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Thermoelectric Air Conditioners

MELCOR



Recirculating Chillers

COOLING FOR

ENCLOSURES



Plate-to-Air Assemblies

& LABORATORY



Power Supplies

APPLICATIONS



Temperature Controllers

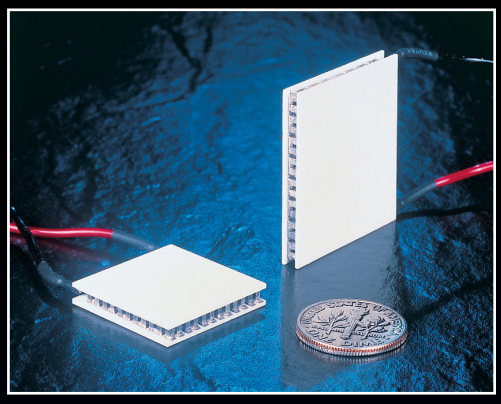
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The Standard in Thermoelectrics

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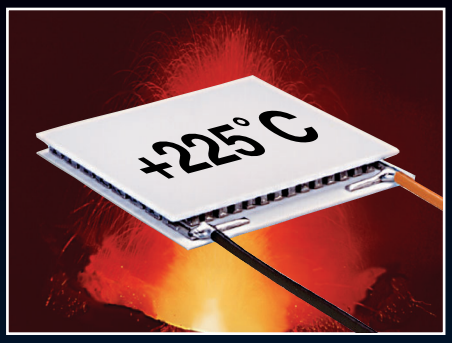
More thermal technologies from MELCOR



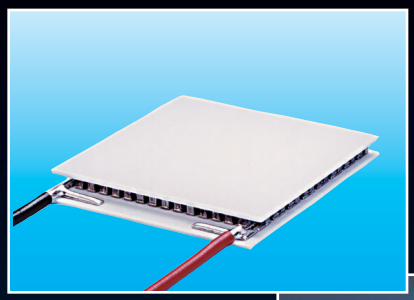
CP Series



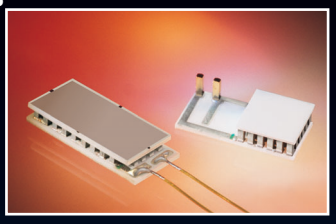
Thermoelectric Chillers



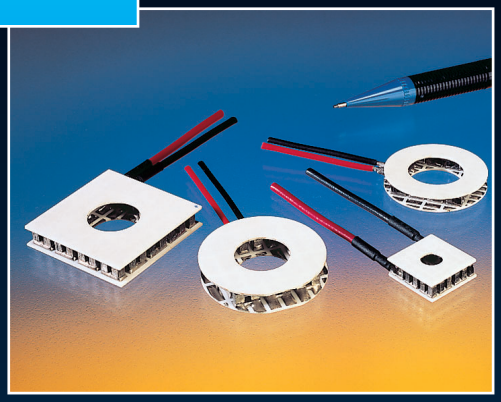
ThermaTEC™



PolarTEC™



OptoTEC™



Center Hole

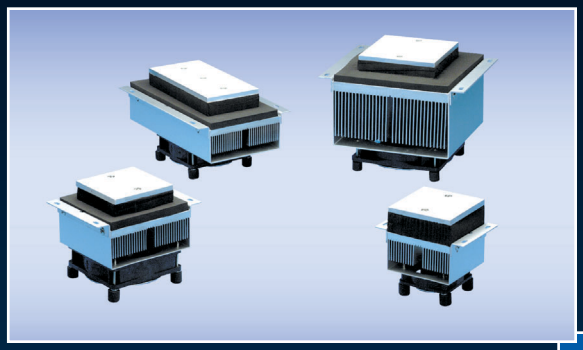
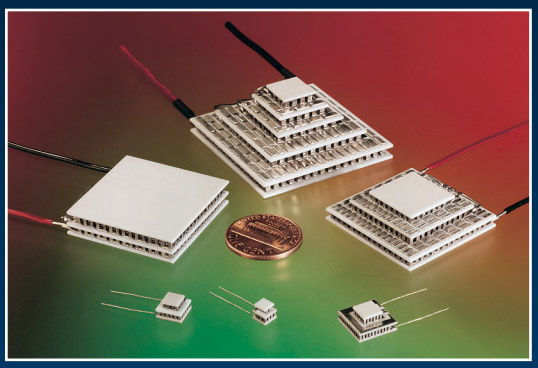


Plate to Air Assemblies



AZTEC™ Design Software



Multistage (Cascades)

The Standard in Thermoelectrics

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Thermoelectric External Mount Air Conditioners

Series	Capacity (BTU/Hr)	AC	DC	Pages
MAA1200E	1200	✓	✓	8-9

Thermoelectric Thru Mount Air Conditioners

Model:	Capacity (BTU/Hr)	AC	DC	Pages
MAA640T & MAA600T	640 / 600	–	✓	10-11
MAA555T	555	✓	–	12-13
MAA550T & MAA510T	550 / 510	–	✓	14-15
MAA280T & MAA260T	280 / 260	–	✓	16-17
MAA150T	150	–	✓	18-19
MAA070T	70	–	✓	20-21
MAA050T	50	–	✓	22-23

Recirculating Chillers

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Laser Chiller Info	24
MRC600	25
MRC300	26-27

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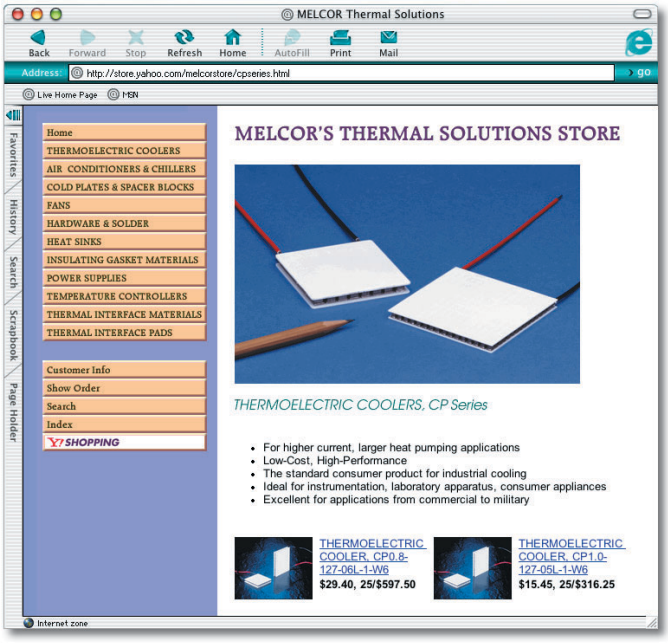
Melcor's online store at www.melcor.com

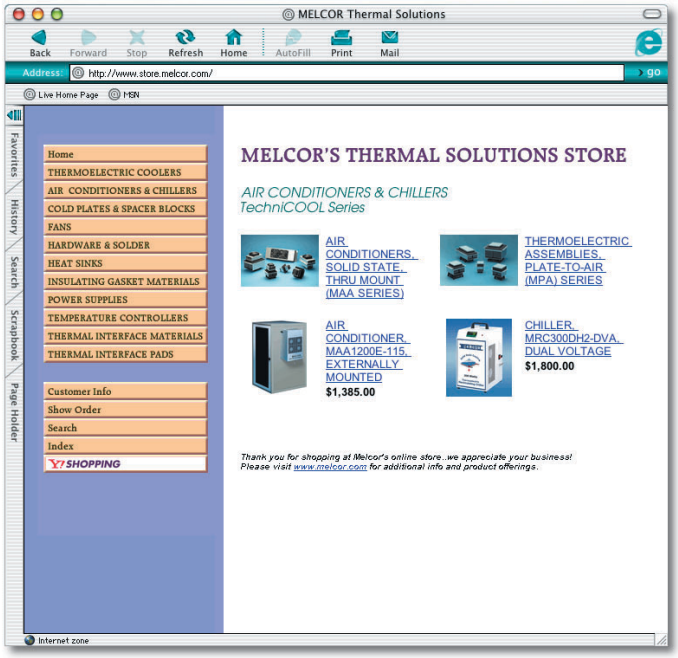
Offering one-stop shopping, "The Melcor Store" at www.melcor.com features a variety of items from the Melcor Thermal Solutions product line that can now be purchased online. Melcor is featuring its most popular products, enabling customers to conveniently obtain all of their thermal needs from a single source.

Some of the products available at www.melcor.com:

- Thermoelectric cooling modules
- Solid-state air conditioners
- Thermoelectric recirculating chillers
- Thermoelectric cold plates
- Heat sinks
- Fans
- Temperature controllers
- Power supplies
- Thermal interface materials

Most items will ship within 5-7 working days, after receipt of order. Free thermal design software (AZTEC) is also available from www.melcor.com.





