

THERMOELECTRIC PRODUCTS

Catalog No.

10

Air Conditioners

Cold Plates

Liquid Chillers

Accessories

Thermoelectric Modules

teca

When heat is the enemy, TECA is your friend.



www.teca-usa.com



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Hello!

Sometimes I think my interest in thermoelectric cooling and excitement about its potential for so many different applications has a genetic basis. I vividly remember back in the early '60s, my dad—an inveterate tinkerer—came home from work with an armful of thermoelectric components and a fascination with the possibilities they presented. Of course, little did I suspect at the time that I was glimpsing my future.

Thermoelectric cooling has come a long way since the early research conducted by some of the biggest names in the industry, such as Westinghouse, Borg-Warner, General Electric, and 3M. I take great pride in TECA's pioneering role in developing solid-state air conditioners for electronic enclosures. As you'll see in this catalog, today we offer a full line of cooling products from air-cooled and liquid-cooled air conditioners, to cold plates and liquid chillers, plus a wide range of accessories.

But our versatile, quality products are only part of the picture. I am also extremely proud of the dedication that the entire TECA team consistently demonstrates to you, our customers. We are committed to understanding your needs and working with you to design solutions that exceed your expectations.

Remember, when heat is your enemy—TECA is your friend. Give us a call at 888-TECA-USA (888-832-2872) and let us show you what we can do to help you.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mike Mikalauski".

Mike Mikalauski

President



What We Stand On

A former division of Borg-Warner, **TECA** was spun-off as an independent company in 1984. Since then, we have been leading the way in developing and marketing solid-state air conditioners for electronic enclosures.

Today the Chicago-based corporation manufactures a wide range of solid state cooling products, including air-cooled and liquid-cooled air conditioners, cold plates, and liquid chillers. Products are also available for harsh environments such as NEMA-4X as well as hazardous locations such as Class 1, Division 1 and 2. Since our cooling systems are based on solid-state construction, product life expectancy is extremely high and maintenance requirements are exceptionally low.

Our mission

TECA's fundamental purpose is to provide world-class products of superior quality. Our goal is to continue setting the standard in thermoelectric cooling by monitoring and improving our operations to meet our customers' needs and exceed their expectations.

Our guiding principles

Quality is our top priority. We are "**TEAM TECA**," recognizing that our success depends upon the involvement, commitment, and performance of every team member, including suppliers.

Our solutions

We can fulfill all of your cooling requirements, whatever your application. In fact, our engineers may have already developed a solution for an application similar to yours.

We offer complete engineering services, prototype development, and custom-built cooling equipment on an exclusive and confidential basis, enabling us to meet the needs of all our customers, including those in the Original Equipment Market.

We will continue to focus our efforts on the people we serve and the products we produce in order to ensure quality without sacrificing health, safety, or the environment in which we live.

How to use this catalog

We hope you'll view this catalog as a working guide to the possibilities of thermoelectric cooling. We've included a foundation of information designed to help you think about the applications for your company, in addition to detailed descriptions of the off-the-shelf products we offer.



Please keep in mind that we are always willing and available to customize existing products or to design and build new products to meet your needs.

Call us at 888-TECA-USA – we're here to help!
888-732-2872

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The Peltier Effect

Thermoelectric cooling, is a solid-state method of heat transfer through dissimilar semiconductor materials.

It is also called "the Peltier Effect" after the French watchmaker who discovered the phenomenon in the early 19th century. Like their conventional refrigeration counterparts, thermoelectric cooling systems obey the basic laws of thermodynamics. However, the actual system for cooling is different.

In a conventional refrigeration system, the main working parts are the evaporator, condenser, and compressor.

The evaporator surface is where the liquid refrigerant boils, changes to vapor, and absorbs heat energy. The compressor circulates the refrigerant and applies enough pressure to increase the temperature of the refrigerant above ambient level. The condenser helps discharge the absorbed heat into surrounding room air.

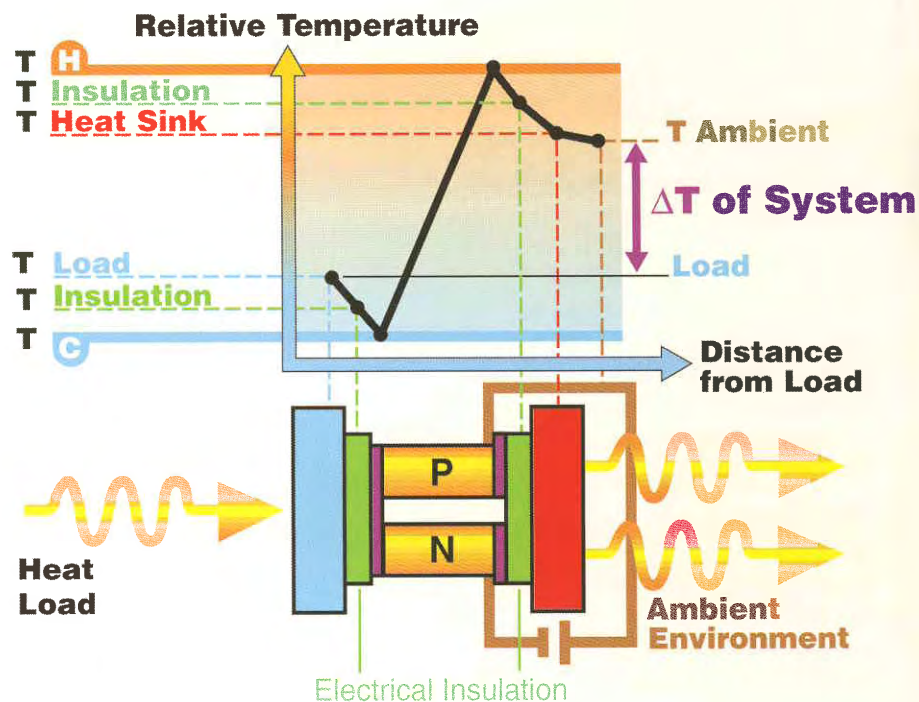
The three main working parts in a thermoelectric refrigeration system are a cold junction, a heat sink, and a DC power source.

Two dissimilar conductors replace the refrigerant in both liquid and vapor form. The cold sink (evaporator surface) becomes cold through absorption of energy by the electrons as they pass from one semiconductor to another, instead of energy absorption by the refrigerant as it changes from liquid to vapor. The DC power source pumps the electrons from one semiconductor to another, and the heat sink (condenser) discharges the accumulated heat energy from the system.

Therefore, the thermoelectric cooling system refrigerates without refrigerant and without the use of mechanical devices, except perhaps in the auxiliary sense.

The semiconductor materials used in thermoelectric cooling are N and P type, named because they either have more electrons than necessary to complete a perfect molecular lattice structure (N-type) or not enough electrons (P-type). The extra electrons in the N-type

material and the holes left in the P-type material are called "carriers," responsible for moving the heat energy from the cold to the hot junction. Good thermoelectric semiconductor materials such as bismuth telluride greatly impede conventional heat conduction from hot to cold areas, yet provide an easy flow for the carriers.



Applications

Application Examples

Solid state cooling solutions help beat the heat more effectively than traditional refrigeration in a wide range of applications from industrial, food service, military, and aerospace to medical, pharmaceutical, and laboratory. Take a look at just a few of the many successful applications:



The U.S. Navy had a need for cooling a small enclosure containing a voice communication system. The shipboard system had to be resistant to salt water corrosion as well as pass shock and vibration testing. Modifications to the **TECA** model **AHP-300X** solid state air conditioner allowed the unit to pass these tests. The next hurdle to overcome was the small available space both inside and outside the enclosure. The heat sinks were turned so that the heat rejection air flow and internal cold side air flow moved in different directions. This unit is a prime example of how flexible Team **TECA** is when customer needs require customization of standard products.

When handling and processing various fluids in laboratory and electronic environments cleanliness is a must. Peristaltic pumps have been developed for the purpose of creating a fluid flow without contacting the fluid itself. **TECA** has developed liquid chillers to cool a fluid while satisfying the same cleanliness requirements. The solution, based on our successful cold plate product line, has proven to be versatile and effective. Applications range from laboratory to medical to industrial.



An original equipment manufacturer required a small cooling solution for outdoor information kiosks before manufacturing could start. We consulted with the customer's engineers and recommended **TECA** model **AHP-300XE**, to provide the necessary cooling in a compact size. **AHP300XE** is a NEMA4 solid state air conditioner, good for this customer because it is designed for outdoor use.

An automation manufacturer requires exact temperature control in a system for pharmaceutical research and development. **TECA** model **FHP-2850** solid state air conditioners provide temperature control for a plate storage/imaging system. Up to 754 plates are stored in the system, with random access for scheduled internal plate imaging. The remainder of the system generates the plates used in various experiments and dispenses small-volumes of chemicals, then seals and returns the plates to storage.



The U.S. Air Force had an overheating problem with a high-tech radio inside the wing of a fighter aircraft. **TECA** provides the solution by making custom cold plates that withstand the shock, vibration, and G forces created by one of the most technically advanced aircraft. In order to assure maximum strength with minimum weight, **TECA's** advanced machining center makes the finned heat sink for each cooler from a single block of material.

A special purpose vehicle manufacturer needs to maintain the temperature of a battery bank in a Class 1 Division 2 explosion proof environment. They are deploying portable communications systems at car racing venues. With our recommendation, this customer has chosen **TECA** model **AHP1800XP**, because ours is the only NEMA4 air conditioner available off-the-shelf which is certified for C1D2 use.



A European manufacturer of special equipment for processing fruits and vegetables uses **TECA** model **AHP1200XE** solid state air conditioners to cool sensitive electronics on their line of produce processing machines which sort products by color, size and weight. The equipment in use is washed down frequently, so the model **AHP1200XE** is ideal because it is certified for NEMA4 and wash-down, while it also carries the CE Mark.

A leading manufacturer of video cameras and mobile electronics communications for law enforcement was thrown for a loop when the thermoelectric vendor they selected admitted that they couldn't meet the delivery promised on a standard cooling assembly. When faced with the question, "Who do you think can help us?" An engineer for the vendor responded that **TECA** was the best choice if they wanted quality and delivery. One week and several phone calls later 16 custom assemblies based on **TECA's** model **AHP-150FF** were delivered in time for testing and installation. Now **TECA** produces these units for the customer in lots of 100.



Design Considerations

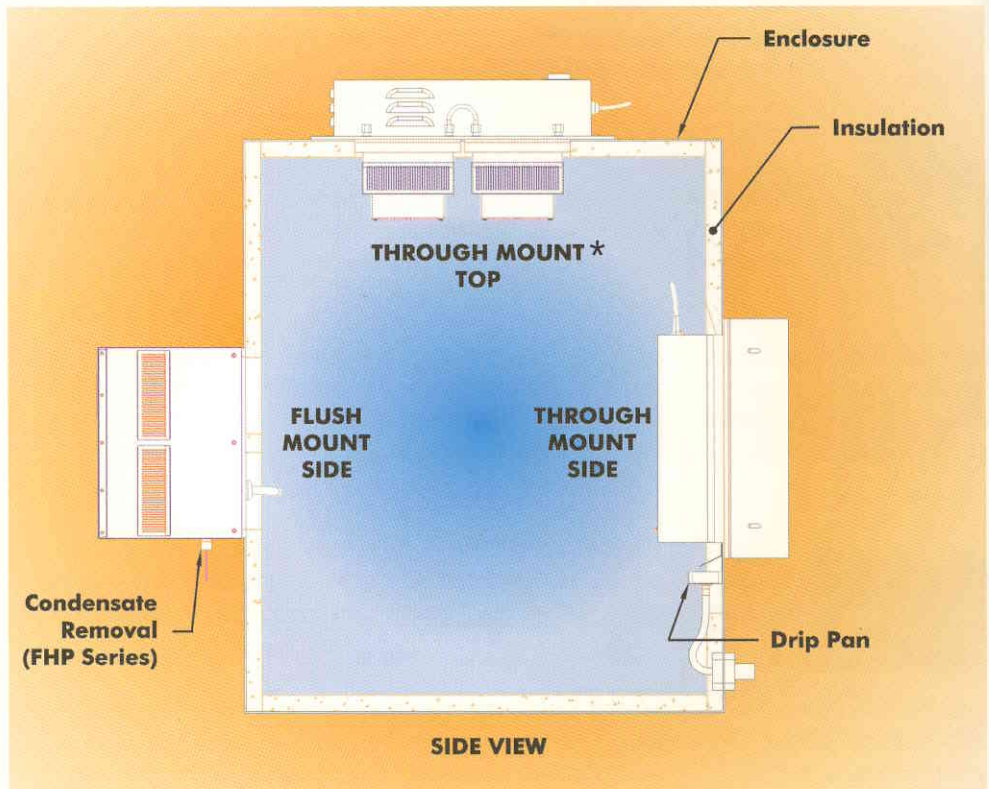
Including:

Mounting Orientation • Moisture Removal • Reliability

COOL HAPPENINGS

Resourceful is our middle name

Creativity and resourcefulness have been the hallmarks of **TECA** since our founding in 1984. Working with one of our earliest customers, we developed a thermoelectric cooler for the computer numerical control (CNC) on his punch tape equipment. The customer preferred an AC power supply to the DC one required, so we built the power supply as part of the air conditioner. Eventually, we reduced the size of the unit and designed it so it could simply plug into a wall socket. This product offered an ideal solution for customers who had electronics in a hostile environment where compressor based air conditioners did not work, or in a dirty environment where filters could not be changed.



Mounting Orientation & Moisture Removal

Side, front, or back mounting is recommended for applications with high humidity or incomplete cabinet seals. Condensation can be removed via moisture collection systems (standard on FHP models and model **AHP-1400**), or a drip pan positioned below the cold side fins. Drip pans are optional for thru mount style units.

Top mounting can make it difficult to collect condensation due to fin orientation and gravity. If a drip pan is used, it must be placed far enough away from the internal fan to minimize the restriction of air flow. The pan should cover the fin ends as well as the fan area. When possible, side orientation is preferred by most users in high humidity environments.

Condensation may form on the cold side fins when their surface temperature goes below the dew point temperature. For all of our products, we provide equations for both enclosure air and fin (cold sink) to help the designer determine if condensation may be a problem.

* Top mount orientation is not recommended if there is any possibility of dripping condensate.

• Air Conditioner Sizing

To reduce the possibility of condensation or to transfer condensate to the outside of the enclosure, consider the following:

- Regulate the fin temperature above the dew point
- Keep the enclosure closed and sealed from outside humidity
- Use desiccant (moisture absorbing granules)
- Do not set the controller for continuous on operation.
- Employ condensate removal system or drip pan.

All FHP-series, **AHP-1400** and **AHP-1501** series air conditioners contain a built-in condensate removal system consisting of an antifungal sponge with a condensate wick. PVC tubing is provided for drainage. The wick should extend below the cooling assembly to allow for a gravity feed. On all other AHP series equipment optional drip pans are available.

Reliability/Mean Time Between Failure

The life expectancy of a thermoelectric device is exceptionally high due to its solid state construction. Service life typically exceeds five years under normal conditions. For individual modules, MTBF's on the order of 200,000 to 300,000 hours at room temperature and 100,000 hours at elevated ambients of 80° C have been calculated.



Our FREE sizing software makes it easy to calculate your cooling needs.

It is available for use on a PC running Microsoft Windows. It requires only about one megabyte of disk space.

Just call toll-free 1-888-TECA-USA (832-2872) or visit www.TECA-USA.com.

COOL HAPPENINGS

Exploring Thermoelectric Cooling

Back in the early 1960's Borg-Warner, General Electric, Westinghouse, 3M, RCA and other major research centers focused a lot of energy (so to speak) on thermoelectrics.

In 1961 issues of *U.S. News & World Report* and *Time*, Borg-Warner ran prominent ads featuring a happy family taking advantage of a small thermoelectric refrigerator in their hotel room.

Although this was not the direction the company ultimately pursued, it signaled excitement about the potential for the new technology.



COOL HAPPENINGS

Going the extra mile

Not only has TECA strived to stay a step ahead, consistently setting the standard in product development and quality – we also go the extra mile in customer service.



Within 60 days, we made two prototypes of Air Transportable

Galley Lavatory (ATGL refrigerators) and personally drove them to the military base in Lexington, Kentucky, for approval. Over the next 2 years we made 500 more, and they're still flying in C130 and C141 military cargo planes.



Ratings

Thermoelectric Modules:

Traditionally thermoelectric modules have been rated at two points under two conditions. The first point is the maximum load (Q_{max}) at zero degrees delta T ($\Delta T=0$) and the second point is the maximum delta T (ΔT_{max}) at a no load ($Q=0$). The load is defined as the amount of energy removed from the cold side ceramic. The delta T is defined as the temperature difference between the cold side and hot side ceramics. Extensive curves showing the performance under other conditions are often available.

Thermoelectric systems:

Reputable system manufacturers rate thermoelectric systems in watts or btu/hr under zero degree delta T conditions. In this case the load is defined as the amount of energy removed from the cooling medium. For air cooled systems the delta T is the temperature difference between the cooled medium and the ambient air. The cooled medium would be a cold plate in direct contact applications, a fluid such as water in liquid chiller applications and the enclosure air return temperature in air conditioner applications.

Air Conditioners, U.S.

Standards have not yet been created for enclosure air conditioners in the United States. The portions of the standards which deal with ratings and test conditions can still be interpreted for enclosure air conditioners. Too complex to display here, these standards define, among other parameters, the temperature conditions under which ratings are supposed to be made. These temperatures are generally defined as the room temperature and the ambient temperature. Typically the room temperature is either below of equal to the ambient temperature.

Air Conditioners, Europe:

The Europeans have developed a standard, DIN 3168, which specifically addresses enclosure air conditioners or coolers for distribution boxes. This standard does contain temperature information specific to the rating of such air conditioners. The load or the "useful cooling capacity", is only the

useful sensible heat flow which is taken up by the appliance for lowering the inside temperature of the distribution box. The temperature rating conditions for DIN 3168 are for the evaporator inlet (enclosure) temperature and condenser inlet to be an equal 35 C, or for the evaporator temperature to be 35 C and the condenser temperature to be 50 C, stated L35 L50.

Performance Curves:

The two types of performance curves used throughout the industry are shown on the following page. Both of these curves represent the performance of the **TECA** model **AHP-1200**. The top curve is shown per DIN 3168. In this curve temperatures are represented as absolutes, the x axis represents the inlet temperature at the condenser (the enclosure temperature), the vertical axis represents the useful cooling capacity, and separate load lines represent various evaporator inlet temperatures (ambient temperatures). Plotting a vertical line from the condenser inlet temperature to a specific evaporator temperature line and from that intersection horizontally, provides the useful cooling capacity. The bottom curve is for the same product represented in the traditional format. Here the temperatures are presented as differentials. Plotting a horizontal line from a desired delta T to intersect with the selected performance curve and then vertically to the x axis provides the cooling capacity under that condition. Both types of curves accurately represent the performance of a thermoelectric cooling system.

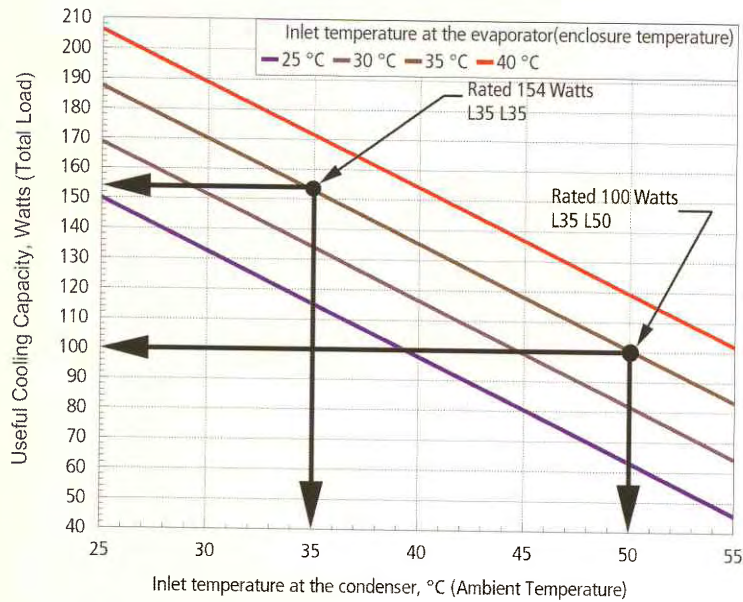
*

*The rated performance value shown for a positive 20 degree F delta T condition is true. However, **TECA** does not consider a 20 degree F delta T to be a valid rating condition for an air conditioner. This value is only shown for purpose of competitive parity with those manufacturers who choose this condition for rating their products. A performance rating stated at the positive 20 degree F delta T condition is more appropriate for above ambient heat exchangers such as heat pipes or for specific applications where it should be clearly stated.*

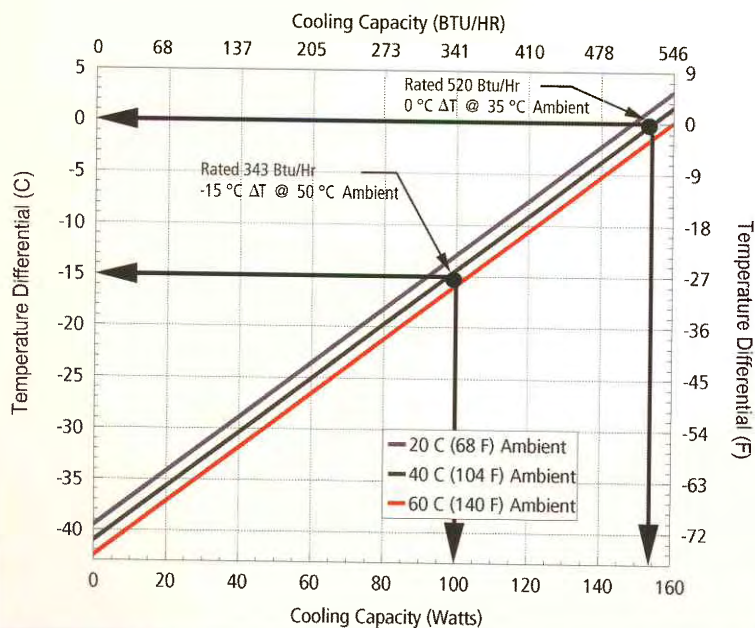
Ratings and Curves

Understanding Different Curves

Performance curve per Din 3168 (AHP-1200)



TECA's traditional performance curve (AHP-1200)



COOL HAPPENINGS

Warming to thermoelectric cooling

Historically, thermoelectric coolers began demonstrating their usefulness in a variety of challenging situations.

For example, in 1975 they were used to cool the electronic instrumentation in oil well equipment 20,000 feet under the earth's surface.

At the other end of the spectrum, thousands of miles above the earth, compact thermoelectric cooling systems have been used to control temperatures of experiments conducted on NASA's space shuttle as well as the Mars Viking lander.



Using Performance Curves

About Performance Curves: Performance curves are provided for the products in this catalog to help you determine which product is most appropriate for your needs. Curves are plotted on an X-Y axis with the X axis representing the total load and the Y axis the delta T or temperature difference between the surrounding ambient temperature and the enclosure temperature.

The following example is for enclosure cooling.

The total load most often consists of two components: the **active load**, defined as the heat generated inside the enclosure and the **enclosure or ambient load** which is that heat entering or leaving the enclosure due to the temperature difference, or ΔT between the inside of the enclosure and the ambient.

Other loads such as solar loads may need to be considered. The curve or load line is often split into 2 or three individual lines. Each representing the performance of the particular unit at different ambient temperatures.

Performance curves can be used in several

| $y = m x + b$ | | | |
|---------------|------------------|--------------------|--------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .122x - 37$ | $y = .122x - 39.7$ | $y = .122x - 42.3$ |
| Cold Sink | $y = .09x - 37$ | $y = .09x - 39.7$ | $y = .09x - 42.3$ |

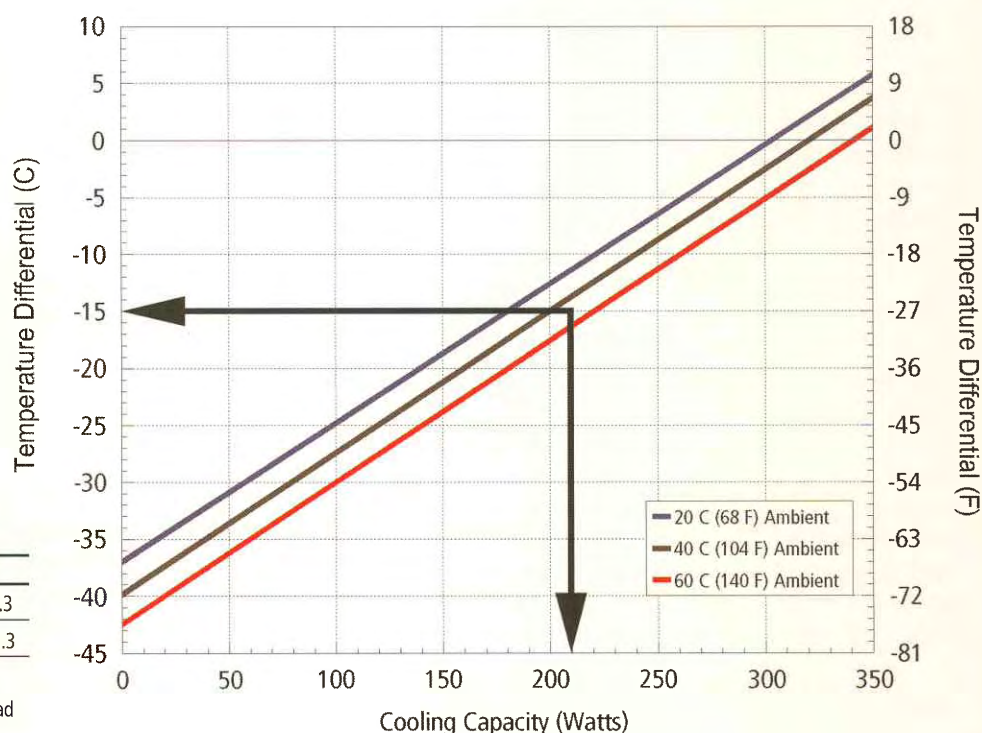
Where:

$y = \Delta T (^{\circ}\text{C})$ $m = \text{slope}$ $x = \text{watts}$ $b = \Delta T @ \text{no load}$

different ways depending on the information available. One way is by applying the known load and temperature requirements and selecting a unit to fill those needs. Another is to assume a specific unit and use the curve to determine what temperatures can be expected. This often involves some iteration involving the enclosure load.

In our example shown below we are assuming a 24" x 24" x 24" enclosure with 1/2" of insulation. Our maximum ambient is 50°C with a desired enclosure temperature of 35°C. Our

active load has been calculated to be 100 watts under full load conditions and using TECA sizing software the enclosure load has been estimated to be 45 watts for a total of 145 watts. Shown below is the curve for the AHP-1800 family plotted to determine the capacity at a -15 C delta T. This shows that this unit has more than enough capacity. Depending on the ambient conditions and mounting restrictions the AHP-1400 or the FHP-1400 would also do the job.



| Step | Determine | Example |
|------|--|-----------------------------------|
| 1 | Choose the family curve that best approximates your requirements and the specific curve for your ambient air temperature. | +50°C (estimated between 40 & 60) |
| 2 | From the desired -15° C delta T plot a horizontal line until you intersect the correct ambient line (shown is intersection at estimated 50°C line). From there plot a vertical line to determine the capacity under those conditions | Delta T = -15°C |
| 3 | Capacity at required Delta T: Please note 1 watt = 3.414 BTU/Hr | 200 Watts |

Design Environments

Including: Explosion proof • Outdoors • Factory Floor • Shipboard • Shock • Vibration

Many TECA products have been engineered to meet or exceed rigorous standards established by the United States military and by industry groups such as NEMA, NEC, UL, CSA and CE. Some typical environments include factories, mills, benign and harsh outdoor environments, shipboard, aircraft and laboratory.

UL/CSA – Underwriters Laboratory/Canadian Standards Association

UL-1604 Hazardous duty operation, Class I and II, Division 2; Class III, Division 1 and 2. Tested through ETL and ETLc Testing Laboratories, Report #532015. **Applies to AHP-1200XP and AHP-1800XP models.**

UL-1995/CSA 22.2 Heating & Cooling Equipment, Categories 169 & 294, No. 236-M90 Tested through ETL and ETLc Testing Laboratories, Report #532015. **Applies to most AHP-1200 and AHP-1800 products.**

CE – EN60335-1 & EN60335-2-40

Safety of household & similar electrical appliances, part 1: General requirements. Part 2: Particular requirements for electrical heat pumps, airconditioners & dehumidifiers (IEC 335-2-40 : 1992, Modified). Low voltage directive 73/23/EEC - European union (EU) EMC directive 89/336/EEC - European union Tested thru ETL. **Applies to most AHP-1200 AHP-1800 and FHP-750 models.**

EN61326, EN61010-1 and EN61010-2

Application of concil directive: Machinery Directive (89/336/EEC) Standard EN61326:1997, Class A; EN61436: 1997, Industrial location. Low voltage directive EN61010-1-A1: 97; EN61010-2-010-A1: 97 Tested thru ETL. **Applies to TLC-700 and TLC-702 models.**

NEMA – National Electrical Manufacturers Association

NEMA-12 Type 12 enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping noncorrosive liquids. **Applies to all models.**

NEMA-4X Type 4X enclosures are intended for indoor and outdoor use primarily to provide a degree of protection against corrosion, wind-blown dust and rain, splashing water, and hose-directed water. TECA products with the "X" designation have Mil-Spec fans, o-ring sealed power supplies, no exposed electronic components, stud/gasket mounting, and Mil-Spec finishes. Products with the "XE" designation have sealed fans, sealed components, stud/gasket mounting, and Mil-Spec finishes. They are designed to maintain the enclosure rating and perform in the rated environment. **Applies to X and XE models.**

Source: NEMA Publication No. 250, Part 1, Page 1

Military Standards Mil-Std 810

Corrosion: (Salt Fog Testing) Method 509.2, 168 Hours. **Applies to X models.**

Vibration: Method 514.3, 2 hours, x,y,z axis 8.9 G's. 10-2000 Hz with a magnitude of 0.04 G²/Hz. **Applies to XM models.**

Shock: Method 516.2, with 30 G's peak amplitude, 11ms pulse duration, half-sine waveform, and three (3) shocks in each direction along three (3) mutually orthogonal axes. Employed for all XM-versions. Standard models are designed to withstand 2.2 G's. **Applies to X models.**

Source: Mil-Std 810

NEC – National Electrical Code

CID2 Class I, Division 2 (Hazardous Environments) – a location (1) in which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of

abnormal operation of equipment; or (2) in which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operation of the ventilating equipment; or (3) that is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided. **Applies to XP models.**

Groups (A-D) Atmospheres containing the following: acetylene, hydrogen, fuel, and combustible process gases containing more than 30% hydrogen by volume, or gases or vapors of equivalent hazard such as butadiene, ethylene oxide, propylene oxide, acrolein, ethyl ether, ethylene, or gases or vapors of equivalent hazard such as acetone, ammonia, benzene, butane cyclopropane, ethanol, gasoline, hexane, methanol, methane, natural gas, naphtha, propane, or gases or vapors of equivalent hazard. **Applies to XP models.**

Source: NEC 2005, Article 500

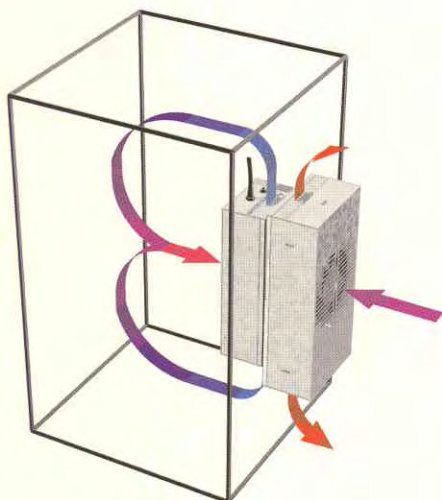
C1D1 Groups B, C, D Class 1, Division 1 (Hazardous Environments) - As an integral part of a larger systems **AHP-1200CXP** has been investigated in accordance with UL 3111-1, First Edition, rev. 6/94 Electrical Equipment for laboratory use and CSA C22.2 No. 1010.1-92 - Safety requirements for Electrical Equipment for Measurement, Control, and Laboratory use.

As an integral part of a larger system it has been investigated in accordance with NFPA 496 Edition - Purged and pressurized Enclosure for Electrical Equipment.

90-1800 BTU/hr

Air Cooled Air Conditioners

THRU MOUNT



Note: Top mounting orientation is not recommended.

AHP-SERIES

Solid state air conditioners with traditional "thru-wall mount" for closed loop cooling of enclosures.

FEATURES

- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Most units mount in any orientation

APPLICATIONS

Cools equipment racks, PCs, drives, amplifiers, motor controls and other electronic equipment.



AHP-1800XP page 12
1035-1180 BTU/hr rating,
18" x 12.35" mounting area
120 and 120/240 VAC
Class 1 Div 2, NEMA-4X, UL-1604

AHP-1800X page 12

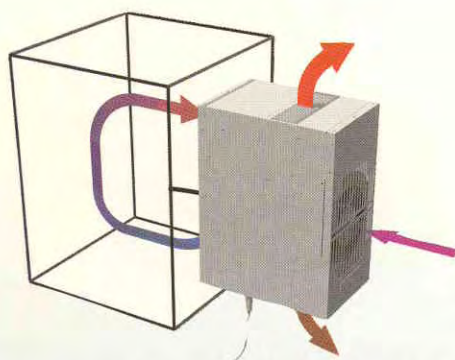
AHP-1800XE
1035-1180 BTU/hr rating,
18" x 12.35" mounting area
120, 240 and 120/220 VAC, NEMA-4/4X
UL-1995/CSA 22.2, CE

AHP-1800 page 12
1035-1180 BTU/hr rating,
18" x 12.3" mounting area
120, 240 and 120/240 VAC,
NEMA-12, UL-1995/CSA 22.2, CE

AHP-1501 page 14
1000-1100 BTU/hr rating,
15.2" x 12" mounting area
120/240 VAC, NEMA-12
NEMA-12, UL-1995/CSA 22.2, CE

AHP-1501XE page 14
NEMA-4X, UL-1995/CSA 22.2, CE

FLUSH MOUNT



Note: Top mounting orientation is not recommended.

FHP-SERIES

Solid state air conditioners designed for tightly packaged NEMA-12 enclosures. There is no intrusion within the enclosure, allowing for greater design flexibility.

FEATURES

- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing

APPLICATIONS

Cools equipment racks, PCs, drives, amplifiers, motor controls and other electronic equipment.



