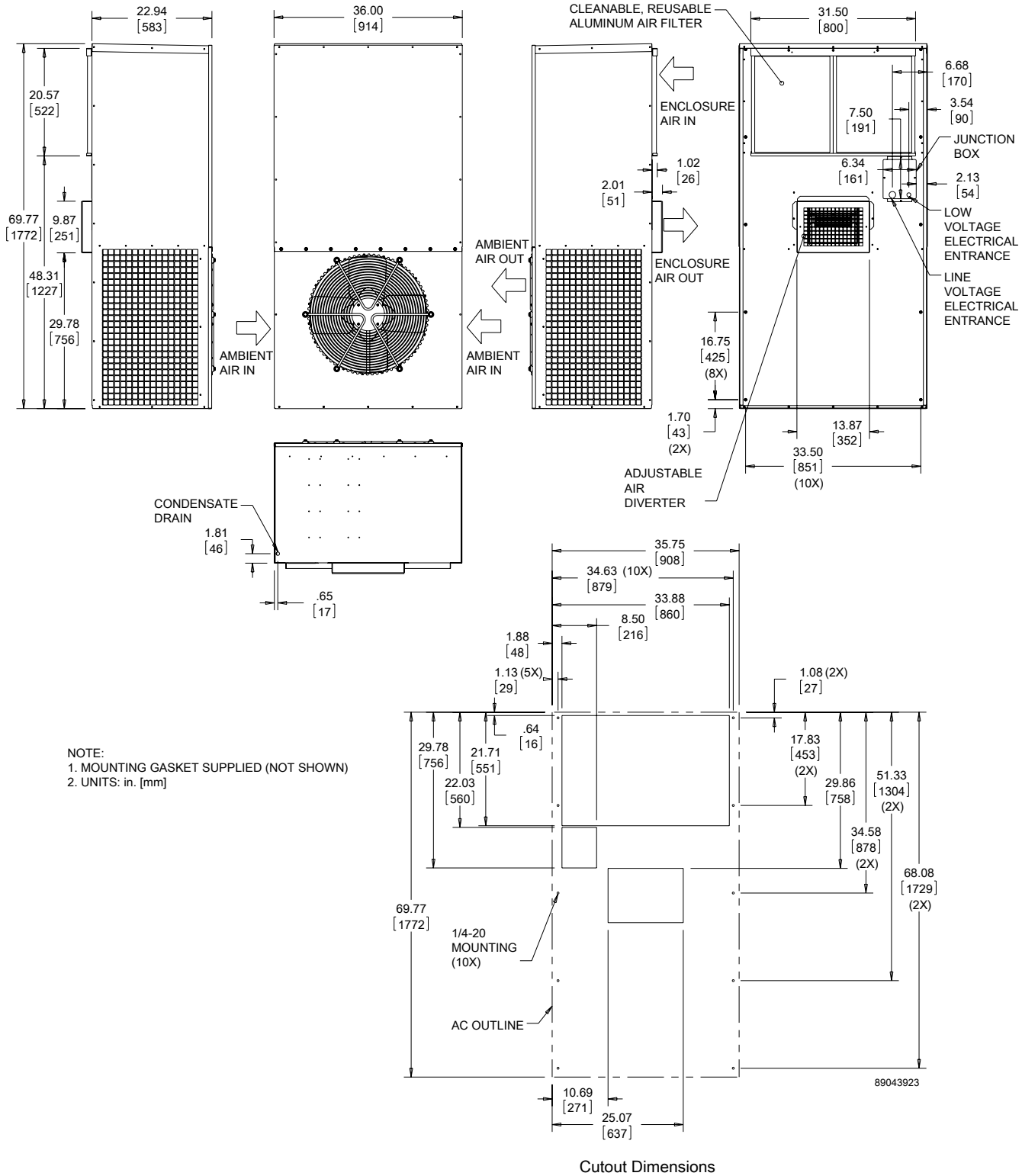
T70-60X6-GXXX R-407c Capacity Curves 50 Hz



T70-60X6-GXXX R-407c Capacity Curves 60 Hz



T70 Models 59000 BTU/Hr. (17287 Watt)



NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]

Cutout Dimensions

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

GENESIS™ TOP-MOUNT INDOOR

HB16
8000 BTU/Hr.
2051 Watt

MHB11
2200-4000 BTU/Hr.
645-1172 Watt

INDUSTRY STANDARDS

UL/cUL Listed; Type 12; File No. SA6453 UR/cUR Recognized

Maintains U/cUL Type 12 rating when properly installed on a UL/cUL Type 12 enclosure.
UR/cUR Recognized on select models, reference performance data tables.
CE
GOST

APPLICATION

- Industrial automation
- Package handling equipment
- Security and defense systems
- Ideal for use where there is little or no clearance around the enclosure

FEATURES

- Robust reciprocating compressor
- R134a and R407c earth-friendly refrigerant
- Models for 115, 230 and 460 single-phase VAC power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from 50 F/10 C to 125 F/52 C
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat located behind the filter of the unit
- Low-carbon mild-steel sheet-metal cover for rugged factory environments
- Cleanable, reusable aluminum mesh filter protects coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Indoor Air Conditioner models also include:
  - Electro-Mechanical Thermostat
  - Surge Suppressor
  - Condensate Management System On MHB11 models

FINISH

- RAL 7042 gray, semi-gloss powder-coat paint standard
- Other colors and textures available

OPTIONS

- Thermostat Malfunction Package
- Special Voltage Package
  * Consult the factory for availability and catalog number

NOTES

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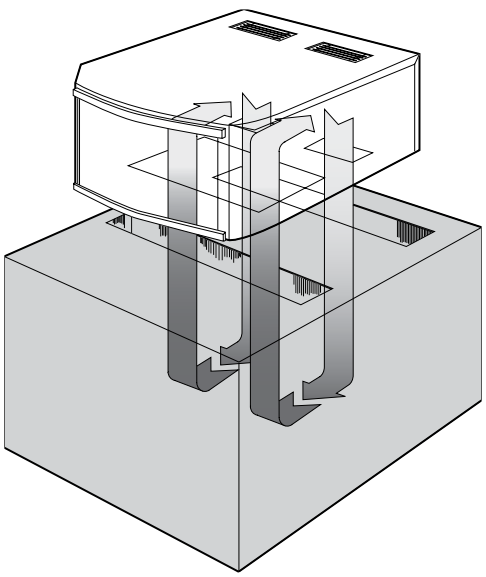
Performance Data **MHB11 Models 2200 BTU/Hr. (645 Watt)**

CATALOG NUMBER	MHB110216G306	MHB110226G306	MHB110246G400
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**2200/2200**	**2200/2200**	**2200/2200**
Watts	**645/645**	**645/645**	**645/645**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	11/312	11/312	11/312
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Airflow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / m^3/hr.)	158/268	170/289	170/289
External loop 50 Hz (CFM / m^3/hr.)	222/377	218/370	218/370
Internal loop 60 Hz (CFM / m^3/hr.)	177/301	192/326	192/326
External loop 60 Hz (CFM / m^3/hr.)	252/428	245/416	245/416
ELECTRICAL DATA			
Rated Voltage	**115**	**220/230**	**440/460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1127/1035	1210/1058	1320/1150
Max. Nominal Current (A at 50/60 Hz)	9.8/9.0	5.5/4.6	3.0/2.5
Starting Current (A)	28	14.4	7.4
Agency Approvals	cUL Listed CE GOST Others available upon request		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12 standard		
CONTROLLER			
Description	Basic mechanical thermostat		
Thermostat Location	Behind filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	62 dB(A)		
UNIT CONSTRUCTION			
Material	Mild steel sheet metal standard Stainless steel optional		
Finish	RAL 7042 gray, semi-gloss powder-coat paint standard		
UNIT DIMENSIONS			
Height (in./mm)	10.25/260	10.25/260	10.25/260
Width (in./mm)	17/432	17/432	17/432
Depth (in./mm)	21.08/535	21.08/535	21.08/535
Weight (lb./kg)	90/41	90/41	110/50

Performance Data **MHB11 Models 4000 BTU/Hr. (1172 Watt)**

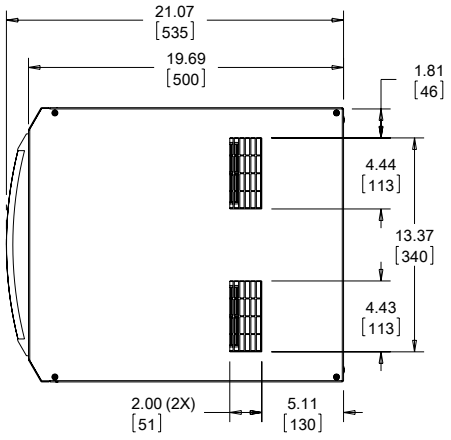
CATALOG NUMBER	MHB110416G307	MHB110426G306	MHB110446G400
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**3300/4000**	**3300/4000**	**3300/4000**
Watts	**967/1172**	**967/1172**	**967/1172**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	13/369	13/369	13/369
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Airflow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / m^3/hr.)	158/268	170/289	170/289
External loop 50 Hz (CFM / m^3/hr.)	222/377	218/370	218/370
Internal loop 60 Hz (CFM / m^3/hr.)	177/301	192/326	192/326
External loop 60 Hz (CFM / m^3/hr.)	252/428	245/416	245/416
ELECTRICAL DATA			
Rated Voltage	**110/115**	**220/230**	**440/460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1617/1564	1760/1725	1936/1886
Max. Nominal Current (A at 50/60 Hz)	14.7/13.6	8.0/7.5	4.4/4.1
Starting Current (A)	48	23	12
Agency Approvals	cUL Listed CE GOST Others available upon request		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-20 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12 standard		
CONTROLLER			
Description	Basic mechanical thermostat		
Thermostat Location	Behind filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	62 dB(A)		
UNIT CONSTRUCTION			
Material	Mild steel sheet metal standard Stainless steel optional		
Finish	RAL 7042 gray, semi-gloss powder-coat paint standard		
UNIT DIMENSIONS			
Height (in./mm)	10.25/260	10.25/260	10.25/260
Width (in./mm)	17/432	17/432	17/432
Depth (in./mm)	21.08/535	21.08/535	21.08/535
Weight (lb./kg)	108/49	108/49	128/58

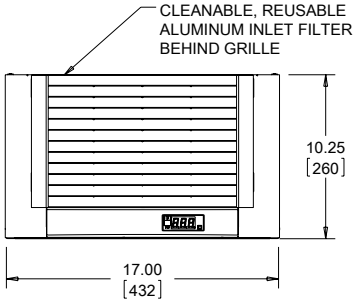


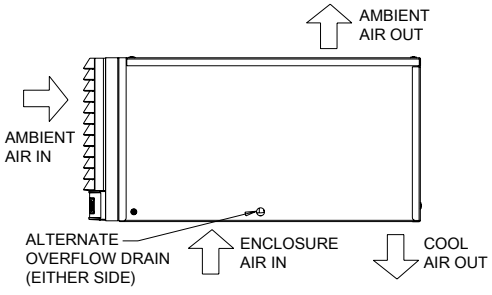
Top-Mount to Enclosure

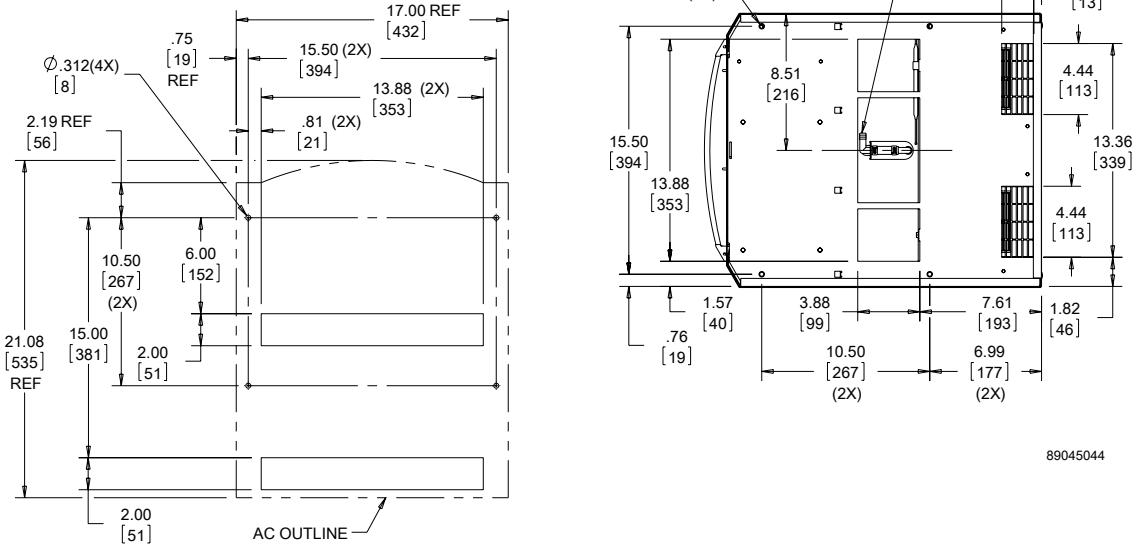
MHB11 Models 2200-4000 BTU/Hr. (645-1172 Watt)

NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]
3. CUTOUT DIMENSIONS FOR STANDARD UNITS ONLY









Cutout Dimensions

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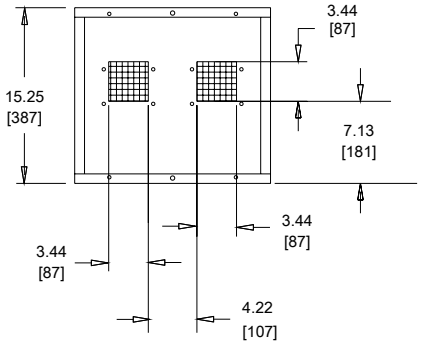
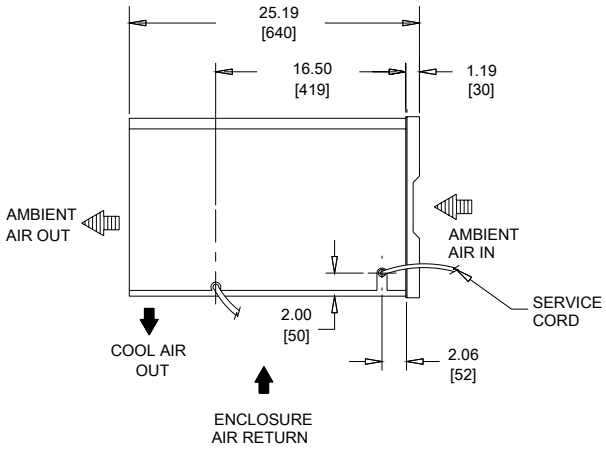
Performance Data **HB16 Models 8000 BTU/Hr. (2051 Watt)**

MODEL NUMBER			
Indoor Model	HB160816G040	HB160826G040	HB160846G040
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**7000/8000**	**7000/8000**	**7000/8000**
Watts	**2051/2344**	**2051/2344**	**2051/2344**
At 125 F/125 F (52 C/52 C):			
BTU/Hr. (50/60 Hz)	6975/8137	7075/8133	7075/8133
Watts (50/60 Hz)	2044/2385	2073/2384	2073/2384
At 95 F/95 F (35 C/35 C):			
BTU/Hr. (50/60 Hz)	6959/8236	6958/7774	6958/7774
W (50/60 Hz)	2039/2414	2039/2278	2039/2278
Refrigerant	R-407C	R-407C	R-407C
Refrigerant Charge (ounces/grams)	24/680	24/680	24/680
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1822/2223	1785/2105	2162
Max. Nominal Current (A at 50/60 Hz)	18.7/20.4	8.5/9.3	4.3/4.7
Starting Current (A)	67	29	15
Agency Approvals		cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-20 plug	6-ft. cord with NEMA 5-20 plug	6-ft. cord with NEMA L8-20 plug
ENCLOSURE PROTECTION			
UL Type		Type 12 Standard	
CONTROLLER			
Description		Basic Mechanical Thermostat	
Thermostat Location		Enclosure Side on All Base Models	
Factory Thermostat Setting (°F/°C)	80/27	80/27	80/27
UNIT CONSTRUCTION			
Material		Galvanized Sheet Metal Standard (Optional: Stainless Steel)	
Finish		RAL 7042 gray, semi-gloss powder-coat paint standard Other colors and textures available	
UNIT DIMENSIONS			
Height (in./mm)	15.25/387.35	15.25/387.35	15.25/387.35
Width (in./mm)	17.00/431.80	17.00/431.80	17.00/431.80
Depth (in./mm)	25.19/639.76	25.19/639.76	25.19/639.76
Weight (lb./kg)	145.00/69.78	145.00/69.78	170.00/77.00

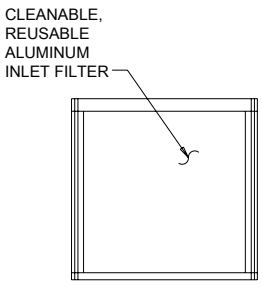
HB16 Models 8000 BTUs/Hr. (2051 Watts)



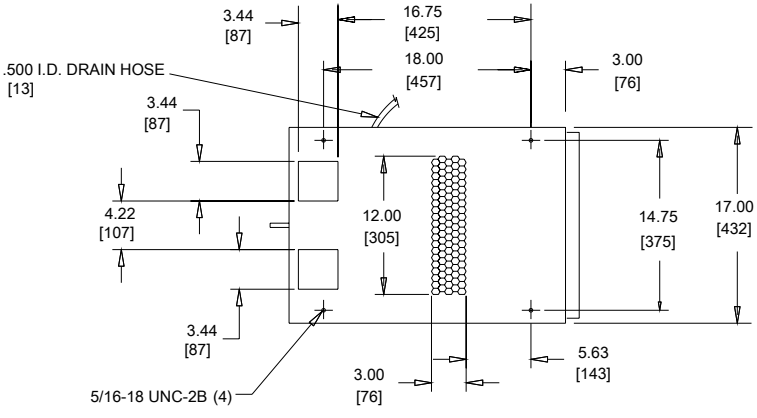
Rear View



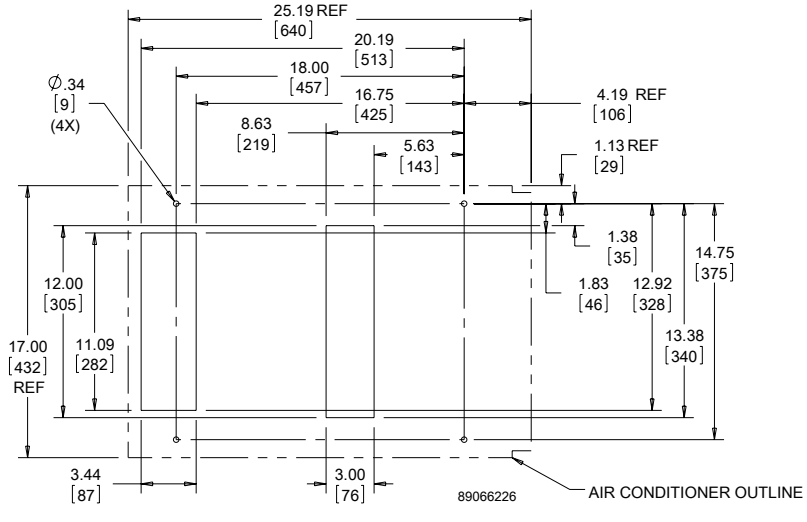
Side View



Front View



Bottom View



Cutout

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PROAIR HARSH ENVIRONMENT

CR23
1600 BTU/Hr.
469 Watts

CR29
2200 and 4000 BTU/Hr.
645 and 1172 Watts

CR43
6000 & 8000 BTU/Hr.
1758 and 2344 Watts

INDUSTRY STANDARDS

UL/cUL Listed; Type 12, 3R, 4; 4X optional; File No. SA6453
UR/cUR Recognized

UR/cUR Recognized on select models, reference performance data tables.
CE
GOST

APPLICATION

- Industrial automation
- Package handling equipment
- Food and beverage
- Wastewater treatment
- Security and defense systems
- And more

FEATURES

- Robust reciprocating compressor
- Easy maintenance: hinged front cover allows quick access to all components; condenser coil can be cleaned while unit is still mounted to the cabinet
- R134a or R407c earth-friendly refrigerant
- Models for 115, 230 and 460 single phase VAC power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from -40 F/-40 C to 131 F/55 C (with optional low-ambient package)
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat located behind the filter of the unit
- Low-carbon mild-steel sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cleanable reusable aluminum mesh filter protects coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- High-performance fans and blowers designed for densely packed enclosures
- Standard Indoor Air Conditioner models also include:
  - Electro-Mechanical Thermostat
  - Surge Suppressor

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint standard
- Stainless steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

OPTIONS

- Thermostat Malfunction Package
- Special Voltage Package
- Outdoor Package*
- Harsh Environment Package*
- Stainless Steel Package*
- Heater Package*

* T-Series may be more appropriate. Refer to T-Series A/C section. Consult the factory for availability and catalog number.

NOTES

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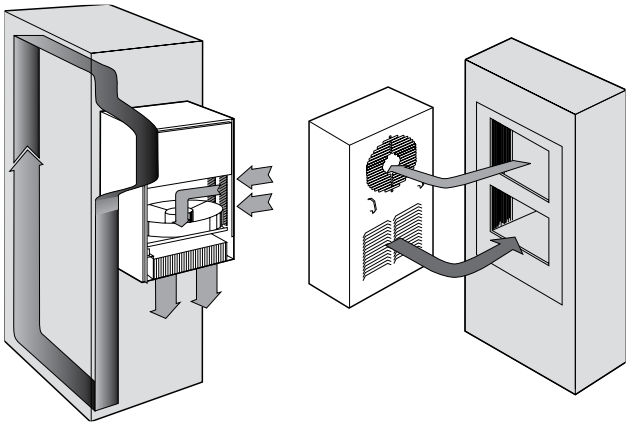
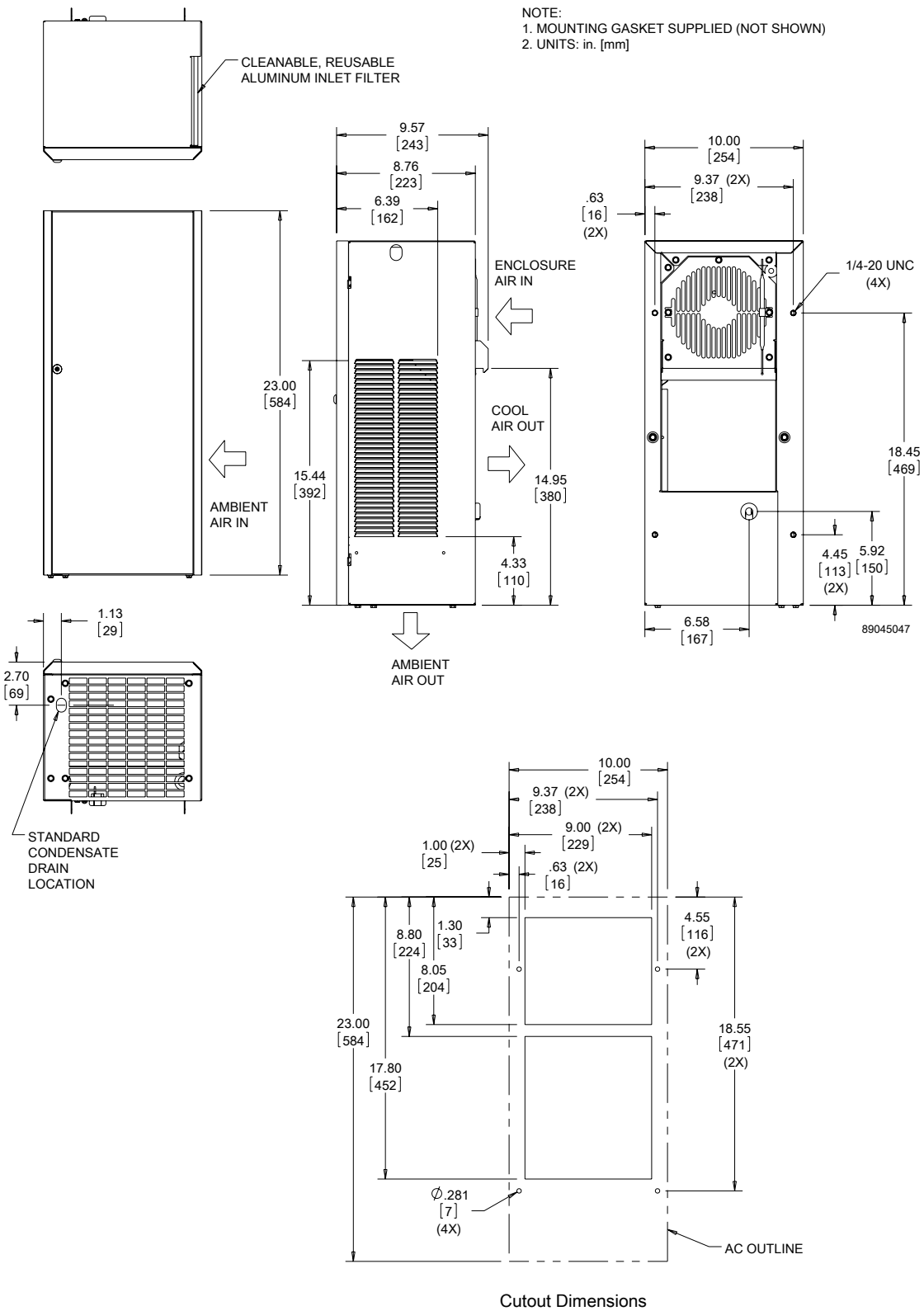
Performance Data **CR23 Models 1600 BTU/Hr. (469 Watt)**

CATALOG NUMBER			
Indoor Model	CR230216G002	CR230226G002	CR230246G400
Indoor Level 2 Controller	CR230216G016	—	—
Outdoor Type 3R	CR230216G013	CR230226G030	—
Outdoor/SST/Corrosion Type 3R	CR230216G007	CR230226G009	—
Outdoor/SST/Level 2 Type 3R	CR230216G017	CR230226G016	—
Indoor/Outdoor/SST/Corrosion Type 4X	CR230216G015	CR230226G014	CR230226G037
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**1400/1600**	**1400/1600**	**1400/1600**
Watts	**410/469**	**410/469**	**410/469**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	10/284	10/284	10/284
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C) (Low Ambient Pkg)	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / m^3/hr.)	117/199	117/199	117/199
External loop 50 Hz (CFM / m^3/hr.)	86/146	86/146	86/146
Internal loop 60 Hz (CFM / m^3/hr.)	130/221	130/221	130/221
External loop 60 Hz (CFM / m^3/hr.)	95/161	95/161	95/161
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	471.5/517.5	506	552
Max. Nominal Current (A at 50/60 Hz)	4.1/4.5	2.2	1.2
Starting Current (A)	18	8.5	5
Agency Approvals	cUL Listed CE GOST		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12, 3R standard Type 4, 4X Stainless steel optional		
CONTROLLER			
Description	Basic mechanical thermostat		
Thermostat Location	Behind cover		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	62 dB(A)		
UNIT CONSTRUCTION			
Material	Mild steel sheet metal standard Stainless steel optional		
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		
UNIT DIMENSIONS			
Height (in./mm)	23/584		23/584
Width (in./mm)	10/254		10/254
Depth (in./mm)	8.75/222		8.75/222
Weight (lb./kg)	57/26		67/30



CR23 Models 1600 BTU/Hr. (469 Watt)



Cutout Dimensions

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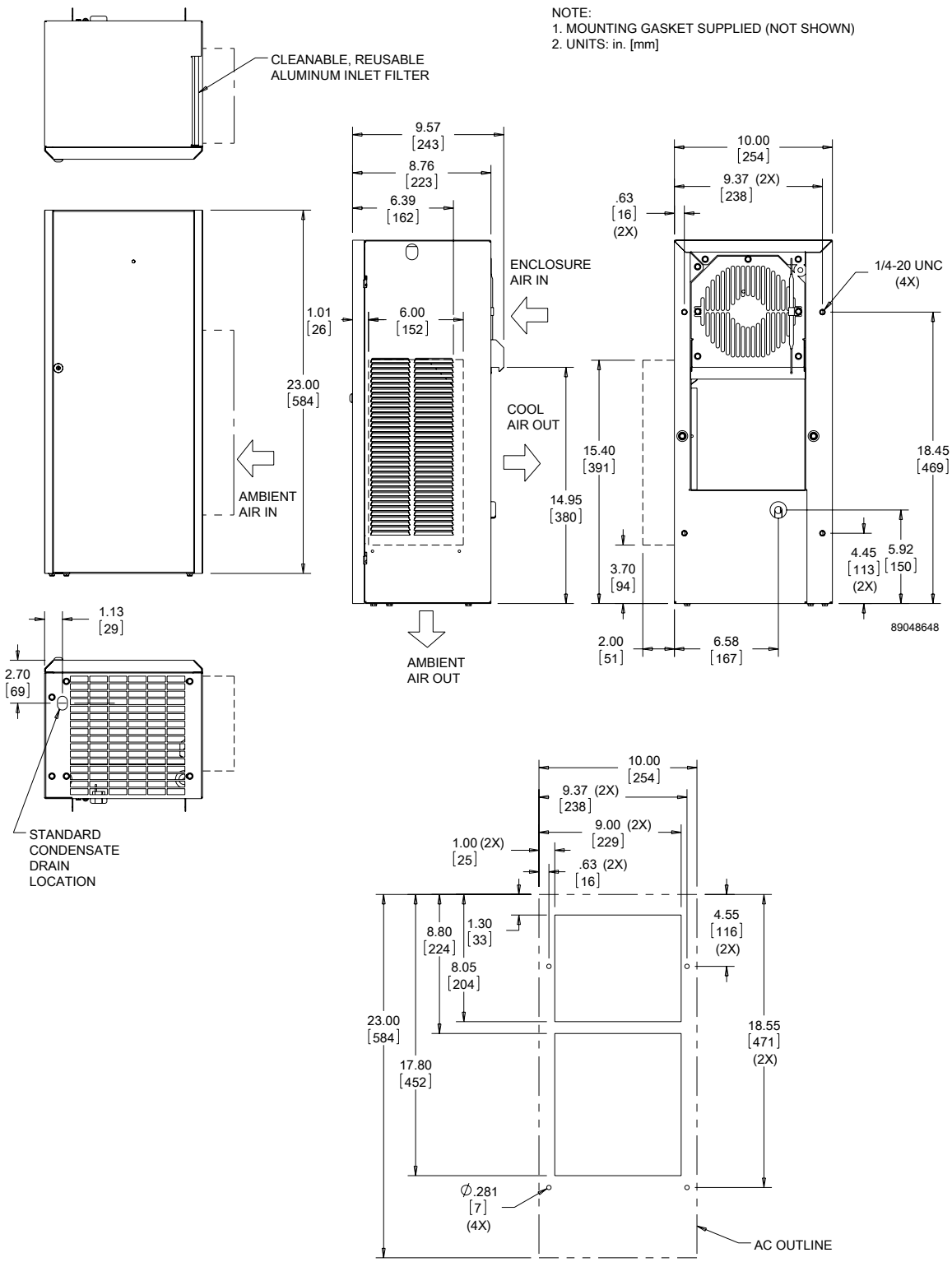
CR23 Models 1600 BTU/Hr. (469 Watt) With Type 4X Hood

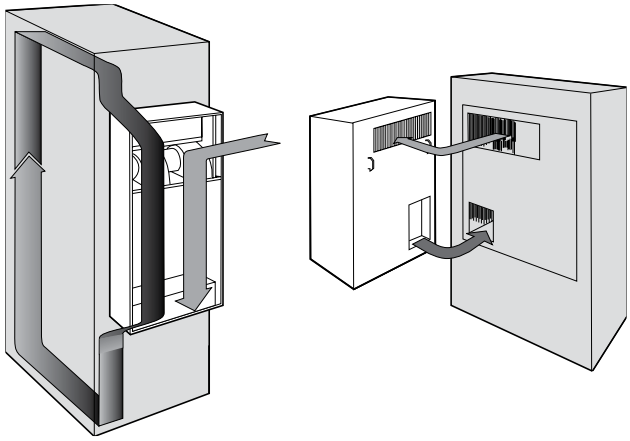


Cutout Dimensions

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

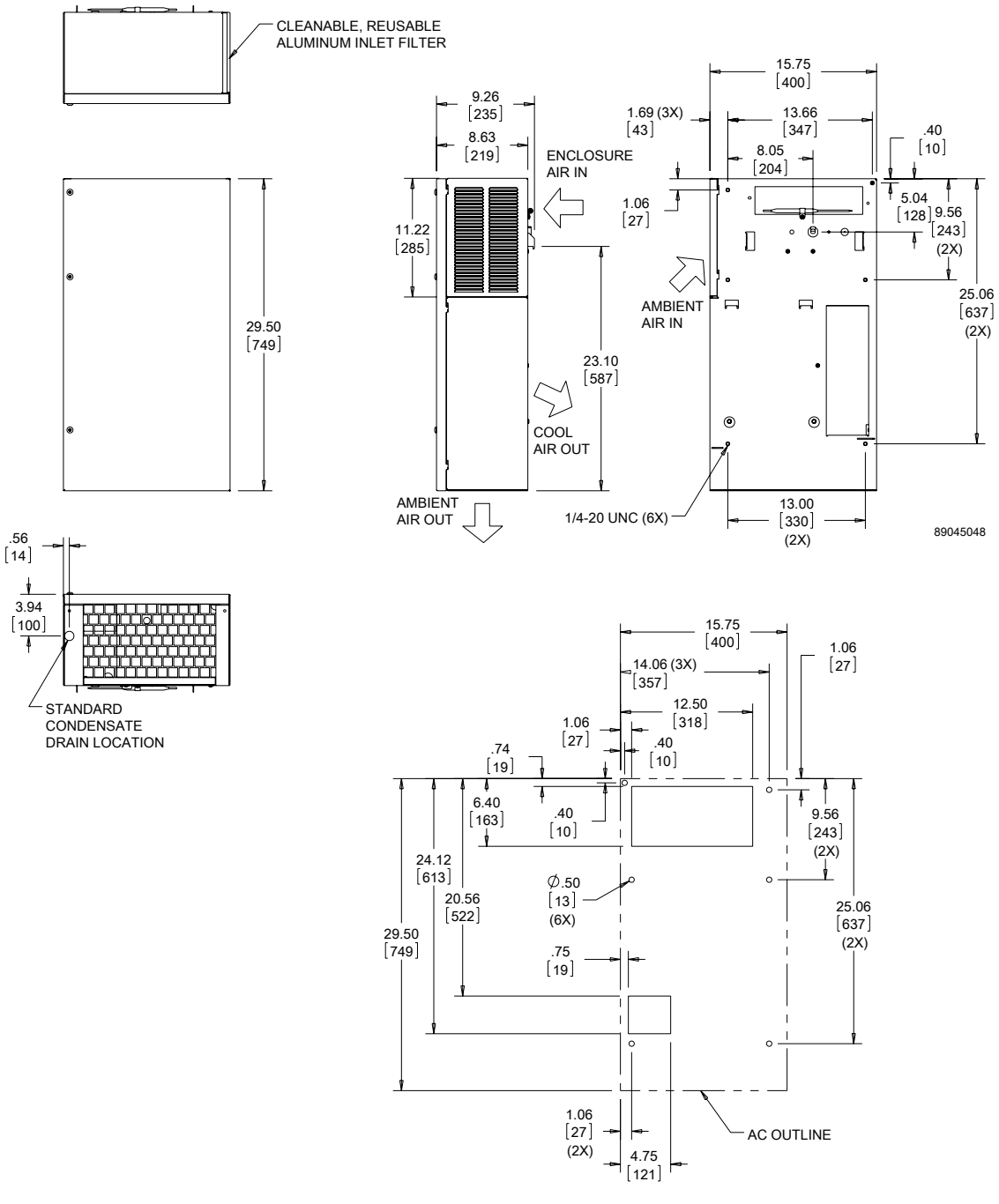
Performance Data **CR29 Models 2200/4000 BTU/Hr. (645/1172 Watt)**

CATALOG NUMBER						
Indoor Model	CR290216G002	CR290226G002	CR290246G400	CR290416G002	CR290426G002	CR290446G400
Indoor Level 2 Controller	CR290216G030	CR290226G030	CR290226G041	CR290416G047	CR290426G027	—
Outdoor Type 3R	CR290216G035	CR290226G020	CR290226G046	CR290416G045	CR290426G022	CR290426G067
Outdoor/SST/Corrosion Type 3R	CR290216G013	CR290226G010	CR290246G401	CR290416G030	CR290426G017	—
Outdoor/SST/Level 2 Type 3R	—	CR290226G031	CR290226G058	CR290416G052	—	CR290426G101
Indoor/Outdoor/SST/Corrosion Type 4X	CR290216G036	CR290226G037	CR290226G045	CR290416G068	CR290426G054	CR290426G061
COOLING PERFORMANCE						
Nominal:						
BTU/Hr.	**2000/2200**	**2500/2700**	**2500/2700**	**3500/4000**	**3500/4000**	**3500/4000**
Watts	**586/645**	**732/791**	**732/791**	**1025/1172**	**1025/1172**	**1026/1172**
Refrigerant	R-134A	R-134A	R-134A	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	11/312	11/312	11/312	11/312	12/341	12/341
Operating Temperature Range:						
Maximum (°F/°C)	131/55	131/55	131/55	131/55	131/55	131/55
Minimum (°F/°C) (Low Ambient Pkg)	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:						
Internal loop 50 Hz (CFM / m^3/hr.)	141/239	141/239	141/239	141/239	141/239	141/239
External loop 50 Hz (CFM / m^3/hr.)	235/399	235/399	235/399	235/399	235/399	235/399
Internal loop 60 Hz (CFM / m^3/hr.)	157/266	157/266	157/266	157/266	157/266	157/266
External loop 60 Hz (CFM / m^3/hr.)	261/443	261/443	261/443	261/443	261/443	261/443
ELECTRICAL DATA						
Rated Voltage	**115**	**230**	**460V 1PH**	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	851/517.5	1058/877	1150/996	1116/1253	1541/1518	1702/1656
Max. Nominal Current (A at 50/60 Hz)	7.4	4.6/3.9	2.5/2.1	12.7/12.1	6.7/6.6	3.7/3.6
Starting Current (A)	28	14.4	7.4	44.5	23	12
Agency Approvals	cUL Listed CE GOST		cUR Recognized CE GOST	cUL Listed CE GOST		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads	6-ft. cord with NEMA 5-20 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION						
UL Type	Type 12, 3R standard Type 4, 4X Stainless steel optional			Type 12, 3R standard 4, 4X Stainless steel optional		
CONTROLLER						
Description	Basic mechanical thermostat			Basic mechanical thermostat		
Thermostat Location	Behind cover			Behind cover		
Factory Thermostat Setting (°F/°C)	80/27			80/27		
SOUND LEVEL						
At 1.5 Meters	68 dB(A)			68 dB(A)		
UNIT CONSTRUCTION						
Material	Mild steel sheet metal standard Stainless steel optional			Mild steel sheet metal standard Stainless steel optional		
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard			RAL 7035 light-gray, semi-textured powder-coat paint standard		
UNIT DIMENSIONS						
Height (in./mm)	29.5/749			29.5/749		
Width (in./mm)	15.75/400			15.75/400		
Depth (in./mm)	8.63/219			8.63/219		
Weight (lb./kg)	98/44	98/44	108/49	118/54	118/54	128/58



CR29 Models 2200/4000 BTU/Hr. (645/1172 Watt)

NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]



Cutout Dimensions

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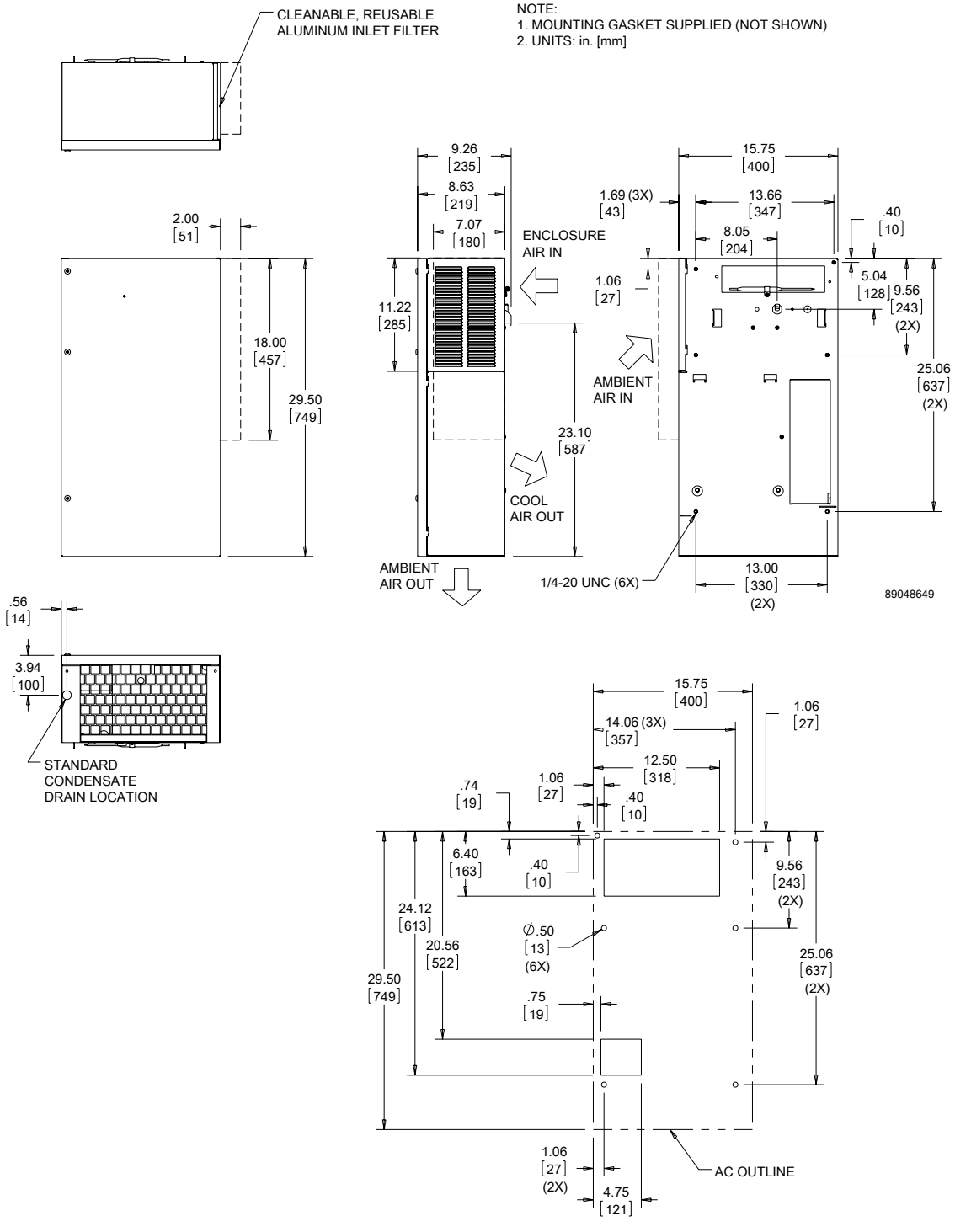
CR29 Models 2200/4000 BTU/Hr. (645/1172 Watt) With Type 4X Hood



Cutout Dimensions

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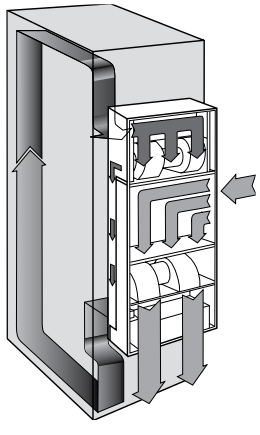
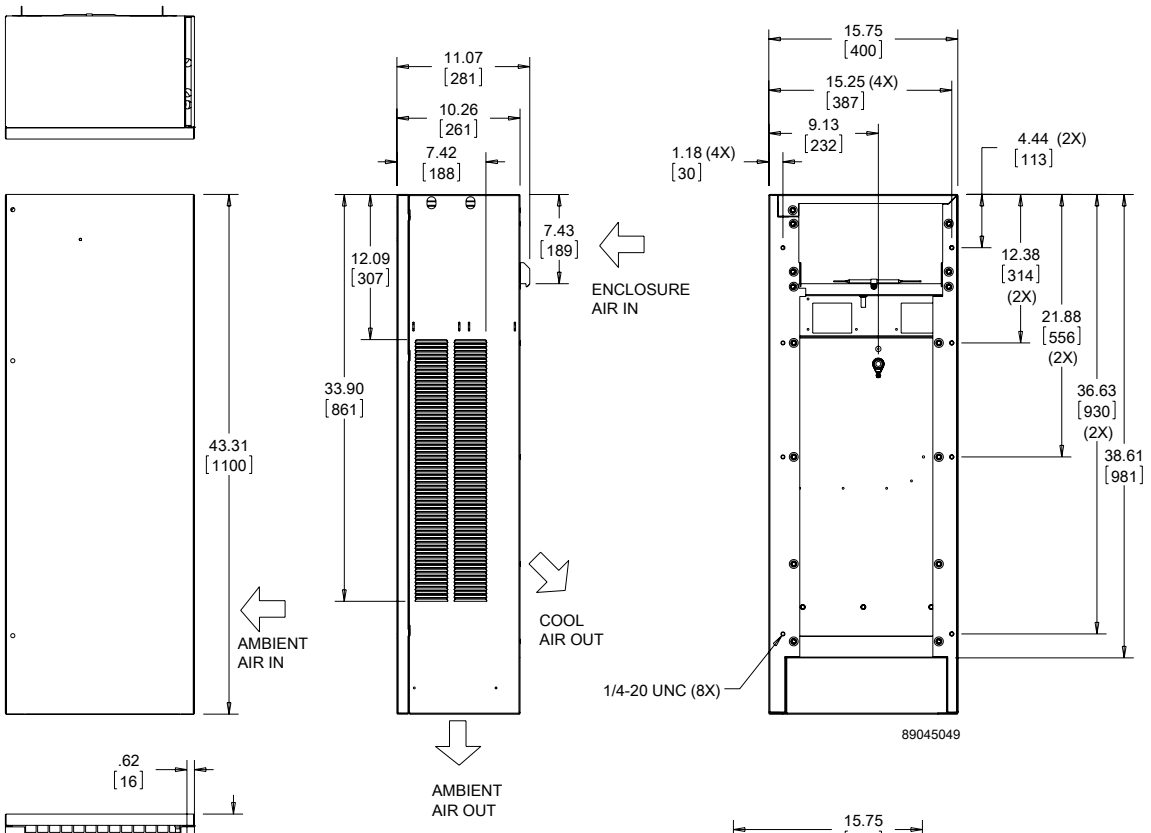
Performance Data **CR43 Models 6000/8000 BTU/Hr. (1758/2344 Watt)**

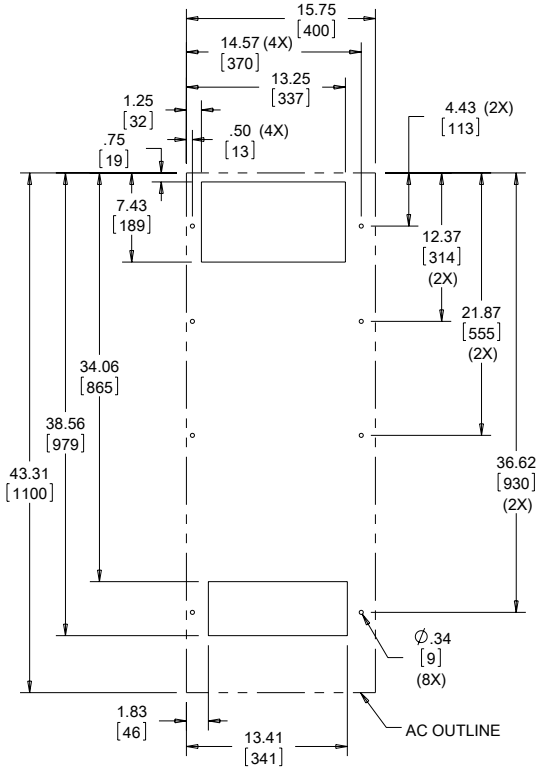
CATALOG NUMBER						
Indoor Model	CR430616G002	CR430626G002	CR430646G004	CR430816G002	CR430826G002	CR430826G089
Indoor Level 2 Controller	CR430616G016	CR430626G018	CR430626G030	CR430816G021	CR430826G026	—
Outdoor Type 3R	CR430616G013	CR430626G014	—	CR430816G038	CR430826G007	—
Outdoor/SST/Corrosion Type 3R	CR430616G004	—	—	CR430816G010	CR430826G037	—
Outdoor/SST/Level 2 Type 3R	—	CR430626G020	—	CR430816G023	CR430826G024	—
Indoor/Outdoor/SST/Corrosion Type 4X	CR430616G031	CR430626G034	CR430626G074	CR430816G036	CR430826G038	CR430846G401
COOLING PERFORMANCE						
Nominal:						
BTU/Hr.	**5500/6000**	**5500/6000**	**5500/6000**	**7100/8000**	**7100/8000**	**7100/8000**
Watts	1611/1758	**1611/1758**	**1611/1758**	**2080/2344**	**2080/2344**	**2080/2344**
Refrigerant	R-134A	R-134A	R-134A	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	19/538	19/538	19/538	19/538	19/538	19/538
Operating Temperature Range:						
Maximum (°F/°C)	131/55	131/55	131/55	131/55	131/55	131/55
Minimum (°F/°C) (Low Ambient Pkg.)	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:						
Internal loop 50 Hz (CFM / m^3/hr.)	320/543	226/384	226/384	320/543	226/384	226/384
External loop 50 Hz (CFM / m^3/hr.)	480/815	470/798	470/798	480/815	470/798	470/798
Internal loop 60 Hz (CFM / m^3/hr.)	368/625	255/433	255/433	368/625	255/433	255/433
External loop 60 Hz (CFM / m^3/hr.)	544/924	540/917	540/917	544/924	540/917	540/917
ELECTRICAL DATA						
Rated Voltage	**115**	**230**	**460V 1PH**	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	1460	1403/1518	1564/1656	1460	1403/1518	1564/1656
Max. Nominal Current (A at 50/60 Hz)	12.7	6.1/6.6	3.4/3.6	12.7	6.1/6.6	3.4/3.6
Starting Current (A)	48.3	27	14	48.3	27	14
Agency Approvals	cUL Listed CE GOST Others available upon request		cUR Recognized CE GOST	cUL Listed CE GOST Others available upon request		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-20 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads	6-ft. cord with NEMA 5-20 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION						
UL Type	Type 12, 3R standard Type 4, 4X Stainless steel optional			Type 12, 3R standard 4, 4X Stainless steel optional		
CONTROLLER						
Description	Basic mechanical thermostat			Basic mechanical thermostat		
Thermostat Location	Enclosure side on all base models			Enclosure side on all base models		
Factory Thermostat Setting (°F/°C)	80/27			80/27		
SOUND LEVEL						
At 1.5 Meters	71 dB(A)			71 dB(A)		
UNIT CONSTRUCTION						
Material	Galvanized sheet metal standard Stainless steel optional			Galvanized sheet metal standard Stainless steel optional		
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard			RAL 7035 light-gray, semi-textured powder-coat paint standard		
UNIT DIMENSIONS						
Height (in./mm)	43.31/1100			43.31/1100		
Width (in./mm)	15.75/400			15.75/400		
Depth (in./mm)	10.25/260			10.25/260		
Weight (lb./kg)	125/57	125/57	155/70	125/57	125/57	155/70



CR43 Models 6000/8000 BTU/Hr. (1758/2344 Watt)



NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]



Cutout Dimensions

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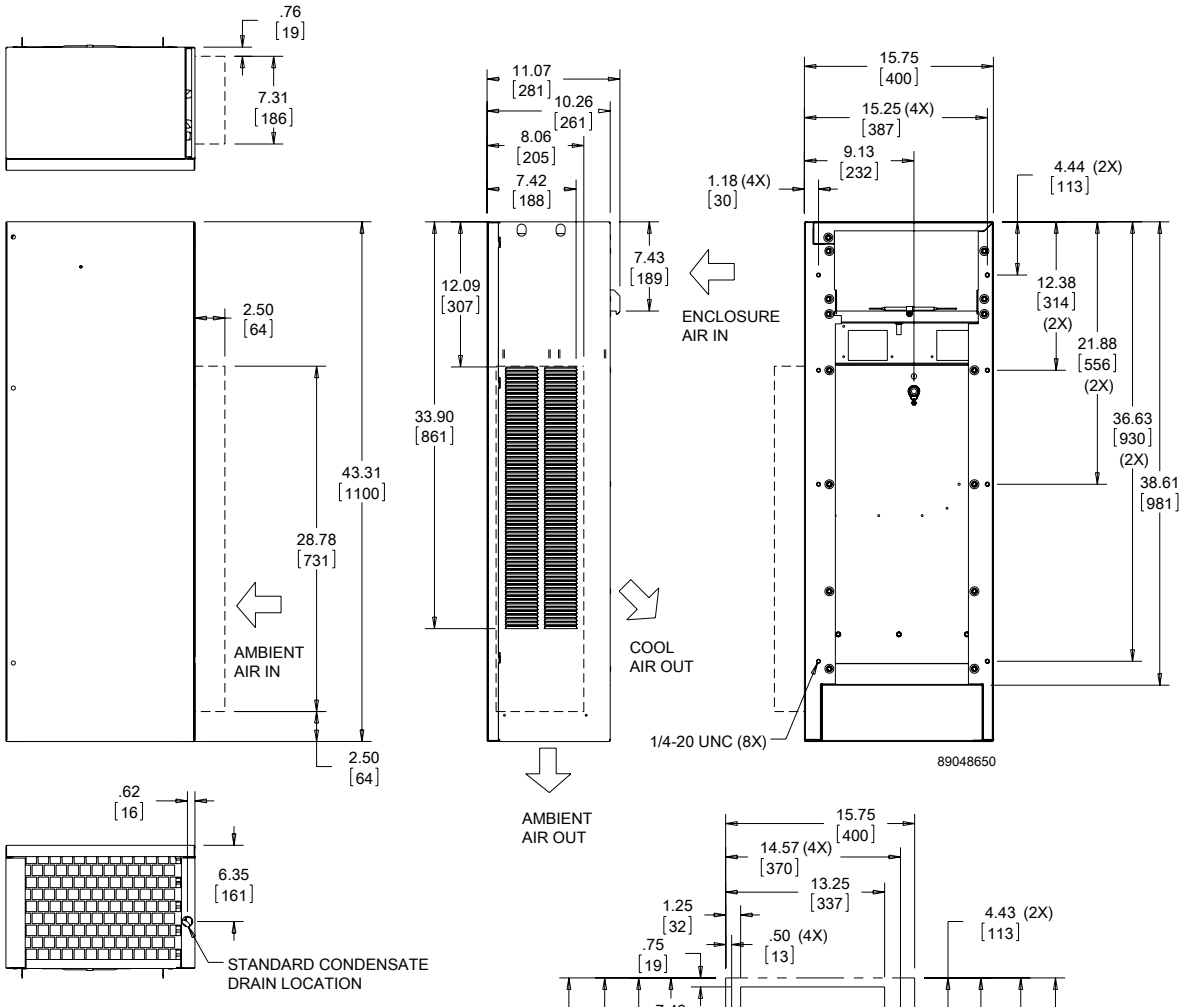
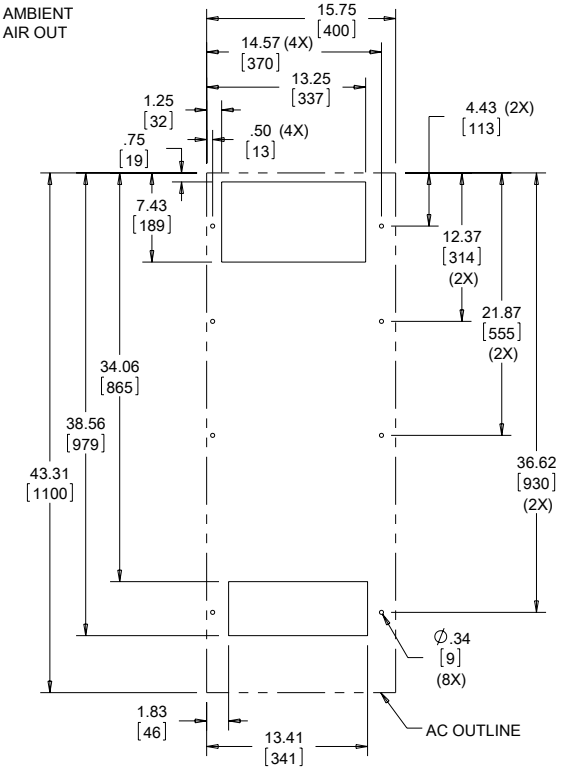
CR43 Models 6000/8000 BTU/Hr. (1758/2344 Watt) With Type 4X Hood



NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]



Cutout Dimensions

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WATER-COOLED INDOOR

33WC
4000 BTU/Hr.
1172 Watt

INDUSTRY STANDARDS

UL/cUL Listed; Type 12; File No. SA6453 UR/cUR Recognized

UR/cUR Recognized on select models, reference performance data tables.
CE
GOST

APPLICATION

- Industrial automation
- Package handling equipment
- Food and beverage
- Wastewater treatment
- Security and defense systems
- Pulp and paper
- And more

FEATURES

- Robust reciprocating compressor
- R134a earth-friendly refrigerant
- Models for 115 VAC, 230 VAC and 460 V 1-phase power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from 50 F/10 C to 125 F/52 C
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat located behind the front panel of the unit
- Low-carbon mild-steel sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Heat is removed from the system by means of the water cooling the refrigerant; no external air movers or condenser coils to get clogged
- Maximum water usage of 2 GPM at 90 F water intake temperature
- Standard Indoor Air Conditioner models also include:
  - Electro-Mechanical Thermostat
  - Surge Suppressor

FINISH

- RAL 7042 gray, semi-gloss powder-coat paint standard
- Stainless steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

OPTIONS

- Thermostat Malfunction Package
- Special Voltage Package
- Active Condensate Evaporator Package
- Harsh Environment Package*
- Stainless Steel Package*

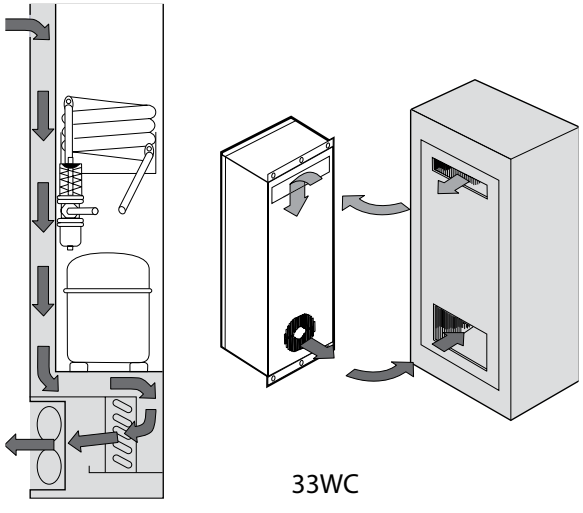
  * Consult the factory for availability and catalog number.

NOTES

Visit **www.HoffmanOnline.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

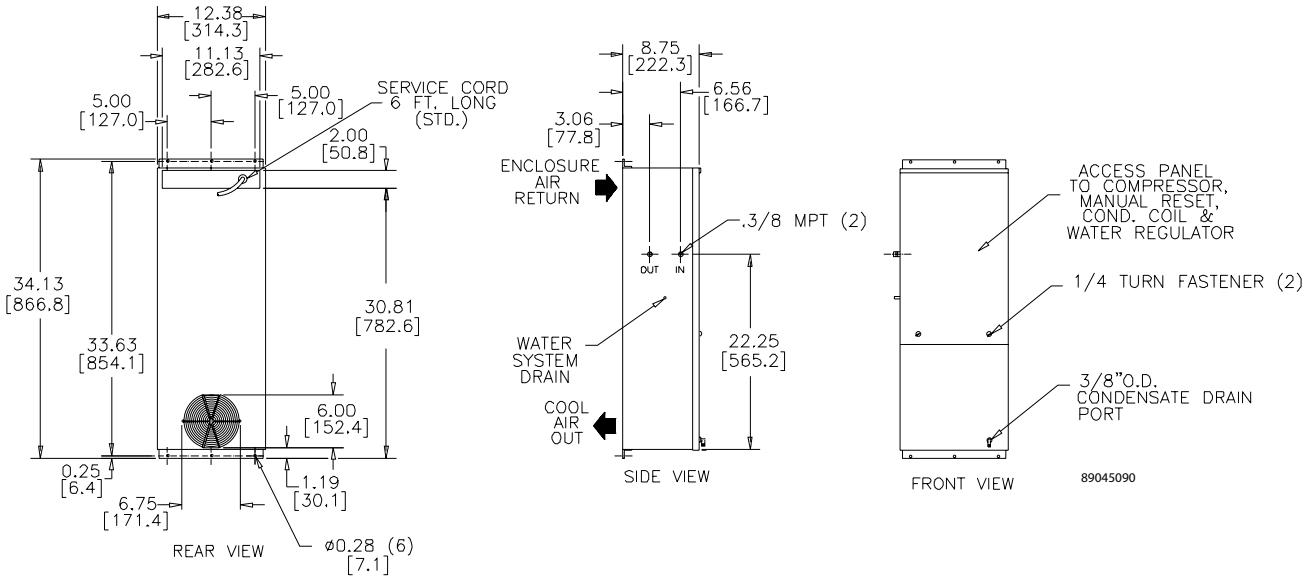
Performance Data **33WC Models 4000 BTU/Hr. (1172 Watt)**

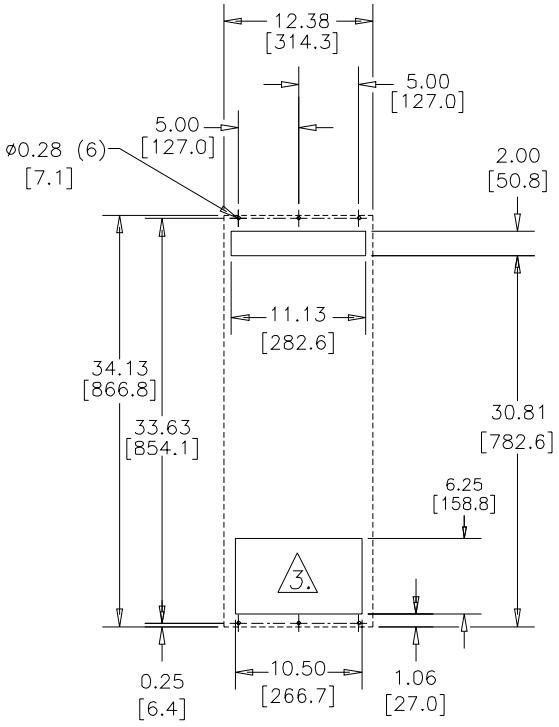
CATALOG NUMBER	330416GW010	330426GW014	330426GW012
COOLING PERFORMANCE			
Nominal:			
BTU/Hr.	**3800/4000**	**3800/4000**	**3800/4000**
Watts	**1113/1172**	**1113/1172**	**1113/1172**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	7/198	7/198	7/198
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Airflow at 0 Static Pressure:			
Internal loop 50 Hz (CFM / m^3/hr.)	135/229	100/170	100/170
External loop 50 Hz	Waterflow: 0.5 GPM @ 90 F	Waterflow: 0.5 GPM @ 90 F	Waterflow: 0.5 GPM @ 90 F
Internal loop 60 Hz (CFM / m^3/hr.)	145/246	110/187	110/187
External loop 60 Hz	Waterflow: 0.5 GPM @ 90 F	Waterflow: 0.5 GPM @ 90 F	Waterflow: 0.5 GPM @ 90 F
ELECTRICAL DATA			
Rated Voltage	**115**	**220/230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	690/667	726/736	828/782
Max. Nominal Current (A at 50/60 Hz)	6.0/5.8	3.3/3.2	1.8/1.7
Starting Current (A)	28	14.4	7.4
Agency Approvals	cUL Listed CE GOST		cUR Recognized CE GOST
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12 standard		
CONTROLLER			
Description	Basic mechanical thermostat		
Thermostat Location	Behind front cover		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	61 dB(A)		
UNIT CONSTRUCTION			
Material	Mild steel sheet metal standard Stainless steel optional		
Finish	RAL 7042 gray, semi-gloss powder-coat paint standard		
UNIT DIMENSIONS			
Height (in./mm)	34.13/867		38.63/981.2
Width (in./mm)	12.38/314		12.38/314
Depth (in./mm)	8.75/222		8.75/222
Weight (lb./kg)	86/39		106/48



33WC

33WC Models 4000 BTU/Hr. (1172 Watt)





Cutout Dimensions

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Notes

WATER-COOLED INDOOR/OUTDOOR

CR43WC
8000 BTU/Hr.
2345 Watt

INDUSTRY STANDARDS

UL/cUL Listed; Type 4; 4X optional; File No. SA6453 UR/cUR Recognized

UR/cUR Recognized on select models, reference performance data tables.
CE
GOST

APPLICATION

- Industrial automation
- Package handling equipment
- Food and beverage
- Wastewater treatment
- Security and defense systems
- Pulp and paper
- And more

FEATURES

- Robust reciprocating compressor
- R134a earth-friendly refrigerant
- Models for 115 and 230 VAC power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from 50 F/10 C to 125 F/52 C
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat located behind the front panel of the unit
- Low-carbon mild-steel sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Heat is removed from the system by means of the water cooling the refrigerant; no external air movers or condenser coils to get clogged
- Maximum water usage of 2 GPM at 90 F water intake temperature
- Standard Indoor Air Conditioner models also include:
  - Electro-Mechanical Thermostat
  - Surge Suppressor

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint standard
- Stainless steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

OPTIONS

- Thermostat Malfunction Package
- Special Voltage Package
- Active Condensate Evaporator Package
- Harsh Environment Package*
- Stainless Steel Package*

  * Consult the factory for availability and catalog number.