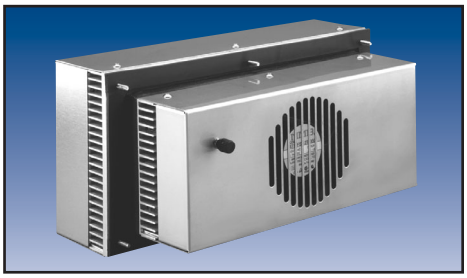
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Thermoelectric Air Conditioner Applications

Telecom

- Enclosure cooling for wireless stations





Medical/Laboratory

- Cell structure cabinet coolers





Industrial

- Electronics enclosure cooling

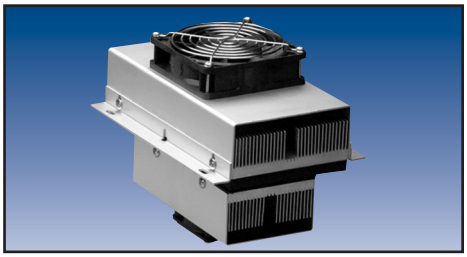




Commercial/ Consumer

- Enclosure air conditioning for consumer products





Military

- High-reliability enclosure cooling for rugged applications





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Air Conditioner Warranty

MELCOR Air Conditioners adhere to the highest quality standards and are free from defects in material, components and workmanship. This warranty covers repair or replacement of product, to be done at a MELCOR facility, for a period of one (1) year from date of shipment. Customer is responsible for shipping product to MELCOR freight prepaid. MELCOR in turn will return warranted product to customer freight prepaid, if within the time period specified above. Warranty coverage is in effect when the following operating conditions are continuously satisfied:

- Ambient temperature range within nameplate specifications.
- Voltage variation within plus or minus 10% of nameplate rating.
- The actual heat load does not exceed the capacity of the unit.

In addition, the following criteria must be met:

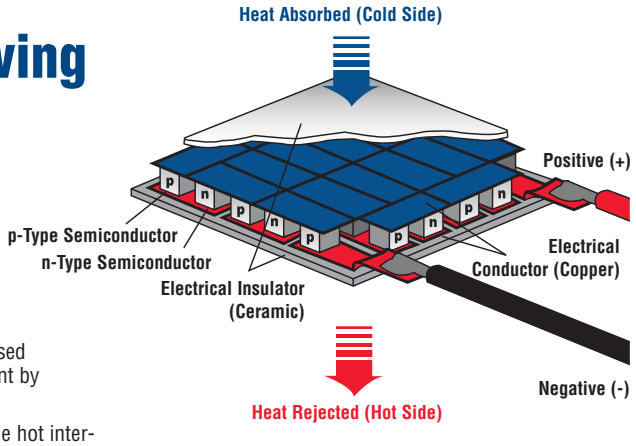
- Electrical installation and grounding must comply with local electrical and safety codes including National Electric Code (NEC) and Occupational Safety and Health Administration (OSHA).
- Unit must be used in the environment that it is designed for and should not be subjected to harsher than specified NEMA or IP rating.
- Customer does not abuse or mishandle product in any way. Any modifications to the original unit will also void warranty unless previously authorized in writing by MELCOR.
- Compliance to Installation and Maintenance manual or any other instructional guide provided by MELCOR for the product.

This warranty does not cover the following:

- Applications where product is being misapplied. This includes inappropriate selection of air conditioner for the environment and conditions in which it is to be used.
- Damage caused by shipping carrier or any other accident after product has left MELCOR. Shipping claims are the responsibility of the customer and should be done in a timely manner.
- Reimbursement of labor for installation or removal of warranted product, or for parts and labor resulting from repairs performed by any other source besides MELCOR.

This is the complete warranty and is in lieu of any other warranty expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. MELCOR will in no way be liable for incidental or consequential damage whatsoever or for any other claims by the customer for damages in connection with MELCOR products, even if advised in advance of the possibility of such damage.

MELCOR is a world leader in thermoelectrics. We've been solving cooling problems for 40 years.



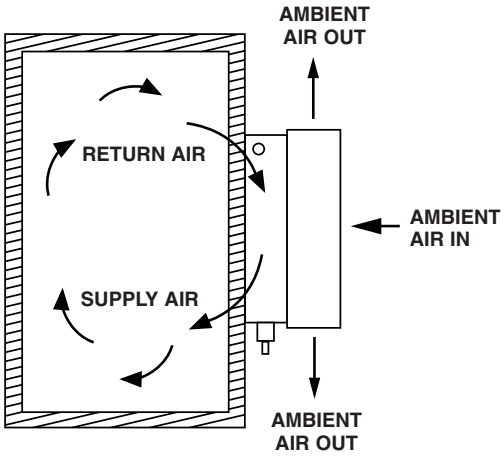
This diagram of a MELCOR thermoelectric cooler (TEC) shows how our solid-state air conditioners work using the Peltier effect. The TEC is a series of P- and N-doped semiconductor material sandwiched between ceramic plates. The ceramic material adds rigidity and the necessary electrical insulation. The N-type material has a surplus of electrons, while the P-type has a deficit. The P-N pairs are arranged electrically in series and thermally in parallel. As electrons move from P to N, the electrons absorb energy in the form of heat, creating a cold junction. As the electrons move from N to P, dropping to a lower energy state, they release the energy, creating a hot junction. This released heat, plus the Joule heat from the power supplied, is dissipated into the ambient environment by a heat sink.

This solid-state heat pump effectively removes heat from electronic enclosures by forcing the hot internal air (return air) through the TE cooled heat sinks, and sending the cooled air (supply air) back into the cabinet.

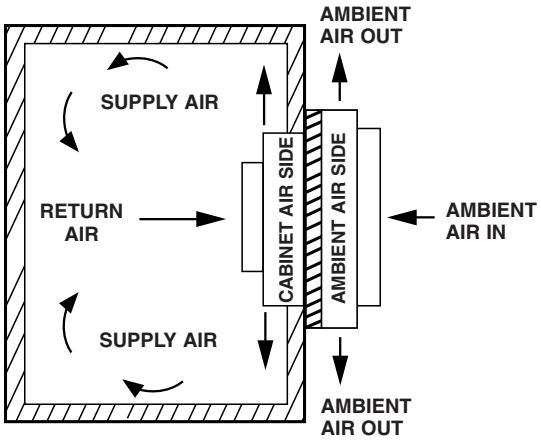
The benefits to you: reliable solid-state operation, precision temperature control, simple installation and supply power flexibility – all in a compact design!

External Mount vs. Thru-Mount Typical Orientation

External Mount



Thru-Mount



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Selecting Air Conditioner Using Sizing Curves

1. Required Information:

A. Cabinet dimensions to calculate surface area.
B. Determine internal heat load within cabinet (Q_{Active})*. If unknown, see various methods for estimating heat loads, below.
C. Determine the maximum ambient temperature ($T_{max\ Ambient}$).
D. Determine the maximum allowable cabinet temperature ($T_{max\ Cabinet}$).
E. Estimate insulation R-Value (function of insulation material and thickness) for non-insulated metal cabinets (R=0).

2. Calculate area: $A_{cabinet\ surface} = 2\ [(H \times W) + (H \times D) + (W \times D)]$.
3. Calculate $\Delta T = T_{max\ Cabinet} - T_{max\ Ambient}$.
4. Using cabinet heat gain curve, determine a $Q/A_{Heat\ Flux}$ value for given ΔT and insulation R-Value.
5. Calculate total $Q_{Surface\ Gain} = (Q/A_{Heat\ Flux}) \times (A_{Cabinet\ Surface})$.
6. For outdoor applications, solar load must be considered.
7. Calculate total $Q_{Required} = Q_{Active} + Q_{Surface\ Gain}$.
8. Go to performance curve of selected air conditioner model with the next highest rated capacity (example $Q_{Required}$ = 200 BTU/Hr, go to the MAA260T). Determine value for ΔT using calculated $Q_{Required}$ at appropriate max ambient curve (you may interpolate).
9. ΔT of selected unit must be equal to or greater than desired ΔT from step #3.
10. If unit will not meet $Q_{Required}$ at ΔT, go to next higher capacity model.