AIR CONDITIONERS

Air Cooled

90-1800 BTU/hr

THRU MOUNT

AHP-1400 page 16

810-900 BTU/hr rating,
12" x 12" mounting area
120 VAC, NEMA-12

AHP-1200XP page 18

500-550 BTU/hr rating,
15" x 7.3" mounting area
120 VAC, Class 1 Div 2, NEMA-4X
UL-1604

AHP-1200X page 18

AHP-1200XE

500-550 BTU/hr rating,
15" x 7.35" mounting area
120 and 240 VAC
NEMA-4/4X, UL-1995/CSA 22.2, CE

AHP-1200 page 18

15" x 7.35" mounting area
120 and 120/240 VAC
NEMA-12,
UL-1995/CSA 22.2, CE

AHP-1200CXP(North American)

page 20
307-680 BTU/hr rating,
15" x 7.35" mounting area
120 VAC
for systems requiring NEMA-4X, Class1 Div 1,

AHP-1200CXP (European) page 22

307-680 BTU/hr rating,
15" x 7.35" mounting area
120 VAC
for systems requiring IP56, Group II,
Category 2,

AHP-301FF page 24

160-200 BTU/hr rating,
10" x 5.52" mounting area
120/240 VAC, NEMA-12

AHP-300X page 26

AHP-300XE

200-220 BTU/hr rating,
10" x 5.37" mounting area
12, 24, and 12/24/48 VDC
NEMA-4/4X

AHP-300FF page 26

200-220 BTU/hr rating,
10" x 5.37" mounting area
12, 24, and 12/24/48 VDC,
NEMA-12

AHP-150FF page 28

90-105 BTU/hr rating,
7" x 5" mounting area
12, 24, and 12/24 VDC
NEMA-12



AHP-1800XP

FLUSH MOUNT

FHP-2850 page 30

1600-1800 BTU/hr rating,
12" x 24" mounting area
120 and 240 VAC
NEMA-12

FHP-1501 page 32

1000-1100 BTU/hr rating,
15.2" x 12" mounting area
120/240 VAC
NEMA-12, UL-1995/CSA 22.2, CE

FHP-1501XE page 32

1000-1100 BTU/hr rating,
15.2" x 12" mounting area
120/240 VAC
NEMA-4/4X, UL-1995/CSA 22.2, CE

FHP-750 page 34

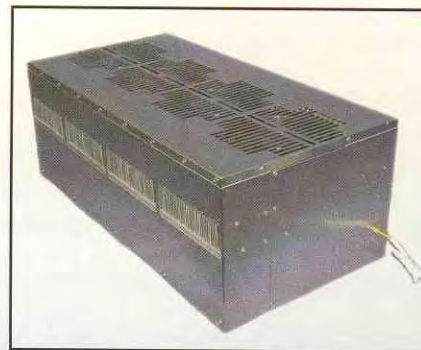
400-450 BTU/hr rating,
12" x 6" mounting area
120 and 240 VAC
UL-1995/CSA 22.2, CE

FHP-750XE page 34

400-450 BTU/hr rating,
12" x 6" mounting area
120 and 240 VAC
NEMA-4/4X, UL-1995/CSA 22.2, CE

FHP-450XE page 36

135-165 BTU/hr rating,
10" x 8" mounting area
120 and 240 VAC
NEMA-4/4X

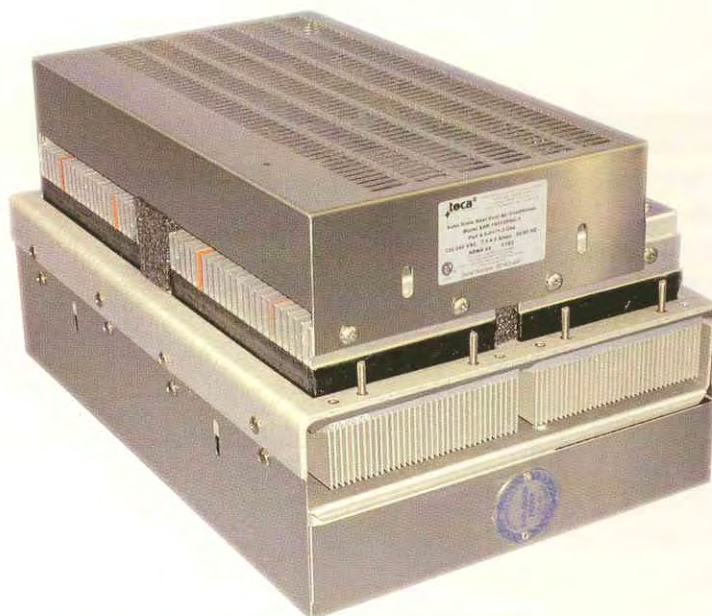


FHP-2850

AHP-1800 Solid-State Air Conditioner



Air Cooled
Thru Mount
Nema-12, 4,4X, Class 1 Div 2



FEATURES

- Compact, (18" L X 12.35" W X 9.69"D)
- Excels in high ambient temperatures
- Environmentally Safe
- Dual voltage versions available, consult factory.
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Versions to withstand corrosive environments, shock and vibration
- Mounts and operates in any orientation

INCLUDES

- Adjustable temperature control
- Mounting gasket and hardware
- Power input line cord

APPLICATIONS

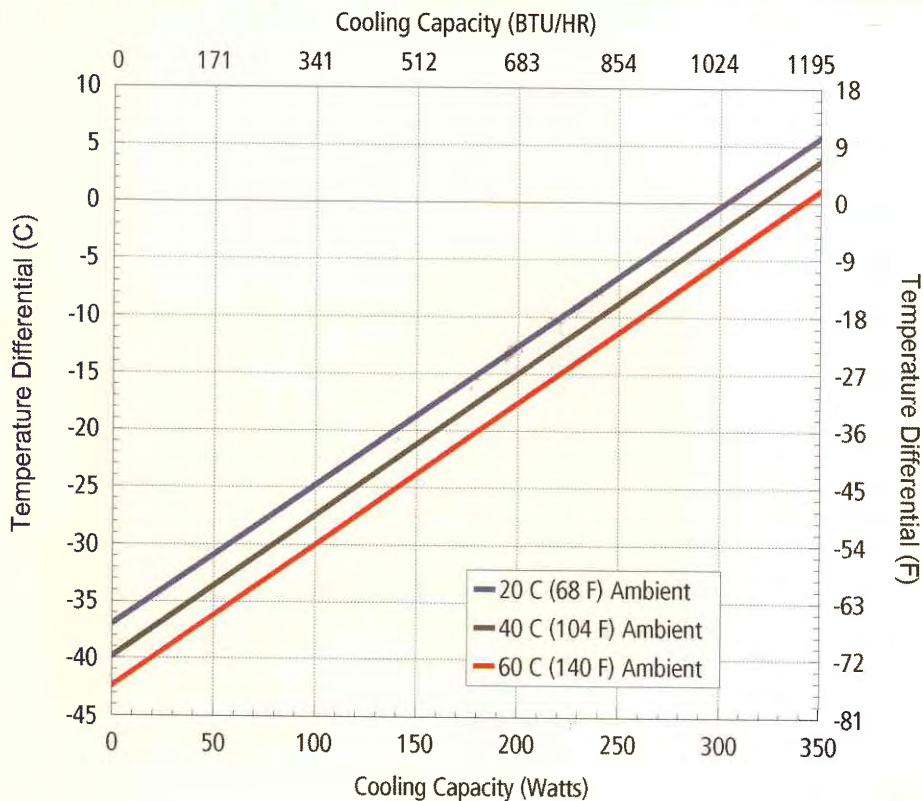
Cools electronic enclosures and control cabinets in factories, mines and on ship board.

SPECIFICATIONS

| | MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS.(KG) | TEMP. CONTROL * | OPERATING AMBIENT °C | AGENCY APPROVALS (ETL) |
|---------|----------------|--------------|-----------|---------------------------------|----------------------------|------------------|--------------------|-----------------------|-------------------------|------------------------------|
| NEMA 12 | AHP-1800 | 0-0180-0-000 | Cool only | 1035-1180 | 120 | 8.0 | 46(21) | TC-6F | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1800 | 0-0150-0-000 | Cool only | 1035-1180 | 120 | 8.0 | 46(21) | OPT* | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1800HC | 0-0130-1-000 | Heat/Cool | 1035-1180 | 120 | 8.0 | 46(21) | TC-3F | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1800HC | 0-0150-1-000 | Heat/Cool | 1035-1180 | 120 | 8.0 | 46(21) | OPT* | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1802 | 0-0182-0-000 | Cool only | 1035-1180 | 240 | 5.0 | 46(21) | TC-6F | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1802 | 0-0152-0-000 | Cool only | 1035-1180 | 240 | 5.0 | 46(21) | OPT* | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1802HC | 0-0132-1-000 | Heat/Cool | 1035-1180 | 240 | 5.0 | 46(21) | TC-3F | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1802HC | 0-0152-1-000 | Heat/Cool | 1035-1180 | 240 | 5.0 | 46(21) | OPT* | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1800XE | 0-0180-4-000 | Cool only | 1035-1180 | 120 | 8.0 | 47(21.4) | TC-6F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1800XE | 0-0150-4-000 | Cool only | 1035-1180 | 120 | 8.0 | 47(21.4) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| NEMA 4X | AHP-1800XEHC | 0-0130-5-000 | Heat/Cool | 1035-1180 | 120 | 8.0 | 47(21.4) | TC-3F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1800XEHC | 0-0150-5-000 | Heat/Cool | 1035-1180 | 120 | 8.0 | 47(21.4) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1802XE | 0-0182-4-000 | Cool only | 1035-1180 | 240 | 5.0 | 52(23.6) | TC-6F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1802XE | 0-0152-4-000 | Cool only | 1035-1180 | 240 | 5.0 | 52(23.6) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1802XEHC | 0-0132-5-000 | Heat/Cool | 1035-1180 | 240 | 5.0 | 52(23.6) | TC-3F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1802XEHC | 0-0152-5-000 | Heat/Cool | 1035-1180 | 240 | 5.0 | 52(23.6) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1800X | 0-0180-2-000 | Cool only | 1035-1180 | 120 | 7.5 | 47(21.4) | TC-6F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1800X | 0-0150-2-000 | Cool only | 1035-1180 | 120 | 7.5 | 47(21.4) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1800XHC | 0-0130-3-000 | Heat/Cool | 1035-1180 | 120 | 7.5 | 47(21.4) | TC-3F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1800XHC | 0-0150-3-000 | Heat/Cool | 1035-1180 | 120 | 7.5 | 47(21.4) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| C1D2 | AHP-1800XP | 0-0180-2-002 | Cool only | 1035-1180 | 120 | 7.5 | 47(21.4) | TC-6F | -28/+70 | UL-1604 |
| | AHP-1800XPHC | 0-0130-3-003 | Heat/Cool | 1035-1180 | 120 | 7.5 | 47(21.4) | TC-3F | -28/+70 | UL-1604 |
| | AHP-1801XP | 0-0181-2-002 | Cool only | 1035-1180 | 120/240 | 7.5/5.0 | 52(23.6) | TC-6F | -28/+70 | UL-1604 |
| | AHP-1801XPHC | 0-0131-3-003 | Heat/Cool | 1035-1180 | 120/240 | 7.5/5.0 | 52(23.6) | TC-3F | -28/+70 | UL-1604 |
| | AHP-1801XPHC-1 | 0-0171-3-004 | Heat/Cool | 1035-1180 | 120/240 | 7.5/5.0 | 52(23.6) | OPT* | -28/+70 | UL-1604 |

Consult us for 120/240 VAC versions, model AHP-1801, with similar features.

*OPT; Unit is set up for TC-3300 Controller (or similar)

AHP-1800**PERFORMANCE CURVE**

| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|--------------------|--------------------|--------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .122x - 37.0$ | $y = .122x - 39.7$ | $y = .122x - 42.3$ |
| Cold Sink | $y = .09x - 37.0$ | $y = .09x - 39.7$ | $y = .09x - 42.3$ |

MOUNTING STYLE

Thru Mount

ENVIRONMENTS

Nema-12 IP 40 (maintains IP 52)

Nema-4/4X IP 56

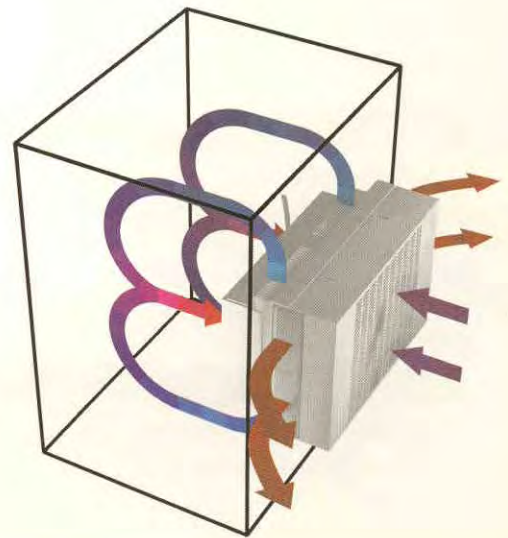
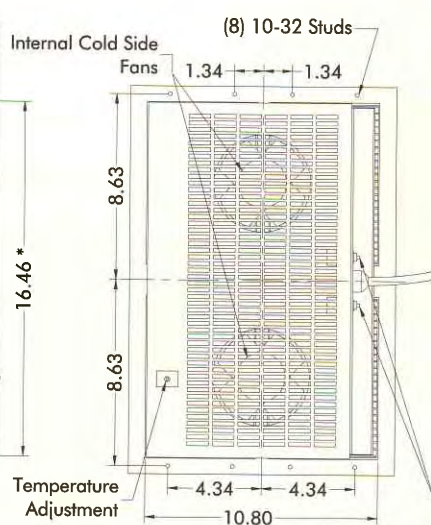
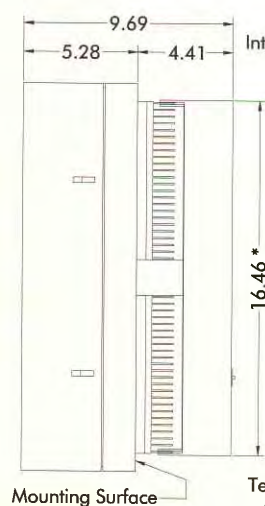
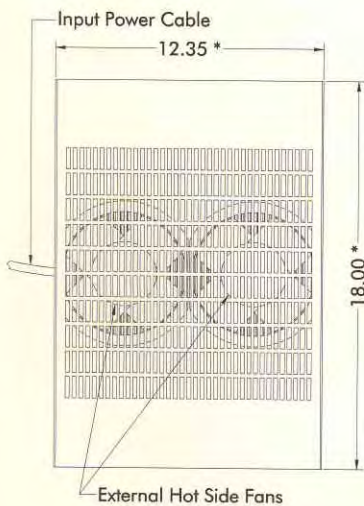
Class 1 Div 2 and Nema-4X IP 56

RATING (TRADITIONAL)1100 BTU/hr @ 0 °F ΔT 1420 BTU/hr @ +20 °F ΔT ***RATING (DIN 3168)**

322 Watts L35 L35

210 Watts L35 L50

* See page 6

**DIMENSIONS****MOUNTING CUTOUT DIMENSIONS**

* Dimension does not include hardware, insulation. Dimensions: Inches
Mounting hardware and gasket included but not shown.

AHP-1501

Solid-State Air Conditioner

Air Cooled
Thru Mount
Nema-12 & Nema-4/4X

FEATURES

- Compact
- Mounts in multi-unit array for incremental capacity
- Dual voltage 120/240 VAC
- Environmentally safe
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing

INCLUDES

- Temperature control
- Mounting gasket and hardware
- Power input line cord
- Condensate removal system including drip pan

APPLICATIONS

Used to cool electronic enclosures in high humidity and elsewhere.



SPECIFICATIONS

| | MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60HZ | CURRENT AMPS. | WEIGHT LBS.(KG) | TEMP. CONTROL | OPERATING AMBIENT °C | CONDENSATE REMOVAL | AGENCY APPROVALS (ETL) |
|----------------------------|--------------|--------------|-----------|---------------------------------|---------------------------|------------------|--------------------|------------------|----------------------------|-----------------------|------------------------------|
| N E M A 12 | AHP-1501 | 0-2171-0-000 | Cool Only | 1000-1100 | 120/240 | 7.5/5.0 | 52(24) | 30 °C | -10/+70 | Wick,Drip Pan | UL1995/CSA22.2, CE |
| | AHP-1501 | 0-2181-0-000 | Cool Only | 1000-1100 | 120/240 | 7.5/5.0 | 52(24) | TC-6F | -10/+70 | Wick | UL1995/CSA22.2, CE |
| | AHP-1501 | 0-2151-0-000 | Cool Only | 1000-1100 | 120/240 | 7.5/5.0 | 52(24) | OPT* | -10/+70 | Wick | UL1995/CSA22.2, CE |
| | AHP-1501HC | 0-2131-1-000 | Heat/Cool | 1000-1100 | 120/240 | 7.5/5.0 | 52(24) | TC-3F | -10/+70 | Wick | UL1995/CSA22.2, CE |
| N E M A 4 X | AHP-1501HC | 0-2151-1-000 | Heat/Cool | 1000-1100 | 120/240 | 7.5/5.0 | 52(24) | OPT* | -10/+70 | Wick | UL1995/CSA22.2, CE |
| | AHP-1501XE | 0-2181-4-000 | Cool Only | 1000-1100 | 120/240 | 7.5/5.0 | 52(24) | TC-6F | -10/+70 | Wick | UL1995/CSA22.2, CE |
| | AHP-1501XE | 0-2151-4-000 | Cool Only | 1000-1100 | 120/240 | 7.5/5.0 | 52(24) | OPT* | -10/+70 | Wick | UL1995/CSA22.2, CE |
| | AHP-1501XEHC | 0-2131-5-000 | Heat/Cool | 1000-1100 | 120/240 | 7.5/5.0 | 52(24) | TC-3F | -10/+70 | Wick | UL1995/CSA22.2, CE |
| | AHP-1501XEHC | 0-2151-5-000 | Heat/Cool | 1000-1100 | 120/240 | 7.5/5.0 | 52(24) | OPT* | -10/+70 | Wick | UL1995/CSA22.2, CE |

*OPT; Unit is set up for TC-3300 Controller (or similar)

AHP-1501

MOUNTING STYLE

Thru Mount

ENVIRONMENTS

Nema-12 IP 40 (maintains IP 52)

Nema-4/4X IP 56

RATING (TRADITIONAL)

1000 BTU/hr @ 0 °F ΔT

1300 BTU/hr @ +20 °F ΔT *

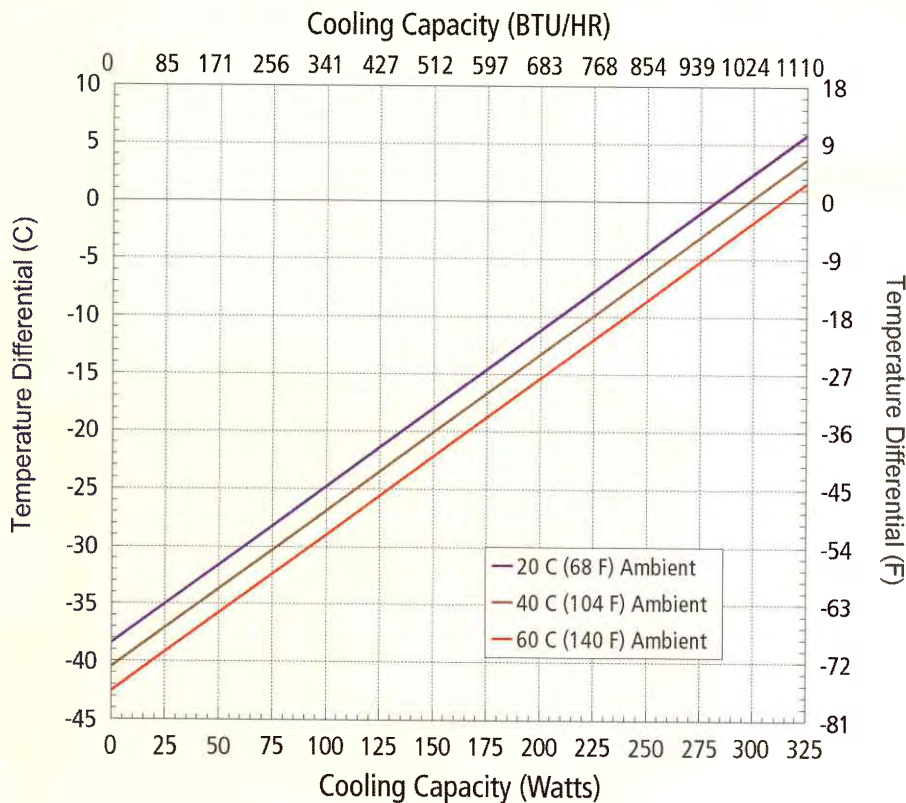
RATING (DIN 3168)

300 Watts L35 L35

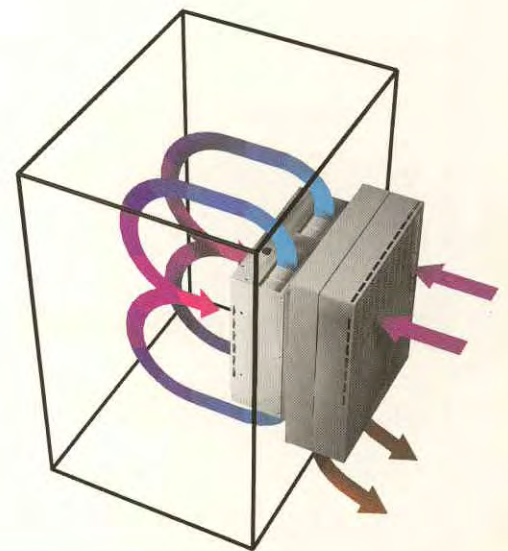
187 Watts L35 L50

* See page 6

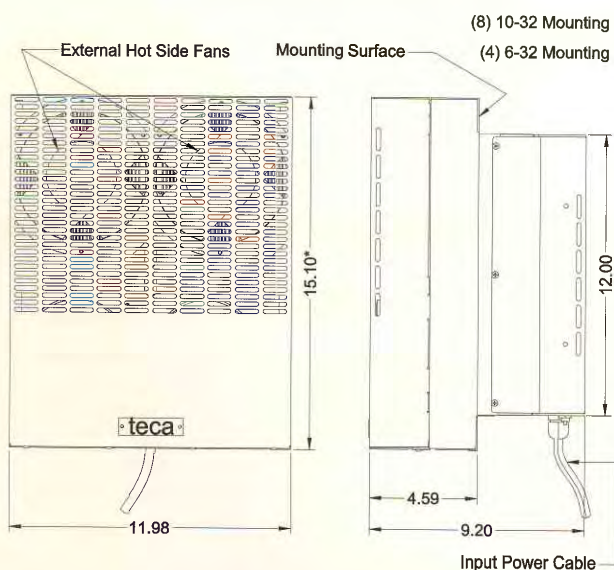
PERFORMANCE CURVE



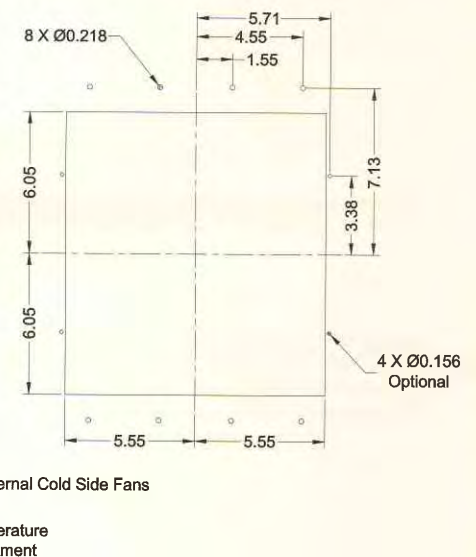
| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|--------------------|--------------------|--------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .136x - 38.4$ | $y = .136x - 40.5$ | $y = .136x - 42.6$ |
| Cold Sink | $y = .10x - 38.4$ | $y = .10x - 40.5$ | $y = .10x - 42.6$ |



AHP-1501 DIMENSIONS



MOUNTING CUTOUT DIMENSIONS



*Dimension does not include hardware. Dimensions: Inches
Mounting hardware, drip pan and gasket included but not shown.

AHP-1400

Air Cooled
Thru Mount
Nema-12

Solid-State Air Conditioner

FEATURES

- Compact
- Excels in high ambient temperatures
- Environmentally safe
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Nema-12 rating maintained
- Mounts in any orientation

INCLUDES

- Integral power supply (120 VAC input)
- Condensate removal system
- TC-6F thermostat



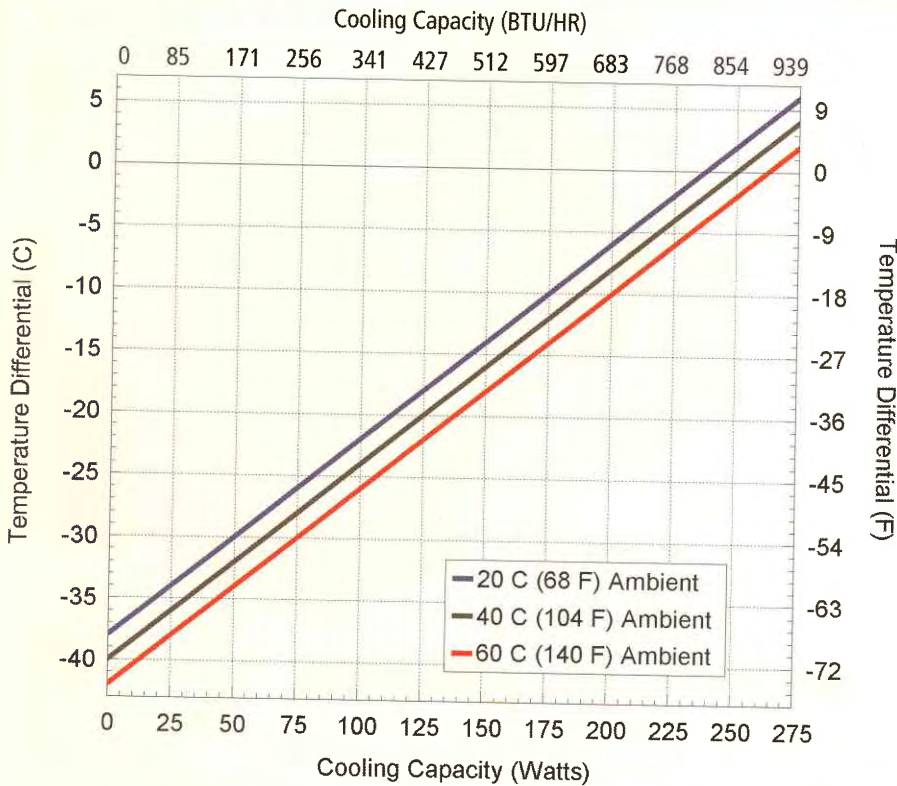
APPLICATIONS

Used to cool electronic enclosures in high humidity and elsewhere.

SPECIFICATIONS

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING (BTU/HR) | VOLTAGE (VAC) 50/60 (Hz) | CURRENT AMPS. | WEIGHT LBS. (Kg) | TEMP. CONTROL | CONDENSATE REMOVAL | OPERATING AMBIENT (°C) |
|----------|--------------|--|-----------------------------------|-----------------------------------|------------------|---------------------|------------------|-----------------------|---------------------------|
| AHP-1400 | 0-B480-0-000 | Cool only, built in temperature control | 810-900 | 120 | 8.5 | 33 (15) | TC-6F | Included | -10/+70 |

PERFORMANCE CURVE



| Equation of Line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|-----------------|-----------------|-----------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .16x - 38$ | $y = .16x - 40$ | $y = .16x - 42$ |
| Cold Sink | $y = .12x - 38$ | $y = .12x - 40$ | $y = .12x - 42$ |

AHP-1400

MOUNTING STYLE

Thru Mount

ENVIRONMENTS

Nema-12 IP 40 (maintains IP 52)

RATING (TRADITIONAL)

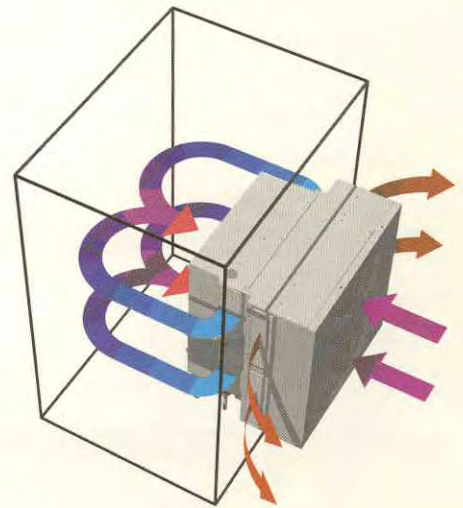
850 BTU/hr @ 0 °F ΔT 1090 BTU/hr @ +20 °F ΔT *

RATING (DIN 3168)

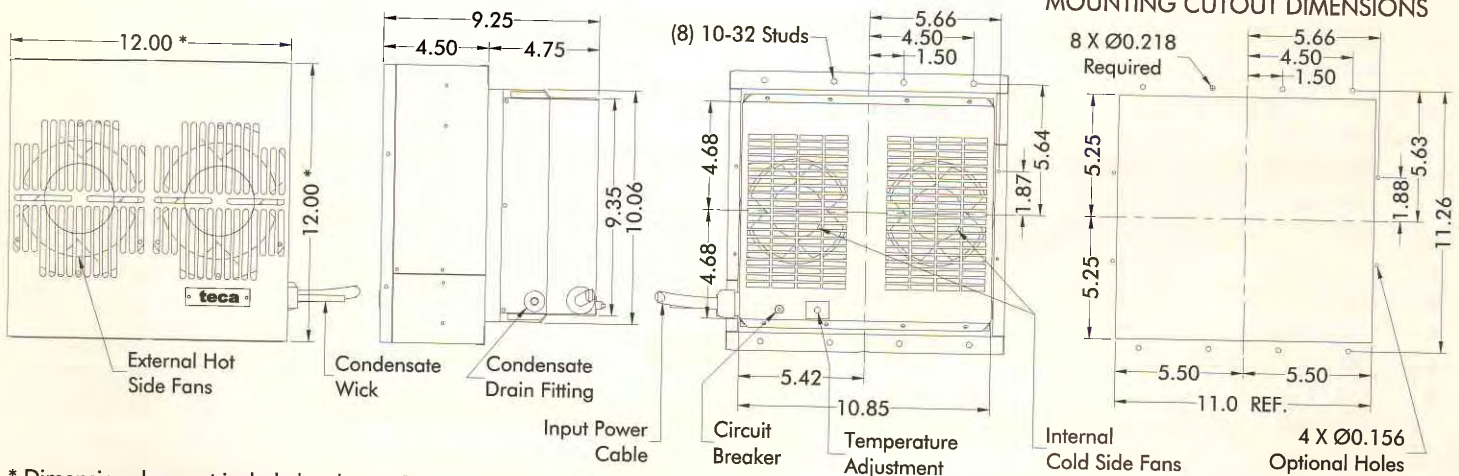
250 Watts L35 L35

155 Watts L35 L50

* See page 6



DIMENSIONS



* Dimension does not include hardware. Dimensions: Inches.
Mounting hardware and gasket included but not shown.

AHP-1200

Solid-State Air Conditioner



Air Cooled
Thru Mount
Nema-12, 4,4X, Class 1 Div 2

FEATURES

- Compact, (only 15" L X 7.35" W X 8.17" D)
- Weighs only 21 lbs. (9.5 kg)
- Excels in high ambient temperatures
- Environmentally safe
- Dual voltage versions available
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Versions to withstand corrosive environments, shock and vibration
- Mounts and operates in any orientation

INCLUDES

- Adjustable temperature control
- Gasket and mounting hardware
- Power input line cord



APPLICATIONS

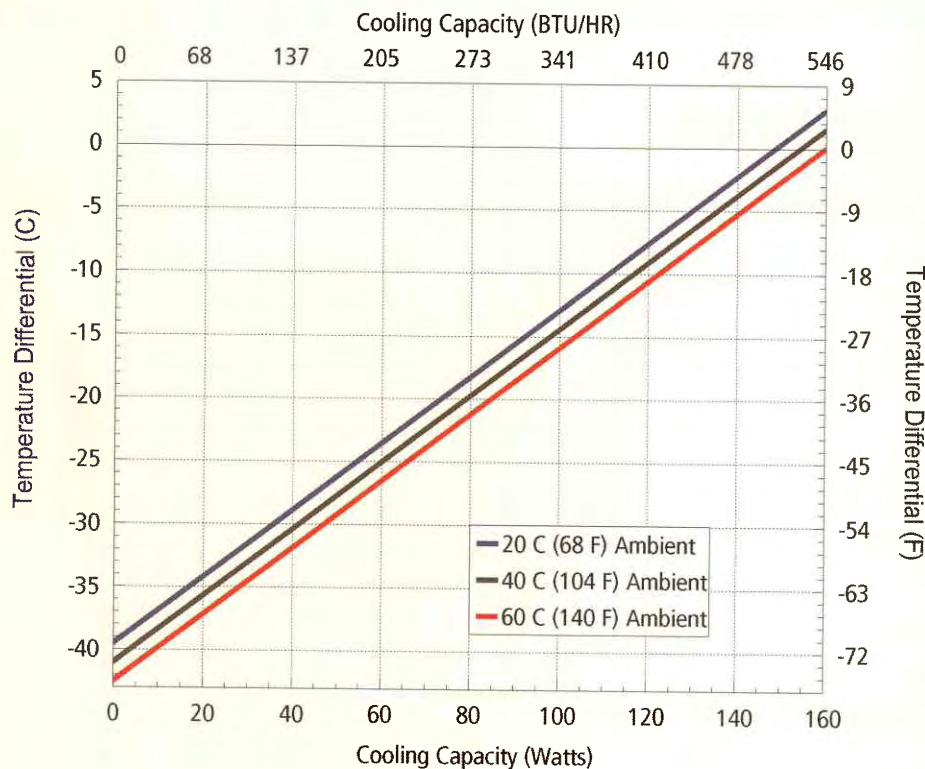
Cools electronic enclosures and control cabinets in factories, mines and on ships.