NOTES

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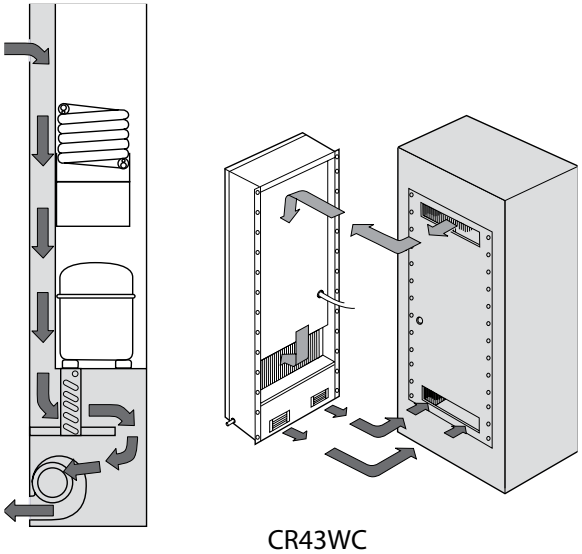
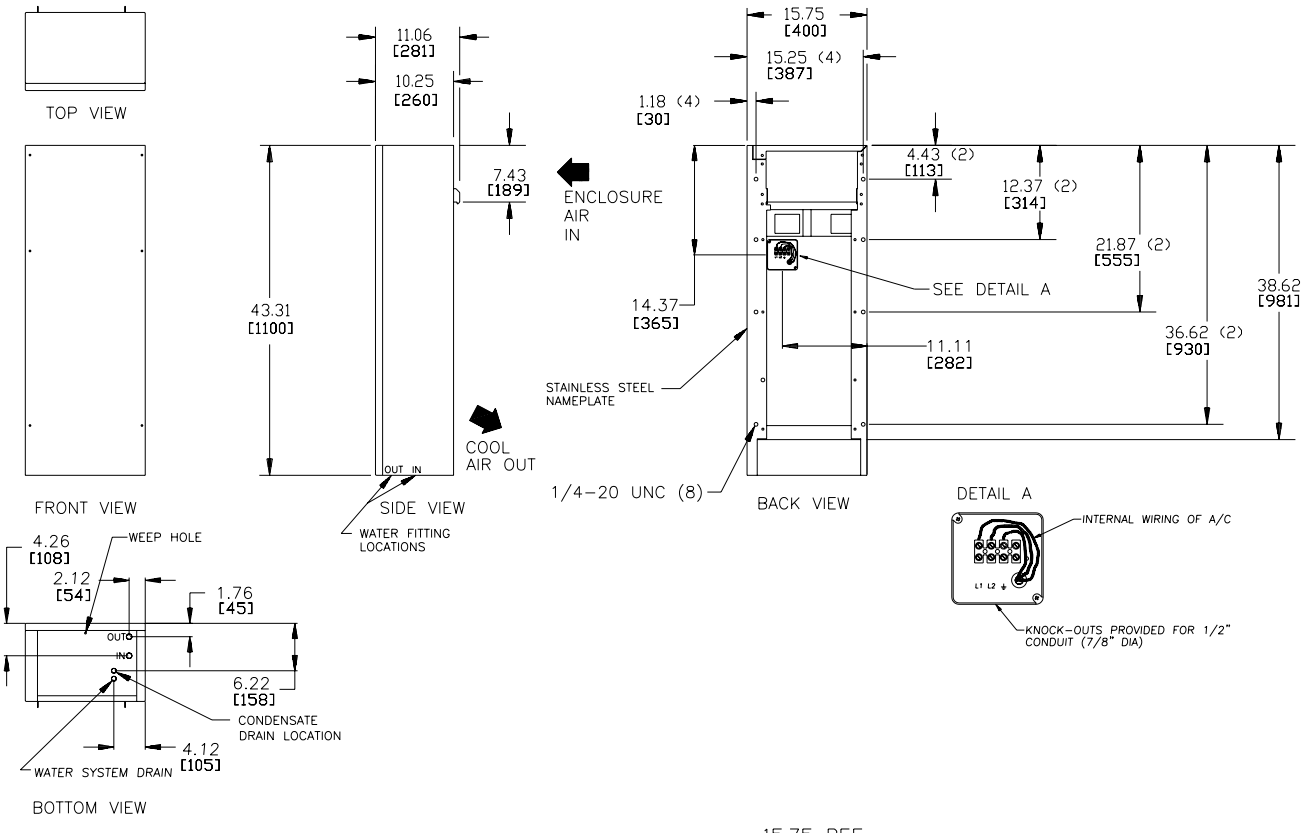
Performance Data **CR43WC Models 8000 BTU/Hr. (2345 Watt)**

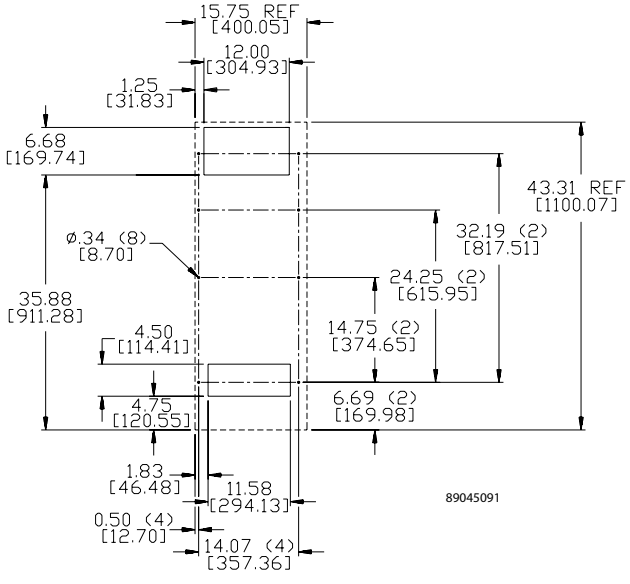
CATALOG NUMBER	CR430816GW010	CR430826GWXXX
COOLING PERFORMANCE		
Nominal:		
BTU/Hr.	**8500**	**8500**
Watts	**2490**	**2490**
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	12/341	12/341
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Minimum (°F/°C)	50/10	50/10
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	135/229	100/170
External loop 50 Hz	Waterflow: 1.5 GPM @ 90F	Waterflow: 1.5 GPM @ 90F
Internal loop 60 Hz (CFM / m^3/hr.)	145/246	110/187
External loop 60 Hz	Waterflow: 1.5 GPM @ 90F	Waterflow: 1.5 GPM @ 90F
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50 / 60 Hz)	1518/1495	1518/1495
Max. Nominal Current (A at 50 / 60 Hz)	13.2/13	6.6/6.5
Starting Current (A)	48.3	27
Agency Approvals	cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 4 standard Type 4X Stainless steel optional	
CONTROLLER		
Description	Basic mechanical thermostat	
Thermostat Location	Behind front cover	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	61 dB(A)	
UNIT CONSTRUCTION		
Material	Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	43.31/1100	
Width (in./mm)	15.75/400	
Depth (in./mm)	10.25/260.4	
Weight (lb./kg)	86/39	



CR43WC

CR43WC Models 8000 BTU/Hr. (2345 Watt)





Cutout Dimensions

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Notes

WATER-COOLED RACK-MOUNT

LB11WC
4000 BTU/Hr.
1172 Watt

INDUSTRY STANDARDS

UL/cUL Listed; Type 12; File No. SA6453 UR/cUR Recognized

UR/cUR Recognized on select models, reference performance data tables.
CE
GOST

APPLICATION

- Industrial automation
- Package handling equipment
- Food and beverage
- Wastewater treatment
- Security and defense systems
- Pulp and paper
- And more

FEATURES

- Robust reciprocating compressor
- R134a earth-friendly refrigerant
- Models for 115 and 230 VAC power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from 50 F/10 C to 125 F/52 C
- Reliable mechanical thermostat located behind the front panel of the unit
- Low-carbon mild-steel sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Heat is removed from the system by means of the water cooling the refrigerant; no external air movers or condenser coils to get clogged
- Maximum water usage of 2 GPM at 90 F water intake temperature
- Standard Indoor Air Conditioner models also include:
  - Electro-Mechanical Thermostat
  - Surge Suppressor

FINISH

- RAL 7042 gray, semi-gloss powder-coat paint standard
- Stainless steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

OPTIONS

- Thermostat Malfunction Package
- Special Voltage Package
- Active Condensate Evaporator Package
- Harsh Environment Package*
- Stainless Steel Package*

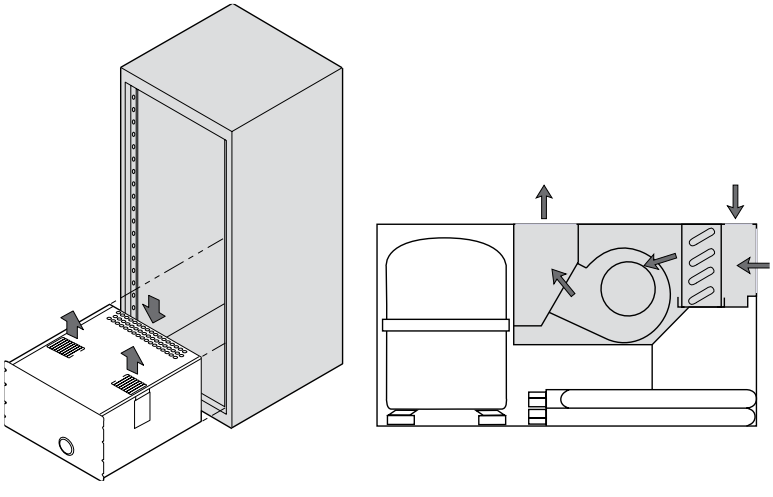
* Consult the factory for availability and catalog number.

NOTES

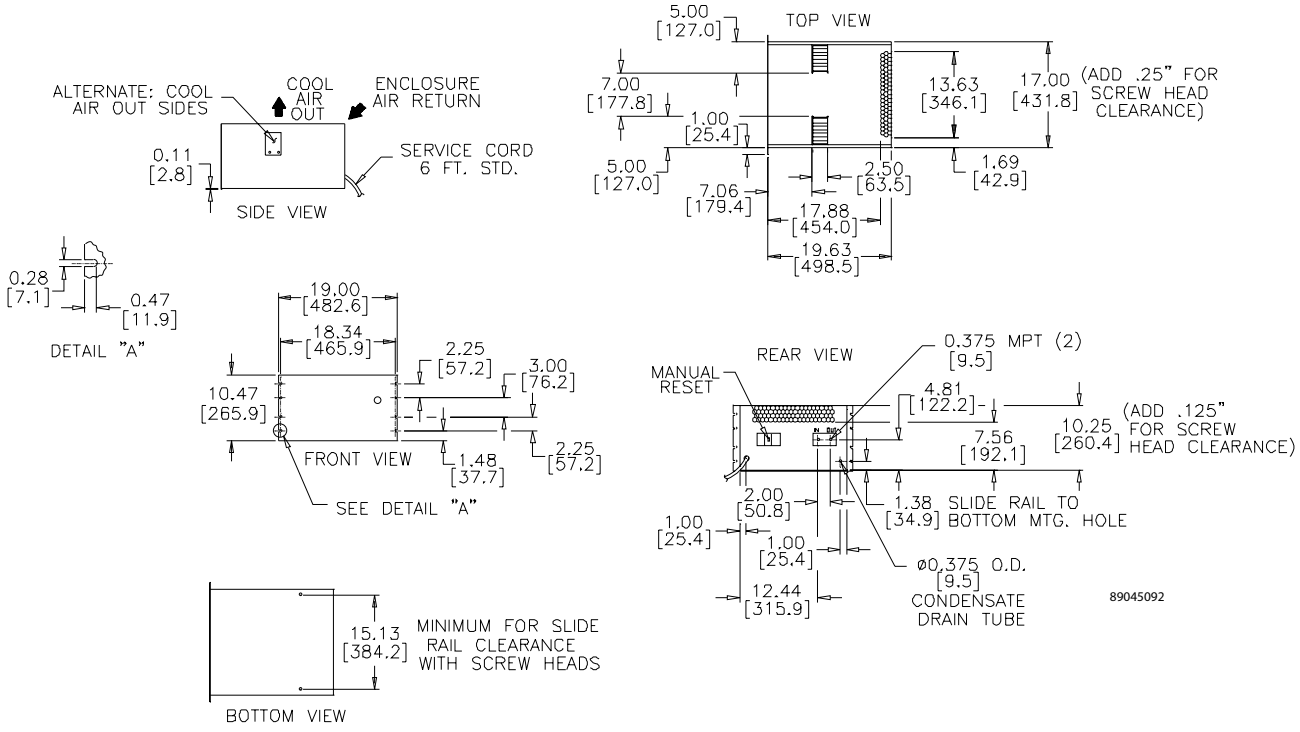
Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

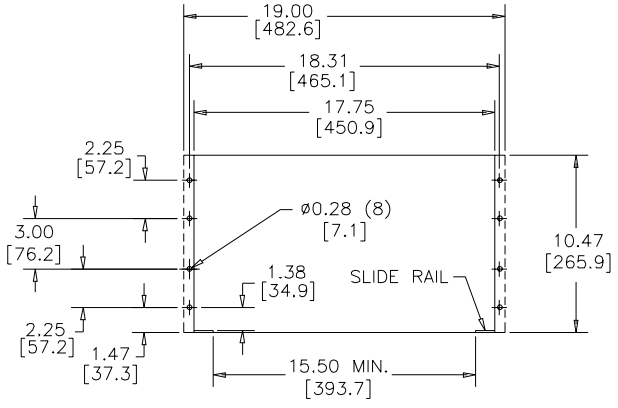
Performance Data **LB11WC Models 4000 BTU/Hr. (1172 Watt)**

CATALOG NUMBER	LB110416GW008	LB110426GW010
COOLING PERFORMANCE		
Nominal:		
BTU/Hr.	**3900/4000**	**3900/4000**
Watts	**1142/1172**	**1142/1172**
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	12/340	12/340
Operating Temperature Range:		
Maximum (°F/°C)	125/52	125/52
Minimum (°F/°C)	50/10	50/10
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	135/229	100/170
External loop 50 Hz	Waterflow: 1.0 GPM @ 90 F	Waterflow: 1.0 GPM @ 90 F
Internal loop 60 Hz (CFM / m^3/hr.)	145/246	110/187
External loop 60 Hz	Waterflow: 1.0 GPM @ 90 F	Waterflow: 1.0 GPM @ 90 F
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	885.5/828	897/792
Max. Nominal Current (A at 50/60 Hz)	7.7/7.2	3.9/3.6
Starting Current (A)	28	14.4
Agency Approvals	Not listed	cUL Listed CE GOST
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12 standard	
CONTROLLER		
Description	Basic mechanical thermostat	
Thermostat Location	Behind front cover	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	61 dB(A)	
UNIT CONSTRUCTION		
Material	Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7042 gray, semi-gloss powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	10.47/266	
Width (in./mm)	19/483	
Depth (in./mm)	19.63/499	
Weight (lb./kg)	110/50	



LB11WC Models 4000 BTU/Hr. (1172 Watt)





Cutout Dimensions

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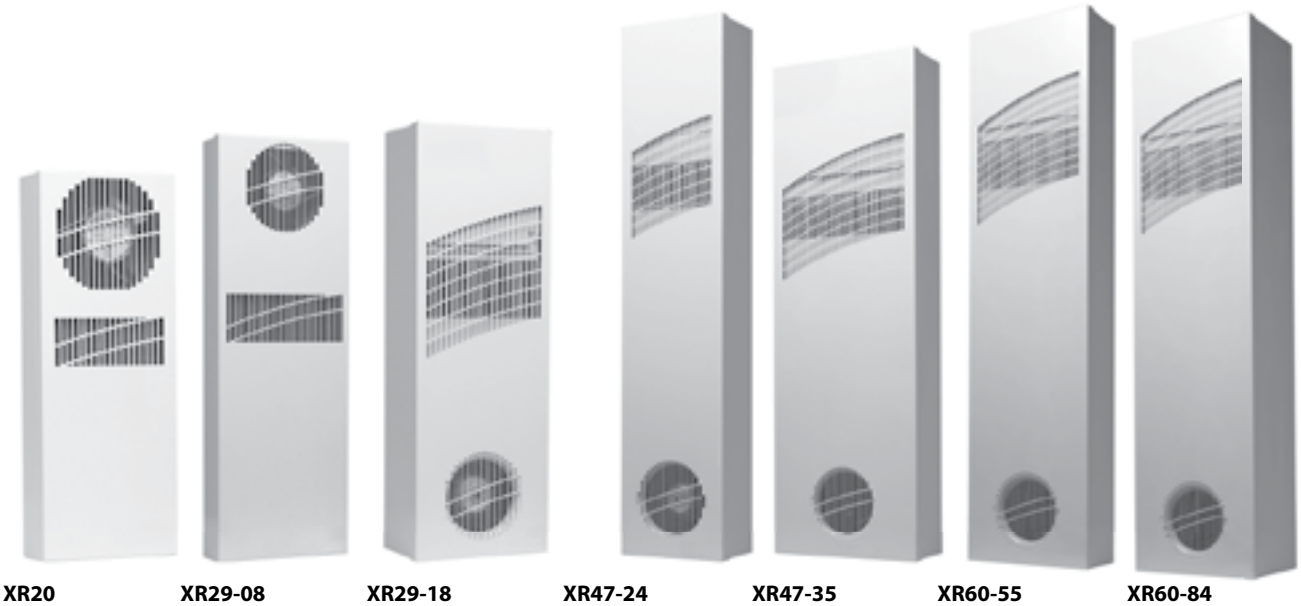
Notes

CLIMAGUARD™ AIR-TO-AIR INDOOR



XR20	XR29-08	XR29-18	XR47-24	XR47-35	XR60-55	XR60-84
Models	Models	Models	Models	Models	Models	Models
4 W/°F (7 W/°C)	8 W/°F (14 W/°C)	18 W/°F (32 W/°C)	24 W/°F (43 W/°C)	35 W/°F (63 W/°C)	55 W/°F (99 W/°C)	84 W/°F (151 W/°C)

3

INDUSTRY STANDARDS

UL/cUL Listed; Type 12, 3R; File No. SA7402
UR/cUR Recognized

Type 12 on XR20 and XR29-08 models
Type 3R on XR29-18 and larger models when surface mounted vertically on an enclosure
CE
GOST

APPLICATION

- Industrial automation
- Package handling equipment
- Security and defense systems
- And more

FEATURES

- Unique counterflow aluminum core for high-efficiency and high-performance heat transfer, except for the XR20 and XR29-08 which use a modified heat pipe core
- Models for 115 and 230 VAC power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from -20 F/-29 C to 140 F/60 C
- Streamlined aesthetics with no visible mounting rails; Slim design allows for mounting to narrow or shallow enclosures
- Reliable top-quality bearing fans and impellers make these units run quietly and with increased reliability
- Low-carbon mild-steel sheet-metal cover for rugged factory environments
- Easy-mount flanges for simple installation
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Filterless design for low maintenance and easy cleaning
- Four fasteners allow simple removal of front cover for easy access

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint standard
- Stainless steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

OPTIONS

- Special Voltage Package
- Outdoor Package*
- Harsh Environment Package*
- Stainless Steel Package*

* CLIMAGUARD™ may be more appropriate. Refer to CLIMAGUARD Air-to-Air Outdoor chapter. Consult the factory for availability and catalog number.

NOTES

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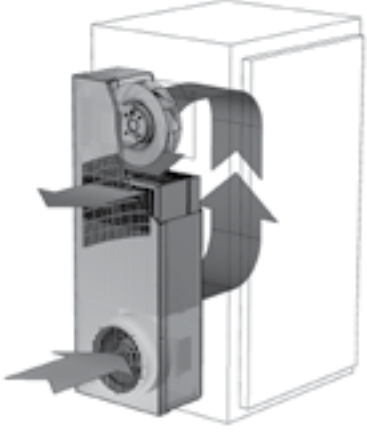
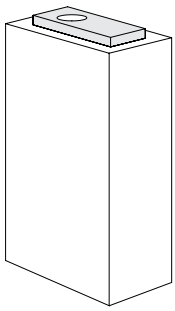


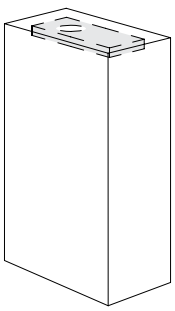
Performance Data **XR20 Models 4 W/°F (7 W/°C)**

CATALOG NUMBER	XR200416012	XR200426012
COOLING PERFORMANCE		
Nominal:		
W per °F	**4**	**4**
W per °C	**7**	**7**
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	4/113	4/113
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	71/121	71/121
External loop 50 Hz (CFM / m^3/hr.)	75/127	75/127
Internal loop 60 Hz (CFM / m^3/hr.)	74/126	74/126
External loop 60 Hz (CFM / m^3/hr.)	78/132	78/132
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	69	69
Max. Nominal Current (A at 50/60 Hz)	0.6	0.3
Agency Approvals	cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12 standard	
SOUND LEVEL		
At 1.5 Meters	56 dBA	
UNIT CONSTRUCTION		
Material	Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	20/508	20/508
Width (in./mm)	7.5/190.5	7.5/190.5
Depth (in./mm)	3/76.2	3/76.2
Weight (lb./kg)	12/5.4	12/5.4

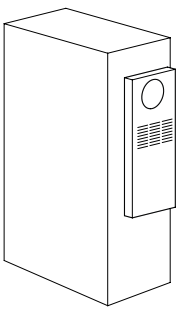
Mounting Options



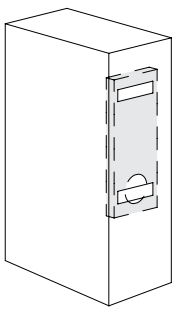
External Top-Mount



Internal Top-Mount



External Vertical-Mount

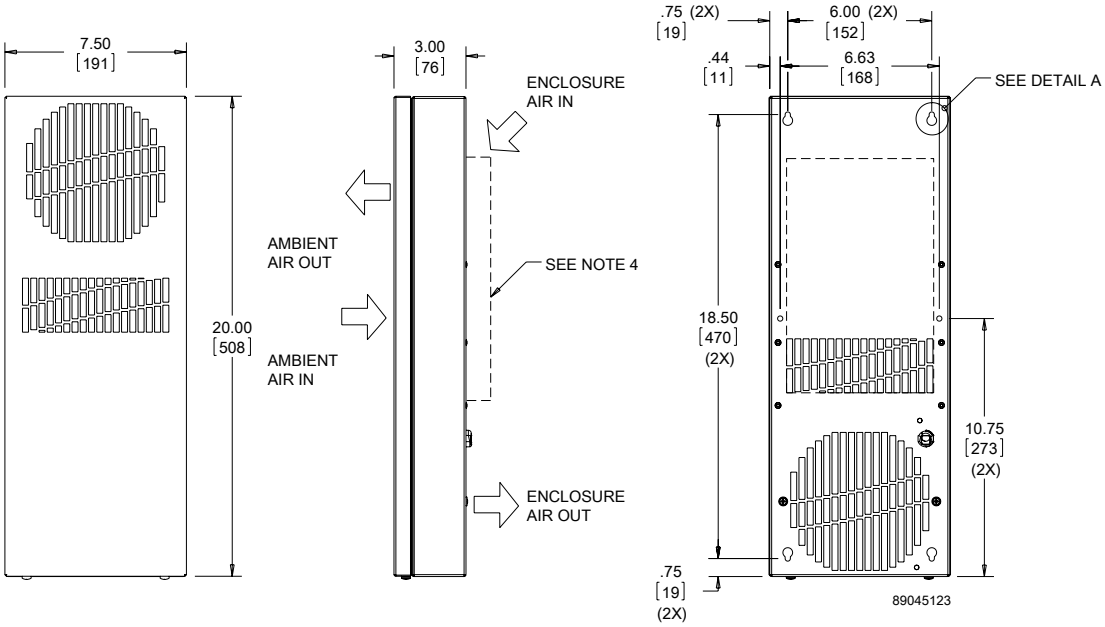


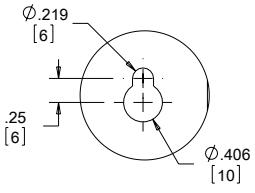
Internal Vertical-Mount

Note: Internal mounting requires inverting the heat exchanger as shown.

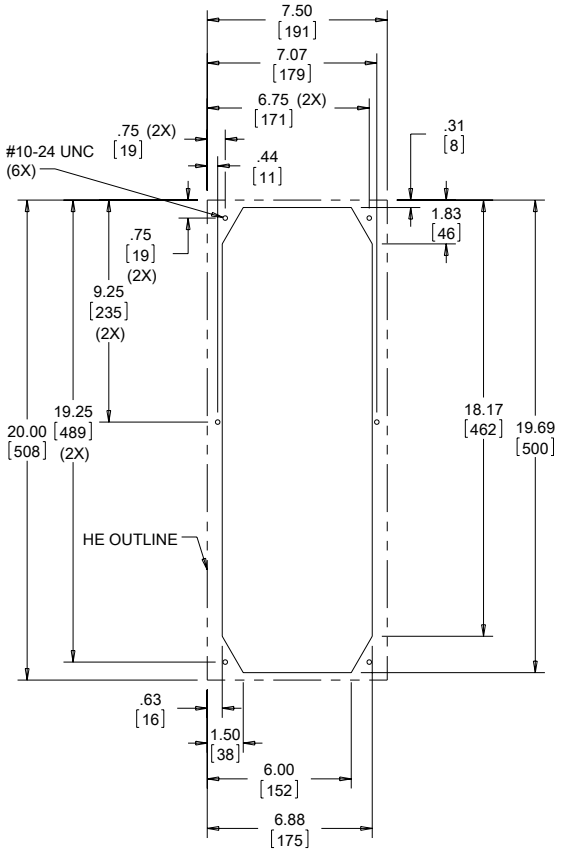
87569532

XR20 Models 4 W/°F (7 W/°C)





DETAIL A
(4X)



Cutout Dimensions

NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in [mm]
3. SERVICE CORD TERMINATED WITH APPROPRIATE PLUG:
   NEMA 5-15P FOR 115V UNITS
   NEMA 6-15P FOR 230V UNITS
4. DETACHABLE AIRFLOW PLENUM MAY BE USED WHEN MOUNTING THE HEAT EXCHANGER INSIDE OR OUTSIDE OF THE ENCLOSURE

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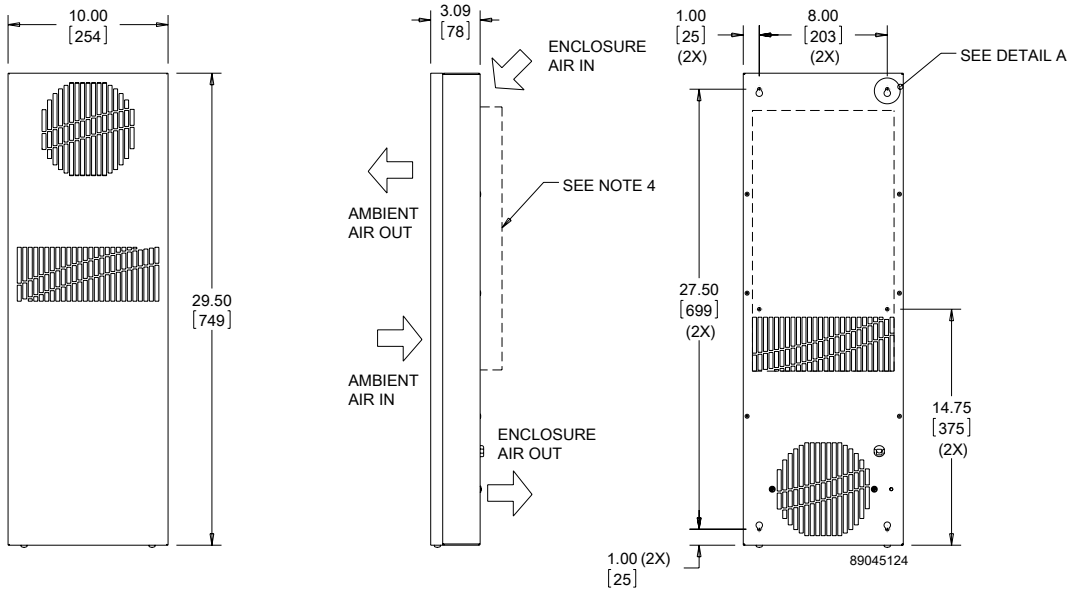
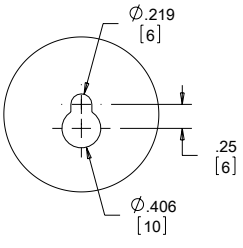
Performance Data **XR29 Models 8 W/°F (14 W/°C)**

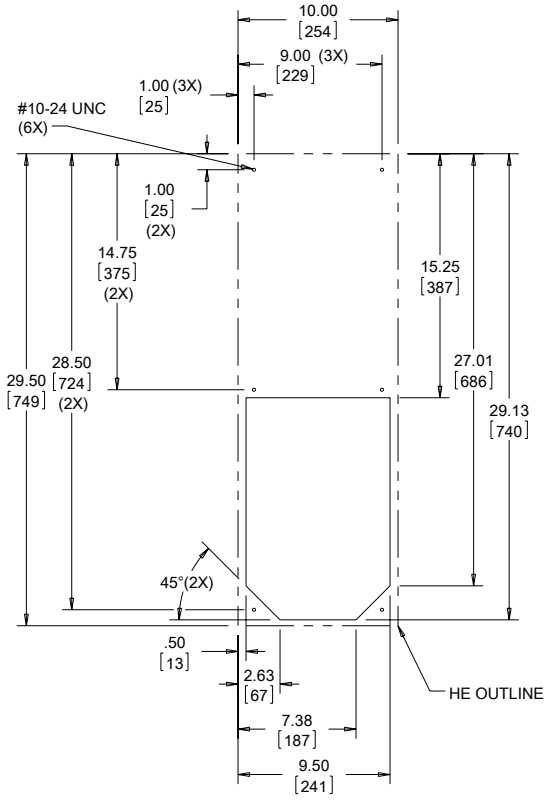
CATALOG NUMBER	XR290816012	XR290826012
COOLING PERFORMANCE		
Nominal:		
W per °F	**8**	**8**
W per °C	**14**	**14**
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	5.5/156	5.5/156
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	71/121	71/121
External loop 50 Hz (CFM / m^3/hr.)	75/127	75/127
Internal loop 60 Hz (CFM / m^3/hr.)	74/126	74/126
External loop 60 Hz (CFM / m^3/hr.)	78/132	78/132
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	69	69
Max. Nominal Current (A at 50/60 Hz)	0.6	0.3
Agency Approvals	cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12 standard	
SOUND LEVEL		
At 1.5 Meters	56 dBA	
UNIT CONSTRUCTION		
Material	Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	29.5/749.3	29.5/749.3
Width (in./mm)	10/254	10/254
Depth (in./mm)	3.09/78.5	3.09/78.5
Weight (lb./kg)	21/9.5	21/9.5

XR29 Models 8 W/°F (14 W/°C)





DETAIL A
(4X)



Cutout Dimensions

NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in [mm]
3. SERVICE CORD TERMINATED WITH APPROPRIATE PLUG:
   NEMA 5-15p FOR 115V UNITS
   NEMA 6-15P FOR 230V UNITS
4. DETACHABLE AIRFLOW PLENUM MAY BE USED WHEN MOUNTING THE HEAT EXCHANGER INSIDE OR OUTSIDE OF THE ENCLOSURE

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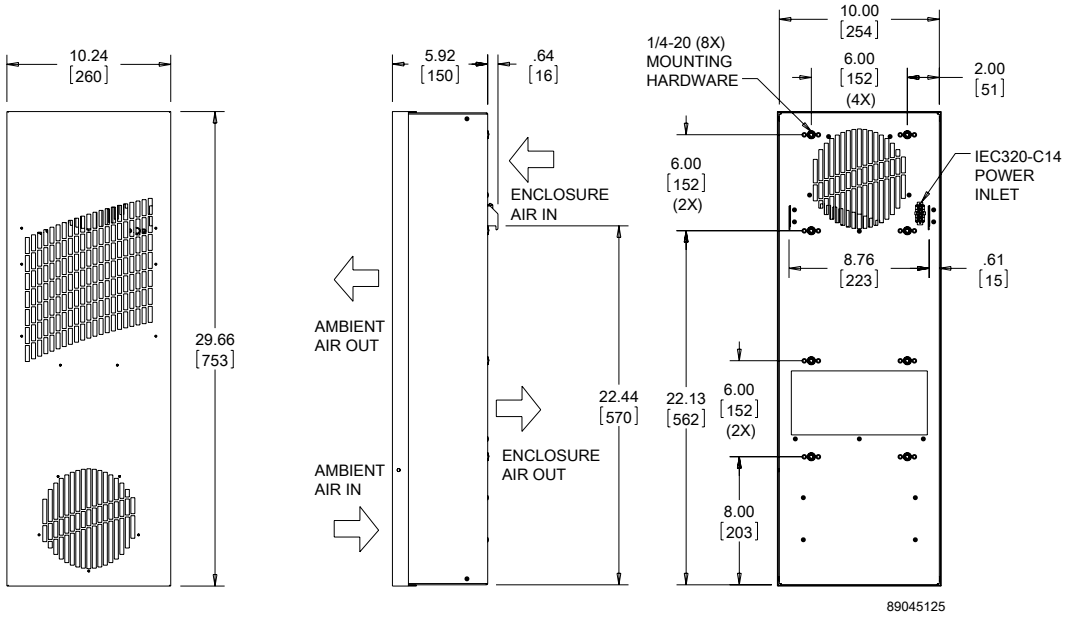
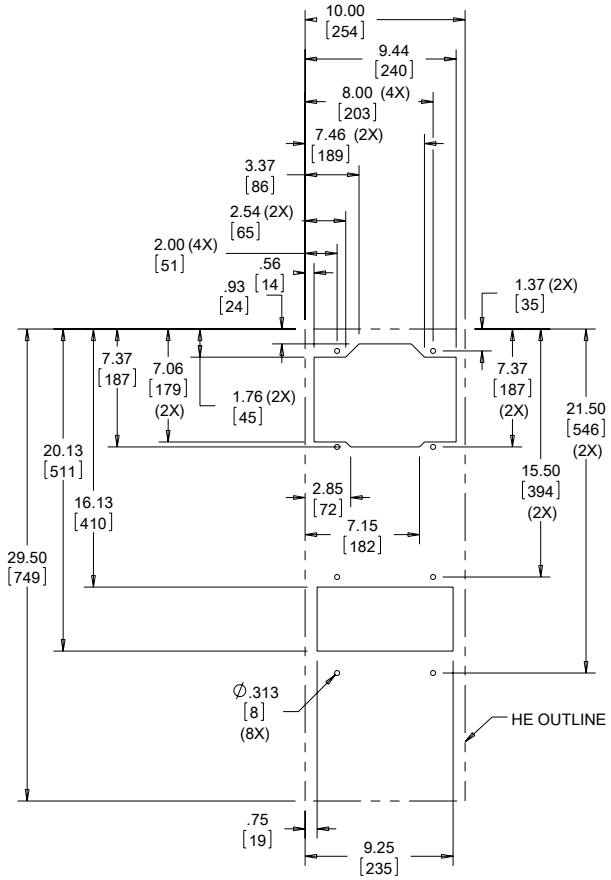
Performance Data **XR29 Models 18 W/°F (32 W/°C)**

CATALOG NUMBER		
	XR291816012	XR291826012
COOLING PERFORMANCE		
Nominal:		
W per °F	**18**	**18**
W per °C	**32**	**32**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	126/214	126/214
External loop 50 Hz (CFM / m^3/hr.)	120/204	120/204
Internal loop 60 Hz (CFM / m^3/hr.)	140/237	140/237
External loop 60 Hz (CFM / m^3/hr.)	133/226	133/226
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	207	207
Max. Nominal Current (A at 50/60 Hz)	1.8	0.9
Agency Approvals	cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12 standard Type 3R, 4, 4X optional	
SOUND LEVEL		
At 1.5 Meters	64 dBA	
UNIT CONSTRUCTION		
Material	Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	29.66/753.3	29.66/753.3
Width (in./mm)	10.24/260.1	10.24/260.1
Depth (in./mm)	5.92/150.4	5.92/150.4
Weight (lb./kg)	32/15	32/15

XR29 Models 18 W/°F (32 W/°C)



NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in. [mm]



Cutout Dimensions

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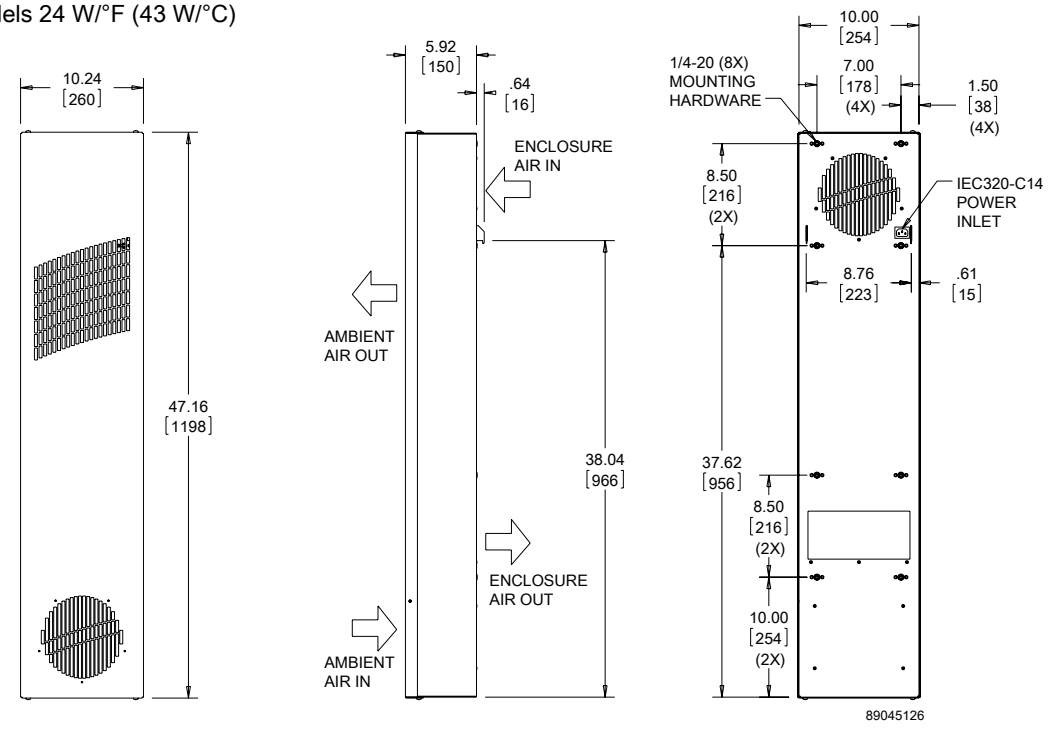
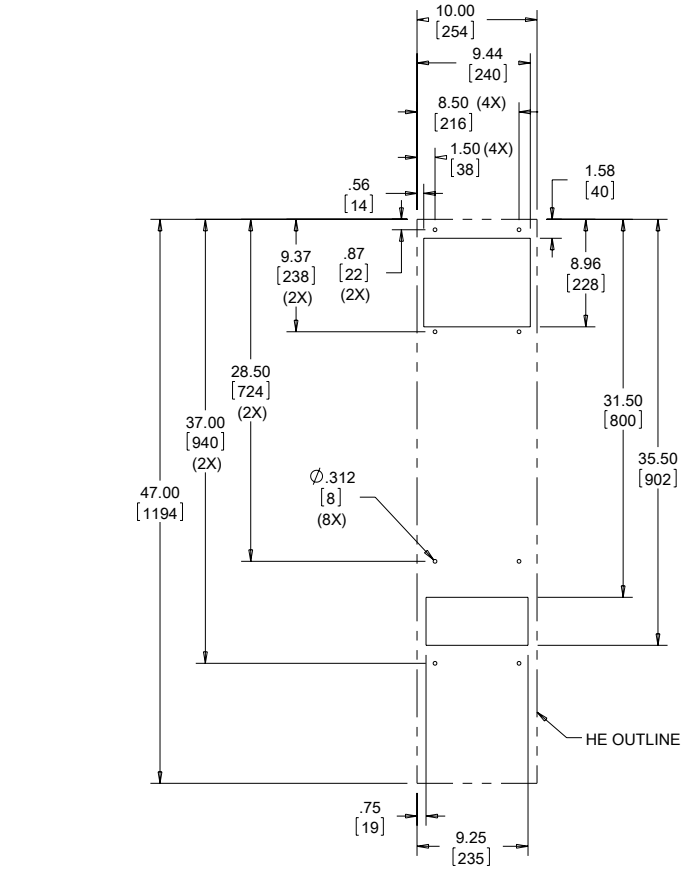
Performance Data **XR47 Models 24 W/°F (43 W/°C)**

CATALOG NUMBER		
	XR472416012	XR472426012
COOLING PERFORMANCE		
Nominal:		
W per °F	**24**	**24**
W per °C	**43**	**43**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	140/238	140/238
External loop 50 Hz (CFM / m^3/hr.)	118/200	118/200
Internal loop 60 Hz (CFM / m^3/hr.)	156/265	156/265
External loop 60 Hz (CFM / m^3/hr.)	131/222	131/222
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	207	207
Max. Nominal Current (A at 50/60 Hz)	1.8	0.9
Agency Approvals	cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12 standard Type 3R, 4, 4X optional	
SOUND LEVEL		
At 1.5 Meters	68 dBA	
UNIT CONSTRUCTION		
Material	Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	47.16/1197.9	47.16/1197.9
Width (in./mm)	10.24/260.1	10.24/260.1
Depth (in./mm)	5.92/150.4	5.92/150.4
Weight (lb./kg)	51/23	51/23

XR47 Models 24 W/°F (43 W/°C)





Cutout Dimensions

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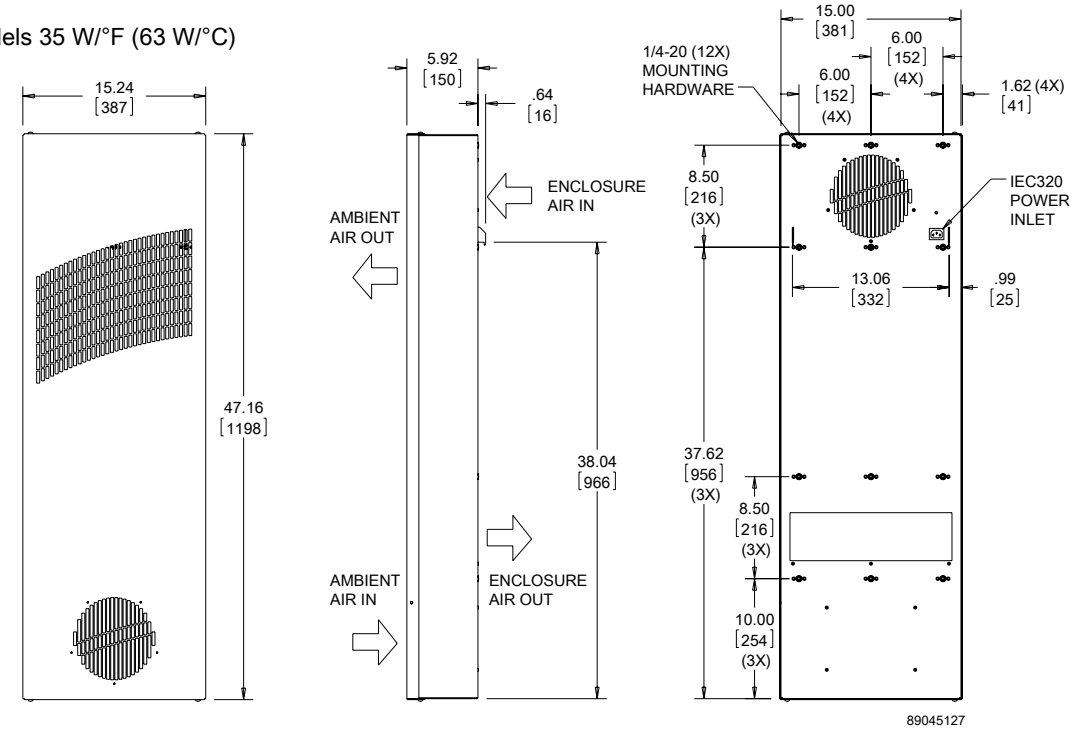
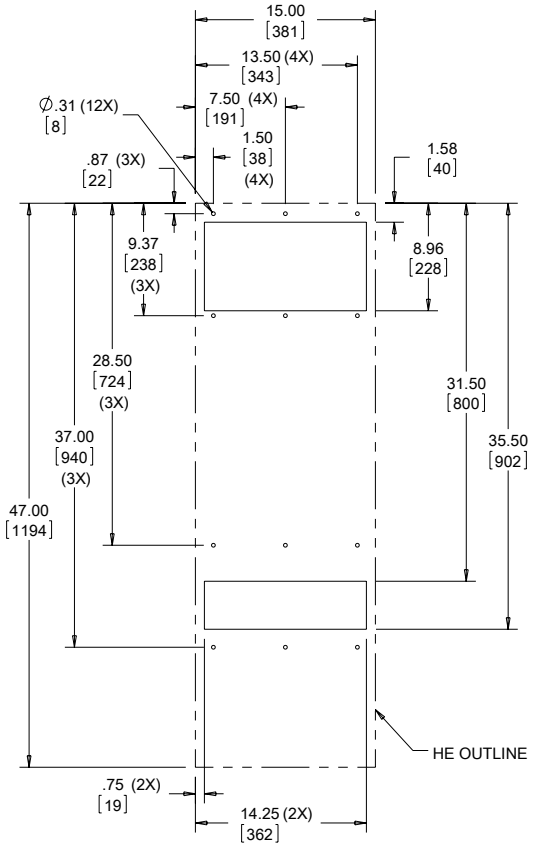
Performance Data **XR47 Models 35 W/°F (63 W/°C)**

CATALOG NUMBER		
	XR473516012	XR473526012
COOLING PERFORMANCE		
Nominal:		
W per °F	**35**	**35**
W per °C	**63**	**63**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	120/204	120/204
External loop 50 Hz (CFM / m^3/hr.)	131/222	131/222
Internal loop 60 Hz (CFM / m^3/hr.)	133/226	133/226
External loop 60 Hz (CFM / m^3/hr.)	146/248	146/248
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	207	207
Max. Nominal Current (A at 50/60 Hz)	1.8	0.9
Agency Approvals	cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12 standard Type 3R, 4, 4X optional	
SOUND LEVEL		
At 1.5 Meters	68 dBA	
UNIT CONSTRUCTION		
Material	Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	47.16/1197.8	47.16/1197.8
Width (in./mm)	15.24/387.1	15.24/387.1
Depth (in./mm)	5.92/150.4	5.92/150.4
Weight (lb./kg)	59/27	59/27

XR47 Models 35 W/°F (63 W/°C)



NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in [mm]
3. 2-METER LONG SERVICE CORD TERMINATED WITH APPROPRIATE PLUG:
   NEMA 5-15P FOR 115V UNITS
   NEMA 6-15P FOR 230V UNITS



Cutout Dimensions

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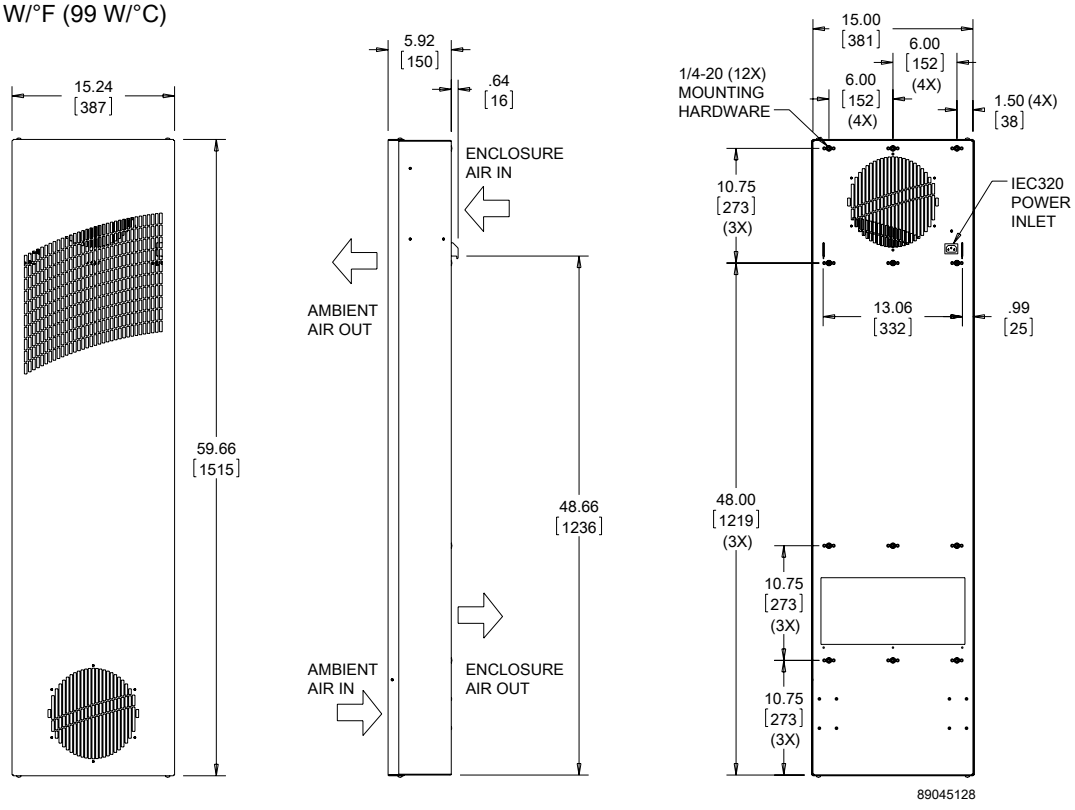
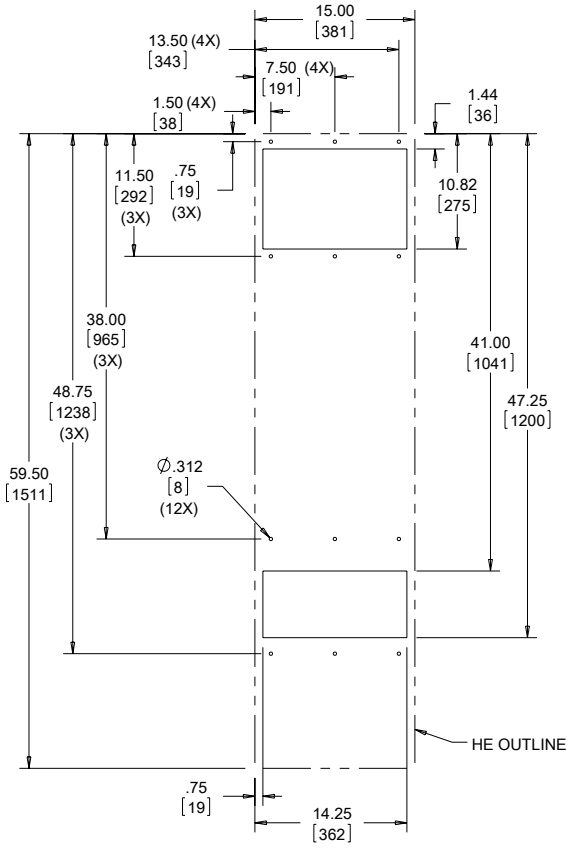
Performance Data **XR60 Models 55 W/°F (99 W/°C)**

CATALOG NUMBER		
	XR605516012	XR605526012
COOLING PERFORMANCE		
Nominal:		
W per °F	**55**	**55**
W per °C	**99**	**99**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	398/676	398/676
External loop 50 Hz (CFM / m^3/hr.)	429/729	429/729
Internal loop 60 Hz (CFM / m^3/hr.)	442/751	442/751
External loop 60 Hz (CFM / m^3/hr.)	477/810	477/810
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	759	759
Max. Nominal Current (A at 50/60 Hz)	6.6	3.3
Agency Approvals	cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12 standard Type 3R, 4, 4X optional	
SOUND LEVEL		
At 1.5 Meters	73 dBA	
UNIT CONSTRUCTION		
Material	Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	59.66/1515.3	59.66/1515.3
Width (in./mm)	15.24/387.1	15.24/387.1
Depth (in./mm)	5.92/150.4	5.92/150.4
Weight (lb./kg)	86/39	86/39

XR60 Models 55 W/°F (99 W/°C)



NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in [mm]
3. 2-METER LONG SERVICE CORD SUPPLIED WITH APPROPRIATE PLUG:
   NEMA 5-15P FOR 115V UNITS
   NEMA 6-15P FOR 230V UNITS



Cutout Dimensions

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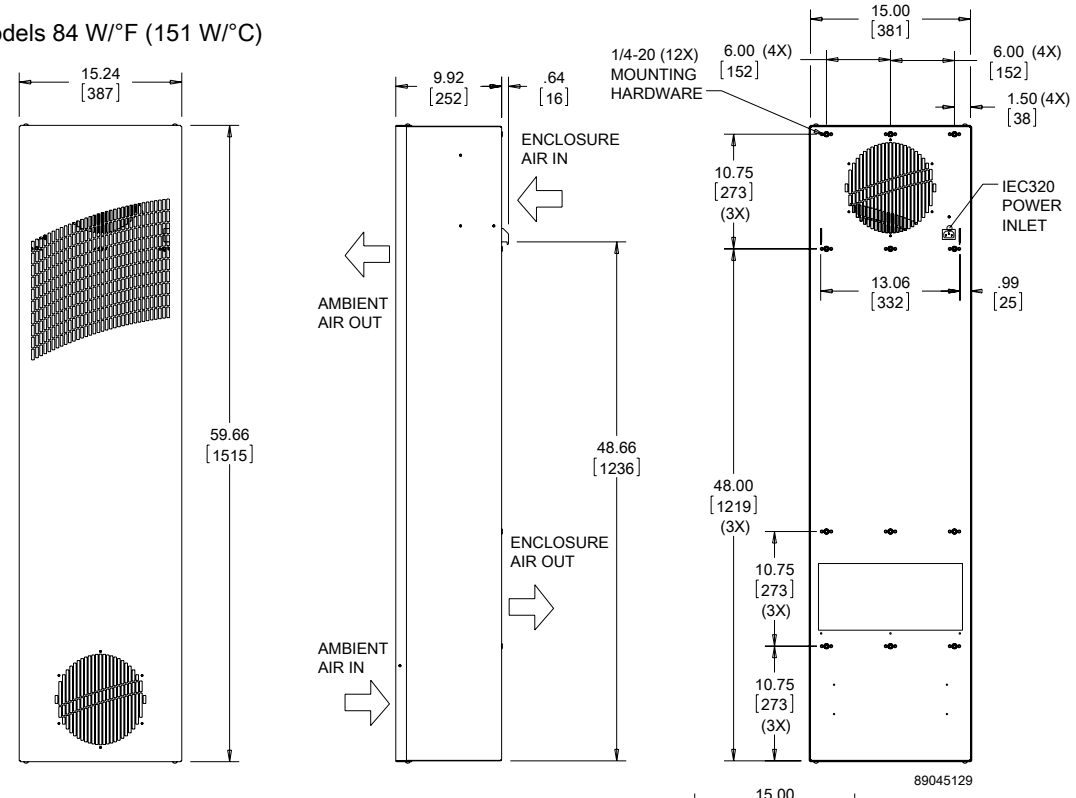
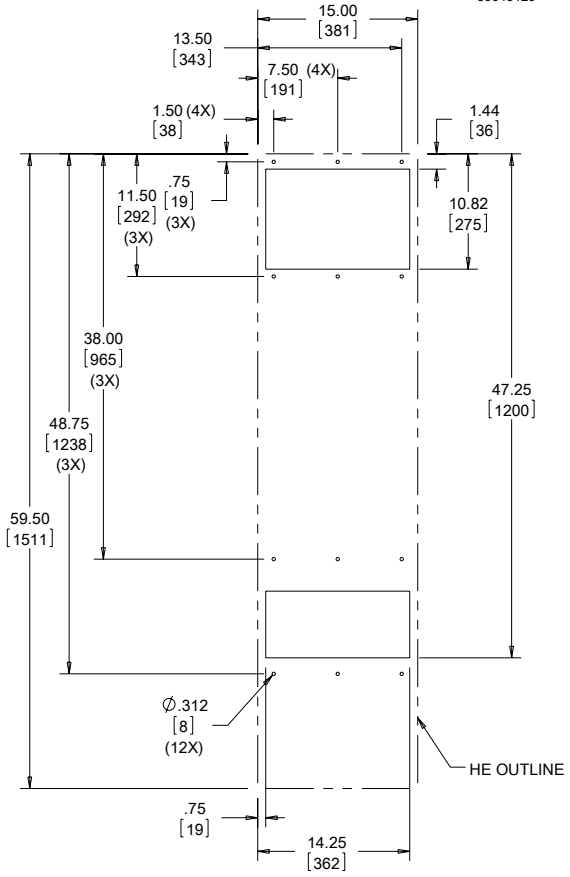
Performance Data **XR60 Models 84 W/°F (151 W/°C)**

CATALOG NUMBER		
	XR608416012	XR608426012
COOLING PERFORMANCE		
Nominal:		
W per °F	**84**	**84**
W per °C	**151**	**151**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Airflow at 0 Static Pressure:		
Internal loop 50 Hz (CFM / m^3/hr.)	497/844	497/844
External loop 50 Hz (CFM / m^3/hr.)	434/737	434/737
Internal loop 60 Hz (CFM / m^3/hr.)	552/938	552/938
External loop 60 Hz (CFM / m^3/hr.)	482/819	482/819
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	759	759
Max. Nominal Current (A at 50/60 Hz)	6.6	3.3
Agency Approvals	cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12 standard Type 3R, 4, 4X optional	
SOUND LEVEL		
At 1.5 Meters	73 dBA	
UNIT CONSTRUCTION		
Material	Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	59.66/1515.3	59.66/1515.3
Width (in./mm)	15.24/387.1	15.24/387.1
Depth (in./mm)	9.92/252	9.92/252
Weight (lb./kg)	106/48	106/48

XR60 Models 84 W/°F (151 W/°C)



NOTE:
1. MOUNTING GASKET SUPPLIED (NOT SHOWN)
2. UNITS: in [mm]
3. 2-METER LONG SERVICE CORD SUPPLIED
   WITH APPROPRIATE PLUG:
   NEMA 5-15P FOR 115V UNITS
   NEMA 6-15P FOR 230V UNITS



Cutout Dimensions

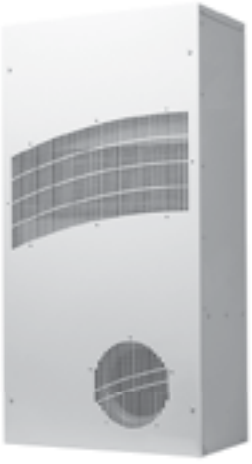
Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Notes

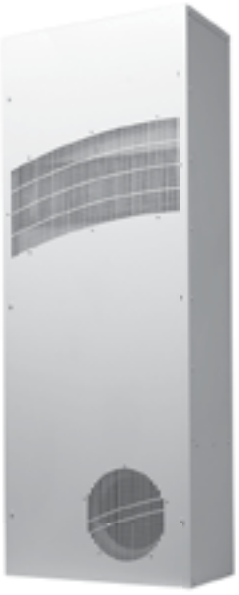
CLIMAGUARD™ AIR-TO-AIR OUTDOOR

TX23
Models
14 W/°F (25 W/°C)

TX33
Models
28 W/°F (50 W/°C)



TX38
Models
56 W/°F (100 W/°C)



TX52
Models
83 W/°F (150 W/°C)

3

INDUSTRY STANDARDS

UL/cUL Listed; Type 12, 3R, 4; 4X optional; File No. SA7402 UR/cUR Recognized

UR/cUR Recognized on select models, reference performance data tables.
CE
GOST
Telcordia GR-487 capable

APPLICATION

- Telecom shelters
- Outdoor cabinets
- Equipment buildings
- Instrument enclosures
- And more

FEATURES

- Unique counterflow aluminum core for high efficiency and high performance heat transfer
- Models for 24 VDC, 48 VDC, 115 VAC and 230 VAC power supplies
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from -40 F/-40 C to 149 F/65 C
- Variable speed blowers standard on DC powered units for quiet running
- Surface or recessed mount capable
- Low-carbon mild-steel sheet-metal cover for rugged factory environments
- Easy-mount flanges for simple installation
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Filterless design for low maintenance and easy cleaning
- Engineered for temperature extremes, corrosive environments and wind driven rain

FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint standard
- Stainless steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

OPTIONS

- Thermostat Package
- Special Voltage Package
- Outdoor Package
- Harsh Environment Package*
- Stainless Steel Package*
- Heater Package*

* Consult the factory for availability and catalog number.

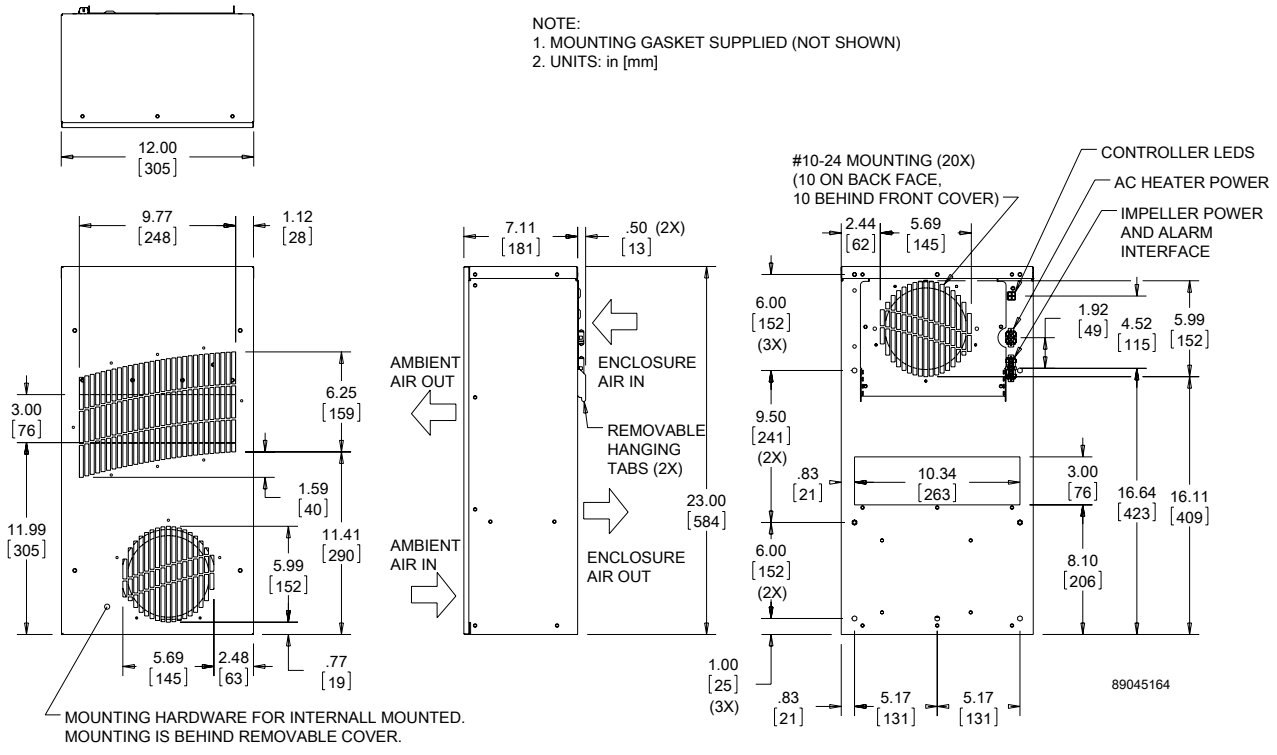
NOTES

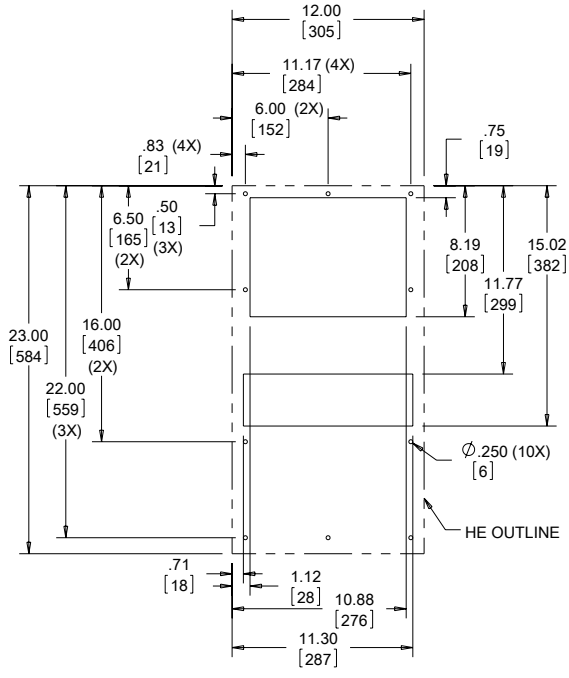
Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **TX23 Models 14 W/°F (25 W/°C)**

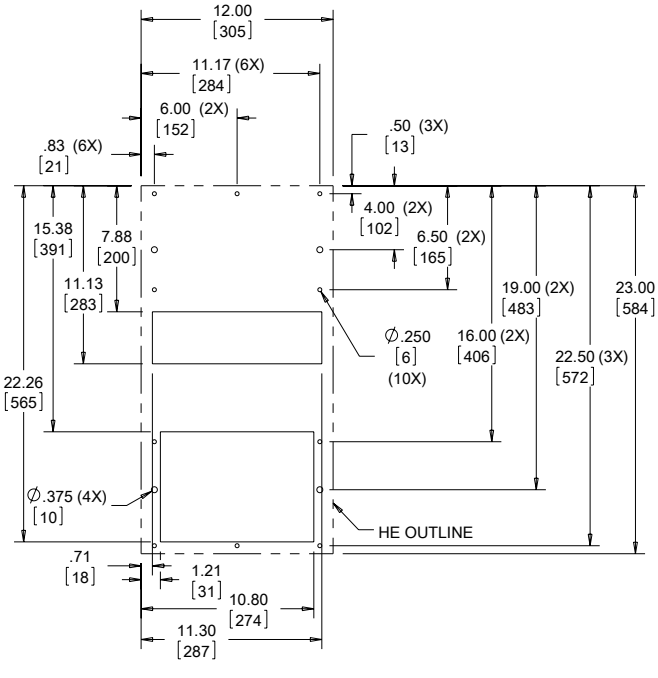
CATALOG NUMBER	TX231416100	TX231426100	TX231424100	TX231448100
COOLING PERFORMANCE				
Nominal:				
W per °F	**14**	**14**	**14**	**14**
W per °C	**25**	**25**	**25**	**25**
Refrigerant	N/A	N/A	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A	N/A	N/A
Operating Temperature Range				
Maximum (°F/°C)	149/65	149/65	149/65	149/65
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:				
Internal loop 50 Hz (CFM / m^3/hr.)	69/117	69/117	N/A	N/A
External loop 50 Hz (CFM / m^3/hr.)	58/98	58/98	N/A	N/A
Internal loop 60 Hz (CFM / m^3/hr.)	84/142	84/142	175/268	175/268
External loop 60 Hz (CFM / m^3/hr.)	69/117	69/117	158/297	158/297
ELECTRICAL DATA				
Rated Voltage	**115 VAC**	**230 VAC**	**24 VDC**	**48 VDC**
Frequency (Hz)	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	69	23	82	87
Max. Nominal Current (A at 50/60 Hz)	0.6	0.1	3.4	1.8
Agency Approvals	cUL Listed CE GOST		cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug	Terminal block	Terminal block
ENCLOSURE PROTECTION				
UL Type	Type 12, 3R, 4 standard Type 4X optional		Type 12, 3R, 4 standard Type 4X optional	
SOUND LEVEL				
At 1.5 Meters	56 dBA		56 dBA	
UNIT CONSTRUCTION				
Material	Mild steel sheet metal standard Stainless steel optional		Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS				
Height (in./mm)	23/584.2	23/584.2	23/584.2	23/584.2
Width (in./mm)	12/304.8	12/304.8	12/304.8	12/304.8
Depth (in./mm)	7.1/180.3	7.1/180.3	7.1/180.3	7.1/180.3
Weight (lb./kg)	30/13.6	30/13.6	30/13.6	30/13.6

TX23 DC Models 14 W/°F (25°C)



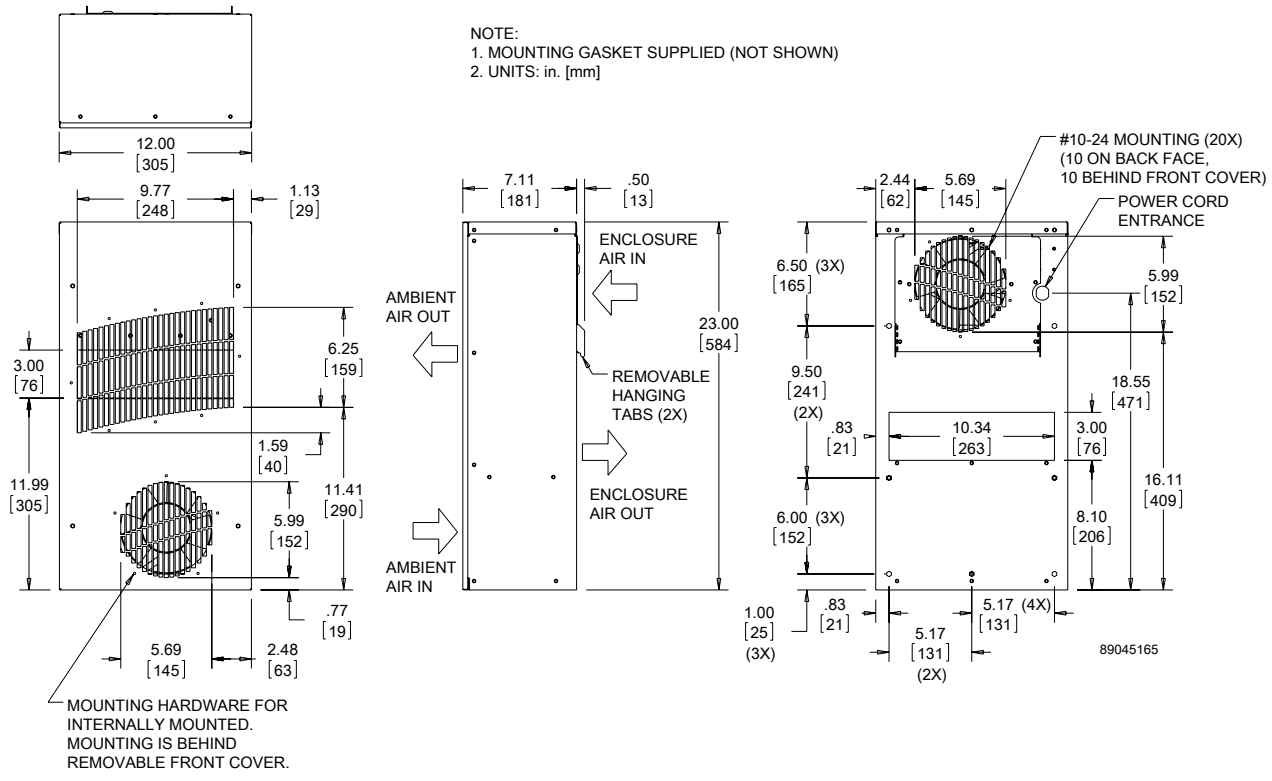


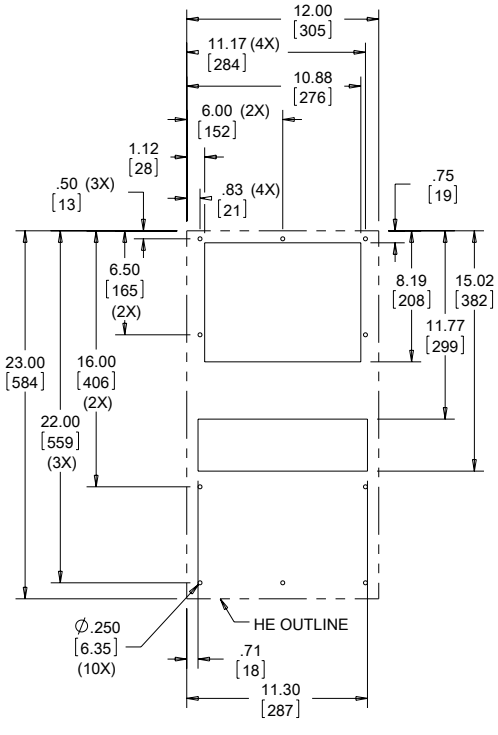
CUTOUT DIMENSIONS
(EXTERNAL MOUNT)