*** Various methods for estimating internal heat load (Q_{Active})**

A. Check with manufacturer of each component for heat dissipated. Q_{Active} is sum of all components' heat dissipation.
B. Measure the steady state internal and surrounding air temperatures at peak load with cabinet completely sealed. Determine $Q_{Surface\ Gain}$ as shown in steps #4 and 5. In this case, the internal load (Q_{Active}) is the $Q_{Surface\ Loss}$ of the cabinet. If cabinet is not sealed contact MELCOR for assistance.
C. For resistive loads, measure the total input power to the enclosure. Subtract work of mechanical components using efficiencies. The remaining power is the heat dissipated in the cabinet expressed as:

Power = (volts) x (amps)

Q_{Active} = Power - Mechanical Work

To Estimate Insulation R-Value:

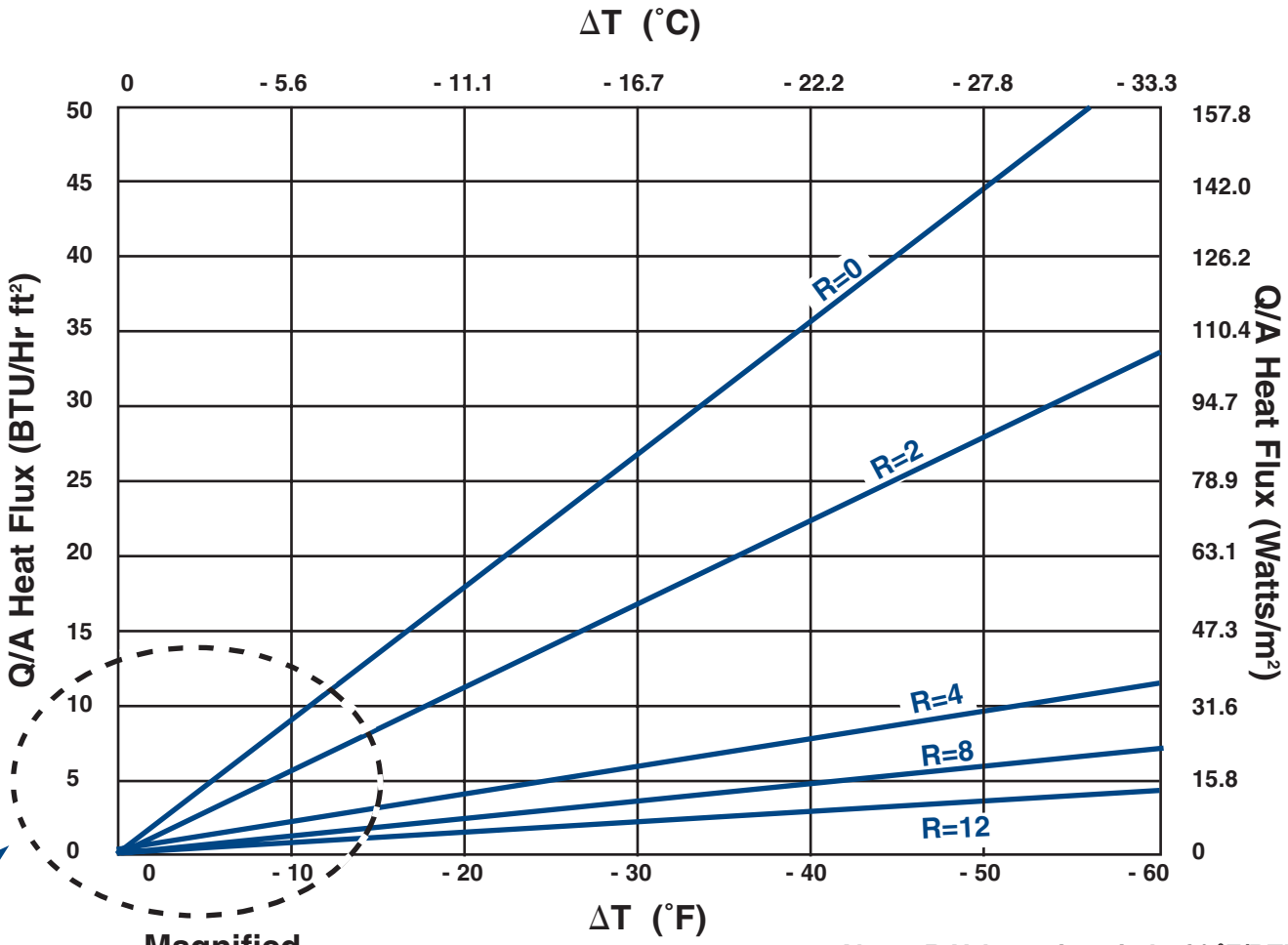
1. Determine thermal conductivity of insulating material.
2. Determine insulation thickness.
3. Calculate R-Value = $\dfrac{\Delta X \text{ (thickness, ft.)}}{k \text{ (thermal conductivity, BTU/Hr ft } ^\circ F)}$

(Remember, for uninsulated metallic cabinets, R=0).

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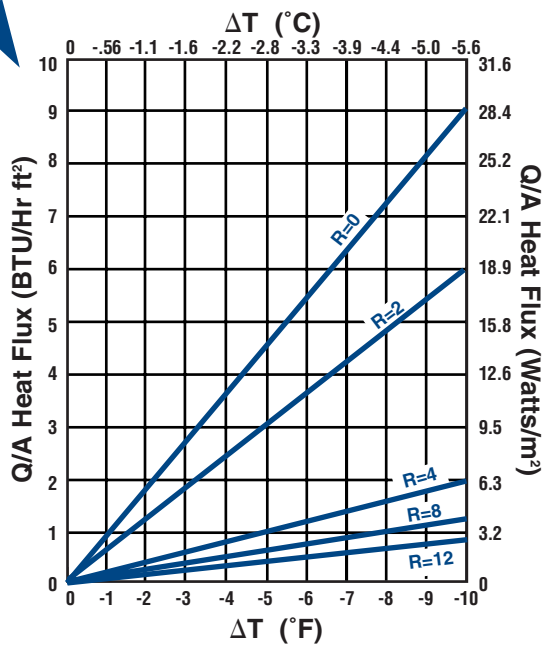
Selecting Air Conditioner Using Sizing Curves

Cabinet Heat Gain vs. ΔT & Insulation R-Value

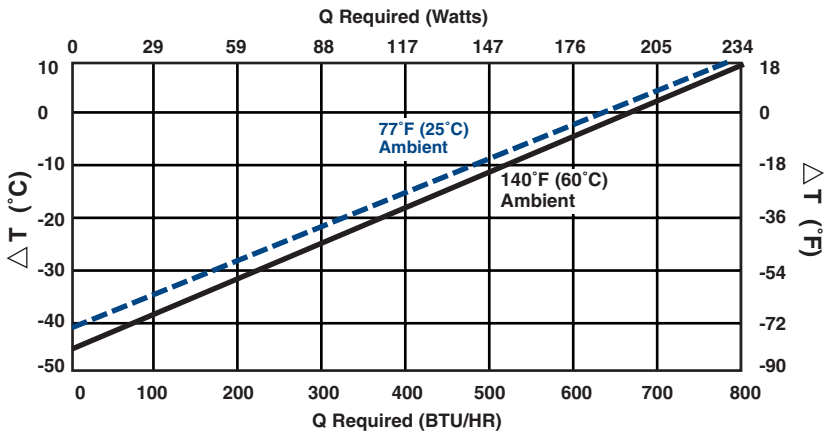


Above R-Values given in hr-ft²-˚F/BTU
1 m²-˚C/Watt = 5.68 hr-ft²-˚F/BTU

Magnified Cabinet Heat Gain vs. ΔT & R-Value



Typical Performance Curve: Selected Model MAA640T-48



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Externally Mounted Air Conditioners



Model MAA1200E-115D

The MAA1200E is a series of 1200 BTU/Hr solid-state air conditioners available in 115 or 230 VAC and in 48 VDC input power. This closed-loop system keeps the internal cabinet air isolated from the dirty ambient air so that NEMA 12 cabinet ratings are maintained. This unit is housed in a powder painted steel shell and is designed to cool below ambient temperature. Optionally, a harsh environment version of the MAA1200E suitable for maintaining NEMA 4X or IP54 ratings is available. This model features a stainless steel shell, special components and modifications which allow it to perform dependably under adverse conditions.

Our thermoelectrically driven air conditioners offer distinct advantages over traditional compressor-based air conditioners in that they use no refrigerants, can be mounted in any orientation, and run quieter. Additionally, our units are filterless and virtually maintenance-free with the inherent reliability of solid state TECs.

Our units also serve as dehumidifiers that compensate for cabinet air leaks and route the condensate through a drain system to the ambient. Standard units come equipped with thermostat control that cycles the thermoelectrics and external fans (ambient side), preventing overcooling. The cooling fans (cabinet side) run continuously, promoting proper air temperature distribution within the cabinet.

Model Number Nomenclature

M A A 1200 E – _____ _____

- M: MELCOR
- A: Cabinet Side (Air)
- A: Ambient Side (Air)
- 1200: Capacity (BTU/Hr)
- E: External Mount

Voltage:
- 115 = 115 VAC
- 230N = 230 VAC (N. American Cord)
- 230E = 230 VAC (European Cord)
- 48 = 48 VDC

Custom Options:
- A = Alarm
- D = Digital Controller
- D2 = RS 232 Interface
- D4 = RS 485 Interface
- H = Heating
- M = Mounting (Horizontal)
- P = 6' Power Cord (1.8m) external
- X = Maintains NEMA 4X and IP54 Ratings

Available Cords

115 (North American)

230N (North American)

230E (European)

Standard Model: MAA1200E-115
(115 VAC, multi position thermostat, 6' power cord through cabinet side, vertical mounting and condensate removal system, maintains NEMA 12, powder painted steel housing.)