SPECIFICATIONS

| | MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60HZ | CURRENT AMPS. | WEIGHT LBS.(KG) | TEMP. CONTROL * | OPERATING AMBIENT °C | AGENCY APPROVALS (ETL) |
|----------------------------|--------------|--------------|-----------|---------------------------------|---------------------------|------------------|--------------------|-----------------------|-------------------------|------------------------------|
| N E M A 1 2 | AHP-1200 | 0-3080-0-000 | Cool only | 500-550 | 120 | 4.0 | 21(9.5) | TC-6F | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1200 | 0-3050-0-000 | Cool only | 500-550 | 120 | 4.0 | 21(9.5) | OPT* | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1200HC | 0-3030-1-000 | Heat/Cool | 500-550 | 120 | 4.0 | 21(9.5) | TC-3F | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1200HC | 0-3050-1-000 | Heat/Cool | 500-550 | 120 | 4.0 | 21(9.5) | OPT* | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1201 | 0-3081-0-000 | Cool only | 500-550 | 120/240 | 4.0/2.2 | 29(13.2) | TC-6F | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1201 | 0-3051-0-000 | Cool only | 500-550 | 120/240 | 4.0/2.2 | 29(13.2) | OPT* | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1201HC | 0-3031-1-000 | Heat/Cool | 500-550 | 120/240 | 4.0/2.2 | 29(13.2) | TC-3F | -10/+70 | UL1995/CSA22.2, CE |
| | AHP-1201HC | 0-3051-1-000 | Heat/Cool | 500-550 | 120/240 | 4.0/2.2 | 29(13.2) | OPT* | -10/+70 | UL1995/CSA22.2, CE |
| N E M A 4 X | AHP-1200XE | 0-3080-4-000 | Cool only | 500-550 | 120 | 4.5 | 23(10.4) | TC-6F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1200XE | 0-3050-4-000 | Cool only | 500-550 | 120 | 4.5 | 23(10.4) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1200XEHC | 0-3030-5-000 | Heat/Cool | 500-550 | 120 | 4.5 | 23(10.4) | TC-3F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1200XEHC | 0-3050-5-000 | Heat/Cool | 500-550 | 120 | 4.5 | 23(10.4) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1202XE | 0-3082-4-000 | Cool only | 500-550 | 240 | 2.5 | 30(13.6) | TC-6F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1202XE | 0-3052-4-000 | Cool only | 500-550 | 240 | 2.5 | 30(13.6) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1202XEHC | 0-3032-5-000 | Heat/Cool | 500-550 | 240 | 2.5 | 30(13.6) | TC-3F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1202XEHC | 0-3052-5-000 | Heat/Cool | 500-550 | 240 | 2.5 | 30(13.6) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| C 1 D 2 | AHP-1200X | 0-3080-2-000 | Cool only | 500-550 | 120 | 4.0 | 23(10.4) | TC-6F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1200X | 0-3050-2-000 | Cool only | 500-550 | 120 | 4.0 | 23(10.4) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1200XHC | 0-3030-3-000 | Heat/Cool | 500-550 | 120 | 4.0 | 23(10.4) | TC-3F | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1200XHC | 0-3050-3-000 | Heat/Cool | 500-550 | 120 | 4.0 | 23(10.4) | OPT* | -28/+70 | UL1995/CSA22.2, CE |
| | AHP-1200XP | 0-3080-2-003 | Cool only | 500-550 | 120 | 4.5 | 23(10.4) | TC-6F | -28/+70 | UL-1604 |
| | AHP-1200XPM | 0-3080-2-004 | Cool only | 500-550 | 120 | 4.5 | 23(10.4) | TC-6F | -28/+70 | UL-1604 |
| | AHP-1200XPHC | 0-3030-3-007 | Heat/Cool | 500-550 | 120 | 4.5 | 23(10.4) | TC-3F | -28/+70 | UL-1604 |
| | | | | | | | | | | |

Consult us for model AHP-1200XM, full shock and vibration version

*OPT; Unit is set up for TC-3300 Controller (or similar)

AHP-1200**PERFORMANCE CURVE**

| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|--------------------|--------------------|--------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .266x - 39.5$ | $y = .266x - 41.0$ | $y = .266x - 42.5$ |
| Cold Sink | $y = .173x - 39.5$ | $y = .173x - 41.0$ | $y = .173x - 42.5$ |

MOUNTING STYLE

Thru Mount

ENVIRONMENTS

Nema-12 IP 40 (maintains IP 52)

Nema-4/4X IP 56

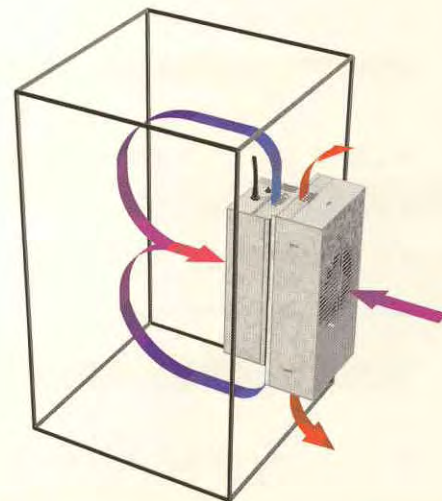
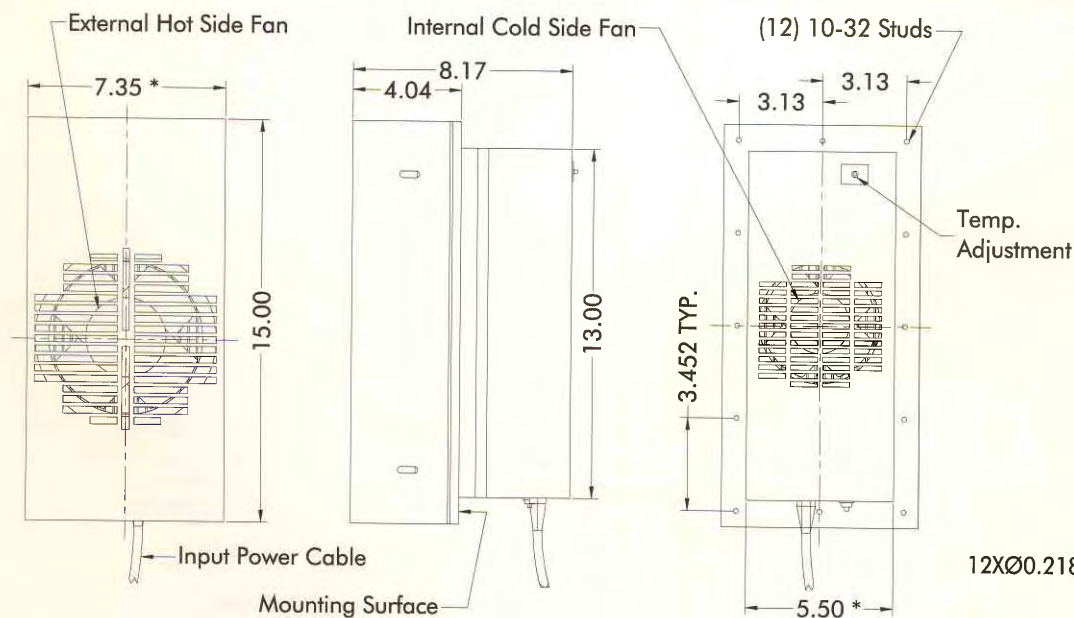
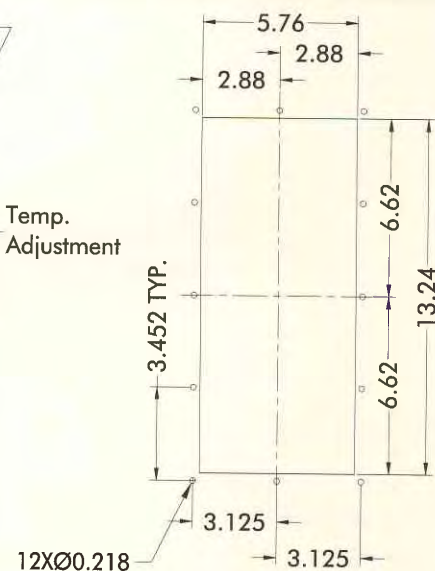
Class 1 Div 2 & Nema-4X IP 56

RATING (TRADITIONAL)530 BTU/hr @ 0 °F ΔT 670 BTU/hr @ +20 °F ΔT ***RATING (DIN 3168)**

154 Watts L35 L35

100 Watts L35 L50

* See page 6

**DIMENSIONS****MOUNTING CUTOUT DIMENSIONS**

* Dimension does not include hardware. Dimensions: Inches, Mounting hardware and gasket included but not shown.

AHP-1200CXP

North American Air Cooled
Thru Mount
Class 1, Division 1 Groups B, C, D

Solid-State Air Conditioner

FEATURES

- Compact, (only 15" L X 7.35" W X 14" D)
- Weighs only 36 lbs. (16.4 kg)
- Excels in high ambient temperatures
- Environmentally safe
- Vortex Air Amplifier included
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Mounts and operates in any orientation

REQUIREMENTS

- Clean and dry compressed air supply
- Purged enclosure
- 120 VAC Input voltage
- Temperature control

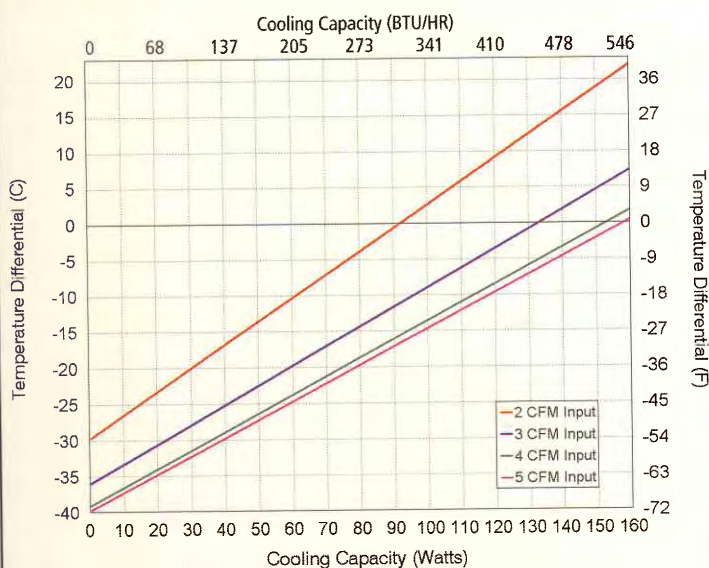
INCLUDES

- Mounting gasket and hardware
- Power input line cord

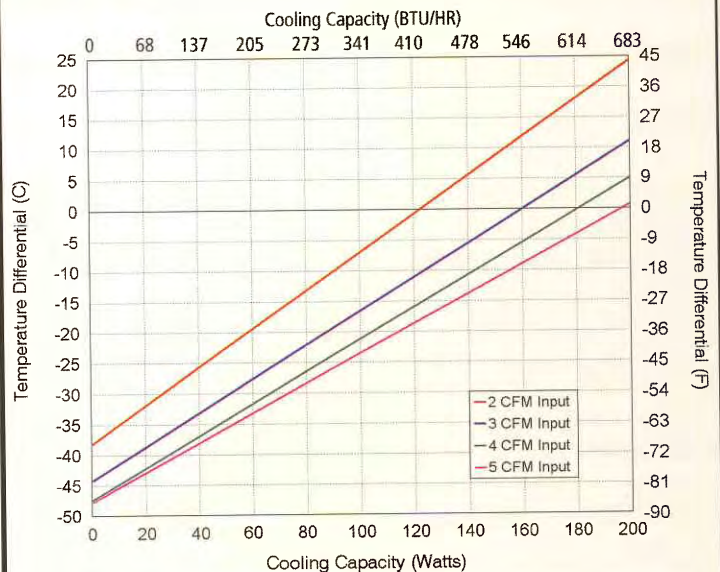


PERFORMANCE CURVE

25°C Ambient



60°C Ambient



AHP-1200CXP

Thru Mount

Class 1, Division 1

Groups B, C, D

307-680 BTU/hr

Nema-4/4X

LISTING & CLASSIFICATION:

The AHP-1200CXP by TECA is the first solid state air conditioner designed for use in Class 1 Division 1 Groups B, C and D hazardous environments in North America. The AHP-1200CXP features a unique air moving device that eliminates static discharge that traditional fans can generate. A compressed air line is required for the air moving device. The AHP-1200CXP has been used successfully in pharmaceutical plants on analyzers that monitor chemical reactions.

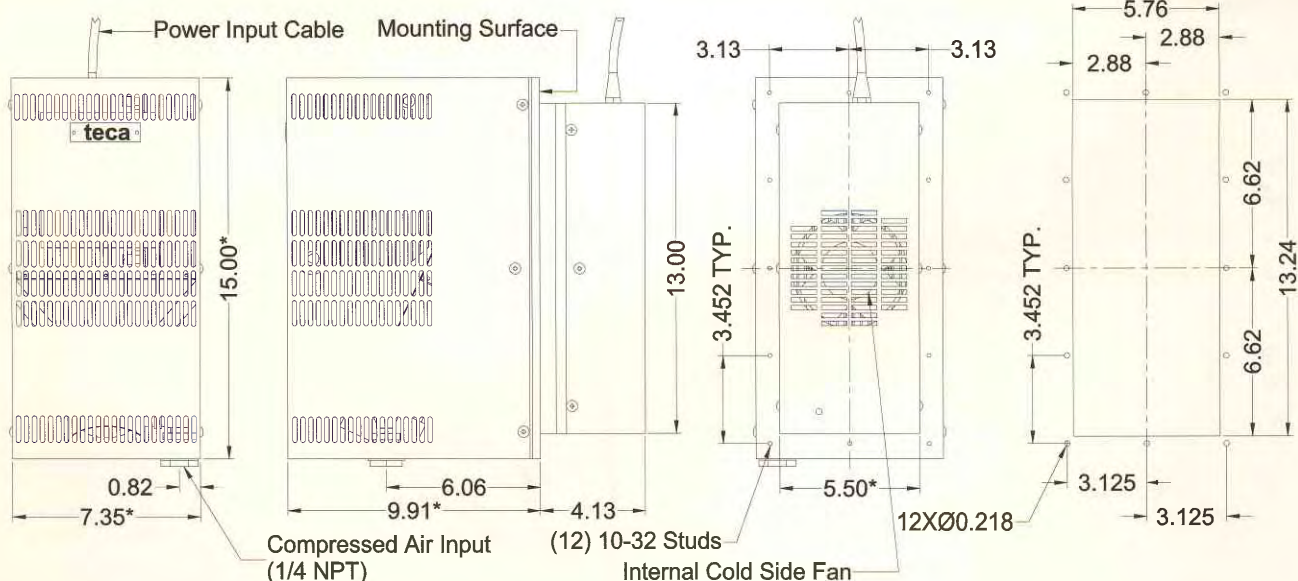
As an integral part of a larger system AHP-1200CXP has been investigated in accordance with UL 3111-1, First Edition, Rev. 6/94 Electrical Equipment for laboratory Use and CSA C22.2 No. 1010.1-92 Safety requirements for Electrical Equipment for Measurement, Control, and Laboratory Use.

As an integral part of a larger system it has been investigated in accordance with NFPA 496 Edition Purged and pressurized Enclosure for Electrical Equipment.

SPECIFICATIONS

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING (BTU/HR) | VOLTAGE (VAC 50/60 HZ) | CURRENT AMPS. | WEIGHT LBS.(KG) | TEMP. CONTROL | OPERATING AMBIENT (°C) |
|-------------|--------------|-----------|-----------------------------|------------------------|---------------|-----------------|---------------|------------------------|
| AHP-1200CXP | 0-3070-2-016 | Cool Only | 307-680 | 120 | 4.0 | 36 (16.4) | OPT* | -20/+40 |

* Requires 3-32 VDC drive signal

DIMENSIONS**MOUNTING CUTOUT DIMENSIONS**

* Dimension does not include hardware. Dimensions: Inches
Mounting hardware and gasket included but not shown.

AHP-1200CXP

European

Air Cooled
Thru Mount
Group II, Category 2 [1] G
EExd p d [ia] ia IIB+H2 T4

Solid-State Air Conditioner

FEATURES

- Compact, (only 15" L X 7.35" W X 18.4" D)
- Weighs only 39 lbs. (17.7kg)
- Excels in high ambient temperatures
- Environmentally safe
- Vortex Air Amplifier included
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Mounts and operates in any orientation

REQUIREMENTS

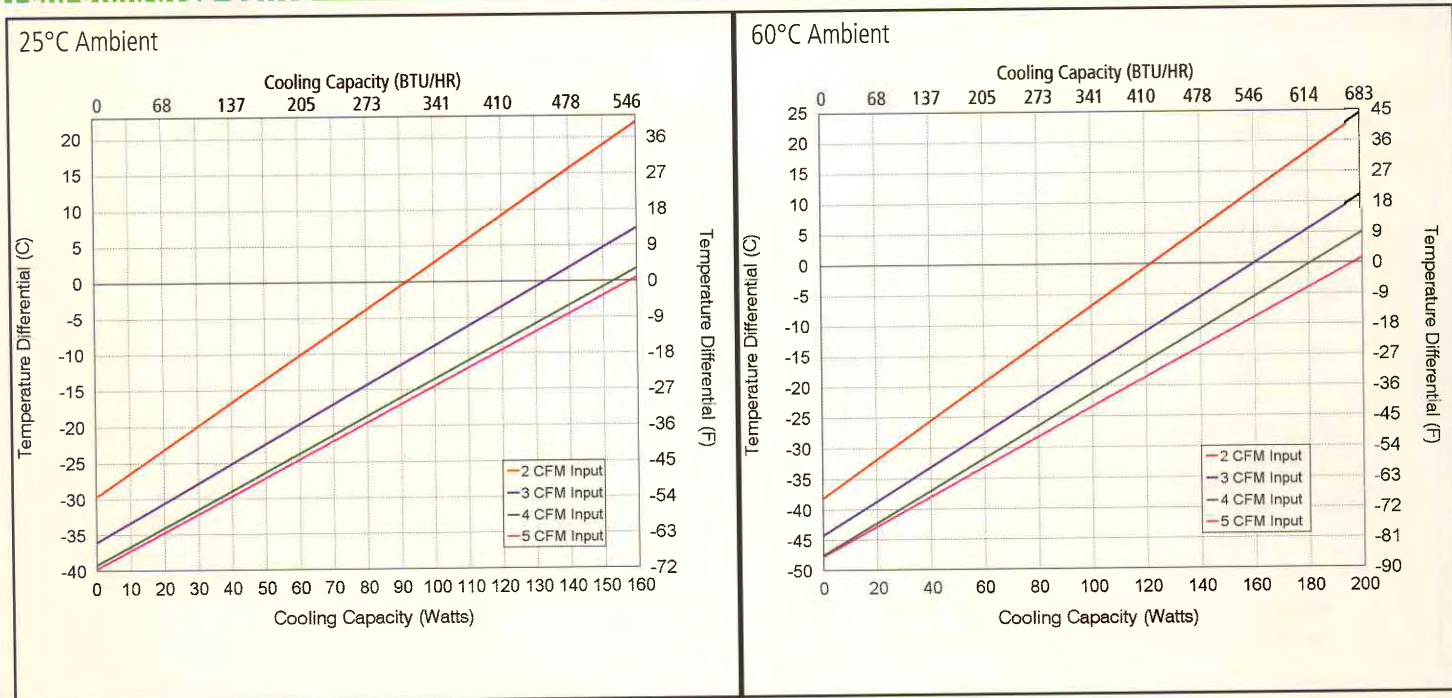
- Clean and dry compressed air supply
- Purged enclosure
- 120 VAC Input voltage

INCLUDES

- Mounting gasket and hardware
- Power input line cord
- Temperature control



PERFORMANCE CURVE



AHP-301FF

Air Cooled
Thru Mount
Nema-12

Solid-State Air Conditioner

FEATURES

- Compact (only 10" L X 5.52" W X 7.83" D)
- Weighs only 12 lbs. (5.4 kg)
- Ambient range -10°C to +70°C
- Mounts and operates in any orientation: horizontal, vertical, etc.
- Low vibration and noise
- No moving parts except fans
- Environmentally safe
- Dual voltage
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing

INCLUDES

- Integral power supply 120/240 VAC
- Gasket and mounting hardware

APPLICATIONS

Cools electronic enclosures and control cabinets in factories and elsewhere.



SPECIFICATIONS

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60HZ | CURRENT AMPS. | WEIGHT LBS.(KG) | TEMP. CONTROL * | OPERATING AMBIENT °C |
|------------------|--------------|-----------|---------------------------------|---------------------------|------------------|--------------------|-----------------------|-------------------------|
| AHP-301FF | 0-7091-0-000 | Cool only | 160-200 | 120/240 | 1.4/.70 | 12(5.4) | none | -10/+70 |
| AHP-301FF | 0-7081-0-000 | Cool only | 160-200 | 120/240 | 1.4/.70 | 12(5.4) | TC-6F | -10/+70 |
| AHP-301FFHC | 0-7031-1-000 | Heat/Cool | 160-200 | 120/240 | 1.4/.70 | 12(5.4) | TC-3F | -10/+70 |
| AHP-301FF | 0-7051-0-000 | Cool only | 160-200 | 120/240 | 1.4/.70 | 12(5.4) | OPT* | -10/+70 |
| AHP-301FFHC | 0-7051-1-000 | Heat/Cool | 160-200 | 120/240 | 1.4/.70 | 12(5.4) | OPT* | -10/+70 |
| AHP-301FF/85 | 0-70F1-0-000 | Cool only | 160-200 | 120/240 | 1.4/.70 | 12(5.4) | 85°F (30°C) | -10/+70 |
| AHP-301FF/3300 | 0-70D1-0-000 | Cool only | 160-200 | 120/240 | 1.4/.70 | 14(6.4) | TC-3300 | -10/+70 |
| AHP-301FFHC/3300 | 0-70D1-1-000 | Heat/Cool | 160-200 | 120/240 | 1.4/.70 | 14(6.4) | TC-3300 | -10/+70 |

*OPT; Unit is set up for TC-3300 Controller (or similar)

AHP-301FF**MOUNTING STYLE**

Thru Mount

ENVIRONMENTS

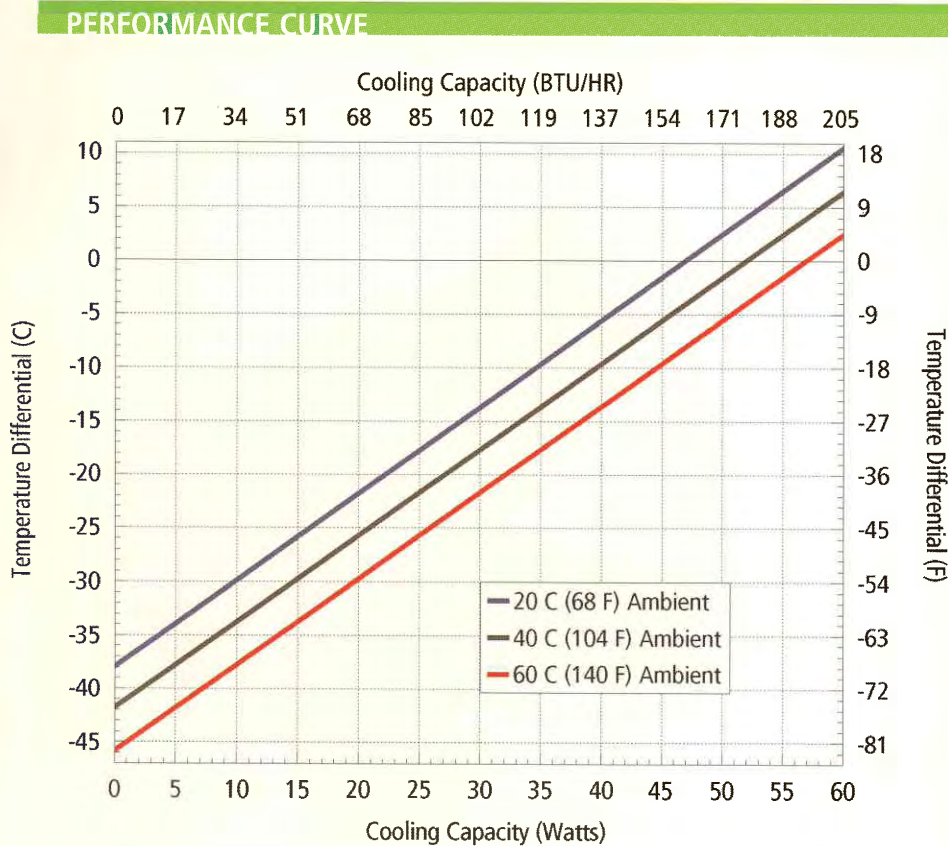
Nema-12 IP 40 (maintains IP 52)

RATING (TRADITIONAL)180 BTU/hr @ 0 °F ΔT 220 BTU/hr @ +20 °F ΔT ***RATING (DIN 3168)**

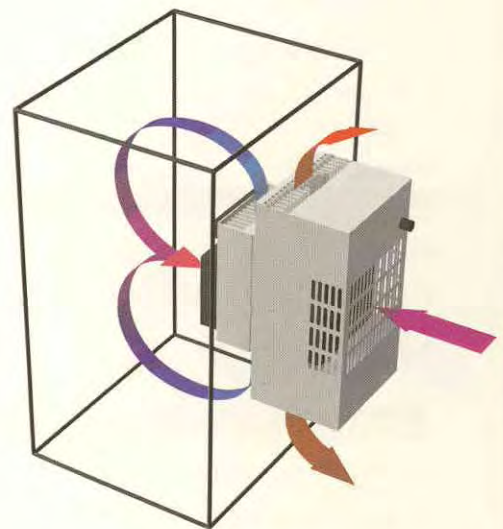
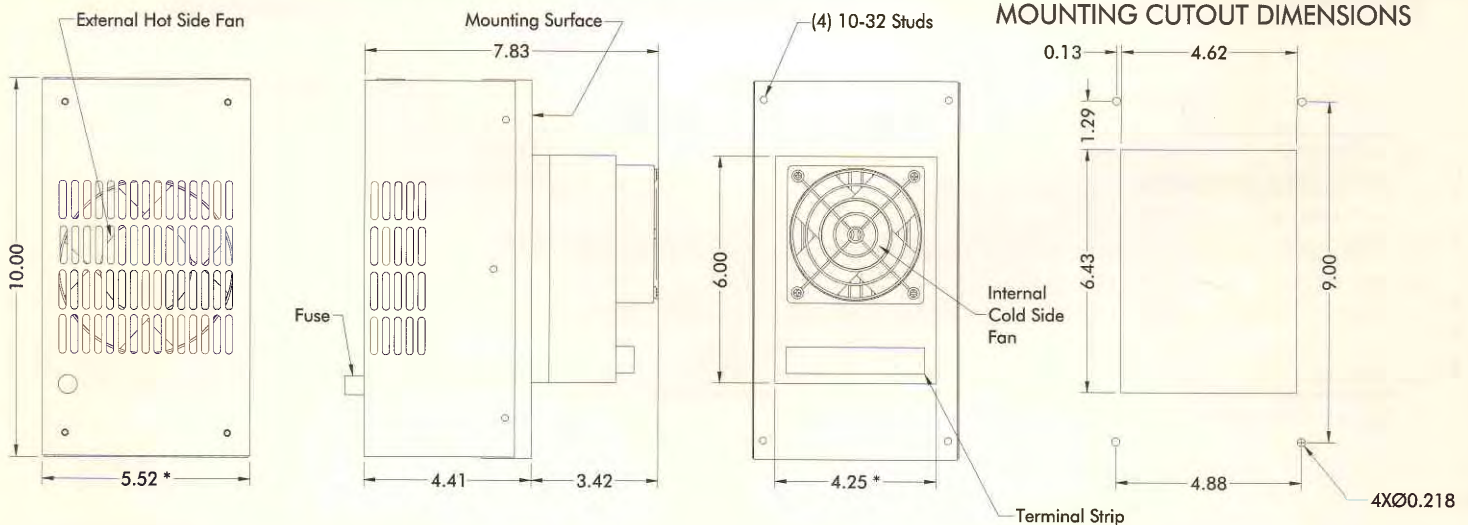
52 Watts L35 L35

36 Watts L35 L50

* See page 6



| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|-------------------|-------------------|-------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .81x - 38.0$ | $y = .81x - 42.0$ | $y = .81x - 46.0$ |
| Cold Sink | $y = .62x - 38.0$ | $y = .62x - 42.0$ | $y = .62x - 46.0$ |

**DIMENSIONS**

* Dimension does not include hardware, insulation. Dimensions: Inches, Mounting hardware and gasket included but not shown.

AHP-300FF

Solid-State Air Conditioner

Air Cooled
Thru Mount
Nema-12, 4, and 4x



FEATURES

- Compact (only 10"L X 5.37"W X 6.45"D)
- Weighs only 7.5 lbs. (3.4 kg)
- Ambient range -10°C to +70°C
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Mounts in any orientation
- X versions use mil-grade hot side fan
- XE versions use industrial grade high quality sealed fans

INCLUDES

- Gasket and mounting hardware
- Hook-up leads
- Mounting hardware

OPTIONS

- Temperature Control TC-6F DC for cool only
- Temperature Control TC-3F DC for heat/cool
- Adaptable for TC-3300 control

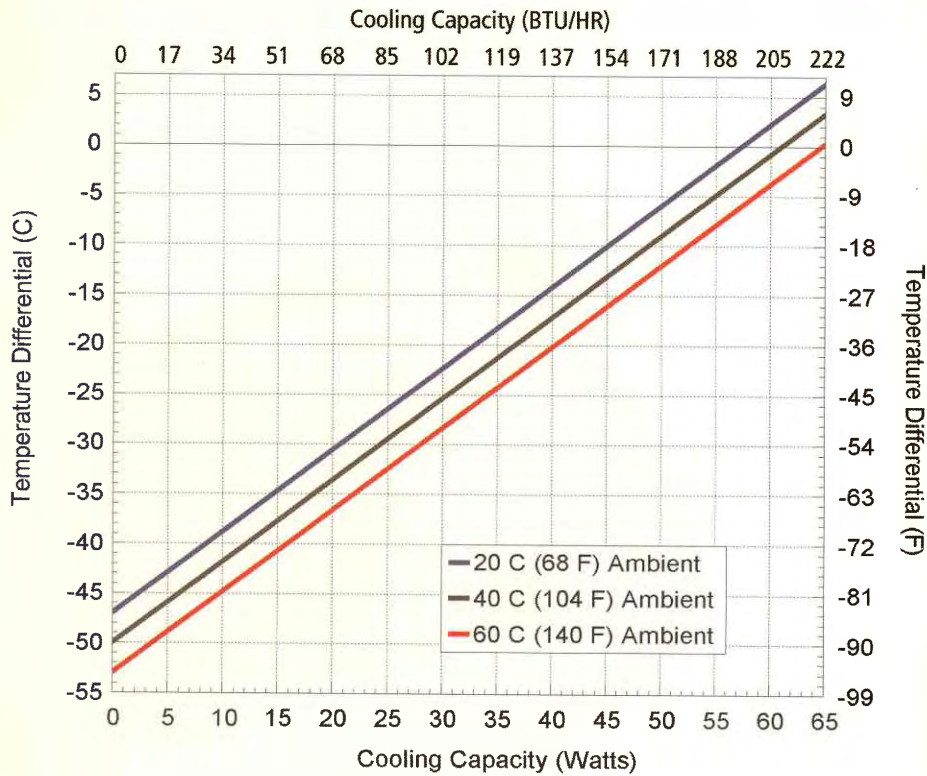
APPLICATIONS

Cools electronic enclosures and control cabinets in telecommunications and telecom applications.

SPECIFICATIONS

| | MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VDC * | CURRENT AMPS. | WEIGHT LBS.(KG) | TEMP. CONTROL | OPERATING AMBIENT °C |
|---|-------------|--------------|--------------------------|---------------------------------|---------------------|------------------|--------------------|------------------|-------------------------|
| N | AHP-300FF | 0-7097-0-000 | Cool only | 200-220 | 12/24/48 | 12/6/3 | 7.5(3.4) | none | -10/+70 |
| 1 | AHP-300FFHC | 0-7094-1-000 | Heat/Cool | 200-220 | 12 | 12 | 7.5(3.4) | none | -10/+70 |
| 2 | AHP-300FFHC | 0-7095-1-000 | Heat/Cool | 200-220 | 24 | 6 | 7.5(3.4) | none | -10/+70 |
| N | AHP-300XE | 0-7097-4-000 | Cool only, sealed fan | 200-220 | 12/24/48 | 12/6/3 | 7.5(3.4) | none | -10/+70 |
| 4 | AHP-300XEHC | 0-7095-5-000 | Heat/Cool, sealed fan | 200-220 | 24 | 6 | 7.5(3.4) | none | -10/+70 |
| X | AHP-300X | 0-7097-2-000 | Cool only, Mil grade fan | 200-220 | 12/24/48 | 12/6/3 | 9.2(4.2) | none | -10/+70 |
| | AHP-300XHC | 0-7094-3-000 | Heat/Cool, Mil grade fan | 200-220 | 12 | 12 | 9.2(4.2) | none | -10/+70 |
| | AHP-300XHC | 0-7095-3-000 | Heat/Cool, Mil grade fan | 200-220 | 24 | 6 | 9.2(4.2) | none | -10/+70 |

*See also , "Power Supplies" , P. 67

AHP-300FF**PERFORMANCE CURVE**

| | $y = \Delta T(^{\circ}\text{C}) \quad x = \text{Capacity (Watts)}$ | | |
|---------------|--|-------------------|-------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .82x - 47.0$ | $y = .82x - 50.0$ | $y = .82x - 53.0$ |
| Cold Sink | $y = .64x - 47.0$ | $y = .64x - 50.0$ | $y = .64x - 53.0$ |

MOUNTING STYLE

Thru Mount

ENVIRONMENTS

Nema-12 IP 40 (maintains IP 52)

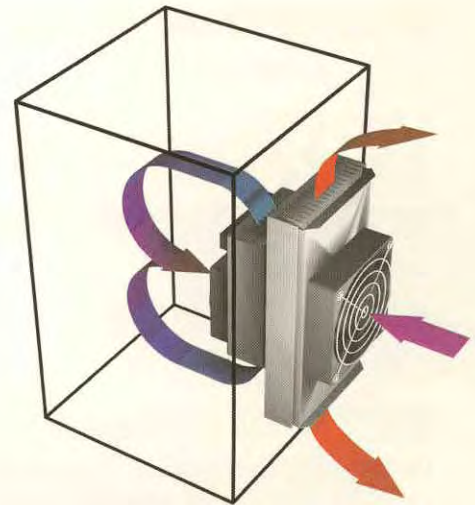
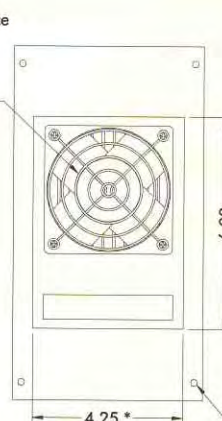
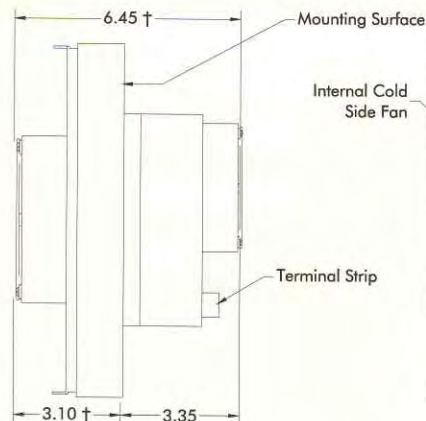
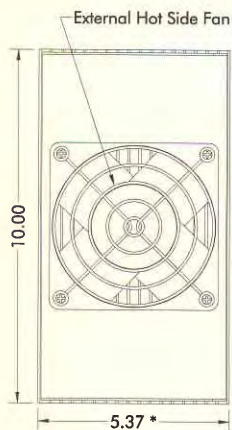
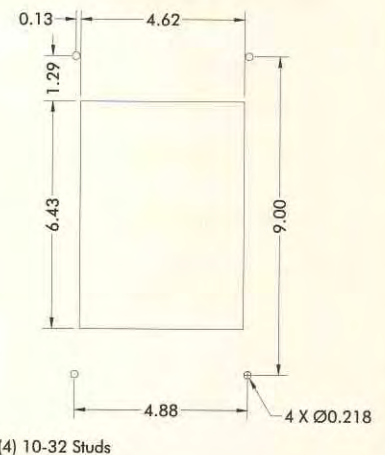
Nema-4/4X IP 56

RATING (TRADITIONAL)210 BTU/hr @ 0 °F ΔT 250 BTU/hr @ +20 °F ΔT ***RATING (DIN 3168)**

61 Watts L35 L35

44 Watts L35 L50

* See page 6

**DIMENSIONS****MOUNTING CUTOUT DIMENSIONS**

* Dimension does not include hardware, insulation. Dimensions: Inches, Mounting hardware and gasket included but not shown.
 † On all models of AHP-300X, these dimensions are greater by 0.25 inch.