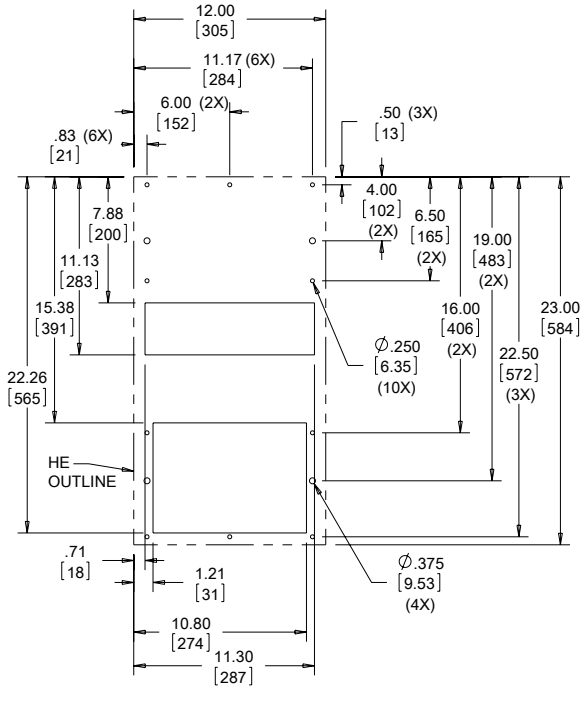
CUTOUT DIMENSIONS
(INTERNAL MOUNT)

TX23 AC Models 14W/°F (25 W /°C)





CUTOUT DIMENSIONS (EXTERNAL MOUNT)

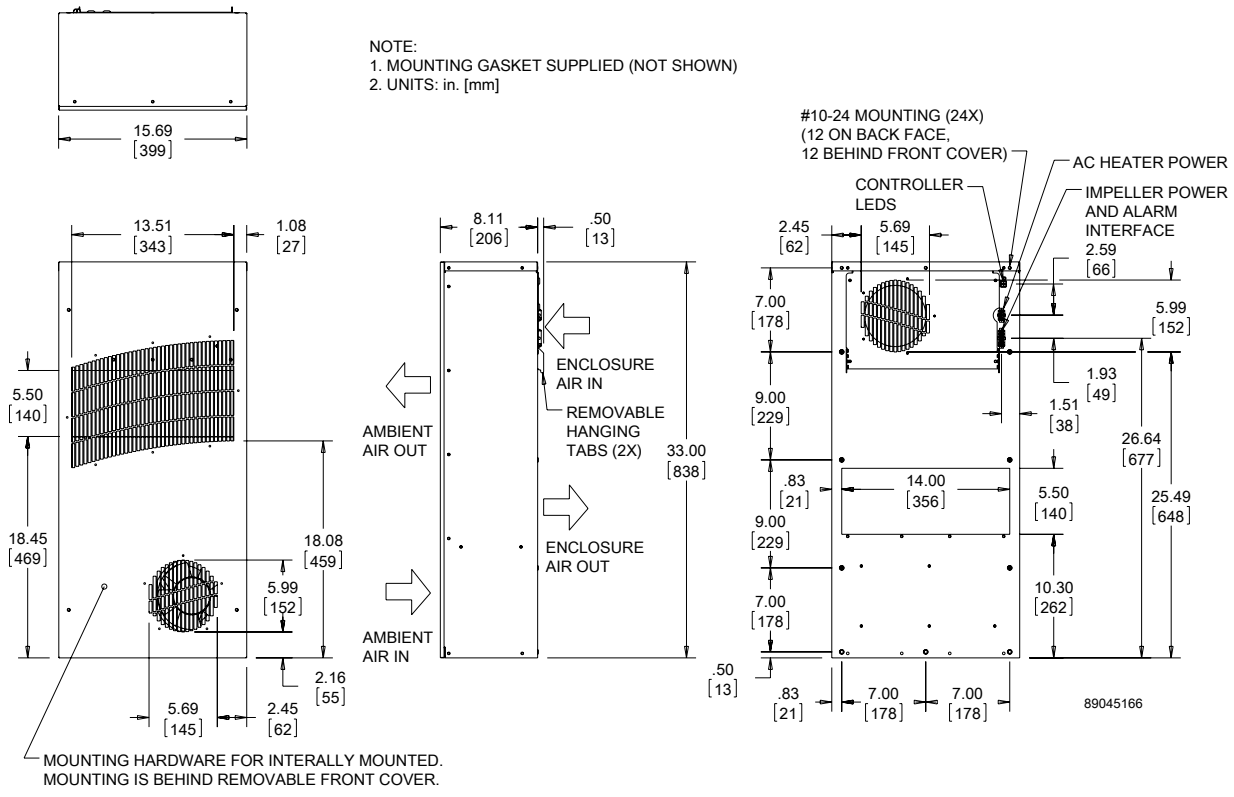


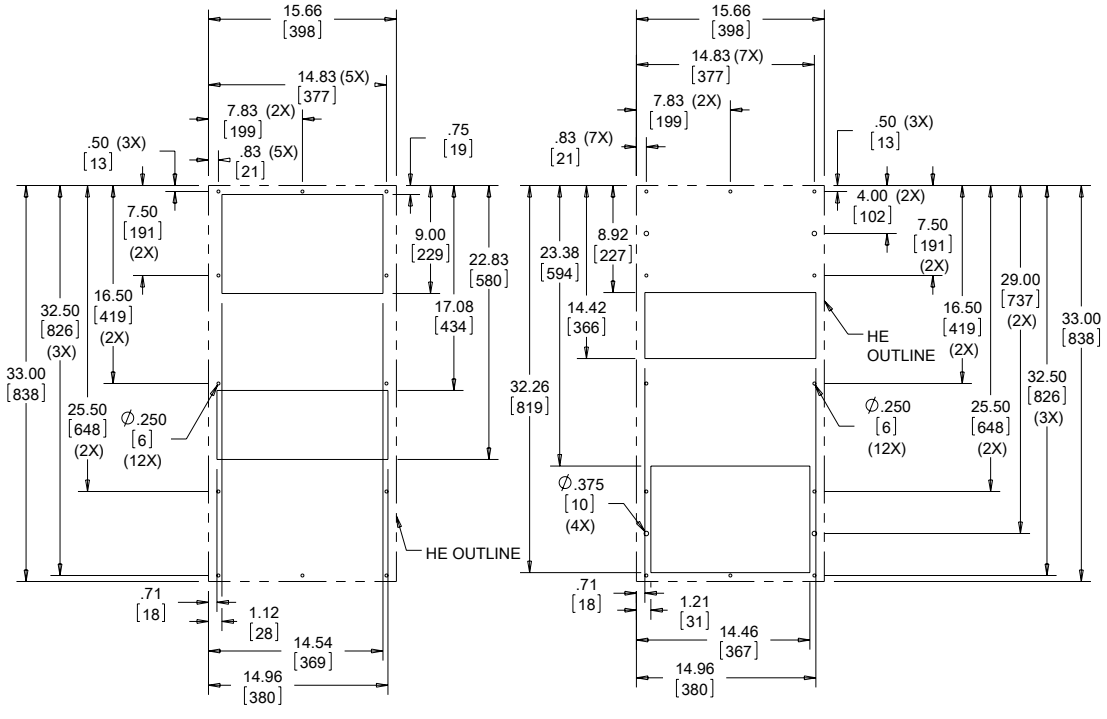
CUTOUT DIMENSIONS (INTERNAL MOUNT)

Performance Data **TX33 Models 28 W/°F (50 W/°C)**

CATALOG NUMBER	TX332816100	TX332826100	TX332824100	TX332848100
COOLING PERFORMANCE				
Nominal:				
W per °F	**28**	**28**	**28**	**28**
W per °C	**50**	**50**	**50**	**50**
Refrigerant	N/A	N/A	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A	N/A	N/A
Operating Temperature Range:				
Maximum (°F/°C)	149/65	149/65	149/65	149/65
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:				
Internal loop 50 Hz (CFM / m^3/hr.)	212/360	212/360	N/A	N/A
External loop 50 Hz (CFM / m^3/hr.)	238/404	238/404	N/A	N/A
Internal loop 60 Hz (CFM / m^3/hr.)	228/387	228/387	228/387	228/387
External loop 60 Hz (CFM / m^3/hr.)	263/447	263/447	166/282	166/282
ELECTRICAL DATA				
Rated Voltage	**115 VAC**	**230 VAC**	**24 VDC**	**48 VDC**
Frequency (Hz)	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	161	92	82	87
Max. Nominal Current (A at 50/60 Hz)	1.4	0.4	3.4	1.8
Agency Approvals	cUL Listed CE GOST		cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug	Terminal block	Terminal block
ENCLOSURE PROTECTION				
UL Type	Type 12, 3R, 4 standard Type 4X optional		Type 12, 3R, 4 standard Type 4X optional	
SOUND LEVEL				
At 1.5 Meters	56 dBA		56 dBA	
UNIT CONSTRUCTION				
Material	Mild steel sheet metal standard Stainless steel optional		Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS				
Height (in./mm)	33/838.2	33/838.2	33/838.2	33/838.2
Width (in./mm)	15.7/398.8	15.7/398.8	15.7/398.8	15.7/398.8
Depth (in./mm)	8.1/205.7	8.1/205.7	8.1/205.7	8.1/205.7
Weight (lb./kg)	45/20.4	45/20.4	45/20.4	45/20.4

TX 33 DC Models 28 W/°F (50 W/°C)

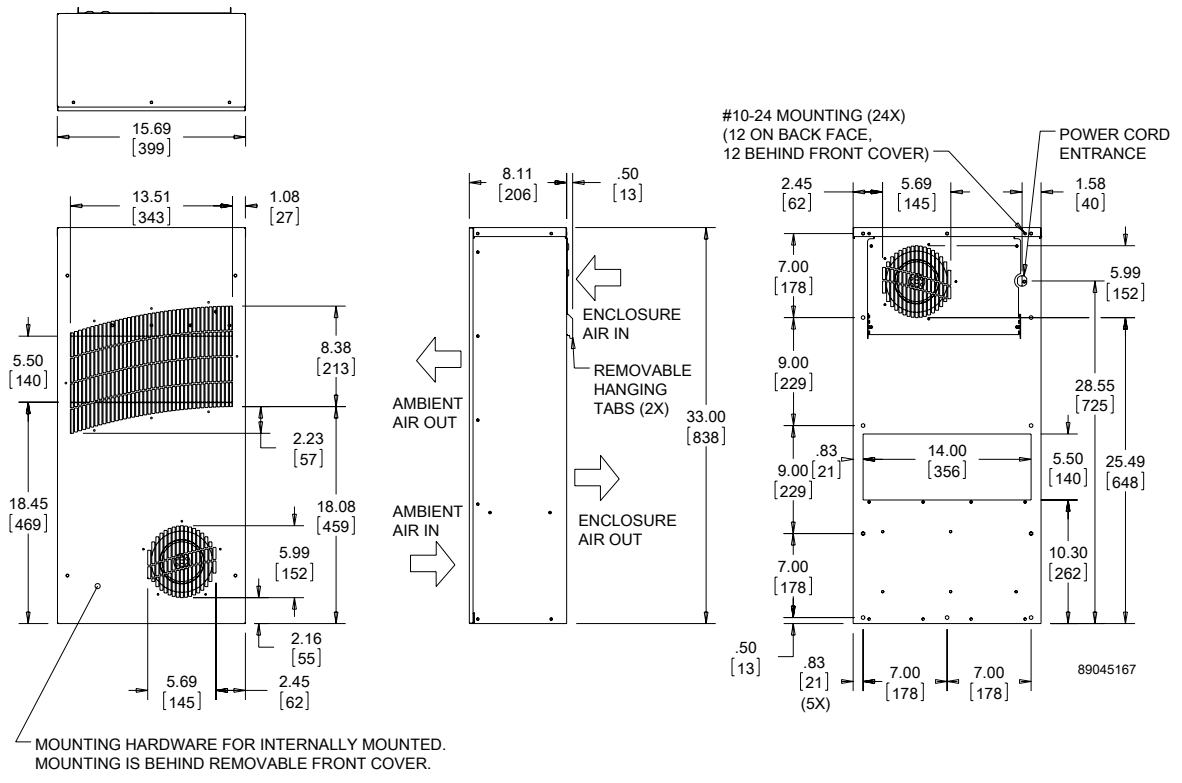


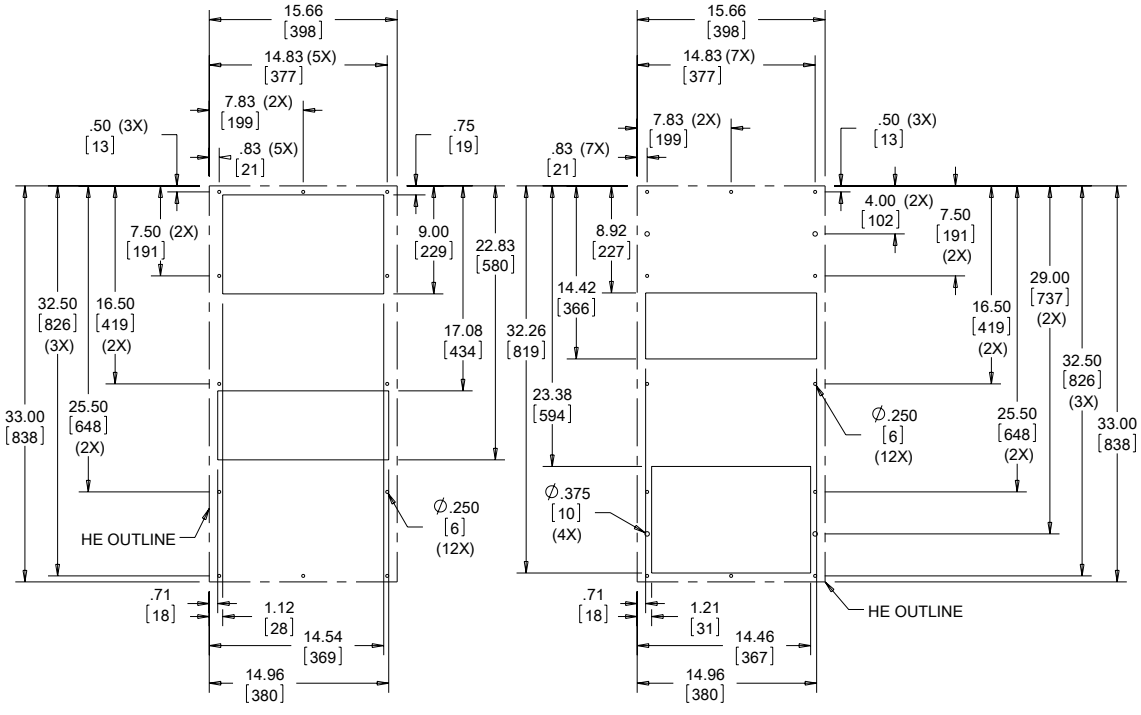


Cutout Dimensions (External Mount)

Cutout Dimensions (Internal Mount)

TX33 AC Models 28 W/°F (50 W/°C)





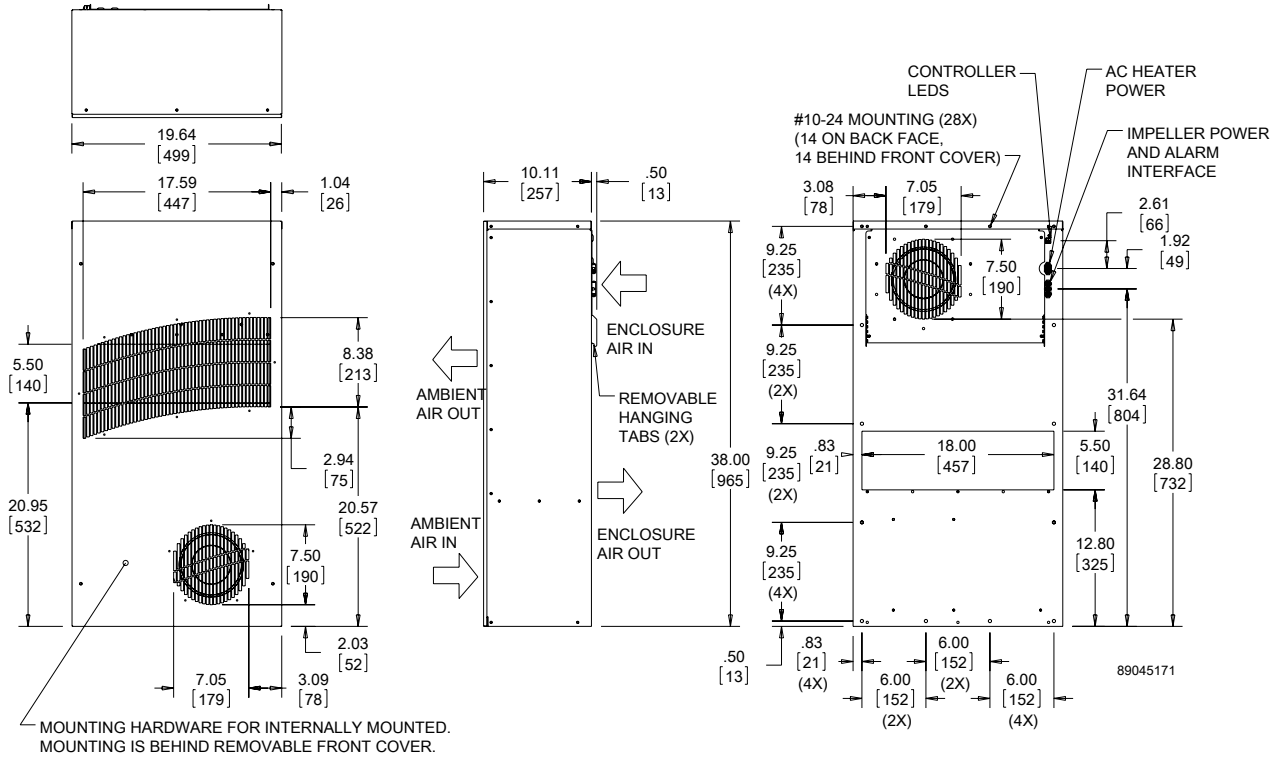
Cutout Dimensions
(External Mount)

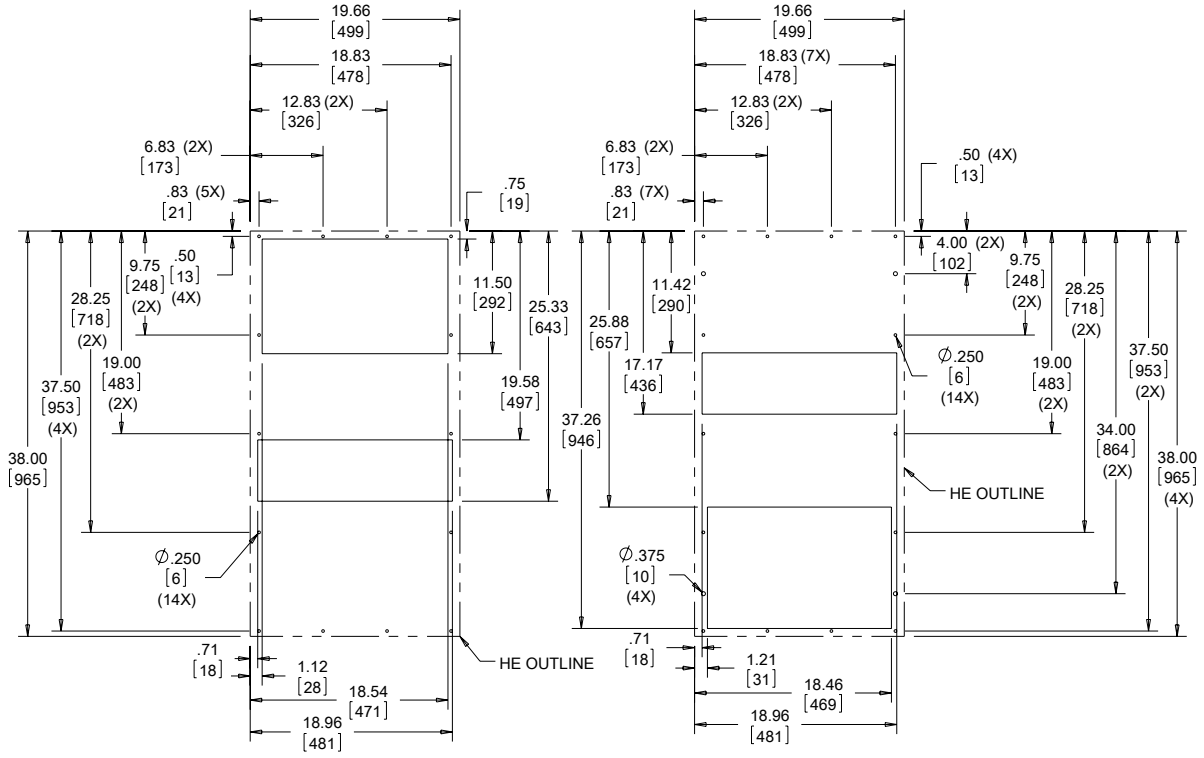
Cutout Dimensions
(Internal Mount)

Performance Data **TX38 Models 56 W/°F (100 W/°C)**

CATALOG NUMBER	TX385616100	TX385626100	TX385624100	TX385648100
COOLING PERFORMANCE				
Nominal:				
W per °F	**56**	**56**	**56**	**56**
W per °C	**100**	**100**	**100**	**100**
Refrigerant	N/A	N/A	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A	N/A	N/A
Operating Temperature Range:				
Maximum (°F/°C)	149/65	149/65	149/65	149/65
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:				
Internal loop 50 Hz (CFM / m^3/hr.)	425/722	425/722	N/A	N/A
External loop 50 Hz (CFM / m^3/hr.)	461/738	461/738	N/A	N/A
Internal loop 60 Hz (CFM / m^3/hr.)	477/810	477/810	368/625	368/625
External loop 60 Hz (CFM / m^3/hr.)	517/878	517/878	422/717	422/717
ELECTRICAL DATA				
Rated Voltage	**115 VAC**	**230 VAC**	**24 VDC**	**48 VDC**
Frequency (Hz)	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	368	276	207	279
Max. Nominal Current (A at 50/60 Hz)	2.3/3.2	0.7/1.2	8.6	5.8
Agency Approvals	cUL Listed CE GOST		cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug	Terminal block	Terminal block
ENCLOSURE PROTECTION				
UL Type	Type 12, 3R, 4 standard Type 4X optional		Type 12, 3R, 4 standard Type 4X optional	
SOUND LEVEL				
At 1.5 Meters	64 dBA		64 dBA	
UNIT CONSTRUCTION				
Material	Mild Mild steel sheet metal standard		Mild Mild steel sheet metal standard	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS				
Height (in./mm)	38/965.2	38/965.2	38/965.2	38/965.2
Width (in./mm)	19.7/500.4	19.7/500.4	19.7/500.4	19.7/500.4
Depth (in./mm)	10.1/256.5	10.1/256.5	10.1/256.5	10.1/256.5
Weight (lb./kg)	66/30	66/30	66/30	66/30

TX38 DC Models 56 W/°F (100 W/°C)

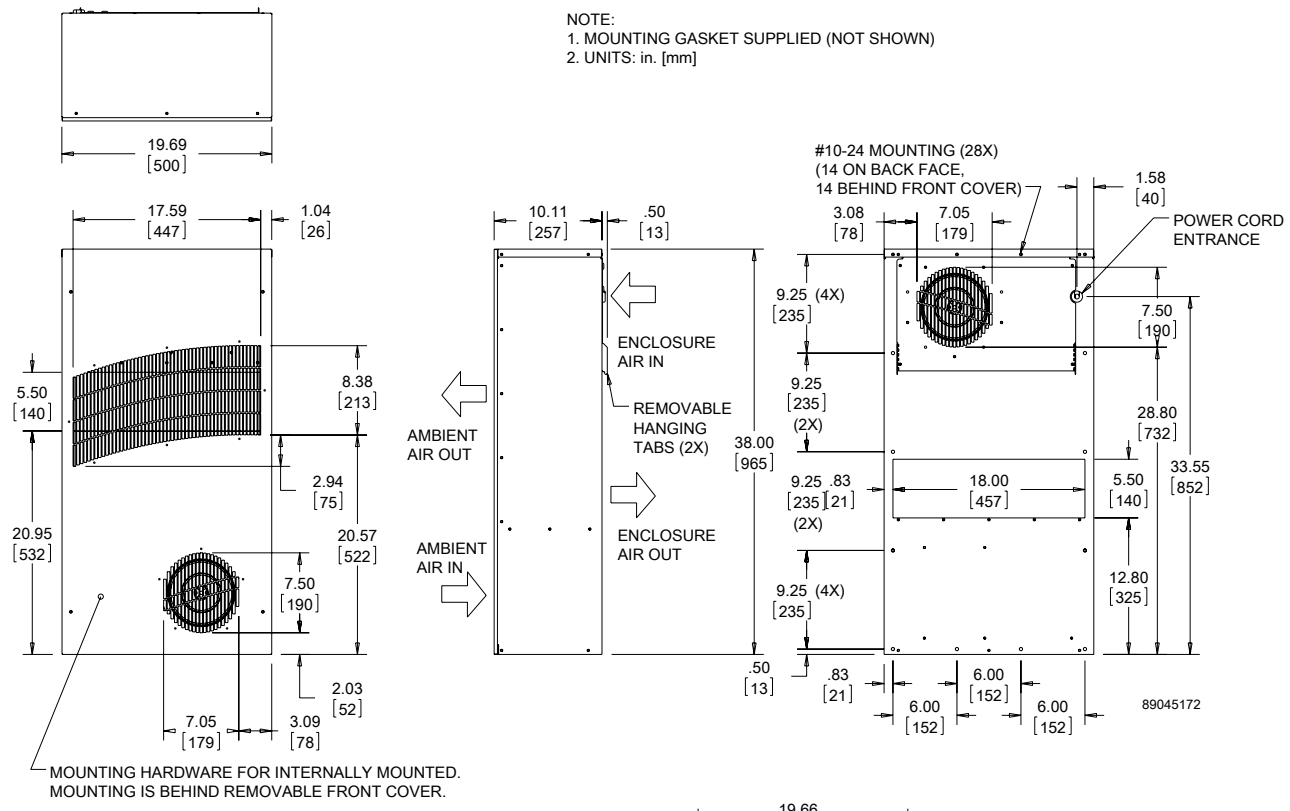


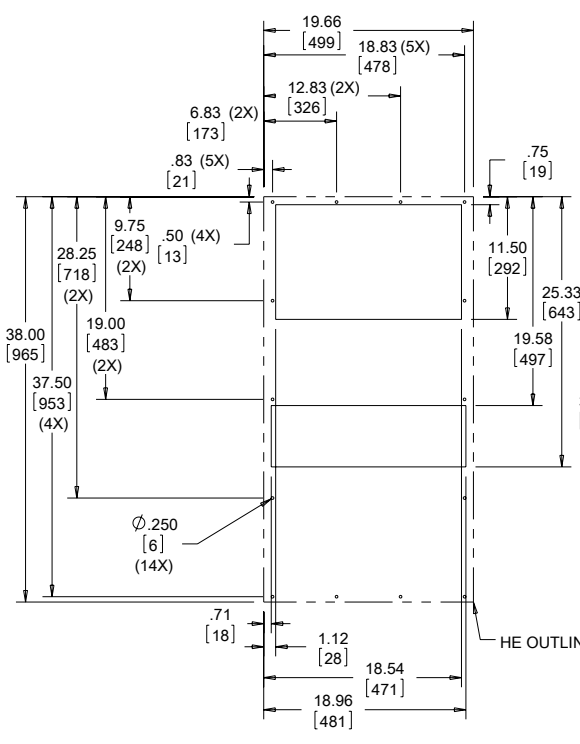


Cutout Dimensions (External Mount)

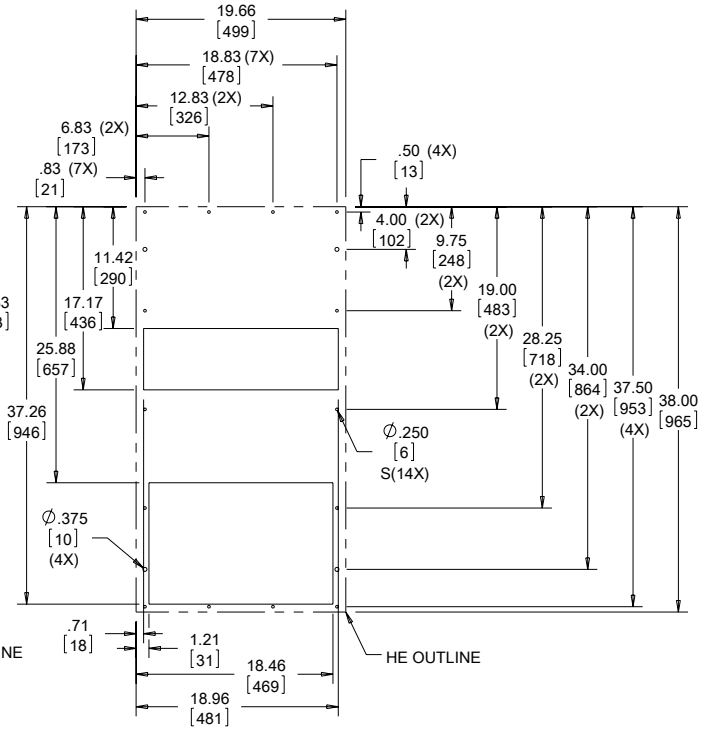
Cutout Dimensions (Internal Mount)

TX38 AC Models 56 W/°F (100 W/°C)





Cutout Dimensions (External Mount)

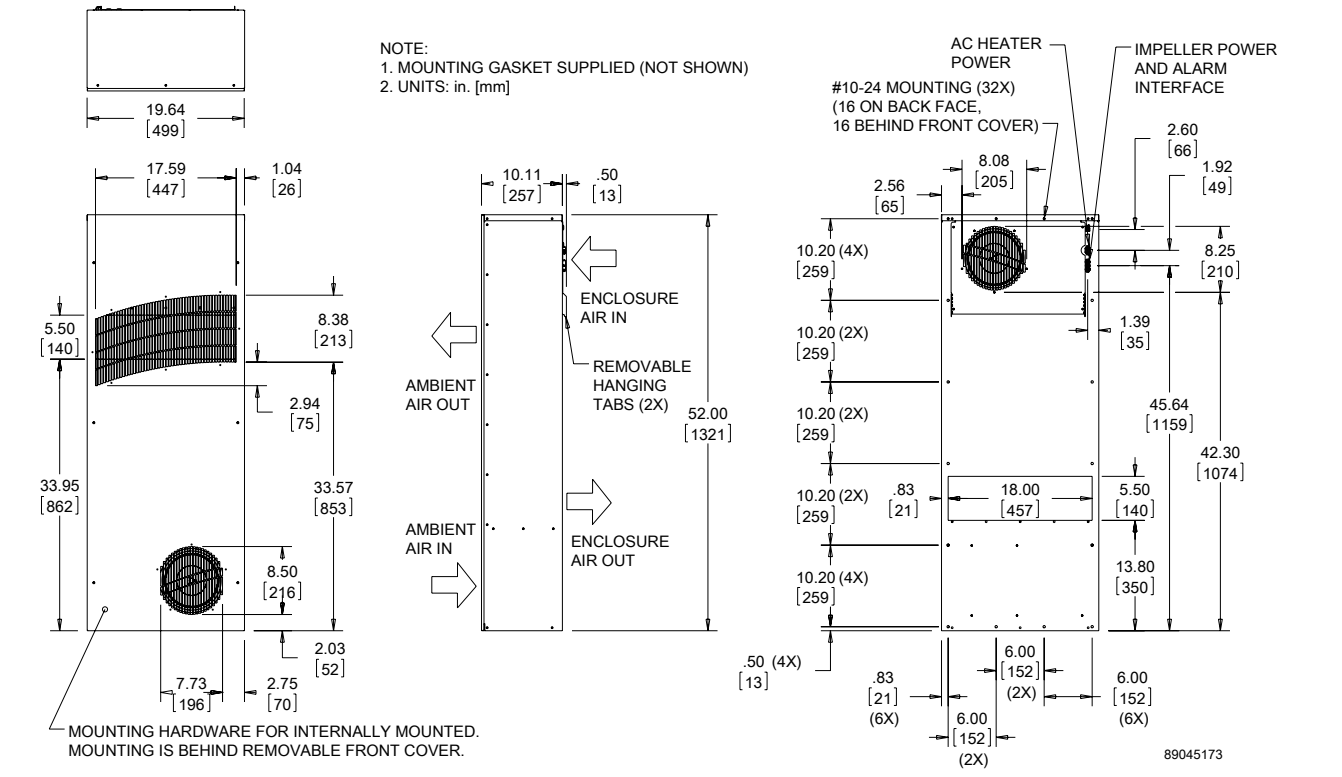


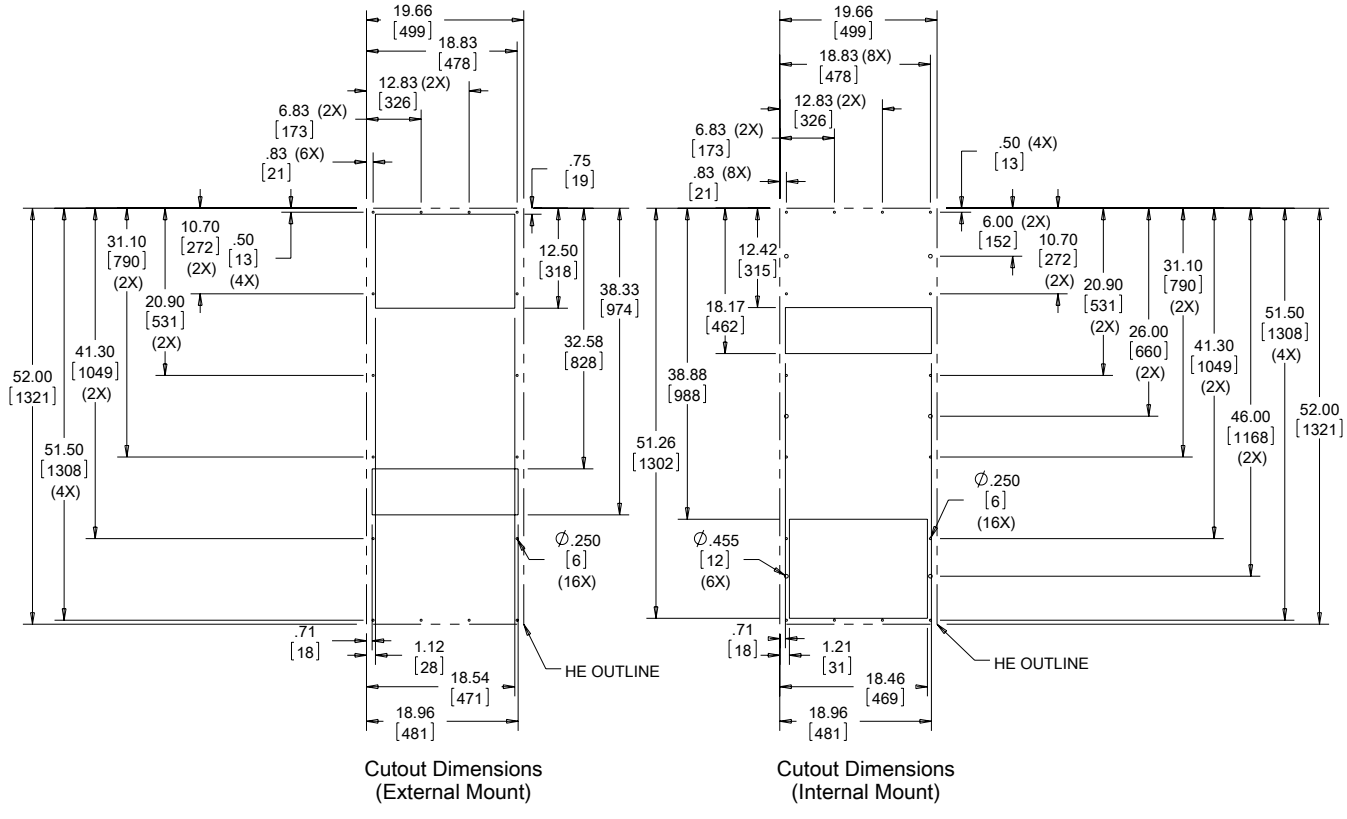
Cutout Dimensions (Internal Mount)

Performance Data **TX52 Models 83 W/°F (150 W/°C)**

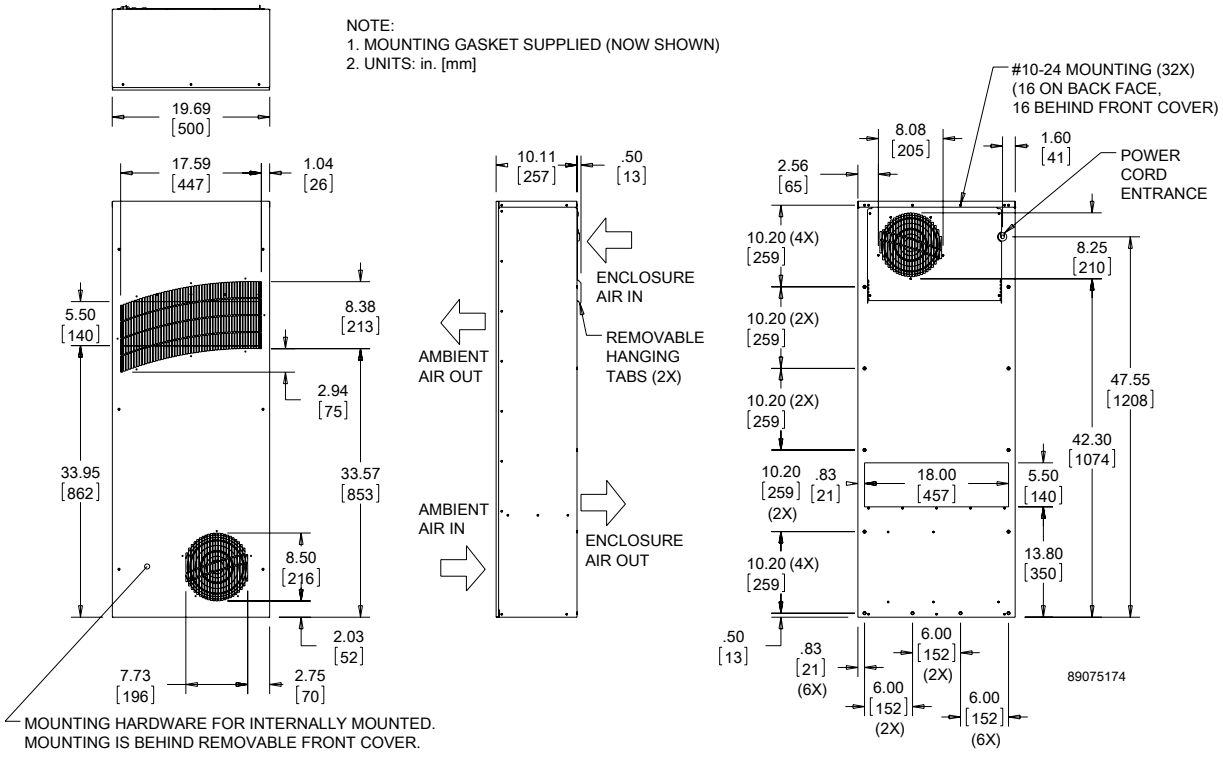
CATALOG NUMBER	TX528316100	TX528326100	TX528324100	TX528348100
COOLING PERFORMANCE				
Nominal:				
W per °F	**83**	**83**	**83**	**83**
W per °C	**150**	**150**	**150**	**150**
Refrigerant	N/A	N/A	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A	N/A	N/A
Operating Temperature Range:				
Maximum (°F/°C)	149/65	149/65	149/65	149/65
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40
Airflow at 0 Static Pressure:				
Internal loop 50 Hz (CFM / m^3/hr.)	495/841	495/841	N/A	N/A
External loop 50 Hz (CFM / m^3/hr.)	540/917	540/917	N/A	N/A
Internal loop 60 Hz (CFM / m^3/hr.)	533/905	533/905	466/792	466/792
External loop 60 Hz (CFM / m^3/hr.)	605/1028	605/1028	547/929	547/929
ELECTRICAL DATA				
Rated Voltage	**115 VAC**	**230 VAC**	**24 VDC**	**48 VDC**
Frequency (Hz)	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	782	771	507	375
Max. Nominal Current (A at 50/60 Hz)	4.3/6.7	2.2/3.4	21.1	7.8
Agency Approvals	cUL Listed CE GOST		cUL Listed CE GOST	
Power Input Description	6-ft. cord with NEMA 5-15 plug	6-ft. cord with NEMA 6-15 plug	Terminal block	Terminal block
ENCLOSURE PROTECTION				
UL Type	Type 12, 3R, 4 standard Type 4X optional		Type 12, 3R, 4 standard Type 4X optional	
SOUND LEVEL				
At 1.5 Meters	68 dBA		68 dBA	
UNIT CONSTRUCTION				
Material	Mild steel sheet metal standard Stainless steel optional		Mild steel sheet metal standard Stainless steel optional	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard		RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS				
Height (in./mm)	52/1320.8	52/1320.8	52/1320.8	52/1320.8
Width (in./mm)	19.7/500.4	19.7/500.4	19.7/500.4	19.7/500.4
Depth (in./mm)	10.1/256.5	10.1/256.5	10.1/256.5	10.1/256.5
Weight (lb./kg)	100/45.3	100/45.3	100/45.3	100/45.3

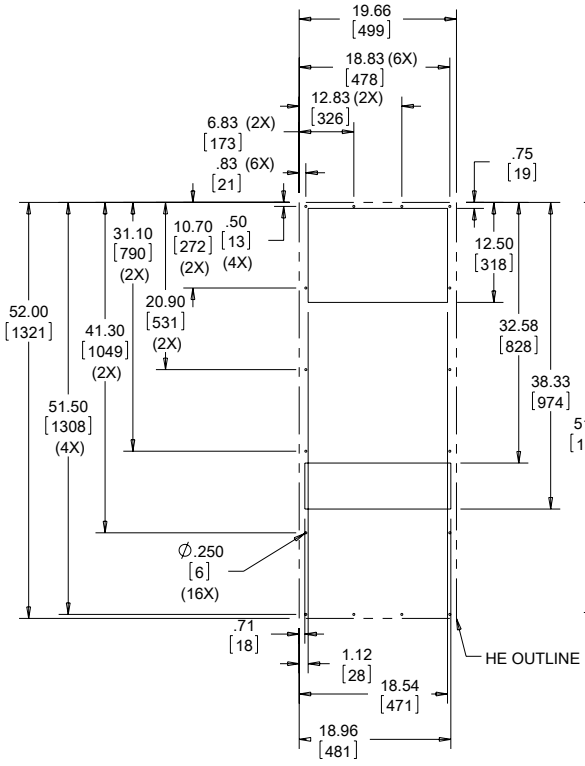
TX52 DC Models 83 W/°F (150 W/°C)



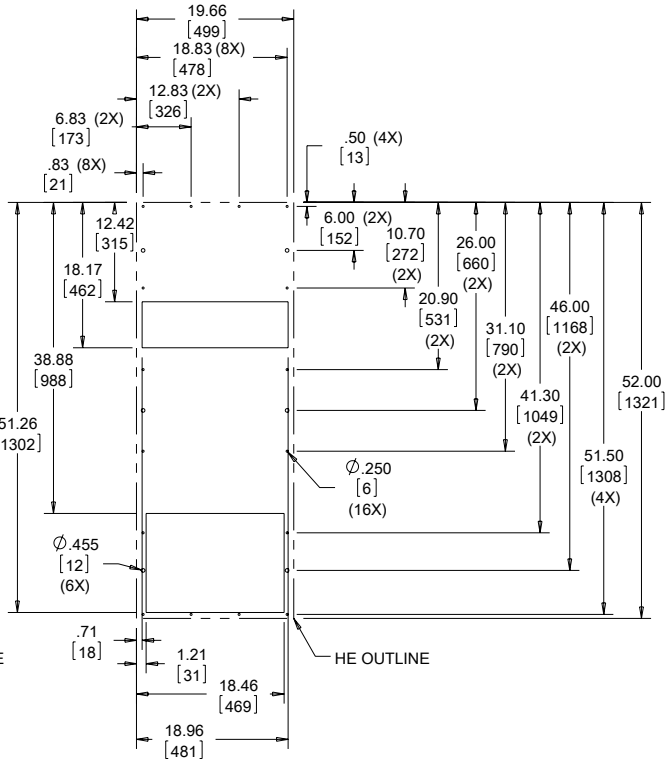


TX52 AC Models 83 W/°F (150 W/°C)





Cutout Dimensions (External Mount)



Cutout Dimensions (Internal Mount)

Notes

CLIMAGUARD™ AIR-TO-WATER INDOOR

WCHE01
2968 BTU/Hr.
870 Watts

WCHE04/WCHE06
7506/10577 BTU/Hr.
2200/3100 Watts

WCHE14
22861 BTU/Hr.
6700 Watts

INDUSTRY STANDARDS

UL/cUL Listed; Type 12; File No. SA33866

CE
IP55

APPLICATION

- Industrial process controls
- Industrial robotics controls
- Electronic cabinets in harsh environments
- Conveyor systems

FEATURES

- Capacities ranging from 870 watts to 6700 watts
- Filterless design
- NEMA power cord connection standard
- Copper pipe and aluminum fins heat exchanger core
- Air movers with thermal protection
- Regulating mechanical thermostat set at 35 C (95 F), differential of 4 C (7 F)
- Operating temperature from 10-50 C (50-122 F)
- Solenoid water valve
- UL Listed to save customers time and money with agency approvals
- Recovery of condensation system and condensation discharge pipe
- Requires an available cooled water source

FINISH

- Standard models constructed of rugged steel
- RAL 7035 light-gray, powder-coat polyester paint

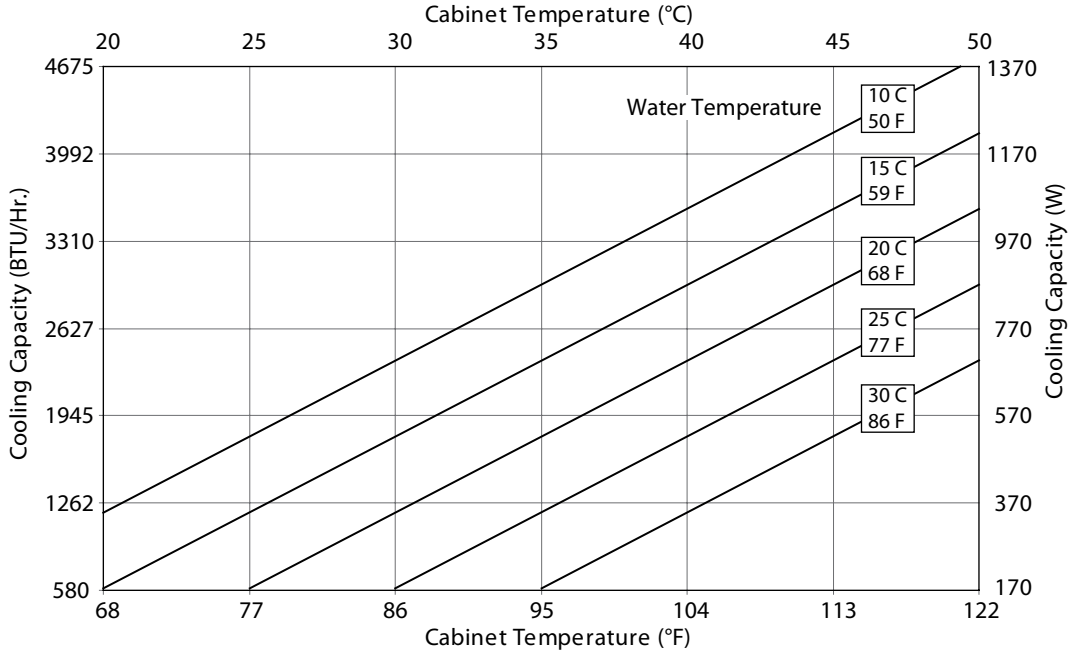
NOTES

Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

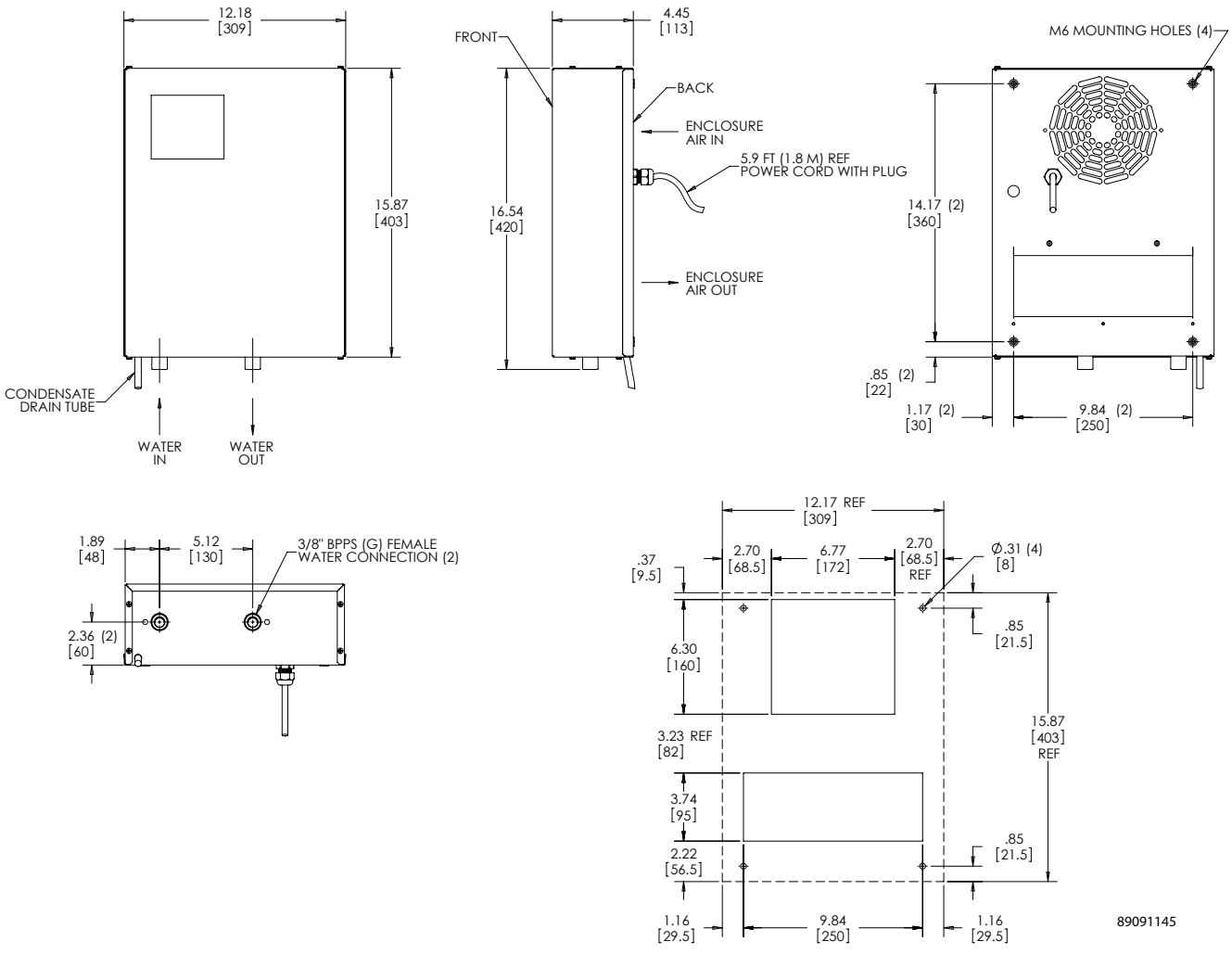
Performance Data **WCHE01 Models 870 Watt**

CATALOG NUMBER	WCHE01916002	WCHE01926002
COOLING PERFORMANCE		
Nominal:		
BTU/Hr. @ Δt 25 C	2968	2968
Watts @ Δt 25 C	870	870
Refrigerant	NA	NA
Refrigerant Charge (ounces/grams)	NA	NA
Operating Temperature Range:		
Maximum (°F/°C)	122/50	122/50
Minimum (°F/°C)	50/10	50/10
Flow at 0 Static Pressure:		
Internal loop 50 Hz (Airflow: CFM / m^3/hr.)	194/330	194/330
External loop 50 Hz (Waterflow: GPM @ 95 F)	0.66	0.66
Internal loop 60 Hz (Airflow: CFM / m^3/hr.)	194/330	194/330
External loop 60 Hz (Waterflow: GPM @ 95 F)	0.66	0.66
ELECTRICAL DATA		
Rated Voltage	115	230
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	28	28
Max. Nominal Current (A at 50/60 Hz)	0.5	0.5
Starting Current (Amps)	0.7	0.7
Agency Approvals	UL/cUL Listed	
Power Input Description	Cord with NEMA 5-15 plug	Cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12/IP55	Type 12/IP55
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Behind front cover, near the fan	
Factory Thermostat Setting (°F/°C)	95/35	95/35
SOUND LEVEL		
At 1.0 Meters	58 dBA	58 dBA
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	15.9/404	15.9/404
Width (in./mm)	12.12/308	12.12/308
Depth (in./mm)	4.49/114	4.49/114
Weight (lb./kg)	19.84/9	19.84/9

Performance Curves for WCHE01 Models 870 Watt



WCHE01 Models 870 Watt



CUTOUT DIMENSIONS

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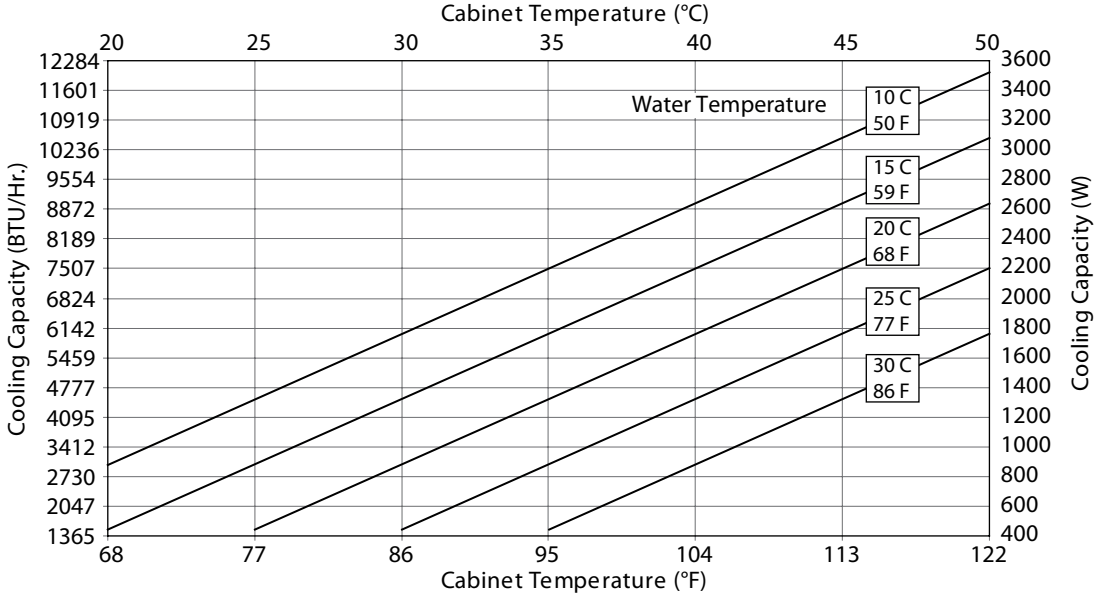
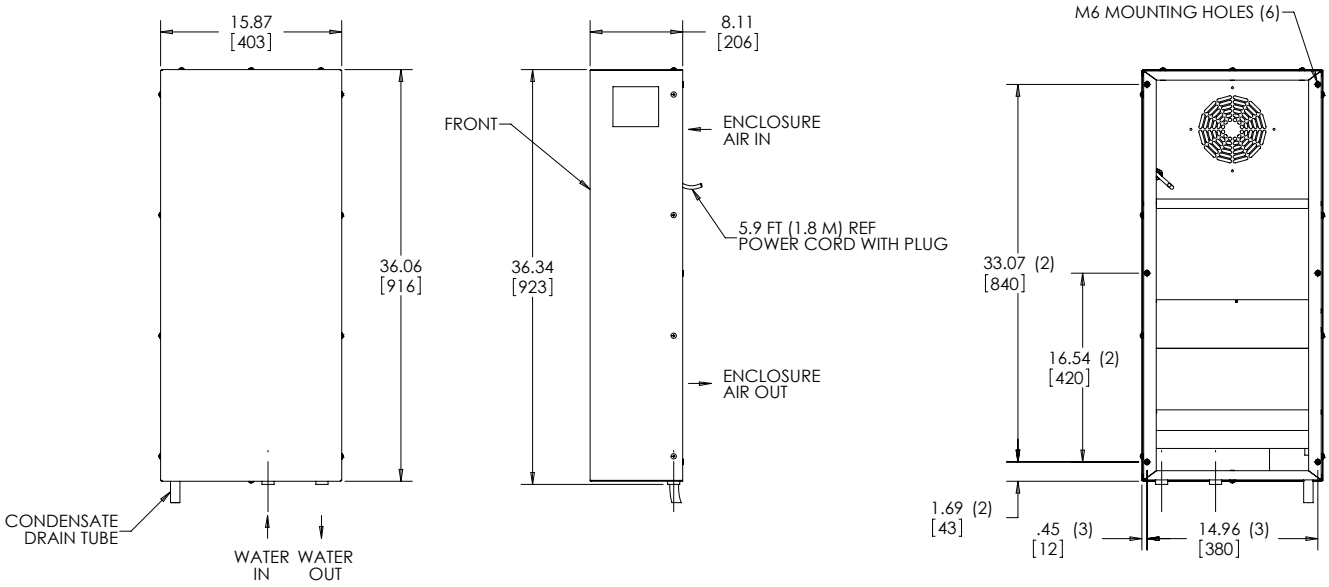
Performance Data **WCHE04 Models 2200 Watt**

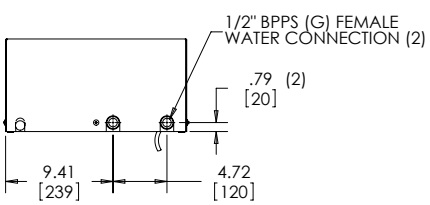
CATALOG NUMBER	WCHE04916002	WCHE04926002
COOLING PERFORMANCE		
Nominal:		
BTU/Hr. @ Δt 25 C	7506	7506
Watts @ Δt 25 C	2200	2200
Refrigerant	NA	NA
Refrigerant Charge (ounces/grams)	NA	NA
Operating Temperature Range:		
Maximum (°F/°C)	122/50	122/50
Minimum (°F/°C)	50/10	50/10
Flow at 0 Static Pressure:		
Internal loop 50 Hz (Airflow: CFM / m^3/hr.)	339/575	339/575
External loop 50 Hz (Waterflow: GPM @ 95 F)	0.66	0.66
Internal loop 60 Hz (Airflow: CFM / m^3/hr.)	339/575	339/575
External loop 60 Hz (Waterflow: GPM @ 95 F)	0.66	0.66
ELECTRICAL DATA		
Rated Voltage	115	230
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	90	90
Max. Nominal Current (A at 50/60 Hz)	0.8	0.8
Starting Current (Amps)	1	1
Agency Approvals	UL/cUL Listed	
Power Input Description	Cord with NEMA 5-15 plug	Cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12/IP55	Type 12/IP55
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Behind front cover, near the fan	
Factory Thermostat Setting (°F/°C)	95/35	95/35
SOUND LEVEL		
At 1.0 Meters	58 dBA	58 dBA
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	36.41/925	36.41/925
Width (in./mm)	15.75/400	15.75/400
Depth (in./mm)	8.07/205	8.07/205
Weight (lb./kg)	44.1/20	44.1/20

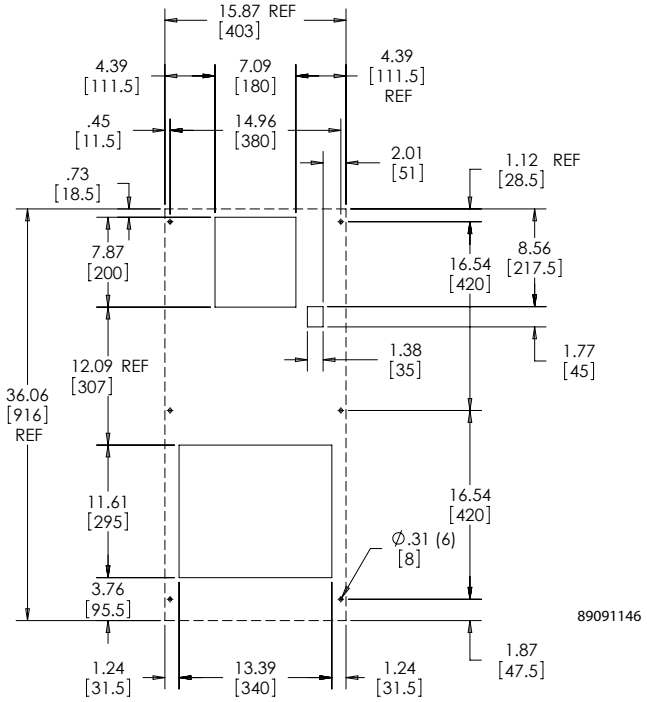
Performance Curves for WCHE04 Models 2200 Watt



WCHE04 Models 2200 Watt







CUTOUT DIMENSIONS

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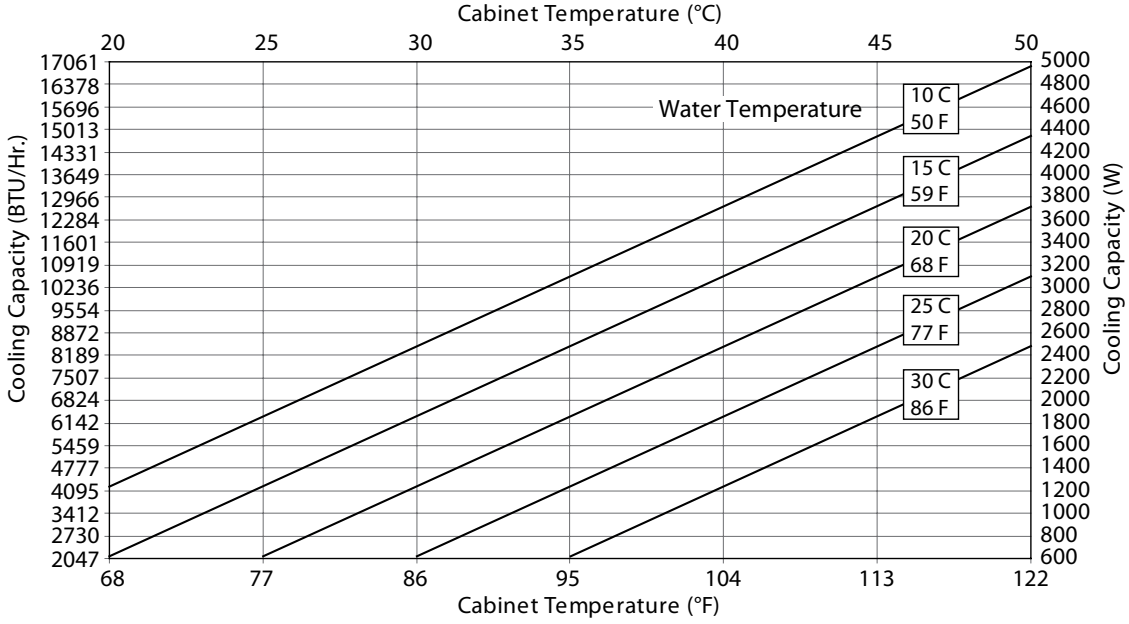
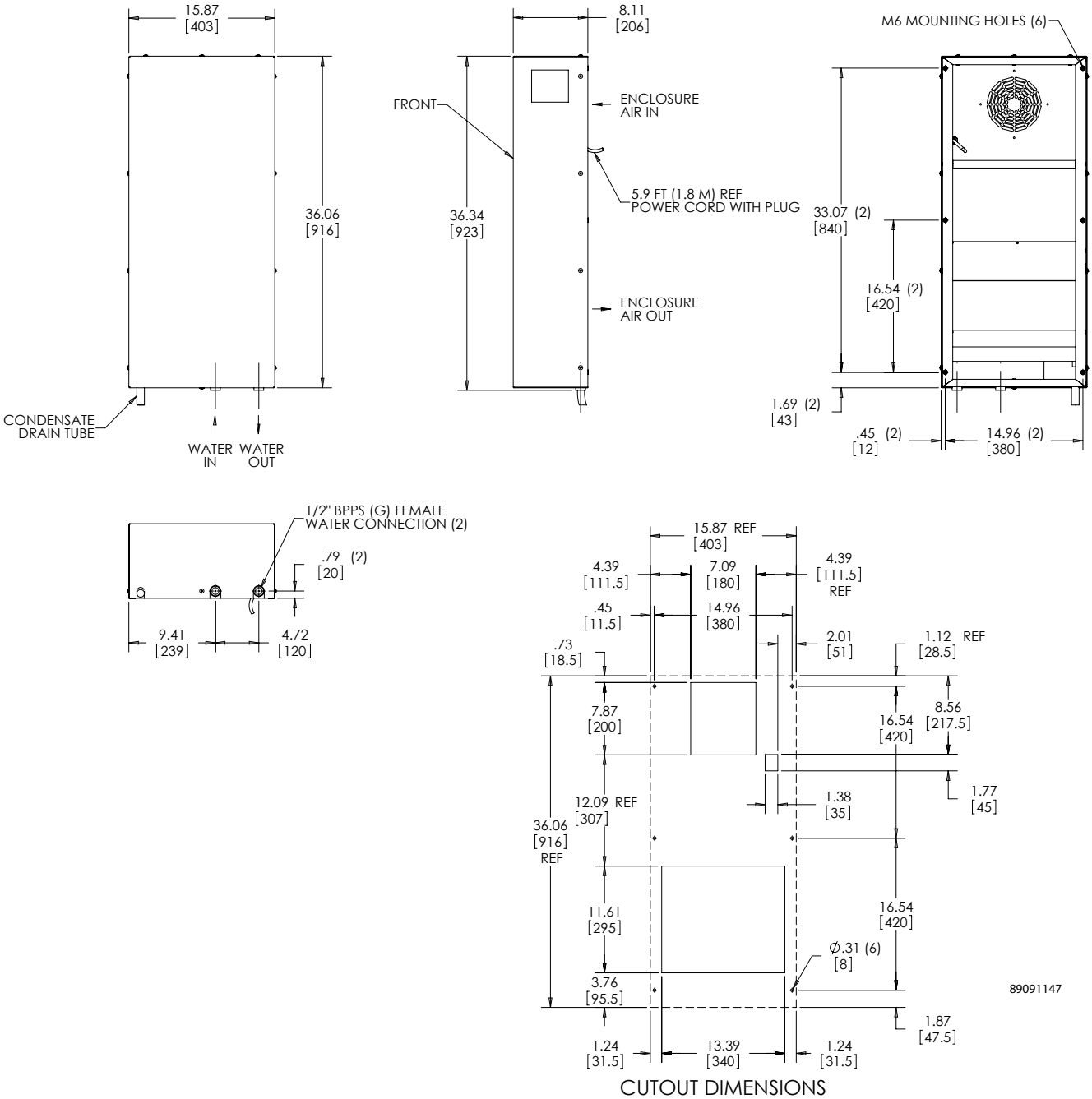
Performance Data **WCHE06 Models 3100 Watt**