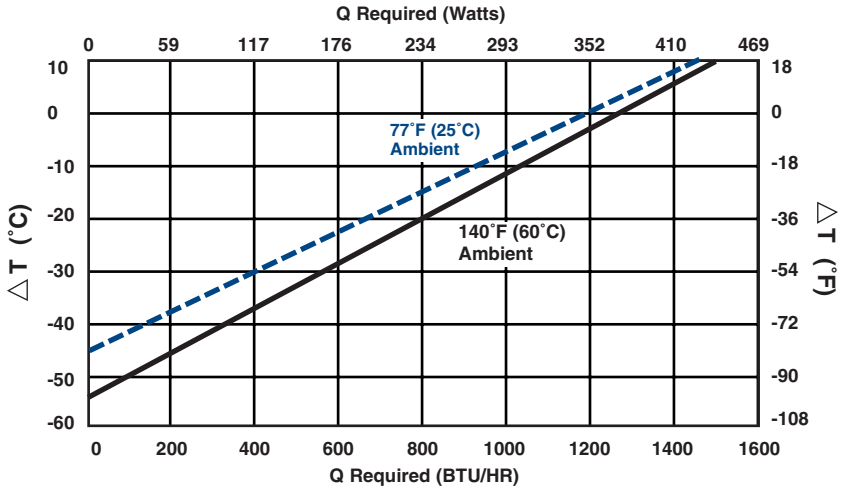
Example: MAA1200E-230EDHX (230 VAC European cord, digital controller, heating option, maintains NEMA 4X and IP54 ratings, stainless steel housing).

Specifications:

Model:	MAA1200E-115	MAA1200E-230E/N	MAA1200E-48
Capacity	1200 BTU/Hr (352 Watts)	1200 BTU/Hr (352 Watts)	1200 BTU/Hr (352 Watts)
Input Voltage	115 VAC	230 VAC	48 VDC
Max. Ambient Temp.	158˚F / 70˚C	158˚F / 70˚C	158˚F / 70˚C
Frequency	60/50 Hz	60/50 Hz	N/A
Current (Running)	8.0 amps	3.75 amps	17.25 amps
Weight	52 lbs. (23.6 kg)	52 lbs. (23.6 kg)	51 lbs. (23.2 kg)
Rating Maintained	NEMA 12 OR 4X/IP54	NEMA 12 OR 4X/IP54	NEMA 12 OR 4X/IP54
Overall Dimensions	18.40" H x 11.75" W x 8.42" D 467mm x 298mm x 214mm	18.40" H x 11.75" W x 8.42" D 467mm x 298mm x 214mm	18.40" H x 11.75" W x 8.42" D 467mm x 298mm x 214mm

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Performance Curve: MAA1200E Series



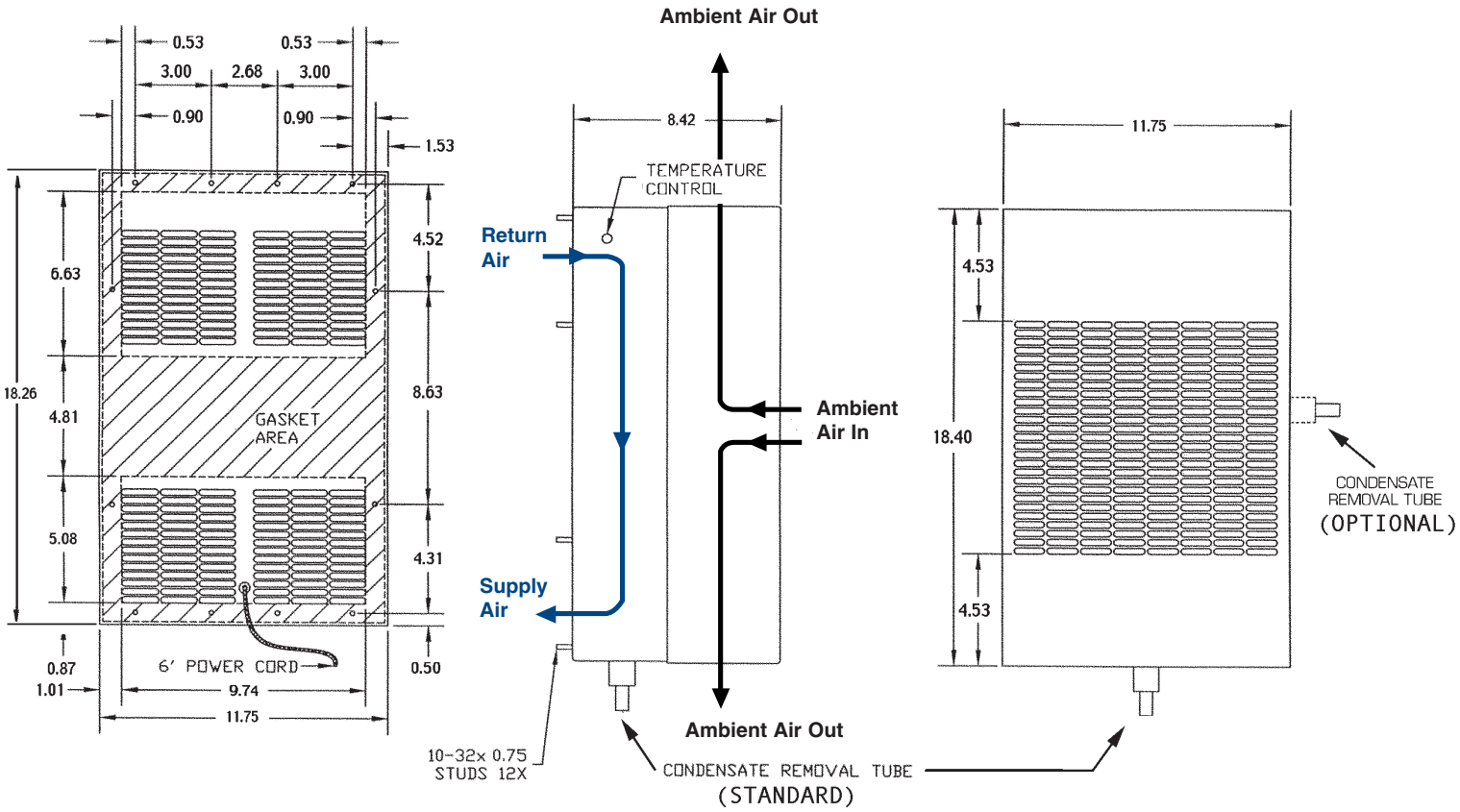
△T = Tmax Cabinet - Tmax Ambient

Important:

The air conditioner performance curves are dependent upon active and passive heat loads. To calculate passive cabinet heat gain, see the instructions on pages 6 and 7.

For assistance contact MELCOR.

Dimensional Drawing



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Model MAA600T-24

MAA640T-48
MAA600T-12/24

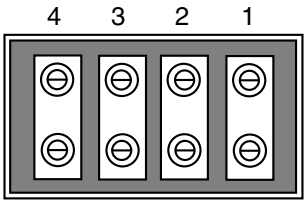
The MAA640T-48 and the MAA600T-12/24 Thermoelectric air conditioners are designed for electronic cabinets, refrigeration and environmental chambers. They can cool to 78˚F below ambient or maintain ambient temperature while removing up to 640 BTU/Hr (@ 77˚F ambient). These units offer increased capacity within a compact design, making them ideal where space is limited. Because there is no air exchanged between the cabinet and the ambient, the MAA640T-48 and MAA600T-12/24 are ideal for NEMA 12 environments. Optionally, a harsh environment version of this series, suitable for maintaining NEMA 4X or IP54 ratings is available. These air conditioners are virtually maintenance-free, with no filter to change, and can be mounted in any orientation, offering design flexibility with solid-state reliability.