AHP-150FF Solid-State Air Conditioner

Air Cooled
Thru Mount
Nema-12
Nema-4/4X

FEATURES

- Compact (only 7" L X 5" W X 6.02" D)
- Weighs only 3.2 lbs. (1.5 kg)
- Ambient range -10°C to +70°C
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Mounts in any orientation

INCLUDES

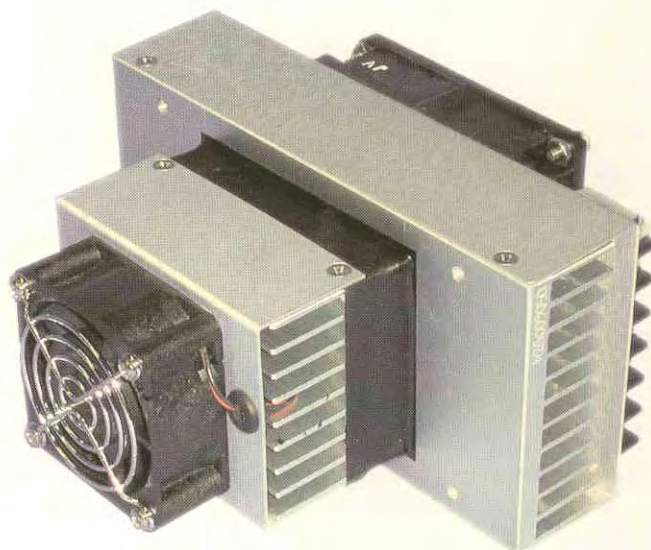
- Gasket for Nema-12 seal
- Hook-up leads
- Mounting Hardware

OPTIONS

- Temperature control TC-6F DC for cool only
- Temperature control TC-3F DC for heat/cool
- Adaptable for TC-3300 controller

APPLICATIONS

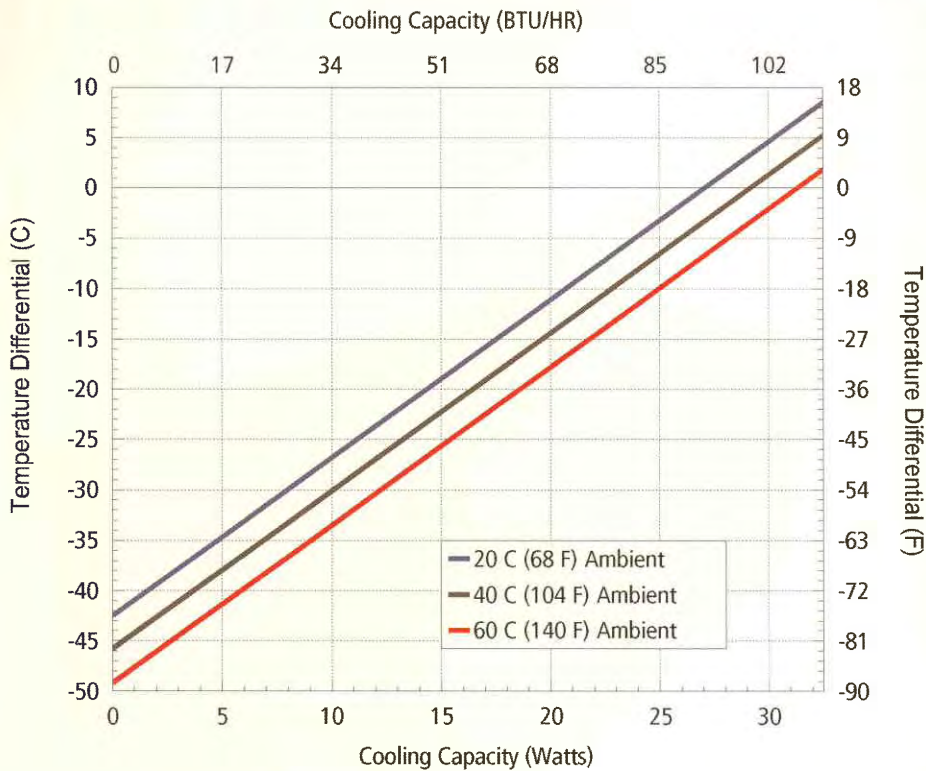
Useful to cool small instrument enclosures. Especially useful where available power is 12VDC or 24VDC, telecom applications.



SPECIFICATIONS

| | MODEL | PART NUMBER | NOTES | PERFORMANCE RATING | VOLTAGE VDC BTU/HR | CURRENT AMPS. * | WEIGHT LBS.(KG) | TEMP. CONTROL | OPERATING AMBIENT °C |
|------|-------------|--------------|-----------|--------------------|--------------------|-----------------|-----------------|---------------|----------------------|
| N 12 | AHP-150FF | 0-8098-0-000 | Cool only | 90-105 | 12/24 | 6/3 | 3.2(1.5) | none | -10/+70 |
| | AHP-150FFHC | 0-8094-1-000 | Heat/Cool | 90-105 | 12 | 6 | 3.2(1.5) | none | -10/+70 |
| | AHP-150FFHC | 0-8095-1-000 | Heat/Cool | 90-105 | 24 | 3 | 3.2(1.5) | none | -10/+70 |
| N | AHP-150XE | 0-8094-4-000 | Cool only | 90-105 | 12 | 6 | 3.2(1.5) | none | -10/+70 |
| 4X | AHP-150XEHC | 0-8094-5-000 | Heat/Cool | 90-105 | 12 | 6 | 3.2(1.5) | none | -10/+70 |

*See also, "Power Supplies", P. 67

AHP-150FF**PERFORMANCE CURVE**

| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|--------------------|--------------------|--------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = 1.57x - 42.5$ | $y = 1.57x - 45.8$ | $y = 1.57x - 49.2$ |
| Cold Sink | $y = 1.24x - 42.5$ | $y = 1.24x - 45.8$ | $y = 1.24x - 49.2$ |

MOUNTING STYLE

Thru Mount

ENVIRONMENTS

Nema-12 IP 40 (maintains IP 52)

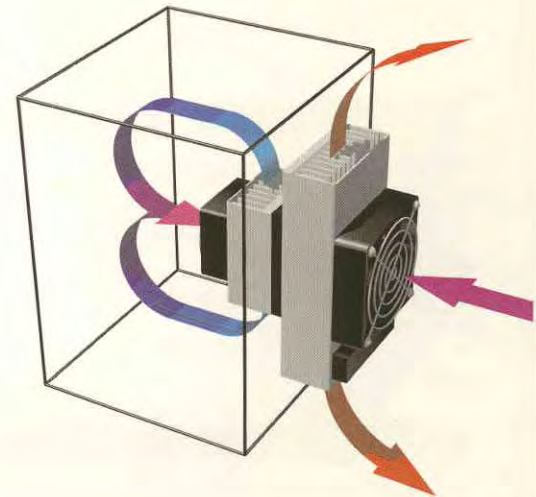
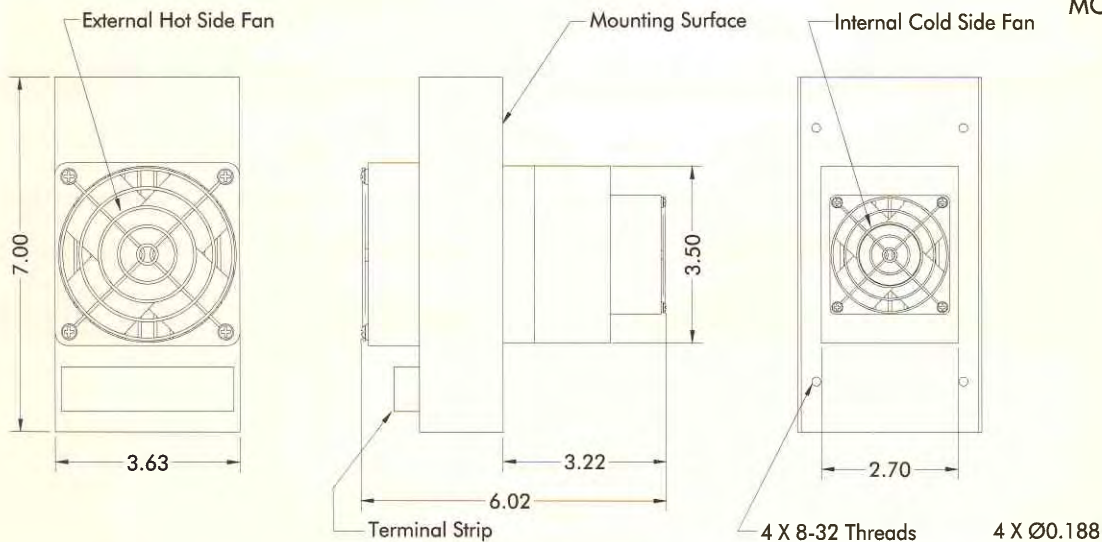
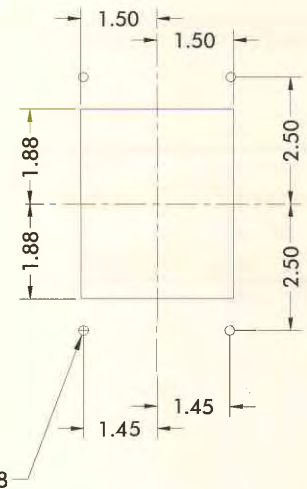
Nema-4/4X IP 56

RATING (TRADITIONAL)100 BTU/hr @ 0 °F ΔT 123 BTU/hr @ +20 °F ΔT ***RATING (DIN 3168)**

29 Watts L35 L35

21 Watts L35 L50

* See page 6

**DIMENSIONS****MOUNTING CUTOUT DIMENSIONS**

* Dimension does not include hardware, insulation. Dimensions: Inches, Hardware and gasket included but not shown.

FHP-2850

Air Cooled
Flush Mounted
Nema-12

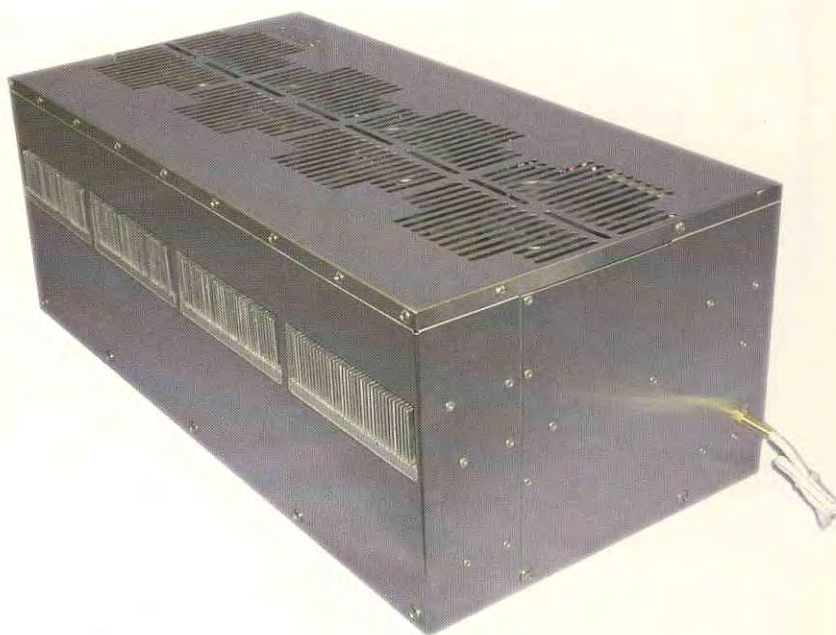
Solid-State Air Conditioner

FEATURES

- Externally mounted, no intrusion
- Ambient range -10°C to +70°C
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Mounts in any orientation
- No moving parts except fans
- Environmentally safe

INCLUDES

- Integral power supply
- Condensate removal system
- TC-6F thermostat
- Mounting hardware
- Gasket for NEMA-12 seal



APPLICATIONS

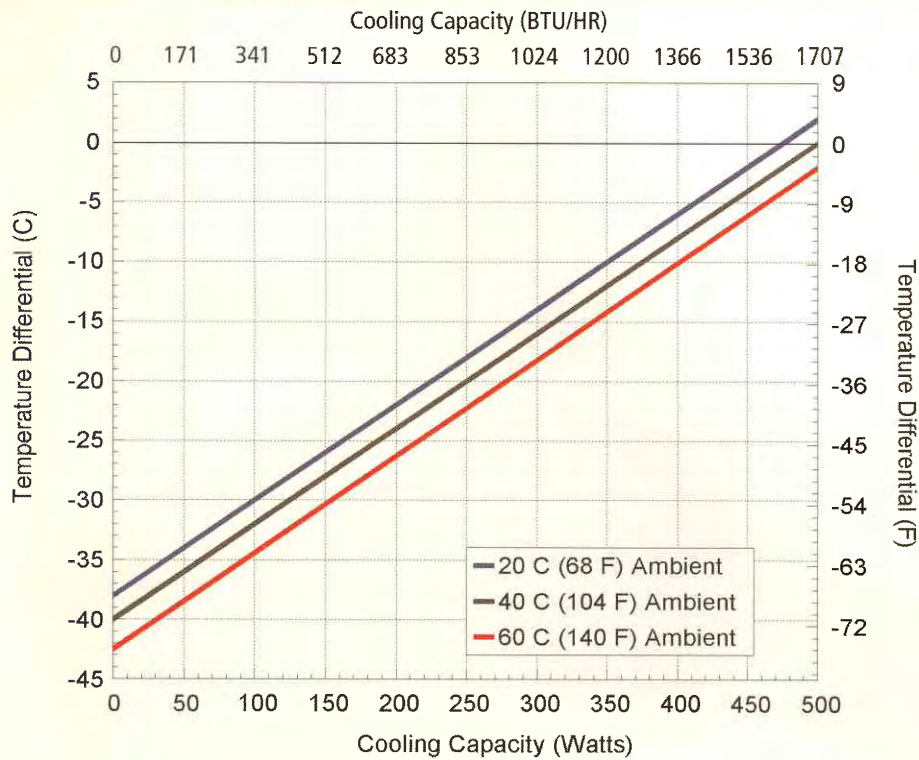
This unit has been employed for larger cooling loads such as overhead cranes in rolling mills and in mobile applications for military camera cooling.

SPECIFICATIONS

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS. (kg) | TEMP. CONTROL * | CONDENSATE REMOVAL | OPERATING AMBIENT °C |
|----------|--------------|-----------|---------------------------------|----------------------------|------------------|---------------------|-----------------------|-----------------------|-------------------------|
| FHP-2850 | 7-D580-0-000 | Cool only | 1600-1800 | 120 | 12.5 | 68(31) | TC-6F | Included | -10/+70 |
| FHP-2850 | 7-D550-0-000 | Cool only | 1600-1800 | 120 | 12.5 | 68(31) | OPT* | Included | -10/+70 |
| FHP-2852 | 7-D582-0-000 | Cool only | 1600-1800 | 240 | 7.5 | 68(31) | TC-6F | Included | -10/+70 |
| FHP-2852 | 7-D552-0-000 | Cool only | 1600-1800 | 240 | 7.5 | 68(31) | OPT* | Included | -10/+70 |

*OPT; Unit is set up for TC-3300 Controller (or similar)

PERFORMANCE CURVE



| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|-------------------|-------------------|-------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .08x - 38.0$ | $y = .08x - 40.0$ | $y = .08x - 42.0$ |
| Cold Sink | $y = .05x - 38.0$ | $y = .05x - 40.0$ | $y = .05x - 42.0$ |

FHP-2850

MOUNTING STYLE

Flush Mounted

ENVIRONMENTS

Nema-12 IP 40 (maintains IP 52)

RATING (TRADITIONAL)

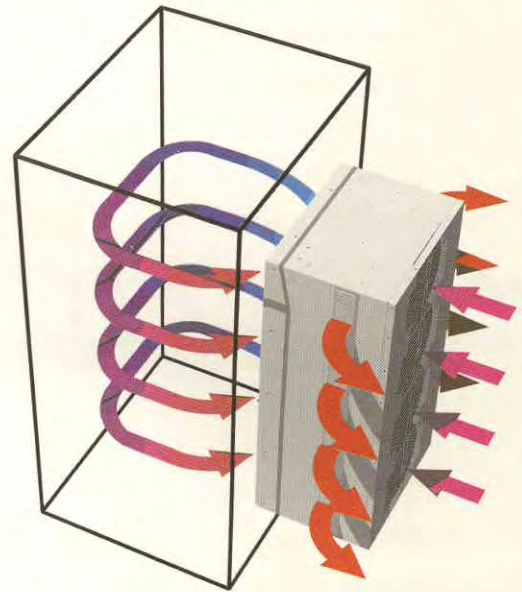
1700 BTU/hr @ 0 °F ΔT 2200 BTU/hr @ +20 °F ΔT *

RATING (DIN 3168)

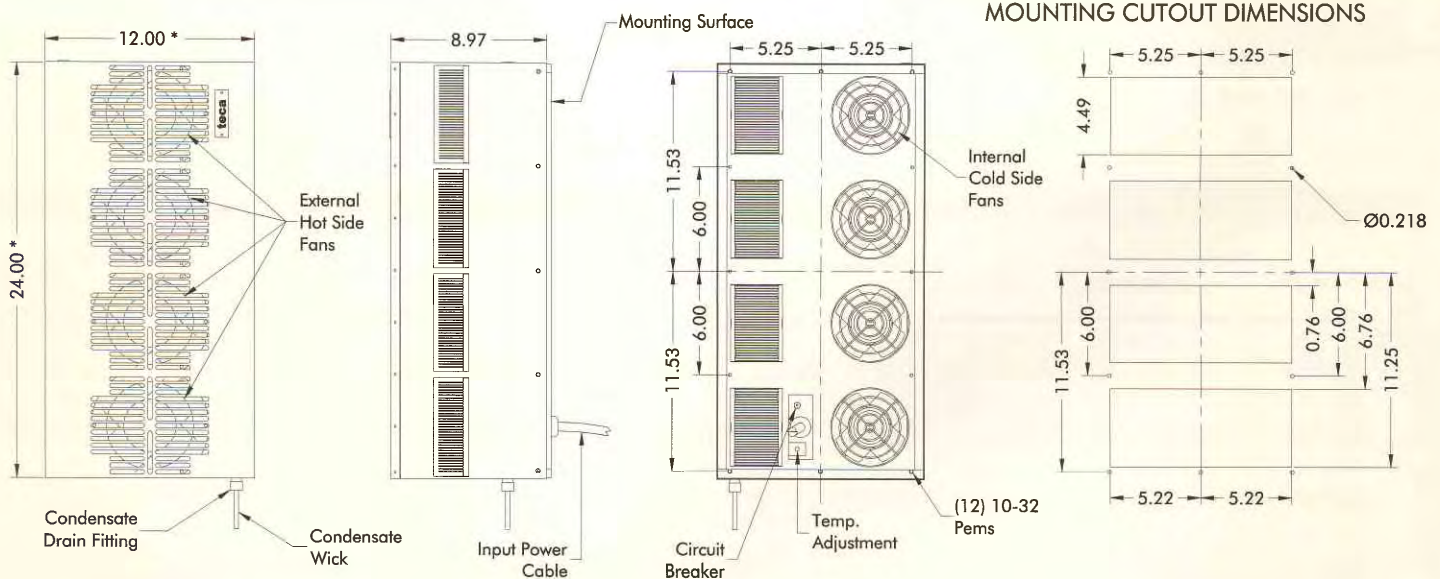
500 Watts L35 L35

325 Watts L35 L50

* See page 6



DIMENSIONS



* Dimension does not include hardware. Dimensions: inches. Mounting hardware and gasket included but not shown.

FHP-1501

Air Cooled
Flush Mounted
Nema-12, 4/4X

Solid-State Air Conditioner

FEATURES

- Externally mounted (no intrusion)
- Mounts in multi-unit array for incremental capacity
- Compact (only 15" L X 12" W X 9" D)
- Weighs only 55 lbs. (25 kg)
- Ambient range -10°C to +70°C
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Dual voltage (120/240 VAC)
- No moving parts except fans
- Environmentally safe



INCLUDES

- Integral power supply
- Condensate removal system
- Adjustable temperature control
- Mounting gasket for Nema-12, Nema-4 seal
- Mounting hardware

APPLICATIONS

Used to cool electronic enclosures where limited amount of space is available for through mount style.

SPECIFICATIONS

| | MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS. (KG) | TEMP. CONTROL * | CONDENSATE REMOVAL | OPERATING AMBIENT °C | AGENCY APPROVALS (ETL) |
|----------------------------|----------------|--------------|-----------|---------------------------------|----------------------------|------------------|---------------------|-----------------------|-----------------------|-------------------------|------------------------------|
| N E M A 12 | → FHP-1501 | 7-2181-0-000 | Cool only | 1000-1100 | 120/240 | 7.5/5.0 | 55(25) | TC-6F | Included | -10/+70 | UL1995/CSA22.2, CE |
| | → FHP-1501 | 7-2151-0-000 | Cool only | 1000-1100 | 120/240 | 7.5/5.0 | 55(25) | OPT* | Included | -10/+70 | UL1995/CSA22.2, CE |
| | → FHP-1501HC | 7-2131-1-000 | Heat/Cool | 1000-1100 | 120/240 | 7.5/5.0 | 55(25) | TC-3F | Included | -10/+70 | UL1995/CSA22.2, CE |
| | → FHP-1501HC | 7-2151-1-000 | Heat/Cool | 1000-1100 | 120/240 | 7.5/5.0 | 55(25) | OPT* | Included | -10/+70 | UL1995/CSA22.2, CE |
| N E M A 4 X | → FHP-1501XE | 7-2181-4-000 | Cool only | 1000-1100 | 120/240 | 8.0/5.5 | 55(25) | TC-6F | Included | -10/+60 | UL1995/CSA22.2, CE |
| | → FHP-1501XE | 7-2151-4-000 | Cool only | 1000-1100 | 120/240 | 8.0/5.5 | 55(25) | OPT* | Included | -10/+60 | UL1995/CSA22.2, CE |
| | → FHP-1501XEHC | 7-2131-5-000 | Heat/Cool | 1000-1100 | 120/240 | 7.5/5.0 | 55(25) | TC-3F | Included | -10/+70 | UL1995/CSA22.2, CE |
| | → FHP-1501XEHC | 7-2151-5-000 | Heat/Cool | 1000-1100 | 120/240 | 7.5/5.0 | 55(25) | OPT* | Included | -10/+70 | UL1995/CSA22.2, CE |

*OPT; Unit is set up for TC-3300 controller (or similar)

FHP-1501**MOUNTING STYLE**

Flush Mounted

ENVIRONMENTS

Nema-12 IP 40 (maintains IP 52)

Nema-4/4X IP 56

RATING (TRADITIONAL)

950 BTU/hr @ 0 °F ΔT

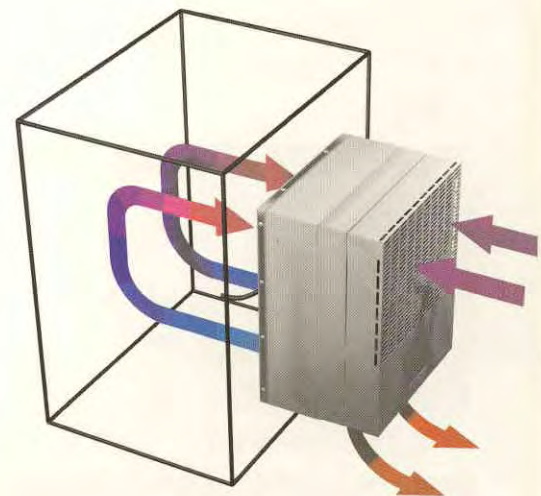
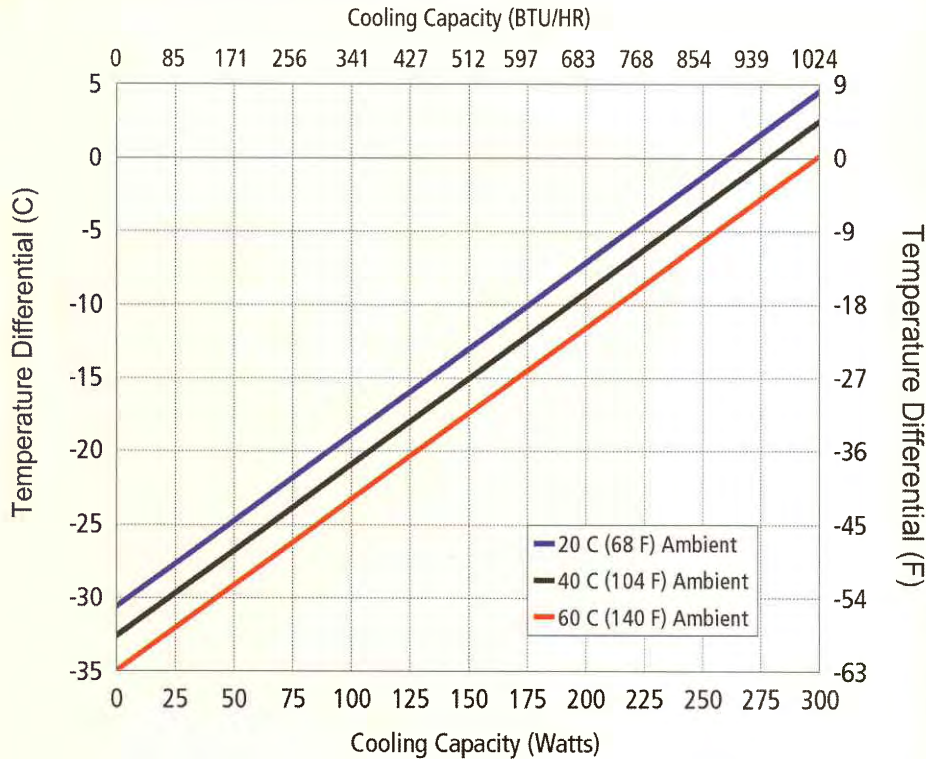
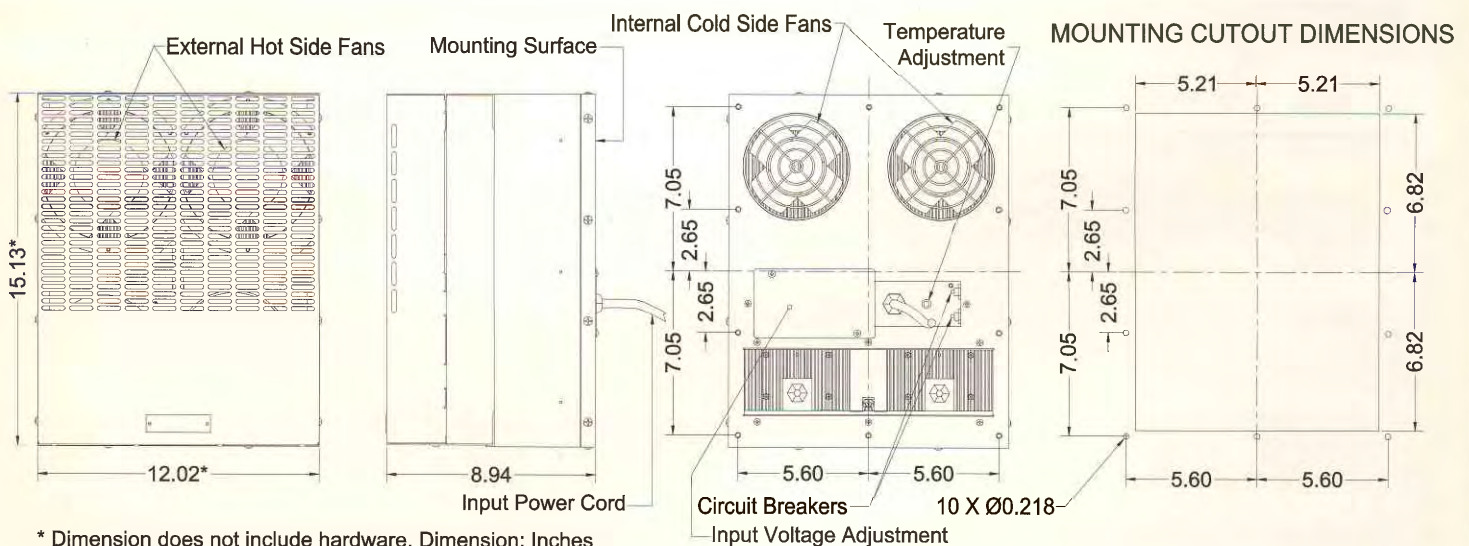
1270 BTU/hr @ +20 °F ΔT *

RATING (DIN 3168)

278 Watts L35 L35

162 Watts L35 L50

* See page 6

**DIMENSIONS**

* Dimension does not include hardware. Dimension: Inches
Mounting hardware and gasket included but not shown.

FHP-750

Solid-State Air Conditioner



Air Cooled
Flush Mounted
Nema-12, Nema-4/4X

FEATURES

- Externally mounted, no intrusion
- Compact (only 12"L X 6"W X 9"D)
- Weighs only 16 lbs. (7.2 kg)
- Ambient range -10°C to +70°C
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Nema-4 and Nema-12 versions
- Both 120 VAC and 240 VAC available
- CE marked

INCLUDES

- Integral power supply
- Power input cable
- Condensate removal system
- Adjustable temperature control
- Gasket for mounting
- Mounting hardware

APPLICATIONS

Used on small enclosures in electronics where space is premium. Telecommunications, medical and industrial.



SPECIFICATIONS

| | MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS. (KG) | TEMP. CONTROL * | CONDENSATE REMOVAL | OPERATING AMBIENT °C | AGENCY APPROVALS (ETL) |
|---------|-----------|--------------|---|---------------------------------|----------------------------|------------------|---------------------|-----------------------|-----------------------|-------------------------|------------------------------|
| NEMA 12 | FHP-750 | 7-A580-0-000 | Cool only, built in temperature control | 400-450 | 120 | 4.5 | 16 (7.2) | TC-6F | Included | -10/+70 | UL1995 CSA22.2, CE |
| | FHP-750 | 7-A550-0-000 | Cool only, for remote temperature control | 400-450 | 120 | 4.5 | 16 (7.2) | OPT* | Included | -10/+70 | UL1995 CSA22.2, CE |
| | FHP-752 | 7-A582-0-000 | Cool only, built in temperature control | 400-450 | 240 | 2.5 | 23 (10.5) | TC-6F | Included | -10/+70 | UL1995 CSA22.2, CE |
| | FHP-752 | 7-A552-0-000 | Cool only, for remote temperature control | 400-450 | 240 | 2.5 | 23 (10.5) | OPT* | Included | -10/+70 | UL1995 CSA22.2, CE |
| NEMA 4X | FHP-750XE | 7-A580-4-000 | Cool only, built in temperature control | 400-450 | 120 | 5.0 | 19(8.6) | TC-6F | Included | -10/+70 | UL1995 CSA22.2, CE |
| | FHP-750XE | 7-A550-4-000 | Cool only, for remote temperature control | 400-450 | 120 | 5.0 | 19(8.6) | OPT* | Included | -10/+70 | UL1995 CSA22.2, CE |
| | FHP-752XE | 7-A582-4-000 | Cool only, built in temperature control | 400-450 | 240 | 2.5 | 25(11.5) | TC-6F | Included | -10/+70 | UL1995 CSA22.2, CE |
| | FHP-752XE | 7-A552-4-000 | Cool only, for remote temperature control | 400-450 | 240 | 2.5 | 25(11.5) | OPT* | Included | -10/+70 | UL1995 CSA22.2, CE |

*OPT; Unit is set up for TC-3300 controller (or similar)

FHP-750**MOUNTING STYLE**

Flush Mounted

ENVIRONMENTS

Nema-12 IP 40 (maintains IP 52)

Nema-4/4X IP 56

RATING (TRADITIONAL)

430 BTU/hr @ 0 °F ΔT

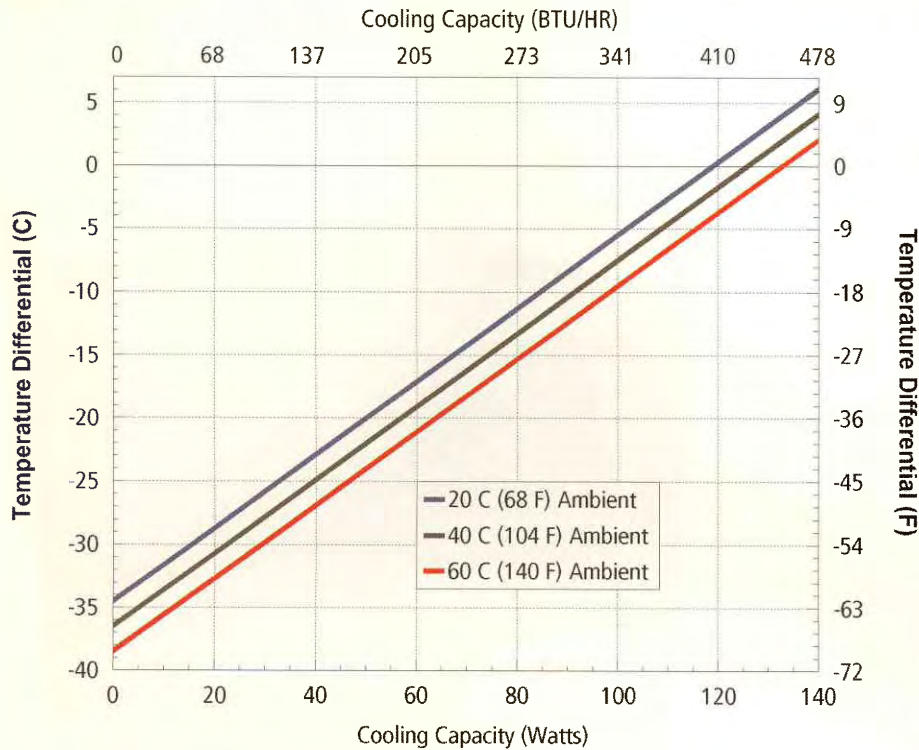
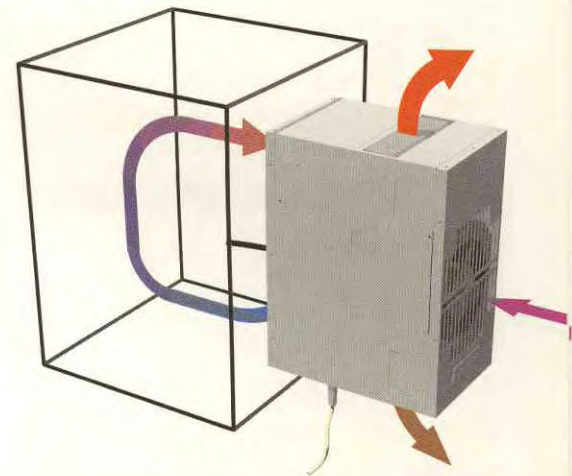
560 BTU/hr @ +20 °F ΔT *

RATING (DIN 3168)

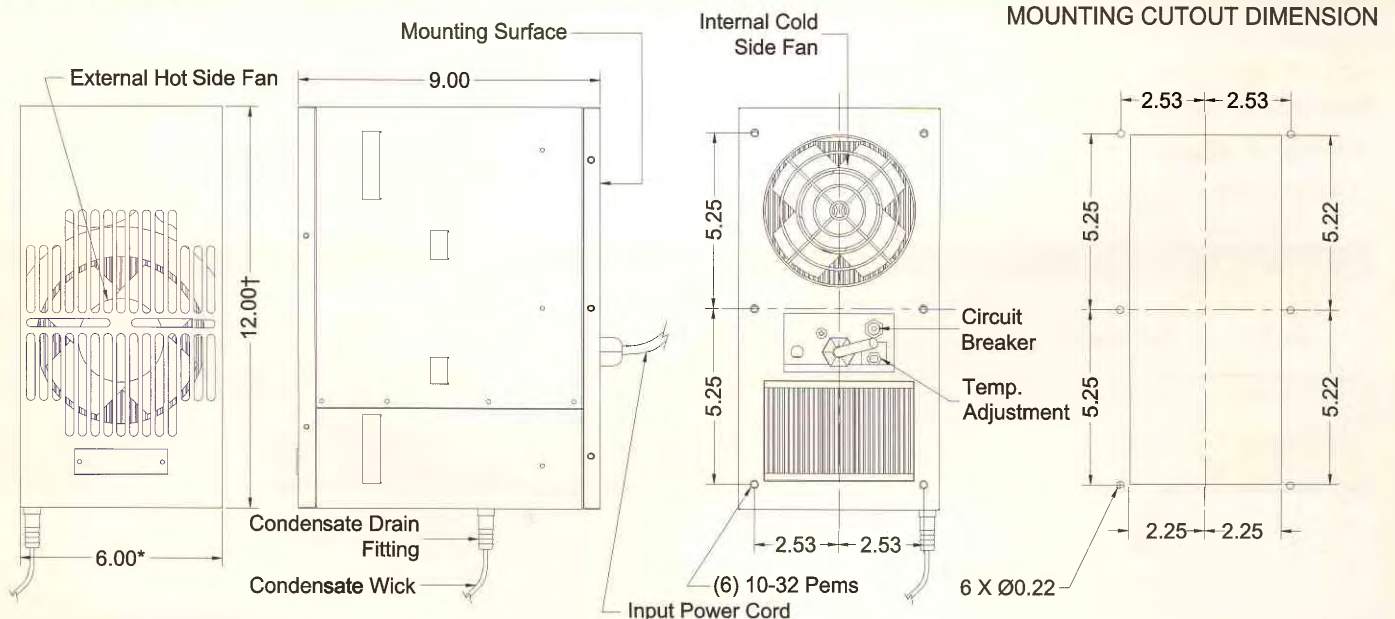
125 Watts L35 L35

78 Watts L35 L50

* See page 6



| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|-------------------|-------------------|-------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .29x - 34.5$ | $y = .29x - 36.5$ | $y = .29x - 38.5$ |
| Cold Sink | $y = .18x - 34.5$ | $y = .18x - 36.5$ | $y = .18x - 38.5$ |

DIMENSIONS

* Dimension does not include hardware. Dimension: Inches

† For FHP-752 this dimension is 14.55.