CATALOG NUMBER	WCHE06916002	WCHE06926002
COOLING PERFORMANCE		
Nominal:		
BTU/Hr. @ Δt 25 C	10577	10577
Watts @ Δt 25 C	3100	3100
Refrigerant	NA	NA
Refrigerant Charge (ounces/grams)	NA	NA
Operating Temperature Range:		
Maximum (°F/°C)	122/50	122/50
Minimum (°F/°C)	50/10	50/10
Flow at 0 Static Pressure:		
Internal loop 50 Hz (Airflow: CFM / m^3/hr.)	507/860	507/860
External loop 50 Hz (Waterflow: GPM @ 95 F)	2.2	2.2
Internal loop 60 Hz (Airflow: CFM / m^3/hr.)	507/860	507/860
External loop 60 Hz (Waterflow: GPM @ 95 F)	2.2	2.2
ELECTRICAL DATA		
Rated Voltage	115	230
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	110	115
Max. Nominal Current (A at 50/60 Hz)	2	1
Starting Current (Amps)	2.4	1.2
Agency Approvals	UL/cUL Listed	
Power Input Description	Cord with NEMA 5-15 plug	Cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12/IP55	Type 12/IP55
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Behind front cover, near the fan	
Factory Thermostat Setting (°F/°C)	95/35	95/35
SOUND LEVEL		
At 1.0 Meters	58 dBA	58 dBA
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	36.41/925	36.41/925
Width (in./mm)	15.75/400	15.75/400
Depth (in./mm)	8.07/205	8.07/205
Weight (lb./kg)	46.3/21	46.3/21

Performance Curves for WCHE06 Models 3100 Watt



WCHE06 Models 3100 Watt



CUTOUT DIMENSIONS

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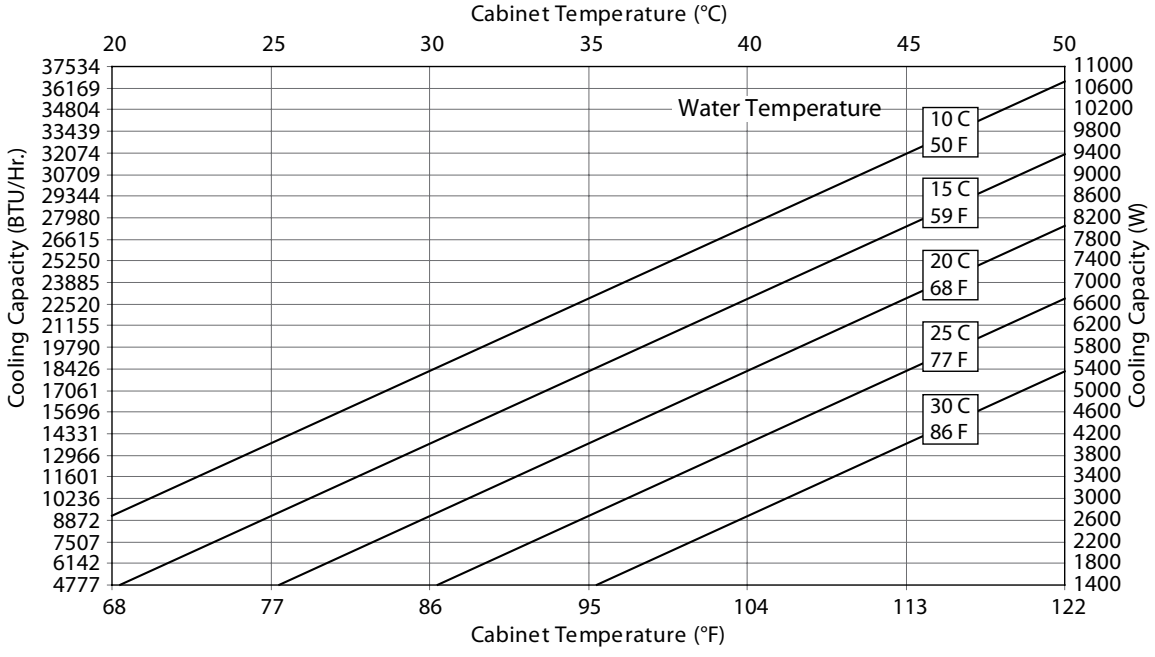
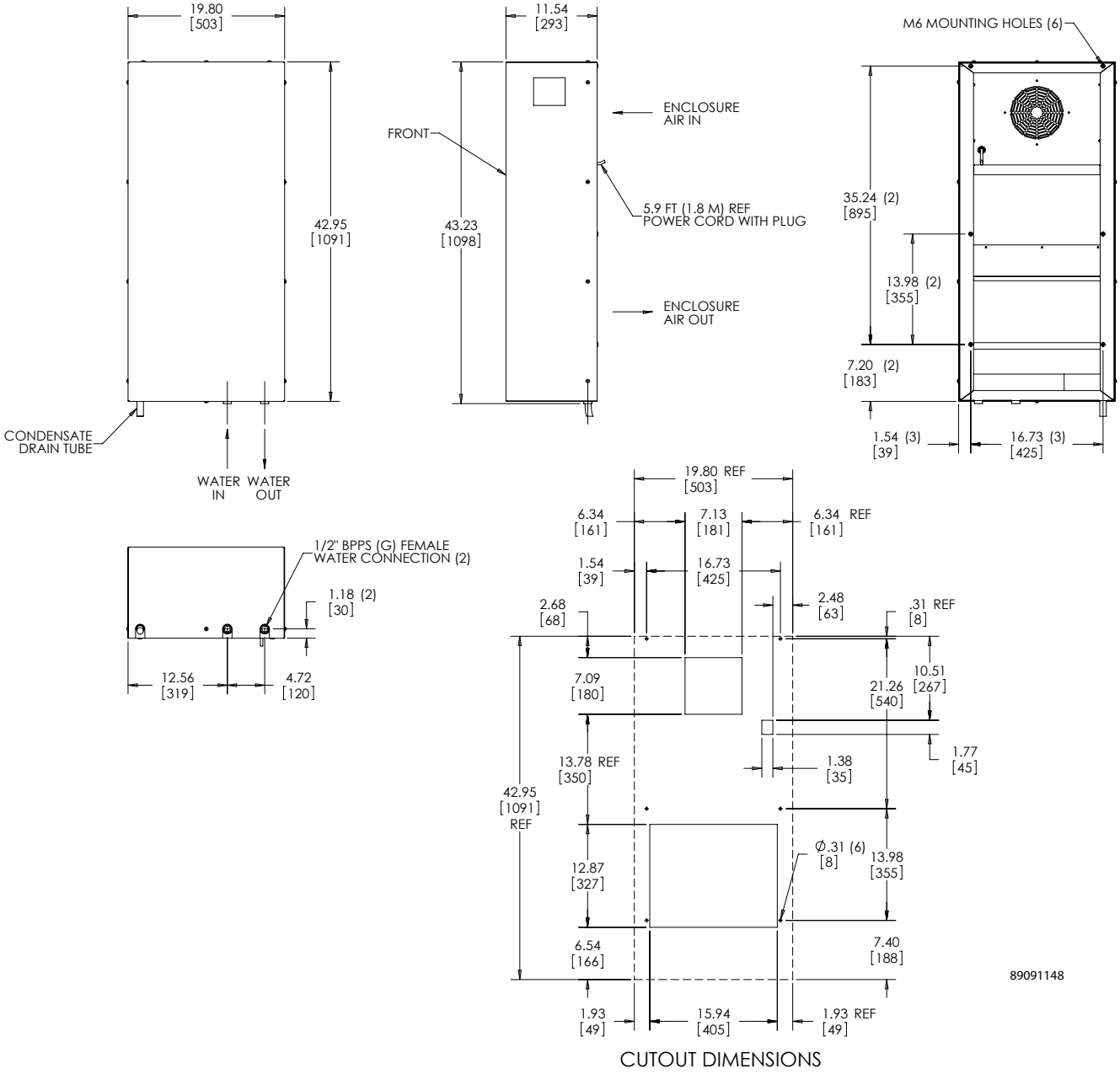
Performance Data **WCHE14 Models 6700 Watt**

CATALOG NUMBER	WCHE14916002	WCHE14926002
COOLING PERFORMANCE		
Nominal:		
BTU/Hr. @ Δt 25 C	22861	22861
Watts @ Δt 25 C	6700	6700
Refrigerant	NA	NA
Refrigerant Charge (ounces/grams)	NA	NA
Operating Temperature Range:		
Maximum (°F/°C)	122/50	122/50
Minimum (°F/°C)	50/10	50/10
Flow at 0 Static Pressure:		
Internal loop 50 Hz (Airflow: CFM / m^3/hr.)	855/1450	855/1450
External loop 50 Hz (Waterflow: GPM @ 95 F)	3.78	3.78
Internal loop 60 Hz (Airflow: CFM / m^3/hr.)	855/1450	855/1450
External loop 60 Hz (Waterflow: GPM @ 95 F)	3.78	3.78
ELECTRICAL DATA		
Rated Voltage	115	230
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (W at 50/60 Hz)	200	245
Max. Nominal Current (A at 50/60 Hz)	2	1.3
Starting Current (Amps)	2.4	1.4
Agency Approvals	UL/cUL Listed	
Power Input Description	Cord with NEMA 5-15 plug	Cord with NEMA 6-15 plug
ENCLOSURE PROTECTION		
UL Type	Type 12/IP55	Type 12/IP55
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Behind front cover, near the fan	
Factory Thermostat Setting (°F/°C)	95/35	95/35
SOUND LEVEL		
At 1.0 Meters	58 dBA	58 dBA
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard	
Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard	
UNIT DIMENSIONS		
Height (in./mm)	43.34/1101	43.34/1101
Width (in./mm)	19.72/501	19.72/501
Depth (in./mm)	11.81/300	11.81/300
Weight (lb./kg)	86/39	86/39

Performance Curves for WCHE14 Models 6700 Watt



WCHE14 Models 6700 Watt



CUTOUT DIMENSIONS

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Notes

THERMOELECTRIC COOLERS INDOOR/OUTDOOR

Unshrouded
60, 100 and 200 Watts

Shrouded
60, 100 and 200 Watts

INDUSTRY STANDARDS

UR, cUR Recognized; Type 12, 3R, 4, 4X; File No. SA6453

CE
IP 65

APPLICATION

Thermoelectric Coolers minimize downtime and component loss by removing heat around critical components within an enclosure. These compact, low-profile coolers using the Peltier effect allow for cooling of small indoor and outdoor enclosures. No condensers, compressors or filters are required making it a reliable solution for demanding low-maintenance environments.

FEATURES

- DC Powered operation for 24V and 48V applications
- Low profile design allows for mounting vertically and horizontally on any enclosure to avoid interference with internal components
- Filterless design reduces maintenance requirements
- Contains no refrigerant, making it earth friendly
- Prewired with simple terminal block for easy wiring connections
- Operates on the Peltier effect for cooling or heating
- Compressor-free air conditioning for demanding indoor and outdoor applications
- Shrouded and unshrouded models included in standard packages
- Operating temperature range -40 C (-40 F) to 55 C (131 F)
- Partial recess mount

SPECIFICATIONS

- Models
  60 Watt, 24 Volt
  100 Watt, 24/48 Volt
  200 Watt, 24/48 Volt

FINISH

- Shrouded finish includes both powder coat paint RAL 7035 light gray standard and stainless steel 304

ACCESSORIES

- Optional thermolelectric temperature controller regulates cooling and heating automatically
- Optional thermoelectric condenser manager helps direct condensation to the bottom of the enclosure

NOTES

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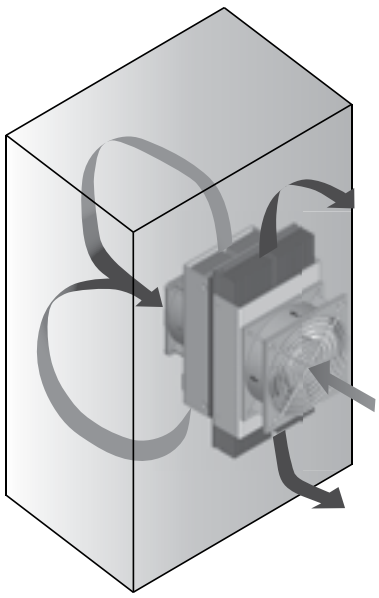
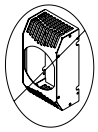
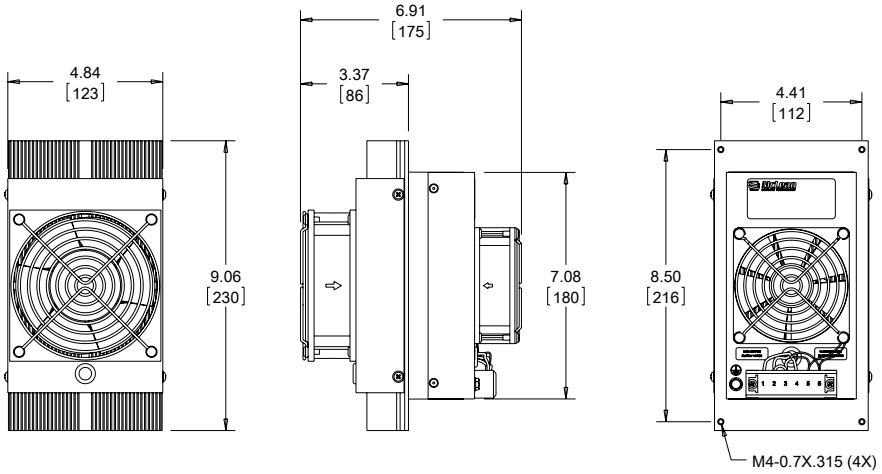


Performance Data **TE09 60W 204 BTU/Hr. (24 V)**

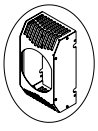
CATALOG NUMBERS			
Description	24V w/o shroud	24V w/ painted shroud	24V w/ SS shroud
Catalog Number	TE090624020	TE090624010	TE090624011
COOLING PERFORMANCE			
BTU/Hr.	**178**	**178**	**178**
Watts	**52**	**52**	**52**
Operating Temperature Range:			
Maximum (°C / °F)	55 / 131	55 / 131	55 / 131
Minimum (°C / °F)	-40 / -40	-40 / -40	-40 / -40
Air Flow at 0 Static Pressure:			
Internal loop (CFM / M^3/Hr.)	24 / 41	24 / 41	24 / 41
External loop (CFM / M^3/Hr.)	80 / 136	80 / 136	80 / 136
Nominal Heating Watts	64	64	64
ELECTRICAL DATA			
Input DC Voltage			
Nominal (VDC)	**24**	**24**	**24**
Minimum (VDC)	18	18	18
Maximum (VDC)	27.6	27.6	27.6
Power Consumption 95 F / 95 F (35 C / 35 C)	89	89	89
Max Current (Amps)	4.4	4.4	4.4
Agency Approvals	UR, cUR Recognized CE	UR, cUR Recognized CE	UR, cUR Recognized CE
Power Input Description	Terminal Block	Terminal Block	Terminal Block
ENCLOSURE PROTECTION			
UL Type / IP Rating	Type 12,3R,4,4X / IP 65	Type 12,3R,4 / IP 65	Type 12,3R,4,4X / IP 65
SOUND LEVEL			
At 1.5 Meters	65 dBA	65 dBA	65 dBA
UNIT CONSTRUCTION			
Heat Sink Material	Anodized Aluminum	Anodized Aluminum	Anodized Aluminum
Shroud Material	N/A	Galvanized Steel	Stainless Steel
Shroud Finish	N/A	RAL 7035 light-gray, semi-textured powder-coat paint standard	No. 4 Brushed Finish
UNIT DIMENSIONS			
Height (in. / mm)	9.06/230	9.29/236	9.29/236
Width (in. / mm)	4.84/123	5.02/128	5.02/128
Depth (in. / mm)	6.91/176	6.94/176	6.94/176
Weight (lb. / kg)	6.00/2.70	7.80/3.60	7.80/3.60

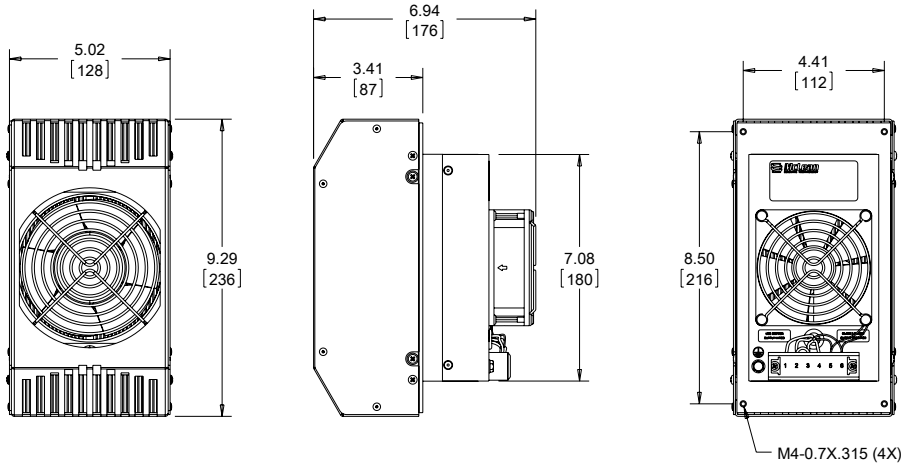
60 W 24 V

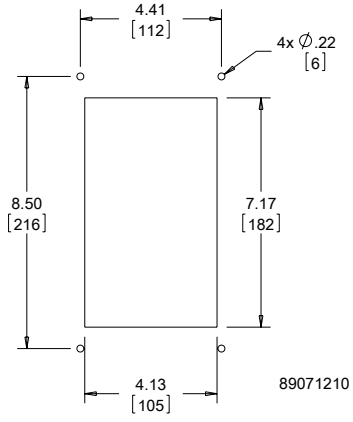




60 W 24 V





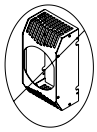


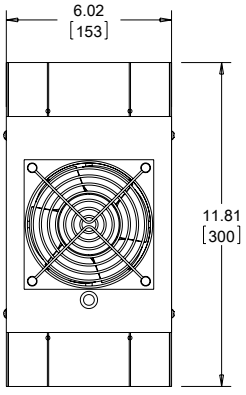
Cutout Dimensions

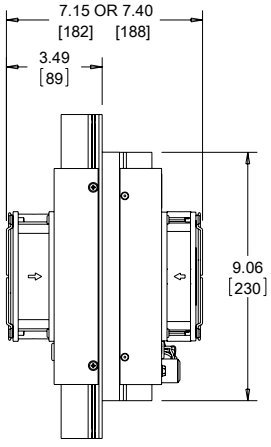
Performance Data **TE12 100W 341 BTU/Hr. (24/48 V)**

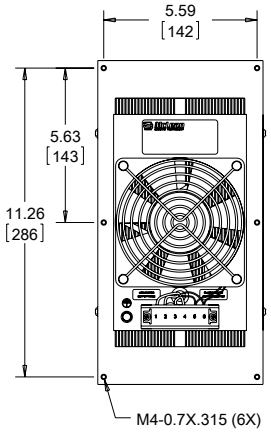
CATALOG NUMBERS					
Description	24V w/o shroud	24V w/ painted shroud	24V w/ SS shroud	48V w/o shroud	48V w/ painted shroud
Catalog Number	TE121024020	TE121024010	TE121024011	TE121048020	TE121048010
COOLING PERFORMANCE					
BTU/Hr.	**321**	**321**	**321**	**321**	**321**
Watts	**94**	**94**	**94**	**94**	**94**
Operating Temperature Range:					
Maximum (°C / °F)	55 / 131	55 / 131	55 / 131	55 / 131	55 / 131
Minimum (°C / °F)	-40 /-40	-40 /-40	-40 /-40	-40 /-40	-40 /-40
Air Flow at 0 Static Pressure:					
Internal loop (CFM / M^3/Hr.)	62 / 105	62 / 105	62 / 105	62 / 105	62 / 105
External loop (CFM / M^3/Hr.)	86 / 146	86 / 146	86 / 146	86 / 146	86 / 146
Nominal Heating Watts	94	94	94	94	94
ELECTRICAL DATA					
Input DC Voltage					
Nominal (VDC)	**24**	**24**	**24**	**48**	**48**
Minimum (VDC)	18	18	18	40	40
Maximum (VDC)	27.6	27.6	27.6	56.7	56.7
Power Consumption 95 F / 95 F (35 C / 35 C)	162	162	162	162	162
Max Current (Amps)	8.5	8.5	8.5	4.4	4.4
Agency Approvals	UR, cUR Recognized CE GOST	UR, cUR Recognized CE GOST	UR, cUR Recognized CE GOST	UR, cUR Recognized CE GOST	UR, cUR Recognized CE GOST
Power Input Description	Terminal Block	Terminal Block	Terminal Block	Terminal Block	Terminal Block
ENCLOSURE PROTECTION					
UL Type / IP Rating	Type 12,3R,4,4X / IP 65	Type 12,3R,4 / IP 65	Type 12,3R,4,4X / IP 65	Type 12,3R,4,4X / IP 65	Type 12,3R,4 / IP 65
SOUND LEVEL					
At 1.5 Meters	68 dBA	68 dBA	68 dBA	68 dBA	68 dBA
UNIT CONSTRUCTION					
Heat Sink Material	Anodized Aluminum	Anodized Aluminum	Anodized Aluminum	Anodized Aluminum	Anodized Aluminum
Shroud Material	N/A	Galvanized Steel	Stainless Steel	N/A	Galvanized Steel
Shroud Finish	N/A	RAL 7035 light-gray, semi-textured powder-coat paint standard	No. 4 Brushed Finish	N/A	RAL 7035 light-gray, semi-textured powder-coat paint standard
UNIT DIMENSIONS					
Height (in. / mm)	11.81/300	12.00/305	12.00/305	11.81/300	12.00/305
Width (in. / mm)	6.02/153	6.18/157	6.18/157	6.02/153	6.18/157
Depth (in. / mm)	7.40/188	7.43/189	7.43/189	7.40/188	7.43/189
Weight (lb. / kg)	8.50/3.90	11.00/5.00	11.00/5.00	8.50/3.90	11.00/5.00

100 W 24/48 V

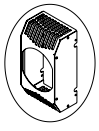


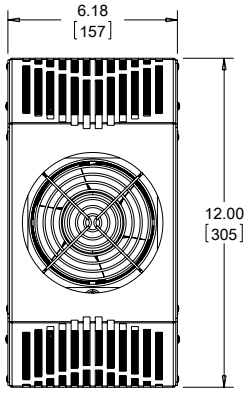


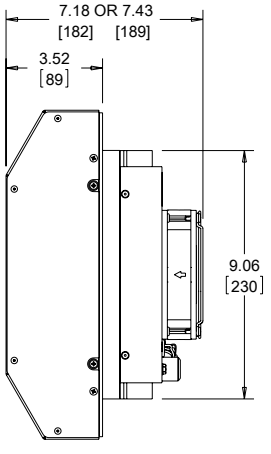


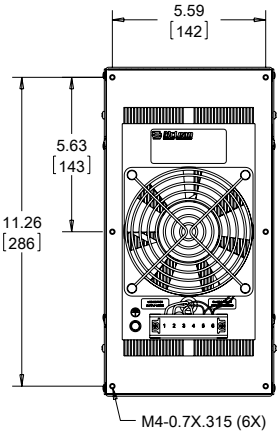


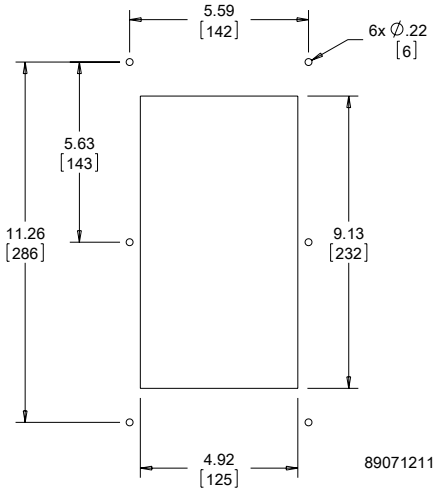
100 W 24/48 V









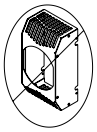


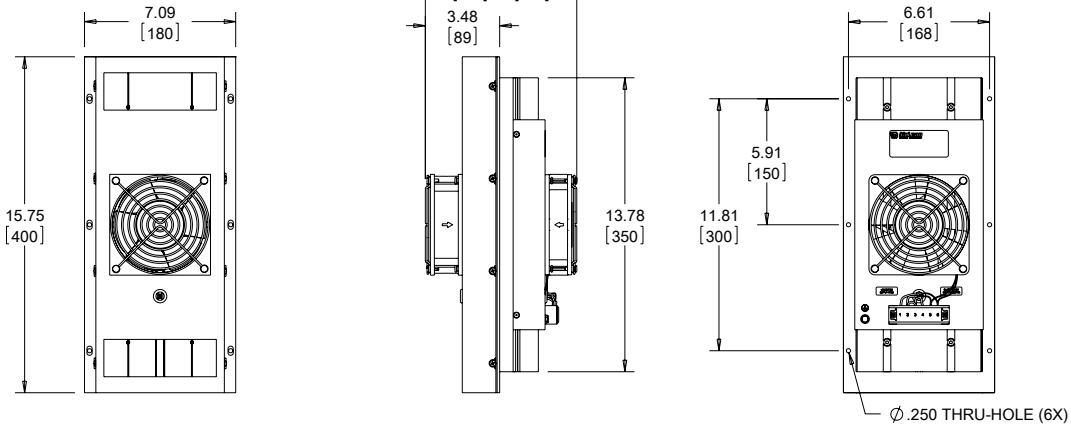
Cutout Dimensions

Performance Data **TE16 200W 682 BTU/Hr. (24/48 V)**

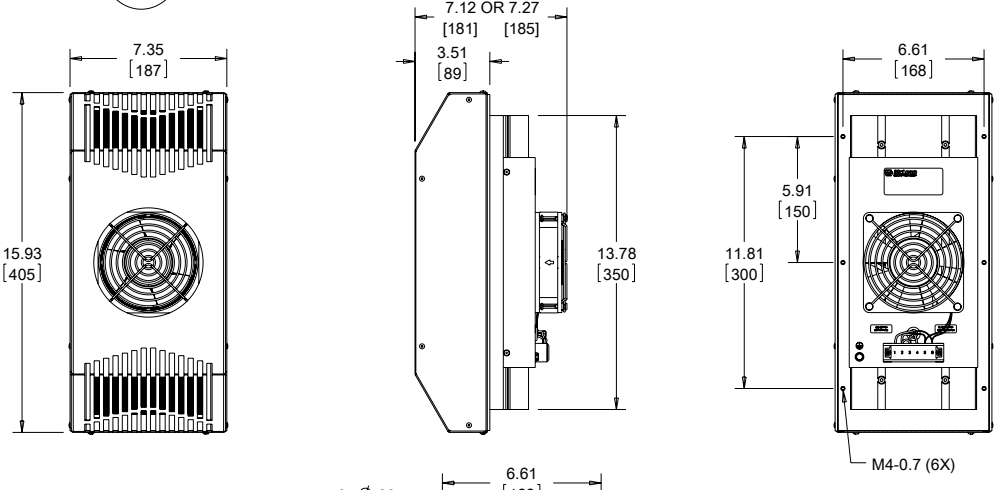
CATALOG NUMBERS					
Description	24V w/o shroud	24V w/ painted shroud	24V w/ SS shroud	48V w/o shroud	48V w/ painted shroud
Catalog Number	TE162024020	TE162024010	TE162024011	TE162048020	TE162048010
COOLING PERFORMANCE					
BTU/Hr.	**567**	**567**	**567**	**567**	**567**
Watts	**166**	**166**	**166**	**166**	**166**
Operating Temperature Range:					
Maximum (°C / °F)	55 / 131	55 / 131	55 / 131	55 / 131	55 / 131
Minimum (°C / °F)	-40 /-40	-40 /-40	-40 /-40	-40 /-40	-40 /-40
Air Flow at 0 Static Pressure:					
Internal loop (CFM / M^3/Hr.)	62 / 105	62 / 105	62 / 105	62 / 105	62 / 105
External loop (CFM / M^3/Hr.)	86 / 146	86 / 146	86 / 146	86 / 146	86 / 146
Nominal Heating Watts	146	146	146	146	146
ELECTRICAL DATA					
Input DC Voltage					
Nominal (VDC)	**24**	**24**	**24**	**48**	**48**
Minimum (VDC)	18	18	18	40	40
Maximum (VDC)	27.6	27.6	27.6	56.7	56.7
Power Consumption 95 F / 95 F (35 C / 35 C)	295	295	295	295	295
Max Current (Amps)	14.7	14.7	14.7	7.6	7.6
Agency Approvals	UR, cUR Recognized CE GOST	UR, cUR Recognized CE GOST	UR, cUR Recognized CE GOST	UR, cUR Recognized CE GOST	UR, cUR Recognized CE GOST
Power Input Description	Terminal Block	Terminal Block	Terminal Block	Terminal Block	Terminal Block
ENCLOSURE PROTECTION					
UL Type / IP Rating	Type 12,3R,4,4X / IP 65	Type 12,3R,4 / IP 65	Type 12,3R,4,4X / IP 65	Type 12,3R,4,4X / IP 65	Type 12,3R,4 / IP 65
SOUND LEVEL					
At 1.5 Meters	68 dBA	68 dBA	68 dBA	68 dBA	68 dBA
UNIT CONSTRUCTION					
Heat Sink Material	Anodized Aluminum	Anodized Aluminum	Anodized Aluminum	Anodized Aluminum	Anodized Aluminum
Shroud Material	N/A	Galvanized Steel	Stainless Steel	N/A	Galvanized Steel
Shroud Finish	N/A	RAL 7035 light-gray, semi-textured powder-coat paint standard	No. 4 Brushed Finish	N/A	RAL 7035 light-gray, semi-textured powder-coat paint standard
UNIT DIMENSIONS					
Height (in. / mm)	15.75/400	15.93/405	15.93/405	15.75/400	15.93/405
Width (in. / mm)	7.09/180	7.35/187	7.35/187	7.09/180	7.35/187
Depth (in. / mm)	7.25/184	7.27/185	7.27/185	7.25/184	7.27/185
Weight (lb. / kg)	14.80/6.70	18.60/8.40	18.60/8.40	14.80/6.70	18.60/8.40

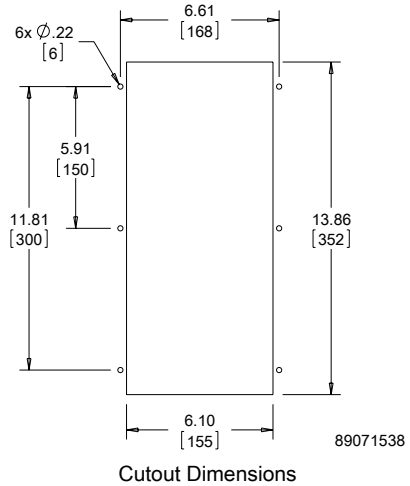
200 W 24/48 V



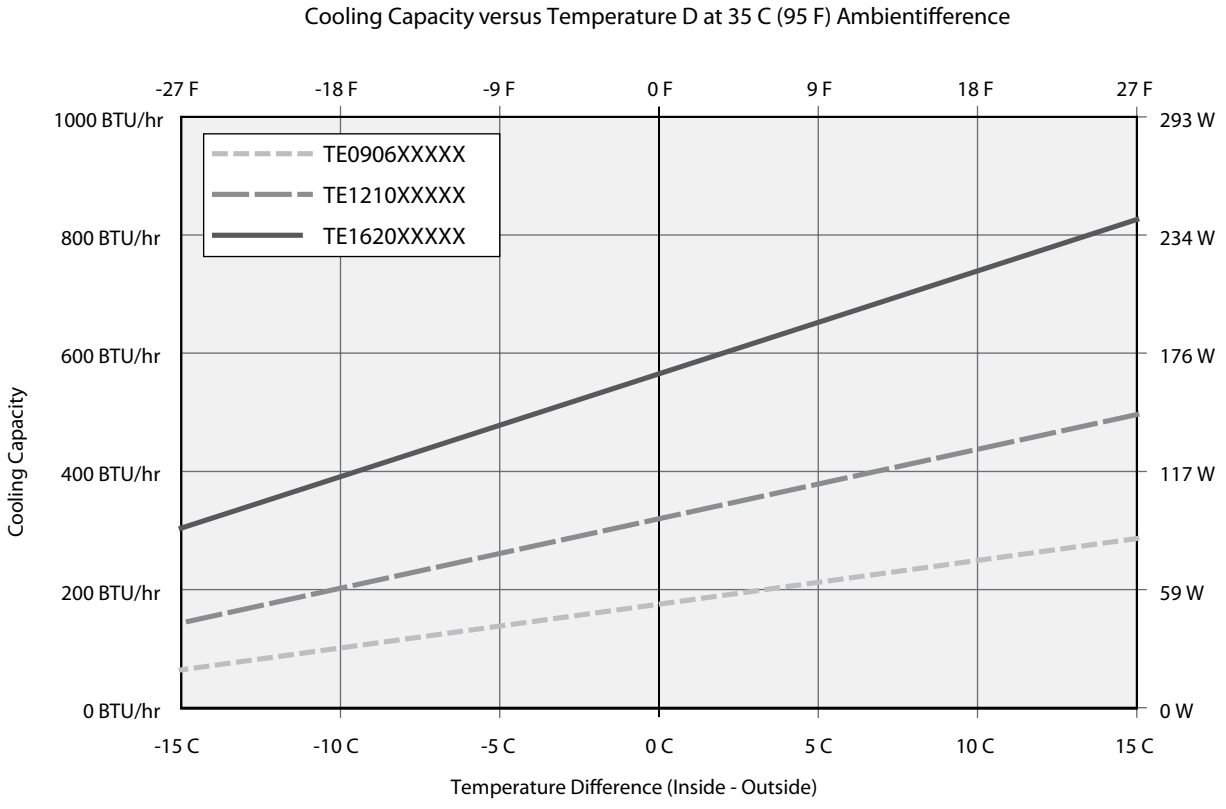


200 W 24/48 V





Cutout Dimensions


Cooling Capacity versus Temperature D at 35 C (95 F) Ambientifference
-27 F
-18 F
-9 F
0 F
9 F
18 F
27 F
1000 BTU/hr
800 BTU/hr
600 BTU/hr
400 BTU/hr
200 BTU/hr
0 BTU/hr
293 W
234 W
176 W
117 W
59 W
0 W
TE0906XXXXX
TE1210XXXXX
TE1620XXXXX
Cooling Capacity
-15 C
-10 C
-5 C
0 C
5 C
10 C
15 C
Temperature Difference (Inside - Outside)

THERMOELECTRIC TEMPERATURE CONTROLLER

INDUSTRY STANDARDS

UL Recognized; File No. 60730

FEATURES

- Provides PWM regulation of cooling and heating output for TEC units
- Automatically switches between cooling and heating
- 4 cooling temperature set points range from 22.5 C to 35 C (35 C Factory Setting)
- 3 heating temperature set points range from -5 C to 15 C (15 C Factory Setting)
- Heating function can be easily disabled if desired
- On-board LEDS indicate low temp, high temp alarm, and overall system status
- Dry contact relay output provides for external alarm indication

Performance Data

CATALOG NUMBERS	TEC24VCNTLRN	TEC48VCNTLRN
ELECTRICAL DATA		
Rated Voltage (VDC)	24	48
Operating Range (VDC)	18 to 30	40 to 60
Current @ Rated Voltage (Amps)	17.2	8.6
Operating Temperature Range		
Maximum (°F/°C)	149 / 65	
Minimum (°F/°C)	-40 / -40	
Temperature Accuracy (°F/°C)	± 3.6 / 2.0	
Alarm Contact Rating	1) 0.5 A max @ 24 VDC - from same source of power as unit, SELV, non-power limited (greater than 15 W); OR 2) 0.5 A max @ 24 VAC - from, SELV, Class 2 safety isolating transformer.	1) 0.5 A max @ 48 VDC - from same source of power as unit, SELV, non-power limited (greater than 15 W); OR 2) 0.5 A max @ 24 VAC - from, SELV, Class 2 safety isolating transformer.
UNIT DIMENSIONS		
PCB Dimensions		
Height (in/mm)	1.20 / 30	
Width (in/mm)	2.88 / 73	
Length (in/mm)	6.50 / 165	
Weight (lb./kg)	0.21 / 0.10	
Mounting Bracket Dimensions		
Height (in/mm)	0.50 / 13	
Width (in/mm)	3.19 / 91	
Length (in/mm)	6.50 / 165	
Weight (lb./kg)	0.29 / 0.13	
Accessories		
Input Supply Harness	60-in. (1525mm) long Supply Harness Catalog Number TECSUPPLYHARNESS	
Board to TEC Harness	36-in. (915mm) long Control Harness Catalog Number TECCONTROLHARNESS	

THERMOELECTRIC CONDENSATE MANAGER

INDUSTRY STANDARDS

Maintains UL/cUL Type 3R, 12, 4 and 4X rating when properly installed

FEATURES

- Includes all required hardware and vent drain
- Maintains the integrity of Type 4 or Type 4X enclosure
- Drains condensation to bottom of enclosure via vent drain (vent drain included with package)
- Utilizes existing mounting holes and fasteners of thermoelectric cooler that requires no additional mounting

FINISH

- Pan Material Galvanized steel polyester powder coat paint with RAL 7035
- Vent drain material options include stainless steel or non-metallic

Performance Data

CATALOG NUMBERS						
	TEC60WCMSS4	TEC60WCMNM	TEC100WCMSS4	TEC100WCMNM	TEC200WCMSS4	TEC200WCMNM
Fits TEC Unit Model	All TE09	All TE09	All TE12	All TE12	All TE16	All TE16
UNIT CONSTRUCTION						
Pan Material	Galvanized Steel					
Pan Finish	RAL 7035 light-gray, semi-textured powder-coat paint standard					
Vent Drain Material	Stainless Steel	Non-Metallic	Stainless Steel	Non-Metallic	Stainless Steel	Non-Metallic
UNIT DIMENSIONS						
Height (in./mm)	.75/19	.75/19	.75/19	.75/19	.75/19	.75/19
Width (in./mm)	5.50/140	5.50/140	6.25/159	6.25/159	7.44/189	7.44/189
Depth (in./mm)	2.50/64	2.50/64	2.50/64	2.50/64	2.50/64	2.50/64

VORTEX COOLERS INDOOR/OUTDOOR

INDUSTRY STANDARDS

NEMA Type 4 Models:
Maintains UL/cUL Type 4 when properly installed on a UL/cUL Type 4 enclosure.

UL508 Listed; Type 4; File No. E187045

NEMA Type 4X Models:
Maintains UL/cUL Type 4X when properly installed on a UL/cUL Type 4X enclosure.

UL508 Listed; Type 4X; File No. E187045

NEMA Type 12 Models:
Maintains UL/cUL Type 12 when properly installed on a UL/cUL Type 12 enclosure.

UL508 Listed; Type 12; File No. E187045

APPLICATION

Powered by compressed air, Vortex Cooling Systems generate chilled air to cool small enclosures without refrigerants or moving parts. These systems are exceptionally reliable and low maintenance, even in the harshest and dirtiest environments.

FEATURES

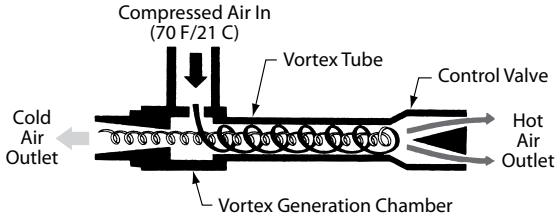
- Five-micron airline filter, 115 V solenoid
- Thermostat
- Ducting kit
- Cooling capacities to 2500 BTU/Hr. (733 W)

FINISH

Brushed satin aluminum or stainless steel

ACCESSORIES

(for the enclosure)
Can be installed on all enclosure product families.
Separate accessories include an in-line oil filter.



Vortex Tube Air Flow Schematic

Performance Data **VC Series NEMA Type 12**

CATALOG NUMBERS				
Aluminum	VC0416012	VC0916012	VC1516012	VC2516012
COOLING PERFORMANCE				
Cooling Capacity (BTU/Hr.)	**400**	**900**	**1500**	**2500**
Cooling Capacity (Watts)	**117**	**264**	**440**	**733**
Compressed Air Consumption (SCFM)	8	15	25	35
Compressed Air Consumption (L^3/M)	227	425	708	991
SOUND LEVEL				
Noise Level (dB)	69	80	83	90
ENCLOSURE PROTECTION				
UL Type	Type 12			
ELECTRICAL DATA				
Rated Voltage	**115**	**115**	**115**	**115**
Frequency (Hz)	50/60	50/60	50/60	50/60
UNIT DIMENSIONS				
Weight (lb./kg)	5/2.27	6/2.72	6/2.72	6/2.72

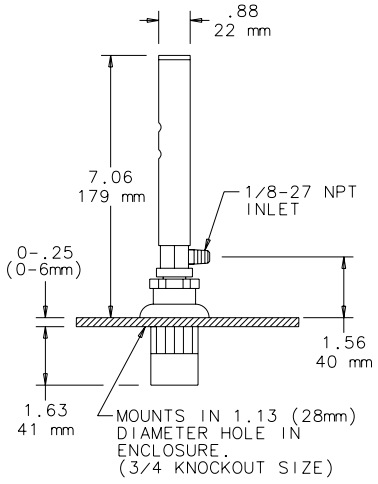
Performance Data **VC Series NEMA Type 4, 4X**

CATALOG NUMBERS			
Aluminum	VC0916004	VC1716004	VC2516004
Stainless Steel	VC091604X	VC171604X	VC251604X
COOLING PERFORMANCE			
Cooling Capacity (BTU/Hr.)	**900**	**1700**	**2500**
Cooling Capacity (Watts)	**264**	**498**	**733**
Compressed Air Consumption (SCFM)	15	25	35
Compressed Air Consumption (L^3/M)	425	708	991
SOUND LEVEL			
Noise Level (dB)	83	86	90
ENCLOSURE PROTECTION			
UL Type	Type 4, 4X		
ELECTRICAL DATA			
Rated Voltage	**115**	**115**	**115**
Frequency (Hz)	50/60	50/60	50/60
UNIT DIMENSIONS			
Weight (lb./kg)	6/2.72	6/2.72	6/2.72

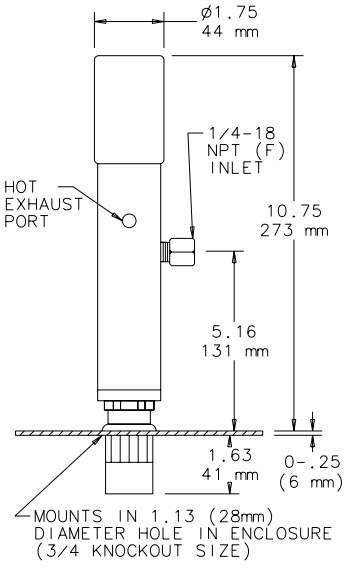
Vortex Cooling System Accessories

CATALOG NUMBERS		
	VCOF17	VCOF25
PERFORMANCE		
Description	Oil Filter	
Use with VCool Model Capacity	Up to 1700 BTU/Hr.	2500 BTU/Hr.

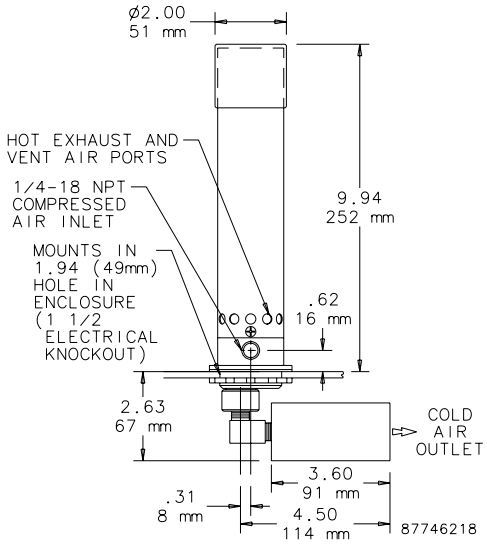
NEMA Type 12 - 400 BTU/Hr.



NEMA Type 12 -
900, 1500, 2500 BTU/Hr.



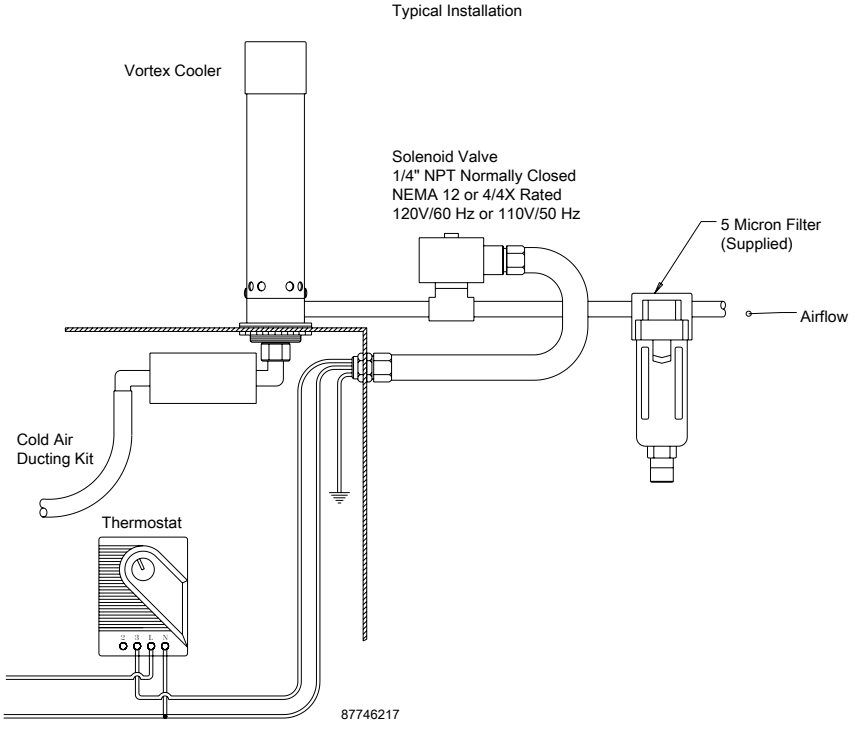
NEMA Type 4X
900, 1700, 2500 BTU/Hr.



ENCLOSURE COOLER MUST REMAIN
IN A VERTICAL ORIENTATION TO
MAINTAIN NEMA 4/4X RATINGS.

3

Typical Installation



Notes

QUIET VORTEX A/C ENCLOSURE COOLERS, TYPE 4/4X/12

VA09, VA15, VA25
NEMA Type 4/4X

VA09, VA15, VA25
NEMA Type 12

VA50
NEMA Type 4/4X

VA50
NEMA Type 12

INDUSTRY STANDARDS

NEMA Type 4,4X Models:

Maintains UL/cUL Type 4, 4X when properly installed on a UL/cUL Type 4, 4X enclosure.
UL508 Listed; Type 4, 4X; File No. E249700

IP66

NEMA Type 12 Models:

Maintains UL/cUL Type 12 when properly installed on a UL/cUL Type 12 enclosure.
UL508 Listed; Type 12; File No. E249700

IP54

APPLICATION

Vortex A/C Enclosure Coolers keep enclosures cool, clean and protected even in the harshest environments. Offering flexible installation, these enclosure coolers are ideal in space-restrictive areas where compressed air is readily available. With almost no moving parts, these enclosure coolers are highly reliable and virtually maintenance free.

FEATURES

- Mechanical thermostat reduces energy consumption
- Top, side, and front mount allows for versatile installation in confined areas
- Quieter operation with noise level of 60-75 dB
- Cooling capacities up to 5000 BTU/Hr. (1465 W)
- Supplied with five-micron, automatic drain compressed air filter, cold ducting kit, and cold air muffler
- Operates in environments up to 175 F (80 C)

FINISH

- NEMA Type 4,4X models: Polycarbonate and stainless steel exterior; aluminum and brass internal components
- NEMA Type 12 models: Polycarbonate and aluminum exterior; aluminum and brass internal components

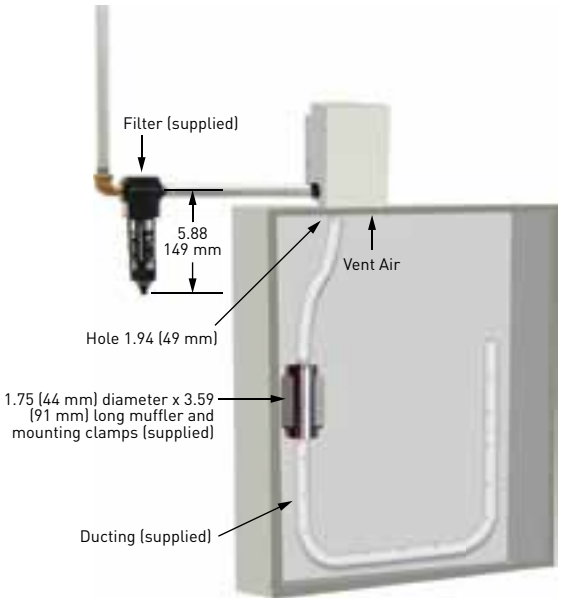
ACCESSORIES

- Oil Removal Filter
- Generator Kit
- Five-micron Air Filter
- Cold Air Ducting Kit
- Cold Air Muffler

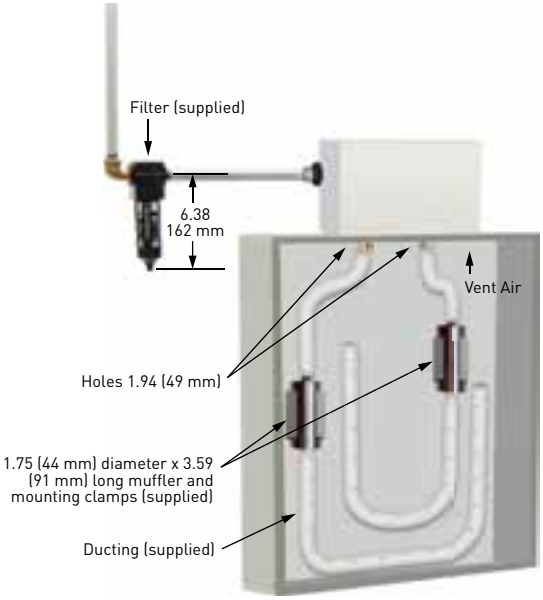
Performance Data **VA Series NEMA Type 4, 4X**

CATALOG NUMBERS	VA091604X	VA151604X	VA251604X	VA501604X
COOLING PERFORMANCE				
Cooling Capacity (BTU/Hr.)	**900**	**1500**	**2500**	**5000**
Cooling Capacity (Watts)	**264**	**440**	**733**	**1465**
Compressed Air Consumption (SCFM)	15	25	35	70
Compressed Air Consumption (SLPM)	425	708	991	1982
SOUND LEVEL				
Noise Level (dB)	60	66	72	75
ENCLOSURE PROTECTION				
UL Type	Type 4, 4X			
IP	IP66			
UNIT DIMENSIONS				
Height (in./mm)	8.00/203	8.00/203	8.00/203	6.44/164
Width (in./mm)	4.75/121	4.75/121	4.75/121	9.44/240
Depth (in./mm)	5.38/137	5.38/137	5.38/137	5.56/141
Weight (lb./kg)	6.3/2.86	6.3/2.86	6.4/2.90	11.0/4.99

VA09, VA15, VA25, Type 4/4X



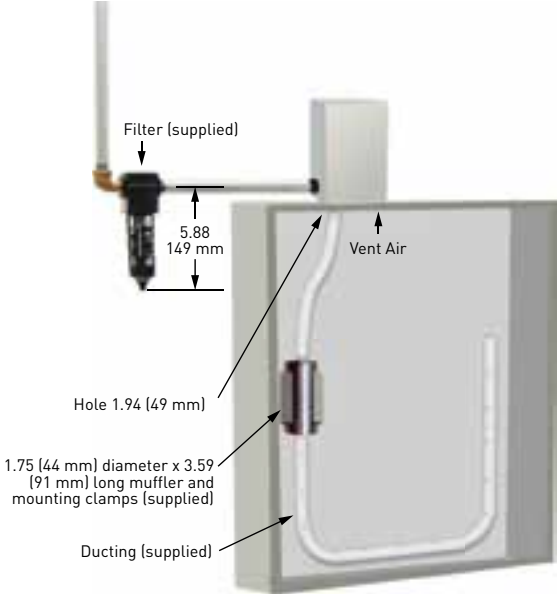
VA50, Type 4/4X



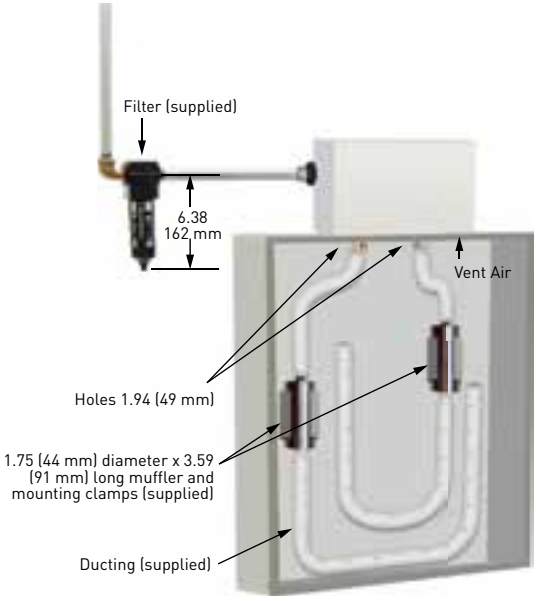
Performance Data **VA Series NEMA Type 12**

CATALOG NUMBERS	VA0916012	VA1516012	VA2516012	VA5016012
COOLING PERFORMANCE				
Cooling Capacity (BTU/Hr.)	**900**	**1500**	**2500**	**5000**
Cooling Capacity (Watts)	**264**	**440**	**733**	**1465**
Compressed Air Consumption (SCFM)	15	25	35	70
Compressed Air Consumption (SLPM)	425	708	991	1982
SOUND LEVEL				
Noise Level (dB)	60	66	72	75
ENCLOSURE PROTECTION				
UL Type	Type 12			
IP	IP54			
UNIT DIMENSIONS				
Height (in./mm)	8.00/203	8.00/203	8.00/203	6.44/164
Width (in./mm)	4.75/121	4.75/121	4.75/121	9.44/240
Depth (in./mm)	3.56/90	3.56/90	3.56/90	4.25/108
Weight (lb./kg)	4.9/2.22	4.9/2.22	5.0/2.27	7.7/3.50

VA09, VA15, VA25, Type 12



VA50, Type 12


Filter (supplied)
6.38
162 mm
Vent Air
Holes 1.94 (49 mm)
1.75 (44 mm) diameter x 3.59
(91 mm) long muffler and
mounting clamps (supplied)
Ducting (supplied)

Vortex AC Accessories **Type 4/4X/12**

CATALOG NUMBERS	Description	Use with VA Model Capacity
Air Filters		
VAAF15	5 micron, automatic drain compressed air filter	Up to 1500 BTU/Hr.
VAAF25	5 micron, automatic drain compressed air filter	Up to 2500 BTU/Hr.
VAAF50	5 micron, automatic drain compressed air filter	Up to 5000 BTU/Hr.
Oil Filters		
VCOF17	Oil Filter	Up to 1500 BTU/Hr.
VCOF25	Oil Filter	Up to 5000 BTU/Hr.
Generators		
VAGK09	Generator Kit	900 BTU/Hr. models
VAGK15	Generator Kit	1500 BTU/Hr. models
VAGK25	Generator Kit	2500 and 5000 BTU/Hr. models
Air Ducting		
VADK124X	Cold Air Ducting Kit	All NEMA 12, 4/4X models

VORTEX A/C ENCLOSURE COOLERS, HAZARDOUS LOCATION

VHL09, VHL15, VHL25

VHL50

APPLICATION

Hazardous Location Vortex A/C Enclosure Coolers keep enclosures cool, clean and protected even in hazardous environments. These systems are ideal for applications where compressed air is available in Hazardous Locations. With almost no moving parts, these systems are highly reliable and virtually maintenance free.

FEATURES

- Approved for a 175 F (80 C) maximum ambient temperature in Class I, Div. 2; Class II, Div. 2; and Class III areas
- Mechanical thermostat reduces energy consumption
- Top, side, and front mount allows for versatile installation in confined areas
- Quieter operation with noise level of 60-75 dB
- Supplied with five-micron, automatic drain compressed air filter, cold ducting kit, cold air muffler, and check valve
- Cooling capacities up to 5000 BTU/Hr. (1465 W)

FINISH

- Polycarbonate and stainless steel exterior with aluminum and brass internal components

ACCESSORIES

- Oil Removal Filter
- Generator Kit
- 5 micron Air Filter
- Cold Air Ducting Kit
- Cold Air Muffler
- Check Valve
- Purge System

3

INDUSTRY STANDARDS

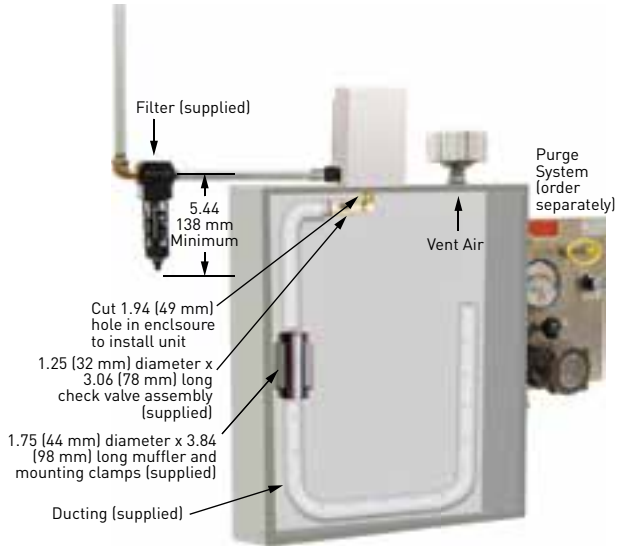
Hazardous Location Models:

UL Classified for Class 1, Div. 2, Groups A through D; Class II, Div. 2, Groups F & G; and Class III locations (when used with an approved purge/pressurization system); File No. E364567. Maintains UL/cUL Type 4, 4X when properly installed on a UL/cUL Type 4, 4X enclosure.

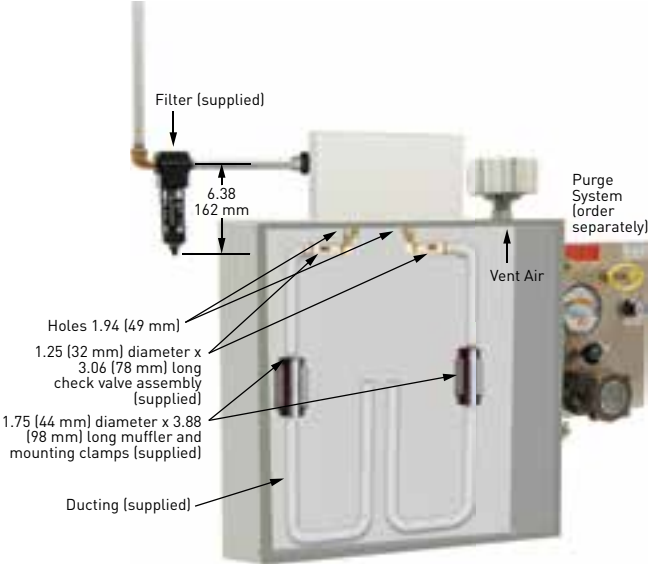
Performance Data **VHL Series for Hazardous Locations**

CATALOG NUMBERS	VHL09160	VHL15160	VHL25160	VHL50160
COOLING PERFORMANCE				
Cooling Capacity (BTU/Hr.)	900	1500	2500	5000
Cooling Capacity (Watts)	264	440	733	1465
Compressed Air Consumption (SCFM)	15	25	35	70
Compressed Air Consumption (SLPM)	425	708	991	1982
SOUND LEVEL				
Noise Level (dB)	60	66	72	75
ENCLOSURE PROTECTION				
UL Classified	Class 1, Div. 2, Groups A-D; Class II, Div. 2, Groups F & G, Class III			
UNIT DIMENSIONS				
Height (in./mm)	8.00/203	8.00/203	8.00/203	6.44/164
Width (in./mm)	4.75/121	4.75/121	4.75/121	9.44/240
Depth (in./mm)	5.38/137	5.38/137	5.38/137	5.56/141
Weight (lb./kg)	6.70/3.04	6.7/3.04	6.8/3.08	11.4/5.17

VHL09, VHL15, VHL25 HAZLOC



VHL50 HAZLOC



Vortex AC Accessories **Hazardous Location**

CATALOG NUMBERS	Description	Use with VHL Model Capacity
Air Filters		
VAAF15	5 micron, automatic drain compressed air filter	Up to 1500 BTU/Hr.
VAAF25	5 micron, automatic drain compressed air filter	Up to 2500 BTU/Hr.
VAAF50	5 micron, automatic drain compressed air filter	Up to 5000 BTU/Hr.
Oil Filters		
VCOF17	Oil Filter	Up to 1500 BTU/Hr.
VCOF25	Oil Filter	Up to 5000 BTU/Hr.
Generators		
VAGK09	Generator Kit	900 BTU/Hr. models
VAGK15	Generator Kit	1500 BTU/Hr. models
VAGK25	Generator Kit	2500 and 5000 BTU/Hr. models
Air Ducting		
VHLDK	Cold Air Ducting Kit	All Hazardous Location models

PENTAIR

Hoffman

CHAPTER 4 FRESH AIR ENCLOSURE COOLING

FEATURED PRODUCTS

DIRECT AIR COOLING SYSTEMS (DACS)

DACS provides flexible, effective heat removal for outdoor enclosures. A cost-efficient alternative to closed-loop cooling solutions, DACS utilizes quiet, fan-based technology to draw filtered ambient air into the enclosure to dissipate heat. Models include Hydrophobic Gore™ and MERV 12 filtration styles to protect against outdoor elements such as water, dust, bugs and rain.

FILTER FANS

Filter Fans cool a wide range of heat loads in applications ranging from industrial drives to process equipment and controls. With more than 175 models, Type 12, Type 3R and Type 1 options, a wide range of airflow capabilities and various mounting options, Filter Fans are available for diverse environments.

FAN TRAYS

Fan Trays deliver a versatile solution to efficiently cool card cages and racks. Redundant cooling with optional failure detection ensures reliable cooling for sensitive electronic equipment. With a slim, field-adjustable design, these 19-inch rack mountable trays provide simple installation and easy access.

CHAPTER CONTENTS

DACS OUTDOOR

INDUSTRY STANDARDS

UL Recognized

CE
Telcordia GR-487 capable

APPLICATION

- Outdoor telecommunications equipment
- Industrial automation
- Outdoor kiosk
- Outdoor displays
- OSP applications

FEATURES

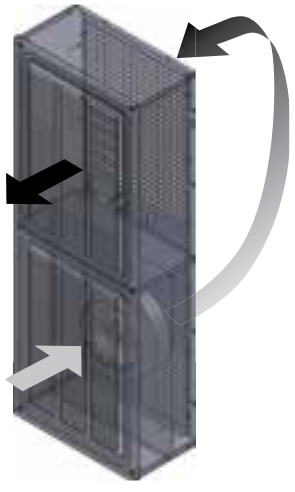
- Customizable solutions to meet any customer need
- Two models utilizing Hydrophobic GORE® filter
- Two models with MERV 12, pleated filter
- Standard power input: 48 VDC
- UL Listed to save time and money with agency approvals
- Power Cord included
- Easy to replace filters
- Broad operating temperature range -40 C to 55 C
- Every unit functionally tested before shipping
- Hydrophobic GORE® filter protects against salt and other corrosive agents
- Controller provides soft start and current limiting at start up
- Vibration resistant to withstand over-the-ground transportation of the telecom system
- Variable speed blowers standard on units for quiet running
- Controller provides fan speed control and temperature alarm

FINISH

- Standard Finish: Galvanized steel with RAL 7035 light-gray semi-textured powder coat paint

OPTIONS

- Custom Material: Aluminum, Stainless Steel, Mild Steel
- Custom Finish: Paint Color
- Custom Power Input: 24 VDC, 115 VAC, & 230 VAC
- Custom Sizes: Height 29 in. (737 mm) to 56 in. (1422 mm)



NOTES

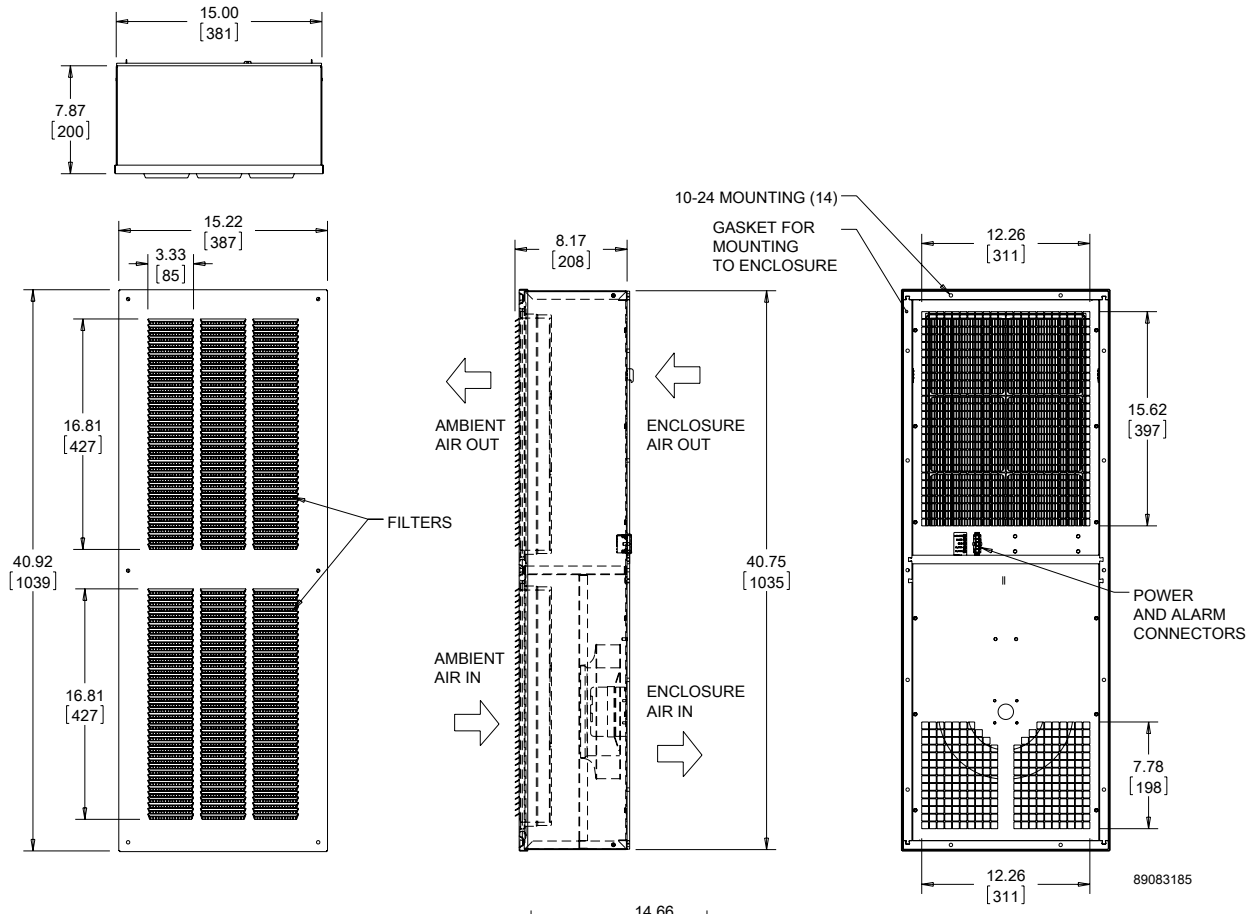
Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

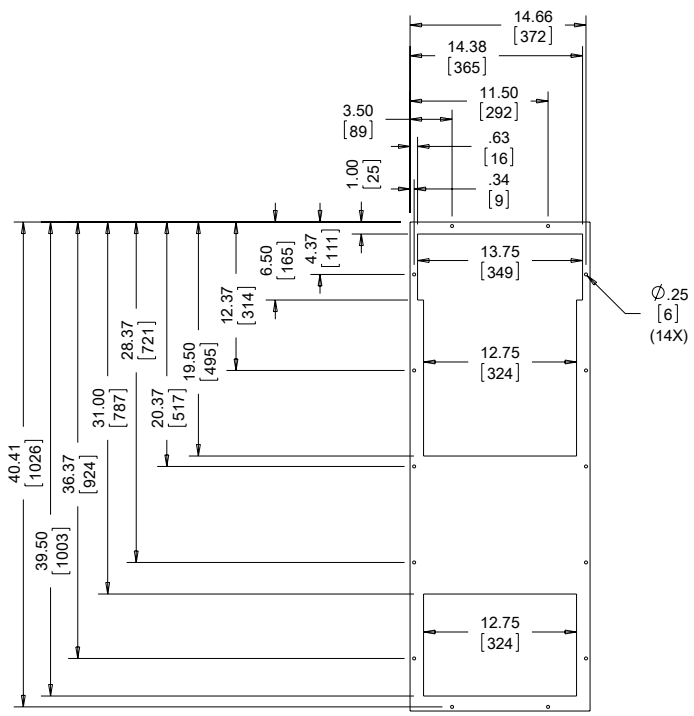
GORE® is a registered trademark of W.L. Gore & Associates, Inc.