Model Number Nomenclature

M A A ___ T - ___ ___

- MELCOR
- Cabinet Side (Air)
- Ambient Side (Air)
- Capacity (BTU/Hr): 640 (48 VDC); 600 (12/24 VDC)
- Thru Mount
- Voltage: 12 = 12 VDC; 24 = 24 VDC; 48 = 48 VDC
- X = Maintains NEMA 4X and IP54 ratings; Leave blank for standard NEMA12

Wiring Schematic (Power Connector)



Position	Description
1	TEC +
2	TEC -
3	FAN +
4	FAN -

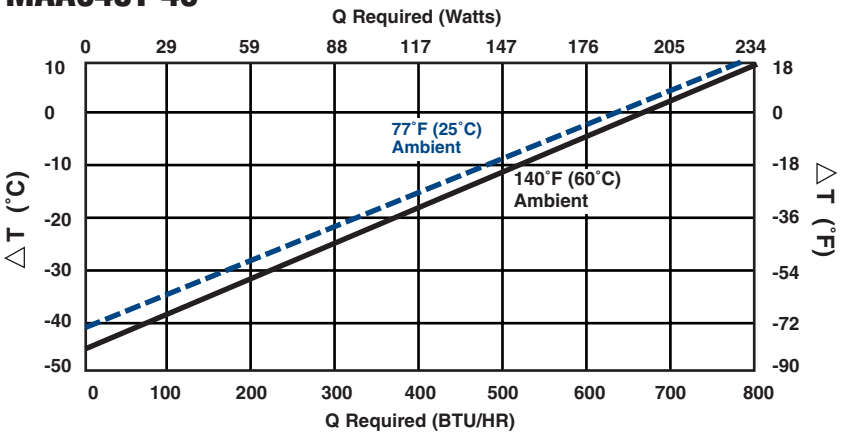
Specifications:			
Model:	MAA600T-12	MAA600T-24	MAA640T-48
Capacity	600 BTU/Hr (176 Watts)	600 BTU/Hr (176 Watts)	640 BTU/Hr (188 Watts)
Input Voltage	12 VDC	24 VDC	48 VDC
Max. Ambient Temp.**	140˚F / 60˚C	140˚F / 60˚C	140˚F / 60˚C
Current (Running)	29.0 amps	14.5 amps	9.0 amps
Weight	16.3 lbs. (7.4 kg)	16.3 lbs. (7.4 kg)	16.3 lbs. (7.4 kg)
Rating Maintained	NEMA 12 or 4X / IP54	NEMA 12 or 4X / IP54	NEMA 12 or 4X / IP54
Overall Dimensions	10” H x 7” W x 9.6” D 254mm x 178mm x 244mm	10” H x 7” W x 9.6” D 254mm x 178mm x 244mm	10” H x 7” W x 9.6” D 254mm x 178mm x 244mm

** Consult MELCOR for higher ambient temperature.

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Performance Curves:

MAA640T-48

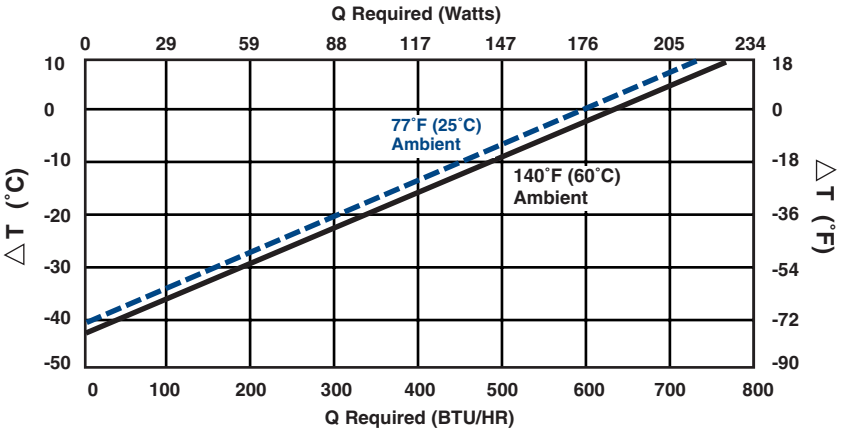


Important:

The air conditioner performance curves are dependent upon active and passive heat loads. To calculate passive cabinet heat gain, see the instructions on pages 6 and 7.

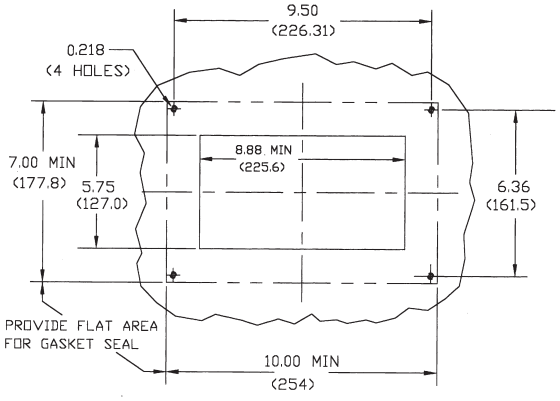
For assistance contact MELCOR.

MAA600T-12/24



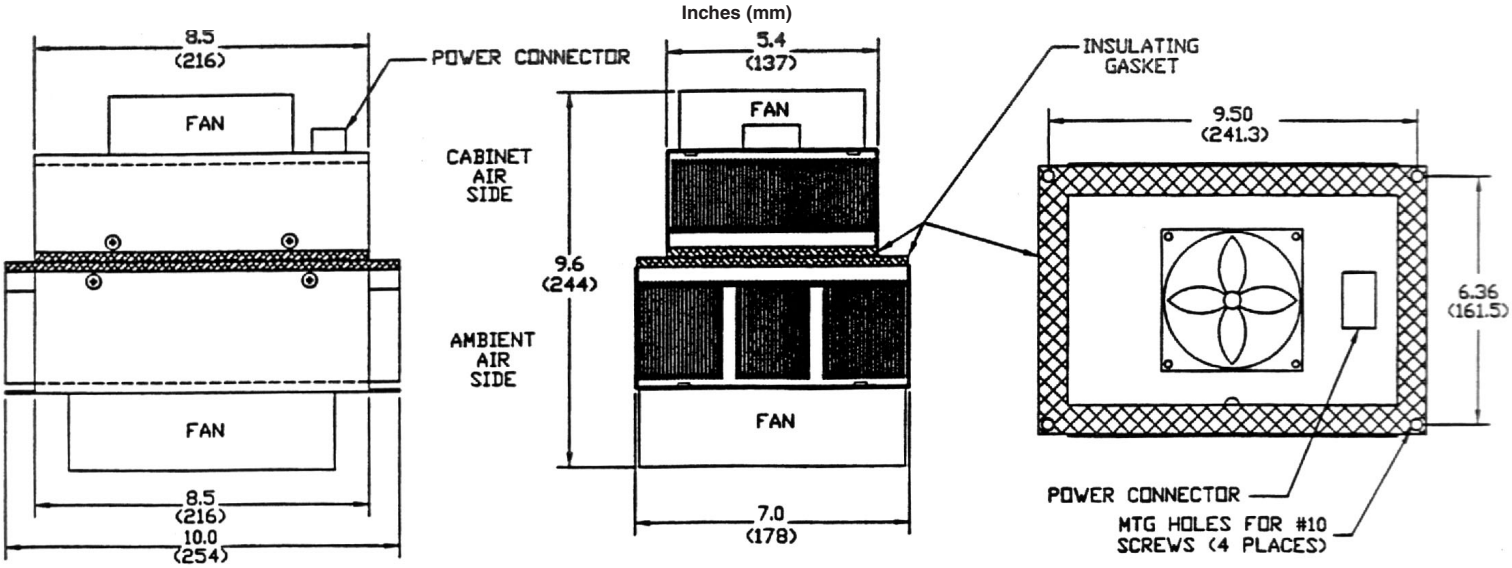
△T = Tmax Cabinet - Tmax Ambient

Installation Cutout

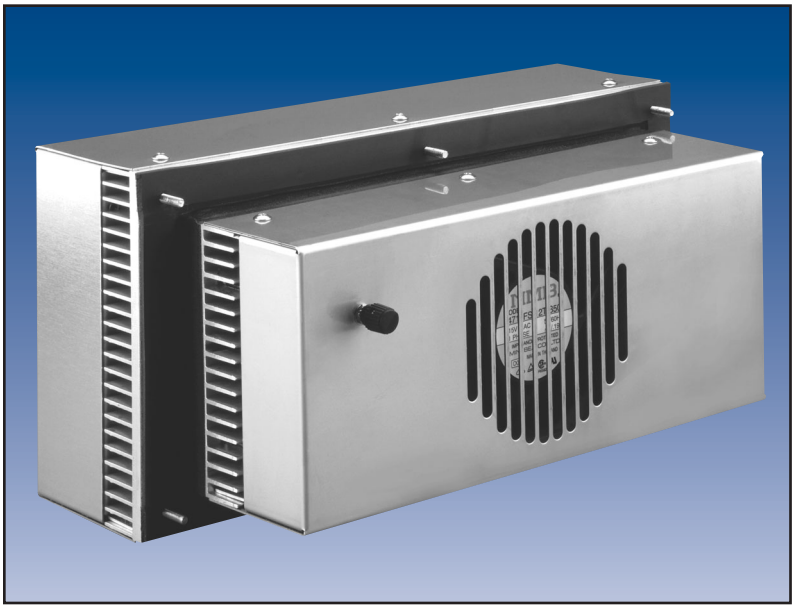


Dimensional Drawing

Inches (mm)



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Model MAA555T-115X

MAA555T-115 Series

The MAA555T-115 Series, is a 555 BTU/Hr, 115 VAC, Thru Mount Thermoelectric air conditioner designed for electronic cabinets, refrigeration and environmental chambers where temperature control is critical. It can cool to 72˚F below ambient or maintain ambient temperature while removing up to 555 BTU/Hr. The standard unit is designed to maintain NEMA 12 ratings while the ambient side of this closed loop cooler can be designed for harsh environments maintaining the integrity of NEMA 4X and IP54 systems. Temperature is controlled through a multi-position thermostat and the unit comes complete with a 115 VAC plugged end 6' cord. This air conditioner is virtually maintenance-free, with no filters to change, and can be mounted in any orientation, offering design flexibility with solid-state reliability.