Mounting hardware and gasket included but not shown.

FHP-450XE

Air Cooled
Flush Mounted
Nema-4, 4X

Solid-State Air Conditioner

FEATURES

- Externally mounted , no intrusion
- Maintains Nema-4X rating
- Compact (only 10"L X 8"W X 6.93"D)
- Weighs less than 20 lbs.
- Ambient range -10°C to +70°C
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Mounts in any orientation
- 120 VAC and 240 VAC input versions

INCLUDES

- Integral power supply
- Single set point control
- Gasket for Nema-4X seal
- Mounting hardware
- Optional condensate removal
- Power input cable

APPLICATIONS

Intended for use in the communications industry for cooling small outdoor enclosures, also used in food and chemical industries for washdown areas.



SPECIFICATIONS

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS. (KG) | TEMP. CONTROL | CONDENSATE REMOVAL | OPERATING AMBIENT °C |
|-----------|--------------|----------------------------------|---------------------------------|----------------------------|------------------|---------------------|------------------|-----------------------|-------------------------|
| FHP-450XE | 7-7070-4-000 | Cool only temperature control | 135-165 | 120 | 2.3 | 19.8(9) | T'stat 85 F | Optional | -10/+70 |
| FHP-452XE | 7-7072-4-000 | Cool only temperature control | 135-165 | 240 | 1.1 | 19.8(9) | T'stat 85 F | Optional | -10/+70 |

FHP-450XE**MOUNTING STYLE**

Flush Mounted

ENVIRONMENTS

Nema-4/4X IP 56

RATING (TRADITIONAL)

150 BTU/hr @ 0 °F ΔT

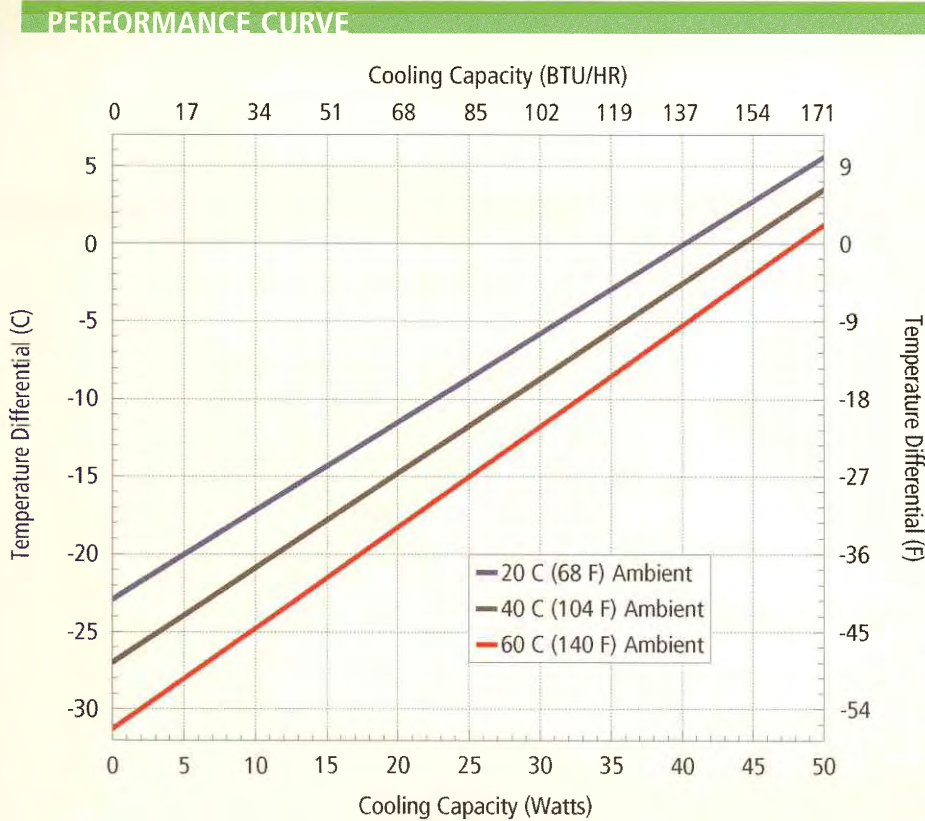
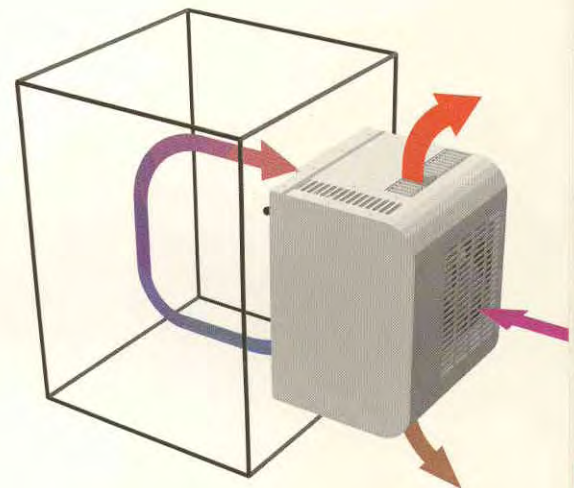
213 BTU/hr @ +20 °F ΔT *

RATING (DIN 3168)

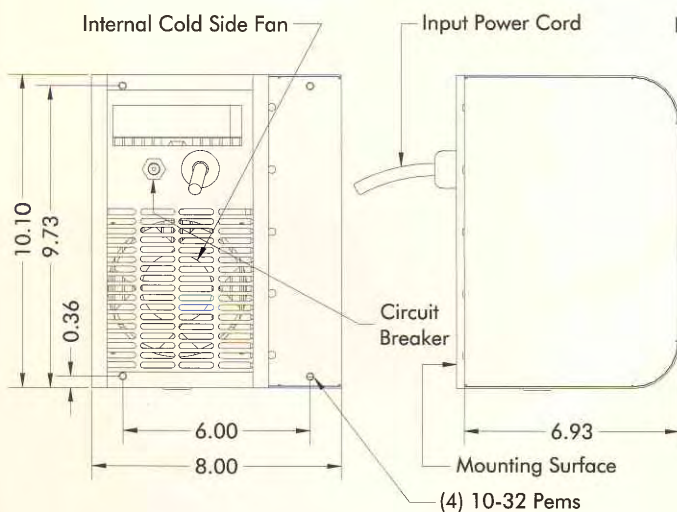
44 Watts L35 L35

23 Watts L35 L50

* See page 6

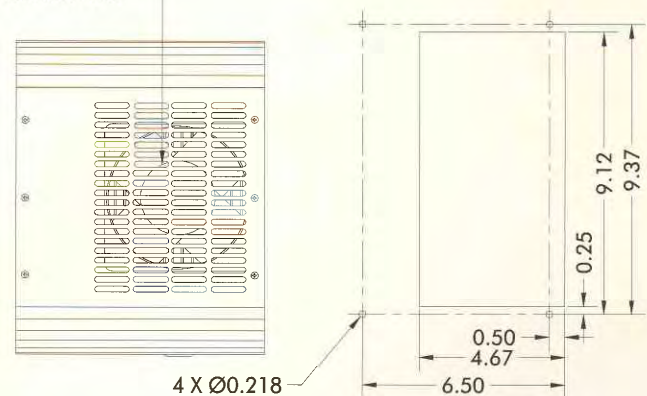


| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|-------------------|-------------------|-------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Enclosure Air | $y = .57x - 22.9$ | $y = .61x - 27.0$ | $y = .65x - 31.3$ |
| Cold Sink | $y = .48x - 22.9$ | $y = .51x - 27.0$ | $y = .55x - 31.3$ |

DIMENSIONS

Dimension: Inches

Hardware and gasket included but not shown.

MOUNTING CUTOUT DIMENSION

150-1180 BTU/hr

Liquid Cooled Air Conditioners

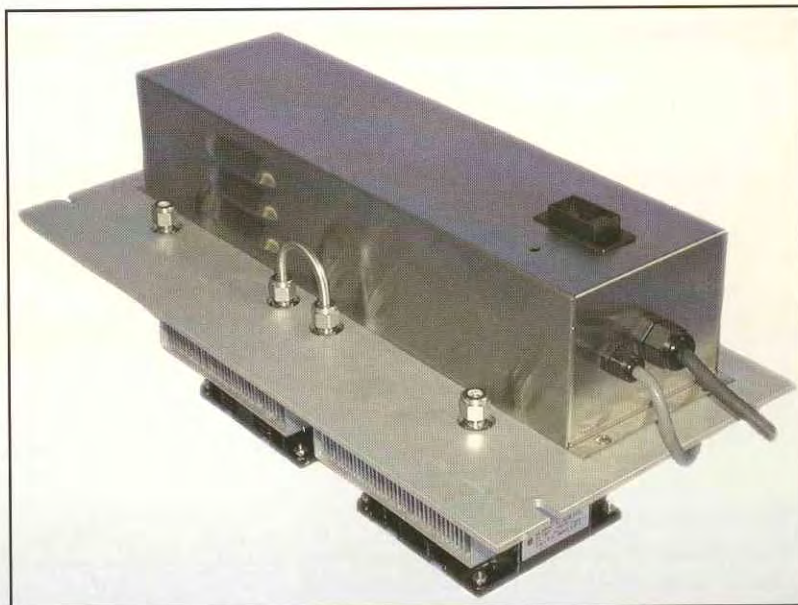
Solid-state liquid-cooled air conditioners work well in tight enclosures.

FEATURES

- No compressor, fluorocarbons or filters
- Virtually maintenance free operation
- Stainless steel exterior housing
- Mounts in any orientation
- No air exhaust

APPLICATIONS

Cools equipment racks, PCs, Drives, Amplifiers, Motor Controls and other electronic equipment.



AIR CONDITIONERS

Liquid Cooled

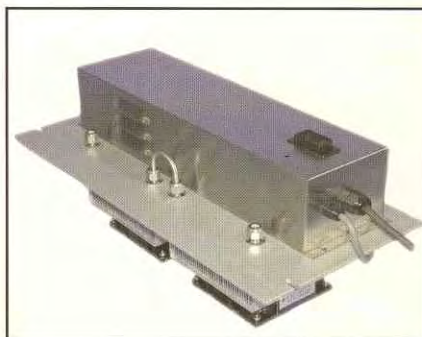
150-1180 BTU/hr

LHP-SERIES

LIQUID COOLED

LHP-1700FF page 40

950-1180 BTU/hr rating,
19.0" x 8.7" mounting area
120 and 240 VAC input.



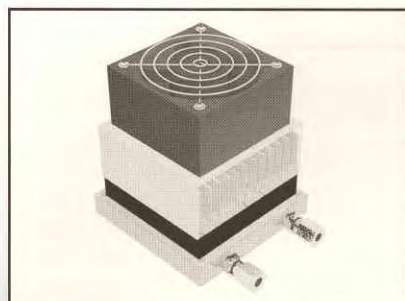
LHP-800FF page 42

460-540 BTU/hr rating,
6.6" x 6.6" mounting area
30 and 130 VDC for TE
120 VAC fan



LHP-300FF page 42

150-175 BTU/hr rating,
4" x 4" mounting area
24 VDC for TE
120 VAC fan



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ENGINEERING
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LHP-1700FF

Liquid Cooled
Thru Mount
Nema-12

Solid-State Air Conditioner

FEATURES

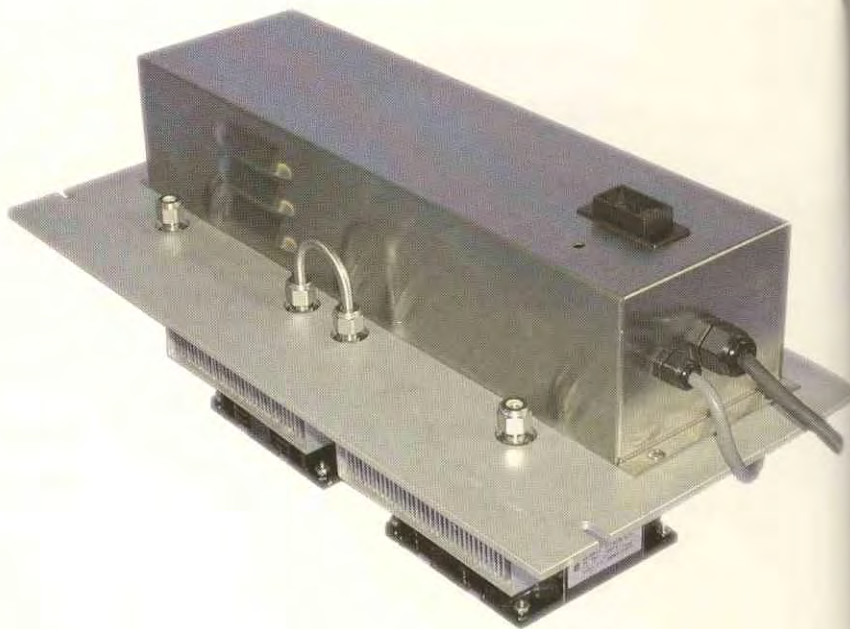
- Standard 19" rack mount
- Weighs only 46 lbs. (21 kg)
- Ambient range 0°C to +70°C
- Available in 120 or 240 VAC
- Adaptable to NEMA-4 and explosion proof applications
- Can be mounted entirely inside purged enclosure
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Mounts in any orientation

INCLUDES

- Integral power supply
- Compression fittings
- Power cord

APPLICATIONS

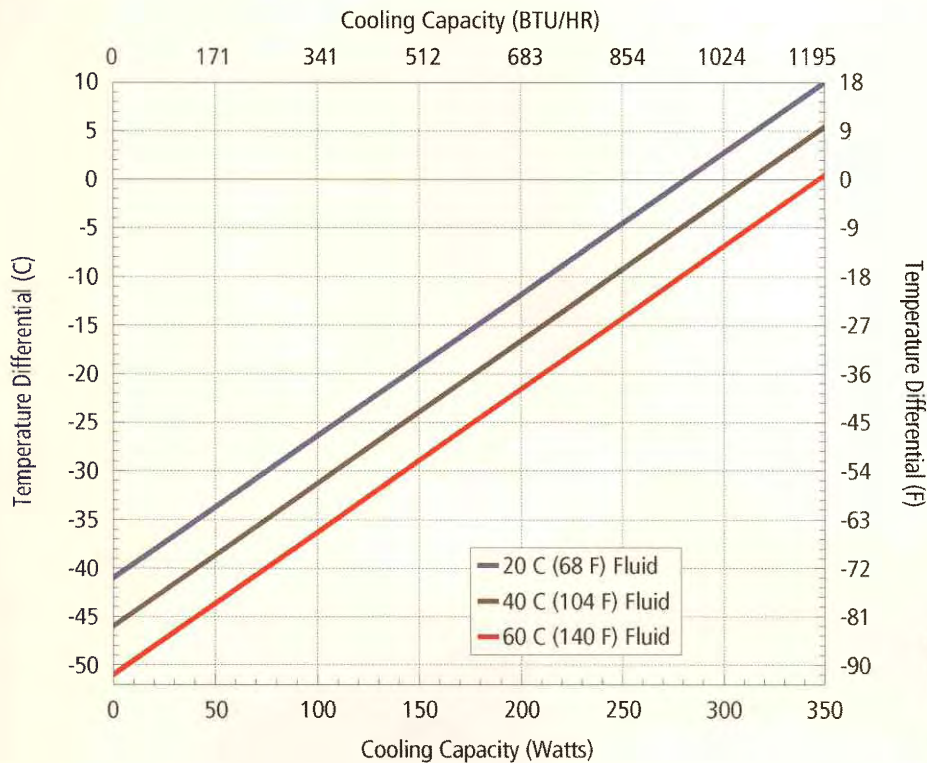
Useful where ambient air can not be used for heat removal such as paper processing at paper mills, and abrasives processing plants.



SPECIFICATIONS

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | Min Flow GPM | WEIGHT LBS. (kg) | TEMP. CONTROL * | OPERATING AMBIENT °C |
|--------------|--------------|-----------|---------------------------------|----------------------------|------------------|-----------------|---------------------|-----------------------|-------------------------|
| LHP-1700FF | 2-1090-0-000 | Cool only | 950-1180 | 120 | 7.0 | 0.3 | 46(21) | none | 0/+70 |
| LHP-1700FF | 2-1080-0-000 | Cool only | 950-1180 | 120 | 7.0 | 0.3 | 46(21) | TC-6F | 0/+70 |
| LHP-1700FF | 2-1050-0-000 | Cool only | 950-1180 | 120 | 7.0 | 0.3 | 46(21) | OPT* | 0/+70 |
| LHP-1700FFHC | 2-1030-1-000 | Heat/Cool | 950-1180 | 120 | 7.0 | 0.3 | 46(21) | TC-3F | 0/+70 |
| LHP-1700FFHC | 2-1050-1-000 | Heat/Cool | 950-1180 | 120 | 7.0 | 0.3 | 46(21) | OPT* | 0/+70 |
| LHP-1702FF | 2-1092-0-000 | Cool only | 950-1180 | 240 | 4.7 | 0.3 | 46(21) | none | 0/+70 |
| LHP-1702FF | 2-1082-0-000 | Cool only | 950-1180 | 240 | 4.7 | 0.3 | 46(21) | TC-6F | 0/+70 |
| LHP-1702FF | 2-1052-0-000 | Cool only | 950-1180 | 240 | 4.7 | 0.3 | 46(21) | OPT* | 0/+70 |
| LHP-1702FFHC | 2-1032-1-000 | Heat/Cool | 950-1180 | 240 | 4.7 | 0.3 | 46(21) | TC-3F | 0/+70 |
| LHP-1702FFHC | 2-1052-1-000 | Heat/Cool | 950-1180 | 240 | 4.7 | 0.3 | 46(21) | OPT* | 0/+70 |

*OPT; Unit is set up for TC-3300 controller (or similar)

LHP-1700FF**PERFORMANCE CURVE**Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$

| Fluid Temp | 20°C | 40°C | 60°C |
|---------------|--------------------|--------------------|--------------------|
| Enclosure Air | $y = .147x - 41.0$ | $y = .147x - 46.0$ | $y = .147x - 51.0$ |
| Cold Sink | $y = .11x - 41.0$ | $y = .11x - 46.0$ | $y = .11x - 51.0$ |

MOUNTING STYLE

Thru Mount

ENVIRONMENTS

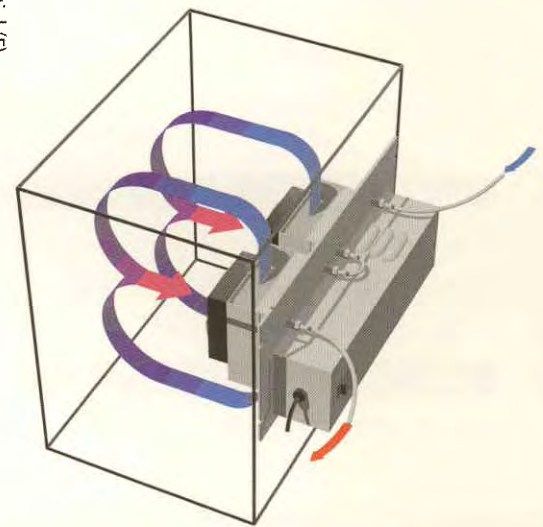
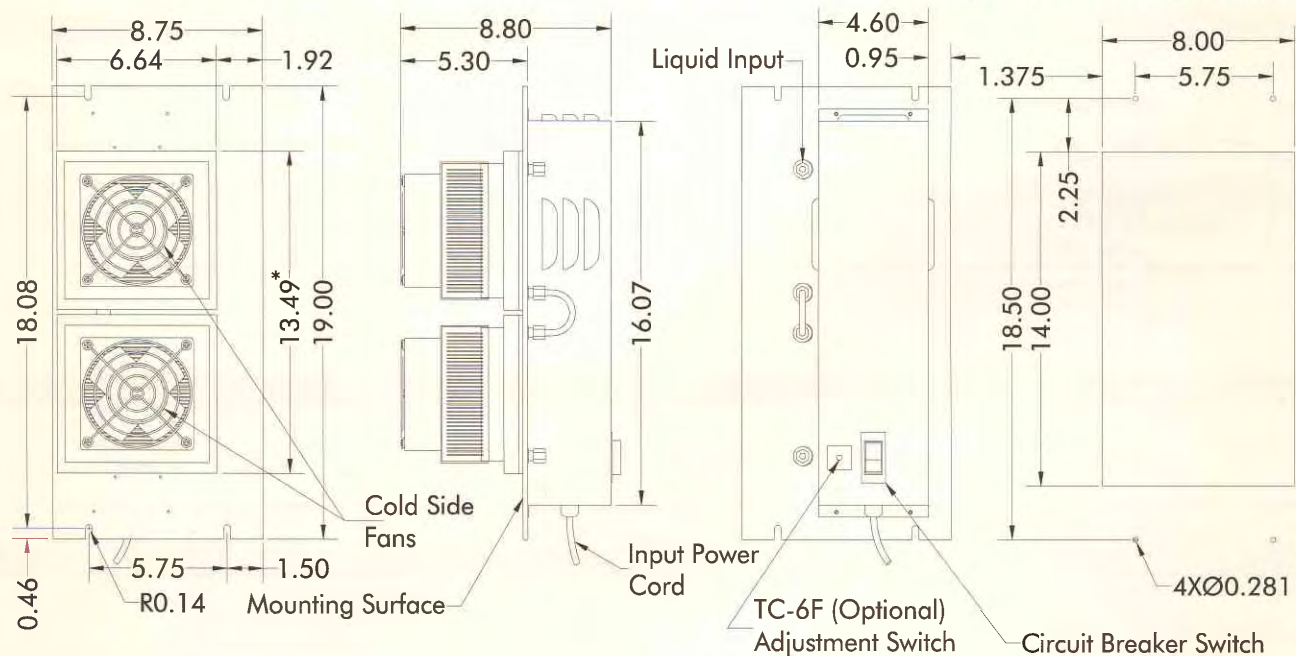
Nema-12 IP 40 (maintains IP 52)

RATING (TRADITIONAL)1050 BTU/hr @ 0 °F ΔT 1320 BTU/hr @ +20 °F ΔT ***RATING (DIN 3168)**

312 Watts L35 L35

225 Watts L35 L50

* See page 6

**DIMENSIONS**

* Dimension does not include hardware, insulation. Dimensions: inches.

LHP-800FF

LHP-300FF

Liquid Cooled
Thru Mount
Nema-12

Solid-State Air Conditioner

FEATURES

- Compact
- Light weight
- Ambient range 0°C to +70°C
- No compressor, fluorocarbons or filters
- Adaptable to NEMA-4 and explosion proof applications. Can be mounted entirely inside purged enclosure
- Virtually maintenance-free operation
- Mounts in any orientation

INCLUDES

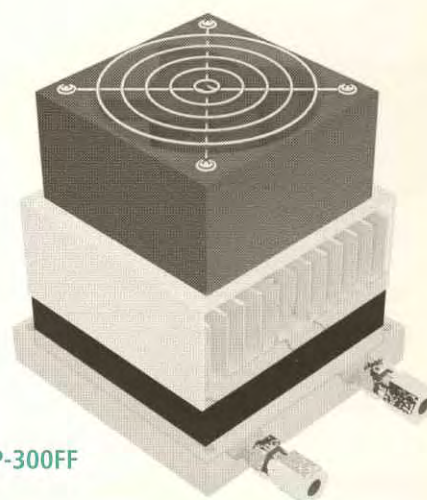
- Compression fittings
- Terminal strip for wire hook up

APPLICATIONS

Used in laboratory equipment and specialized systems world wide.



LHP-800FF



LHP-300FF

SPECIFICATIONS LHP-800FF

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VDC | CURRENT AMPS. | FAN VOLTAGE VAC | WEIGHT LBS (kg) | MIN FLOW GPM | OPERATING AMBIENT °C |
|-------------|--------------|-----------|------------------------------|----------------|------------------|-----------------------|--------------------|-----------------|-------------------------|
| LHP-800FF | 2-5099-0-000 | Cool only | 460-540 | 30 | 10 | 120 | 6(2.7) | 0.3 | 0/+70 |
| LHP-800FFHC | 2-5099-1-000 | Heat/Cool | 460-540 (120 VAC Heat) | 30 | 10 | 120 | 6(2.7) | 0.3 | 0/+70 |
| LHP-810FF | 2-509A-0-000 | Cool only | 460-540 | 120 | 3.5 | 120 | 6(2.7) | 0.3 | 0/+70 |

Note: No provision for temperature control is included. Consult factory for options.

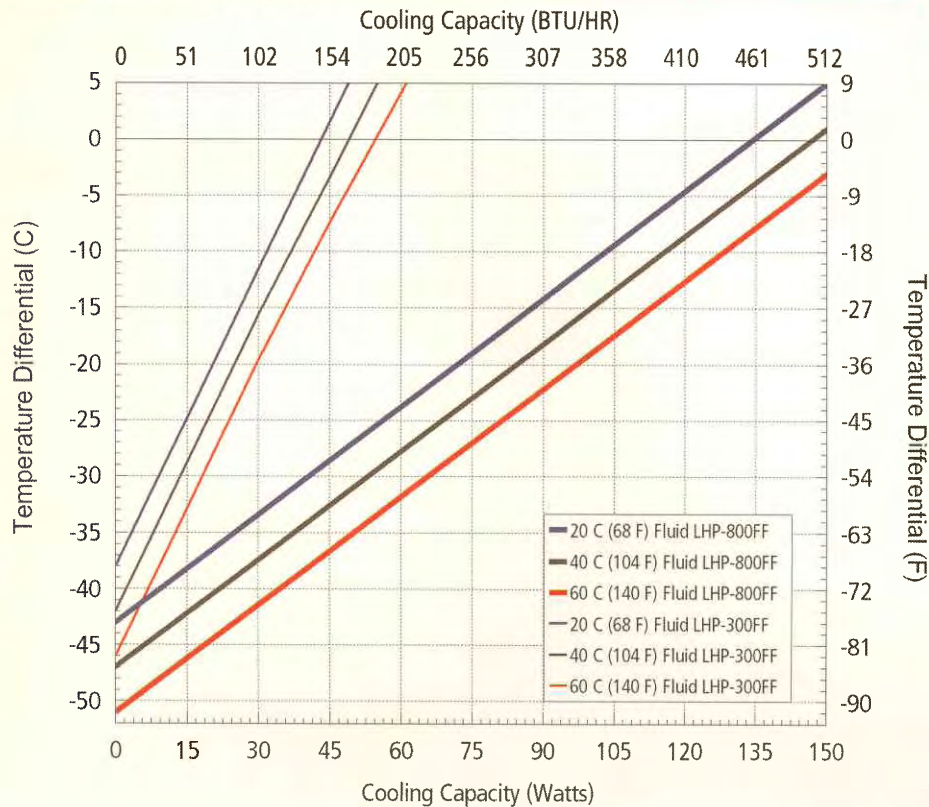
SPECIFICATIONS LHP-300FF

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VDC | CURRENT AMPS. | HEAT WATTS | WEIGHT LBS (kg) | MIN FLOW GPM | OPERATING AMBIENT °C |
|-------------|--------------|------------------------|------------------------------|----------------|------------------|---------------|--------------------|-----------------|-------------------------|
| LHP-300FF | 2-7098-0-000 | Cool only | 150-175 | 12/24 | 12/6 | N/A | 2.75(1.25) | 0.3 | 0/+70 |
| LHP-300FFHC | 2-7095-1-000 | Heat/Cool, 24 VDC Heat | 150-175 | 24 | 6 | 75 | 2.75(1.25) | 0.3 | 0/+70 |

Note: No provision for temperature control is included. Consult factory for options.

See also , "Power Supplies" , P. 67

PERFORMANCE CURVE

Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$

| Fluid Temp | 20°C | 40°C | 60°C |
|------------|-------------------|-------------------|-------------------|
| LHP-800FF | $y = .32x - 43.0$ | $y = .32x - 47.0$ | $y = .32x - 51.0$ |
| LHP-300FF | $y = .88x - 38.0$ | $y = .88x - 42.0$ | $y = .88x - 46.0$ |

LHP-800FF

MOUNTING STYLE

Internal

RATING (TRADITIONAL)

500 BTU/hr @ 0 °F ΔT 615 BTU/hr @ +20 °F ΔT *

RATING (DIN 3168)

146 Watts L35 L35

105 Watts L35 L50

LHP-300FF

MOUNTING STYLE

Internal

RATING (TRADITIONAL)

160 BTU/hr @ 0 °F ΔT 200 BTU/hr @ +20 °F ΔT *

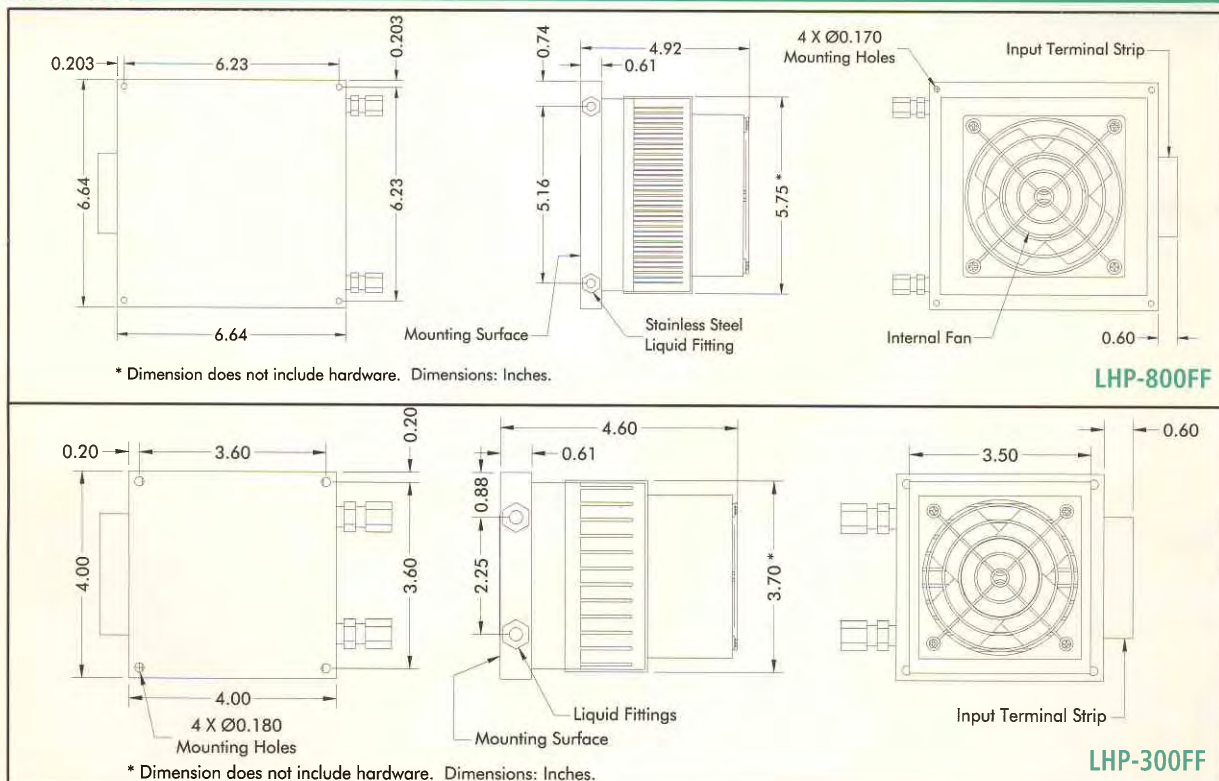
RATING (DIN 3168)

48 Watts L35 L35

34 Watts L35 L50

* See page 6

DIMENSIONS



LHP-800FF

LHP-300FF

Cold Plates

140-1630 BTU/hr

AIR COOLED

AHP-SERIES

FEATURES

- No load cooling to -20°C (in 22°C Amb)
- Optional heating
- Temperature control
- Low maintenance
- No compressor, fluorocarbons or filters
- Compact
- Lightweight
- Durable
- Reliable

LIQUID COOLED

LHP-SERIES

FEATURES

- No load cooling to -25°C (25°C Fluid)
- Optional heating
- Temperature control, optional
- Low maintenance
- No compressor, fluorocarbons or filters
- Compact
- Lightweight
- Durable
- Reliable

COLD PLATES

Air Cooled

Liquid Cooled

AIR COOLED

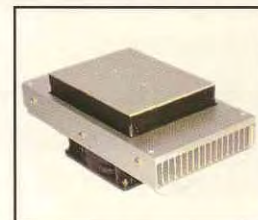
AHP-1200CP page 46

830-950 BTU/hr rating,
15" x 7.3" x 5" size,
5.38" x 13" cold plate surface,
120 VAC operation



AHP-300CP page 50

290-330 BTU/hr rating,
10" x 5.37" x 4.1" size,
4.5" x 6" cold plate surface,
12/24/48 VDC operation



AHP-301CP page 48

225-265 BTU/hr rating,
10" x 5.37" x 4.1" size,
4.5" x 6" cold plate surface,
120 or 240 VAC operation



AHP-150CP page 50

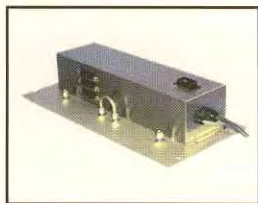
140-160 BTU/hr rating,
7" x 5" x 3.95" size,
2" x 3.5" cold plate surface,
12/24 VDC operation



LIQUID COOLED

LHP-1700CP page 52

1360-1630 BTU/hr rating,
19" x 8.7" x 5" size,
6.00" x 12.88" cold plate surface,
120 VAC operation



LHP-300CP page 54

280-335 BTU/hr rating,
4" x 4" x 1.63" size,
3.5" x 3.5" cold plate surface,
24 VDC operation



LHP-800CP page 54

700-830 BTU/hr rating,
6.6" x 6.6" x 1.75" size,
6" x 6" cold plate surface,
30 VDC operation



LHP-150CP page 54

130-160 BTU/hr rating,
4" x 2" x 1.63" size,
2" x 3.2" cold plate surface,
12 VDC operation



AHP-1200CP

Air Cooled
Flush Mount
Nema-12

Solid-State Cold Plate

FEATURES

- Direct contact cooling as much as 48 °C below room temperature
- Weighs only 19 lbs. (8.6 kg)
- Compact bench top units
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Integral temperature controller option (shown)
- Mounts in any orientation

INCLUDES

- Integral power supply (120 VAC input)
- Cold plate mounting taps
- Rubber feet
- Power input cord

APPLICATIONS

Cooling of components, processors, and various assemblies and products.