Performance Data **DACS**

CATALOG NUMBERS	DCG4108548100	DCG2904248100	DCT5615048100	DCT3809448100
COOLING PERFORMANCE				
Nominal:				
Watts/°F	**85**	**42**	50	**94**
Watts/°C	**152**	**75**	**270**	**170**
Operating Temperature Range:				
Maximum (°F/°C)	131/55	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure: (CFM/ m^3/hr.)	265/450	130/221	470/799	300/510
ELECTRICAL DATA				
Rated Voltage (VDC)		**48**		
Operating Range (VDC)		40-60		
Max. Power Consumption (Watts)	159	159	192	173
Max. Nominal Current (Amps)	3.3	3.3	4.0	3.6
Agency Approvals		cUL Listed, CE		
ENCLOSURE PROTECTION				
UL Type		Type 3R		
CONTROLLER				
Description		Fan speed control and temperature alarm		
Factory Thermostat Setting (°F/°C)		104/40		
SOUND LEVEL				
At 1.5 Meters - Full Speed (dBA)	67.1	68.1	65.0	63.4
UNIT CONSTRUCTION				
Material		Galvanized Steel		
Finish		RAL 7035 light-gray, semi-textured powder-coat paint standard		
Filter Type		**Hydrophobic GORE®**	**Pleated Filter Merv 12**	
UNIT DIMENSIONS				
Height (in./mm)	40.75/1035	28.75/730	56/1422	38/965
Width (in./mm)	15/381	12/305	20/508	16/406
Depth (in./mm)	7.88/200	7.12/181	7/178	6/152
Weight (lb./kg)	50/22.7	40/18.1	65/29.5	38/17.2

DCG4108548100

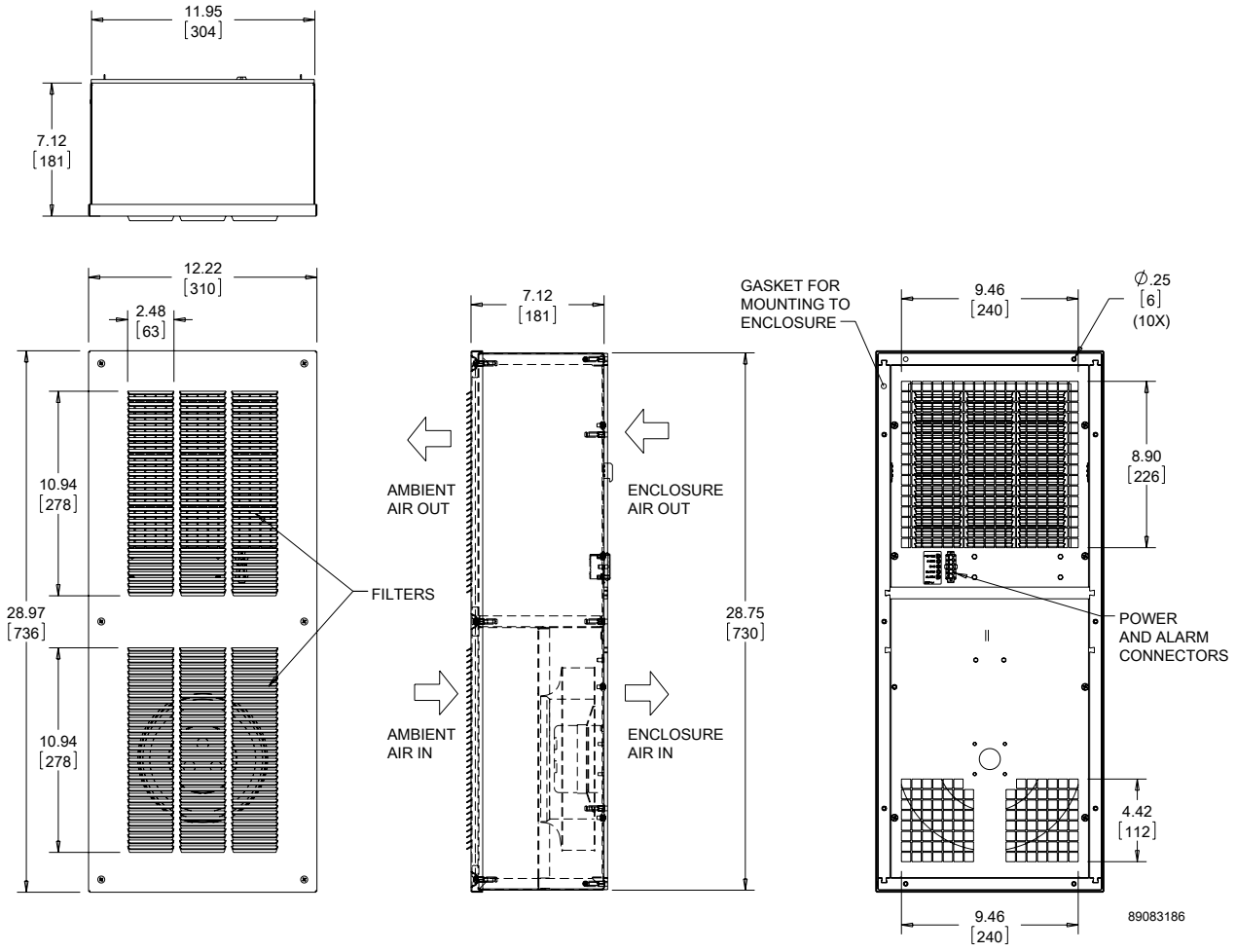


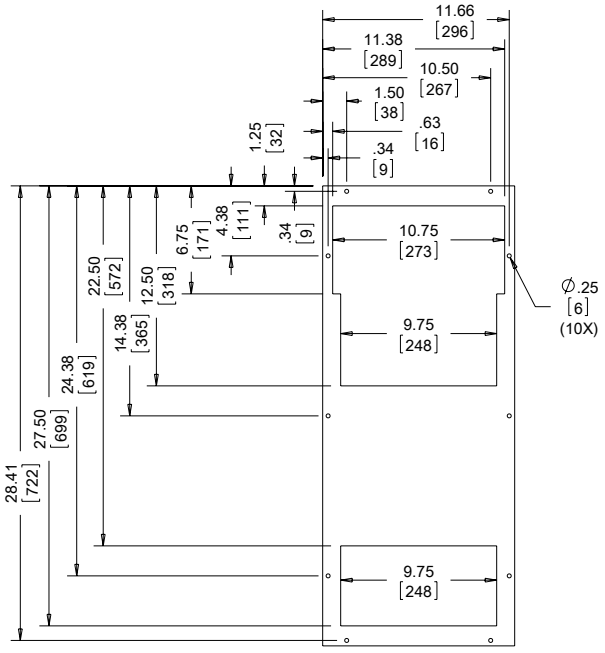


CUTOUT DIMENSIONS

4

DCG2904248100





CUTOUT DIMENSIONS

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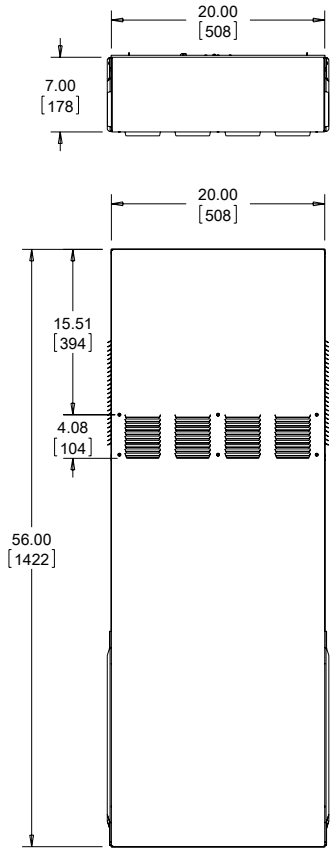

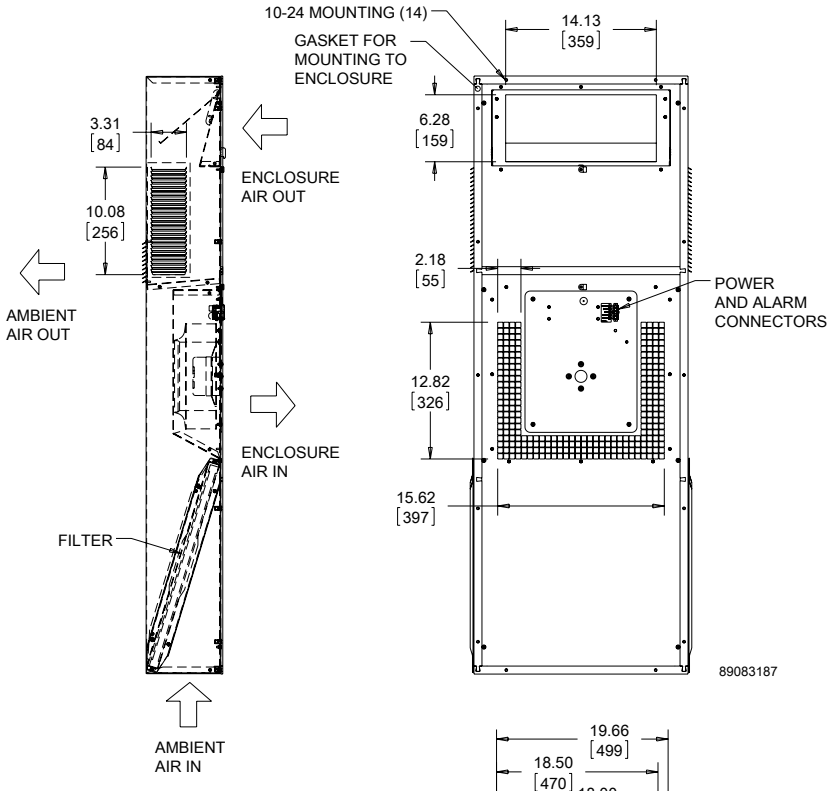

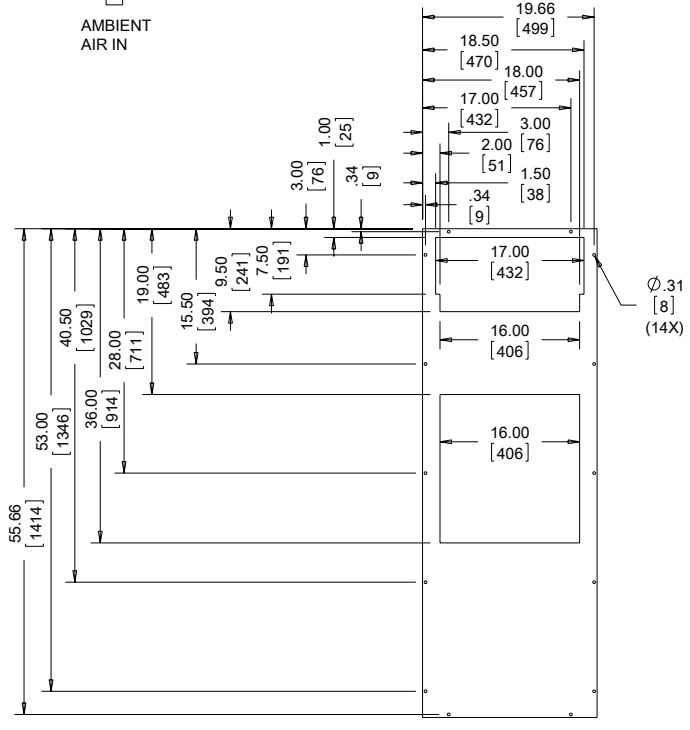

CUTOUT DIMENSIONS

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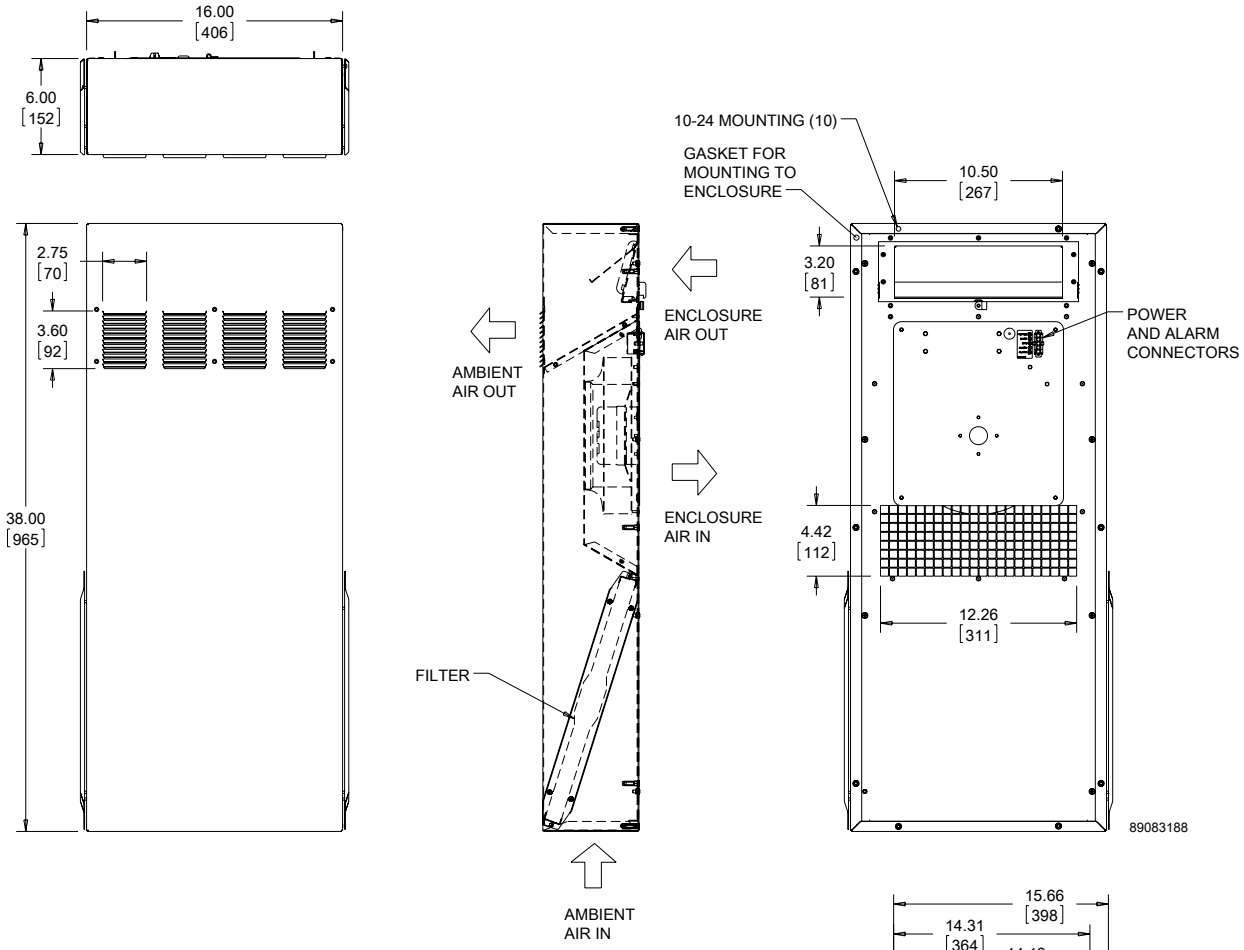
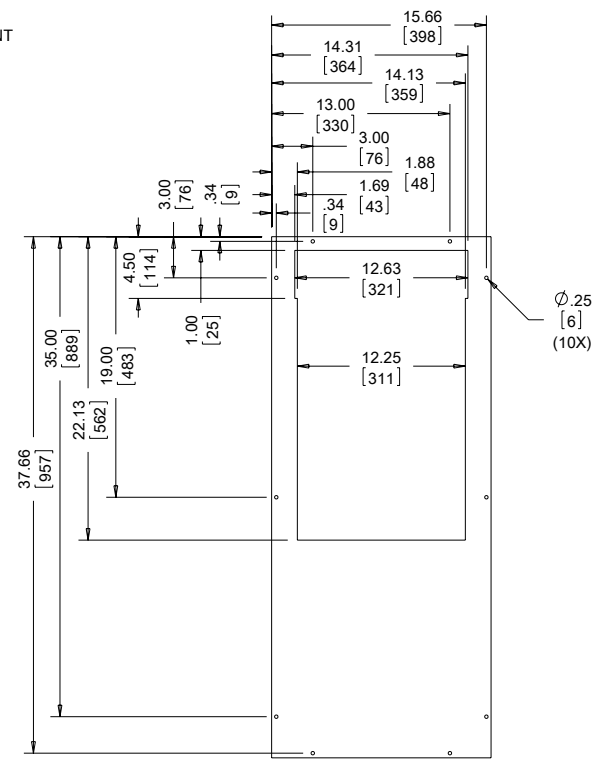
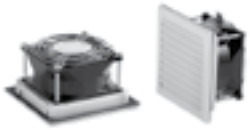




CUTOUT DIMENSIONS

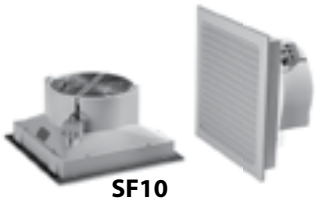
SF SIDE-MOUNT



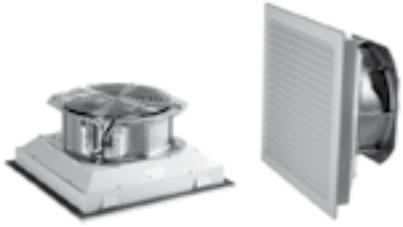
SF04
16 CFM (28 m^3/hr.)

SF05
39 CFM (66 m^3/hr.)

SF09
75 CFM (127 m^3/hr.)

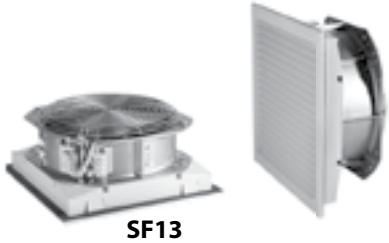


SF10
162 CFM (275 m^3/hr.)



SF13
376 CFM (638 m^3/hr.)

SF13
473 CFM (803 m^3/hr.)



SF13
571 CFM (970 m^3/hr.)

INDUSTRY STANDARDS

UL/cUL recognized; File No. 235470

CE, CSA (fan motor only)
Type 12, IP54 standard
Type 12, IP 55 optional

APPLICATION

- Industrial automation
- Automotive assembly
- Package handling equipment
- Food and beverage process controlls
- Wind energy systems

FEATURES

- Click-fit design quickly installs into enclosure wall; no tools or screws required
- Simple snap-open grille for easy filter replacement
- Enclosure side wall mounting
- Reverse airflow option on SF13 models available to push/pull air through higher static pressure
- Standard foam-in-place gasket
- Similar cut-out sizes as other filter fan manufacturers
- Terminal wire connections
- Optional thermostat available to save energy and extend service life

SPECIFICATIONS

- Size rage from 4 in. (102 mm) to 13 in. (325 mm)
- Free air flow from 16 CFM (28 m^3/hr.) to 571 CFM (920 m^3/hr.)
- Service life hours from 40000 to 70000 hours
- Operating temperature range fo -4 F/-20 C to 149 F/65 C

FINISH

- RAL 7035 light-gray, UV-resistant plastic standard
- RAL 9011 black, UV-resistant plastic optional

ACCESSORIES

- Replacement filters
- Thermostat
- Rain shroud

NOTES

Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **SF04 16 CFM (28 m³/hr.) Side-Mount Filter Fan**

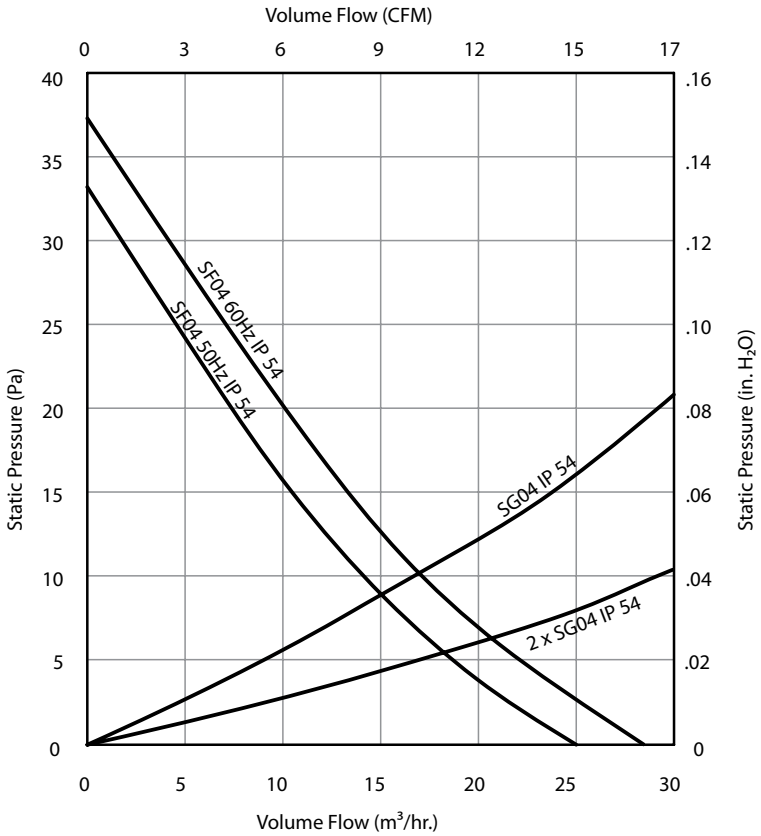
ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**24**	**48**
Frequency (Hz)	50 / 60	50 / 60	—	—
Nominal Current Maximum (Amps)	1.40/1.20	0.70	1.00	0.54
Power Consumption Maximum (Watts)	12 / 11	12	2.2	2.6
Power Connection	Lead Wires			
TYPE 12 / IP54 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**SF0416414**	**SF0426414**	**SF0424414**	**SF0448414**
RAL 9011 Black:				
Catalog Number	**SF0416413**	**SF0426413**	**SF0424413**	**SF0448413**
Free Airflow (CFM / m³/hr.)	16 / 28	16 / 28	16 / 28	16 / 28
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	10/17	10/17	10/17	10/17
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	12/21	12 / 21	12 / 21	12 / 21
FILTER FAN UNIT CONSTRUCTION				
Fan RPM	2700 / 3200	2700 / 3200	3300	3300
Sound Pressure (dBA)	30	30	36	36
Operating Temperature Range:				
Maximum (°F / °C)	131 / 55	131 / 55	149 / 65	149 / 65
Minimum (°F / °C)	14 / -10	14 / -10	-4 / -20	-4 / -20
Service Life (hours)	37,500	37,500	70,000	70,000
Unit Dimensions - H x W x D (in. / mm)	4.13 x 4.13 x 2.17 / 105 x 105 x 55			
Cutout Dimensions - H x W (in. / mm)	3.62 x 3.62 / 92 x 92			
Weight (lb. / kg)	.73 / .33			
TYPE 12 / IP54 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number	SG0400404			
RAL 9011 Black:				
Catalog Number	SG0400403			
ACCESSORIES				
Replacement Filters:				
Type 12 / IP54 Catalog Number	10100059H			
Thermostat Catalog Number	TWR60			

Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

Unit depth is from the back edge of the grille to the back of the fan.

Exhaust Grilles sold separately.

SF04 16 CFM (28 m^3/hr.) Side-Mount Filter Fan
Performance Curve



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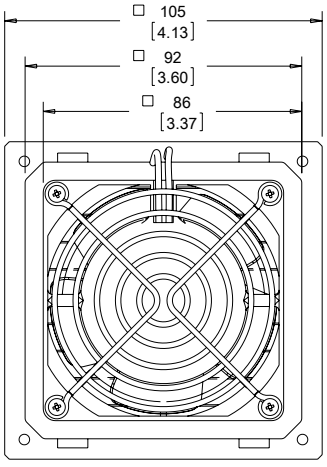
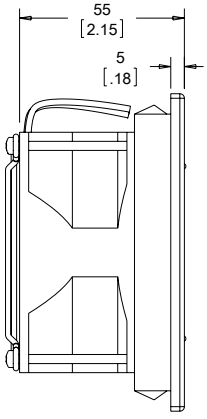
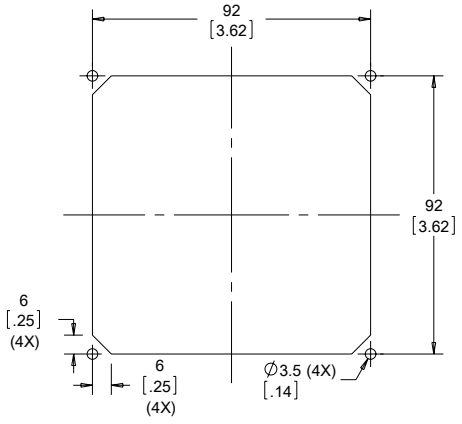
Filter Fan, SF04 16 CFM (28m³/hr.)



BACK VIEW

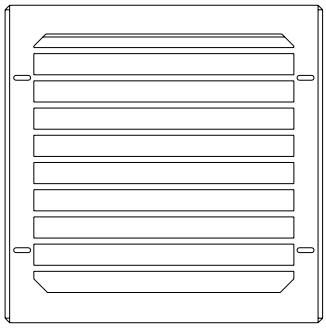


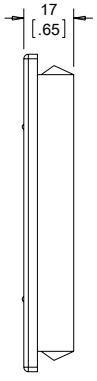
SIDE VIEW



CUTOUT DIMENSIONS

EXHAUST GRILLE





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Order Exhaust Grille Kits separately

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **SF05 39 CFM (66 m³/hr.) Side-Mount Filter Fan**

ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**24**	**48**
Frequency (Hz)	50 / 60	50 / 60	—	—
Nominal Current Maximum (Amps)	0.23	0.11	0.17	0.08
Power Consumption Maximum (Watts)	20	20	4.1	3.5
Power Connection		Terminal Block		
TYPE 12 / IP54 FILTER FANSRAL 7035 Light Gray:				
RAL 7035 Light Gray:				
Catalog Number	**SF0516414**	**SF0526414**	**SF0524414**	**SF0548414**
RAL 9011 Black:				
Catalog Number	**SF0516413**	**SF0526413**	**SF0524413**	**SF0548413**
Free Airflow (CFM / m³/hr.)	39 / 66	39 / 66	39 / 66	39 / 66
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	26 / 44	26 / 44	26 / 44	26 / 44
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	30 / 51	30 / 51	30 / 51	30 / 51
TYPE 12 / IP55 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**SF0516514**	**SF0526514**	**SF0524514**	**SF0548514**
RAL 9011 Black:				
Catalog Number	**SF0516513**	**SF0526513**	**SF0524513**	**SF0548513**
Free Airflow (CFM / m³/hr.)	36 / 61	36 / 61	36 / 61	36 / 61
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	24 / 40	24 / 40	24 / 40	24 / 40
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	28 / 47	28 / 47	28 / 47	28 / 47
FILTER FAN UNIT CONSTRUCTION				
Fan RPM	2650 / 3100	2650 / 3100	3050	3050
Sound Pressure (dBA)	42	42	42	42
Operating Temperature Range:				
Maximum (°F / °C)	131 / 55	131 / 55	149 / 65	149 / 65
Minimum (°F / °C)	14 / -10	14 / -10	-4 / -20	-4 / -20
Service Life (hours)	27,500	27,500	50,000	50,000
Unit Dimensions - H x W x D (in. / mm)		5.83 x 5.83 x 2.56 / 148 x 148 x 65		
Cutout Dimensions - H x W (in. / mm)		4.92 x 4.92 / 125 x 125		
Weight (lb. / kg)		1.19 / .54		
TYPE 12 / IP54 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number		SG0500404		
RAL 9011 Black:				
Catalog Number		SG0500403		
TYPE 12 / IP55 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number		SG0500504		
RAL 9011 Black:				
Catalog Number		SG0500503		
ACCESSORIES				
Replacement Filters:				
Type 12 / IP54 Catalog Number		10100060		
Type 12 / IP55 Catalog Number		10100064H		
Thermostat Catalog Number		TWR60		
Shroud Catalog Number		SH05GS35001, SH05GS61001, SH05SS04001		

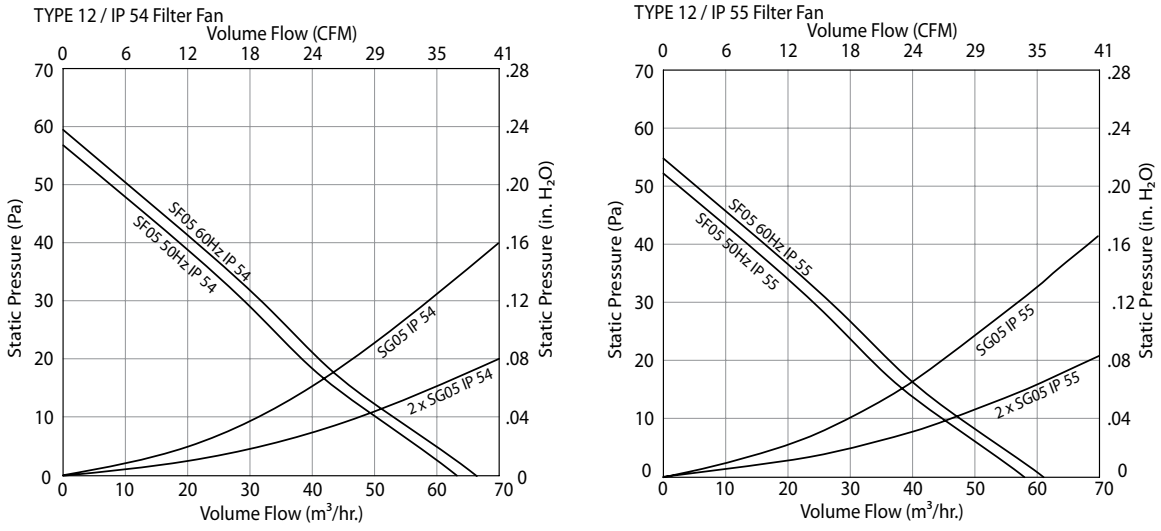
Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

Unit depth is from the back edge of the grille to the back of the fan.

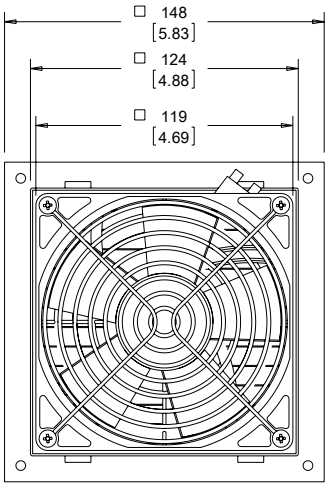
Exhaust Grilles sold separately.

4

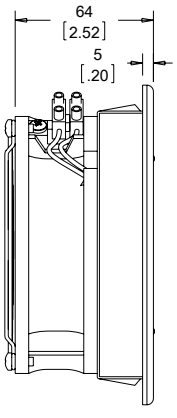
SF05 39 CFM (66 m³/hr.) Side-Mount Filter Fan Performance Curve



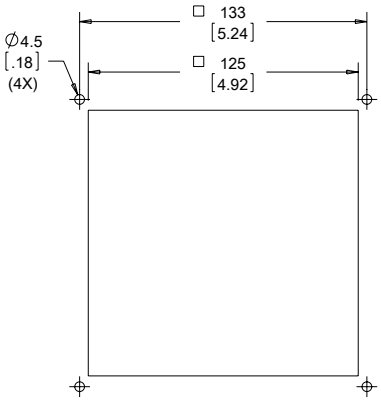
FILTER FAN



BACK VIEW

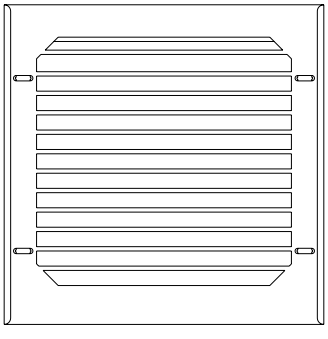


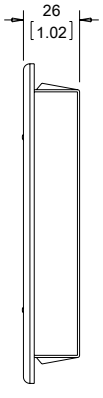
SIDE VIEW



CUTOUT

EXHAUST GRILLE





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Performance Data **SF09 75 CFM (127 m³/hr.) Side-Mount Filter Fan**

ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**24**	**48**
Frequency (Hz)	50 / 60	50 / 60	—	—
Nominal Current Maximum (Amps)	0.23	0.11	0.17	0.08
Power Consumption Maximum (Watts)	20	20	4.1	3.5
Power Connection	Terminal Block			
TYPE 12 / IP54 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**SF0916414**	**SF0926414**	**SF0924414**	**SF0948414**
RAL 9011 Black:				
Catalog Number	**SF0916413**	**SF0926413**	**SF0924413**	**SF0948413**
Free Airflow (CFM / m³/hr.)	75 / 127	75 / 127	75 / 127	75 / 127
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	59 / 100	59 / 100	59 / 100	59 / 100
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	67 / 114	67 / 114	67 / 114	67 / 114
TYPE 12 / IP55 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**SF0916514**	**SF0926514**	**SF0924514**	**SF0948514**
RAL 9011 Black:				
Catalog Number	**SF0916513**	**SF0926513**	**SF0924513**	**SF0948513**
Free Airflow (CFM / m³/hr.)	70 / 118	70 / 118	70 / 118	70 / 118
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	54 / 92	54 / 92	54 / 92	54 / 92
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	62 / 106	62 / 106	62 / 106	62 / 106
FILTER FAN UNIT CONSTRUCTION				
Fan RPM	2650 / 3100	2650 / 3100	3050	3050
Sound Pressure (dBA)	51	51	51	51
Operating Temperature Range:				
Maximum (°F / °C)	131 / 55	131 / 55	149 / 65	149 / 65
Minimum (°F / °C)	14 / -10	14 / -10	-4 / -20	-4 / -20
Service Life (hours)	27,500	27,500	50,000	50,000
Unit Dimensions - H x W x D (in. / mm)	8.03 x 8.03 x 3.54 / 204 x 204 x 90			
Cutout Dimensions - H x W (in. / mm)	6.97 x 6.97 / 177 x 177			
Weight (lb. / kg)	1.74 / .79			
TYPE 12 / IP54 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number	SG0900404			
RAL 9011 Black:				
Catalog Number	SG0900403			
TYPE 12 / IP55 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number	SG0900504			
RAL 9011 Black:				
Catalog Number	SG0900503			
ACCESSORIES				
Replacement Filters:				
Type 12 / IP54 Catalog Number	10100061			
Type 12 / IP55 Catalog Number	10100065H			
Thermostat Catalog Number	TWR60			
Shroud Catalog Number	SH09GS35001, SH09GS61001, SH09SS04001			

Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

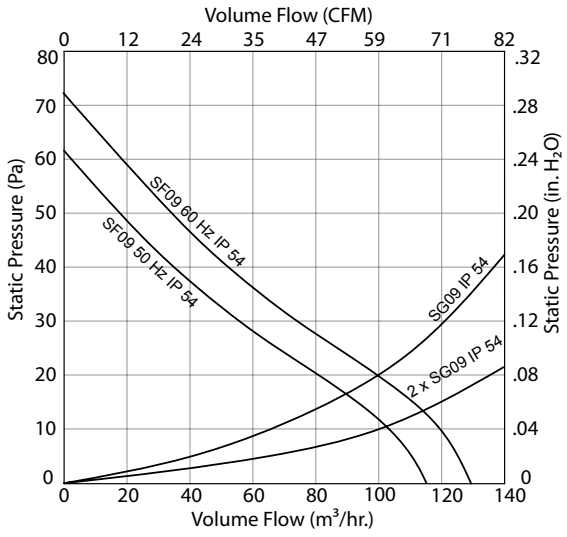
Unit depth is from the back edge of the grille to the back of the fan.

Exhaust Grilles sold separately.

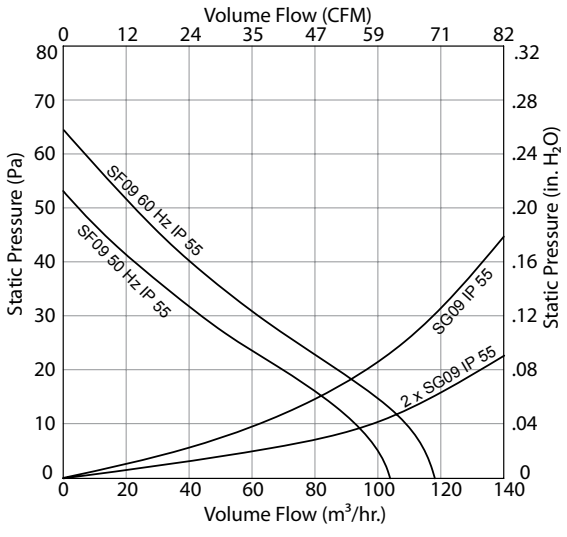
4

SF09 75 CFM (127 m³/hr.) Side-Mount Filter Fan Performance Curve

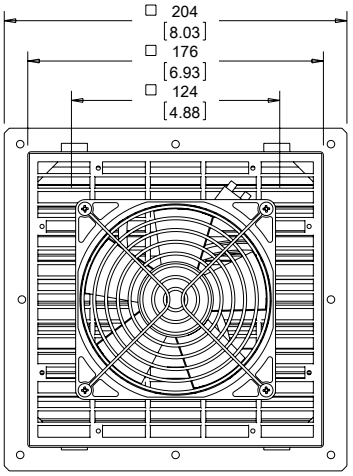
TYPE 12 / IP 54 Filter Fan



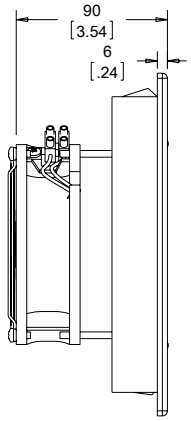
TYPE 12 / IP 55 Filter Fan



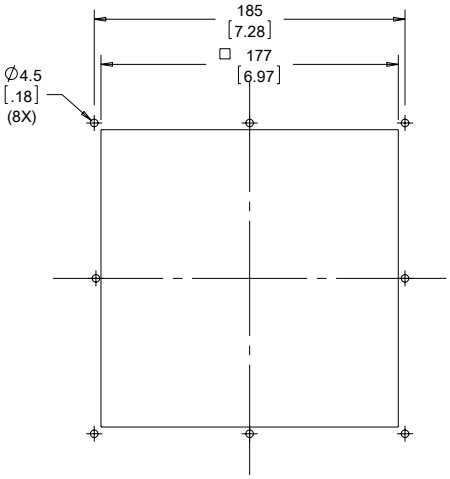
Filter Fan SF09 75 CFM (127 m³/hr.)



BACK VIEW

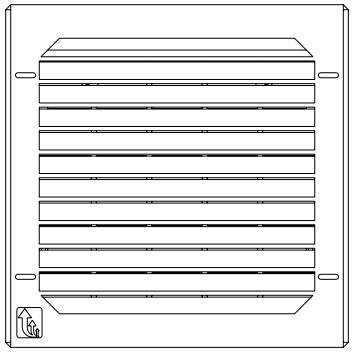


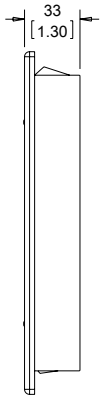
SIDE VIEW



CUTOUT DIMENSIONS

EXHAUST GRILLE





89051217

Order Exhaust Grille Kits separately

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **SF10 162 CFM (275 m³/Hr.) Side-Mount Filter Fan**

ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**24**	**48**
Frequency (Hz)	50 / 60	50 / 60	—	—
Nominal Current Maximum (Amps)	.53 / .50	.30 / .25	0.66	0.33
Power Consumption Maximum (Watts)	43 / 40	45 / 39	16	16
Power Connection	Terminal Block			
TYPE 12 / IP54 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**SF1016414**	**SF1026414**	**SF1024414**	**SF1048414**
RAL 9011 Black:				
Catalog Number	**SF1016413**	**SF1026413**	**SF1024413**	**SF1048413**
Free Airflow (CFM / m³/hr.)	162 / 275	162 / 275	162 / 275	162 / 275
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	133 / 226	133 / 226	133 / 226	133 / 226
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	149 / 253	149 / 253	149 / 253	149 / 253
TYPE 12 / IP55 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**SF1016514**	**SF1026514**	**SF1024514**	**SF1048514**
RAL 9011 Black:				
Catalog Number	**SF1016513**	**SF1026513**	**SF1024513**	**SF1048513**
Free Airflow (CFM / m³/hr.)	149 / 253	149 / 253	149 / 253	149 / 253
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	122 / 207	122 / 207	122 / 207	122 / 207
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	137 / 233	137 / 233	137 / 233	137 / 233
FILTER FAN UNIT CONSTRUCTION				
Fan RPM	2760 / 3030	2760 / 3030	2950	2950
Sound Pressure (dBA)	52	52	52	52
Operating Temperature Range:				
Maximum (°F / °C)	131 / 55	131 / 55	131 / 55	131 / 55
Minimum (°F / °C)	14 / -10	14 / -10	14 / -10	14 / -10
Service Life (hours)	40,000	40,000	40,000	40,000
Unit Dimensions - H x W x D (in. / mm)	9.84 x 9.84 x 4.72 / 250 x 250 x 120			
Cutout Dimensions - H x W (in. / mm)	8.78 x 8.78 / 223 x 223			
Weight (lb. / kg)	4.19 / 1.9			
TYPE 12 / IP54 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number	SG1000404			
RAL 9011 Black:				
Catalog Number	SG1000403			
TYPE 12 / IP55 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number	SG1000504			
RAL 9011 Black:				
Catalog Number	SG1000503			
ACCESSORIES				
Replacement Filters:				
Type 12 / IP54 Catalog Number	10100062			
Type 12 / IP55 Catalog Number	10100066H			
Thermostat Catalog Number	TWR60			
Shroud Catalog Number	SH10GS35001, SH10GS61001, SH10SS04001			

Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

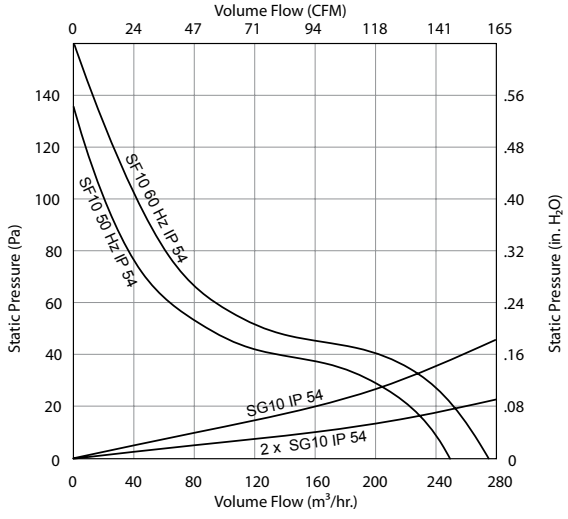
Unit depth is from the back edge of the grille to the back of the fan.

Exhaust Grilles sold separately.

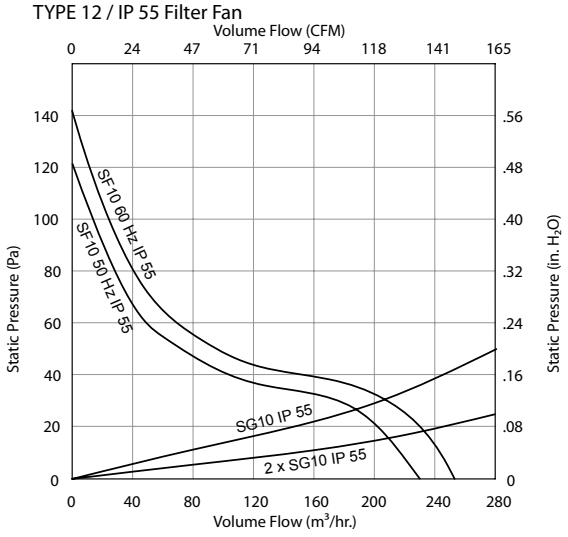
4

SF10 162 CFM (275 m³/hr.) Side-Mount Filter Fan Performance Curve

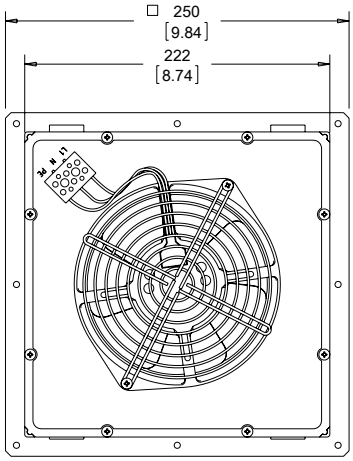
TYPE 12 / IP 54 Filter Fan



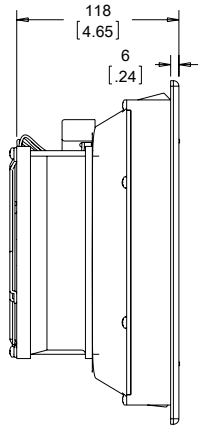
TYPE 12 / IP 55 Filter Fan



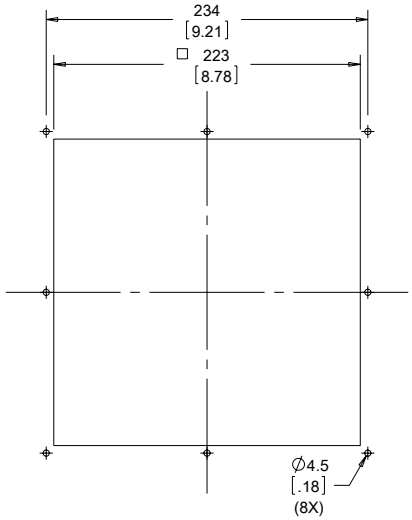
Filter Fan SF10 162 CFM (275 m³/hr.)



BACK VIEW

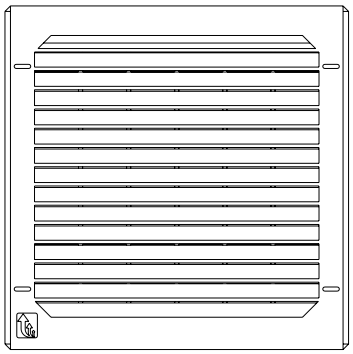


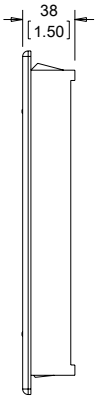
SIDE VIEW



CUTOUT DIMENSIONS

EXHAUST GRILLE





89051219

Order Exhaust Grille Kit separately

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **SF13 376 CFM (638 m³/hr.) Side-Mount Filter Fan - Standard and Reverse**

ELECTRICAL DATA						
Rated Voltage	**115**	**230**	**24**	**48**	**115 Rvrs**	**230 Rvrs**
Frequency (Hz)	50 / 60	50 / 60	—	—	50 / 60	50 / 60
Nominal Current Maximum (Amps)	.58 / .70	.29 / .35	2.60	1.30	.58 / .70	.29 / .35
Power Consumption Maximum (Watts)	64 / 80	64 / 80	55	55	64 / 80	64 / 80
Power Connection	Terminal Block					
TYPE 12 / IP54 FILTER FANS						
RAL 7035 Light Gray:						
Catalog Number	**SF1316414**	**SF1326414**	**SF1324414**	**SF1348414**	**SF1316414R**	**SF1326414R**
RAL 9011 Black:						
Catalog Number	**SF1316413**	**SF1326413**	**SF1324413**	**SF1348413**	**SF1316413R**	**SF1326413R**
Free Airflow (CFM / m³/hr.)	375 / 638	375 / 638	375 / 638	375 / 638	375 / 638	375 / 638
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	249 / 423	249 / 423	249 / 423	249 / 423	249 / 423	249 / 423
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	333 / 565	333 / 565	333 / 565	333 / 565	333 / 565	333 / 565
TYPE 12 / IP55 FILTER FANS						
RAL 7035 Light Gray:						
Catalog Number	**SF1316514**	**SF1326514**	**SF1324514**	**SF1348514**	—	—
RAL 9011 Black:						
Catalog Number	**SF1316513**	**SF1326513**	**SF1324513**	**SF1348513**	—	—
Free Airflow (CFM / m³/hr.)	346 / 587	346 / 587	346 / 587	346 / 587	—	—
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	228 / 387	228 / 387	228 / 387	228 / 387	—	—
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	301 / 511	301 / 511	301 / 511	301 / 511	—	—
FILTER FAN UNIT CONSTRUCTION						
Fan RPM	2550 / 2800	2550 / 2800	2950	2950	2550 / 2800	2550 / 2800
Sound Pressure (dBA)	60	60	60	60	60	60
Operating Temperature Range:						
Maximum (°F / °C)	131 / 55	131 / 55	140 / 60	140 / 60	131 / 55	131 / 55
Minimum (°F / °C)	14 / -10	14 / -10	-13 / -25	-13 / -25	14 / -10	14 / -10
Service Life (hours)	40,000	40,000	40,000	40,000	40,000	40,000
Unit Dimensions - H x W x D (in. / mm)	12.72 x 12.72 x 5.83 / 323 x 323 x 148					
Cutout Dimensions - H x W (in. / mm)	11.5 x 11.5 / 292 x 292					
Weight (lb. / kg)	7.5 / 3.4					
TYPE 12 / IP54 EXHAUST GRILLES						
RAL 7035 Light Gray:						
Catalog Number	SG1300404					
RAL 9011 Black:						
Catalog Number	SG1300403					
TYPE 12 / IP55 EXHAUST GRILLES						
RAL 7035 Light Gray:						
Catalog Number	SG1300504					
RAL 9011 Black:						
Catalog Number	SG1300503					
ACCESSORIES						
Replacement Filters:						
Type 12 / IP54 Catalog Number	10100063					
Type 12 / IP55 Catalog Number	10100067H					
Thermostat Catalog Number	TWR60					
Shroud Catalog Number	SH13GS35001, SH13GS61001, SH13SS04001					

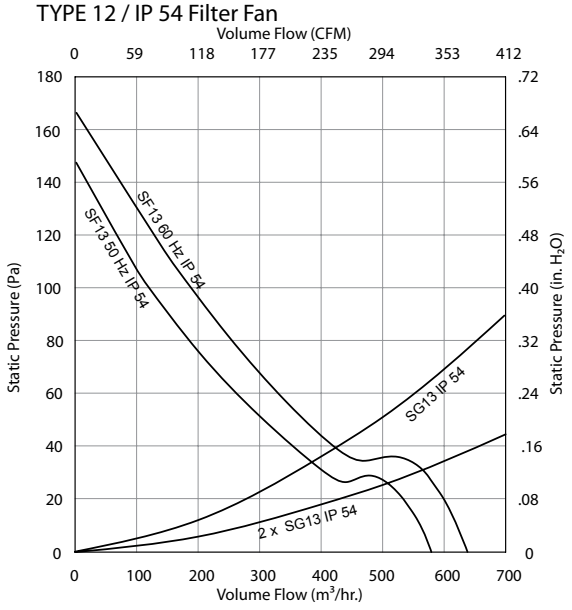
Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

Unit depth is from the back edge of the grille to the back of the fan.

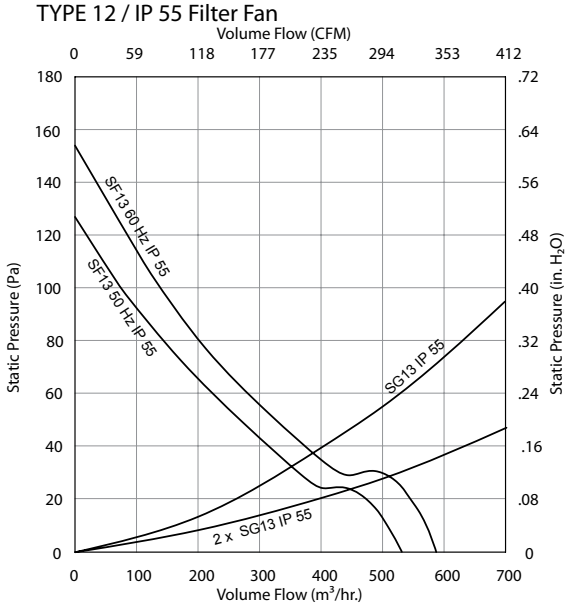
Exhaust Grilles sold separately.

SF13 376 CFM (638 m³/hr.) Side-Mount Filter Fan Performance Curve

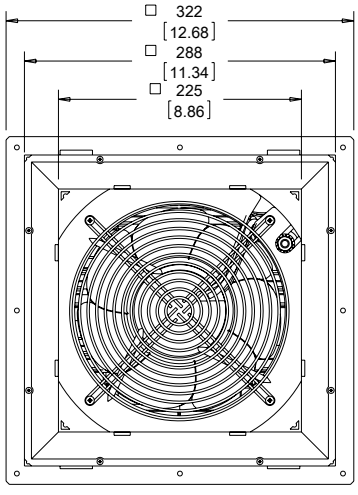
TYPE 12 / IP 54 Filter Fan



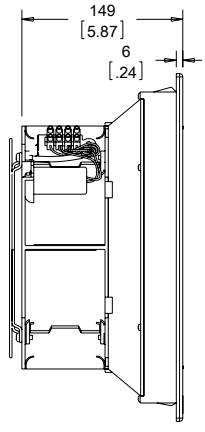
TYPE 12 / IP 55 Filter Fan



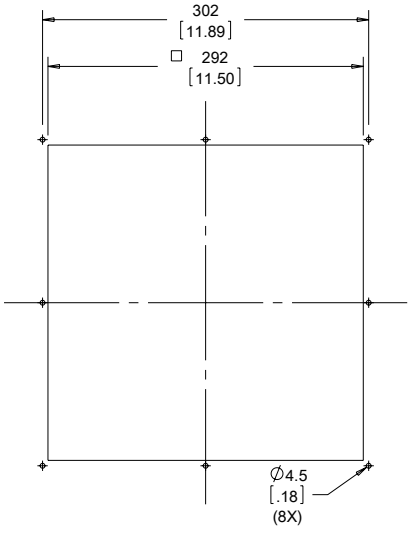
Filter Fan SF13 376 CFM (638 m³/hr.)



BACK VIEW

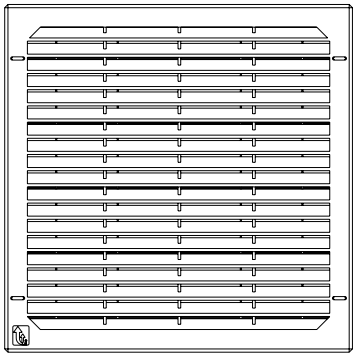


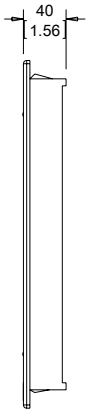
SIDE VIEW



CUTOUT DIMENSIONS

EXHAUST GRILLE





89051221

Order Exhaust Grille Kit separately

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **SF13 473 CFM (803 m³/hr.) Side-Mount Filter Fan - Standard**

ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**400**
Frequency (Hz)	50 / 60	50 / 60	50 / 60
Nominal Current Maximum (Amps)	1.02 / 1.4	.51 / .74	.22 /. 26
Power Consumption Maximum (Watts)	115 / 166	115 / 175	110 / 150
Power Connection		Terminal Block	
TYPE 12 / IP54 FILTER FANS			
RAL 7035 Light Gray:			
Catalog Number	**SF1316424**	**SF1326424**	**SF1340424**
RAL 9011 Black:			
Catalog Number	**SF1316423**	**SF1326423**	**SF1340423**
Free Airflow (CFM / m³/hr.)	473 / 803	473 / 803	473 / 803
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	343 / 583	343 / 583	343 / 583
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	399 / 677	399 / 677	399 / 677
TYPE 12 / IP55 FILTER FANS			
RAL 7035 Light Gray:			
Catalog Number	**SF1316524**	**SF1326524**	**SF1340524**
RAL 9011 Black:			
Catalog Number	**SF1316523**	**SF1326523**	**SF1340523**
Free Airflow (CFM / m³/hr.)	436 / 740	436 / 740	436 / 740
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	314 / 533	314 / 533	314 / 533
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	369 / 627	369 / 627	369 / 627
FILTER FAN UNIT CONSTRUCTION			
Fan RPM	2450 / 2650	2550 / 2750	2650 / 2900
Sound Pressure (dBA)	70	70	70
Operating Temperature Range:			
Maximum (°F / °C)	131 / 55	131 / 55	131 / 55
Minimum (°F / °C)	14 / -10	14 / -10	14 / -10
Service Life (hours)	40,000	40,000	40,000
Unit Dimensions - H x W x D (in. / mm)		12.72 x 12.72 x 6.38 / 323 x 323 x 162	
Cutout Dimensions - H x W (in. / mm)		11.50 x 11.50 / 292 x 292	
Weight (lb. / kg)		7.72 / 3.5	
TYPE 12 / IP54 EXHAUST GRILLES			
RAL 7035 Light Gray:			
Catalog Number		SG1300404	
RAL 9011 Black:			
Catalog Number		SG1300403	
TYPE 12 / IP55 EXHAUST GRILLES			
RAL 7035 Light Gray:			
Catalog Number		SG1300504	
RAL 9011 Black:			
Catalog Number		SG1300503	
ACCESSORIES			
Replacement Filters:			
Type 12 / IP54 Catalog Number		10100063	
Type 12 / IP55 Catalog Number		10100067H	
Thermostat Catalog Number		TWR60	
Shroud Catalog Number		SH13GS35001, SH13GS61001, SH13SS04001	

Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

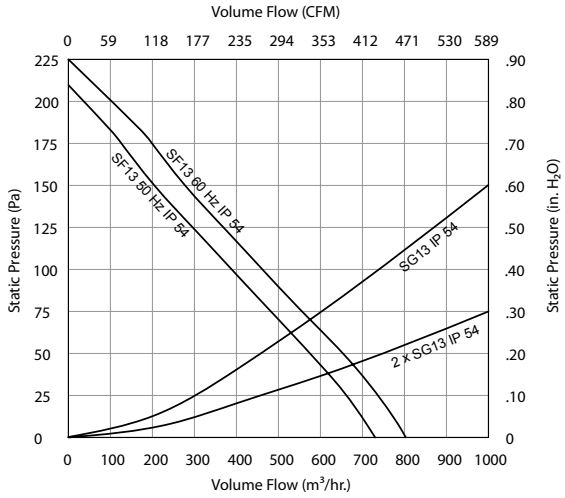
Unit depth is from the back edge of the grille to the back of the fan.

Exhaust Grilles sold separately.

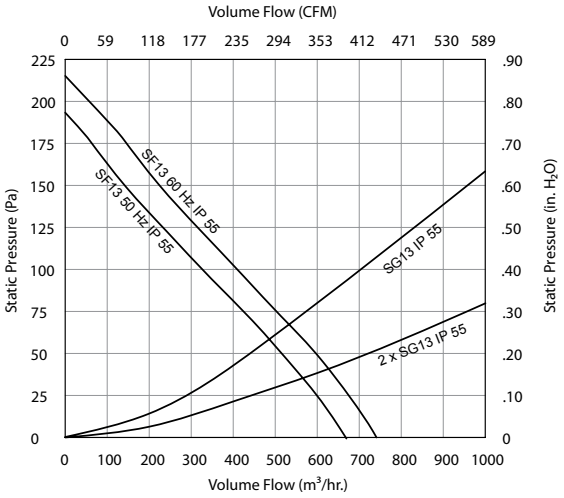
4

SF13 473 CFM (803 m³/hr.) Side-Mount Filter Fan Performance Curve

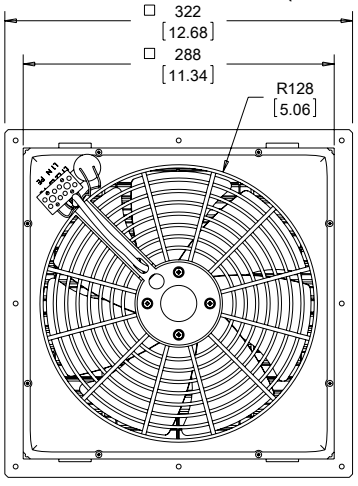
TYPE 12 / IP 54 Filter Fan



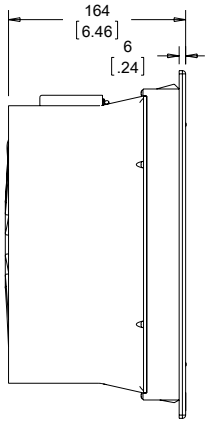
TYPE 12 / IP 55 Filter Fan



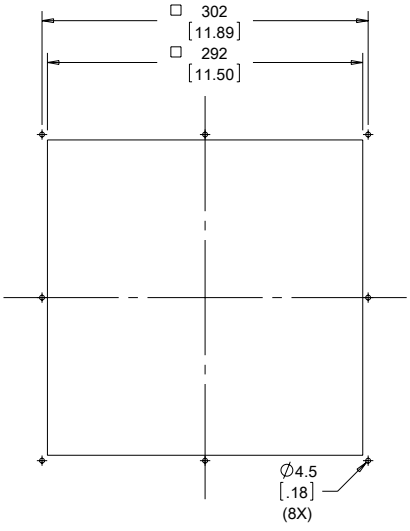
Filter Fan SF13 473 CFM (803 m³/hr.)



BACK VIEW

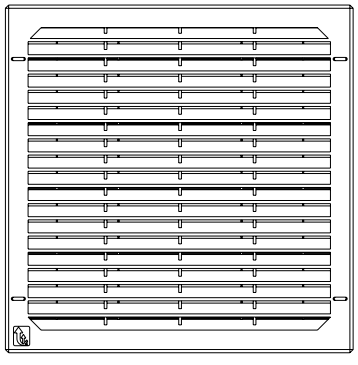


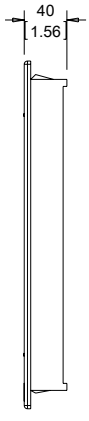
SIDE VIEW



CUTOUT DIMENSIONS

EXHAUST GRILLE





89051223

Order Exhaust Grille Kit separately

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **SF13 473 CFM (803 m³/hr.) Side-Mount Filter Fan - Reverse**

ELECTRICAL DATA			
Rated Voltage	**115 Rvrs**	**230 Rvrs**	**400 Rvrs**
Frequency (Hz)	50 / 60	50 / 60	50 / 60
Nominal Current Maximum (Amps)	1.05 / 1.5	.51 / .70	.22 / .26
Power Consumption Maximum (Watts)	120 / 175	115 / 165	110 /1 50
Power Connection		Terminal Block	
TYPE 12 / IP54 FILTER FANS			
RAL 7035 Light Gray:			
Catalog Number	**SF1316424R**	**SF1326424R**	**SF1340424R**
RAL 9011 Black:			
Catalog Number	**SF1316423R**	**SF1326423R**	**SF1340423R**
Free Airflow (CFM / m³/hr.)	473 / 803	473 / 803	473 / 803
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	343 / 583	343 / 583	343 / 583
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	399 / 677	399 / 677	399 / 677
FILTER FAN UNIT CONSTRUCTION			
Fan RPM	2450 / 2650	2550 / 2750	2650 / 2900
Sound Pressure (dBA)	70	70	70
Operating Temperature Range:			
Maximum (°F / °C)	131 / 55	131 / 55	131 / 55
Minimum (°F / °C)	14 / -10	14 / -10	14 / -10
Service Life (hours)	40,000	40,000	40,000
Unit Dimensions - H x W x D (in. / mm)		12.72 x 12.72 x 6.38 / 323 x 323 x 162)	
Cutout Dimensions - H x W (in. / mm)		11.50 x 11.50 / 292 x 292)	
Weight (lb. / kg)		7.72 / 3.5	
TYPE 12 / IP54 EXHAUST GRILLES			
RAL 7035 Light Gray:			
Catalog Number		SG1300404	
RAL 9011 Black:			
Catalog Number		SG1300403	
TYPE 12 / IP55 EXHAUST GRILLES			
RAL 7035 Light Gray:			
Catalog Number		SG1300504	
RAL 9011 Black:			
Catalog Number		SG1300503	
ACCESSORIES			
Replacement Filters:			
Type 12/IP54 Catalog Number		10100063	
Type 12 / IP55 Catalog Number		10100067H	
Thermostat Catalog Number		TWR60	
Shroud Catalog Number		SH13GS35001, SH13GS61001, SH13SS04001	

Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

Unit depth is from the back edge of the grille to the back of the fan.

Exhaust Grilles sold separately.

4

Performance Data **SF13 571 CFM (970 m³/hr.) Side-Mount Filter Fan - Standard**

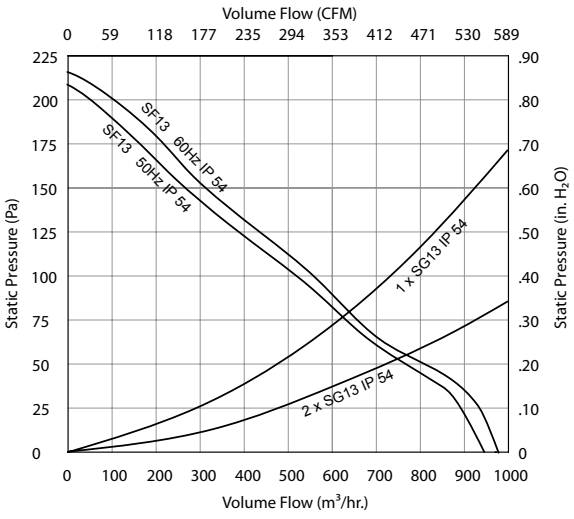
ELECTRICAL DATA					
Rated Voltage	**115**	**230**	**24**	**48**	**400/460**
Frequency (Hz)	50 / 60	50 / 60	—	—	50 / 60
Nominal Current Maximum (Amps)	1.02 / 1.47	.6 / .92	5.00	2.60	.25 / .27
Power Consumption Maximum (Watts)	115 / 175	135 / 215	105	105	113 / 172
Power Connection			Terminal Block		
TYPE 12 / IP54 FILTER FANS					
RAL 7035 Light Gray:					
Catalog Number	**SF1316434**	**SF1326434**	**SF1324434**	**SF1348434**	**SF1346434**
RAL 9011 Black:					
Catalog Number	**SF1316433**	**SF1326433**	**SF1324433**	**SF1348433**	**SF1346433**
Free Airflow (CFM / m³/hr.)	571 / 970	571 / 970	571 / 970	571 / 970	571 / 970
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	377 / 640	377 / 640	377 / 640	377 / 640	377 / 640
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	454 / 770	454 / 770	454 / 770	454 / 770	454 / 770
TYPE 12 / IP55 FILTER FANS					
RAL 7035 Light Gray:					
Catalog Number	**SF1316534**	**SF1326534**	**SF1324534**	**SF1348534**	**SF1346534**
RAL 9011 Black:					
Catalog Number	**SF1316533**	**SF1326533**	**SF1324533**	**SF1348533**	**SF1346533**
Free Airflow (CFM / m³/hr.)	526 / 893	526 / 893	526 / 893	526 / 893	526 / 893
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	345 / 586	345 / 586	345 / 586	345 / 586	345 / 586
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	415 / 705	415 / 705	415 / 705	415 / 705	415 / 705
FILTER FAN UNIT CONSTRUCTION					
Fan RPM	2600 / 2850	2650 / 2950	2750	2750	2650 / 3050
Sound Pressure (dBA)	70	69	70	70	73
Operating Temperature Range:					
Maximum (°F / °C)	140 / 60	140 / 60	140 / 60	140 / 60	140 / 60
Minimum (°F / °C)	5 / -15	5 / -15	5 / -15	5 / -15	5 / -15
Service Life (hours)	40,000	40,000	40,000	40,000	40,000
Unit Dimensions - H x W x D (in. / mm)			12.72 x 12.72 x 5.51 / 323 x 323 x 140		
Cutout Dimensions - H x W (in. / mm)			11.50 x 11.50 / 292 x 292		
Weight (lb. / kg)			10.14 / 4.6		
TYPE 12 / IP54 EXHAUST GRILLES					
RAL 7035 Light Gray:					
Catalog Number			SG1300404		
RAL 9011 Black:					
Catalog Number			SG1300403		
TYPE 12 / IP55 EXHAUST GRILLES					
RAL 7035 Light Gray:					
Catalog Number			SG1300504		
RAL 9011 Black:					
Catalog Number			SG1300503		
ACCESSORIES					
Replacement Filters:					
Type 12 / IP54 Catalog Number			1010063		
Type 12 / IP55 Catalog Number			10100067H		
Thermostat Catalog Number			TWR60		
Shroud Catalog Number			SH13GS35001, SH13GS61001, SH13SS04001		

Unit depth is from the back edge of the grille to the back of the fan.