Model Number Nomenclature

M A A 555 T - 115 ___

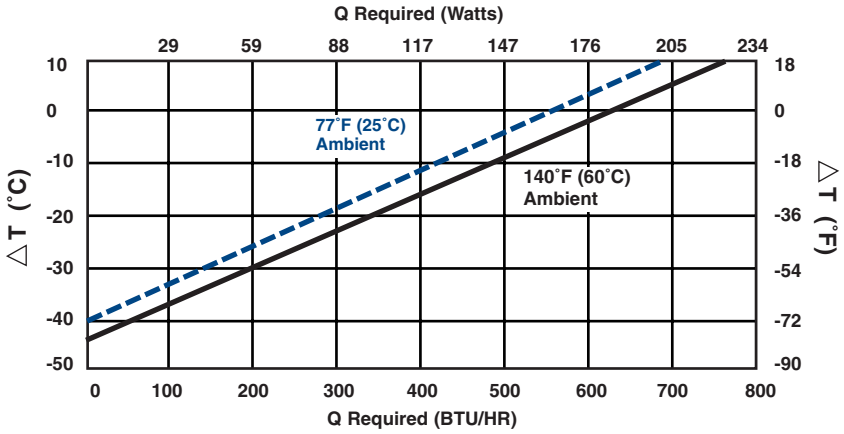
- M — MELCOR
- A — Cabinet Side (Air)
- A — Ambient Side (Air)
- 555 — Capacity (BTU/Hr)
- T — Thru Mount
- 115 — AC Voltage
- ___ — Rating Maintained:
  - X = NEMA 4X and IP54
  - Leave blank for standard NEMA 12

* *

Specifications:		
Model:	MAA555T-115	MAA555T-115X
Capacity	555 BTU/Hr (163 Watts)	555 BTU/Hr (163 Watts)
Input Voltage	115 VAC	115 VAC
Running Current	3.2 amps	3.2 amps
Weight	23 lbs. (10.4 kg)	23 lbs. (10.4 kg)
Rating Maintained	NEMA 12	NEMA 4X and IP54
Max. Ambient Temp.	158˚F / 70˚C	158˚F / 70˚C
Frequency	50 / 60 Hz	50 / 60 Hz
Overall Dimensions	15.0" H x 7.3" W x 7.4" D 381mm x 186mm x 188mm	15.0" H x 7.3" W x 7.4" D 381mm x 186mm x 188mm

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Performance Curve: MAA555T-115



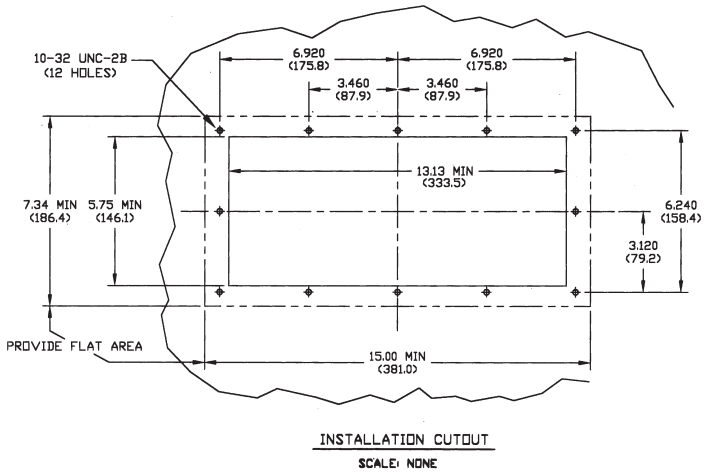
△T = Tmax Cabinet - Tmax Ambient

Important:

The air conditioner performance curves are dependent upon active and passive heat loads. To calculate passive cabinet heat gain, see the instructions on pages 6 and 7.

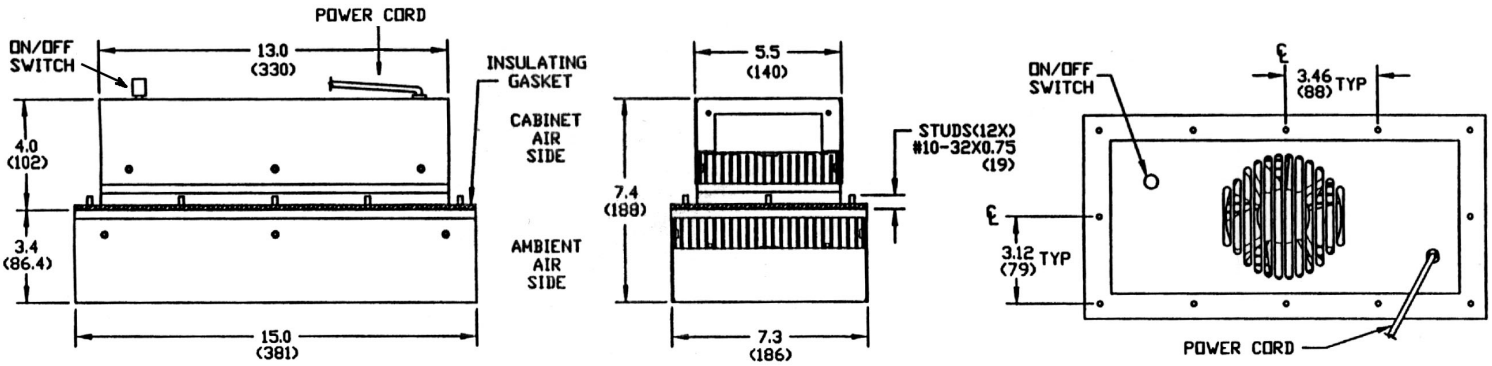
For assistance contact MELCOR.

Installation Cutout



Dimensional Drawing

Inches (mm)



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Model MAA510T-48

MAA550T-12
MAA510T-24/48

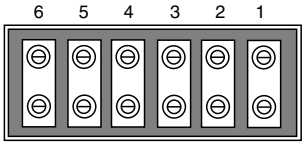
The MAA550T-12 and MAA510T-24/48 Thermoelectric air conditioners are designed for electronic cabinets, refrigeration and environmental chambers. They can cool to 72˚F below ambient or maintain ambient temperatures while removing up to 550 BTU/Hr (@ 77˚F ambient). Choose a model, depending upon your needs, in 12, 24 or 48 VDC configuration. Because there is no air exchanged between the cabinet and the ambient, the MAA550T-12 and MAA510T-24/48 are ideal for NEMA 12 requirements. These air conditioners are virtually maintenance-free, with no filters to change, and they can be mounted in any orientation, offering design flexibility with solid-state reliability.

Model Number Nomenclature

M A A ___ T - ___

- Voltage: 12 = 12 VDC; 24 = 24 VDC; 48 = 48 VDC
- Thru Mount
- Capacity (BTU/Hr): 550 (12 VDC); 510 (24/48 VDC)
- Ambient Side (Air)
- Cabinet Side (Air)
- MELCOR

Wiring Schematic (Power Connector)



Position	MAA510T-24/48	Position	MAA550T-12
1	TEC +	1	TEC +
2	TEC -	2	TEC -
3	Cabinet Side Fans +	3	Cabinet Side Fans +
4	Cabinet Side Fans -	4	Cabinet Side Fans -
5	Ambient Side Fans +	5	Ambient Side Fans +
6	Ambient Side Fans -	6	Ambient Side Fans -