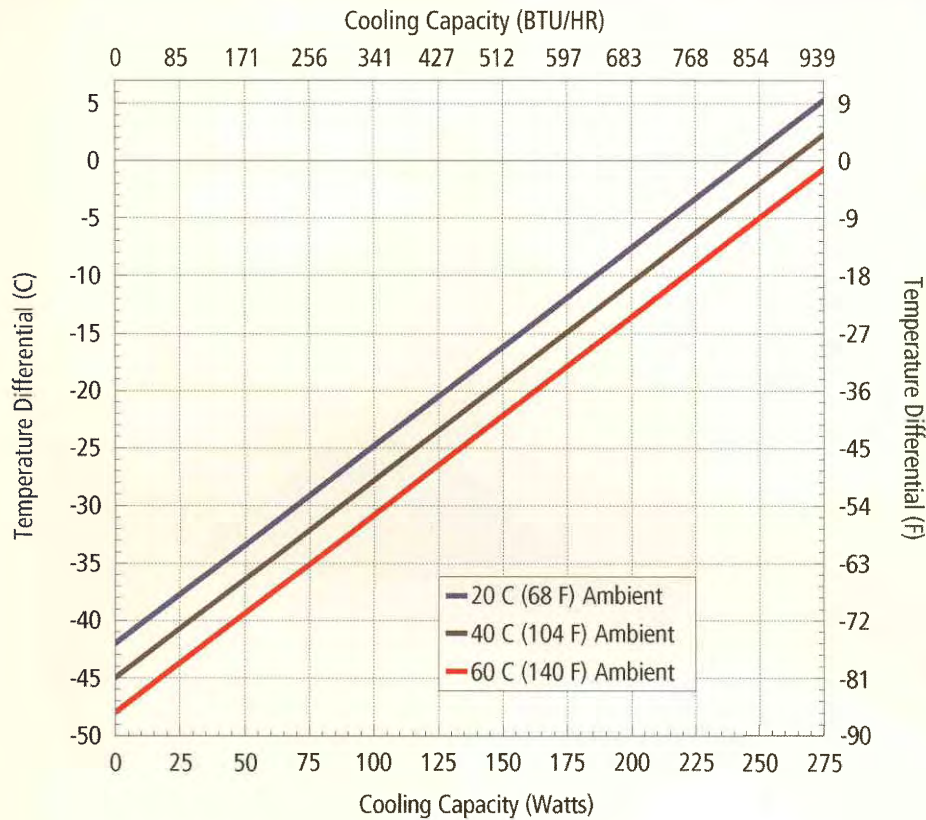
Shown above is the AHP-1200CPHC with integral TC-3300 temperature control.

SPECIFICATIONS

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS. (KG) | TEMP. CONTROL * | OPERATING AMBIENT °C |
|--------------|--------------|-----------|---------------------------------|----------------------------|------------------|---------------------|-----------------------|-------------------------|
| AHP-1200CP | 1-3090-0-000 | Cool only | 830-950 | 120 | 4.0 | 18(8.2) | None | -10/+70 |
| AHP-1200CP | 1-3050-0-000 | Cool only | 830-950 | 120 | 4.0 | 18(8.2) | OPT* | -10/+70 |
| AHP-1200CP | 1-30D0-0-000 | Cool only | 830-950 | 120 | 4.0 | 19(8.6) | TC-3300^ | -10/+70 |
| AHP-1200CPHC | 1-3050-1-000 | Heat/Cool | 830-950 | 120 | 4.0 | 18(8.2) | OPT* | -10/+70 |
| AHP-1200CPHC | 1-30D0-1-000 | Heat/Cool | 830-950 | 120 | 4.0 | 19(8.6) | TC-3300^ | -10/+70 |
| AHP-1202CP | 1-3092-0-000 | Cool only | 830-950 | 240 | 2.5 | 23(10.5) | None | -10/+70 |
| AHP-1202CP | 1-3052-0-000 | Cool only | 830-950 | 240 | 2.5 | 23(10.5) | OPT* | -10/+70 |
| AHP-1202CPHC | 1-3052-1-000 | Heat/Cool | 830-950 | 240 | 2.5 | 23(10.5) | OPT* | -10/+70 |

*OPT; Unit is setup for TC-3300 controller (or similar).
Controller not included.

^TC-3300 Temperature controller is integral (built in).

AHP-1200CP**PERFORMANCE CURVE**

| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|--------------------|--------------------|--------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Cold Plate | $y = .172x - 44.0$ | $y = .172x - 45.0$ | $y = .172x - 48.0$ |

ENVIRONMENTS

Bench top
Laboratory
Industrial

COOLING CAPACITY

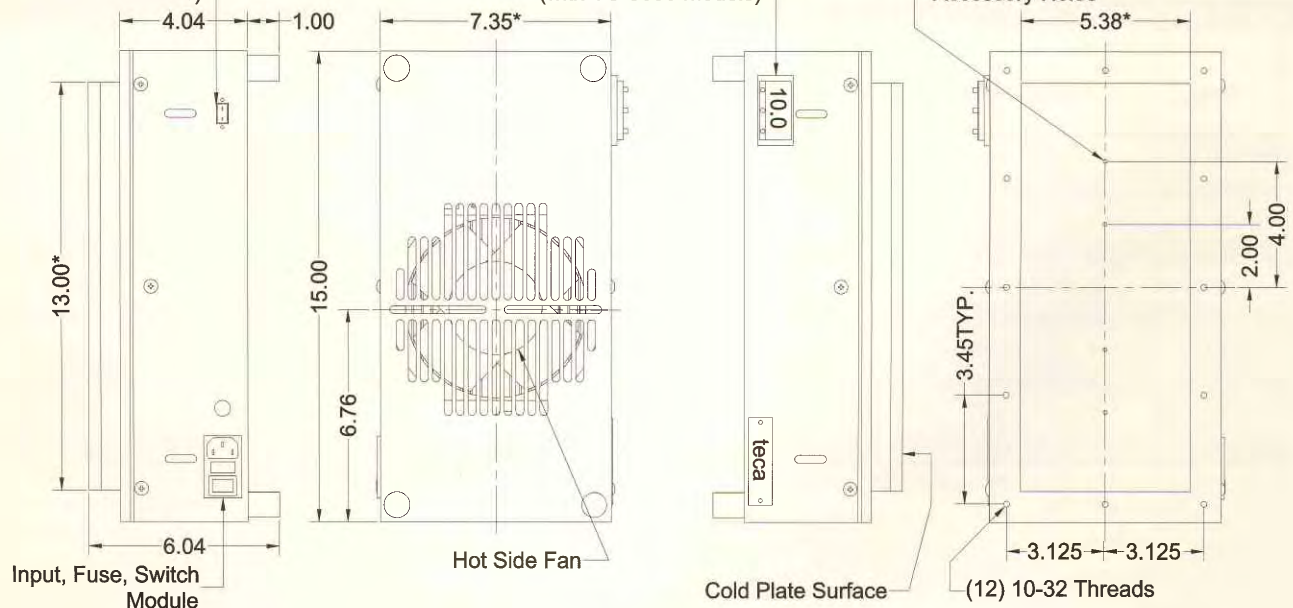
260 Watts @ 0 °C ΔT

Model AHP-1200CP is TECA'S largest air cooled cold plate.

DIMENSIONS

Thermocouple Connector
(with TC-3300 models)

Temperature Control
(with TC-3300 models)



* Dimension does not include hardware, insulation.
Dimension: Inches

AHP-301CP

Air Cooled

Solid-State Cold Plate

FEATURES

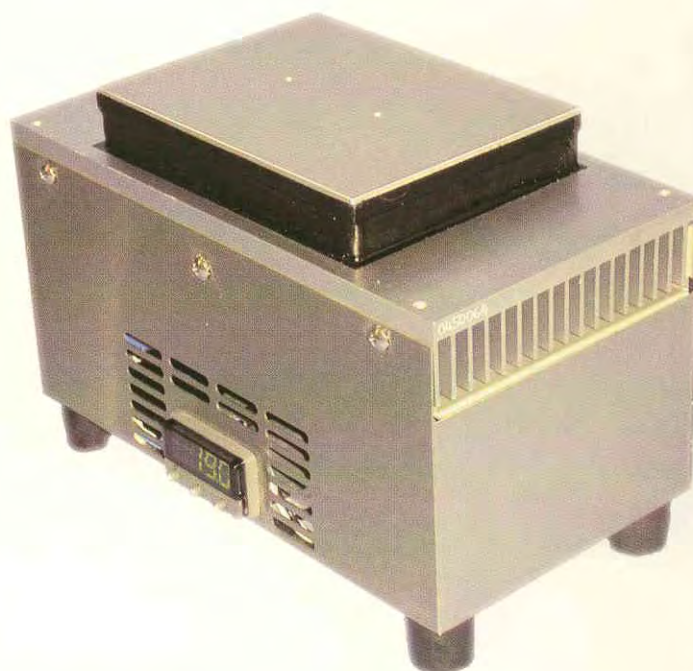
- Direct contact cooling as much as 52°C below room temperature
- Weighs only 11 lbs. (5.0 kg)
- Compact bench top units
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Integral temperature controller option (shown)
- Mounts in any orientation

INCLUDES

- Cold plate accessory tapped holes
- Rubber feet
- Power input cord
- Machined cold plate surface

APPLICATIONS

Cooling of components in telecom, labs, factories, etc.



Shown above is the AHP-301CPHC with integral TC-3300 temperature control.

SPECIFICATIONS

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 Hz | CURRENT AMPS. | WEIGHT LBS. (KG) | TEMP. CONTROL * | OPERATING AMBIENT °C |
|-------------|--------------|-----------|---------------------------------|----------------------------|------------------|---------------------|-----------------------|-------------------------|
| AHP-301CP | 1-7090-0-000 | Cool only | 225-265 | 120 | 1.2 | 11(5) | none | -10/+70 |
| AHP-301CP | 1-7050-0-000 | Cool only | 225-265 | 120 | 1.2 | 11(5) | OPT* | -10/+70 |
| AHP-301CP | 1-70D0-0-000 | Cool only | 225-265 | 120 | 1.2 | 12(5.5) | TC-3300^ | -10/+70 |
| AHP-301CPHC | 1-7050-1-000 | Heat/Cool | 225-265 | 120 | 1.2 | 11(5) | OPT* | -10/+70 |
| AHP-301CPHC | 1-70D0-1-000 | Heat/Cool | 225-265 | 120 | 1.2 | 12(5.5) | TC-3300^ | -10/+70 |
| AHP-301CP | 1-7092-0-000 | Cool only | 225-265 | 240 | 0.6 | 11(5) | none | -10/+70 |
| AHP-301CP | 1-7052-0-000 | Cool only | 225-265 | 240 | 0.6 | 11(5) | OPT* | -10/+70 |
| AHP-301CP | 1-70D2-0-000 | Cool only | 225-265 | 240 | 0.6 | 12(5.5) | TC-3300^ | -10/+70 |
| AHP-301CPHC | 1-7052-1-000 | Heat/Cool | 225-265 | 240 | 0.6 | 11(5) | OPT* | -10/+70 |
| AHP-301CPHC | 1-70D2-1-000 | Heat/Cool | 225-265 | 240 | 0.6 | 12(5.5) | TC-3300^ | -10/+70 |

*OPT; Unit is set up for TC-3300 controller (or similar).
Controller not included.

^ TC-3300 Temperature controllers are integral (built in).

AHP-301CP

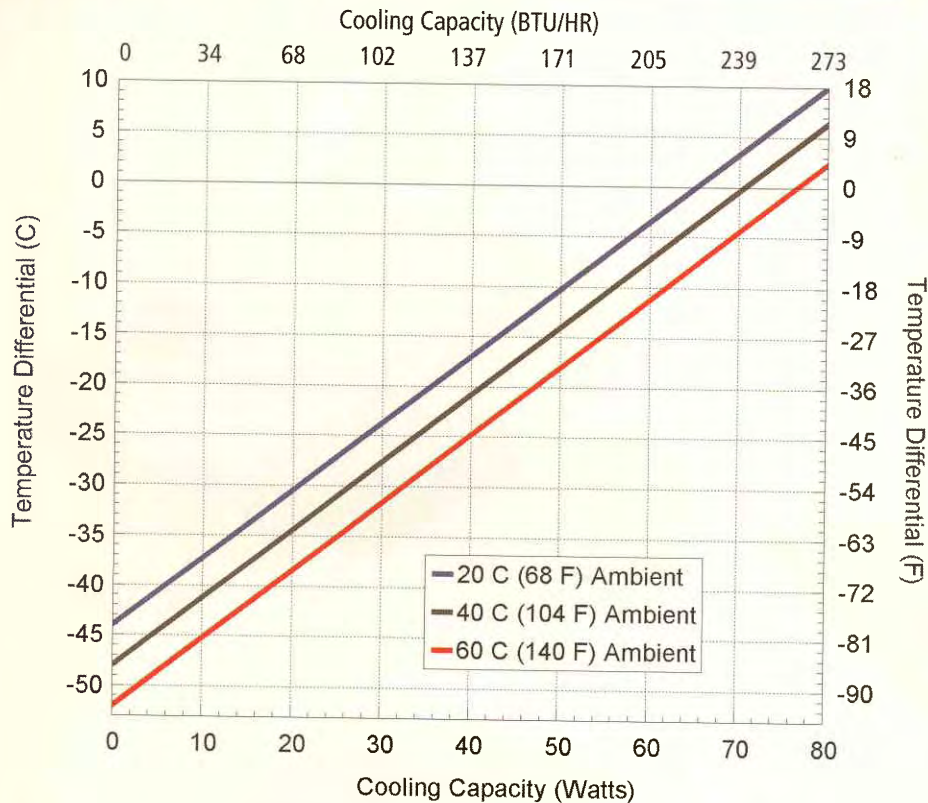
ENVIRONMENTS

Bench top
Laboratory
Industrial

COOLING CAPACITY

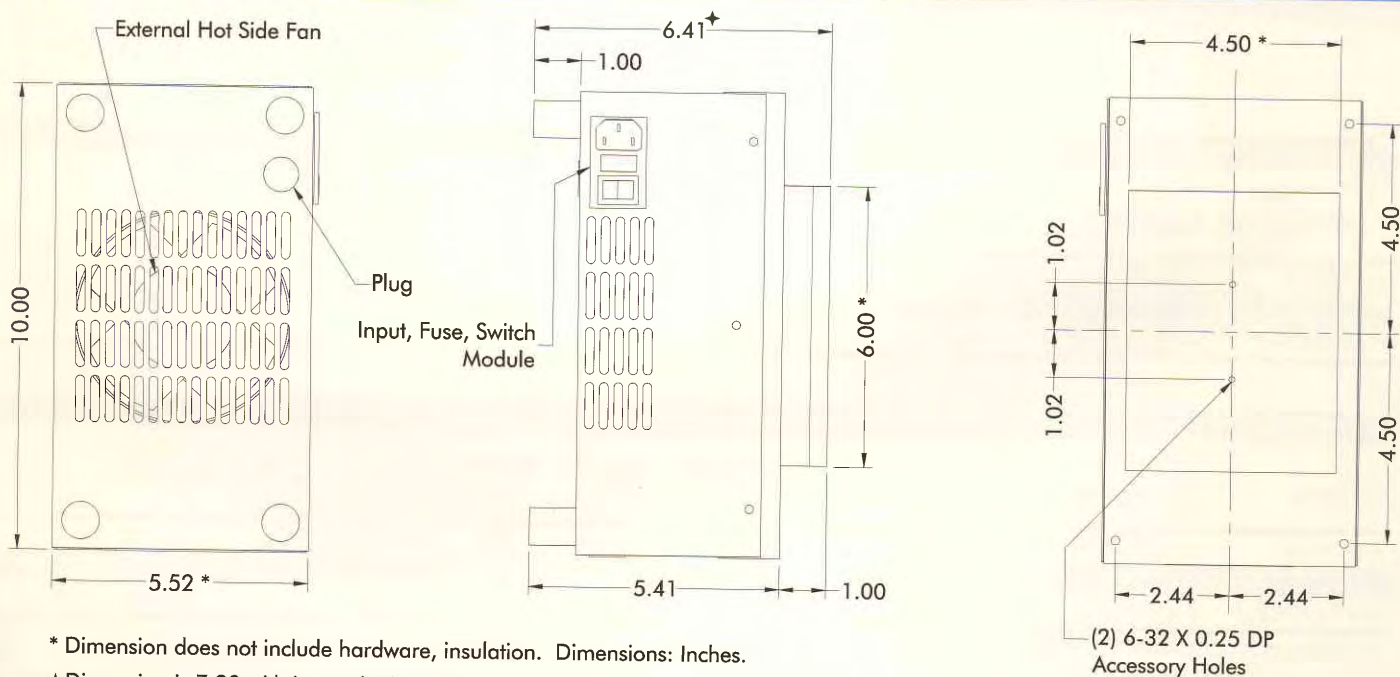
70 Watts @ 0 °C ΔT

PERFORMANCE CURVE



| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | | |
|--|-------------------|-------------------|-------------------|
| Ambient Temp | 20°C | 40°C | 60°C |
| Cold Plate | $y = .68x - 44.0$ | $y = .68x - 48.0$ | $y = .68x - 52.0$ |

DIMENSIONS



AHP-300CP AHP-150CP

Air Cooled

Solid-State Cold Plate

FEATURES

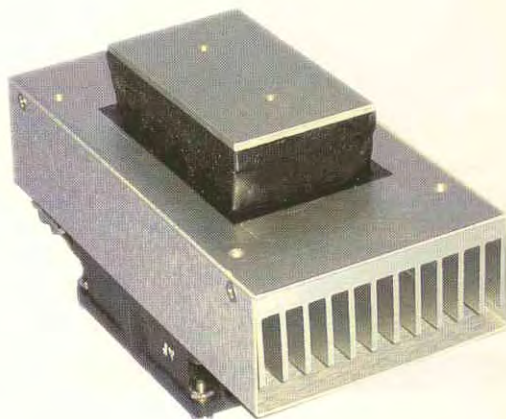
- Direct contact cooling as much as 56°C below room temperature
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Mounts in any orientation

INCLUDES

- Cold plate accessory tapped holes
- Machined surface
- Terminal strip for wire hook up



AHP-300CP



AHP-150CP

SPECIFICATIONS AHP-300CP

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VDC | CURRENT AMPS. | WEIGHT LBS. (KG) | TEMP. CONTROL | OPERATING AMBIENT °C |
|-------------|--------------|-----------|---------------------------------|----------------|------------------|---------------------|------------------|-------------------------|
| AHP-300CP | 1-7097-0-000 | Cool only | 290-330 | 12/24/48 | 12/6/3 | 6(2.7) | none | -10/+70 |
| AHP-300CPHC | 1-7094-1-000 | Heat/Cool | 290-330 | 12 | 12 | 6(2.7) | none | -10/+70 |
| AHP-300CPHC | 1-7095-1-000 | Heat/Cool | 290-330 | 24 | 6 | 6(2.7) | none | -10/+70 |

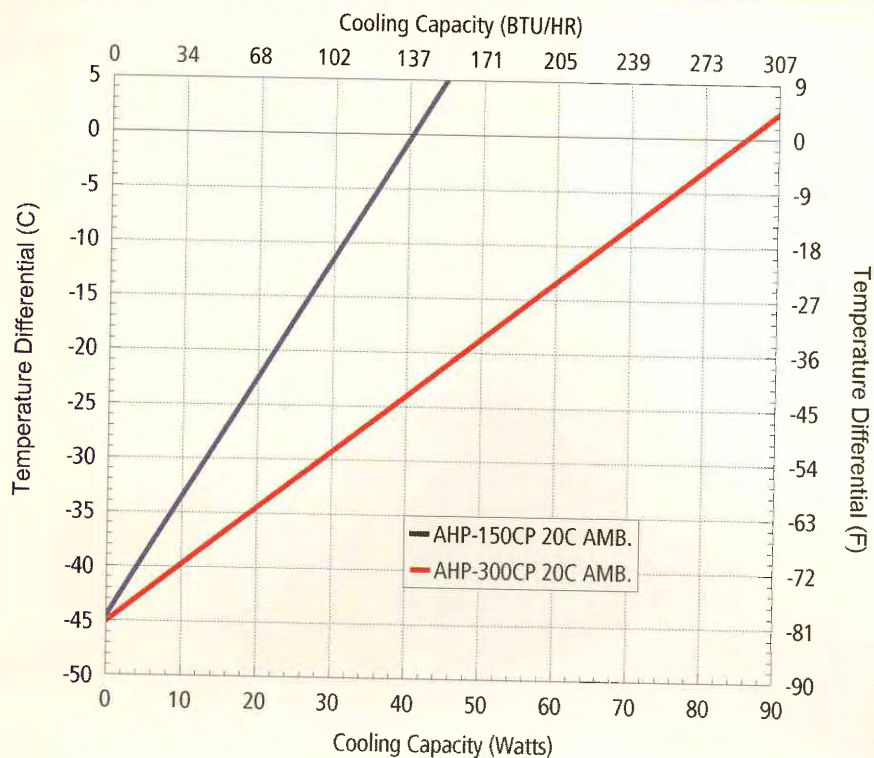
SPECIFICATIONS AHP-150CP

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VDC | CURRENT AMPS. | WEIGHT LBS. (KG) | TEMP. CONTROL | OPERATING AMBIENT °C |
|-------------|--------------|-----------|---------------------------------|----------------|------------------|---------------------|------------------|-------------------------|
| AHP-150CP | 1-8098-0-000 | Cool only | 140-160 | 12/24 | 6/3 | 2.5(1.2) | None | -10/+70 |
| AHP-150CPHC | 1-8094-1-000 | Heat/Cool | 140-160 | 12 | 6 | 2.5(1.2) | None | -10/+70 |
| AHP-150CPHC | 1-8095-1-000 | Heat/Cool | 140-160 | 24 | 3 | 2.5(1.2) | None | -10/+70 |

Note: Options for temperature control, consult factory.

See also, "Power Supplies", P. 67

PERFORMANCE CURVE



AHP-300CP

ENVIRONMENTS

Bench Top, Laboratory, Industrial

COOLING CAPACITY

85 Watts @ 0 °C ΔT

AHP-150CP

ENVIRONMENTS

Bench Top, Laboratory, Industrial

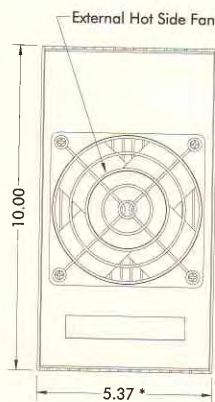
COOLING CAPACITY

40 Watts @ 0 °C ΔT

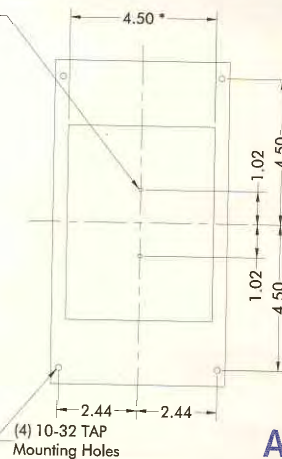
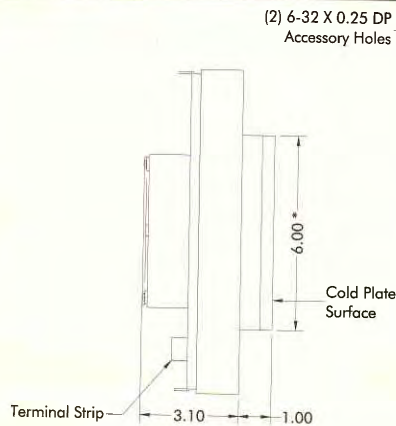
Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$

| Ambient Temp | 20°C | 40°C | 60°C |
|------------------|--------------------|--------------------|--------------------|
| 300CP Cold Plate | $y = .526x - 45.0$ | $y = .526x - 48.0$ | $y = .526x - 51.0$ |
| 150CP Cold Plate | $y = 1.1x - 44.5$ | $y = 1.1x - 48$ | $y = 1.1x - 51.5$ |

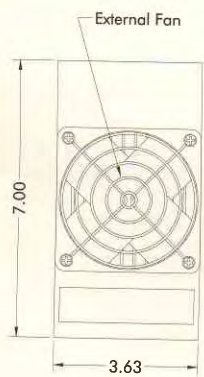
DIMENSIONS



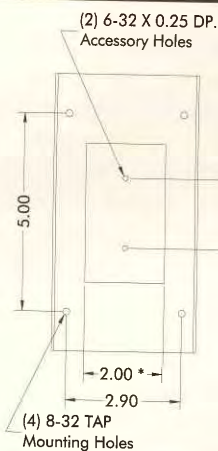
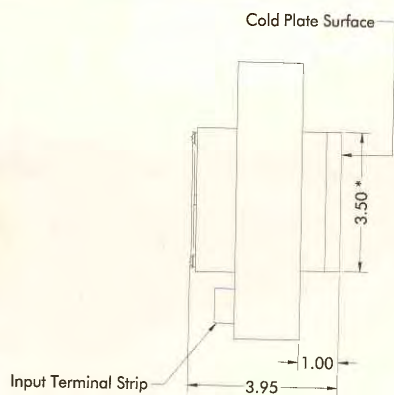
* Dimension does not include hardware, insulation. Dimensions: Inches.



AHP-300CP



* Dimension does not include hardware, insulation. Dimensions: Inches.



AHP-150CP

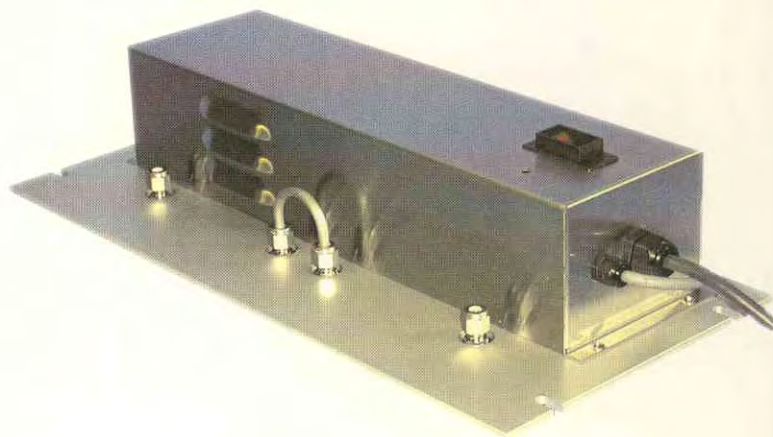
LHP-1700CP

Liquid Cooled

Solid-State Cold Plate

FEATURES

- Standard 19" Rack mounting
- No moving parts
- Weighs only 20 lbs. (9.1kg)
- Direct contact cooling as much as 62 °C below liquid temperature
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Mounts in any orientation



INCLUDES

- Compression fittings
- Power cord
- Mounting provision

APPLICATIONS

This cold plate has been used successfully in laboratory and semiconductor manufacturing settings.

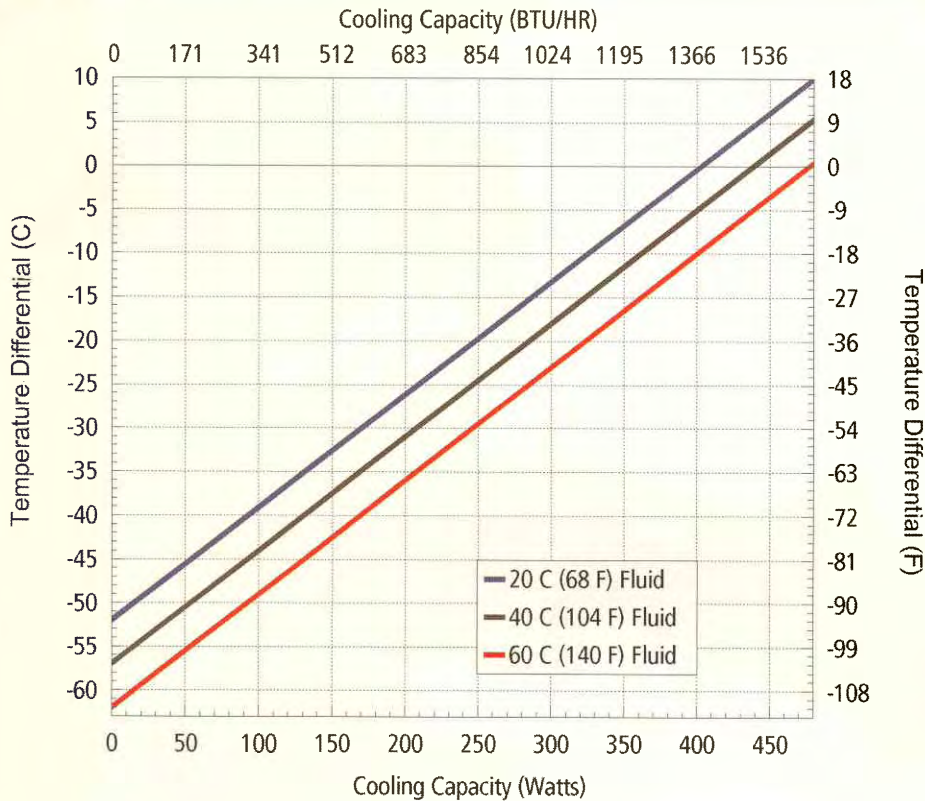
SPECIFICATIONS

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS. (KG) | MIN FLOW GPM | TEMP. CONTROL * | OPERATING AMBIENT °C |
|--------------|--------------|-----------|---------------------------------|----------------------------|------------------|---------------------|--------------------|-----------------------|-------------------------|
| LHP-1700CP | 3-1090-0-000 | Cool only | 1360-1630 | 120 | 7.0 | 20(9.1) | 0.3 | none | 0/+70 |
| LHP-1700CP | 3-1050-0-000 | Cool only | 1360-1630 | 120 | 7.0 | 20(9.1) | 0.3 | OPT* | 0/+70 |
| LHP-1702CP | 3-1092-0-000 | Cool only | 1360-1630 | 240 | 5.0 | 20(9.1) | 0.3 | none | 0/+70 |
| LHP-1702CP | 3-1052-0-000 | Cool only | 1360-1630 | 240 | 5.0 | 20(9.1) | 0.3 | OPT* | 0/+70 |
| LHP-1700CPHC | 3-1050-1-000 | Heat/Cool | 1360-1630 | 120 | 7.0 | 20(9.1) | 0.3 | OPT* | 0/+70 |
| LHP-1702CPHC | 3-1052-1-000 | Heat/Cool | 1360-1630 | 240 | 7.0 | 20(9.1) | 0.3 | OPT* | 0/+70 |

*OPT; Unit is set up for TC-3300 controller (or similar).
Controller not included.