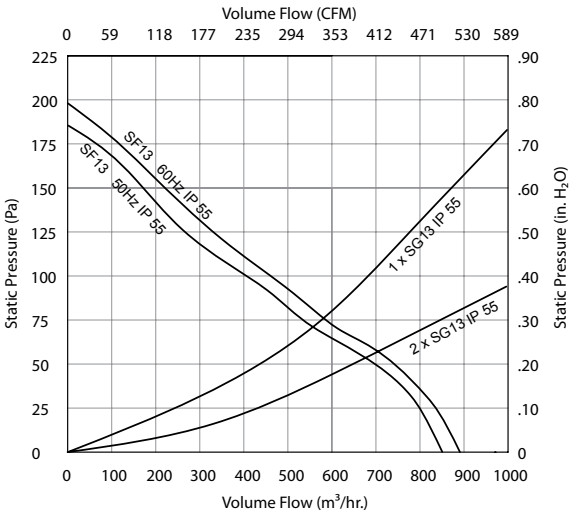
Exhaust Grilles sold separately.

SF13 571 CFM (970 m³/hr.) Side-Mount Filter Fan Performance Curve

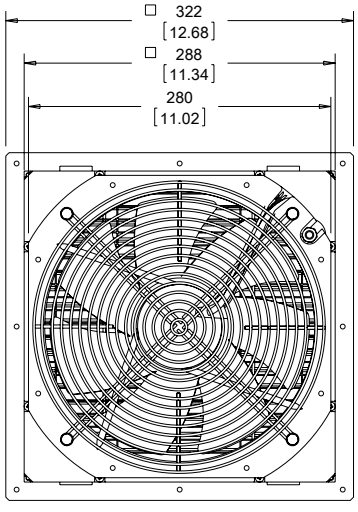
TYPE 12 / IP 54 Filter Fan



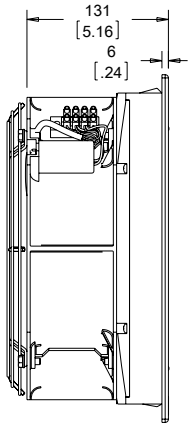
TYPE 12 / IP 55 Filter Fan



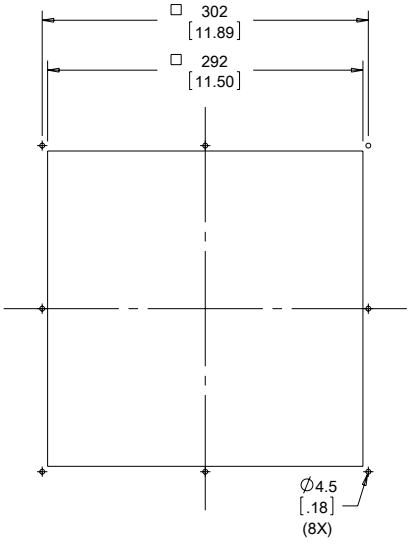
Filter Fan SF13 571 CFM (970 m³/hr.)



BACK VIEW

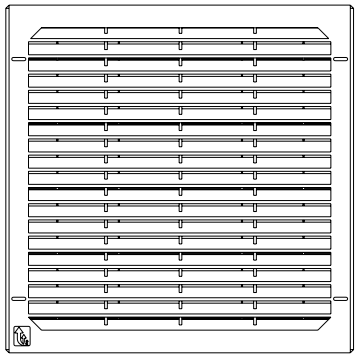


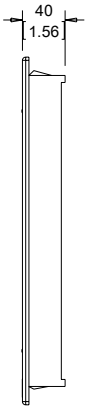
SIDE VIEW



CUTOUT DIMENSIONS

EXHAUST GRILLE





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Order Exhaust Grille Kits separately

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **SF13 571 CFM (970 m³/hr.) Side-Mount Filter Fan - Reverse**

ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**400/460**
Frequency (Hz)	50 / 60	50 / 60	50 / 60
Nominal Current Maximum (Amps)	1.02 / 1.47	.6 / .92	.25 / .27
Power Consumption Maximum (Watts)	115 / 175	135 / 215	113 / 160
Power Connection		Terminal Block	
TYPE 12 / IP54 FILTER FANS			
RAL 7035 Light Gray:			
Catalog Number	**SF1316434R**	**SF1326434R**	**SF1340434R**
RAL 9011 Black:			
Catalog Number	**SF1316433R**	**SF1326433R**	**SF1346433R**
Free Airflow (CFM / m³/hr.)	571 / 970	571 / 970	571 / 970
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	377 / 640	377 / 640	377 / 640
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	454 / 770	454 / 770	454 / 770
FILTER FAN UNIT CONSTRUCTION			
Fan RPM	2600 / 2850	2650 / 2950	2650 / 3050
Sound Pressure (dBA)	70	69	73
Operating Temperature Range:			
Maximum (°F / °C)	140 / 60	140 / 60	140 / 60
Minimum (°F / °C)	5 / -15	5 / -15	5 / -15
Service Life (hours)	40,000	40,000	40,000
Unit Dimensions - H x W x D (in. / mm)		12.72 x 12.72 x 5.51 / 323 x 323 x 140	
Cutout Dimensions - H x W (in. / mm)		11.50 x 11.50 / 292 x 292	
Weight (lb. / kg)		10.14 / 4.6	
TYPE 12 / IP54 EXHAUST GRILLES			
RAL 7035 Light Gray:			
Catalog Number		SG1300404	
RAL 9011 Black:			
Catalog Number		SG1300403	
TYPE 12 / IP55 EXHAUST GRILLES			
RAL 7035 Light Gray:			
Catalog Number		SG1300504	
RAL 9011 Black:			
Catalog Number		SG1300503	
ACCESSORIES			
Replacement Filters:			
Type 12 / IP54 Catalog Number		10100063	
Type 12 / IP55 Catalog Number		10100067H	
Thermostat Catalog Number		TWR60	
Shroud Catalog Number		SH13GS35001, SH13GS61001, SH13SS04001	

Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

Unit depth is from the back edge of the grille to the back of the fan.

Exhaust Grilles sold separately.

ST THIN SIDE-MOUNT


ST10
100 CFM (170 m^3/hr.)


ST13
303 CFM (515 m^3/hr.)

INDUSTRY STANDARDS

UL/cUL recognized; File no. 235470

CE, CSA (fan motor only)
Type 12, IP54 standard
Type 12, IP55 optional

APPLICATION

- Industrial automation
- Automotive assembly
- Package handling equipment
- Food and beverage process controlls
- Wind energy systems

FEATURES

- ST13 has reverse airflow option available to push/pull air through higher static pressure
- Click-fit design quickly installs into enclosure wall; no tools or screws required
- Thin depth to minimize cabinet intrusion
- Enclosure side wall mounting
- Standard foam-in-place gasket
- Similar cut-out sizes as other filter fan manufacturers
- Terminal wire connections
- Simple snap-open grille for easy filter replacement
- Optional thermostat available to save energy and extend service life

SPECIFICATIONS

- Free airflow from 100 CFM (170 m^3/hr.) to 303 CFM (515 m^3/hr.)
- Service life hours range from 40000 to 57500
- Operating temperature range of -4 F / -20 C to 149 F / 65 C

FINISH

- RAL 7035 light-gray UV-resistant plastic standard
- RAL 9011 black UV-resistant plastic optional

ACCESSORIES

- Replacement filters
- Thermostat
- Rain shroud

NOTES

Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **ST10 100 CFM (170 m³/hr.) Thin Side-Mount Filter Fan**

ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**24**	**48**
Frequency (Hz)	50 / 60	50 / 60	—	—
Nominal Current Maximum (Amps)	0.2	0.10	0.27	0.14
Power Consumption Maximum (Watts)	18	18	6.5	6.5
Power Connection	Terminal Block			
TYPE 12 / IP54 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**ST1016414**	**ST1026414**	**ST1024414**	**ST1048414**
RAL 9011 Black:				
Catalog Number	**ST1016413**	**ST1026413**	**ST1024413**	**ST1048413**
Free Airflow (CFM / m³/hr.)	100 / 170	100 / 170	100 / 170	100 / 170
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	74 / 125	74 / 125	74 / 125	74 / 125
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	84 / 143	84 / 143	84 / 143	84 / 143
TYPE 12 / IP55 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**ST1016514**	**ST1026514**	**ST1024514**	**ST1048514**
RAL 9011 Black:				
Catalog Number	**ST1016513**	**ST1026513**	**ST1024513**	**ST1048513**
Free Airflow (CFM / m³/hr.)	92 / 156	92 / 156	92 / 156	92 / 156
Airflow with 1 Exhaust Grille (CFM / m³/hr.)	67 / 114	67 / 114	67 / 114	67 / 114
Airflow with 2 Exhaust Grilles (CFM / m³/hr.)	77 / 130	77 / 130	77 / 130	77 / 130
FILTER FAN UNIT CONSTRUCTION				
Fan RPM	2750 / 3100	2750 / 3100	3150	3150
Sound Pressure (dBA)	44	44	46	46
Operating Temperature Range:				
Maximum (°F / °C)	131 / 55	131 / 55	149 / 65	149 / 65
Minimum (°F / °C)	14 / -10	14 / -10	-4 / -20	-4 / -20
Service Life (hours)	40,000	40,000	57,500	57,500
Unit Dimensions - H x W x D (in. / mm)	9.84 x 9.84 x 4.02 / 250 x 250 x 102			
Cutout Dimensions - H x W (in. / mm)	8.78 x 8.78 / 223 x 223			
Weight (lb. / kg)	2.54 / 1.15			
TYPE 12 / IP54 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number	SG1000404			
RAL 9011 Black:				
Catalog Number	SG1000403			
TYPE 12 / IP55 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number	SG1000504			
RAL 9011 Black:				
Catalog Number	SG1000503			
ACCESSORIES				
Replacement Filters:				
Type 12 / IP54 Catalog Number	10100062			
Type 12 / IP55 Catalog Number	10100066H			
Thermostat Catalog Number	TWR60			
Shroud Catalog Number	SH10GS35001, SH10GS61001, SH10SS04001			

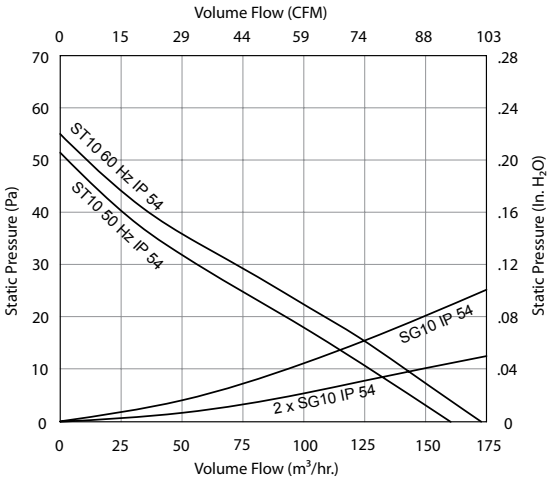
Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

Unit depth is from the back edge of the grille to the back of the fan.

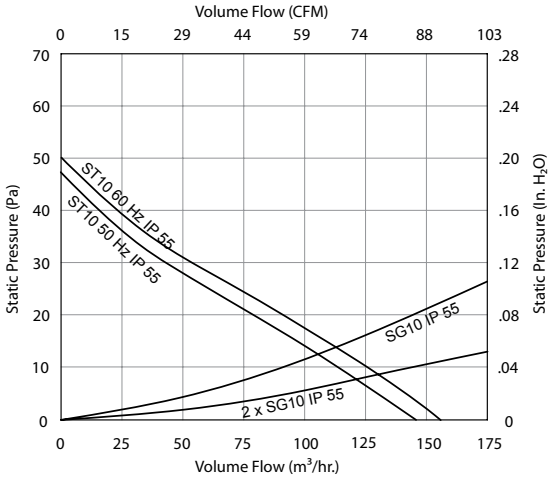
Exhaust Grilles sold separately.

ST10 100 CFM (170 m³/hr.) Thin Side-Mount Filter Fan
Performance Curve

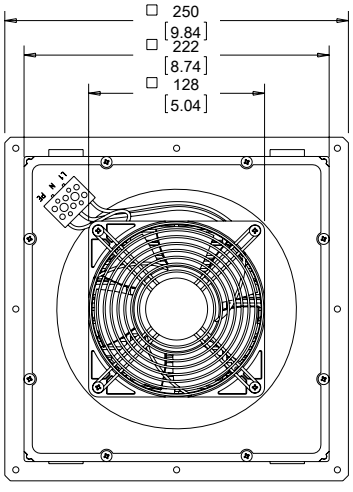
TYPE 12 / IP 54 Filter Fan



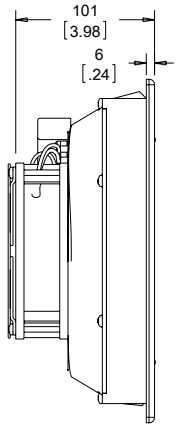
TYPE 12 / IP 55 Filter Fan



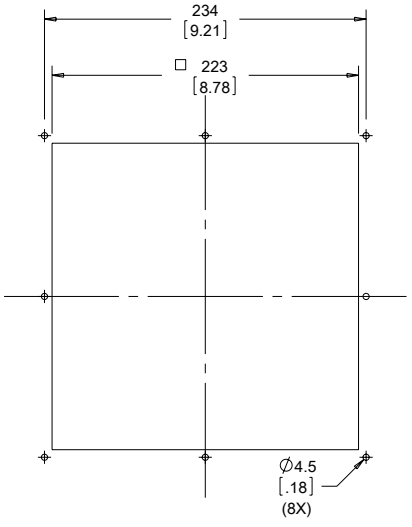
Filter Fan ST10 100 CFM (170 m³/hr.)



BACK VIEW

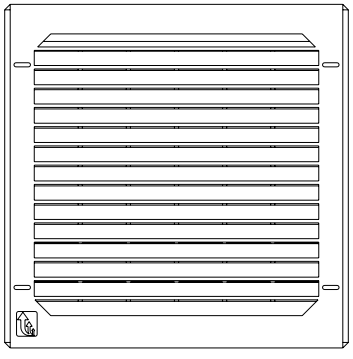


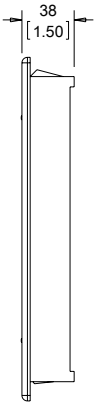
SIDE VIEW



CUTOUT DIMENSIONS

EXHAUST GRILLE





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Order Exhaust Grille Kits separately

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **ST13 303 CFM (515 m³/hr.) Thin Side-Mount Filter Fan - Standard and Reverse**

ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**115**	**230**
Frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60
Nominal Current Maximum (Amps)	.58 / .70	.29 / .35	.58 / .70	.29 / .35
Power Consumption Maximum (Watts)	64 / 80	64 / 80	64 / 80	64 / 80
Power Connection	Terminal Block			
TYPE 12 / IP54 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**ST1316414**	**ST1326414**	**ST1316414R**	**ST1326414R**
RAL 9011 Black:				
Catalog Number	**ST1316413**	**ST1326413**	**ST1316413R**	**ST1326413R**
Free Airflow (CFM / m^3/hr.)	303 / 515	303 / 515	303 / 515	303 / 515
Airflow with 1 Exhaust Grille (CFM / m^3/hr.)	209 / 355	209 / 355	209 / 355	209 / 355
Airflow with 2 Exhaust Grilles (CFM / m^3/hr.)	249 / 422	249 / 422	249 / 422	249 / 422
TYPE 12 / IP55 FILTER FANS				
RAL 7035 Light Gray:				
Catalog Number	**ST1316514**	**ST1326514**	**ST1316514R**	**ST1326514R**
RAL 9011 Black:				
Catalog Number	**ST1316513**	**ST1326513**	**ST1316513R**	**ST1326513R**
Free Airflow (CFM / m^3/hr.)	277 / 470	277 / 470	277 / 470	277 / 470
Airflow with 1 Exhaust Grille (CFM / m^3/hr.)	191 / 325	191 / 325	191 / 325	191 / 325
Airflow with 2 Exhaust Grilles (CFM / m^3/hr.)	219 / 372	219 / 372	219 / 372	219 / 372
FILTER FAN UNIT CONSTRUCTION				
Fan RPM	2550 / 2800	2550 / 2800	2550 / 2800	2550 / 2800
Sound Pressure (dBA)	60	60	60	60
Operating Temperature Range:				
Maximum (°F / °C)	131 / 55	131 / 55	131 / 55	131 / 55
Minimum (°F / °C)	14 / -10	14 / -10	14 / -10	14 / -10
Service Life (hours)	40,000	40,000	40,000	40,000
Unit Dimensions - H x W x D (in. / mm)	12.72 x 12.72 x 4.8 / 323 x 323 x 122			
Cutout Dimensions - H x W (in. / mm)	11.50 x 11.50 / 292 x 292			
Weight (lb. / kg)	7.5 / 3.4			
TYPE 12 / IP54 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number	SG1300404			
RAL 9011 Black:				
Catalog Number	SG1300403			
TYPE 12 / IP55 EXHAUST GRILLES				
RAL 7035 Light Gray:				
Catalog Number	SG1300504			
RAL 9011 Black:				
Catalog Number	SG1300503			
ACCESSORIES				
Replacement Filters:				
Type 12 / IP54 Catalog Number	10100063			
Type 12 / IP55 Catalog Number	10100067H			
Thermostat Catalog Number	TWR60			
Shroud Catalog Number	SH13GS35001, SH13GS61001, SH13SS04001			

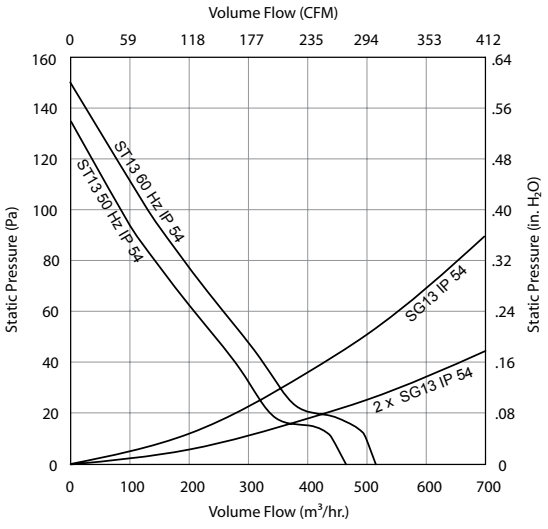
Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

Unit depth is from the back edge of the grille to the back of the fan.

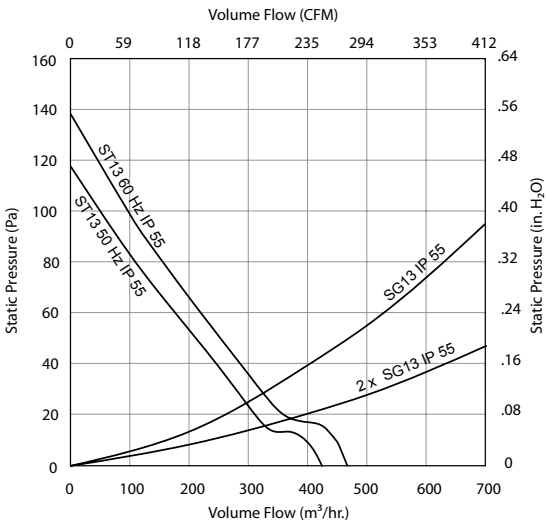
Exhaust Grilles sold separately.

ST13 303 CFM (515 m³/hr.) Thin Side-Mount Filter Fan
Performance Curve

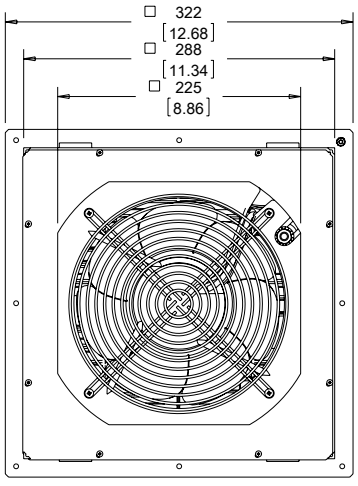
TYPE 12 / IP 54 Filter Fan



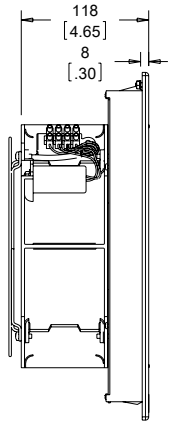
TYPE 12 / IP 55 Filter Fan



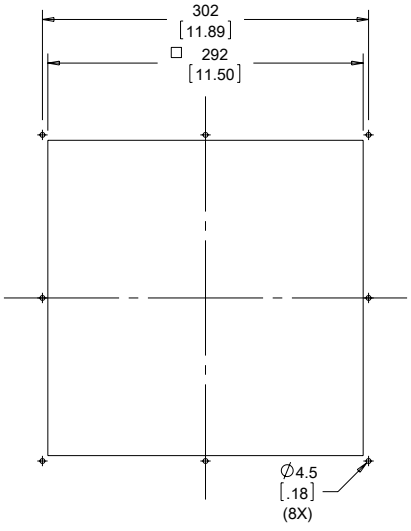
Filter Fan ST13 303 CFM (515 m³/hr.)



BACK VIEW

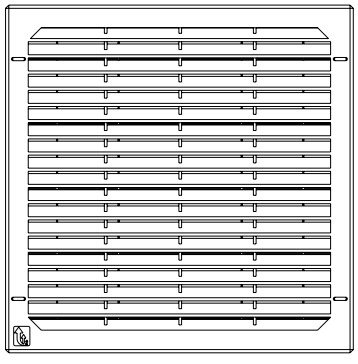


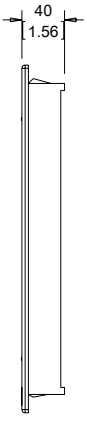
SIDE VIEW



CUTOUT DIMENSIONS

EXHAUST GRILLE





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Order Exhaust Grille Kit separately

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Notes

SR TOP-MOUNT

INDUSTRY STANDARDS

UL (fan motor only)

CE, CSA (fan motor only)

APPLICATION

- Industrial automation
- Automotive assembly
- Package handling equipment
- Food and beverage process controlls
- Wind energy systems

FEATURES

- Free airflow up to 280 CFM (475 m^3/hr.) or 459 CFM (780 m^3/hr.)
- Enclosure roof mounting
- Bolt in place to ensure a tight seal
- Terminal wire connections

FINISH

- RAL 7035 light-gray UV-resistant mild steel standard
- RAL 9011 black UV-resistant mild steel optional

NOTES

Visit **www.PentairProtect.com** to download 2D and 3D CAD drawings into the overall design of your electronic system.

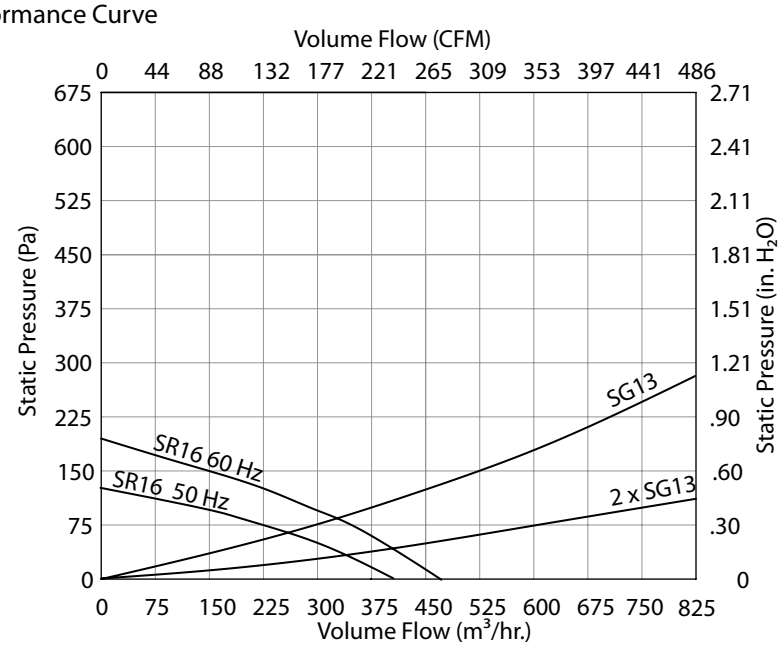
Performance Data **SR16 280 CFM (475 m^3/hr.) Roof-Mount Filter Fan**

ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50 / 60	50 / 60
Nominal Current Maximum (Amps)	.35 / .40	.20 / .21
Power Consumption Maximum (Watts)	40 / 45	40 / 45
Power Connection	Terminal Block	
FILTER FANS		
RAL 7035 Light Gray:		
Catalog Number	**SR1616414**	**SR1626414**
Free Airflow (CFM / m^3/hr.)	227 / 386	227 / 386
Airflow with 1 Exhaust Grille (CFM / m^3/hr.)	151 / 257	151 / 257
Airflow with 2 Exhaust Grilles (CFM / m^3/hr.)	183 / 311	183 / 311
FILTER FAN UNIT CONSTRUCTION		
Fan RPM	1430 / 1700	1430 / 1700
Sound Pressure (dBA)	58 / 62	58 / 62
Operating Temperature Range:		
Maximum (°F / °C)	140 / 60	140 / 60
Minimum (°F / °C)	14 / -10	14 / -10
Service Life (hours)	40,000	40,000
Unit Dimensions - H x W x D (in. / mm)	13.52 x 16.27 x 4.19 / 343 x 413 x 107	
Cutout Dimensions - H x W (in. / mm)	10.43 x 13.58 / 265 x 345	
Weight (lb. / kg)	17.20 / 7.8	
EXHAUST GRILLES		
RAL 7035 Light Gray:		
Catalog Number	SG1300404	
ACCESSORIES		
Replacement Filters:		
Catalog Number	10100063	
Thermostat Catalog Number	TWR60	

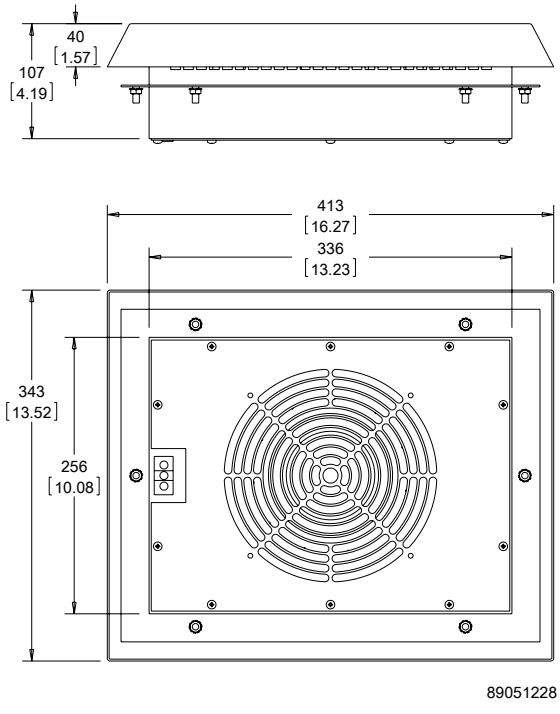
Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

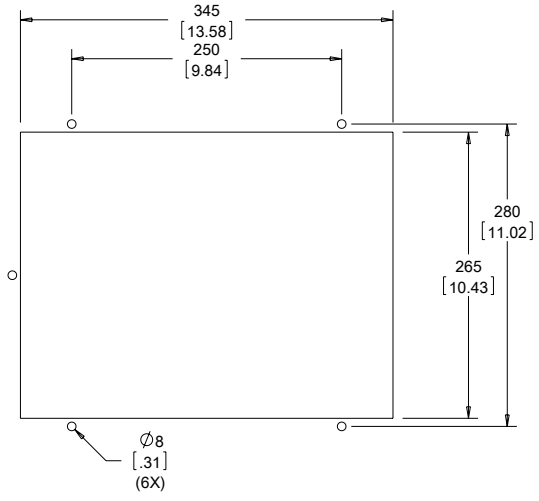
Unit depth is from the back edge of the grille to the back of the fan.

SR16 280 CFM (475 m^3/hr.) Roof-Mount Filter Fan
Performance Curve



Filter Fan SR16 28 CFM (475 m³/hr.)





CUTOUT DIMENSIONS

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

Performance Data **SR16 459 CFM (780 m³/hr.) Roof-Mount Filter Fan**

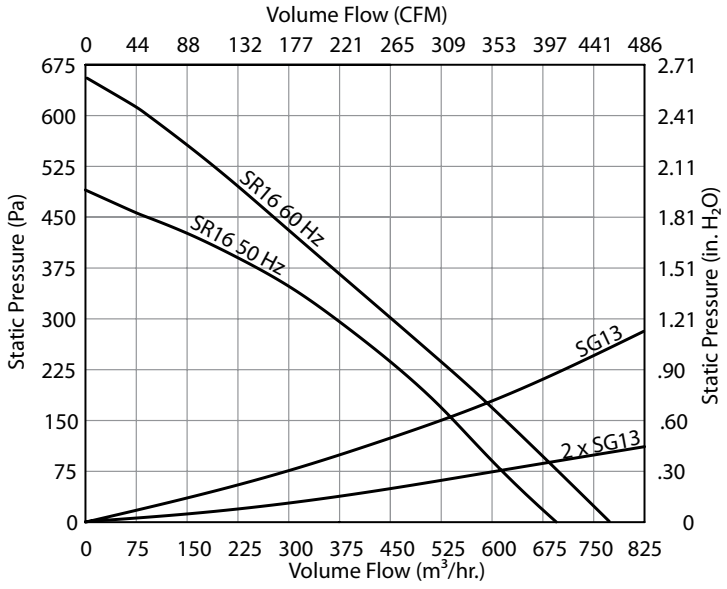
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50 / 60	50 / 60
Nominal Current Maximum (Amps)	.60 / .80	.55 / .73
Power Consumption Maximum (Watts)	100 / 130	110 / 150
Power Connection	Terminal Block	
FILTER FANS		
RAL 7035 Light Gray:		
Catalog Number	**SR1616424**	**SR1626424**
Free Airflow (CFM / m^3/hr.)	459 / 780	459 / 780
Airflow with 1 Exhaust Grille (CFM / m^3/hr.)	347 / 590	347 / 590
Airflow with 2 Exhaust Grilles (CFM / m^3/hr.)	400 / 680	400 / 680
FILTER FAN UNIT CONSTRUCTION		
Fan RPM	2650 / 2950	2650 / 2950
Sound Pressure (dBA)	73 / 76	73 / 76
Operating Temperature Range:		
Maximum (°F / °C)	140 / 60	140 / 60
Minimum (°F / °C)	14 / -10	14 / -10
Service Life (hours)	40,000	40,000
Unit Dimensions - H x W x D (in. / mm)	13.52 x 16.27 x 4.19 / 343 x 413 x 107	
Cutout Dimensions - H x W (in. / mm)	10.43 x 13.58 / 265 x 345	
Weight (lb. / kg)	17.20 / 7.8	
EXHAUST GRILLES		
RAL 7035 Light Gray:		
Catalog Number	SG1300404	
ACCESSORIES		
Replacement Filters:		
Catalog Number	10100063	
Thermostat Catalog Number	TWR60	

Above airflow rates at 60 Hz; see performance curves for airflow at 50 Hz and more details.

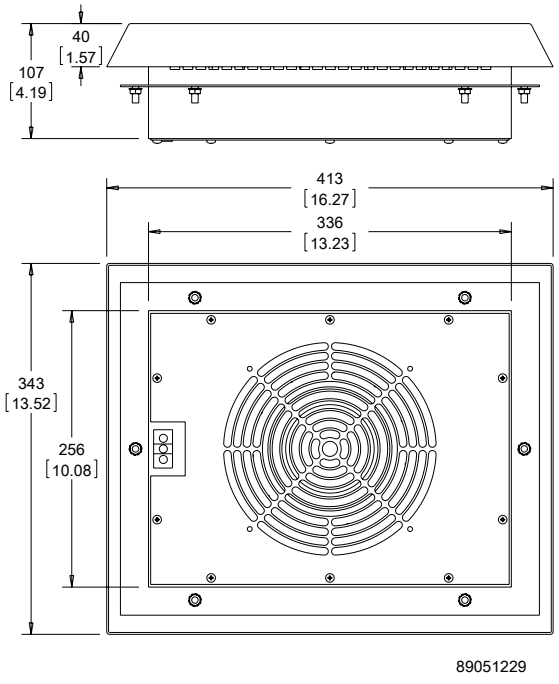
Unit depth is from the back edge of the grille to the back of the fan.

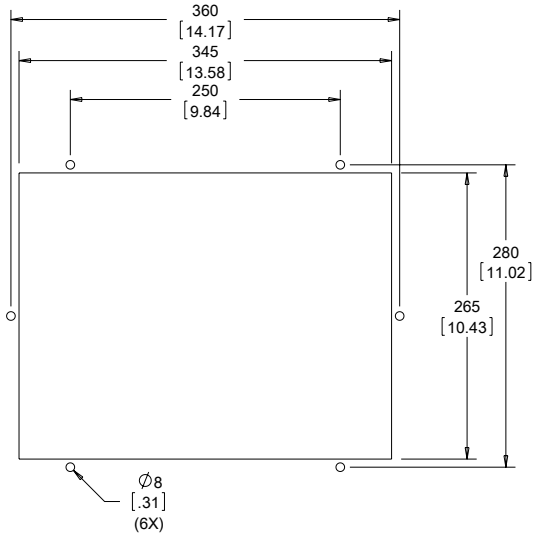
4

SR16 459 CFM (780 m^3/hr.) Roof-Mount Filter Fan
Performance Curve



Filter Fan SR16 459 CFM (780 m³/hr)





CUTOUT DIMENSIONS

Visit www.PentairProtect.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

FILTER FAN SHROUDS

INDUSTRY STANDARDS

Maintains UR/cUR Type 3R and Type 12 rating when properly installed on a Type 3R or Type 12 enclosure

UL 508A UR/cUR; Type 3R; File No. 61997

FEATURES

- Protects filter fan and exhaust grill from wind-driven rain and high-pressure hose water
- Does not impede air flow of filter fan and exhaust grill
- Easy one person installation with simple back panel mounting
- Easily accessed filter simplifies replacement
- Low profile design
- Stainless steel pest screen
- Provides Type 3R protections and maintains a Type 12 rating when used with an equivalent rated filter kit

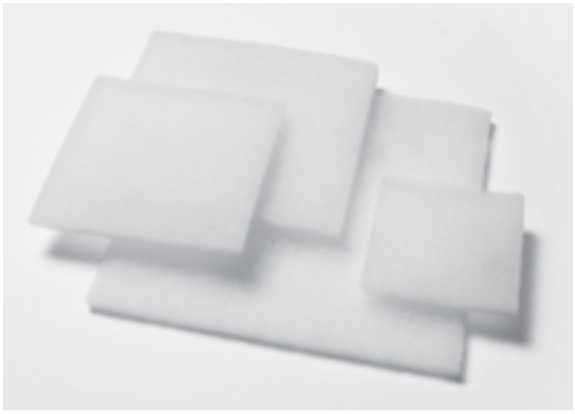
FINISH

- RAL 7035 light gray polyester powder coat paint on galvanized metal
- ANSI 61 gray polyester powder coat paint on galvanized metal
- Stainless Steel #304

Performance Data

SH05 Models			
Catalog Number	**SH05GS35001**	**SH05GS61001**	**SH05SS04001**
Provides protection for:			
Filter Fan Models	SF04 and SF05	SF04 and SF05	SF04 and SF05
Exhaust Grille Models	SG04 and SG05	SG04 and SG05	SG04 and SG05
Unit Construction			
Material	Galvanized	Galvanized	Stainless Steel #304
Finish	RAL 7035 polyester powder coat paint	ANSI 61 polyester powder coated paint	N/A
Unit Dimensions H x W x D (in./mm)	10.25 x 8.0 x 2.25/260 x 203 x 57	10.25 x 8.0 x 2.25/260 x 203 x 57	10.25 x 8.0 x 2.25/260 x 203 x 57
SH09 Models			
Catalog Number	**SH09GS35001**	**SH09GS61001**	**SH09SS04001**
Provides protection for:			
Filter Fan Models	SF09 and TFP4	SF09 and TFP4	SF09 and TFP4
Exhaust Grille Models	SG09 and TFP4	SG09 and TFP4	SG09 and TFP4
Unit Construction			
Material	Galvanized	Galvanized	Stainless Steel #304
Finish	RAL 7035 polyester powder coat paint	ANSI 61 polyester powder coated paint	N/A
Unit Dimensions H x W x D (in./mm)	12.75 x 10.0 x 3.0/324 x 254 x 76	12.75 x 10.0 x 3.0/324 x 254 x 76	12.75 x 10.0 x 3.0/324 x 254 x 76
SH10 Models			
Catalog Number	**SH10GS35001**	**SH10GS61001**	**SH10SS04001**
Provides protection for:			
Filter Fan Models	SF10, ST10 and TFP6	SF10, ST10 and TFP6	SF10, ST10 and TFP6
Exhaust Grille Models	SG10 and TFP6	SG10 and TFP6	SG10 and TFP6
Unit Construction			
Material	Galvanized	Galvanized	Stainless Steel #304
Finish	RAL 7035 polyester powder coat paint	ANSI 61 polyester powder coated paint	N/A
Unit Dimensions H x W x D (in./mm)	14.74 x 12.0 x 3.50/374 x 304 x 89	14.74 x 12.0 x 3.50/374 x 304 x 89	14.74 x 12.0 x 3.50/374 x 304 x 89
SH13 Models			
Catalog Number	**SH13GS35001**	**SH13GS61001**	**SH13SS04001**
Provides protection for:			
Filter Fan Models	SF13, ST13 and TFP10	SF13, ST13 and TFP10	SF13, ST13 and TFP10
Exhaust Grille Models	SG13 and TFP10	SG13 and TFP10	SG13 and TFP10
Unit Construction			
Material	Galvanized	Galvanized	Stainless Steel #304
Finish	RAL 7035 polyester powder coat paint	ANSI 61 polyester powder coated paint	N/A
Unit Dimensions H x W x D (in./mm)	17.62 x 16.0 x 4.75/447 x 406 x 121	17.62 x 16.0 x 4.75/447 x 406 x 121	17.62 x 16.0 x 4.75/447 x 406 x 121

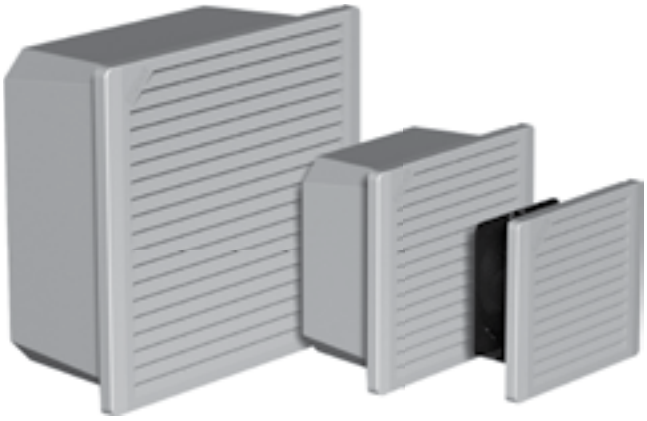
SF/ST REPLACEMENT FILTERS

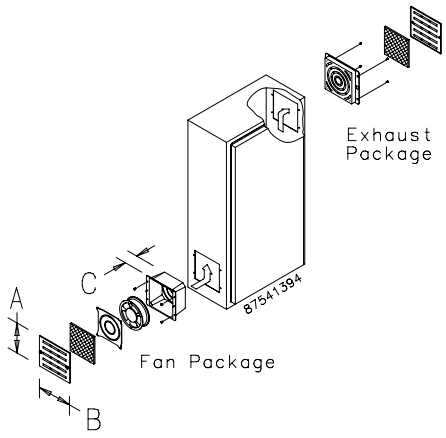


- Type 12 / IP54 filter option provides protection against dust infiltration (6 filters per package)
- IP55 filter adds additional protection against moisture
- See individual product pages for catalog and item numbers to order

REPLACEMENT FILTER	
CATALOG NUMBERS	**FITS FAN PACKAGES**
10100059H	All SF04 Models
10100060	All SF05 IP54 Models
10100064H	All SF05 IP55 Models
10100061	All SF09 IP54 Models
10100065H	All SF09 IP55 Models
10100062	All SF10 IP54 Models
10100066H	All SF10 IP55 Models
10100063	All SF13 IP54 Models
10100067H	All SF13 IP55 Models

TFP SIDE-MOUNT





TFP10
215 CFM
(365 m^3/hr.)

TFP6
140 CFM
(238 m^3/hr.)

TFP4
55 CFM
(93 m^3/hr.)

INDUSTRY STANDARDS

UL 508A Component Recognized; File No. E61997
TFP# Models: Type 1
TFP# UL 12 Models: Type 12

CSA certified (fan only)
CE

APPLICATION

- Industrial automation
- Automotive assembly
- Package handling equipment
- Food and beverage process controlls
- Wind energy systems

FEATURES

- Cooling Fan Package includes fan, air filter, composite air plenum, finger guard and grille
- Exhaust Package includes air filter, filter retainer with integral finger guard and grille
- EMC Upgrade Kit includes a grille standoff collar and a special EMC shielding grille
- Reliable cooling for enclosures with limited space requiring simple filtered airflow for basic cooling
- 24 VDC, 115 VAC and 230 VAC options available
- Washable foam (Type 1) or disposable (Type 12) filter in fan
- Dynamically-balanced fan impellers molded from polycarbonate material
- 4-in. fan is thermally protected and uses permanently-lubricated ball bearings
- 6- and 10-in. fans have ball bearing construction and split-capacitor motors that are thermally protected to avoid premature failure
- Fans have lead wires for power connection with ends stripped 1/2 in. (12 mm)
- All mounting hardware and installation instructions are furnished

SPECIFICATIONS

- Free airflow from 45 CFM (76 m^3/hr.) to 215 CFM (365 m^3/hr.)
- Maximum operating temperature 158 F / 70 C
- Engineered for 50,000 hours of continuous operation without lubrication or service (a monthly maintenance schedule is recommended to ensure optimal cooling performance)

FINISH

- Stainless steel grilles have brushed finish.
- ABS composite grille is black.

ACCESSORIES

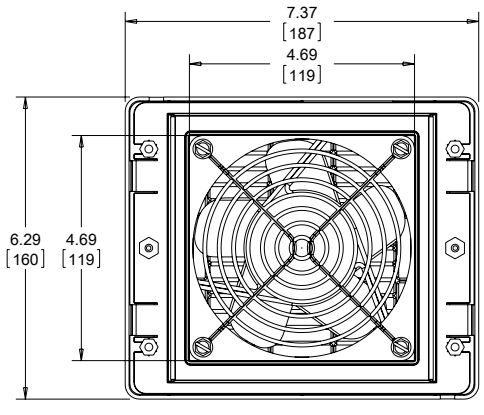
Aluminum Type 1 and Hi-Density Type 12 Filters
EMC Upgrade Kit
Grille Options:
Stainless Steel
Black ABS Plastic

Performance Data **TFP4 Models**

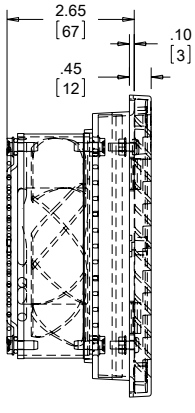
ELECTRICAL DATA			
Rated Voltage	**24 VDC**	**115 VAC**	**230 VAC**
Frequency (Hz)		50/60	
Nominal Current Maximum @ 50/60 Hz(Amps)	.35	.26/.21	.14/.11
Power Consumption Maximum @ 50/60 Hz (Watts)	8.4	17/15	16/14
Power Connection		Stripped Leadwires	
CATALOG NUMBERS			
Composite Type 1			
Catalog Number	**TFP424**	**TFP41**	**TFP42**
Stainless Steel Type 1			
Catalog Number	—	**TFP41SS**	**TFP42SS**
Composite Type 12			
Catalog Number	—	**TFP41UL12**	**TFP42UL12**
Free Airflow @ 50/60 Hz (CFM)*	55	45/55	45/55
Free Airflow @ 50/60 Hz (m^3/hr.)*	93	76/93	76/93
UNIT CONSTRUCTION			
Noise SIL @ 50/60 Hz (dBA)	65	37/41	37/41
Maximum Operating Temperature (°F/°C)		158/70	
Unit Dimensions - H x W x D (in./mm)		6.29 x 7.37 x 2.65/160 x 187 x 67	
Cutout Dimensions - H x W (in./mm)		5.66 x 5.66/144 x 144	
Weight (lb./kg)	4.2/1.90	4.2/1.90	4.3/1.95
EXHAUST GRILLE CATALOG NUMBERS			
Composite Type 1			
Catalog Number		TEP4	
Stainless Steel Type 1			
Catalog Number		TEP4SS	
Composite Type 12			
Catalog Number		TEP4UL12	

*CFM with single exhaust grille installed.

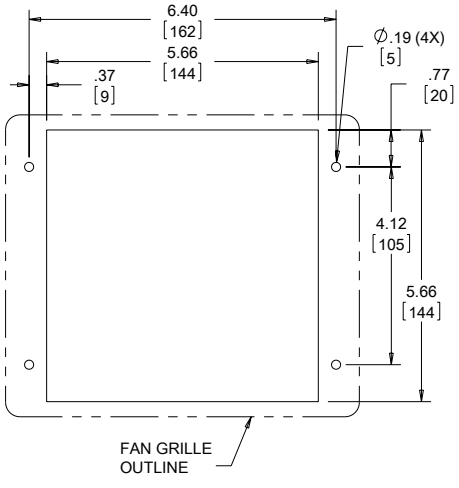
TFP4 Models



BACK VIEW

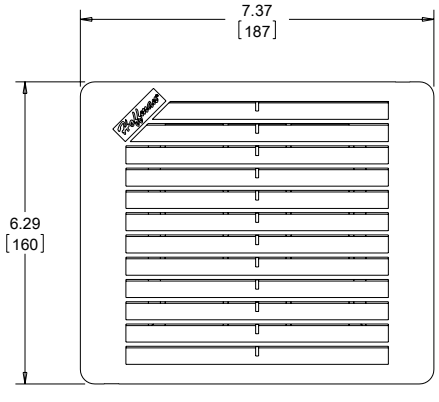


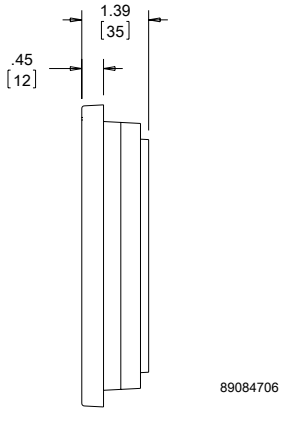
SIDE VIEW



CUTOUT DIMENSIONS

TEP4 EXHAUST GRILLE





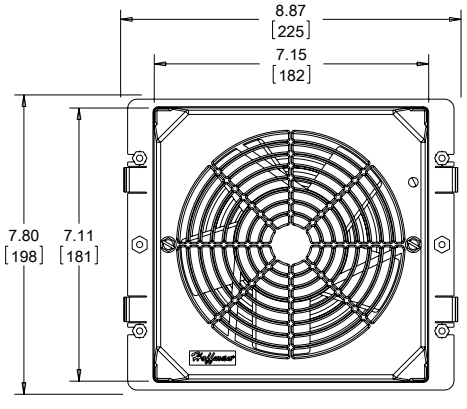
Exhaust grille included with fan package

Performance Data **TFP6 Models**

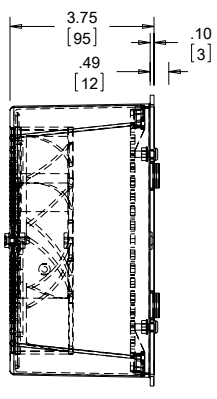
ELECTRICAL DATA			
Rated Voltage	**24 VDC**	**115 VAC**	**230 VAC**
Frequency (Hz)		50/60	
Nominal Current Maximum @ 50/60 Hz(Amps)	.88	.45/.36	.23/.18
Power Consumption Maximum @ 50/60 Hz (Watts)	21.1	36/32	39/35
Power Connection		Stripped Leadwires	
CATALOG NUMBERS			
Composite Type 1			
Catalog Number	**TFP624**	**TFP61**	**TFP62**
Stainless Steel Type 1			
Catalog Number	—	**TFP61SS**	**TFP62SS**
Composite Type 12			
Catalog Number	—	**TFP61UL12**	**TFP62UL12**
Free Airflow @ 50/60 Hz (CFM)*	140	117/140	117/140
Free Airflow @ 50/60 Hz (m^3/hr.)*	238	199/238	199/238
UNIT CONSTRUCTION			
Noise SIL @ 50/60 Hz (dBA)	62.5	50/56	50/56
Maximum Operating Temperature (°F/°C)		158/70	
Unit Dimensions - H x W x D (in./mm)		7.80 x 8.87 x 3.75/198 x 225 x 95	
Cutout Dimensions - H x W (in./mm)		7.16 x 7.16/182 x 182	
Weight (lb./kg)	5.3/2.40	5.3/2.40	5.4/2.45
EXHAUST GRILLE CATALOG NUMBERS			
Composite Type 1			
Catalog Number		TEP6	
Stainless Steel Type 1			
Catalog Number		TEP6SS	
Composite Type 12			
Catalog Number		TEP6UL12	

*CFM with single exhaust grille installed.

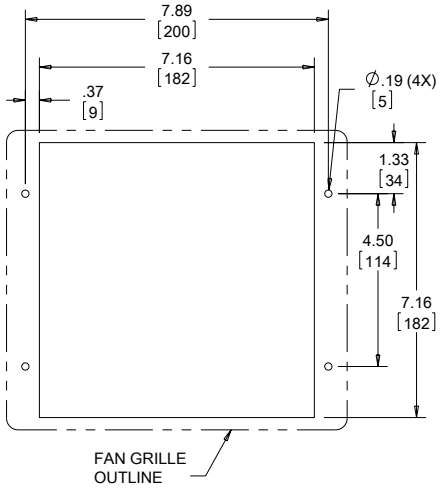
TFP6 Models



BACK VIEW

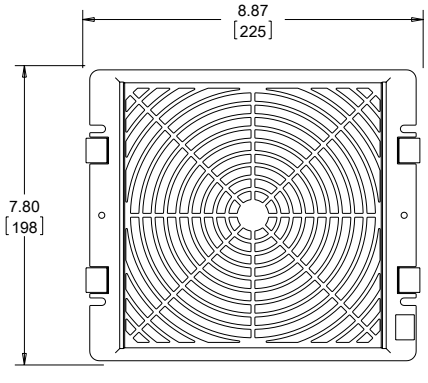


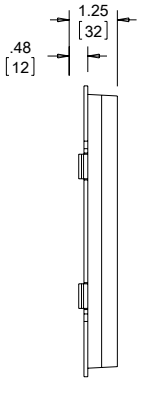
SIDE VIEW



CUTOUT DIMENSIONS

TEP6 EXHAUST GRILLE





89084710

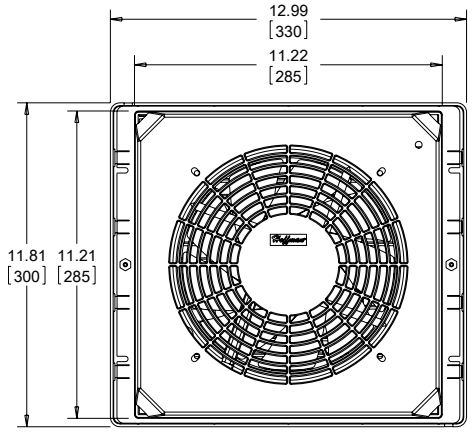
Exhaust grille included with fan package

Performance Data **TFP10 Models**

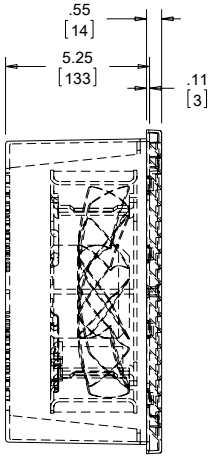
ELECTRICAL DATA		
Rated Voltage	**115 VAC**	**230 VAC**
Frequency (Hz)	50/60	
Nominal Current Maximum @ 50/60 Hz(Amps)	.58/.70	.29/.35
Power Consumption Maximum @ 50/60 Hz (Watts)	64/80	64/80
Power Connection	Stripped Leadwires	
CATALOG NUMBERS		
Composite Type 1		
Catalog Number	**TFP101**	**TFP102**
Stainless Steel Type 1		
Catalog Number	**TFP101SS**	**TFP102SS**
Composite Type 12		
Catalog Number	**TFP101UL12**	**TFP102UL12**
Free Airflow @ 50/60 Hz (CFM)*	180/215	180/215
Free Airflow @ 50/60 Hz (m^3/hr.)*	306/365	306/365
UNIT CONSTRUCTION		
Noise SIL @ 50/60 Hz (dBA)	54/61	54/61
Maximum Operating Temperature (°F/°C)	167/75	167/75
Unit Dimensions - H x W x D (in./mm)	11.81 x 12.99 x 5.25/300 x 330 x 133	
Cutout Dimensions - H x W (in./mm)	11.16 x 11.16/283 x 283	
Weight (lb./kg)	12.0/5.44	11.4/5.17
EXHAUST GRILLE CATALOG NUMBERS		
Composite Type 1		
Catalog Number	TEP10	
Stainless Steel Type 1		
Catalog Number	TEP10SS	
Composite Type 12		
Catalog Number	TEP10UL12	

*CFM with single exhaust grille installed.

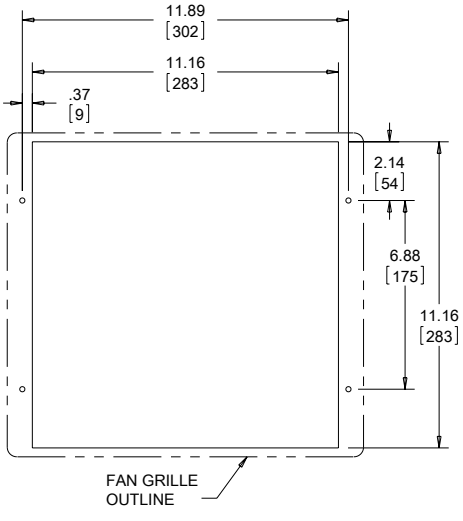
TFP10 Models



BACK VIEW

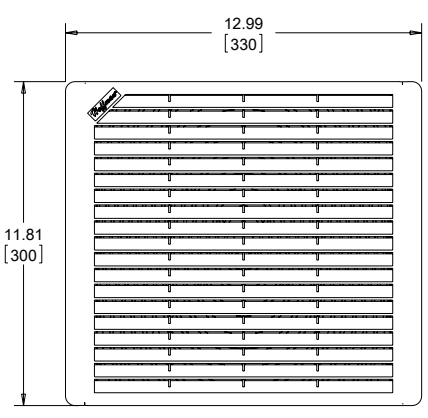


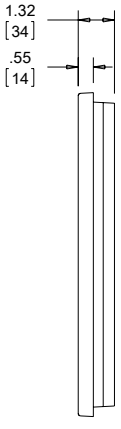
SIDE VIEW



CUTOUT DIMENSIONS

TEP10 EXHAUST GRILLE





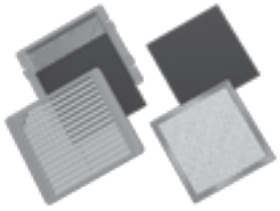
89084711

Exhaust grille included with fan package

TFP EXHAUST GRILLES

CATALOG NUMBERS	Nominal Fan Size
TEP4 Models	
TEP4	4
TEP4SS	4
TEP4UL12	4
TEP6 Models	
TEP6	6
TEP6SS	6
TEP6UL12	6
TEP10 Models	
TEP10	10
TEP10SS	10
TEP10UL12	10

TFP OPTIONAL GRILLES AND REPLACEMENT FILTERS



Optional grilles offer the choice of stainless steel or black ABS plastic. These grilles replace the standard RAL 7035 gray composite or stainless steel grilles on both fan and exhaust packages. Standard replacement filters are washable foam (Type 1) or disposable (Type 12). To maintain UL Type 12 rating on the enclosure, UL Type 12 filters must be used on the fan package inlet. Washable aluminum filters are also available. Aluminum filters are compatible with Type 1 systems only.
Type 12 air filters are not washable.

CATALOG NUMBERS	Description	Fits Fan and Exhaust Nominal Size	Fits Fan and Exhaust Grill Size (in./mm)
4-inch Fan Models			
TG4SS	Brushed stainless steel grille	4	6.29 x 7.31 x .81 160 x 186 x 21
TG4B	Black ABS plastic grille	4	6.29 x 7.37 x .81 160 x 187 x 21
AFLTR4	Type 1 filter replacement (5/package)	4	—
AFLTR4AL	Aluminum filter replacement (5/package)	4	—
TFLT4UL12	Type 12 filter replacement (5/package)	4	—
6-inch Fan Models			
TG6SS	Brushed stainless steel grille	6	7.80 x 8.81 x .75 198 x 224 x 19
TG6B	Black ABS plastic grille	6	7.80 x 8.87 x .49 198 x 225 x 12
AFLTR6	Foam filter replacement (5/package)	6	—
AFLTR6AL	Aluminum filter replacement (5/package)	6	—
TFLT6UL12	UL 12 filter replacement (5/package)	6	—
10-inch Fan Models			
TG10SS	Brushed stainless steel grille	10	11.81 x 12.92 x .75 300 x 328 x 19
TG10B	Black ABS plastic grille	10	11.81 x 12.99 x .75 300 x 330 x 19
AFLTR10	Foam filter replacement (5/package)	10	—
AFLTR10AL	Aluminum filter replacement (5/package)	10	—
TFLT10UL12	UL 12 filter replacement (5/package)a	10	—

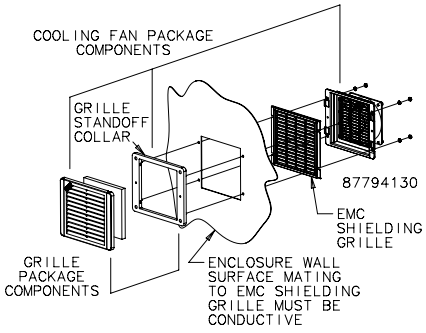
Replacement filter for Type 12 fan package only (models TFF__UL12). For Type 12 exhaust package use replacement filter AFLTRX.

Filters fit all fan and exhaust packages according to their size.

TFP EMC UPGRADE KIT

With the addition of this kit, the cooling fan and exhaust packages are upgraded to provide EMC (electromagnetic compatibility) protection. Consult Hoffman for shielding effectiveness (dB attenuation vs. frequency).
Separate kits must be installed on both the inlet and outlet. Cooling fan and exhaust package must be ordered separately. EMC upgrade kit will not work with stainless steel grille option.

CATALOG NUMBERS	Fits Cooling Fan Package	Fits Exhaust Grille
4-inch Fan Models		
T4EMC	TFP41/TFP42	TEP4
6-inch Fan Models		
T6EMC	TFP61/TFP62	TEP6
10-inch Fan Models		
T10EMC	TFP101/TFP102	TEP10



OUTDOOR FILTER FAN AND EXHAUST PACKAGE

INDUSTRY STANDARDS

cURus Type 12; File No. E234324

NEMA Type 3R
IEC/EN60529, IP55
CE

FEATURES

- Ball bearing axial fan, service life minimum 50,000 hours at 77 F (25 C) and 65 percent RH
- Airflow 11.8 CFM (20 cubic meters/hour) free blowing
- High-impact plastic is highly weatherproof and resistant to UV light
- Removable F5 filter
- Lockable door in hood
- Two-sided tape provided
- Filter hood permanently fixed to enclosure from inside
- 2 lead wires, 3.94-in. (100-mm) long, with pressure clamps, 14 gauge max. (2.5 mm)
- Synthetic filter material, temperature resistant to 212 F (100 C), self-extinguishing class F1, moisture resistant to 100 percent RH
- Filter mat: Fine grade F5 to DIN EN779 filtering degree: 98 percent of particles larger than 10 µm (10 microns)

SPECIFICATIONS

- Aluminum fan body, plastic impeller

FINISH

- Light gray plastic, UL94H-B

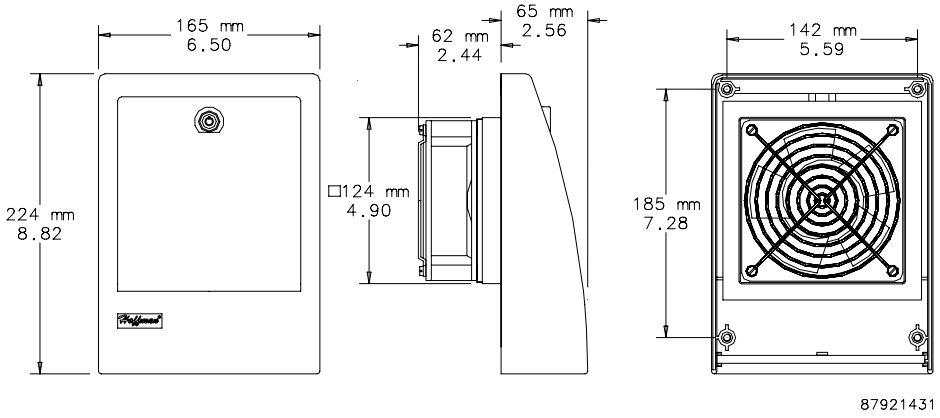
ACCESSORIES

This fan package meets basic requirements for outdoor or indoor applications that require warm air dissipation.

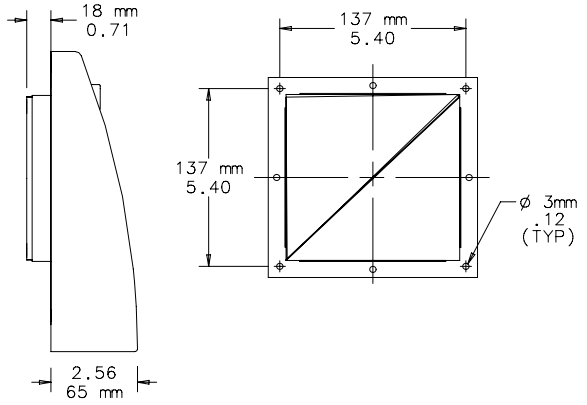
Performance Data **Outdoor Filter Fan**

ELECTRICAL DATA	
Rated Voltage	**120 VAC**
Frequency (Hz)	60
Full Load (Amps)	0.3
FILTER FAN	
Catalog Number	**AOFF118**
UNIT CONSTRUCTION	
External Mounting Depth (in./mm)	2.56/65
Internal Mounting Depth (in./mm)	2.44/62
Enclosure Cutout (in./mm)	4.92 x 4.92 / 125 x 125
EXHAUST GRILLE	
Catalog Number	AOEFG118
ACCESSORIES	
Replacement Filters:	
Catalog Number	AOFILTER
Description	Filter Mat, F5 (3 per package)
Filter Size (in./mm)	4.80 x 4.80 / 122 x 122

Outdoor Filter Fan and Exhaust Package



FILTER FAN



EXHAUST FILTER

MOUNTING FRAME

COMPACT AXIAL FANS

INDUSTRY STANDARDS

UL Component Recognized

CSA certified

APPLICATION

Compact Cooling Fans are ideal for applications where enclosure space is limited and quiet, reliable cooling is required. Engineered for 50,000 hours of continuous operation without lubrication or service.

Installation
Can be installed on any surface of an enclosure. With the addition of accessory fan brackets, Compact Cooling Fans can also be installed in any position inside the enclosure for spot cooling or air circulation.

FEATURES

- Maximum operating temperature is 158 F (70 C)
- 4-in. fan is thermally protected and uses permanently lubricated ball bearings
- 6- and 10-in. fans have ball-bearing construction and split-capacitor motors
- Split-capacitor motors are thermally protected to avoid premature failure
- Dynamically balanced impellers molded from polycarbonate material
- One finger guard is furnished (additional finger guards are available)
- All mounting hardware is provided
- 240 and 560 CFM fans have ball bearing construction and split capacitor motors
- Fans have leadwires with ends stripped 1/2-in. (12-mm) or 6-ft. (1.8-m) cord with polarized plug for power connections

Fan bracket and additional finger guards must be purchased separately

FINISH

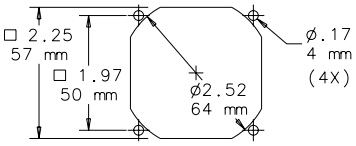
- Fan housing is black.