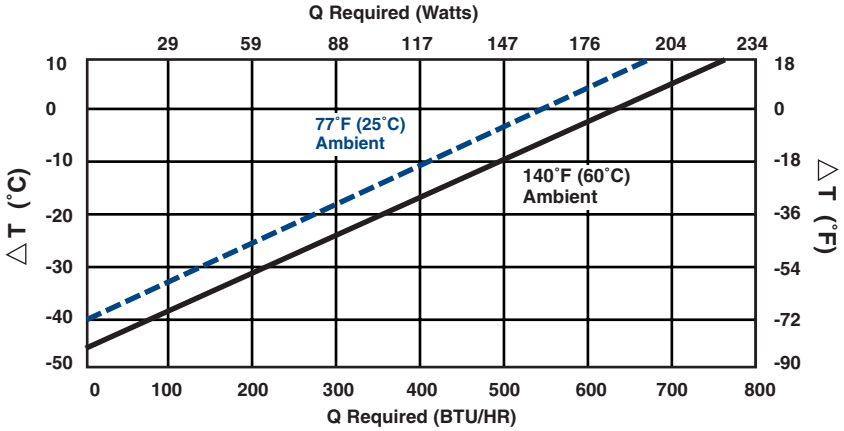
Specifications:			
Model:	MAA550T-12	MAA510T-24	MAA510T-48
Capacity	550 BTU/Hr (161 Watts)	510 BTU/Hr (149 Watts)	510 BTU/Hr (149 Watts)
Input Voltage	12 VDC	24 VDC	48 VDC
Max. Ambient Temp.**	140˚F / 60˚C	140˚F / 60˚C	140˚F / 60˚C
Current (Running)	37.7 amps	8.7 amps	4.8 amps
Weight	16.4 lbs. (7.5 kg)	16.4 lbs. (7.5 kg)	16.4 lbs. (7.5 kg)
Rating Maintained	NEMA 12	NEMA 12	NEMA 12
Overall Dimensions	18.25”H x 6.0”W x 7.8”D 464mm x 152mm x 198mm	18.25”H x 6.0”W x 7.8”D 464mm x 152mm x 198mm	18.25”H x 6.0”W x 7.8”D 464mm x 152mm x 198mm

** Consult MELCOR for higher ambient temperature.

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Performance Curves:

MAA550T-12

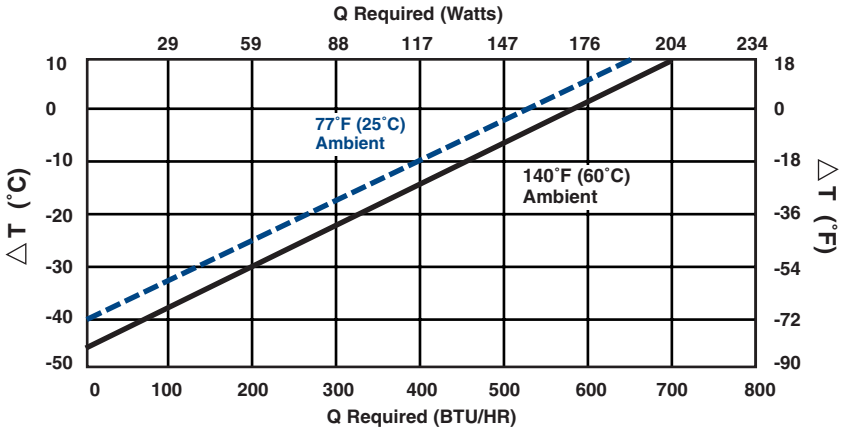


Important:

The air conditioner performance curves are dependent upon active and passive heat loads. To calculate passive cabinet heat gain, see the instructions on pages 6 and 7.

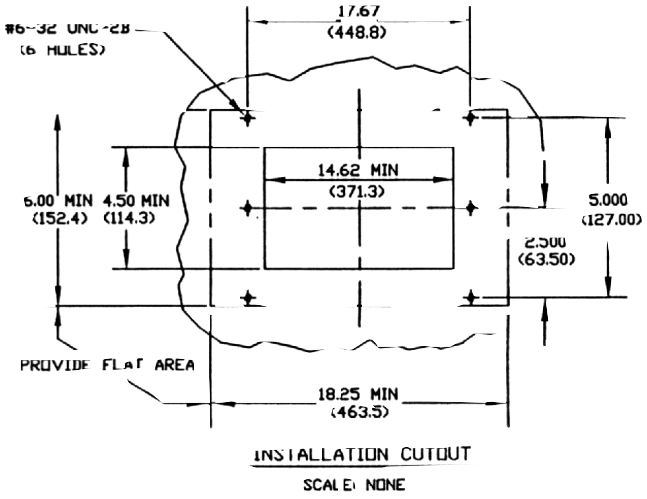
For assistance contact MELCOR.

MAA510T-24/48



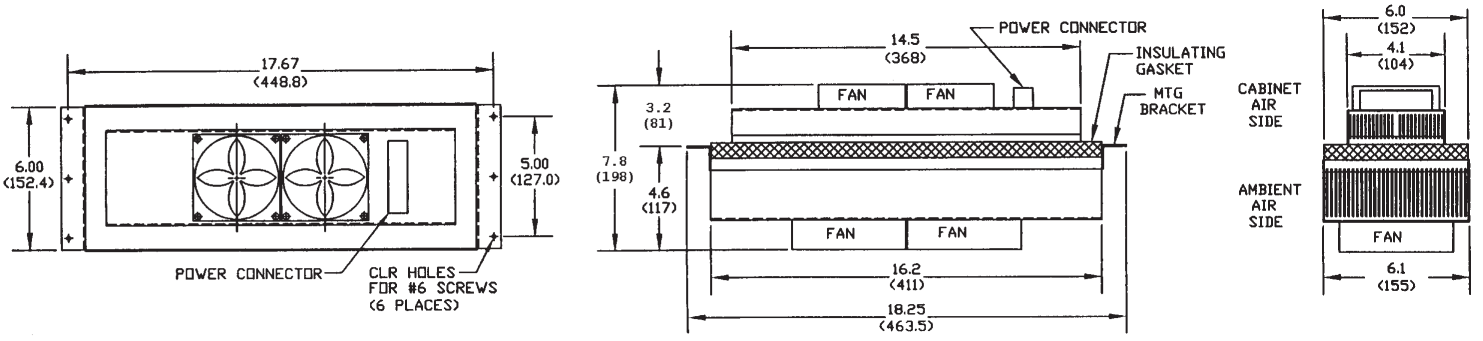
△T = Tmax Cabinet - Tmax Ambient

Installation Cutout

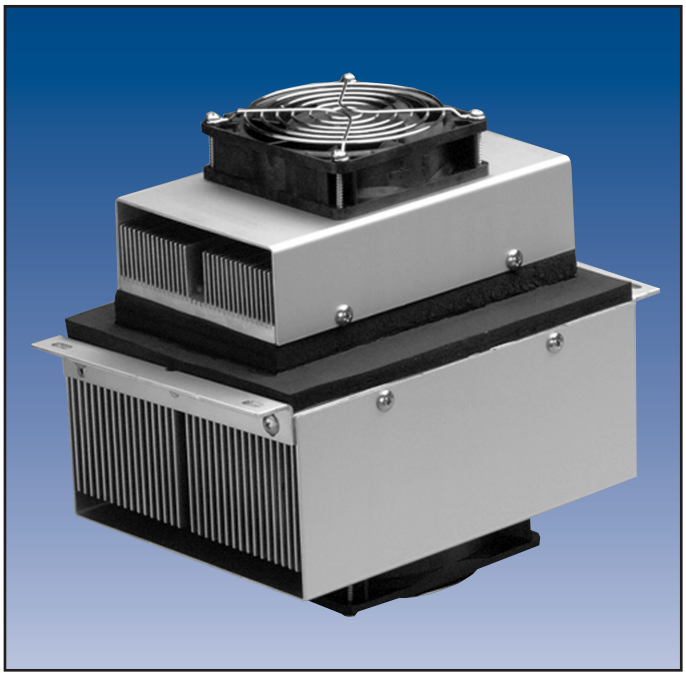


Dimensional Drawing

Inches (mm)



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MAA280T-12/48
MAA260T-24

The MAA280T-12/48 and MAA260T-24 Thermoelectric air conditioners are designed for electronic cabinets, refrigeration and environmental chambers. They can cool to 72˚F below ambient or maintain ambient temperatures while removing up to 280 BTU/Hr (@ 77˚F ambient). Choose a model depending upon your needs for 12, 24 or 48 VDC configuration. Because there is no air exchanged between the cabinet and the ambient, the MAA280T-12/48 and MAA260T-24 are ideal for NEMA 12 requirements. These air conditioners are virtually maintenance-free, with no filters to change, and they can be mounted in any orientation, offering design flexibility with solid-state reliability.