LHP-1700CP**COOLING CAPACITY**

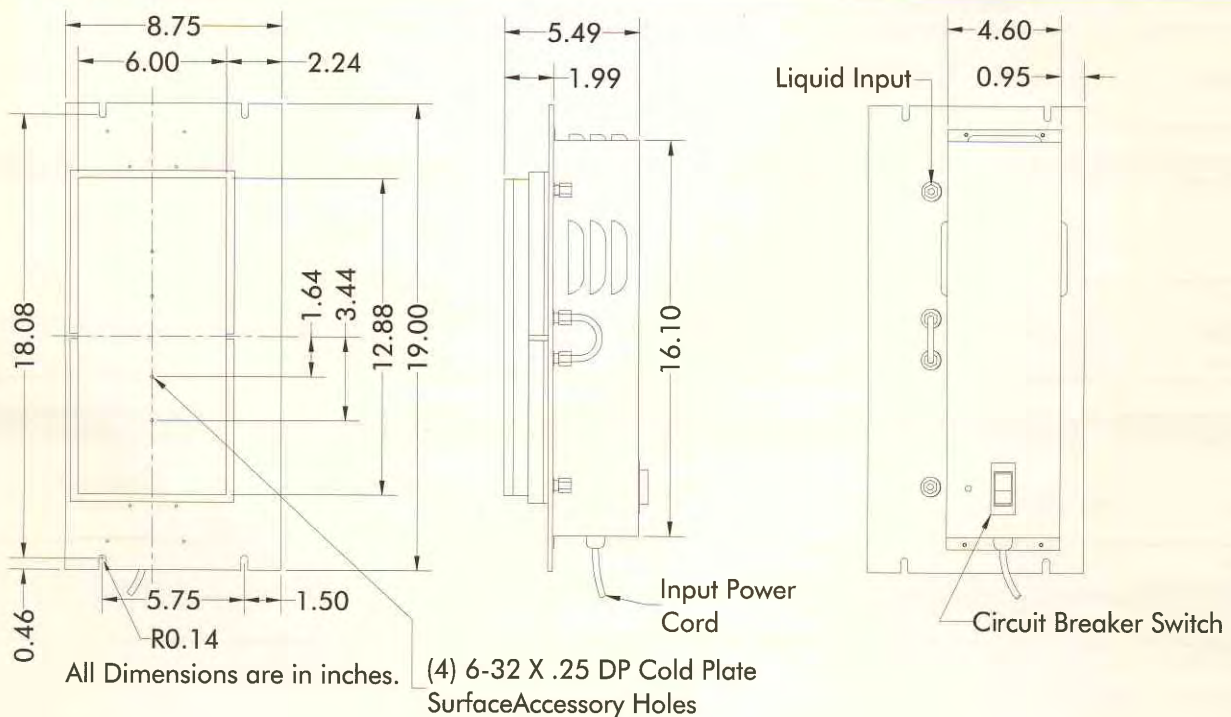
440 Watts @ 0 °C ΔT

PERFORMANCE CURVEEquation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$

| Fluid Temp | 20°C | 40°C | 60°C |
|-----------------|-------------------|-------------------|-------------------|
| Cold Plate Temp | $y = .13x - 52.0$ | $y = .13x - 57.0$ | $y = .13x - 62.0$ |

ENVIRONMENTS

From harsh to benign the LHP-1700CP works in many environments.

DIMENSIONS

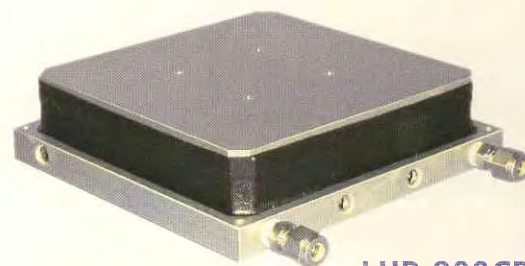
LHP-800CP LHP-300CP LHP-150CP

Liquid Cooled

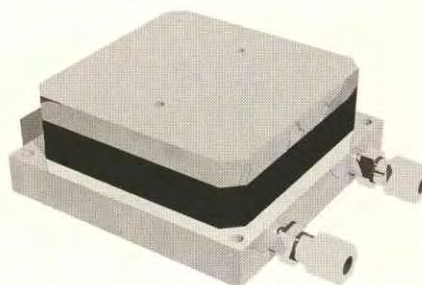
Solid-State Cold Plates

FEATURES

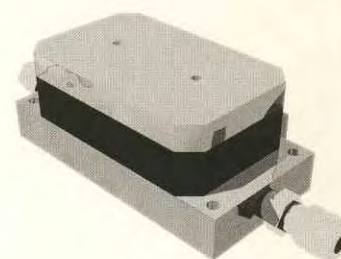
- No moving parts
- Direct contact cooling as much as 51 °C below liquid temperature
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Mounts in any orientation



LHP-800CP



LHP-300CP



LHP-150CP

INCLUDES

- Compression fittings
- Auxiliary mounting holes
- Machined cold plate surfaces

SPECIFICATIONS LHP-800CP

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VDC | CURRENT AMPS. | WEIGHT LBS. (KG) | MIN FLOW GPM | OPERATING AMBIENT °C | HEAT VOLTAGE |
|-------------|--------------|-----------|------------------------------|----------------|------------------|---------------------|--------------------|-------------------------|-----------------|
| LHP-800CP | 3-5099-0-000 | Cool only | 700-830 | 30 | 10 | 5.2 (2.3) | 0.3 | 0/+70 | N/A |
| LHP-800CPHC | 3-5099-1-000 | Heat/Cool | 700-830 | 30 | 10 | 5.2 (2.3) | 0.3 | 0/+70 | 120 VAC |
| LHP-810CP | 3-509A-0-001 | Cool only | 700-830 | 120 | 3.5 | 5.2 (2.3) | 0.3 | 0/+70 | N/A |

SPECIFICATIONS LHP-300CP

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VDC * | CURRENT AMPS. | WEIGHT LBS. (KG) | MIN FLOW GPM | OPERATING AMBIENT °C | HEAT VOLTAGE |
|-------------|--------------|-----------|------------------------------|------------------|------------------|---------------------|--------------------|-------------------------|-----------------|
| LHP-300CP | 3-7098-0-000 | Cool only | 280-335 | 12/24 | 12/6 | 1.8 (.81) | 0.2 | 0/+70 | N/A |
| LHP-300CPHC | 3-7095-1-000 | Heat/Cool | 280-335 | 24 | 6 | 1.8 (.81) | 0.2 | 0/+70 | 24 VDC |
| LHP-300CPHC | 3-7098-1-000 | Heat/Cool | 280-335 | 12/24 | 12/6 | 1.8 (.81) | 0.2 | 0/+70 | 120 VAC |

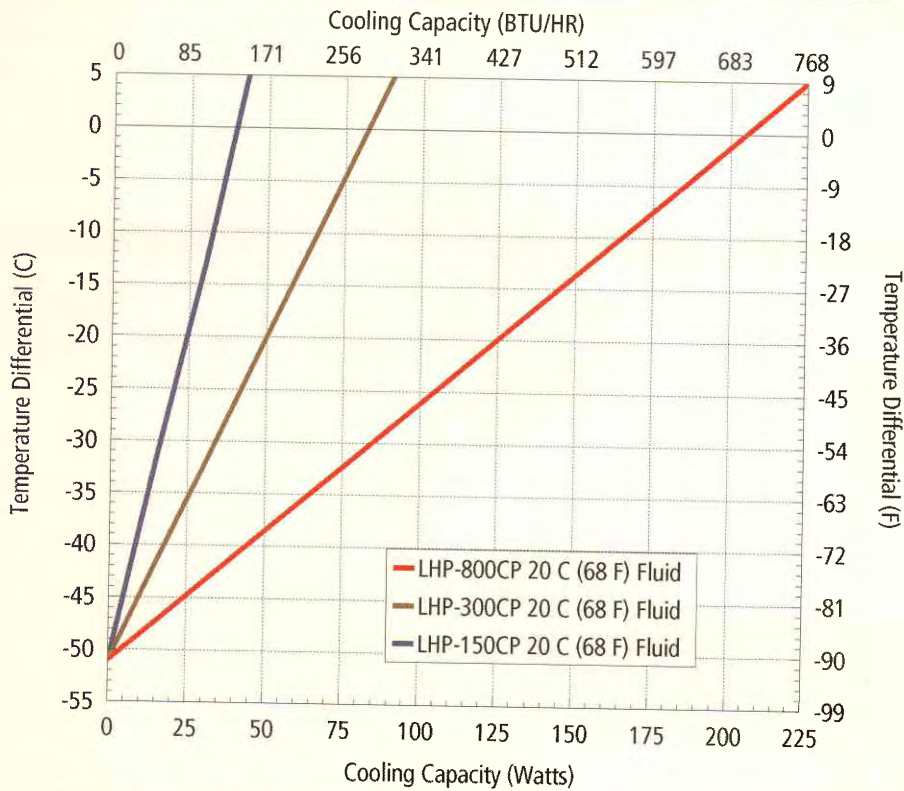
SPECIFICATIONS LHP-150CP

| MODEL | PART NUMBER | NOTES | PERFORMANCE RATING BTU/HR | VOLTAGE VDC * | CURRENT AMPS. | WEIGHT LBS. (KG) | MIN FLOW GPM | OPERATING AMBIENT °C | HEAT VOLTAGE |
|-------------|--------------|-----------|------------------------------|------------------|------------------|---------------------|--------------------|-------------------------|-----------------|
| LHP-150CP | 3-8094-0-000 | Cool only | 130-160 | 12 | 4.5 | .75(.34) | 0.2 | 0/+70 | N/A |
| LHP-150CPHC | 3-8094-1-000 | Heat/Cool | 130-160 | 12 | 4.5 | .75(.34) | 0.2 | 0/+70 | 12 VDC |
| LHP-150CPHC | 3-8099-1-000 | Heat/Cool | 130-160 | 12 | 4.5 | .75(.34) | 0.2 | 0/+70 | 120 VAC |

Note: Option for temperature control, consult factory.

*See also, "Power Supplies", P. 67

PERFORMANCE CURVE



Liquid Cooled

Cold Plates

LHP-800CP

USEFUL COOLING CAPACITY

205 Watts @ 0 °C ΔT

LHP-300CP

USEFUL COOLING CAPACITY

82 Watts @ 0 °C ΔT

LHP-150CP

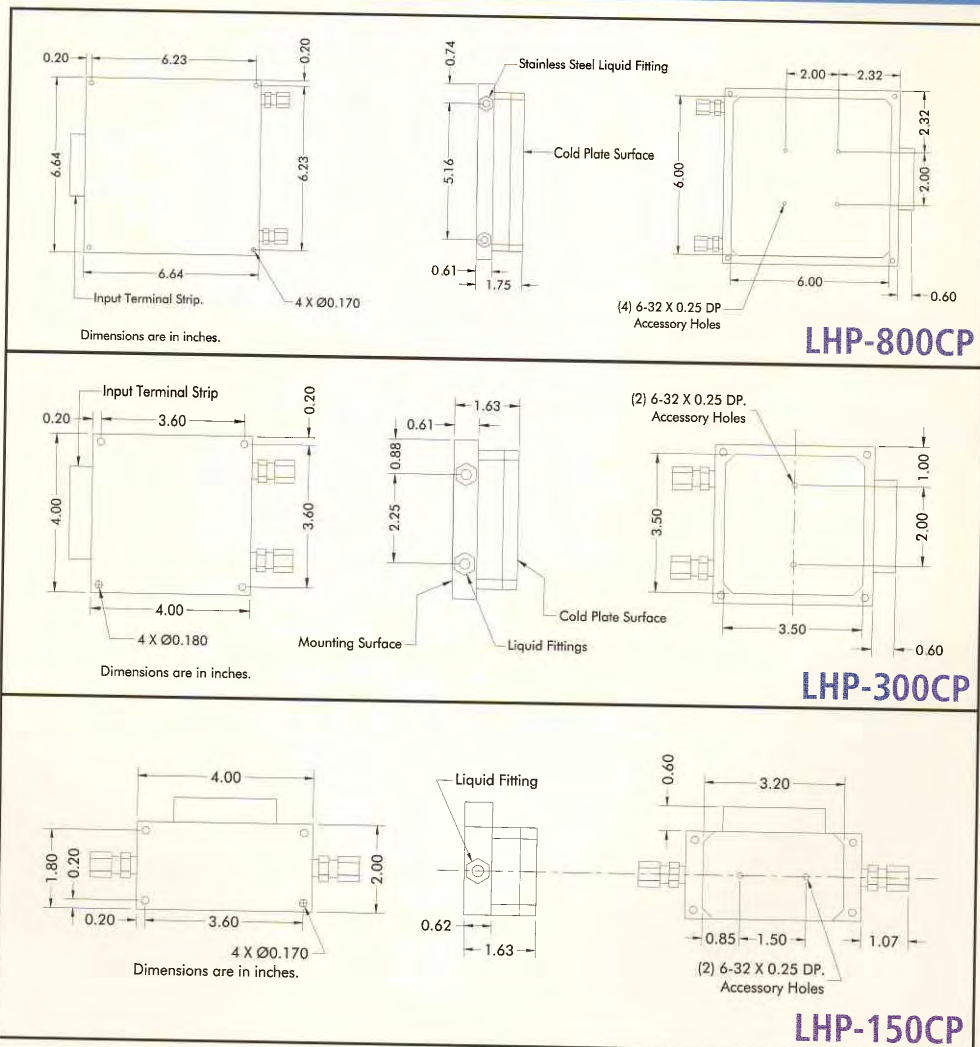
USEFUL COOLING CAPACITY

40 Watts @ 0 °C ΔT

Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$

| Fluid Temp | 20° | 40°C | 60°C |
|------------|-------------------|-------------------|-------------------|
| LHP-800CP | $y = .25x - 51.0$ | $y = .25x - 56.0$ | $y = .25x - 61.0$ |
| LHP-300CP | $y = .62x - 51.0$ | $y = .62x - 56.0$ | $y = .62x - 61.0$ |
| LHP-150CP | $y = 1.3x - 51.0$ | $y = 1.3x - 56.0$ | $y = 1.3x - 61.0$ |

DIMENSIONS



Liquid Chillers

730-1450 BTU/hr

Teca Liquid Chillers are compact and reliable alternatives to conventional recirculating coolers. A complete integrated package is now offered in a standard configuration.

FEATURES

- Precise temperature control
- External plumbing lines with quick connectors
- 12' of tubing and insulation included

Options Available

- Heating
- RS-232 interface
- RS-485 interface
- Computer Communications software

APPLICATIONS

Teca Liquid Chillers are ideal for bench-top or portable applications such as laboratory, laser, x-ray, out-patient and medical therapy as well as many others.

LIQUID CHILLERS

Air Cooled

730-1450 BTH/hr

TLC-SERIES

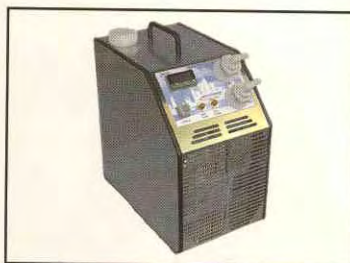
TLC-1400 page 58

1400-1450 BTU/hr Rating,
12" x 14" footprint
120-240 VAC operation



TLC-700 page 60

730-800 BTU/hr Rating,
12" x 7" footprint
120 VAC operation



TLC-702 page 60

730-800 BTU/hr Rating,
12" x 7" footprint
240 VAC operation



RLC-SERIES

RLC-1400 page 62

1400-1450 BTU/hr Rating,
19" X 25" X 9" Size
120-240 VAC operation



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TLC-1400 Liquid Chiller

Air Cooled

FEATURES

- Compact (only 12" x 14" benchtop footprint)
- Weighs only 26.7 lbs. (59.0 kg)
- Ambients to +50°C
- Integral PID "Tunable" temperature control
- No compressor, fluorocarbon or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Low fluid/flow warning
- Convenient front to back air flow

INCLUDES

- Integral power supply
- Self priming pump/reservoir
- TC-3300 temperature control
- Low pressure drop fluid quick connects



OPTIONS

- Heating
- RS-232 or RS-485 interface
- Computer Communications software
- Remote sense capability

APPLICATIONS

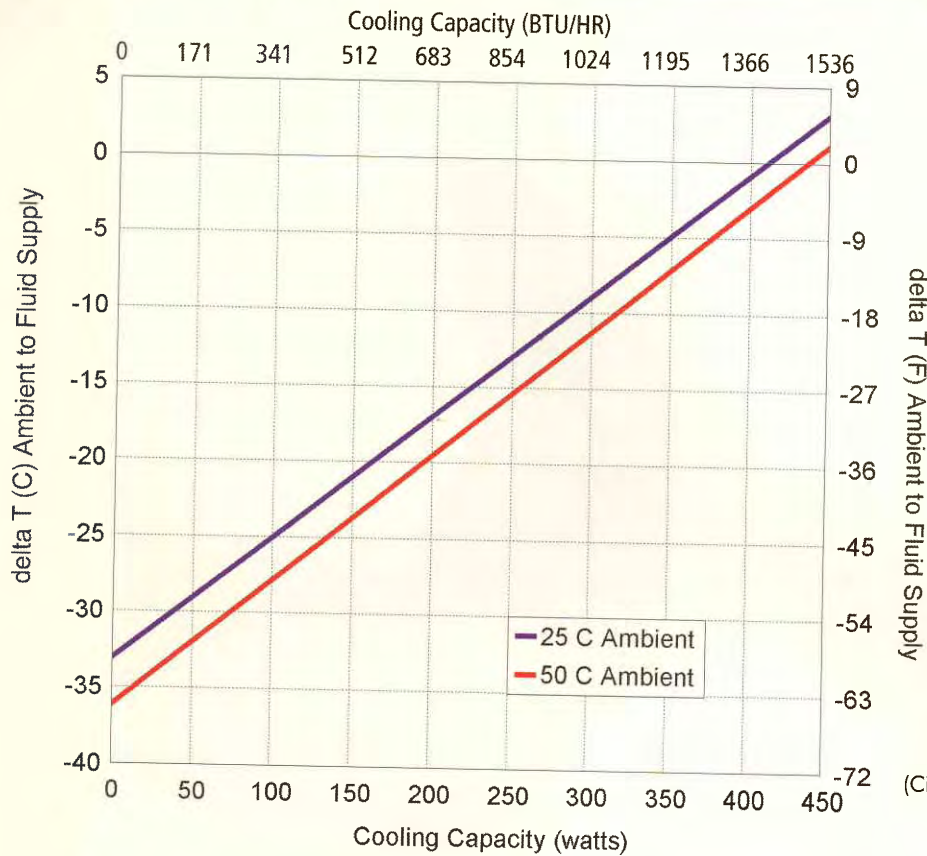
Teca Liquid Chillers are ideal for bench-top or portable applications such as laboratory, laser, x-ray, out-patient and medical therapy as well as many others.

SPECIFICATIONS

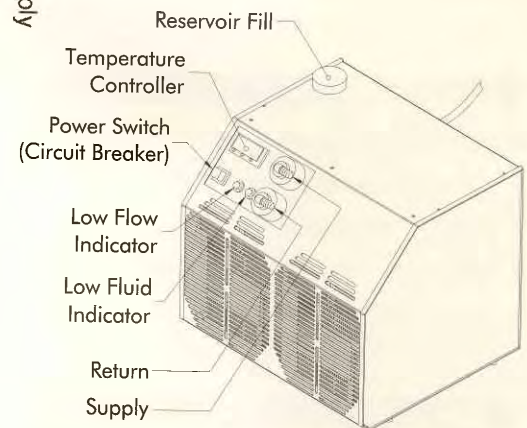
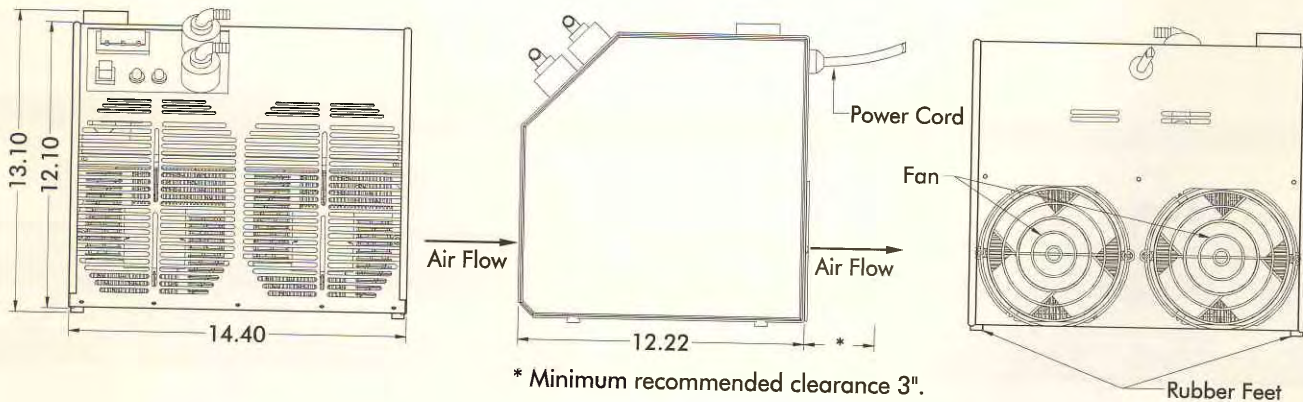
| MODEL | PART NUMBER | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS. (KG) TEMP °C | MAX OPERATING AMBIENT | HEATING OPTION (HC SUFFIX) | FLUID TEMP RANGE °C |
|------------|--------------|---------------------------------|----------------------------|------------------|--------------------------------|-----------------------------|-------------------------------|---------------------------|
| TLC-1400 | 6-B0D0-0-000 | 1400-1450 | 120 VAC | 7.0 | 59(26.7) | 50 °C(+122 F) | | -5/65 |
| TLC-1400HC | 6-B0D0-1-000 | 1400-1450 | 120 VAC | 7.0 | 59(26.7) | 50 °C(+122 F) | 400 Watt | -5/65 |
| TLC-1402 | 6-B0D2-0-000 | 1400-1450 | 240 VAC | 4.0 | 59(26.7) | 50 °C(+122 F) | | -5/65 |
| TLC-1402HC | 6-B0D2-1-000 | 1400-1450 | 240 VAC | 4.0 | 59(26.7) | 50 °C(+122 F) | 400 Watt | -5/65 |

TLC-1400**COOLING CAPACITY**

410 Watts @ 0 °C ΔT

PERFORMANCE CURVE

| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | |
|--|-------------------|-------------------|
| Ambient Temp | 25°C | 50°C |
| Fluid Supply | $y = .08x - 33.1$ | $y = .08x - 36.1$ |

**DIMENSIONS**



TLC-700

Air Cooled

Liquid Chiller

FEATURES

- Compact (only 12" x 7" benchtop footprint)
- Conforms to UL STD 3101-1
- Testing available for CE self certification on model TLC-702.
- Integral PID "Tunable" temperature control
- Ambients to +50°C
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Low fluid/flow warning

INCLUDES

- Integral power supply
- Self priming pump/reservoir
- TC-3300 temperature Control
- Low pressure drop fluid quick connects
- Tubing and insulation

OPTIONS

- Heating
- RS-232 or RS-485 interface
- Computer communication software
- Remote sense capability

APPLICATIONS

Teca Liquid Chillers are ideal for bench top or portable applications such as laboratory, laser, x-ray, out-patient and medical therapy as well as many others.

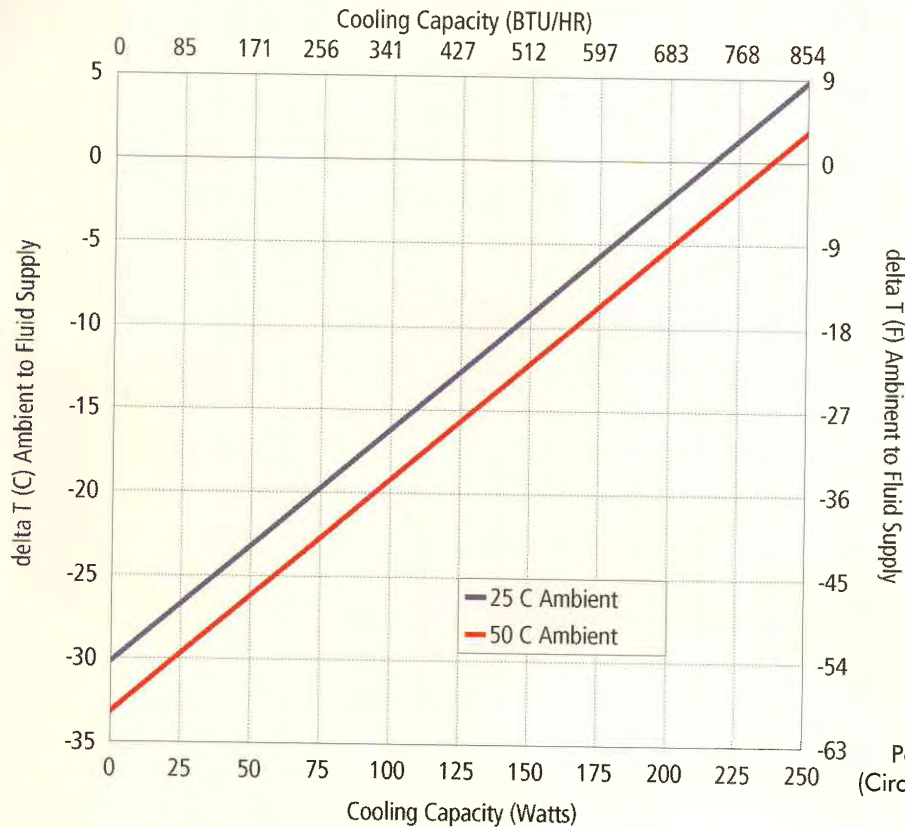


SPECIFICATIONS

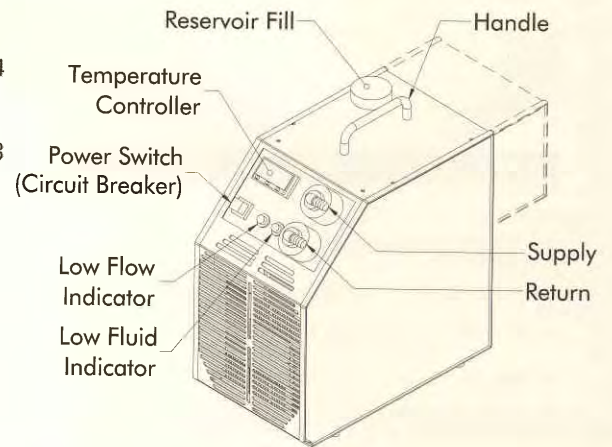
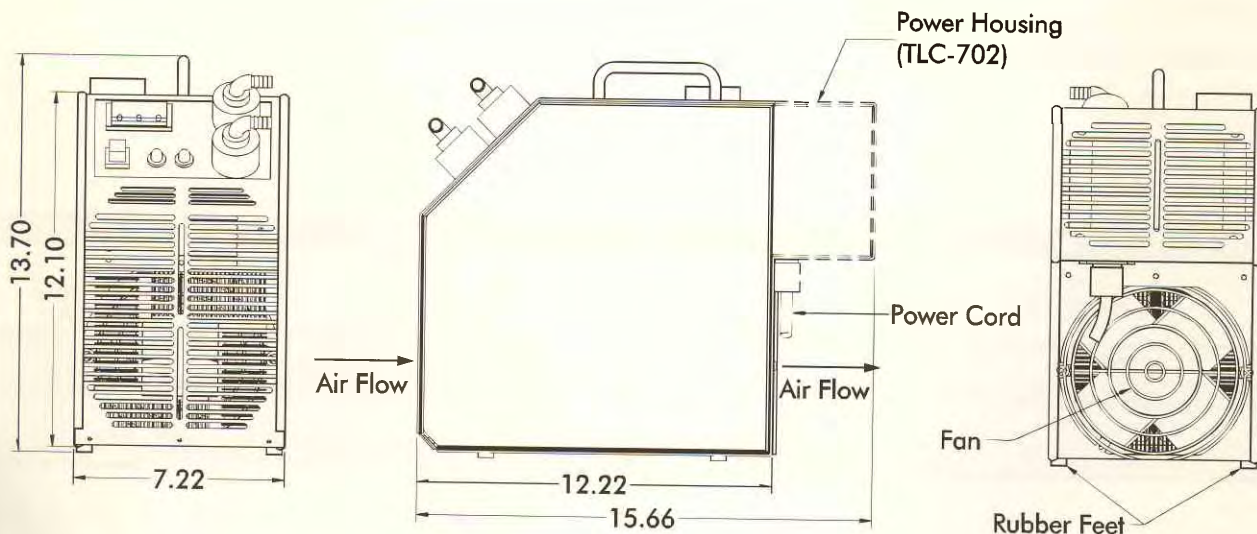
| MODEL | PART NUMBER | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS. (KG) | MAX OPERATING AMBIENT | HEATING OPTION (HC SUFFIX) | FLUID TEMP RANGE °C | AGENCY APPROVALS (ETL) |
|-----------|--------------|---------------------------------|----------------------------|------------------|---------------------|-----------------------------|-------------------------------|---------------------------|------------------------------|
| TLC-700 | 6-A0D0-0-000 | 730-800 | 120 VAC | 4.2 | 32(14.5) | 50 °C(+122 F) | | -5/65 | UL3101-1/CSA22.2, CE |
| TLC-700HC | 6-A0D0-1-000 | 730-800 | 120 VAC | 4.2 | 32(14.5) | 50 °C(+122 F) | 200 Watt | -5/65 | UL3101-1/CSA22.2, CE |
| TLC-702 | 6-A0D2-0-000 | 730-800 | 240 VAC | 2.9 | 42(19) | 50 °C(+122 F) | | -5/65 | UL3101-1/CSA22.2, CE |
| TLC-702HC | 6-A0D2-1-000 | 730-800 | 240 VAC | 2.9 | 42(19) | 50 °C(+122 F) | 200 Watt | -5/65 | UL3101-1/CSA22.2, CE |

TLC-700**COOLING CAPACITY**

215 Watts @ 0 °C ΔT

PERFORMANCE CURVE

| | | |
|--|-------------------|-------------------|
| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | |
| Ambient Temp | 25°C | 50°C |
| Fluid Supply | $y = .14x - 30.2$ | $y = .14x - 33.2$ |

**DIMENSIONS**

RLC-1400

Air Cooled
Rack Mount

Rack Mount Liquid Chiller

FEATURES

- Compact only 19" x 25" x 9"
- Standard 19" rack mounting
- Integral PID "Tuneable" temperature control
- Remote sense capability
- Ambients to +50°C
- No compressor, fluorocarbons
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Low fluid/flow warning



INCLUDES

- Integral power supply
- Self priming pump/reservoir
- TC-3300 temperature Control
- Remote sense capability
- Low pressure drop fluid quick connects

OPTIONS

- Heating
- RS-232 or RS-485 interface
- Computer communication software

APPLICATIONS

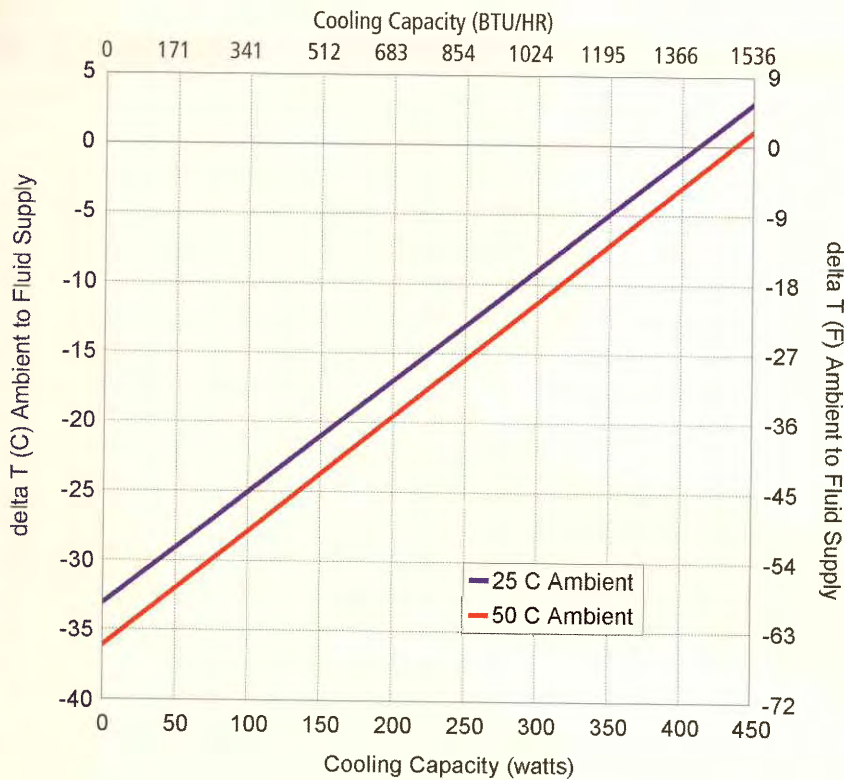
Teca Liquid Chillers are ideal for rack mount applications such as laboratory, laser, x-ray, out-patient, medical therapy and electronics.