ACCESSORIES

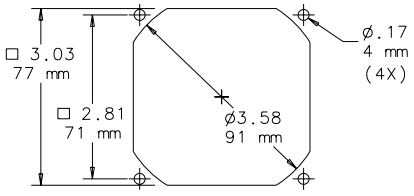
Fan Power Cords
Fan Brackets
Finger Guards
Temperature Control Switch

Design Data **Compact Axial Fans**

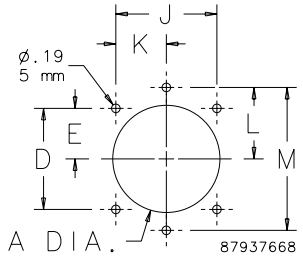
CATALOG NUMBERS	Nominal Size	Voltage	A in./mm	D in./mm	E in./mm	J in./mm	K in./mm	L in./mm	M in./mm
A2AXFN24	2	24 VDC	—	1.97/50	.98/25	1.97/50	.98/25	—	—
3-in. Fans									
A3AXFN	3	115 VAC	—	2.81/71	1.40/36	2.81/71	1.40/36	—	—
A3AXFN24	3	24 VDC	—	2.81/71	1.40/36	2.81/71	1.40/36	—	—
4-in. Fans									
A4AXFNGQ	4	115 VAC	4.62/117	4.12/105	2.06/52	4.12/105	2.06/52	—	—
A4AXFNPG	4	115 VAC	4.62/117	4.12/105	2.06/52	4.12/105	2.06/52	—	—
A4AXFN	4	115 VAC	4.62/117	4.12/105	2.06/52	4.12/105	2.06/52	—	—
A4AXFN2	4	230 VAC	4.62/117	4.12/105	2.06/52	4.12/105	2.06/52	—	—
A4AXFN24	4	24 VDC	4.62/117	4.12/105	2.06/52	4.12/105	2.06/52	—	—
6-in. Fans									
A6AXFNGQ	6	115 VAC	5.88/149	—	—	—	—	3.19/81	6.38/162
A6AXFNPG	6	115 VAC	5.88/149	—	—	—	—	3.19/81	6.38/162
A6AXFN	6	115 VAC	5.88/149	—	—	—	—	3.19/81	6.38/162
A6AXFN2	6	230 VAC	5.88/149	—	—	—	—	3.19/81	6.38/162
A6AXFN24	6	24 VDC	5.88/149	—	—	—	—	3.19/81	6.38/162
10-in. Fans									
A10AXFNPG	10	115 VAC	9.00/229	6.88/175	3.44/87	6.88/175	3.44/87	—	—
A10AXFN	10	115 VAC	9.00/229	6.88/175	3.44/87	6.88/175	3.44/87	—	—
A10AXFN2	10	230 VAC	9.00/229	6.88/175	3.44/87	6.88/175	3.44/87	—	—



MOUNTING CUTOUT
DIMENSIONS 2 INCH



MOUNTING CUTOUT
DIMENSIONS 3 INCH



MOUNTING CUTOUT
DIMENSIONS 4,6,10 INCH

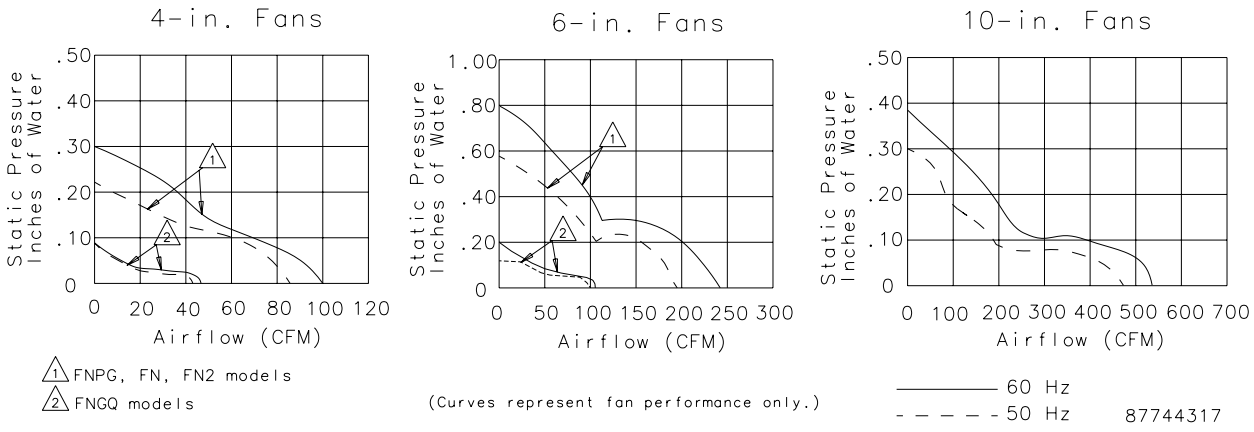
4

Performance Data **Compact Axial Fans**

ELECTRICAL DATA					
Rated Voltage	**24 VDC**	**115 VAC Lead Wires**	**115 VAC Power Cord Quiet Fan**	**115 VAC Power Cord**	**230 VAC Lead Wires**
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Power Connection	Lead Wires	Lead Wires	Power Cord	Power Cord	Lead Wires
2 inch Nominal-Size Fans					
Catalog Number	**A2AXFN24**	—	—	—	—
Nominal Current Maximum @50/60 Hz (Amps)	.09	—	—	—	—
Power Consumption Maximum @ 50/60 Hz (Watts)	2.16	—	—	—	—
Free Airflow @ 50/60 Hz (CFM)*	21.5	—	—	—	—
Free Airflow @ 50/60 Hz (m^3/hr.)*	36.5	—	—	—	—
Noise SIL @ 50/60 Hz (dBA)	65	—	—	—	—
Maximum RPM @50/60 Hz (RPM)	4550	—	—	—	—
Fan Size Diameter (in.)	2.36	—	—	—	—
Fan Depth (in.)	.98	—	—	—	—
3 inch Nominal-Size Fans					
Catalog Number	**A3AXFN24**	**A3AXFN**	—	—	—
Nominal Current Maximum @50/60 Hz (Amps)	.14	.09	—	—	—
Power Consumption Maximum @ 50/60 Hz (Watts)	3.36	7	—	—	—
Free Airflow @ 50/60 Hz (CFM)*	40	27	—	—	—
Free Airflow @ 50/60 Hz (m^3/hr.)*	68	46	—	—	—
Noise SIL @ 50/60 Hz (dBA)	35	40	—	—	—
Maximum RPM @50/60 Hz (RPM)	3400	2700	—	—	—
Fan Size Diameter (in.)	3.15	3.15	—	—	—
Fan Depth (in.)	.98	1.50	—	—	—
4 inch Nominal-Size Fans					
Catalog Number	**A4AXFN24**	**A4AXFN**	**A4AXFNGQ**	**A4AXFNPG**	**A4AXFN2**
Nominal Current Maximum @50/60 Hz (Amps)	.35	.26/.21	.09/.08	.26/.21	.14/.11
Power Consumption Maximum @ 50/60 Hz (Watts)	84	17/15	6/5	17/15	16/14
Free Airflow @ 50/60 Hz (CFM)*	118	85/100	46/49	85/100	85/100
Free Airflow @ 50/60 Hz (m^3/hr.)*	200	144/170	78/83	144/170	144/170
Noise SIL @ 50/60 Hz (dBA)	46.5	37/41	27/28	37/41	37/41
Maximum RPM @50/60 Hz (RPM)	3200	2415/2900	1350/1450	2415/2900	2415/2900
Fan Size Diameter (in.)	4.69	4.69	4.69	4.69	4.69
Fan Depth (in.)	1.52	1.52	1.52	1.52	1.52
6 inch Nominal-Size Fans					
Catalog Number	**A6AXFN24**	**A6AXFN**	**A6AXFNGQ**	**A6AXFNPG**	**A6AXFN2**
Nominal Current Maximum @50/60 Hz (Amps)	.88	.45/.36	.16/.19	.45/.36	.23/.18
Power Consumption Maximum @ 50/60 Hz (Watts)	21.1	36/32	16/18	36/32	39/35
Free Airflow @ 50/60 Hz (CFM)*	280	200/240	85/102	200/240	200/240
Free Airflow @ 50/60 Hz (m^3/hr.)*	476	340/408	144/173	340/408	340/408
Noise SIL @ 50/60 Hz (dBA)	62.5	50/56	35/38	50/56	50/56
Maximum RPM @50/60 Hz (RPM)	3750	2670/3200	1400/1650	2670/3200	2670/3200
Fan Size Diameter (in.)	6.77	6.77	6.77	6.77	6.77
Fan Depth (in.)	2.00	1.50	1.50	1.50	1.50
10 inch Nominal-Size Fans					
Catalog Number	—	**A10AXFN**	—	**A10AXFNPG**	**A10AXFN2**
Nominal Current Maximum @50/60 Hz (Amps)	—	1.0/.88	—	1.0/.88	.47/.43
Power Consumption Maximum @ 50/60 Hz (Watts)	—	36/36	—	36/36	36/36
Free Airflow @ 50/60 Hz (CFM)*	—	480/560	—	480/560	480/560
Free Airflow @ 50/60 Hz (m^3/hr.)*	—	816/951	—	816/951	816/951
Noise SIL @ 50/60 Hz (dBA)	—	46/49	—	46/49	46/49
Maximum RPM @50/60 Hz (RPM)	—	1350/1650	—	1350/1650	1350/1650
Fan Size Diameter (in.)	—	10.00	—	10.00	10.00
Fan Depth (in.)	—	3.50	—	3.50	3.50

* CFM without exhaust grille

Performance Curves for Compact Axial Fans



FAN CORDS

Used to power Compact Cooling Fans when positive ground of the cabinet case is required. Available with connectors for one or two fans. Five-foot (1.52-meter) cord with grounded three-prong plug. Fits A4AXFNPG, A6AXFNPG, A10AXFNPG, A4AXFNGQ and A10AXFNGQ.

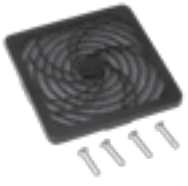
CATALOG NUMBERS	ACORD1	ACORD2
DESIGN DATA		
Description	One connector	Two connectors

FAN CORDS WITH INLINE THERMOSTAT

Use to power 120 VAC Compact Cooling Fans; replaces existing supplied power cord. Fan cord includes inline thermostat. The cord automatically activates up to two fans. Fan(s) will turn on when the inline thermostat reaches 86F (30C). Fan(s) will run only when temperature is above 86F (30C). Use with 110-120 VAC fans with power cords only. One or two fans can be used with power cord.

ELECTRICAL DATA	
Rated Voltage	**110-120 VAC**
Maximum Current (Amps)	10
Fan Activation Temperature (°F/°C)	86/30
CATALOG NUMBERS	
	ACORD2T

FAN FILTER AND FINGER GUARD KIT

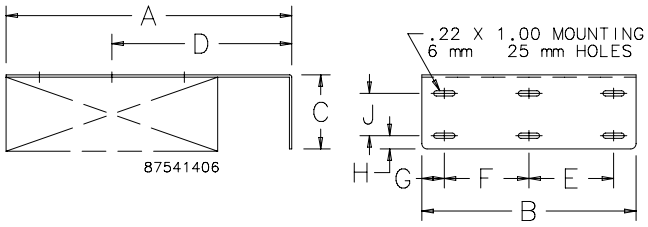


Low-density filter kit for 4-in. (102-mm) and 6-in. (152-mm) fans. Can also be used as vent. Filter is removable and can be cleaned and reused. Mounting hardware included.

CATALOG NUMBERS	AFLTR4LD	AFLTR6LD
DESIGN DATA		
Description	Fan Filter and Finger Guard Kit	
Fits	4-in. fans	6-in. fans

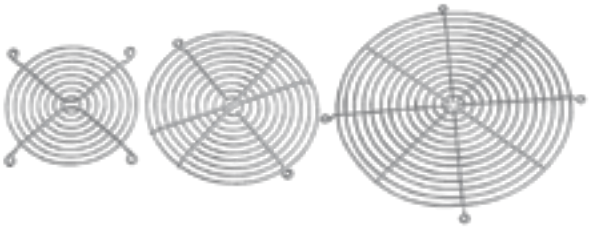
FAN BRACKETS

Designed to provide easy mounting of compact axial fans on enclosure panels. Brackets can be used for general air circulation or to direct air at problem areas. All sizes are .100-in. aluminum. Package quantity of 1 bracket. Fans must be ordered separately.



CATALOG NUMBERS	AxBxC in./mm	Used with Fan Catalog Number	D in./mm	E in./mm	F in./mm	G in./mm	H in./mm	J in./mm
ABRKT2	3.75x2.75x1.50 95x70x38	A2AXFN24	2.38/60	—	1.75/44	.50/13	.37/9	.62/16
ABRKT3	4.50x3.50x1.50 114x89x38	A3AXFN, A3AXFN24	2.75/70	—	2.50/64	.50/13	.37/9	.62/16
ABRKT4	6.00x5.00x1.50 152x127x38	A4AXFNPG, A4AXFNGQ, A4AXFN or A4AXFN2	3.50/89	—	3.00/76	1.00/25	.38/10	.62/16
ABRKT6	10.00x6.88x2.00 254x175x51	A6AXFNPG, A6AXFNGQ, A6AXFN or A6AXFN2	6.50/51	—	5.00/127	.94/24	.38/10	1.00/25
ABRKT10	13.50x10.12x3.50 343x257x89	A10AXFNPG, A10AXFNGQ, A10AXFN or A10AXFN2	8.50/216	4.00/102	4.00/102	1.06/27	.62/16	2.00/51

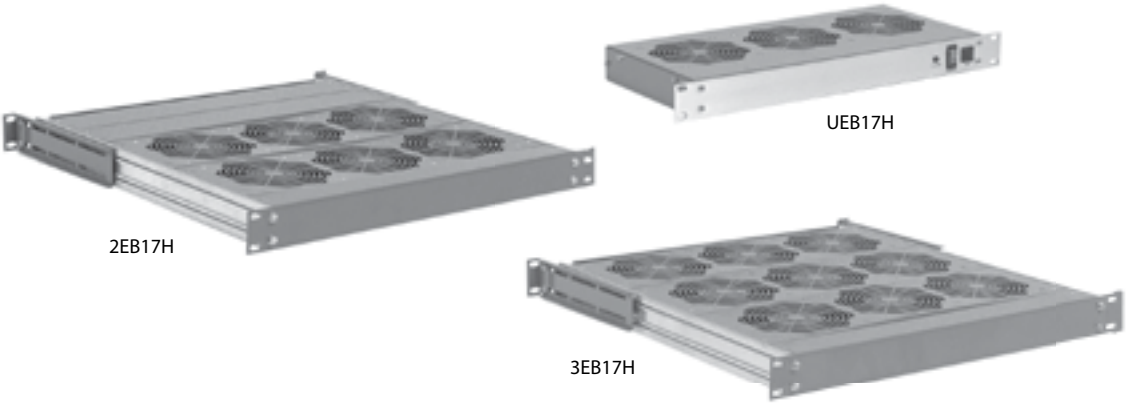
FINGER GUARDS



One finger guard is included with each Compact Axial Fan and Cooling Fan Package. Additional Finger Guards can be mounted on either side of the fan for maximum safety. All guards are chrome-plated and meet UL 507 .25-in. plug gauge test.

CATALOG NUMBERS	Use on Compact Axial Fan Catalog Numbers
AGARD2	A2AXFN24
AGARD3	A3AXFN, A3AXFN24
AGARD4	A4AXFNPG, A4XFNGQ, A4AXFN, A4AXFN2
AGARD6	A6AXFNPG, A6AXFNGQ, A6AXFN, A6AXFN2
AGARD10	A10AXFNPG, A10AXFNQR , A10AXFN, A10AXFN2

RACK-MOUNTABLE ASSEMBLIES



INDUSTRY STANDARDS

UL recognized

- CSA Certified Motors
- CE

APPLICATION

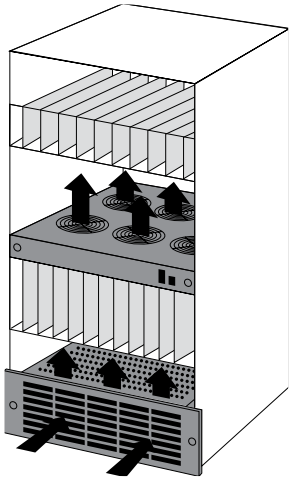
Fan trays are a versatile solution to cooling card cages and racks. Redundant cooling with optional failure detection makes this air mover the obvious choice for sensitive equipment. Minimal rack space and repositionable fans are suited to today's smaller enclosures.

FEATURES

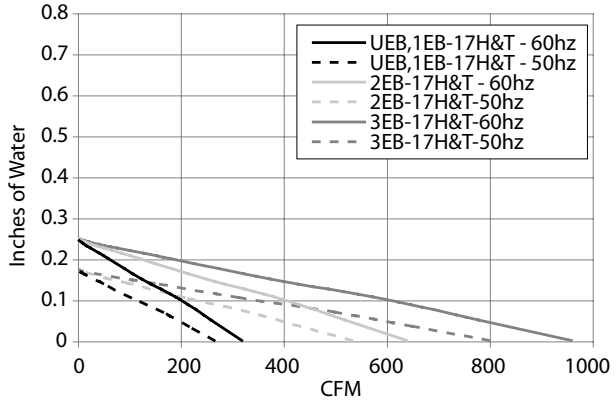
- Slim 1.75 in. (44 mm) Panel Height
- 19-in. rack mountable
- Field adjustable fan strips to optimize air flow
- Easy access to fan tray from front and back
- Simplified installation without the need for side access
- Support bracket
- Exhaust Guard
- 6-inch Power Cord AC trays, Terminal block on DC trays
- Permanently lubricated ball bearing motors
- 100% functionally tested

SPECIFICATIONS

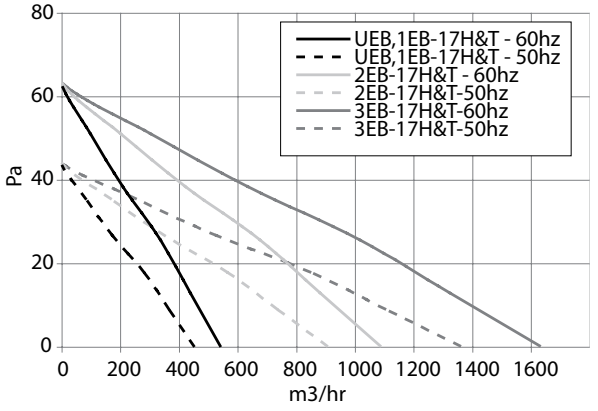
- 115/230 VAC
- 24 VDC
- 50/60 Hz

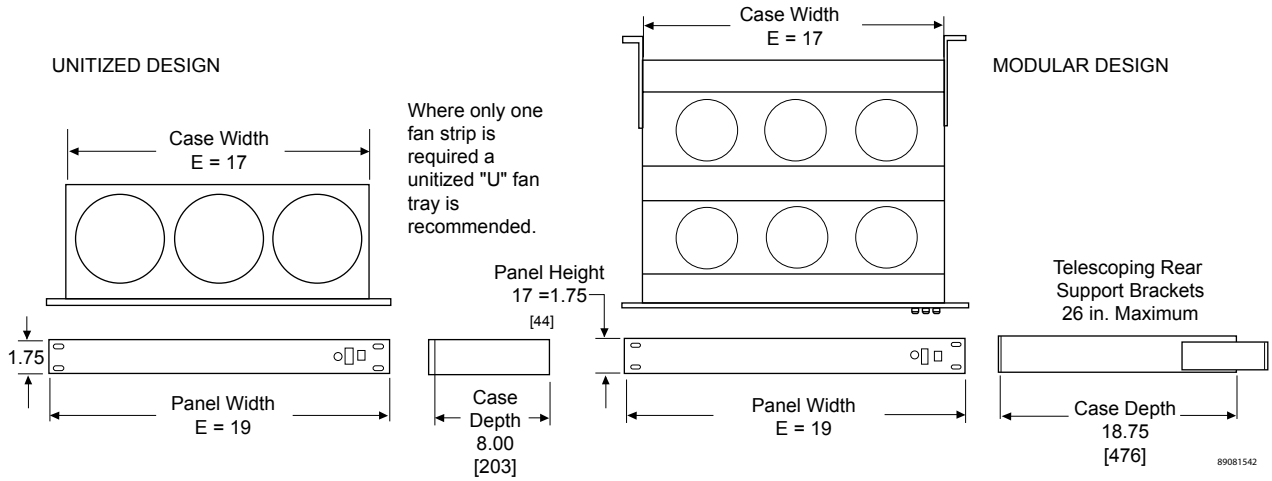


Performance Curves (Inches of Water to CFM)



Performance Curves (Pa to m3/hr)

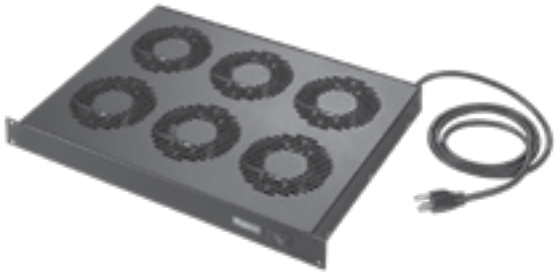




Performance Data **Rack-Mountable Assemblies**

ELECTRICAL DATA			
Rated Voltage	**115 VAC**	**230 VAC**	**24 VDC**
Frequency (Hz)	50/60	50/60	DC
RPM	3100	3100	3000
Nominal Current Maximum (Amps)	0.4	0.2	0.8
Power Consumption Maximum (Watts)	42	42	21
Maximum Operating Temperature (°F/°C)		158/70	
UEB17H			
Catalog Numbers	**UEB17H115**	**UEB17H230**	**UEB17H24**
Nominal Current Maximum @50/60 Hz (Amps)	.4	.2	.8
Power Consumption Maximum @ 50/60 Hz (Watts)	42	42	21
Free Airflow @ 50/60 Hz (CFM)*	315	315	330
Free Airflow @ 50/60 Hz (m^3/hr.)*	536	536	561
Number of Fans		3	
Unit Dimensions H x W x D (In./mm)		1.75 x 19.00 x 8.00/44 x 482 x 203	
Weight (lb./kg)	7.8/3.4	7.8/3.4	7.6/3.3
2EB17H			
Catalog Numbers	**2EB17H115**	**2EB17H230**	—
Nominal Current Maximum @50/60 Hz (Amps)	.9	.5	—
Power Consumption Maximum @ 50/60 Hz (Watts)	84	84	—
Free Airflow @ 50/60 Hz (CFM)*	630	630	—
Free Airflow @ 50/60 Hz (m^3/hr.)*	1071	1071	—
Number of Fans		6	—
Unit Dimensions H x W x D (In./mm)		1.75 x 19.00 x 18.75/44 x 482 x 476	—
Weight (lb./kg)	10.2/4.5	10.2/4.5	—
3EB17H			
Catalog Numbers	**3EB17H115**	**3EB17H230**	—
Nominal Current Maximum @50/60 Hz (Amps)	1.4	.8	—
Power Consumption Maximum @ 50/60 Hz (Watts)	126	126	—
Free Airflow @ 50/60 Hz (CFM)*	945	945	—
Free Airflow @ 50/60 Hz (m^3/hr.)*	1607	1607	—
Number of Fans		9	—
Unit Dimensions H x W x D (In./mm)		1.75 x 19.00 x 18.75/44 x 482 x 476	—
Weight (lb./kg)	12.5/5.5	12.5/5.5	—

19-IN. RACK-MOUNTABLE TRAY



APPLICATION

Fan trays enhance the natural convection airflow within a cabinet when installed with other 19-in. rack-mount equipment.

FEATURES

- Fan trays available with either three or six 4-in. fans
- Includes 72-in. (1829-mm) power cord with IEC 320 standard power socket
- Power cord plugs into standard 115 VAC outlet
- Lighted rocker switch provides on-off control and indicates when fans are on

FINISH

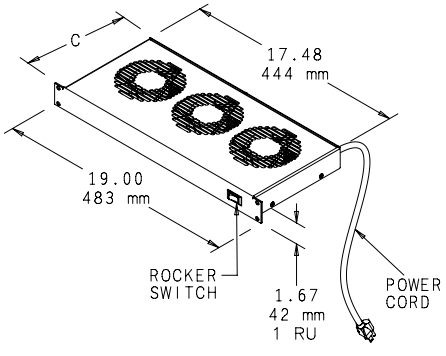
- RAL 9005 black, lightly textured polyester powder paint

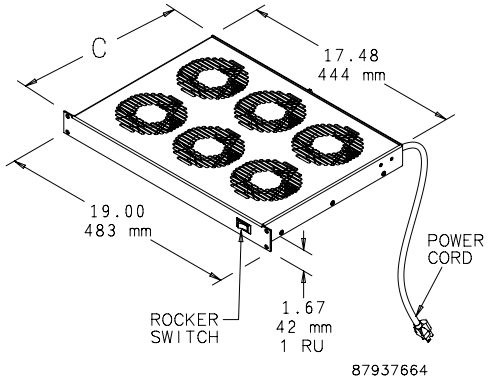
ACCESSORIES

Rack mounting hardware

Performance Data **19-in. Rack-Mountable Tray**

ELECTRICAL DATA		
Rated Voltage	**115**	**115**
Frequency (Hz)	60	60
Power Consumption (Watts)	45	90
CATALOG NUMBERS		
	A19FT3B	**A19FT6B**
Maximum Airflow (CFM)	253	506
Maximum Airflow (m^3/hr.)	430	860
Nominal Airflow Capacity (CFM)	102	102
Nominal Airflow Capacity (m^3/hr.)	173	173
UNIT CONSTRUCTION		
Sound Pressure (dBA)	41	41
Maximum Operating Temperature Range (°F/°C)	158/70	158/70
Maximum Static Pressure (in. WC)	0.27	0.27
Number of Fans	3	6
C (in./mm)	8.10/206	12.96/329





RACK-MOUNT FAN SPEED CONTROL

APPLICATION

Perfect for offices, classrooms and other noise-sensitive areas. Fan Speed Control optimizes airflow in a cabinet or rack, balancing air volume requirements with noise level and power use.

FEATURES

- Continuously variable fan speed control knob with minimum speed adjustment
- Uses 1 RU rack space
- Steel construction
- Two NEMA 5-15R outlets provide power to fan
- Six-foot (1.83-m) power cord plugs into standard 120 V 60 Hz outlet

INDUSTRY STANDARDS

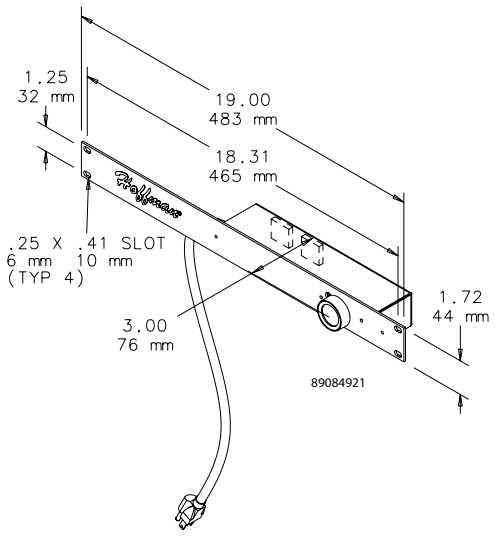
UL 508 Listed; File No. E249700
cUL Listed per CSA C22.2 No. 14; File No. E249700

FINISH

- A19FANSC: RAL 9005 black polyester powder paint

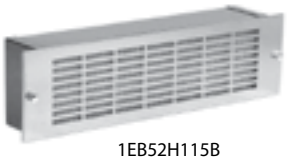
Performance Data **Rack-Mount Fan Speed Controls**

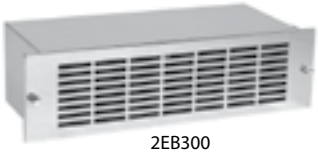
CATALOG NUMBERS	A19FANSC
ELECTRICAL DATA	
Rated Voltage	**120 VAC**
Maximum Nominal Current (Amps)	4
Temperature Settings (°F)	86, 95, 104, 113
Temperature Settings (°C)	30, 35, 40, 45
DESIGN DATA	
Description	19-in. Rack-Mount Fan Speed Control
Application	Fan speed adjusted manually



RACK-MOUNTABLE BLOWERS


1EB52H115A

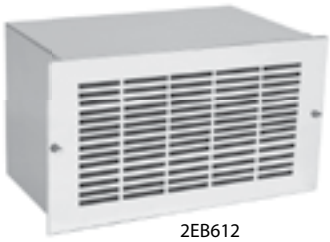

1EB52H115B


2EB300


2EB3500


2EB412


2EB512


2EB612


4EB300

INDUSTRY STANDARDS

UL recognized

CSA Certified Motors
CE

APPLICATION

Fanpack packaged blowers are filtered inlet redundant fan packages. The compact size of the "B" models result in minimal intrusion into the enclosure.

Standard packaged blowers offer reliable rack cooling in a variety of case styles. Two exhaust styles are available with air flowing out the rear or out the top. Specify exhaust style (R or T) when ordering.

Multi-exhaust packaged blowers feature top and rear exhausts, for a wide, deep airflow pattern. Designed with two separate blowers inside, multi-exhaust blowers also offer redundancy and increased airflow.

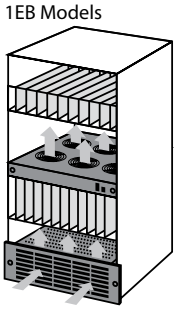
FEATURES

- Permanent, Washable Aluminum Filter
- 19-in. Rack Mountable
- Brushed Aluminum Grille
- Exhaust Guard
- Power Cord
- Permanently lubricated ball bearing motors
- 100% functionally tested

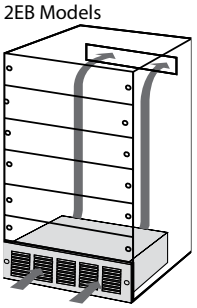
SPECIFICATIONS

- 115/230 VAC
- 50/60 Hz

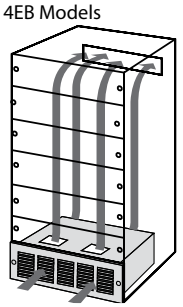
1EB Models



2EB Models



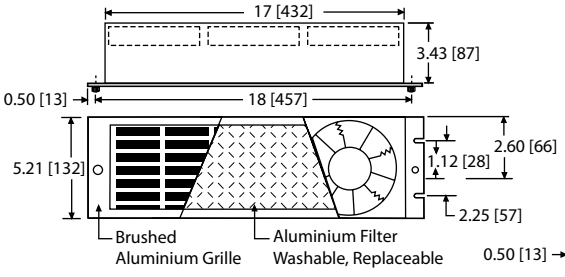
4EB Models



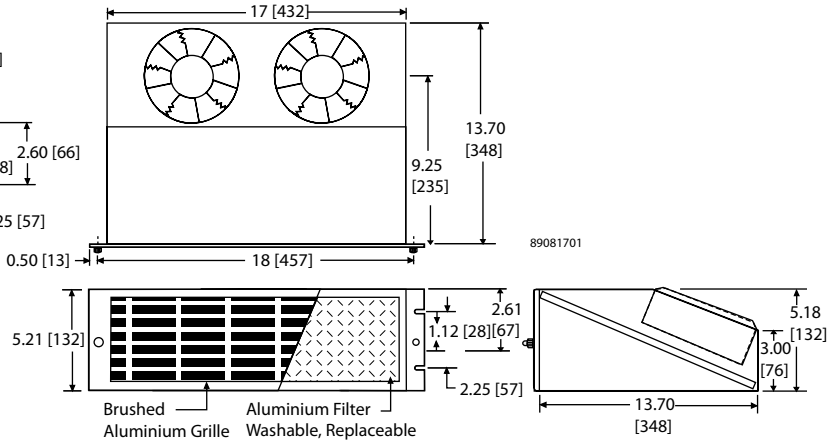
Performance Data **1EB Models**

ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Maximum Operating Temperatur (°F/°C)	140/60	140/60
"A" Models		
Catalog Numbers	**1EB52H115A**	**1EB52H230A**
Free Airflow (CFM/M^3/hr.)	320/544	320/544
RPM	3300	3300
Nominal Run Current Maximum (Amps)	.52	.26
Nominal Start Current Maximum (Amps)	1.00	.50
Power Consumption (Watts)	62	62
Weight (lb./kg)	14/6.3	14/6.3
"B" Models		
Catalog Numbers	**1EB52H115B**	**1EB52H230B**
Free Airflow (CFM/M^3/hr.)	235/400	235/400
RPM	3100	3100
Nominal Run Current Maximum (Amps)	.55	.31
Nominal Start Current Maximum (Amps)	.80	.40
Power Consumption (Watts)	44	44
Weight (lb./kg)	8/3.6	8/3.6

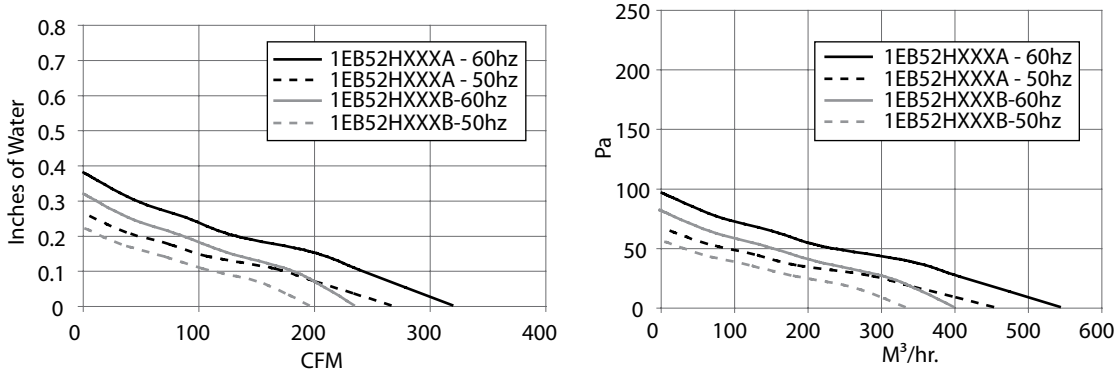
1EB52HxxxB Models



1EB52HxxxA Models



1EB Models



Performance Data **2EB Models**

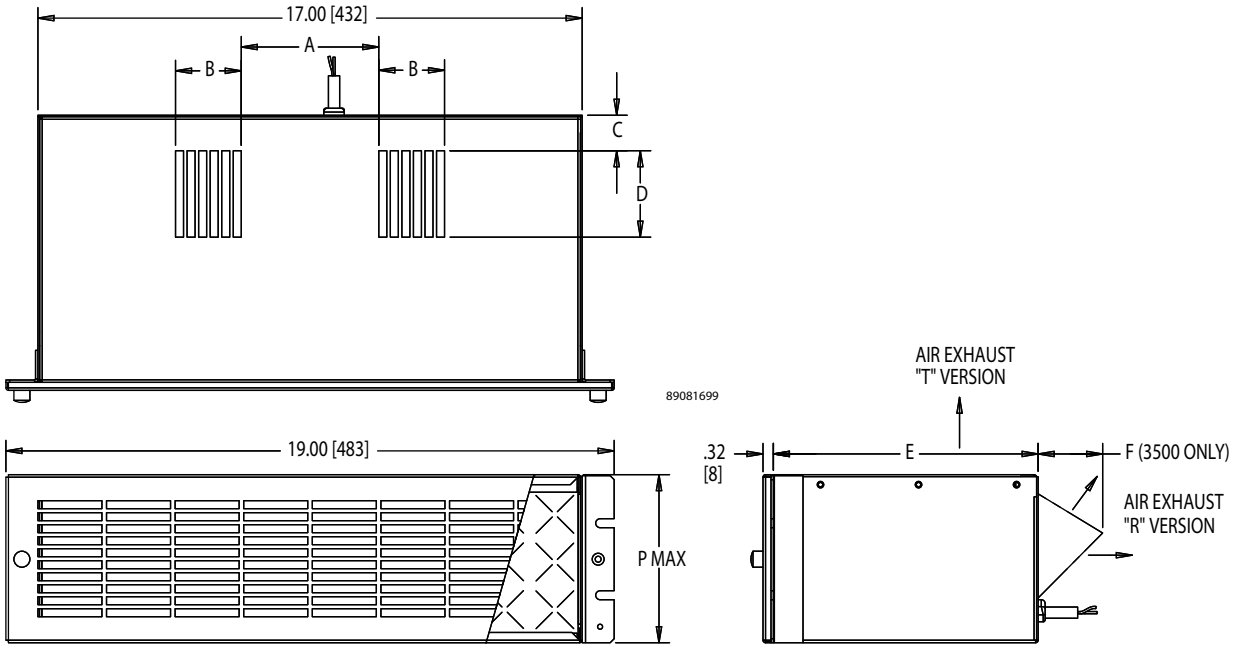
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Maximum Operating Temperatur (°F/°C)	104/40	104/40
2EB300R Models		
Catalog Numbers	**2EB300R115**	**2EB300R230**
Free Airflow (CFM/M^3/hr.)	125/212	125/212
RPM	3000	3000
Nominal Run Current Maximum (Amps)	.9	.5
Power Consumption (Watts)	70	70
Weight (lb./kg)	16/17.3	16/17.3
2EB3500R Models		
Catalog Numbers	**2EB3500R115**	**2EB3500R230**
Free Airflow (CFM/M^3/hr.)	290/493	290/493
RPM	3050	3050
Nominal Run Current Maximum (Amps)	1.8	.9
Power Consumption (Watts)	125	125
Weight (lb./kg)	17/7.7	17/7.7
2EB412R Models		
Catalog Numbers	**2EB412R115**	**2EB412R230**
Free Airflow (CFM/M^3/hr.)	375/637	375/637
RPM	3100	3100
Nominal Run Current Maximum (Amps)	1.8	.8
Power Consumption (Watts)	200	200
Weight (lb./kg)	22/10	22/10
2EB512R Models		
Catalog Numbers	**2EB512R115**	
Free Airflow (CFM/M^3/hr.)	425/722	
RPM	1700	
Nominal Run Current Maximum (Amps)	1.3	
Power Consumption (Watts)	140	
Weight (lb./kg)	25/11.3	
2EB512T Models		
Catalog Numbers	**2EB512T115**	
Free Airflow (CFM/M^3/hr.)	425/722	
RPM	1700	
Nominal Run Current Maximum (Amps)	1.3	
Power Consumption (Watts)	140	
Weight (lb./kg)	25/11.3	
2EB612R Models		
Catalog Numbers	**2EB612R115**	**2EB612R230**
Free Airflow (CFM/M^3/hr.)	800/1359	800/1359
RPM	1650	1650
Nominal Run Current Maximum (Amps)	2.2	1.0
Power Consumption (Watts)	220	220
Weight (lb./kg)	41/18.6	41/18.6

4

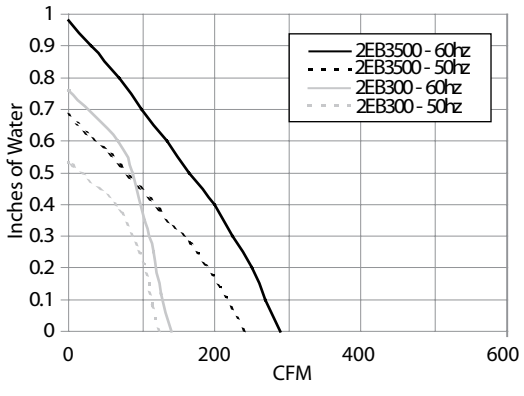
Design Data **2EB Models**

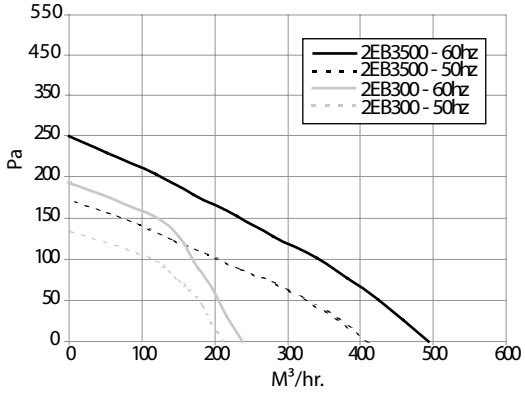
CATALOG NUMBERS	PMax in./mm	A in./mm	B in./mm	C in./mm	D in./mm	E in./mm	F in./mm
2EB300R115	5.25/133	4.30/109	2.05/52	—	—	8.22/209	—
2EB3500R115	5.25/133	4.38/111	4.56/116	—	—	7.17/182	1.75/44
2EB412R115	7.00/178	4.23/107	3.15/80	—	—	8.22/209	—
2EB512R115	8.75/222	4.13/105	3.63/92	—	—	8.22/209	—
2EB512T115	8.75/222	4.13/105	3.63/92	.80/20	3.40/86	9.61/244	—
2EB612R115	10.50/267	4.38/111	3.99/101	—	—	10.22/620	—

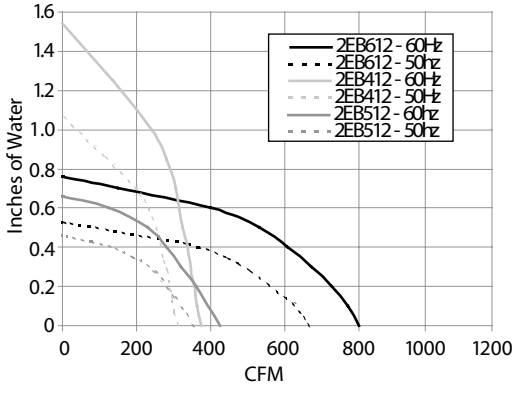
2EB Models

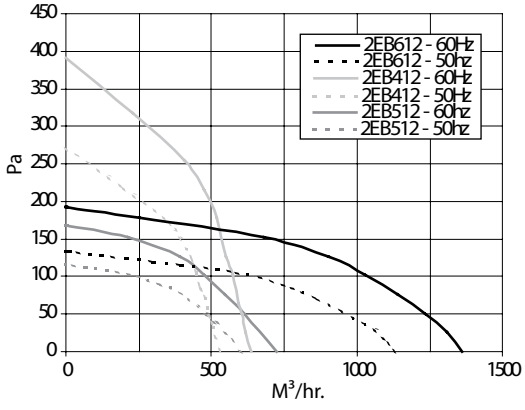


2EB Models









4

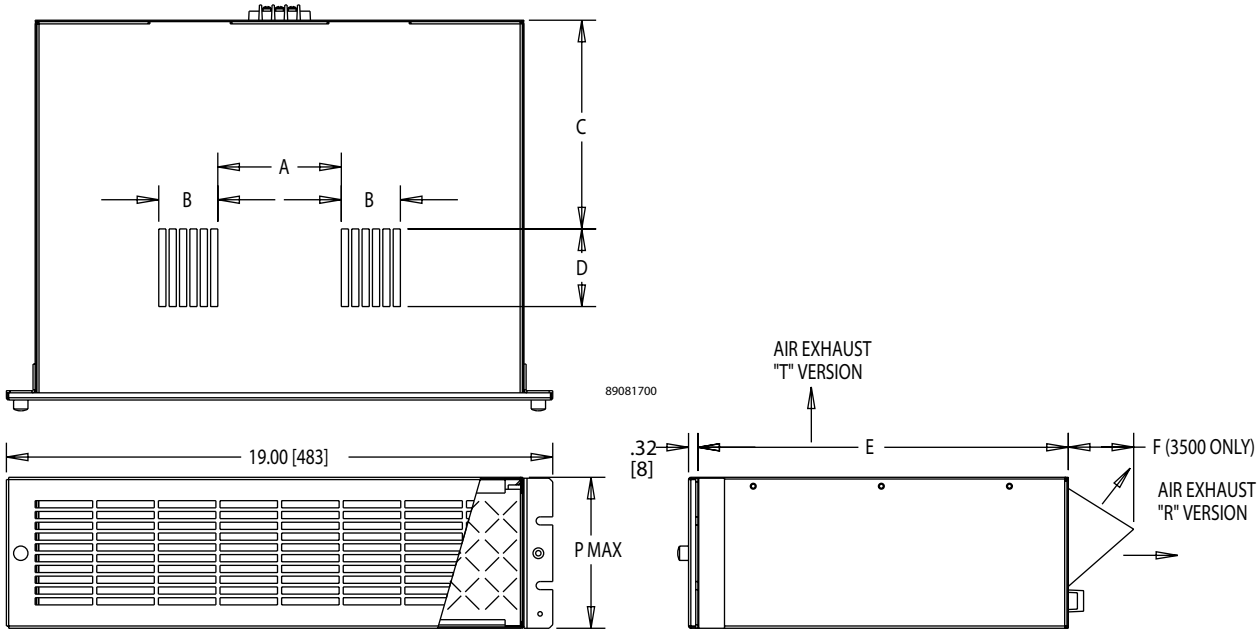
Performance Data **4EB Models**

ELECTRICAL DATA	
Rated Voltage	**115**
Frequency (Hz)	50/60
Maximum Operating Temperatur (°F/°C)	104/40
4EB300RT Models	
Catalog Number	**4EB300RT115**
Free Airflow (CFM/M^3/hr.)	225/382
RPM	2900
Nominal Run Current Maximum (Amps)	1.8
Power Consumption (Watts)	130
Weight (lb./kg)	21/9.5

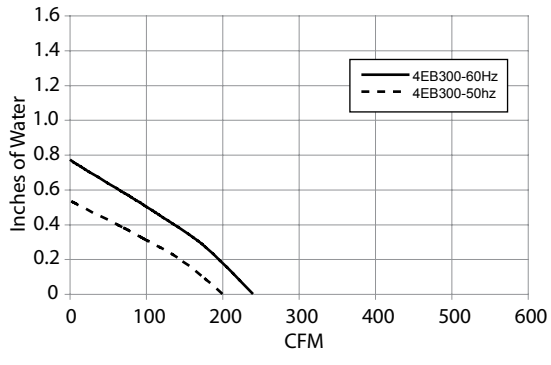
Design Data **4EB Models**

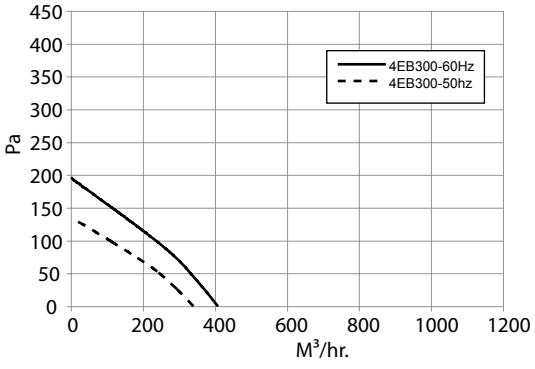
CATALOG NUMBERS	PMax in./mm	A in./mm	B in./mm	C in./mm	D in./mm	E in./mm	F in./mm
4EB300RT115	5.25/133	4.30/109	2.05/52	7.25/184	2.70/69	12.88/327	—

4EB Models



4EB Models





Notes

RACK-MOUNTABLE FAN PACKAGE

INDUSTRY STANDARDS

UL Component Recognized; File No. E61997

EIA RS-310-D
CSA certified
(blower motor only)

APPLICATION

For enclosure or 19-in. rack applications, the Blower Fan Package provides the maximum amount of cooling air in the least amount of space by utilizing 115 volt AC, 60/50 hertz, single-phase input power. Engineered for 20,000 hours of continuous operation when properly powered.

FEATURES

- Intake grille is easily removed with two captive thumbnuts
- Washable aluminum filter
- Single phase motor powers the statically balanced blower
- Motor is thermally protected and cooled by incoming forced air
- Direct drive induction motor contains permanently lubricated ball bearings
- Lubricant protects from -20 F to 298 F (-29 C to 148 C)
- Rotating components are suspended on neoprene shock-mounts
- Three-conductor power cord (five feet long)
- The unit is self-supporting with 16 gauge steel flanges notched per EIA RS-310-D.
- An exhaust grille and filter package (catalog number AEXGR275) is required and must be ordered separately

SPECIFICATIONS

- 16 gauge steel housing

FINISH

- Blower housing is black enamel.
- Grille is brushed stainless steel.

ACCESSORIES

Exhaust Grille and Filter
Filter Adhesive
Temperature Control Switch

4

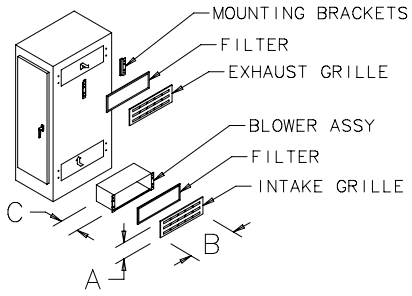
Performance Data **Rack-Mountable Fan Package**

CATALOG NUMBERS	
	ADB275
ELECTRICAL DATA	
Rated Voltage	**115**
Frequency	50/60
Free Airflow (CFM)	230/275
RPM	2580/3100
Nominal Current Maximum (Amps)	1.2
Power Consumption (Watts)	84
SOUND LEVEL	
Sound Pressure (dBA)	56
UNIT CONSTRUCTION	
Weight (lb./kg)	15/7
EXHAUST GRILLE CATALOG NUMBERS	
Catalog Number	AEXGR275*

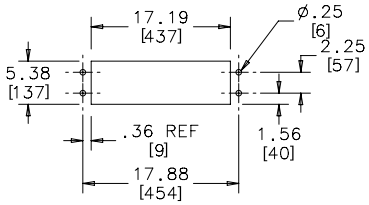
* Exhaust grille sold separately

Rack-Mountable Fan Package

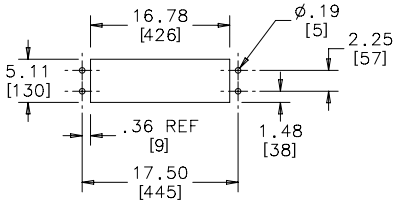
Mounting Cutout Dimensions



Blower Cutout



Exhaust Grille Cutout



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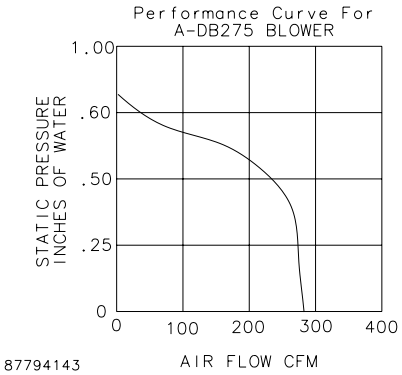

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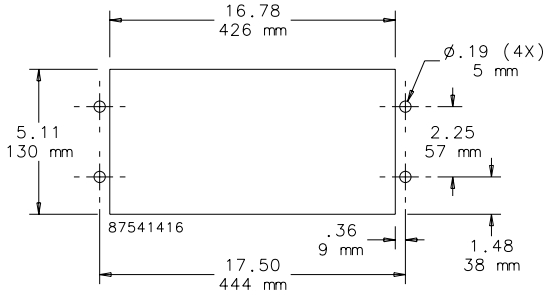
EXHAUST GRILLES AND REPLACEMENT FILTERS

Located at air discharge side of an enclosure using Blower Package ADB275. Polished stainless steel grille is 65 percent open and offers low resistance to airflow. Expanded aluminum filter (included with each grille) is easily removed for cleaning from outside the enclosure. Mounting hardware is furnished.

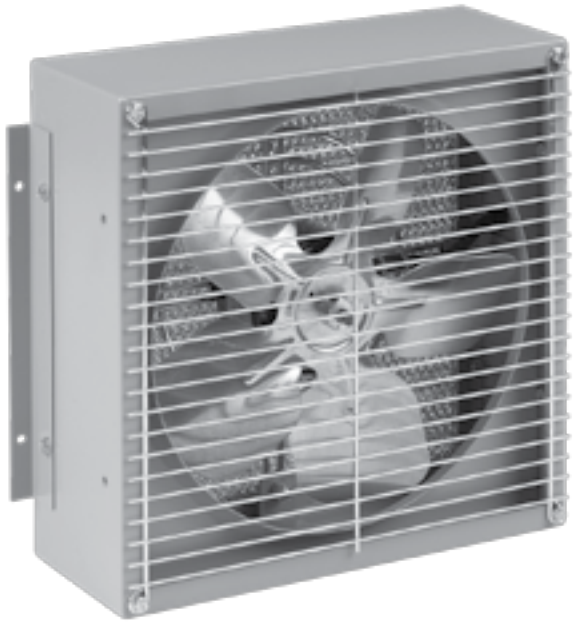


CUTOUT DIMENSIONS

Performance Data **Exhaust Grilles and Replacement Filters for Rack-Mountable Fan Package**

CATALOG NUMBERS	
	AEXGR275
UNIT CONSTRUCTION	
Dimensions H x W (in./mm)	5.75/146 x 19.00/483
Filter Size (in./mm)	4.98/126 x 16.56/421
ACCESSORIES	
Replacement Filters:	
Catalog Number	**AFLTR275AL**
Description	Aluminum Filter Replacement (5 per package)

FILTER BOX FANS



INDUSTRY STANDARDS

Motor UL Recognized

Motor CSA

APPLICATION

Thermal filter boxes are high volume air movers that require minimal enclosure space. Repositionable mounting ears allow the fans to be mounted internally or externally, and used for either intake or exhaust.

FEATURES

- Inlet Guard
- Outlet Guard
- Power Cord
- 5-15 plug available on catalog numbers ending with "M" only
- Permanently lubricated ball bearing motors
- 100% functionally tested

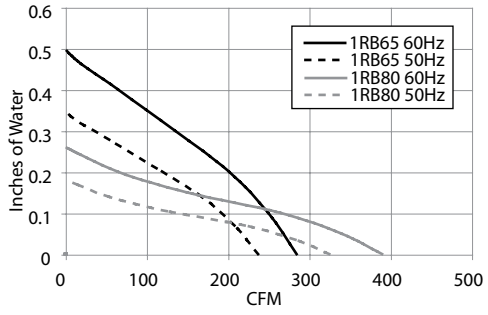
SPECIFICATIONS

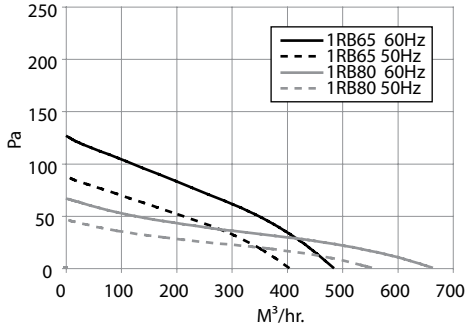
- 115 VAC
- 50/60Hz

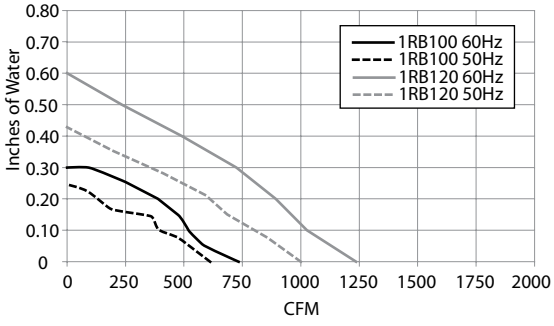
Performance Data **Filter Box Fans**

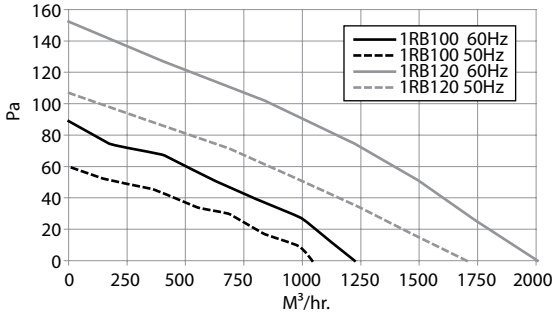
ELECTRICAL DATA		
Rated Voltage	**115**	**115**
Frequency (Hz)	50/60	50/60
Maximum Operating Temperature (°F/°C)	104/40	104/40
1RB65 Models		
Catalog Numbers	**1RB65**	**1RB65M**
Free Airflow (CFM/M^3/hr.)	275/493	275/493
RPM	3000	3000
Nominal Run Current Maximum (Amps)	.85	.85
Nominal Start Current Maximum (Amps)	1.2	1.2
Power Consumption (Watts)	70	70
Filter	N/A	Aluminum
Weight (lb./kg)	8/3.5	8/3.5
1RB80 Models		
Catalog Numbers	**1RB80**	**1RB80M**
Free Airflow (CFM/M^3/hr.)	390/699	390/699
RPM	1600	1600
Nominal Run Current Maximum (Amps)	1.1	1.1
Nominal Start Current Maximum (Amps)	1.5	1.5
Power Consumption (Watts)	80	80
Filter	N/A	Aluminum
Weight (lb./kg)	10/4.5	10/4.5
1RB100 Models		
Catalog Numbers	**1RB100**	**1RB100M**
Free Airflow (CFM/M^3/hr.)	725/1299	725/1299
RPM	1600	1600
Nominal Run Current Maximum (Amps)	1.2	1.2
Nominal Start Current Maximum (Amps)	1.5	1.5
Power Consumption (Watts)	90	90
Filter	N/A	Aluminum
Weight (lb./kg)	12/5.4	12/5.4
1RB120 Models		
Catalog Numbers	**1RB120**	**1RB120M**
Free Airflow (CFM/M^3/hr.)	1200/2151	1200/2151
RPM	1500	1500
Nominal Run Current Maximum (Amps)	1.5	1.5
Nominal Start Current Maximum (Amps)	2.5	2.5
Power Consumption (Watts)	160	160
Filter	N/A	Aluminum
Weight (lb./kg)	24/10.8	24/10.8

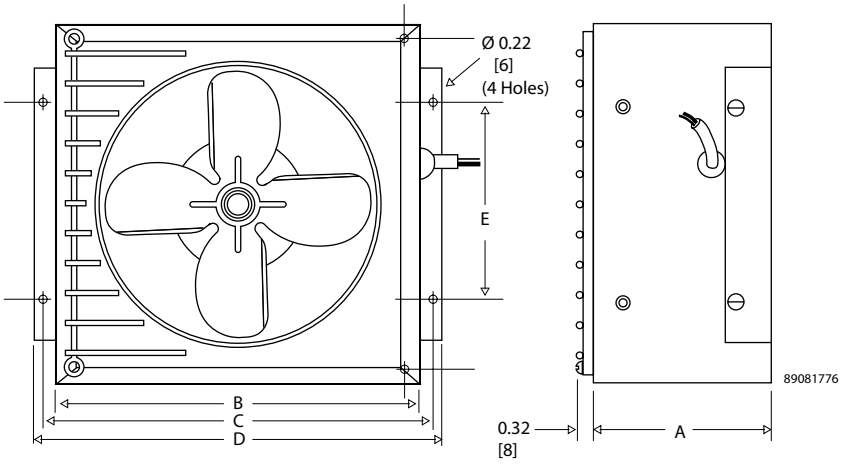
Performance Curves Filter Box











Design Data **Filter Box**

CATALOG NUMBERS	A in./mm	B in./mm	C in./mm	D in./mm	E in./mm
1RB65	4.50/114	8.88/226	9.56/243	10.13/257	4.88/124
1RB65M	4.50/114	8.88/226	9.56/243	10.13/257	4.88/124
1RB80	4.50/114	8.88/226	9.56/243	10.13/257	4.88/124
1RB80M	4.50/114	8.88/226	9.56/243	10.13/257	4.88/124
1RB100	4.50/114	12.13/308	12.81/325	13.38/340	6.13/156
1RB100M	4.50/114	12.13/308	12.81/325	13.38/340	6.13/156
1RB120	7.38/187	15.13/384	15.81/402	16.38/416	9.00/229
1RB120M	7.38/187	15.13/384	15.81/402	16.38/416	9.00/229

CENTRIFUGAL BLOWERS

INDUSTRY STANDARDS

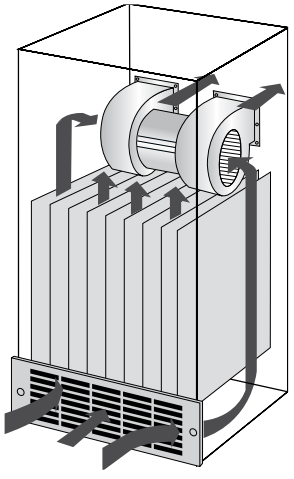
UL Recognized

CSA Certified Motors

APPLICATION

Single Centrifugal Blowers are compact for the maximum in spot cooling applications. Single centrifugal blowers can be mounted in any position for effective air movement.

Dual Centrifugal Blowers are designed for applications where space limitations are a problem. Mountable in any position, these blowers provide dual blasts from separate housings mounted on a reliable motor.



FEATURES

- 100% Functionally Tested

SPECIFICATIONS

- 115/230 VAC
- 50/60 Hz

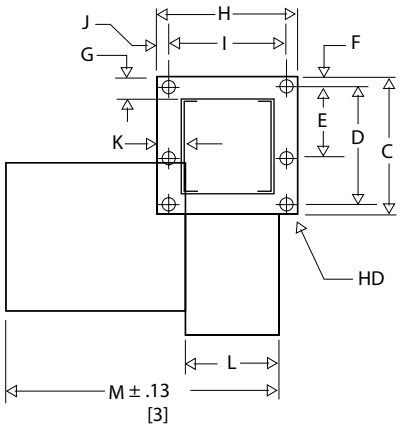
Performance Data **1NB Models**

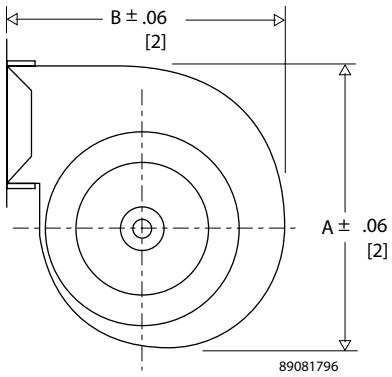
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Maximum Operating Temperature (°F/°C)	104/40	104/40
1NB412 Models		
Catalog Numbers	**1NB412115**	**1NB412230**
Free Airflow (CFM/M^3/hr.)	200/340	200/340
RPM	3100	3100
Nominal Run Current Maximum (Amps)	1.2	0.6
Nominal Start Current Maximum (Amps)	2.1	1.5
Power Consumption (Watts)	120	120
Weight (lb./kg)	6/2.7	6/2.7

Design Data **1NB Models**

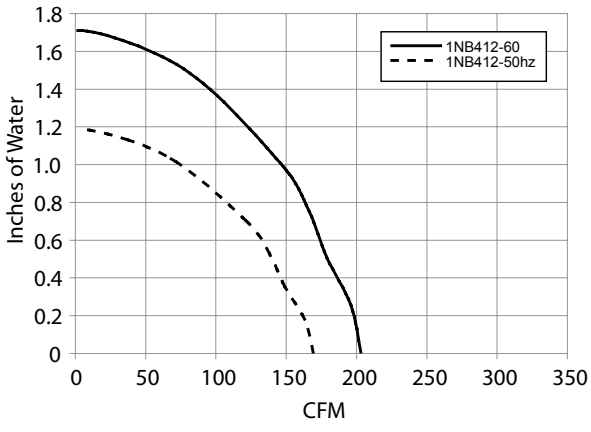
CATALOG NUMBERS	A in./mm	B in./mm	C in./mm	D in./mm	F in./mm	G in./mm	H in./mm	I in./mm	J in./mm	K in./mm	L in./mm	M in./mm	HD in./mm
1NB412115	6.81/173	6.14/156	3.84/96	3.29/84	0.31/8	0.62/16	4.66/118	4.03/102	0.31/8	0.72/18	3.22/82	7.47/190	0.28/7
1NB412230	6.81/173	6.14/156	3.84/96	3.29/84	0.31/8	0.62/16	4.66/118	4.03/102	0.31/8	0.72/18	3.22/82	7.47/190	0.28/7

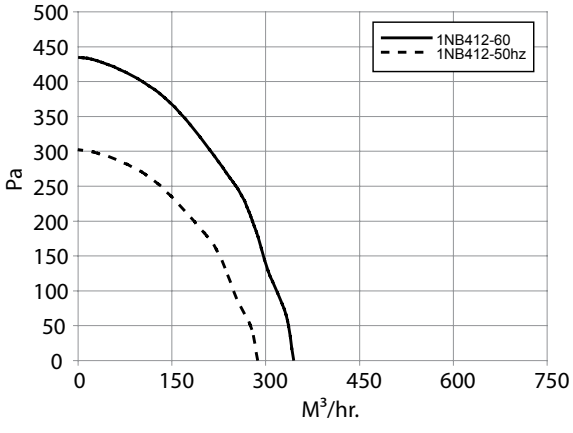
1NB Models





Performance Curves 1NB Models





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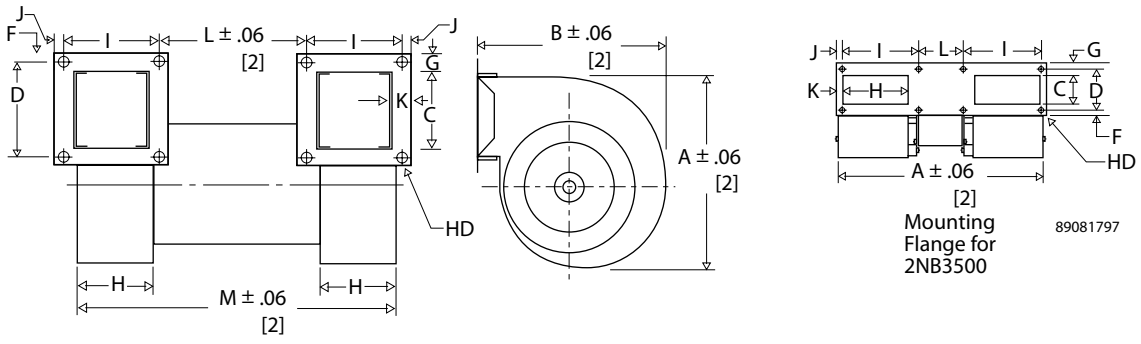
Performance Data **2NB Models**

ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Maximum Operating Temperature (°F/°C)	104/40	104/40
2NB300 Models		
Catalog Numbers	**2NB300115**	**2NB300230**
Free Airflow (CFM/M^3/hr.)	130/221	130/221
RPM	2900	2900
Nominal Run Current Maximum (Amps)	0.9	0.5
Nominal Start Current Maximum (Amps)	1.2	0.6
Power Consumption (Watts)	70	70
Weight (lb./kg)	6/2.7	6/2.7
2NB3500 Models		
Catalog Numbers	**2NB3500115**	**2NB3500230**
Free Airflow (CFM/M^3/hr.)	300/510	300/510
RPM	3050	3050
Nominal Run Current Maximum (Amps)	1.8	0.9
Nominal Start Current Maximum (Amps)	2.5	1.3
Power Consumption (Watts)	125	125
Weight (lb./kg)	8/3.6	8/3.6
2NB412 Models		
Catalog Numbers	**2NB412115**	**2NB412230**
Free Airflow (CFM/M^3/hr.)	360/612	360/612
RPM	3000	3000
Nominal Run Current Maximum (Amps)	1.6	0.8
Nominal Start Current Maximum (Amps)	4	2
Power Consumption (Watts)	225	225
Weight (lb./kg)	9/4.1	9/4.1
2NB424 Models		
Catalog Numbers	**2NB424115**	**2NB424230**
Free Airflow (CFM/M^3/hr.)	595/1011	595/1011
RPM	3100	3100
Nominal Run Current Maximum (Amps)	4	2
Nominal Start Current Maximum (Amps)	6.8	3.5
Power Consumption (Watts)	400	400
Weight (lb./kg)	12/5.4	12/5.4
2NB512 Models		
Catalog Numbers	**2NB512115**	**2NB512230**
Free Airflow (CFM/M^3/hr.)	500/850	500/850
RPM	1700	1700
Nominal Run Current Maximum (Amps)	1.5	0.8
Nominal Start Current Maximum (Amps)	3.5	1.7
Power Consumption (Watts)	130	130
Weight (lb./kg)	14/6.3	14/6.3

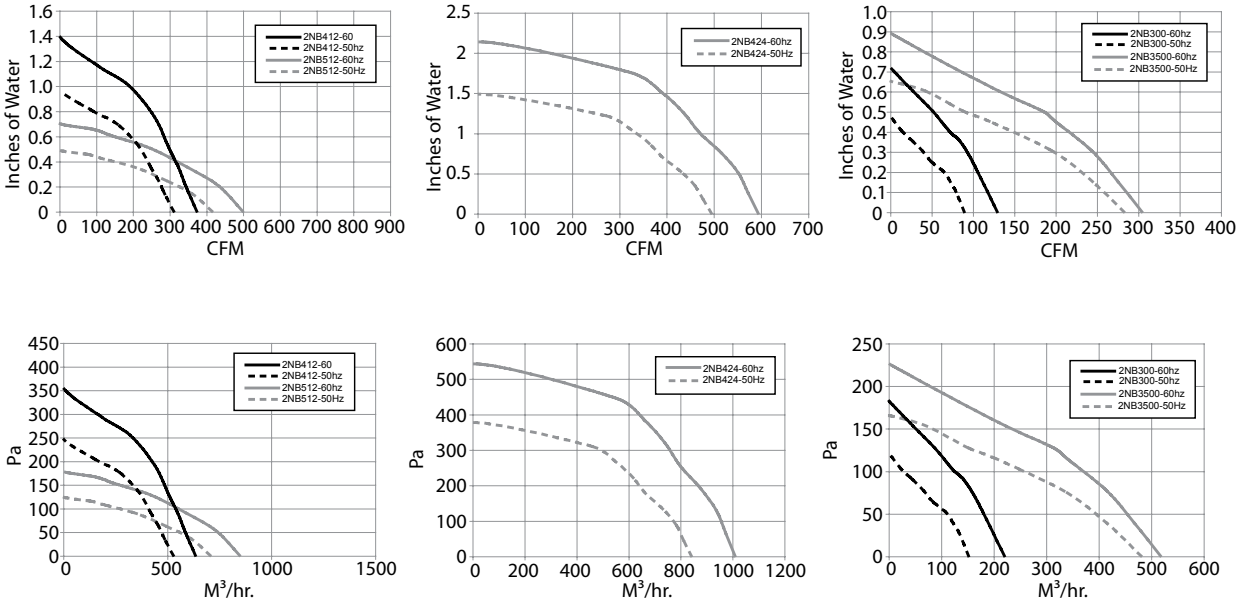
Design Data **2NB Models**

CATALOG NUMBERS	A in/mm	B in/mm	C in/mm	D in/mm	F in/mm	G in/mm	H in/mm	I in/mm	J in/mm	K in/mm	L in/mm	M in/mm	HD in/mm
2NB300XXX	5.19/132	5.25/133	2.19/56	2.50/64	.28/7	.43/11	2.13/54	2.63/67	.22/6	.42/11	3.87/98	8.69/221	.25/6
2NB3500XXX	5.57/141	5.07/129	2.00/51	2.75/70	.38/10	.78/20	4.37/111	5.25/133	.38/10	.50/13	3.00/76	13.80/350	.22/6
2NB412XXX	6.73/171	6.37/162	2.59/66	2.53/64	.38/10	- / -	3.22/82	4.03/102	.27/7	.68/17	3.31/84	10.62/270	.28/7
2NB424XXX	8.06/205	7.00/178	3.13/80	3.25/83	.63/16	.13/3	3.50/89	4.13/105	.69/18	1.12/28	3.63/92	11.25/286	.25/6
2NB512XXX	8.06/205	7.75/197	3.44/87	4.06/103	.31/8	.63/16	3.66/93	4.25/108	.31/8	.63/16	3.63/92	11.56/294	.28/7

2NB Models



Performance Curves 2NB Models



FILTER GRILLE PANEL

APPLICATION

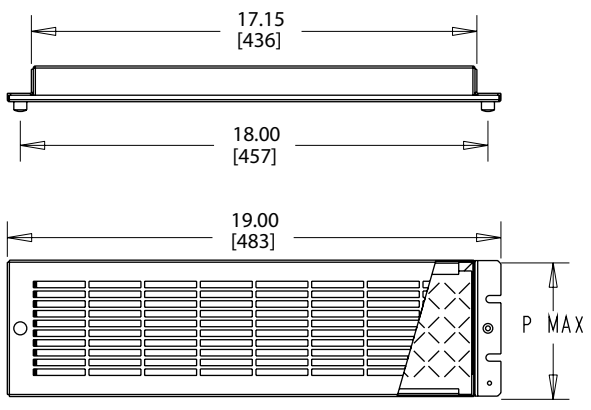
Filter Grille Panels add valuable ventilation to a rack for either inlet or exhaust air. Used alone, filter grille panels allow adequate air flow on natural convection applications or in conjunction with an air moving device to provide filtered air intake.

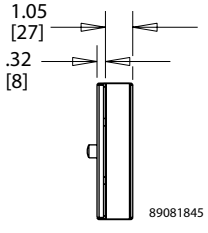
FEATURES

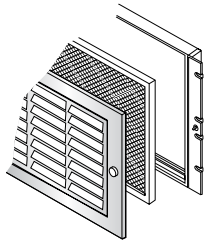
- Permanent, Washable Aluminum Filter
- 19-inch Rack Mountable
- Brushed Aluminum or Stainless Steel Grilles

Performance Data **Filter Grille Panel**

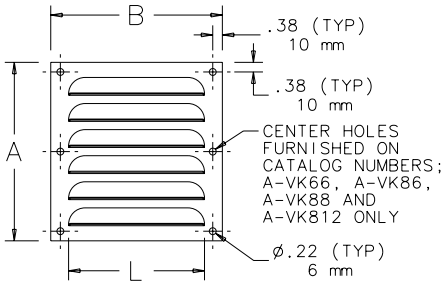
CATALOG NUMBERS					
Stainless Steel	**35G19**	**525G19**	**7G19**	**875G19**	**105G19**
Aluminum	**35H19**	**525H19**	**7H19**	**875H19**	**105H19**
UNIT CONSTRUCTION					
Height PMax (in./mm)	3.5/89	5.25/133	7.00/178	8.75/222	10.50/267
Width (in./mm)	19/483	19/483	19/483	19/483	19/483
Weight (lb./kg)	2/1.0	3/1.4	5/2.2	5/2.2	5/2.2



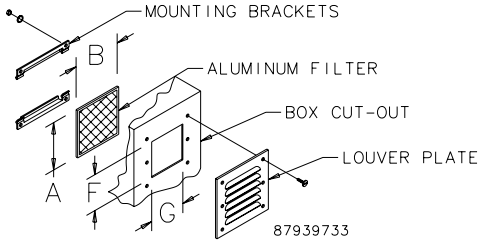




LOUVER PLATE KITS



Designed to provide ventilation in enclosures where excessive internal heat or excessive moisture is a problem. Although louvers cannot keep all moisture out of an enclosure, gasketing or sealing the perimeter of the louver plate reduces problems associated with moisture intrusion. These kits may be easily installed in the field by making a cutout of the proper size and attaching the louver plate in place. Louver plates are made from 14 gauge steel with an ANSI 61 gray polyester powder finish over pretreated surfaces or 316 stainless steel. Hardware is furnished for mounting. Custom sizes, materials, finishes, etc., can be provided on special order.

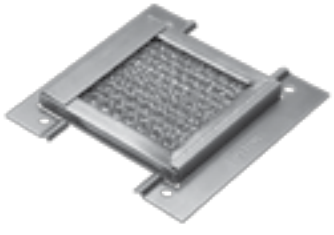


Design Data **Louver Plate Kits**

CATALOG NUMBERS	Dimensions A x B in./mm	Number of Louvers	Thickness in./mm	Length L in./mm	Opening Area in.²/cm²	Cutout Size, F in./mm	Cutout Size, G in./mm
AVK23	3.25 x 3.25/83 x 83	3	0.19/5	2.00/51	.86/5.54	2.00/51	1.75/44
AVK23SS6	3.25 x 3.25/83 x 83	3	0.19/5	2.00/51	.86/5.54	2.00/51	1.75/44
AVK33	3.88 x 4.50/98 x 114	3	0.25/6	3.00/76	1.32/8.52	2.62/67	3.00/76
AVK33SS6	3.88 x 4.50/98 x 114	3	0.25/6	3.00/76	1.32/8.52	2.62/67	3.00/76
AVK34	4.75 x 4.50/121 x 114	4	0.25/6	3.00/76	1.76/11.35	3.50/89	3.00/76
AVK34SS6	4.75 x 4.50/121 x 114	4	0.25/6	3.00/76	1.76/11.35	3.50/89	3.00/76
AVK43	4.50 x 5.50/114 x 140	3	0.25/6	4.00/102	1.88/12.10	3.25/83	4.00/102
AVK43SS6	4.50 x 5.50/114 x 140	3	0.25/6	4.00/102	1.88/12.10	3.25/83	4.00/102
AVK44	5.62 x 5.50/143 x 140	4	0.25/6	4.00/102	2.50/16.13	4.38/111	4.00/102
AVK44SS6	5.62 x 5.50/143 x 140	4	0.25/6	4.00/102	2.50/16.13	4.38/111	4.00/102
AVK64	5.62 x 7.50/143 x 191	4	0.31/8	6.00/152	5.21/33.61	4.38/111	6.00/152
AVK64SS6	5.62 x 7.50/143 x 191	4	0.31/8	6.00/152	5.21/33.61	4.38/111	6.00/152
AVK66	7.88 x 7.50/200 x 191	6	0.31/8	6.00/152	7.82/50.45	6.62/168	6.00/152
AVK66SS6	7.88 x 7.50/200 x 191	6	0.31/8	6.00/152	7.82/50.45	6.62/168	6.00/152
AVK84	5.81 x 9.50/148 x 241	4	0.31/8	8.00/203	8.08/52.12	4.56/116	8.00/203
AVK84SS6	5.81 x 9.50/148 x 241	4	0.31/8	8.00/203	8.08/52.12	4.56/116	8.00/203
AVK86	8.19 x 9.50/208 x 241	6	0.31/8	8.00/203	12.11/78.13	6.94/176	8.00/203
AVK86SS6	8.19 x 9.50/208 x 241	6	0.31/8	8.00/203	12.11/78.13	6.94/176	8.00/203
AVK88	10.56 x 9.50/268 x 241	8	0.31/8	8.00/203	16.15/104.19	9.31/236	8.00/203
AVK88SS6	10.56 x 9.50/268 x 241	8	0.31/8	8.00/203	16.15/104.19	9.31/236	8.00/203
AVK812	15.31 x 9.50/389 x 241	12	0.31/8	8.00/203	24.22/156.26	14.06/357	8.00/203
AVK812SS6	15.31 x 9.50/389 x 241	12	0.31/8	8.00/203	24.22/156.26	14.06/357	8.00/203

Catalog numbers ending in SS6 indicates 316L stainless steel

LOUVER PLATE KIT FILTERS

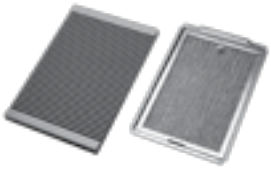


Design
Designed for use with Louver Plate Kit. Mounting holes on filter bracket align with louver mounting holes. Hardware supplied with louvers also secures filter brackets in place. Aluminum air filters provide good arrestment of airborne dust and dirt.

Filter Media
Filter media is composed of layers of slit and expanded aluminum providing hundreds of adhesive coated baffle surfaces for trapping impurities. Impurities are held throughout the depth of the filter. Washing with warm water will keep the filter clean. To achieve best results, Filter Adhesive is recommended.

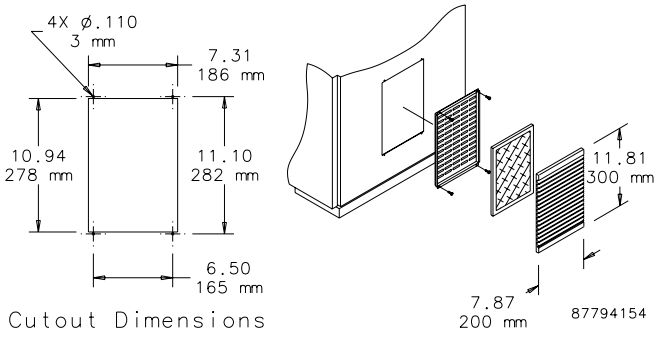
CATALOG NUMBERS	Dimensions H x W (in./mm)	Use with Steel Louver	Use with Stainless Steel Louver
AFLT33	3.22x 3.25/82 x 83	AVK33	AVK33SS6
AFLT34	4.09 x 3.25/104 x 83	AVK34	AVK34SS6
AFLT43	3.84 x 4.25/98 x 108	AVK43	AVK43SS6
AFLT44	4.97 x 4.25/126 x 108	AVK44	AVK44SS6
AFLT64	4.45 x 6.25/113 x 159	AVK64	AVK64SS6
AFLT66	6.72 x 6.25/171 x 159	AVK66	AVK66SS6
AFLT84	4.64 x 8.25/118 x 210	AVK84	AVK84SS6
AFLT86	7.02 x 8.25/178 x 210	AVK86	AVK86SS6
AFLT88	9.39 x 8.25/239 x 210	AVK88	AVK88SS6
AFLT812	14.14 x 8.25/359 x 210	AVK812	AVK812SS6

VENT KIT



Includes a stylized louvered cover and filter package. Use as an air inlet when a cooling fan is mounted in an enclosure or use two vent kits to allow passive airflow. Mounting hardware included. Vent Kit requires cutout shown in diagram. Available in gray (RAL 7042) or black.

CATALOG NUMBERS	XPV32	PPV32B
UNIT CONSTRUCTON		
Dimension H x W x D (in./mm)	11.81 x 7.88 x 1.03 300 x 200 x 26	11.81 x 7.88 x 1.03 300 x 200 x 26
Color	Gray	Black

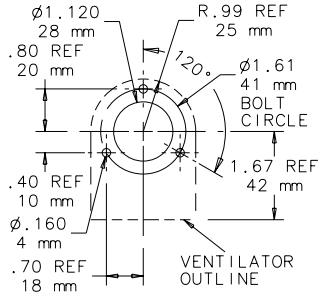


Cutout Dimensions

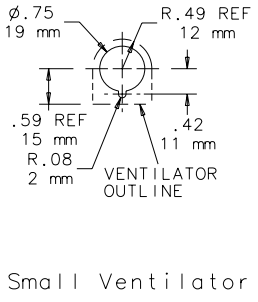
VENTILATOR

Designed to fit most metallic and non-metallic enclosures. Proper installation will provide rainproof ventilation but will not meet Type 4 or 12 requirements. Kit includes mounting hardware, and instructions.
Supplied screws are 13-mm (.515-inch) long. Some applications may require longer screws.

CATALOG NUMBERS	ANMV6	ANMV3
DESIGN DATA		
Description	Large nonmetallic vent	Small nonmetallic vent



Large Ventilator



Small Ventilator

FILTER ADHESIVE

Designed to maximize the efficiency of all expanded aluminum air filters. Use of Filter Adhesive doubles the dust-retention capacity of the filter. Adhesive contains a low-viscosity water-soluble oil which absorbs dirt particles trapped on the surface of the filter. Through the circulation of the oil, a renewed impurity-absorbing surface is constantly established. Washing with water will remove dust, dirt and other impurities. Once the filter is dry, re-coat with adhesive.

CATALOG NUMBERS	
	AFLTAD
DESIGN DATA	
Description	Spray Adhesive

Hoffman

CHAPTER 5 ACCESSORIES

FEATURED PRODUCTS

H2OMIT™ VENT DRAINS

UL-approved vent drains allow accumulated water to drain out the bottom of an enclosure, while also functioning as an air pressure equalizer to prevent water and moisture from being pulled into the enclosure. Installs in the bottom of mild steel, aluminum, stainless steel or non-metallic enclosures.

H2OMIT™ THERMOELECTRIC DEHUMIDIFIER

Thermoelectric dehumidifiers remove moisture from the air within an enclosure and standing liquids, providing a cost-effective way to protect sensitive electronics from condensation. A built-in drain provision with plastic hose directs collected moisture to the vent drain (sold separately).

CHAPTER CONTENTS

ENCLOSURE HEATERS

Protect electronic, pneumatic, hydraulic and mechanical equipment from low temperatures, condensation and corrosion with Enclosure Heaters. To accommodate diverse applications, semiconductor, electric and hazardous locations are available.

DUAL THERMOSTAT

With two thermostats in one unit, the Dual Thermostat independently controls equipment heating and cooling systems. Temperatures range from 32 to 140 degrees Fahrenheit.

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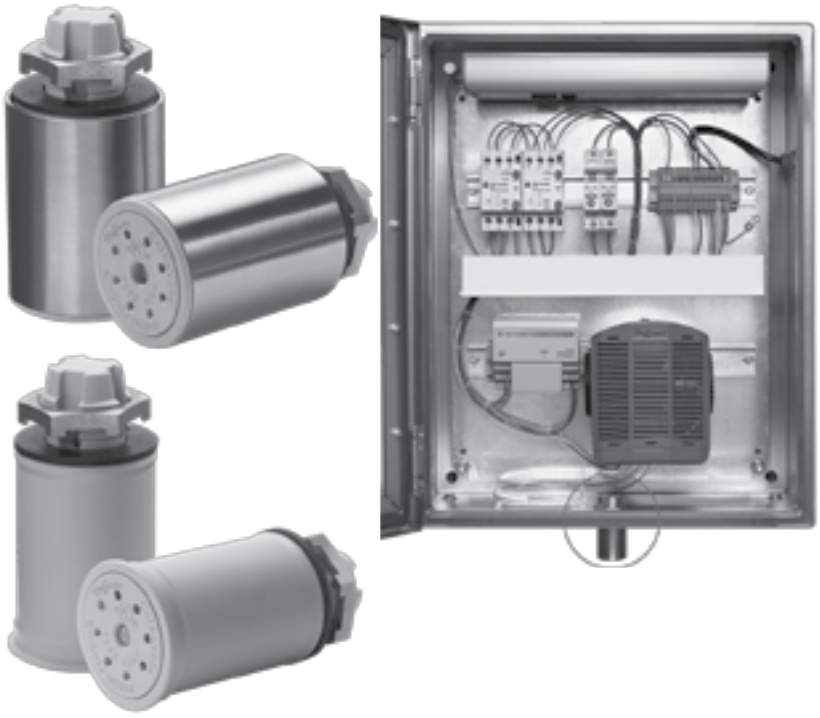
H2OMIT™ VENT DRAINS



INDUSTRY STANDARDS

Maintains UL/cUL Type 4, 4X rating when properly installed on a UL/cUL Type 4 or 4X enclosure.

UL 508A Listed; Type 4, 4X; File No. E61997
cUL Listed per CSA C22.2 No 94; Type 4, 4X; File No. E61997

NEMA/EEMAC Type 4, 4X
IEC 60529, IP66

APPLICATION

H2OMIT™ Vent Drains allow accumulated water to drain out the bottom of an enclosure. The UL-approved vent drains also function as an air pressure equalizer, reducing the harmful effects of temperature-induced vacuums that could pull water and moisture into the enclosure.

FEATURES

- Uses gravity to remove collected liquids
- One-way mechanical shut-off when pressure is equalized prevents water and contaminants from entering the enclosure
- Helps reduce corrosion that can limit the life of internal electrical and electronic components
- Installs in a 7/8-in. hole in the bottom of enclosure with provided nut or in a 1/2-in. NPT/NPS threaded conduit hub
- Installs in the bottom of mild steel, aluminum, stainless steel or non-metallic enclosures
- Maintains enclosure's UL Type rating when properly installed

SPECIFICATIONS

Stainless Steel Vent Drain

- Corrosion-resistant polyester material with a Type 304 stainless steel sleeve
- 2.00-in. long x 1.38-in outside diameter

Non-Metallic Drain Vent

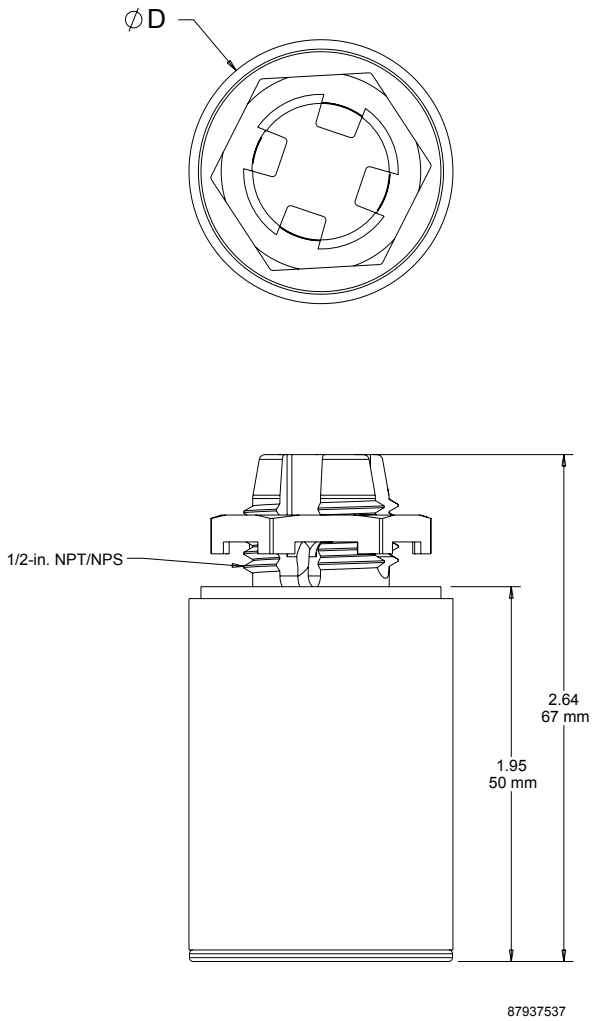
- Corrosion-resistant polyester material
- 2.00-in. long x 1.25-in. outside diameter

5

Performance Data **H2OMIT Vent Drains**

CATALOG NUMBERS	AVDR4NM	AVDR4SS4
UNIT CONSTRUCTION		
Description	Non-metallic Vent Drain	Stainless Steel Vent Drain
D (in./mm)	1.25/32	1.38/35
Quantity	1	1

H2OMIT Vent Drains



H2OMIT™ THERMOELECTRIC DEHUMIDIFIER

INDUSTRY STANDARDS

UL 508A Listed; File No. E61997
cUL Listed per C22.2 No. 14; File No. E61997

CE

APPLICATION

The H2OMIT™ Thermoelectric Dehumidifier removes moisture from the air within an enclosure, providing an inexpensive yet highly effective way to protect electronic and electrical components from condensation.

FEATURES

- Reduces corrosion that can limit the life of internal electrical and electronic components
- Condenses moisture from internal enclosure air and standing liquids
- Built-in drain provision with plastic hose directs collected moisture to the Vent Drain (sold separately)
- Rotating side air vents direct recirculating air away from critical controls
- Mounts via DIN rail on internal panel or mounts directly onto the inside bottom of enclosure above the Vent Drain (sold separately)
- Can be used in mild steel, aluminum, stainless steel and non-metallic enclosures

SPECIFICATIONS

- High-impact ABS shell
- Operates on 24-Volt DC power
- 4.5 A max. (84 W)
- Runs continuously above 32 F[a] (power supply not included)
- Removes 8 oz. of moisture in 24 hours
- Compact 6.00-in. x 5.50-in. x 5.75-in. design
- One Thermoelectric Dehumidifier includes:
  - Four feet of plastic hose
  - Two hose retainers
  - One double-ended hose retainer
  - Six inches of Velcro®
  - Seven-inch strip of DIN rail
  - Two mounting screws

Must be used with UL-certified drain to remove pooled liquid from enclosure.
[a]If continual operation is not desired, a Mechanical Hygrostat (AMHUM) can be wired to the thermoelectric dehumidifier and then set to turn the dehumidifier on at the desired relative humidity.

VELCRO is a trademark of Velcro Industries B.V.

Performance Data **H2OMIT Thermoelectric Dehumidifier**

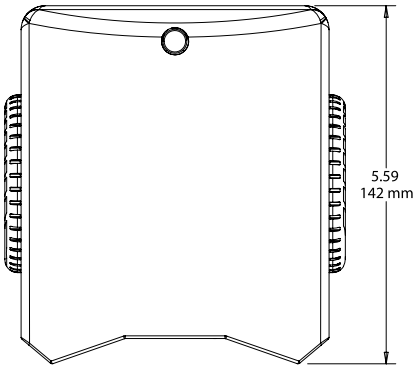
CATALOG NUMBERS

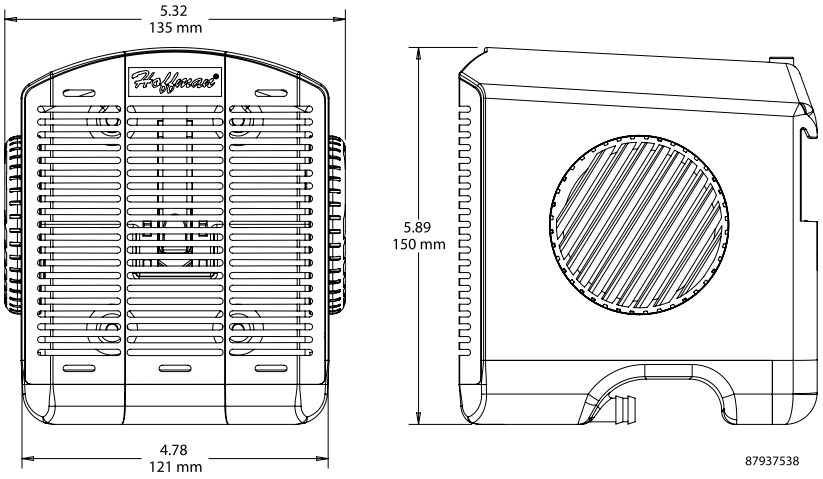
H2OMITTER

Dew Point Temperature : Percent Relative Humidity

Temp. (° F)	100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%	20%	15%	10%
110	110	108	106	104	**102**	100	98	95	93	90	87	84	80	76	72	65	60	51	41
105	105	103	101	99	**97**	95	93	91	88	85	83	80	76	72	67	62	55	47	37
100	100	99	97	95	**93**	91	89	86	84	81	78	75	71	67	63	58	52	44	32
95	95	96	92	90	**88**	86	87	81	79	76	73	70	67	63	59	54	48	40	32
90	90	88	87	85	**83**	81	79	79	74	71	68	65	62	59	54	49	43	36	32
85	**85**	**83**	**81**	**80**	**78**	76	74	71	69	67	64	61	58	54	50	45	38	32	—
80	80	78	77	75	73	71	69	67	65	62	59	56	53	50	45	40	35	32	—
75	75	73	72	70	68	66	64	62	60	58	55	52	49	45	41	36	32	—	—
70	70	68	67	65	63	61	59	58	55	53	50	47	44	40	37	32	—	—	
65	65	63	62	60	59	57	55	53	50	48	45	42	40	36	62	—	—	—	—
60	60	58	57	55	53	52	50	48	45	43	41	38	35	32	—	—	—	—	—
55	55	53	52	50	49	47	45	43	40	38	36	33	32	—	—	—	—	—	—
50	50	48	46	45	44	42	40	38	36	34	32	—	—	—	—	—	—	—	—
45	45	43	42	40	39	37	35	34	32	—	—	—	—	—	—	—	—	—	—
40	40	39	37	35	34	32	—	—	—	—	—	—	—	—	—	—	—	—	—
35	35	34	32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
32	32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Definition: Dew Point is the temperature at which condensation forms. If the temperature of the enclosure is 85 F and the relative humidity is 80 percent, Dew Point is reached at a temperature of 78 F or below.
This means that moisture vapor will condense on any surface that is below the Dew Point temperature of 78 F.





TOUCH-SAFE HEATERS

INDUSTRY STANDARDS

cURus Component Recognized; File No. E150057

IP 20
CE

APPLICATION

Protect electronic, mechanical equipment from low temperatures, condensation, and corrosion with this heater, which will maintain stable enclosure temperatures by using natural convection resulting in current circulation of warm air.

SPECIFICATIONS

- Heating element PTC resistor - temperature limiting
- Double Insulated Protection
- Mounting clip for 35mm DIN rail, EN 60 715
- Vertical mount

FINISH

- UL 94 V-0 Black Plastic Housing

Performance Data

CATALOG NUMBERS	DAH101TS	DAH201TS	DAH501TS
Electrical Data			
Rated Voltage (AC/DC)	**110/120**	**110/120**	**110/120**
Power Consumption (Watts)	10	20	50
Start Nominal Current (Amps)	2.5	4.5	8
Unit Construction			
H x W x D (in./mm)	3.9 X 1.5 X 3.0/98 x 38 x 75	3.9 X 1.5 X 3.0/98 x 38 x 75	4.3 X 2.4 X 3.5/110 x 60 x 90
Weight (oz)	5.0	6.1	10.4

SEMICONDUCTOR HEATERS

INDUSTRY STANDARDS

cURus Component Recognized; File No. E150057

IEC IP54
CE

APPLICATION

Protect electronic, pneumatic, hydraulic and mechanical equipment from low temperatures, condensation and corrosion with this heater, which maintains a stable enclosure temperature.

SPECIFICATIONS

- PTC (Positive Temperature Coefficient) heating element
- Mounting clip for 35-mm DIN rails EN 50022

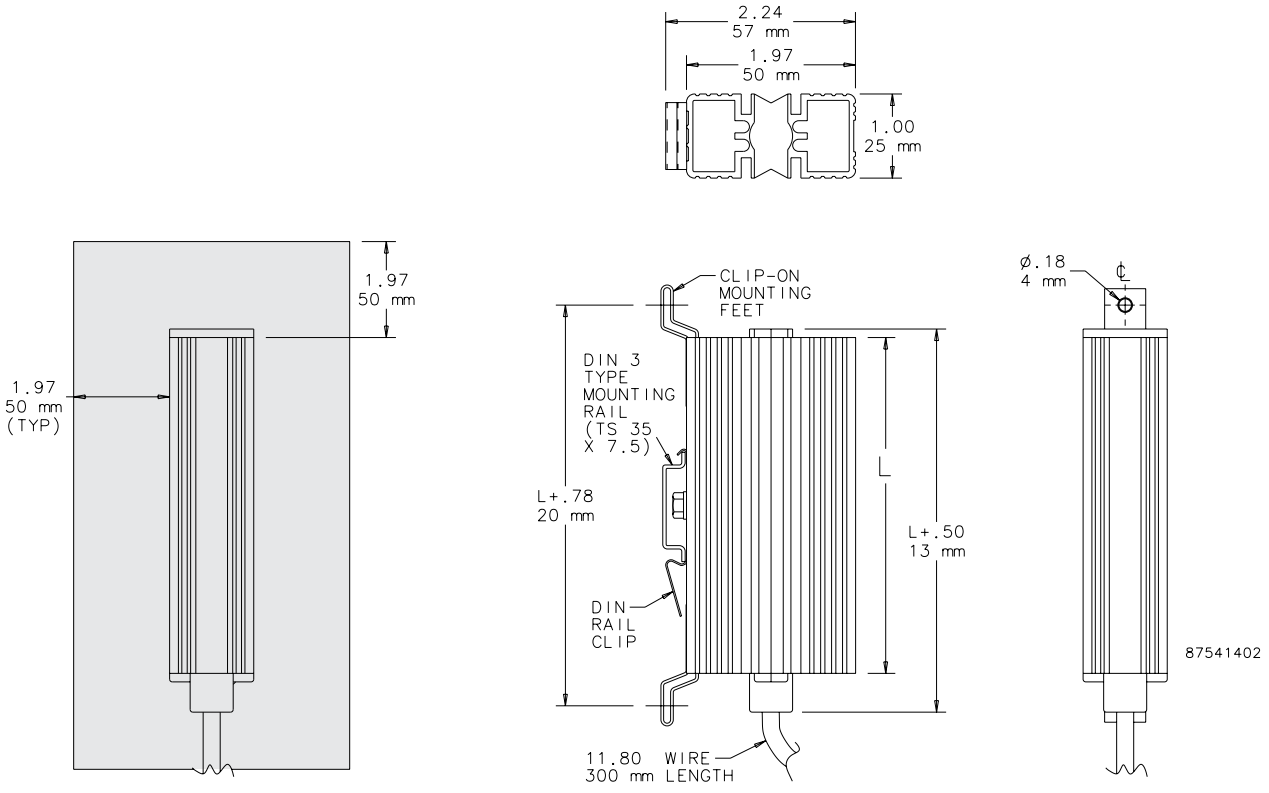
FINISH

- Black anodized, extruded aluminum.

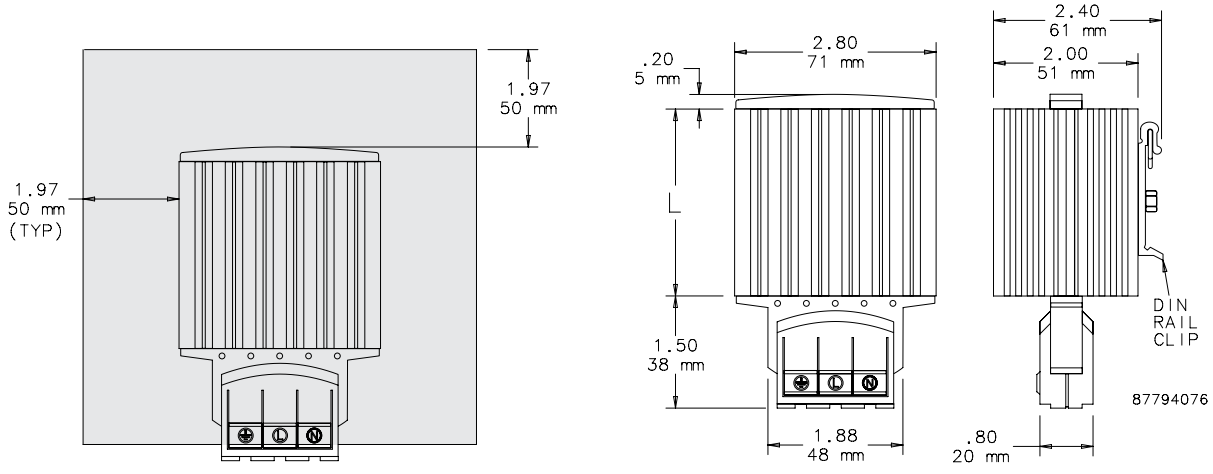
Performance Data **Semiconductor Heater**

CATALOG NUMBERS	DAH101	DAH301	DAH601
ELECTRICAL DATA			
Rated Voltage	**AC/DC 110/120**	**AC/DC 110/120**	**AC/DC 110/250**
Power Consumption (Watts)	10	30	60
Start Nominal Current (Amps)	0.8	1.2	2.5
HEATING PERFORMANCE			
Watts	**10**	**30**	**60**
UNIT CONSTRUCTION			
L (in./mm)	1.97/50	3.93/100	5.5/140
Weight (lb./kg)	0.45/0.20	0.66/0.30	1.10/0.50

Clearance Range for DAH101 and DAH301



Clearance Range for DAH601



ELECTRIC HEATERS

115/230 Volt
100/200 Watt

115/230 Volt
400/800 Watt

115/230 Volt
1300 Watt

INDUSTRY STANDARDS

UL 508A Component Recognized; File No. E61997

CSA Certified, CSA File No. LR42186
CE

APPLICATION

Protect mechanical, electrical and electronic equipment from low temperatures, condensation and corrosion with this thermostatically controlled, fan-driven heater that maintains a stable enclosure temperature.
Fan draws cool air from the bottom of the enclosure and passes this air across the thermostat and heating element before being released into enclosure cavity. Heated air is discharged through the top of the heater unit.

SPECIFICATIONS

- Aluminum housing
- Thermostat range adjustable from 0 F to 100 F (-18 C to 38 C)
- Four 10-32 x self-tapping screws are included with each heater
- Ball bearing fan
- Terminal strip with clamp connector that accepts both solid and stranded wire

FINISH

- Brushed aluminum

⚠ CAUTION

These electric heaters are not designed for use in dusty, dirty, corrosive, or hazardous locations. Portions of the heater can get hot. Adequate protection must be taken to protect people from potential burns, and to protect other components from this heat. Pentair Technical Products recommends this heater only be installed in a totally-enclosed metal enclosure.

DO NOT INSTALL HEATERS ON WOOD PANELS. Heat sensitive components should not be placed near the heater discharge area since this air can be quite warm. The clearance range defines the space that must be kept free of these components for proper and safe operation of the heater.

Performance Data **100 and 200 Watt Heaters**

CATALOG NUMBERS	DAH1001A	DAH1002A	DAH2001A	DAH2002A
ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**115**	**230**
Frequency (Hz)	50/60	50/60	50/60	50/60
Power Consumption (Watts)	100	100	200	200
Nominal Current (Amps)	0.98	0.49	1.89	0.95
HEATING PERFORMANCE				
Watts	**100**	**100**	**200**	**200**
UNIT CONSTRUCTION				
Weight (lb./kg)	1.6/0.73	1.6/0.73	1.6/0.73	1.6/0.73
X (in./mm)	4.00/102	4.00/102	4.00/102	4.00/102

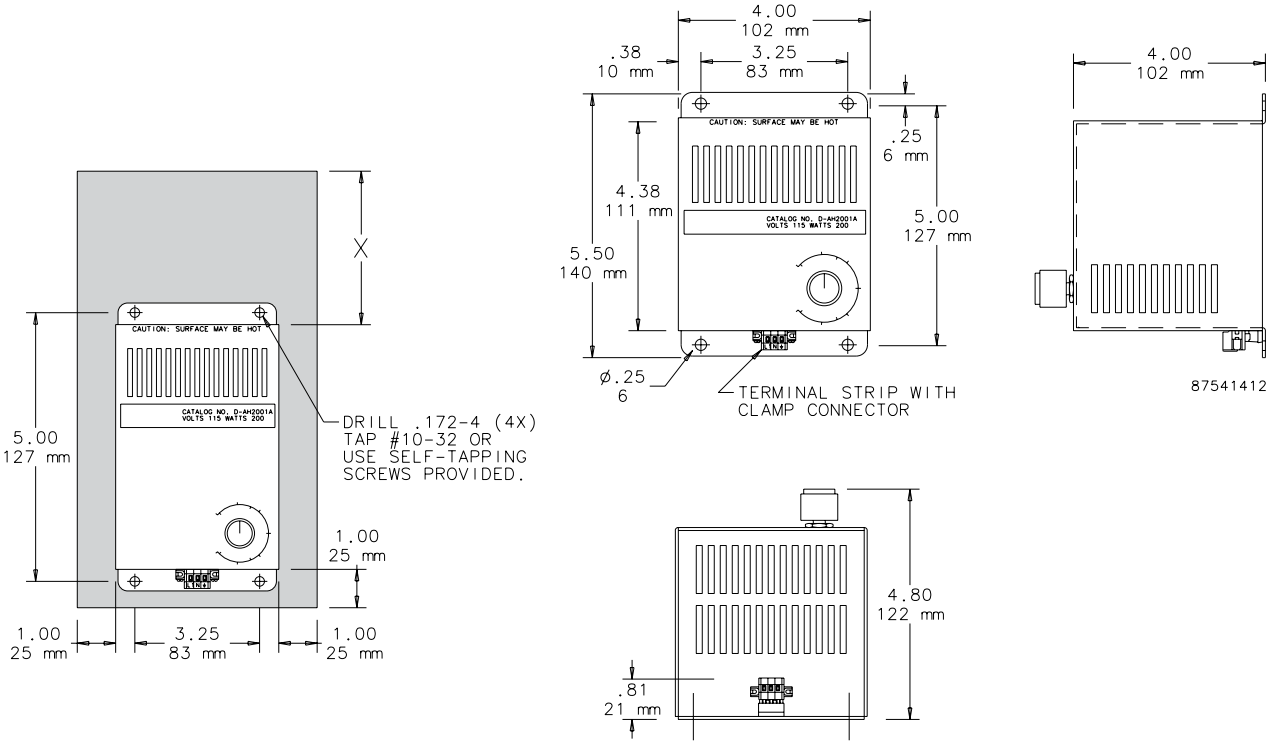
Performance Data **400 and 800 Watt Heaters**

CATALOG NUMBERS	DAH4001B	DAH4002B	DAH8001B	DAH8002B
ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**115**	**230**
Frequency (Hz)	50/60	50/60	50/60	50/60
Power Consumption (Watts)	400	400	800	800
Nominal Current (Amps)	3.72	1.86	7.37	3.69
HEATING PERFORMANCE				
Watts	**400**	**400**	**800**	**800**
UNIT CONSTRUCTION				
Weight (lb./kg)	2.2/1.00	2.2/1.00	2.2/1.00	2.2/1.00
X (in./mm)	6.00/152	6.00/152	8.00/203	8.00/203

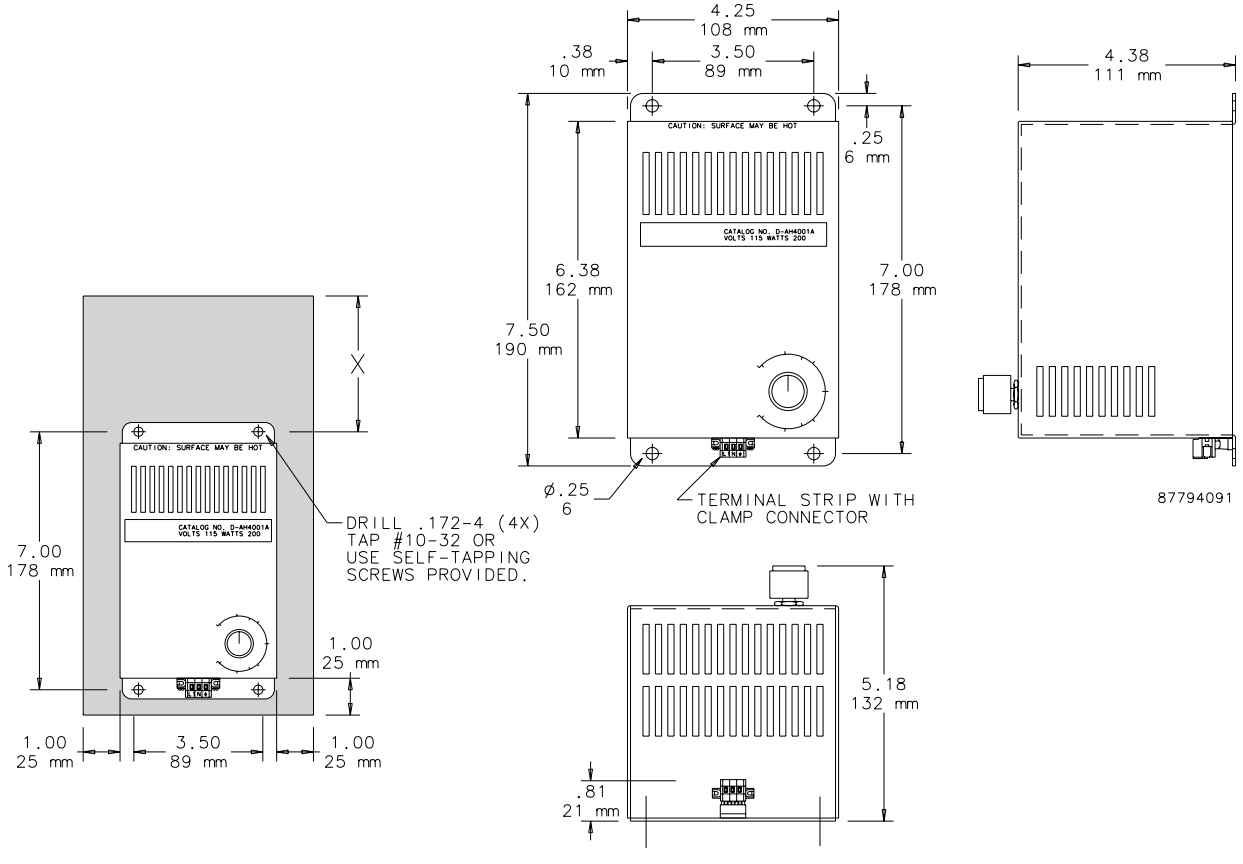
Performance Data **1300 Watt Heaters**

CATALOG NUMBERS	DAH13001C	DAH13002C
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Power Consumption (Watts)	1300	1300
Nominal Current (Amps)	11.5	5.7
HEATING PERFORMANCE		
Watts	**1300**	**1300**
UNIT CONSTRUCTION		
Weight (lb./kg)	3.4/1.54	3.4/1.54
X (in./mm)	8.00/203	8.00/203

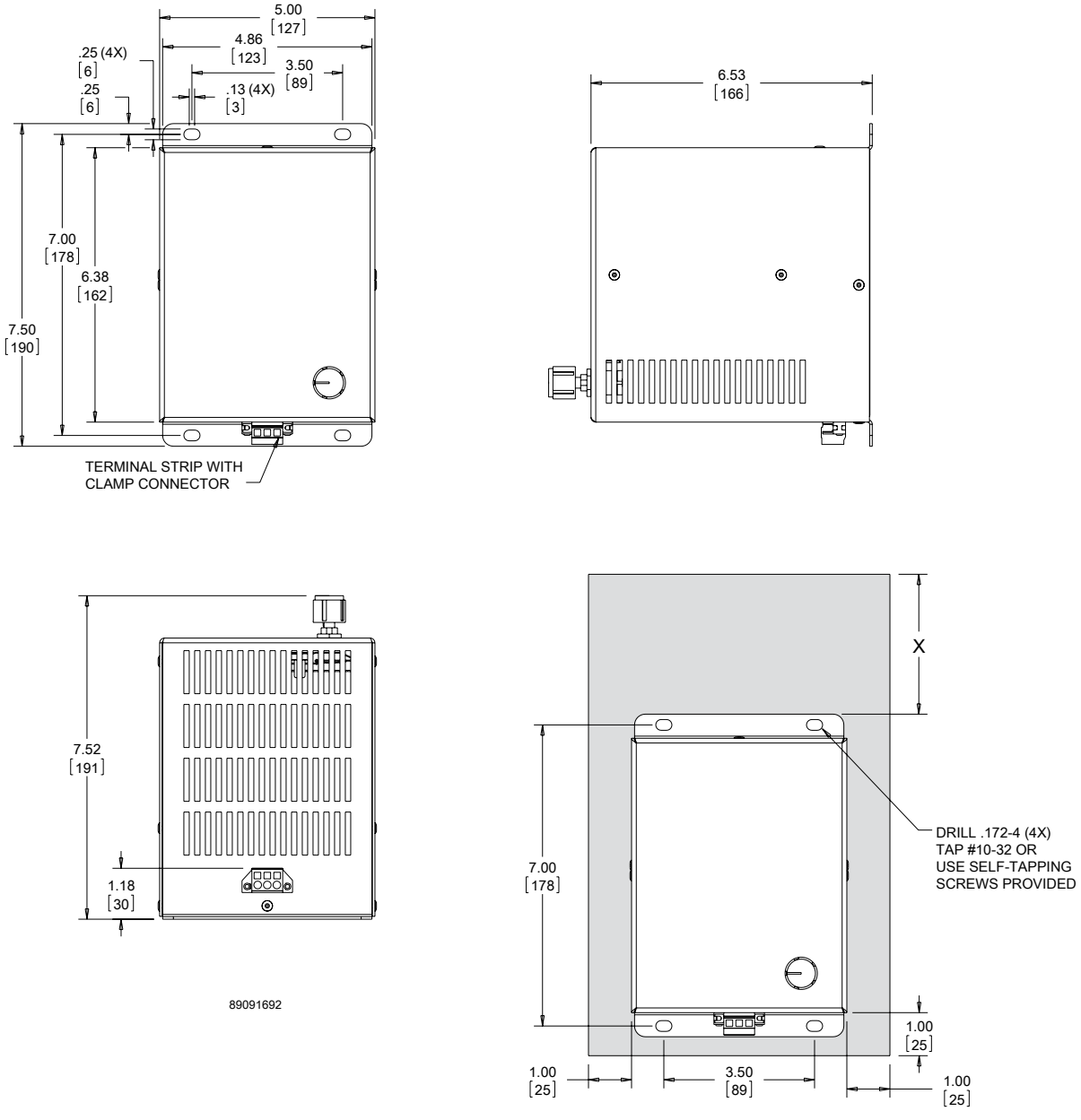
Dimensions and Clearance Range Drawing for DAH1001A, -2A and DAH2001A, -2A



Dimensions and Clearance Range Drawing for DAH4001B, -2B and DAH8001B, -2B



Dimensions and Clearance Range Drawing for DAH13001C and DAH13002C



HAZARDOUS LOCATION HEATER

INDUSTRY STANDARDS

CE
Conformity Certificate LCIE (Laboratoire Central des Industries Electriques) LCIE 01 ATEX 6073
EEx d IIC T4/II 2 GD, IP6x T135°C
IEC 60529, IP65/I (grounded)

APPLICATION

Designed for use in hazardous locations where electronic components require protection from condensation and corrosion, sudden temperature drops and low temperatures.

FEATURES

- Maintenance-free
- High-performance heating cartridge (element)
- Large convection surface
- Extruded aluminum heat sink
- DIN clip for mounting
- Connection cable: Si HF-JZ 3 x AWG 18 x 3.3 ft. (0.75 mm² x 1 m)
- Operating voltage 110-120 VAC

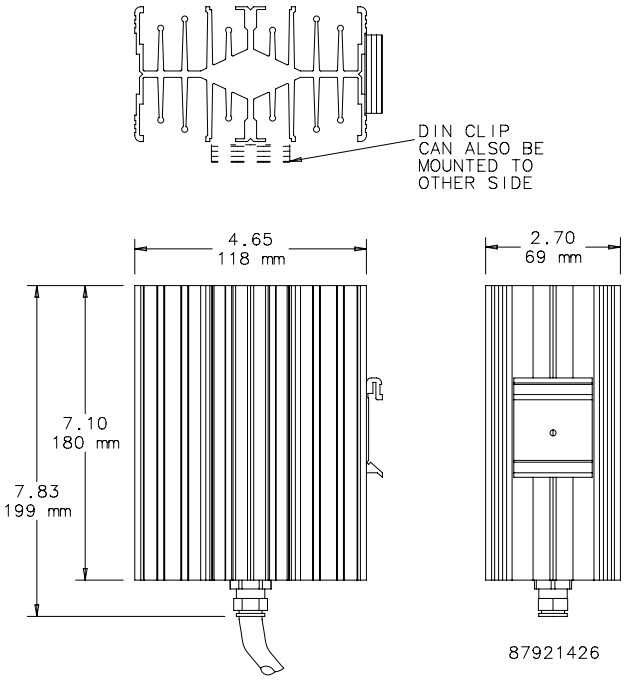
FINISH

- Black anodized

Performance Data **Hazardous Location Heater**

CATALOG NUMBERS	HLHEAT100
DESIGN DATA	
Heating Power (Watts)	100
Surface Temperature T4 (°F/°C) *	275/135
UNIT CONSTRUCTION	
Unit Dimensions - H x W x D (in. / mm)	7.10/180 x 4.65/118 x 2.70/69

* Surface temperature when mounted vertically.



THERMOSTAT CONTROLLER

FEATURES

- Saves energy, reduces filter replacement frequency and extends filter fan life
- Terminal block connection
- 38-mm DIN rail mounting bracket (according to EN 60715) and screws included

FINISH

- RAL7035 light gray
- Plastic housing UL94 V-0

NOTES

Caution: When setting the temperature of the break contact (NC) and the changeover contact (CO) to use it as a break contact, care must be taken to add the maximum hysteresis (that consists of the switching difference and the operating tolerance) to the required minimum temperature. For instance, if the temperature in the enclosure may not fall below 5 C, the controller must be set to 5+7+3=15 C (with a switching) difference of 4-7 k and tolerance of +/- 3 k.

Performance Data **Thermostat Controller**

CATALOG NUMBERS	TWR60
DESIGN DATA	
Control Range (°F / °C)	-4 / -20 to 104 / 40 or 32 / 0 to 140 / 60 or 68 / 20 to 176 / 80 (see type plate)
Switching Differences:	
Bimetal controllers	Approx. 1 k, approx. 3 k, 4-7 k (see type plate)
Capillary controllers	less than 7 k
Contact	Snap contact as break contact = NC Make contact = NO Changeover contact = CO (see type plate)
Switching Capacity:	
Break contact/make contact	100V...250V / 10(2)A, at 4 max. 30 W
Changeover contact - heating	100V...250V / 10(2)A, at 4 max. 30 W
Changeover contact - cooling	100V...250V / 15(2)A, at 4 max. 30 W
Supply Voltage	**Controller (CO) requires 230V**
Protection	IP20
Switchpoint Tolerance	+/- 3k
Sensor	Bimetal
Power Connection	Terminal screws 0.5 to 2.5 mm^2
Bimetal Controller Ambient Temperature:	
T40	-4 / -20 to 104 / 40
T60	32 / 0 to 140 / 60
T80	68 / 20 to 176 / 80
Storage Temperature (°F / °C)	-4 / -20 to 140 / 60
UNIT CONSTRUCTION	
Unit Dimensions - H x W x D (in. / mm)	2.52 x 1.46 x 1.81 / 64 x 37 x 46
Weight (oz / g)	1.8 / 50

DUAL THERMOSTAT

INDUSTRY STANDARDS

cURus; File No. E164102

CSA File No. 215952
CE

APPLICATION

Two thermostats in one, the Dual Thermostat independently controls equipment heating and cooling systems.

FEATURES

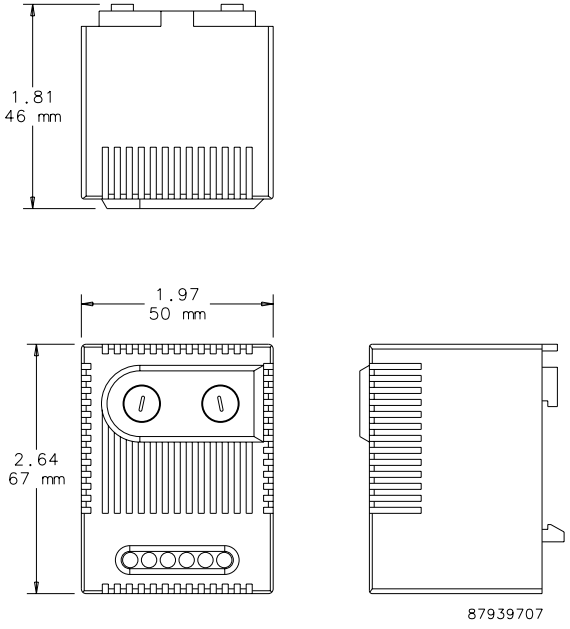
- Two thermostats; one normally closed (NC), red, and one normally open (NO), blue, in one casing
- Wide adjustable temperature range (32 -140 F)
- Thermostatic bimetallic sensor element
- Connection: 4-pole terminal for AWG 14 max (2.5 mm^2)
- Mounting clip for 35-mm DIN rail

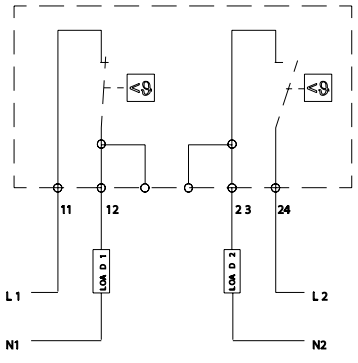
FINISH

- Light-gray plastic, UL94V-0

Performance Data **Dual Thermostat**

CATALOG NUMBERS	ADLTEMP
ELECTRICAL DATA	
Switching Capacity (Normally Closed)	10 A resistive/2 A inductive @250 VAC, DC 30 W
Switching Capacity - Normally Open	5 A resistive/2 A inductive @250 VAC, DC 30 W
Setting Range - Normally Closed (°F/C°)	32/0 to 140/60
Setting Range - Normally Open (°F/C°)	32/0 to 140/60
UNIT CONSTRUCTION	
Unit Dimensions - H x W x D (in./mm)	2.64/67 x 1.97/50 x 1.81/46





CONNECTION DIAGRAM

ELECTRONIC HYGROTHERM

APPLICATION

The Electronic Hygrotherm senses ambient temperature and relative air humidity and adjusts a connected device to maintain temperature and humidity set points.

FEATURES

- Temperature (32-140 F) and humidity (50%-90% RH) adjustment
- High switching capacity
- Optical function displays (LED) in each control
- Mounting clip for 35-mm DIN rail
- Change-over contact (relay)
- Connection: 5-pole terminal for AWG 14 max (2.5-mm square). Clamping torque .5 Nm (4.4 in-lbs) maximum.
- Plastic housing UL94V-0
- Vertical mounting
- Operating voltage is AC 100-240 V with maximum switching capacity of 10 A resistive / 1.6 A inductive at AC 240 V

FINISH

- Light-gray plastic UL94V-0

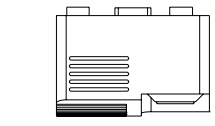
INDUSTRY STANDARDS

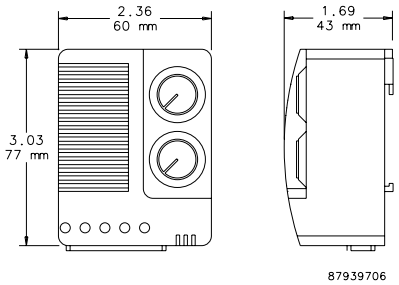
cURus; File No. E164102

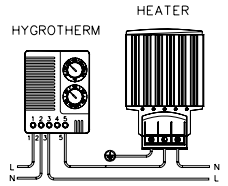
CE

Performance Data **Electronic Hygrotherm**

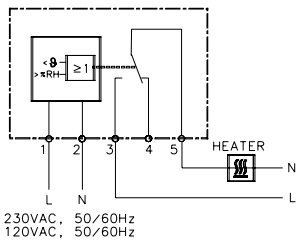
CATALOG NUMBERS	ATEMHUM
ELECTRICAL DATA	
Hysteresis	~ 3.6 F (2K) ± 1.8 F (1K) tolerance
Humidity Set Point (adjustable)	50-90% RH
Temperature Set Point (adjustable) (°F/°C)	32/0 to 140/60
Operating Temperature Range (°F/°C)	-40 to 140/-40 to 60
Storage Temperature (°F/°C)	-40 to 140/-40 to 60
CONTACTS	
3 and 5	
Close at...	humidity rise or temperature drop
Open at...	humidity drop or temperature rise
Use for...	heaters, dehumidifiers, low-temp alarms
4 and 5	
Close at...	humidity drop or temperature rise
Open at...	humidity rise or temperature drop
Use for...	cooling, humidifiers, high-temp alarms
UNIT CONSTRUCTION	
Unit Dimensions - H x W x D (in./mm)	3.03/77 x 2.36/60 x 1.69/43







EXAMPLE OF CONNECTION



CONNECTION DIAGRAM

MECHANICAL HYGROSTAT

INDUSTRY STANDARDS

cURus; File No. E164102

CE

APPLICATION

The Mechanical Hygrostat controls relative air humidity inside an enclosure to prevent condensation and corrosion that can damage components. It can also be connected to an enclosure heater, cooling fans, warning lights or other devices.
The critical relative humidity (RH) level for most components is 65 percent. Above 65 percent RH, condensation can form and cause electronic equipment to malfunction.

FEATURES

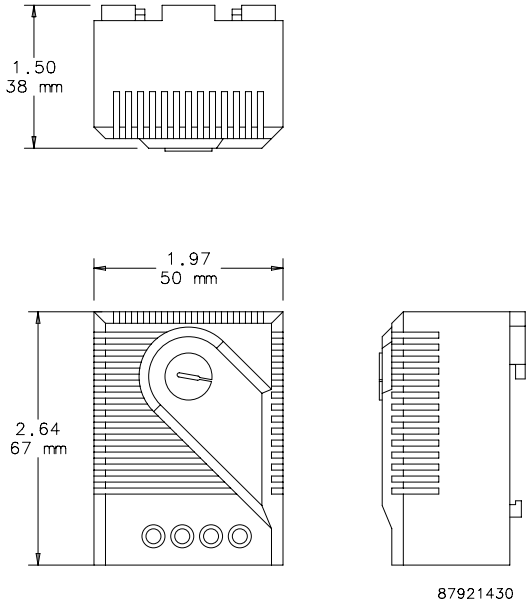
- Adjustable relative humidity range
- High switching capacity
- Long service life (>100,000 cycles)
- Maximum permissible air velocity of 50 ft./sec. (15 m/s)
- Maximum switching voltage = 250 VAC
  250 V should be switched only in a non-condensing environment
- Change-over contact
- Mounting clip for 35-mm DIN rail
- Connection: 3-pole terminal for AWG 14 max. (2.5-mm squared)
- Contact resistance less than 10 mΩ

FINISH

- Light-gray plastic, UL94V-0

Performance Data **Mechanical Hygrostat**

CATALOG NUMBERS	
	AMHUM
ELECTRICAL DATA	
Switching Capacity (Minimum)	100mA @ AC/DC 20 V
Switching Capacity (Maximum)	5A @ AC 250 V (resistive load) 0.2A @ AC 250 V (inductive load at cos O = 0.8) DC 20W
Operating Temperature Adjustable) (°F/°C)	32/0 to 140/60
Storage Temperature (°F/°C)	-40/-40 to 140/60
UNIT CONSTRUCTION	
Unit Dimensions - H x W x D (in./mm)	2.64/67 x 1.97/50 x 1.5/38
Weight (oz/g)	2/60



TEMPERATURE CONTROL SWITCH

INDUSTRY STANDARDS

cURus; File No. E164102
UL94-V0

Protection rating IEC IP30
CSA Certified, File Number 215952
CE

APPLICATION

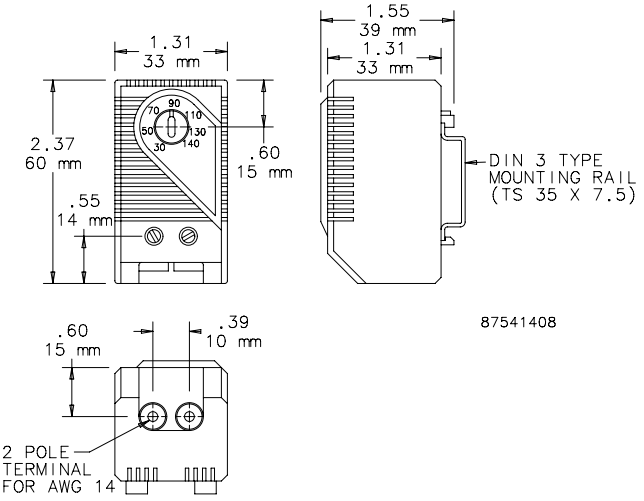
These easy-to-install thermostats regulate and monitor air temperature in enclosures that contain heat-emitting equipment. Thermostats prolong heater and fan life expectancy by controlling operation time and increase electrical component working efficiency by exposing them to fewer environmental contaminants.

FEATURES

- Additional label for conversion to Celsius scale and blank label to cover set point range label when adjustment after initial setting is not desired are included
- Bimetal temperature sensor
- Plastic housing
- Connections consist of tubular screw terminals for AWG 14 (.04 sq. in.)
- Provision for both panel mounting and DIN rail mounting

FINISH

- Molded plastic housing is black



Performance Data **Temperature Control Switch**

CATALOG NUMBERS		
	ATEMNC	ATEMNO
ELECTRICAL DATA		
Maximum Load (Switching Capacity)		
120 VAC	15 A resistive / 2 A inductive @ 120 VAC	
250 VAC	10 A resistive / 2 A inductive @ 250 VAC	
DC	DC 30 W	
Minimum load	20 mA (all voltages)	
Contact Type	NC (normally closed), quick acting	NO (normally open), quick acting
Control Application	Heater	Fan
UNIT CONSTRUCTION		
Unit Dimensions - H x W x D (in./mm)	2.37/60 x 1.31/33 x 1.55/39	

PANEL-MOUNT FAN SPEED CONTROLS

APPLICATION

Perfect for offices, classrooms and other noise-sensitive areas. Fan Speed Control optimizes airflow in a cabinet or rack, balancing air volume requirements with noise level and power use.

FEATURES

- Automatically adjusts fan speed depending on remote temperature sensor input
- Temperature set point is field adjustable; preset at 35 C (95 F)
- Idle speed and temperature slope are field-adjustable
- Push-to-reset thermal circuit breaker inside control housing
- Compact polycarbonate control housing can be mounted in any position
- NEMA 5-15R outlet provides power to fan
- Six-foot (1.83-m) power cord plugs into standard 120 V, 50 or 60 Hz outlet
- Remote temperature sensor with 10-ft. (3.05-m) lead mounts in airflow
- Mounting brackets included

FINISH

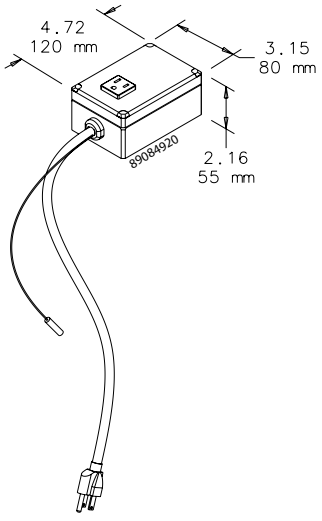
- AFANTSC: Light-gray polycarbonate control housing

INDUSTRY STANDARDS

UL 508 Listed; File No. E249700
cUL Listed per CSA C22.2 No. 14; File No. E249700

Performance Data **Panel-Mount Fan Speed Controls**

CATALOG NUMBERS	
	AFANTSC
ELECTRICAL DATA	
Rated Voltage	**120 VAC**
Maximum Nominal Current (Amps)	2
Temperature Settings (°F)	86, 95, 104, 113
Temperature Settings (°C)	30, 35, 40, 45
DESIGN DATA	
Description	Panel-Mount Fan Speed Control
Application	Fan speed controlled automatically with remote temperature sensor



HAZARDOUS LOCATION THERMOSTAT

APPLICATION

Compact mechanical thermostat for temperature control of heaters or low-temperature alarms in enclosures that are used in explosion-hazardous areas.

FEATURES

- Compact design
- Set temperature
- High switching capacity
- Small hysteresis (switching difference)
- Long service life (greater than 100,000 cycles)
- Can usually be connected directly and switched without the need for additional relays
- Thermostatic bimetallic sensor element
- One-pole contact opens with rising temperature
- Mounting bracket and DIN clip for mounting
- Connection cable: Si HF - JZ 3 x AWG 18 x 3.3 ft. (0.75 mm² x 1 m)

FINISH

- Black anodized aluminum

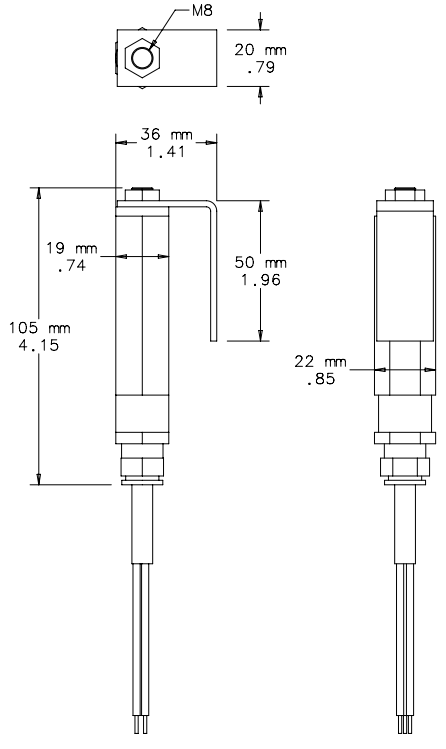
INDUSTRY STANDARDS

CE
Conformity Certificate LCIE (Laboratoire Central des Industries Electriques) LCIE 01 ATEX 6074

EEx d IIC T6/II 2 GD, IP6x T85 °C
IEC 60529, IP65/1 (grounded)

Performance Data **Hazardous Location Thermostat**

CATALOG NUMBERS	
	HLTHERMNC
DESIGN DATA	
Maximum Operating Voltage (AC)	250 V
Maximum Operating Voltage (DC)	100 V
Switching Capacity @ 250 VAC	4A resistive; 1A ind. (cos f = 0.6)
Switch Off (Open) Temperature (°F)	77 +/- 6
Switch Off (Open) Temperature (°C)	25 +/- 3K
Switch On (Closed) Temperature below Switch Off Temperature (°F)	7.2 +/- 2
Switch On (Closed) Temperature below Switch Off Temperature (°C)	4 +/- 1K



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Notes

STAINLESS STEEL PRESSURE COMPENSATION

INDUSTRY STANDARDS

CE
NEMA Type 4X
IEC/EN 60529, IP66

APPLICATION

Pressure differentials in a tightly sealed enclosure result from heat generated by electrical and electronic equipment within the enclosure and fluctuations of outside ambient temperature. Stainless steel pressure compensation devices provide IP66 protection in corrosive applications requiring slow pressure equalization. For optimal performance, install two plugs diagonally to each other.

FEATURES

- Air permeability = 42 cubic feet/hour (1,200 liters/hour) at a pressure difference of min. 70 mbar
- Easy installation: drill one 1.60-in. (41-mm) diameter hole
- Sealing gasket (Nitrile Buna-N Rubber)

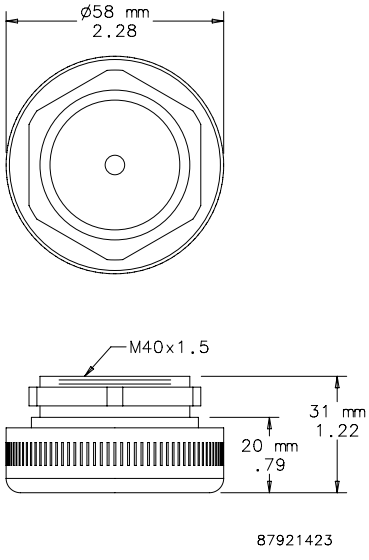
SPECIFICATIONS

- Type 316L stainless steel
- Semipermeable membrane inside the plug filters moisture and dust
- Mounting thread M40 with union nut

FINISH

- Machined Type 316L stainless steel

CATALOG NUMBERS	
	APCDSS6
UNIT CONSTRUCTION	
Operating/Storage Temperature (°F/°C)	-40/-40 to 176/80
Unit Dimenstions (in./mm)	2.28/58Ø x 1.22/31
Depth into Enclosure (in./mm)	.35/9



PRESSURE COMPENSATION

INDUSTRY STANDARDS

UL Type 1, 4, 4X; File No. E234324

CE
IEC/EN 60529, IP66

APPLICATION

Pressure differentials in a tightly sealed enclosure result from heat generated by electrical and electronic equipment within the enclosure and fluctuations of outside ambient temperature. Pressure compensation devices provide IP66 protection in applications requiring slow pressure equalization. For optimal performance, install two plugs diagonally to each other.

FEATURES

- Air permeability = 42 cubic feet/hour (1,200 liters/hour) at a pressure difference of min. 70 mbar
- Easy installation: drill one 1.60-in. (41-mm) diameter hole
- Sealing gasket (Nitrile Buna-N Rubber)

SPECIFICATIONS

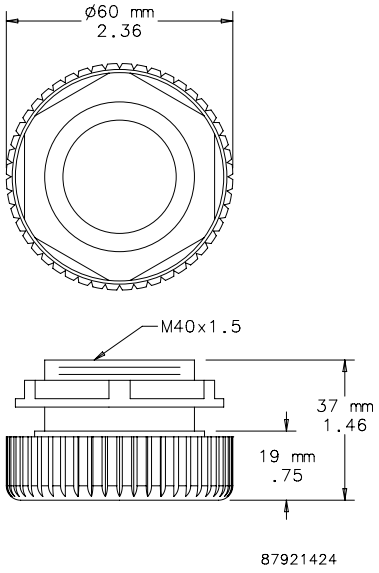
- Semipermeable membrane inside the plug to filter moisture and dust
- Mounting thread M40 with union nut
- Plastic PA66

FINISH

- Light-gray plastic. Polymeric material manufactured by DuPont™ .

DuPont is the trademark of E. I. duPont de Nemours and Company.

CATALOG NUMBERS	
	APCDABS
UNIT CONSTRUCTION	
Operating/Storage Temperature (°F/°C)	-49/-45 to 158/70
Unit Dimensions (in./mm)	2.36/60Ø x 146/37
Depth into Enclosure (in./mm)	.6/15



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