SPECIFICATIONS

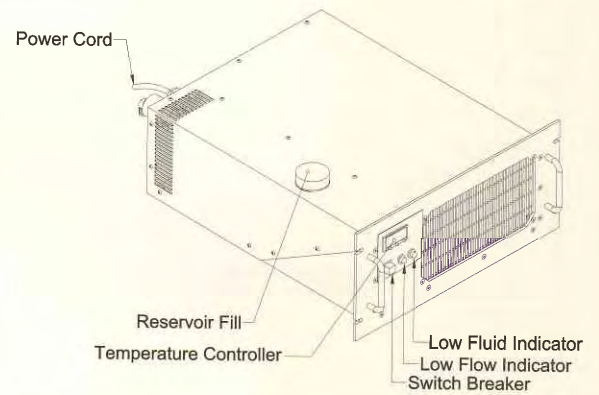
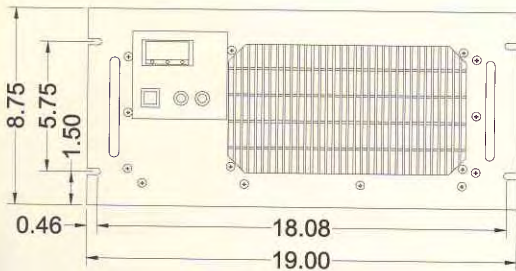
| MODEL | PART NUMBER | PERFORMANCE RATING BTU/HR | VOLTAGE VAC 50/60 HZ | CURRENT AMPS. | WEIGHT LBS. (KG) | MAX OPERATING AMBIENT | HEATING OPTION (HC SUFFIX) | FLUID TEMP RANGE °C |
|------------|--------------|---------------------------------|----------------------------|------------------|---------------------|-----------------------------|-------------------------------|---------------------------|
| RLC-1400 | 8-B0D0-0-000 | 1400-1450 | 120 VAC | 7.0 | 59(26.7) | 50 °C(+122 F) | | -5/65 |
| RLC-1400HC | 8-B0D0-1-000 | 1400-1450 | 120 VAC | 7.0 | 59(26.7) | 50 °C(+122 F) | 400 Watt | -5/65 |
| RLC-1402 | 6-B0D2-0-000 | 1400-1450 | 240 VAC | 7.0 | 59(26.7) | 50 °C(+122 F) | | -5/65 |
| RLC-1402HC | 6-B0D2-1-000 | 1400-1450 | 240 VAC | 7.0 | 59(26.7) | 50 °C(+122 F) | 400 Watt | -5/65 |

RLC-1400**COOLING CAPACITY**

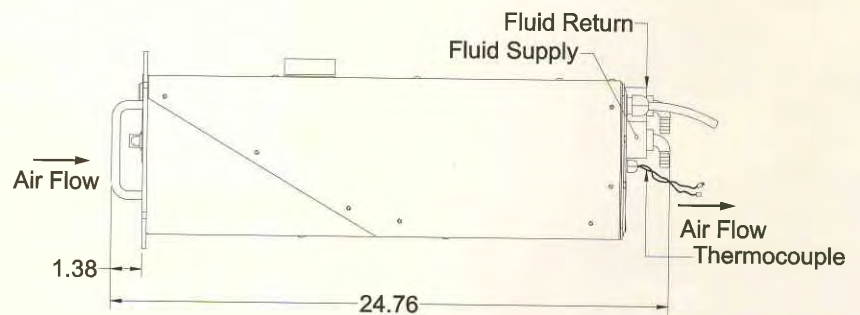
410 Watts @ 0 °C ΔT

PERFORMANCE CURVE

| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | |
|--|-------------------|-------------------|
| Ambient Temp | 25°C | 50°C |
| Fluid Supply | $y = .08x - 33.1$ | $y = .08x - 36.1$ |

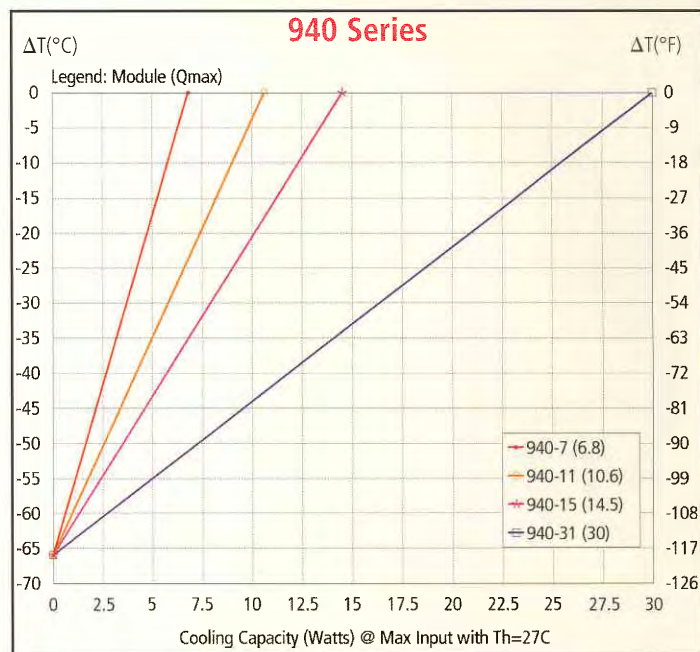
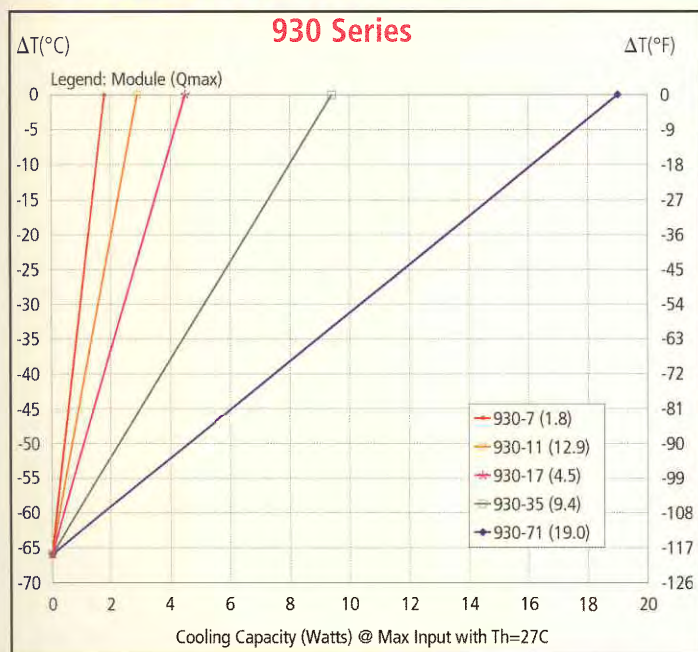
**DIMENSIONS**

Dimensions are inches



Single Stage Modules

PERFORMANCE CURVES

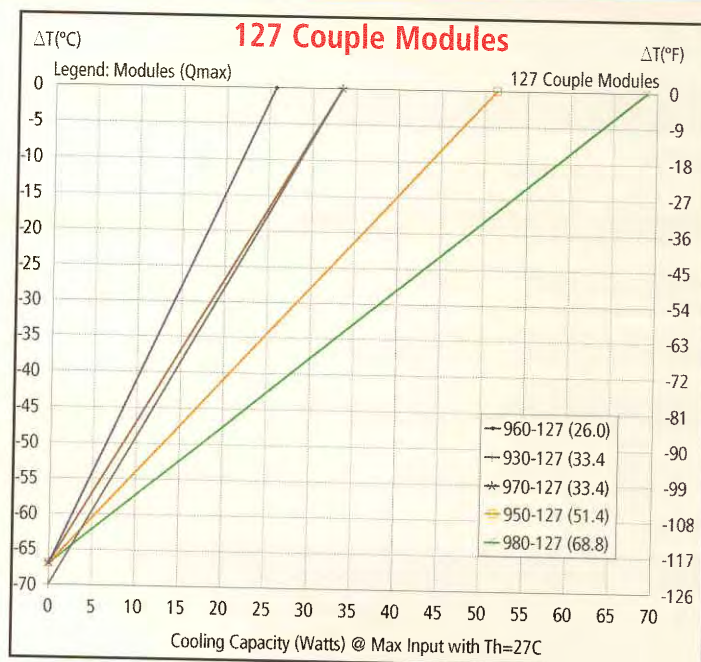
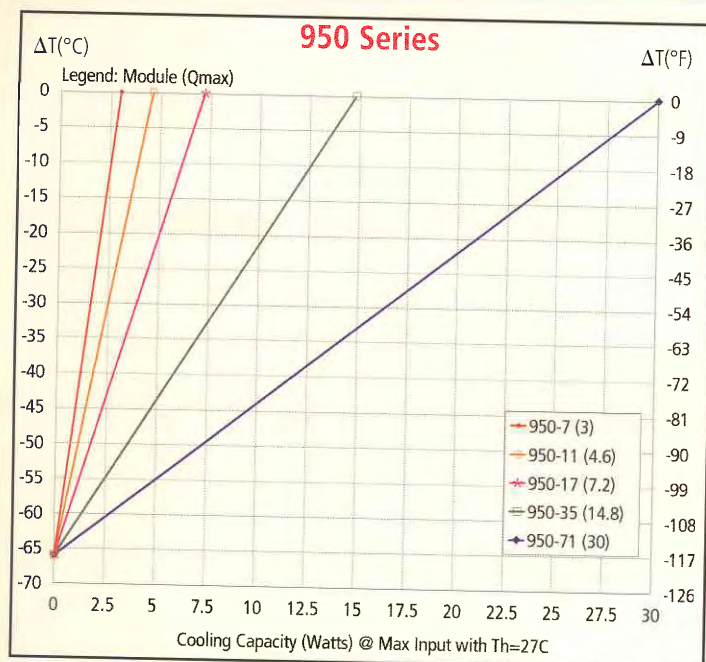


SPECIFICATIONS

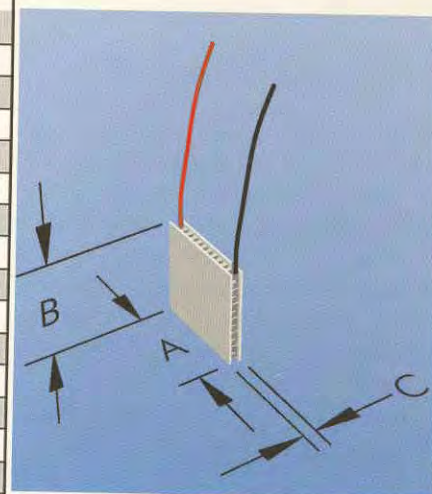
| Module Series / Couples | Performance | | | | | | | | |
|-------------------------|----------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------------|----------------------|-------------------------|----------------------------|
| | Th=27 °C | | | Th=35 °C | | | Th=50 °C | | |
| | Max ΔT @Qc=0 (ΔT °C) | Max Qc @ΔT=0 (Qc watts) | Equation of Line | Max ΔT @Qc=0 (ΔT °C) | Max Qc @ΔT=0 (Qc watts) | Equation of Line | Max ΔT @Qc=0 (ΔT °C) | Max Qc @ΔT=0 (Qc watts) | Equation of Line |
| 930-7 | 66 | 1.8 | $\Delta T = 36.7Qc - 66$ | 73.6 | 1.9 | $\Delta T = 38.7Qc - 73.6$ | 78.1 | 2.0 | $\Delta T = 39.1Qc - 78.1$ |
| 930-11 | 66 | 2.9 | $\Delta T = 22.76Qc - 66$ | 73.6 | 3.1 | $\Delta T = 23.7Qc - 73.6$ | 78.1 | 3.2 | $\Delta T = 24.4Qc - 78.1$ |
| 930-17 | 66 | 4.5 | $\Delta T = 14.67Qc - 66$ | 73.6 | 4.7 | $\Delta T = 15.7Qc - 73.6$ | 78.1 | 5.0 | $\Delta T = 15.6Qc - 78.1$ |
| 930-35 | 66 | 9.4 | $\Delta T = 7.02Qc - 66$ | 73.6 | 9.9 | $\Delta T = 7.43Qc - 73.6$ | 78.1 | 10.4 | $\Delta T = 7.51Qc - 78.1$ |
| 930-71 | 66 | 19.0 | $\Delta T = 3.7Qc - 66$ | 73.6 | 20.0 | $\Delta T = 3.65Qc - 73.6$ | 78.1 | 21.0 | $\Delta T = 3.68Qc - 78.1$ |
| 940-7 | 66 | 6.8 | $\Delta T = 9.7Qc - 66$ | 70.0 | 7.0 | $\Delta T = 10Qc - 70$ | 75.4 | 7.5 | $\Delta T = 10.1Qc - 75.4$ |
| 940-11 | 66 | 10.6 | $\Delta T = 6.23Qc - 66$ | 70.0 | 11.0 | $\Delta T = 6.4Qc - 70$ | 75.4 | 11.7 | $\Delta T = 6.4Qc - 75.4$ |
| 940-15 | 66 | 14.5 | $\Delta T = 4.55Qc - 66$ | 70.0 | 15.0 | $\Delta T = 4.67Qc - 70$ | 75.4 | 16.0 | $\Delta T = 4.71Qc - 75.4$ |
| 940-31 | 66 | 30.0 | $\Delta T = 2.23Qc - 66$ | 70.0 | 31.0 | $\Delta T = 2.25Qc - 70$ | 75.4 | 33.0 | $\Delta T = 2.27Qc - 75.4$ |
| 950-7 | 66 | 3.0 | $\Delta T = 22Qc - 66$ | 70.0 | 3.1 | $\Delta T = 2.2Qc - 70$ | 75.0 | 3.3 | $\Delta T = 2.27Qc - 75$ |
| 950-11 | 66 | 4.6 | $\Delta T = 14.35Qc - 66$ | 70.0 | 4.8 | $\Delta T = 14.6Qc - 70$ | 75.0 | 5.1 | $\Delta T = 14.7Qc - 75$ |
| 950-17 | 66 | 7.2 | $\Delta T = 9.17Qc - 66$ | 70.0 | 7.4 | $\Delta T = 9.46Qc - 70$ | 75.0 | 7.9 | $\Delta T = 9.5Qc - 75$ |
| 950-35 | 66 | 14.8 | $\Delta T = 4.46Qc - 66$ | 70.0 | 15.3 | $\Delta T = 4.58Qc - 70$ | 75.0 | 16.3 | $\Delta T = 4.6Qc - 75$ |
| 950-71 | 66 | 30.0 | $\Delta T = 2.3Qc - 66$ | 70.0 | 31.0 | $\Delta T = 2.26Qc - 70$ | 75.0 | 33.0 | $\Delta T = 2.23Qc - 75$ |
| 980-127 | 70 | 33.4 | $\Delta T = 2.1Qc - 70$ | 75.0 | 38.1 | $\Delta T = 1.97Qc - 75$ | 80.0 | 38.6 | $\Delta T = 2.07Qc - 80$ |
| 950-127 | 66 | 51.4 | $\Delta T = 1.28Qc - 66$ | 71.0 | 54.4 | $\Delta T = 1.30Qc - 71$ | 74.4 | 60.0 | $\Delta T = 1.24Qc - 74.4$ |
| 960-127 | 66 | 26.0 | $\Delta T = 2.54Qc - 66$ | 75.0 | 29.4 | $\Delta T = 2.55Qc - 75$ | 80.0 | 30.0 | $\Delta T = 2.67Qc - 80$ |
| 970-127 | 66 | 33.4 | $\Delta T = 1.98Qc - 66$ | 75.0 | 37.8 | $\Delta T = 1.98Qc - 75$ | 80.0 | 38.6 | $\Delta T = 2.07Qc - 80$ |
| 980-127 | 65 | 68.8 | $\Delta T = 0.94Qc - 65$ | 72.2 | 83.2 | $\Delta T = 0.87Qc - 72.2$ | 77.2 | 84.9 | $\Delta T = 0.91Qc - 77.2$ |

TE MODULES

Thermoelectric Modules



| Module Series / Couples | Electrical | | | | Dimensions | | | |
|-------------------------|--------------------|------------------------|--------------------------------|----------------------------------|----------------------------------|-----------------------------------|------------------|----------------------|
| | Max Current (amps) | Max DC Voltage (volts) | Nominal Resistance (Ω) @ 25 °C | Dimension A in (cm) ±0.42 (0.11) | Dimension B in (cm) ±0.42 (0.11) | Dimension C in (cm) ±0.008 (0.02) | Wire Gauge (AWG) | Wire Length (inches) |
| 980-7 | 3.7 | 0.8 | 0.20 ± .02 | 0.38 (.965) | 0.38 (.965) | 0.185 (.47) | 20 | 6.0 |
| 980-11 | 3.7 | 1.2 | 0.32 ± .05 | 0.38 (.965) | 0.57 (1.46) | 0.185 (.47) | 20 | 6.0 |
| 980-17 | 3.7 | 1.9 | 0.49 ± .04 | 0.57 (1.46) | 0.57 (1.46) | 0.185 (.47) | 20 | 6.0 |
| 980-35 | 3.7 | 3.9 | 1.00 ± .07 | 0.57 (1.46) | 1.18 (3.00) | 0.185 (.47) | 20 | 6.0 |
| 980-71 | 3.7 | 8.0 | 2.03 ± .15 | 1.18 (3.00) | 1.18 (3.00) | 0.185 (.47) | 18 | 4.5 |
| 940-7 | 14.0 | 0.8 | 0.07 ± .01 | 0.57 (1.46) | 0.57 (1.46) | 0.18 (.46) | 18 | 6.0 |
| 940-11 | 14.0 | 1.2 | 0.08 ± .01 | 0.57 (1.46) | 0.85 (2.16) | 0.18 (.46) | 18 | 6.0 |
| 940-15 | 14.0 | 1.7 | 0.12 ± .01 | 0.57 (1.46) | 1.18 (3.00) | 0.18 (.46) | 18 | 6.0 |
| 940-31 | 14.0 | 3.5 | 0.24 ± .02 | 1.18 (3.00) | 1.18 (3.00) | 0.18 (.46) | 18 | 4.5 |
| 950-7 | 6.0 | 0.8 | 0.13 ± .01 | 0.38 (.965) | 0.38 (.965) | 0.15 (.38) | 20 | 6.0 |
| 950-11 | 6.0 | 1.2 | 0.18 ± .02 | 0.38 (.965) | 0.57 (1.46) | 0.15 (.38) | 20 | 6.0 |
| 950-17 | 6.0 | 1.9 | 0.32 ± .03 | 0.57 (1.46) | 0.57 (1.46) | 0.15 (.38) | 20 | 6.0 |
| 950-35 | 6.0 | 3.9 | 0.65 ± .05 | 0.55 (1.40) | 1.18 (3.00) | 0.15 (.38) | 20 | 6.0 |
| 950-71 | 6.0 | 8.0 | 1.32 ± .10 | 1.18 (3.00) | 1.18 (3.00) | 0.15 (.38) | 20 | 6.0 |
| 930-127 | 3.9 | 15.4 | 3.62 ± .26 | 1.57 (3.99) | 1.57 (3.99) | 0.185 (.47) | 18 | 4.5 |
| 950-127 | 6.0 | 15.4 | 2.36 ± .17 | 1.57 (3.99) | 1.57 (3.99) | 0.15 (.38) | 18 | 4.5 |
| 960-127 | 3.0 | 15.4 | 4.22 ± .30 | 1.18 (3.00) | 1.18 (3.00) | 0.142 (.36) | 24 | 4.5 |
| 970-127 | 3.9 | 15.4 | 3.51 ± .25 | 1.18 (3.00) | 1.18 (3.00) | 0.126 (.32) | 24 | 4.5 |
| 980-127 | 8.5 | 15.4 | 1.63 ± .12 | 1.57 (3.99) | 1.57 (3.99) | 0.13 (.33) | 18 | 4.5 |



Temperature Controllers

TEMPERATURE POWER SENSOR

TC-6F

Model TC-6F (Cool Only) thermostat is designed using two temperature power switches in conjunction with a solid state relay. A three position switch is provided to adjust temperature settings.

TC-6F SPECIFICATION

| MODEL NUMBER | PART NUMBER | NOTES | TEMP @ T1 °C | TEMP @ T2 °C | T1-T2 (MAX) °C | RESET (TYP) °C | RESET | TEMP @ T3 | OPERATING VOLTAGE | SWITCHING VOLTAGE | SWITCHING CURRENT |
|--------------|-------------|-------------|--------------|--------------|----------------|----------------|-------|---------------|-------------------|-------------------|-------------------|
| TC-6F | 6-5211-000 | No Relay | 35 +/- 5 | 25 +/- 5 | 10 +/- 3 °C | 6.5 °C | 3 °C | Continuous On | NA | NA | NA |
| TC-6F-AC | 6-5232-000 | VAC Version | 35 +/- 5 | 25 +/- 5 | 10 +/- 3 °C | 6.5 °C | 3 °C | Continuous On | 85-250 VAC | 24-280 VAC | 10 |
| TC-6F-DC | 6-5242-000 | 12/24 VDC | 35 +/- 5 | 25 +/- 5 | 10 +/- 3 °C | 6.5 °C | 3 °C | Continuous On | 3.5-32 VDC | 0-100 VDC | .02-20 ADC |
| TC-6F-DC | 6-5252-000 | 48 VDC | 35 +/- 5 | 25 +/- 5 | 10 +/- 3 °C | 6.5 °C | 3 °C | Continuous On | 3.5-32 VDC | 0-100 VDC | .02-20 ADC |

TC-3F

Model TC-3F (Heat/Cool) thermostat incorporates the same technology as the TC-6F. It contains a single setting each for both heating and cooling as referenced below:

TC-3F SPECIFICATION

| MODEL NUMBER | PART NUMBER | NOTES | TEMP @ T1 °C | TEMP @ T2 °C | T1-T2 °C | RESET (MAX) °C | RESET (TYP) °C | OPERATING VOLTAGE | SWITCHING VOLTAGE | SWITCHING CURRENT |
|--------------|-------------|-------------|--------------|--------------|------------|----------------|----------------|-------------------|-------------------|-------------------|
| TC-3F-AC | 6-5232-000 | VAC Version | 35 +/- 5 | 15 +/- 5 | 20 +/- 3 C | 6.5 C | 3 C | 85-250 VAC | 24-280 VAC | 10 RMS |
| TC-3F-DC | 6-5242-000 | 12/24 VDC | 35 +/- 5 | 15 +/- 5 | 20 +/- 3 C | 6.5 C | 3 C | 3.5-32 VDC | 0-100 VDC | .02-20 ADC |

DIGITAL CONTROLLER

TC-3300 Temperature Controller

Model 3300 is a digital, microprocessor based temperature controller designed to be used in conjunction with TECA products. When ordering a complete package, simply plug in the control cable and with factory preset tuning and you are ready to go! All models are designed with Nema-4X front panel for corrosion and water resistance. This is ideal for applications such as food processing where equipment needs to be cleaned frequently. Features such as auto-tuning, dual output, and single input are available from these controllers. Each unit comes with factory default programming, but can be user modified through a setup menu.

Part Number:



3300 - X - X X X

OUTPUT

- 0 Single Output (Cool Only)
- 1 Dual Output (Heat/Cool)

INPUT

- 0 AC Input (100-240 VAC)
- 1 DC Input (12-24 VDC)

Relay Style

- 0 Internal Relay(s) See "**OPT" on standard products
- 1 External Relay(s) AC load switching, 10 amps
- 2 External Relay(s) DC load switching, 20 amps

Communication

- 0 No Communications
- 1 RS-232
- 2 RS-485

Software (order separately) Windows Based, Part # 100-1GB-300

- Universal 88-264 VAC input (SP-300)
- 115/230 VAC switch selectable input (AS-100F, AS-150)
- Regulated outputs
- 3000 V (SP-300, AS-150); 1500 V (AS-100F) Isolation
- Built in PFC circuit 0.99 (SP-300)
- Built in EMI filter (AS-150, AS-100F)

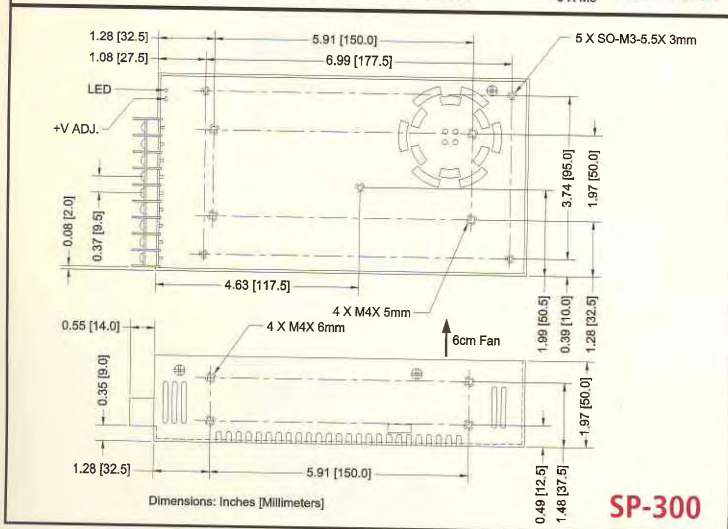
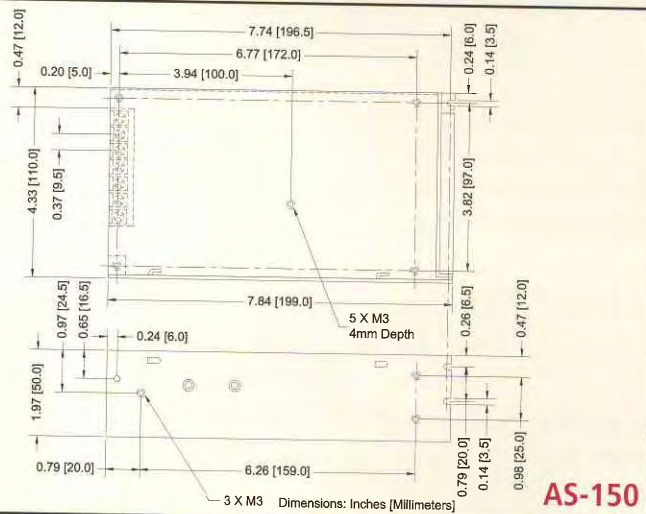
POWER SUPPLIES

Switching Power Supplies

100, 150, 300 WATTS

| MODEL | INPUT VOLTAGE VAC 47-440 HZ | OUTPUT VOLTAGE VDC | DC OUTPUT POWER WATTS | OUTPUT CURRENT AMPS. | WEIGHT LBS. | WORKING TEMPERATURE °C 20-90%RH | DIMENSIONS L X W X H INCHES |
|-----------|-----------------------------------|--------------------------|-----------------------------|----------------------------|----------------|---------------------------------------|-----------------------------------|
| SP300-12 | 88-264 | 12 | 300 | 24 | 2.6 | -10 - 50 | 8.6X4.6X2 |
| SP300-24 | 88-264 | 24 | 300 | 12.5 | 2.6 | -10 - 50 | 8.6X4.6X2 |
| SP300-48 | 88-264 | 48 | 300 | 6.25 | 2.6 | -10 - 50 | 8.6X4.6X2 |
| AS150F-12 | 88-132 OR 176-264* | 12 | 150 | 12.5 | 1.76 | -10 - 60 | 7.96X4.4X2 |
| AS150F-24 | 88-132 OR 176-264* | 24 | 150 | 6.5 | 1.76 | -10 - 60 | 7.96X4.4X2 |
| AS150F-48 | 88-132 OR 176-264* | 48 | 150 | 3.2 | 1.76 | -10 - 60 | 7.96X4.4X2 |
| AS100F-12 | 88-132 OR 176-264* | 12 | 100 | 8.5 | 1.4 | -10 - 60 | 7.96X3.9X1.52 |
| AS100F-24 | 88-132 OR 176-264* | 24 | 100 | 4.5 | 1.4 | -10 - 60 | 7.96X3.9X1.52 |

* Input voltage range is switch selectable.

[illegible]

TECA WEB SITE

This catalog and much more can be accessed by visiting our website, www.teca-usa.com.

The home page for TECA is illustrated here.

You can use the interactive navigation buttons to find information about this company, about thermoelectric technology, about our products and much more.

Of course, if you know what product you are looking for; you might prefer to simply scroll down the product headings in the center of the page and in two clicks you will find the product you want.

Any way you go, the interactive navigation buttons always remain on the screen, and every page has a "home" key so you can navigate the site with ease.

There are numerous things you can get from the web site that you cannot get from this catalog!

- Product Information Packets are downloadable. These are the installation and service documents and schematics which are shipped with the products when you buy them.
- This catalog is downloadable, so you can print pages or sections of interest for your own use.
- The site is often updated with news and other current items of interest ...articles, stories, links, etc.
- Teca Sizing Software is downloadable. This is a handy, easy to use program which is very helpful in choosing air conditioners of the appropriate capacity for your job.



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Thermoelectric Cooling America Corporation

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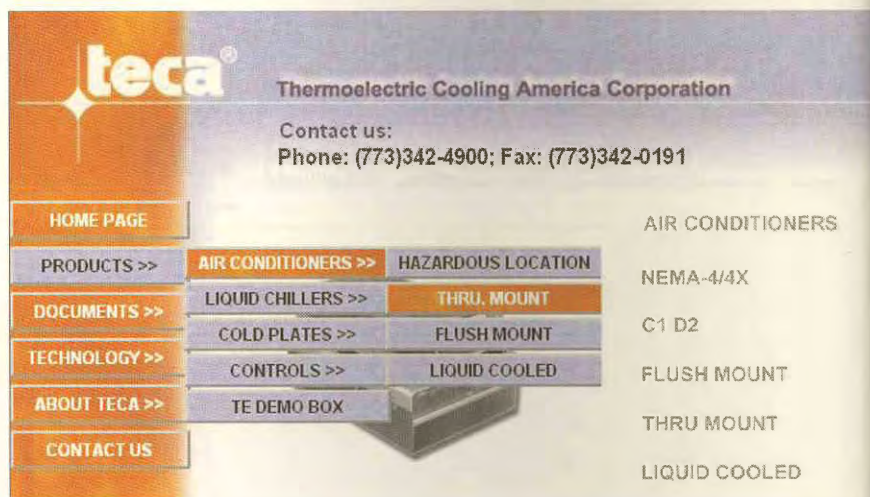
AIR CONDITIONERS
NEMA-4/4X
C1 D2
FLUSH MOUNT
THRU MOUNT
LIQUID COOLED

COLD PLATES
AIR COOLED
LIQUID COOLED

LIQUID CHILLERS
BENCH TOP
RACK MOUNT

TEMP. CONTROL

TECA offers a full product line of thermoelectric solid state air conditioners; thermoelectric liquid chillers and thermoelectric cold plates all applying the peltier refrigeration effect for closed loop cooling. Our products are used for electric and electronic enclosure cooling and for cooling by direct contact and closed loop liquid chilling in industrial, medical, telecom, laboratory, laser, processing, mining and many other industries. Our TE technology is superior as well in areas of hazardous or harsh environments; C1D1, C1D2 explosion proof and military defense.



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TE DEMO BOX

AIR CONDITIONERS
NEMA-4/4X
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FLUSH MOUNT
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TECA offers a full product line of thermoelectric solid state air conditioners; thermoelectric liquid chillers and thermoelectric cold plates all applying the peltier refrigeration effect for closed loop cooling. Our products are used for electric and electronic enclosure cooling and for cooling by direct contact and closed loop liquid chilling in industrial, medical, telecom, laboratory, laser, processing, mining and many other industries. Our TE technology is superior as well in areas of hazardous or harsh environments; C1D1, C1D2 explosion proof and military defense.

The **TECA** website as a companion to this catalog is intended to help us help you anytime you are considering solid state cooling. Give us a click at www.teca-usa.com; or call (888) [teca-usa](http://www.teca-usa.com).

Terms and Conditions

Ordering information:

- By telephone during business hours, **773-342-4900** and **888-832-2872**.
Monday – Friday 8 AM to 4:30 PM, Central Time.
- By fax or email 24 hours a day.
Fax: **773-342-0191**
email: **sales@thermoelectric.com**
- By mail on your purchase order or company letterhead.
Thermoelectric Cooling America Corporation
4048 West Schubert, Chicago, Illinois 60639

All orders are subject to written acceptance on our form "Acceptance of Order" with our required terms and conditions, depending upon quantity, price, availability of parts and other considerations.

Prices:

- Prices are quoted F.O.B. Chicago and do not include sales or other taxes. Applicable taxes will be shown as a separate item on the invoice, as will charges for freight.
- Prices are in US Dollars and are subject to change without notice.

Terms:

- Terms of payment are 30 days after shipment, subject to approved credit. New accounts must furnish necessary credit references. Until credit has been established, payment in full with order or C.O.D. may be requested. American Express, Visa and Mastercard are accepted.



Cancellation, Schedule Changes:

- A charge of 15% of net price will be assessed for cancellation of formally accepted orders. Special part numbers containing a (CD or P) prefix are non-cancelable, non-returnable (NCNR). A 100% cancellation charge applies.
- Requests for schedule changes which defer delivery may be subject to price adjustments or other charges.

Returned Goods, Restocking Charges:

- In order to return merchandise for any reason (repair, replacement or credit), a return authorization number must be issued by TECA.
- New merchandise may not be returned for credit beyond 60 days from shipment. Charges for incidental or other damages may also be made.
- All returned goods must be sent freight prepaid. A restocking charge of 15% will apply.

Limited Warranty

In the event a claimed defect in material or workmanship is discovered in any of TECA's products within one year after the date they are delivered to Buyer, and if TECA is notified of the defect in writing by certified mail within 14 days of the date of discovery, then TECA may either, at its sole discretion; a) inspect the product at the Buyer's location, or; b) require that the product be made available at Buyer's expense at TECA's premises for TECA's inspection within 14 days of notification. If after such inspection TECA deems that the products are defective and the defects result from faulty materials and/or workmanship and not in any way from accident, misuse, misapplication, mishandling, modification or alteration by the Buyer or the shipper, then TECA shall, at its sole option, repair or exchange defective products free of charge to Buyer, and return same to Buyer at Buyer's expense, or credit the Buyer the net price of the defective products. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARE EXCLUDED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL TECA BE LIABLE FOR ANY CLAIM BASED ON BREACH OF EXPRESS OR IMPLIED WARRANTY OR OTHER DAMAGES WHETHER SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, LOST PROFITS, BUSINESS INTERRUPTION, OR LOSS OF BUSINESS OR CUSTOMER RELATIONSHIPS.

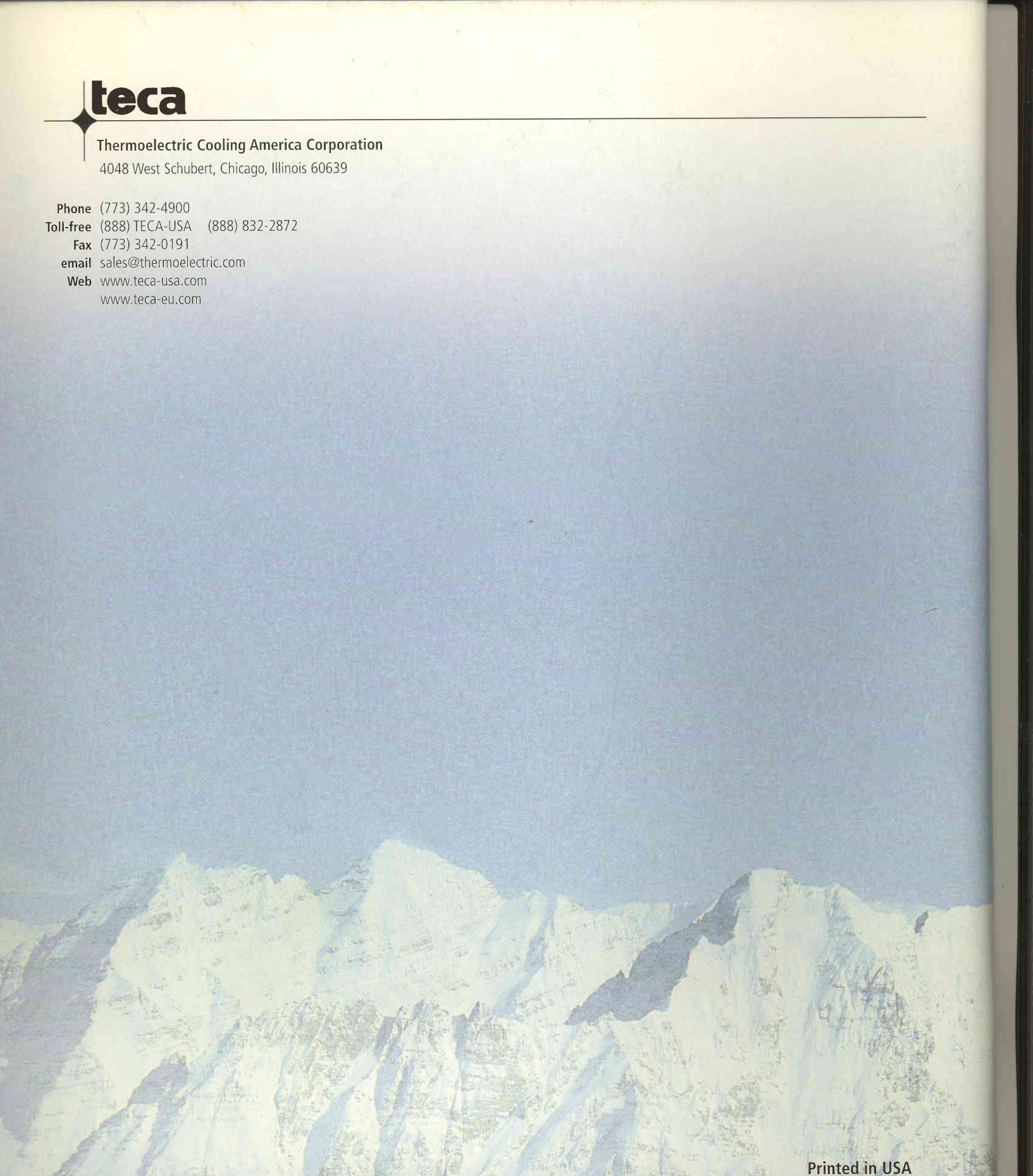
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The logo for teca, featuring the word "teca" in a bold, lowercase, sans-serif font. A horizontal line extends from the left side of the "t" across the top of the page.

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email sales@thermoelectric.com
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A photograph of a rugged mountain range with significant snow cover. The peaks are sharp and jagged, with deep shadows in the crevices. The sky is a clear, pale blue. The image occupies the lower two-thirds of the page.

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