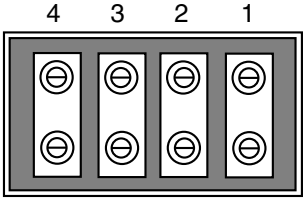
Model MAA280T-12

Model Number Nomenclature

M A A ___ T – ___

- Voltage: 12 = 12 VDC; 24 = 24 VDC; 48 = 48 VDC
- Thru Mount
- Capacity (BTU/Hr): 280 (12 and 48 VDC); 260 (24 VDC)
- Ambient Side (Air)
- Cabinet Side (Air)
- MELCOR

Wiring Schematic (Power Connector)



Position	Description
1	TEC +
2	TEC -
3	FAN +
4	FAN -

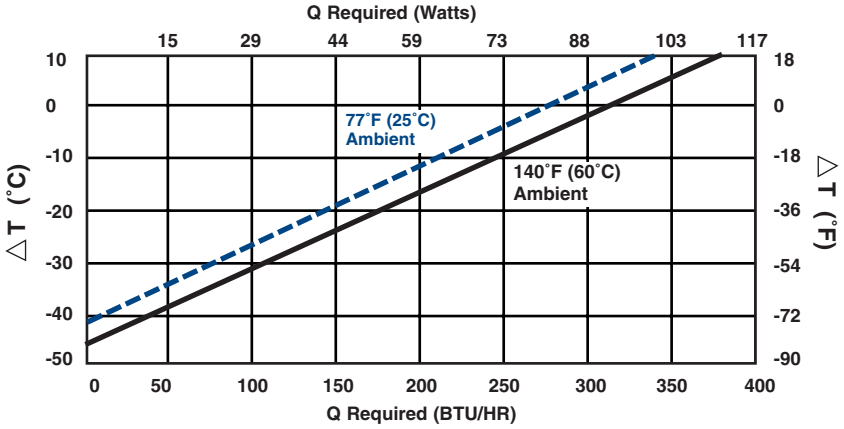
Specifications:			
Model:	MAA280T-12	MAA260T-24	MAA280T-48
Capacity	280 BTU/Hr (82 Watts)	260 BTU/Hr (76 Watts)	280 BTU/Hr (82 Watts)
Input Voltage	12 VDC	24VDC	48 VDC
Max. Ambient Temp.**	140˚F / 60˚C	140˚F / 60˚C	140˚F / 60˚C
Current (Running)	18.5 amps	4.8 amps	1.6 amps
Weight	9.6 lbs. (4.4 kg)	9.6 lbs. (4.4 kg)	9.6 lbs. (4.4 kg)
Rating Maintained	NEMA 12	NEMA 12	NEMA 12
Overall Dimensions	9.5” H x 6.75” W x 8.43” D 241mm x 171mm x 214mm	9.5” H x 6.75” W x 8.43” D 241mm x 171mm x 214mm	9.5” H x 6.75” W x 8.43” D 241mm x 171mm x 214mm

** Consult MELCOR for higher ambient temperature.

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Performance Curves:

MAA280T-12/48

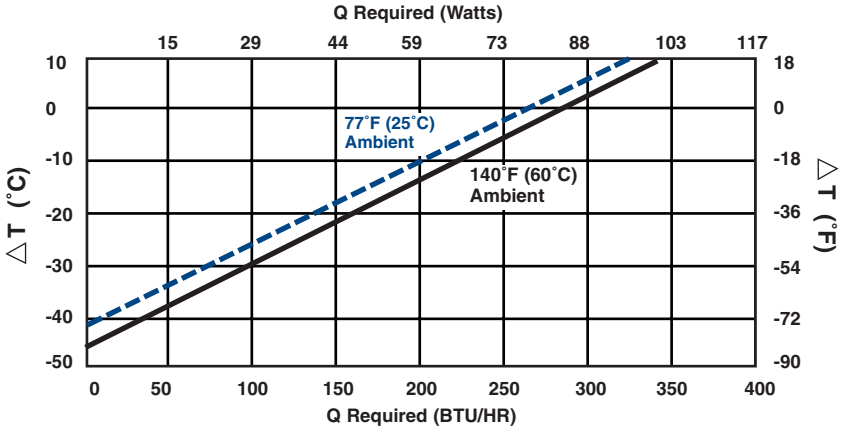


Important:

The air conditioner performance curves are dependent upon active and passive heat loads. To calculate passive cabinet heat gain, see the instructions on pages 6 and 7.

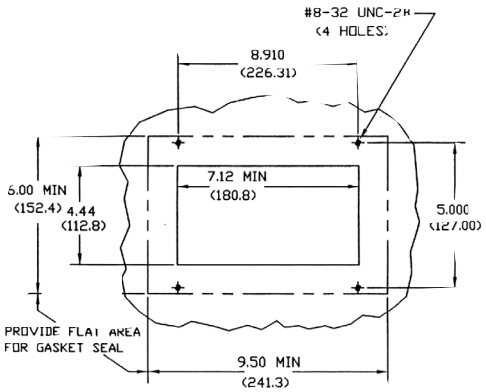
For assistance contact MELCOR.

MAA260T-24



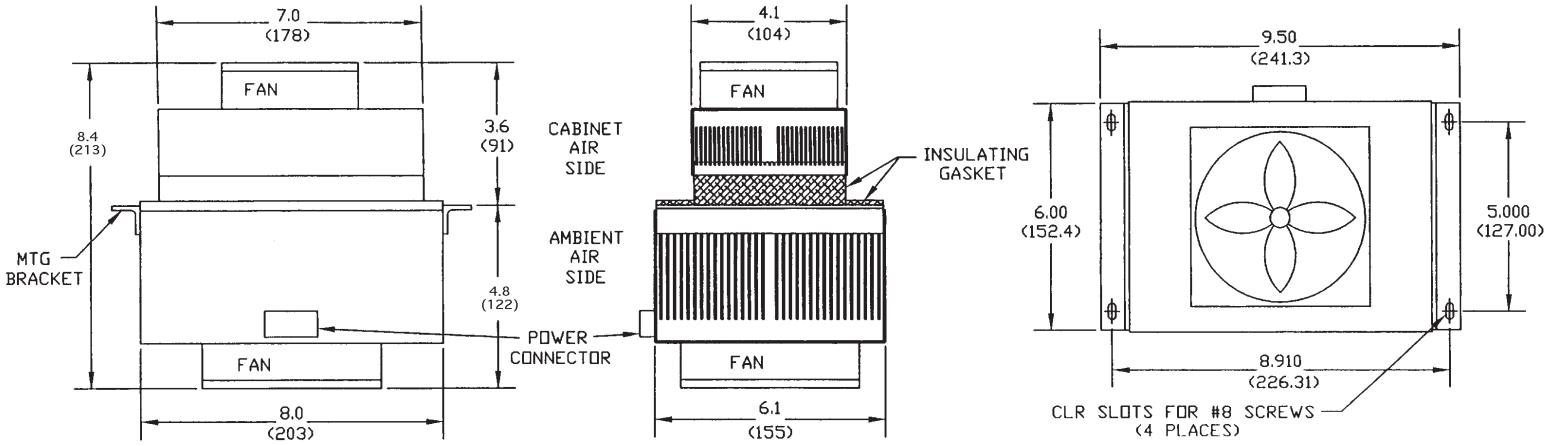
△T = Tmax Cabinet - Tmax Ambient

Installation Cutout

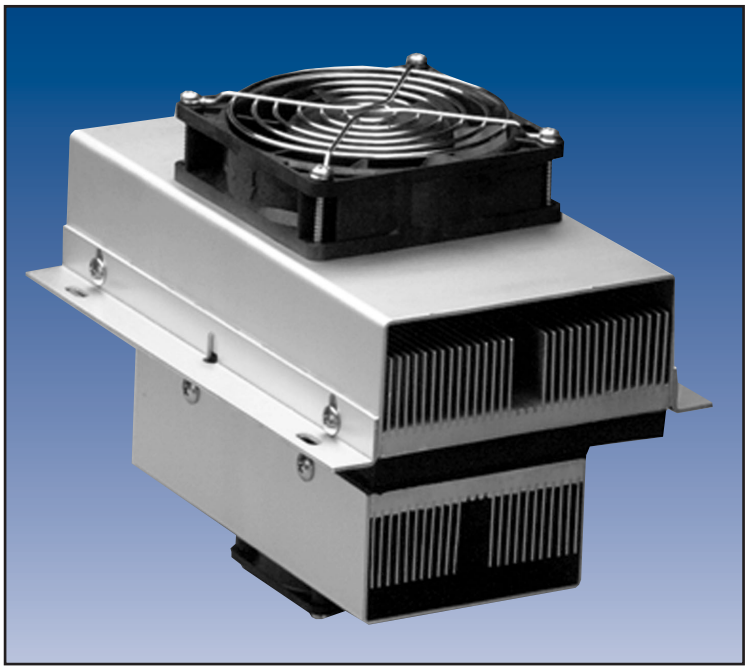


Dimensional Drawing

Inches (mm)



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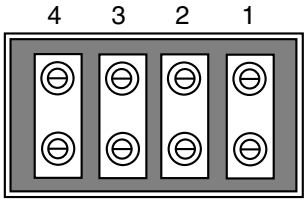


Model MAA150T-12

MAA150T-12/24

The MAA150T-12/24 Thermoelectric air conditioners are designed for electronic cabinets and environmental chambers. They can cool to 72˚F below ambient or maintain ambient temperatures while removing up to 150 BTU/Hr (@ 77˚F ambient). These models are available in 12 or 24 VDC configurations. Because there is no air exchanged between the cabinet and the ambient, the MAA150T-12/24 series are ideal for NEMA 12 requirements. These air conditioners are virtually maintenance-free, with no filters to change, and they can be mounted in any orientation, offering design flexibility with solid-state reliability.

Wiring Schematic (Power Connector)



Position	Description
1	TEC +
2	TEC -
3	FAN +
4	FAN -

Model Number Nomenclature

M A A 150 T - __

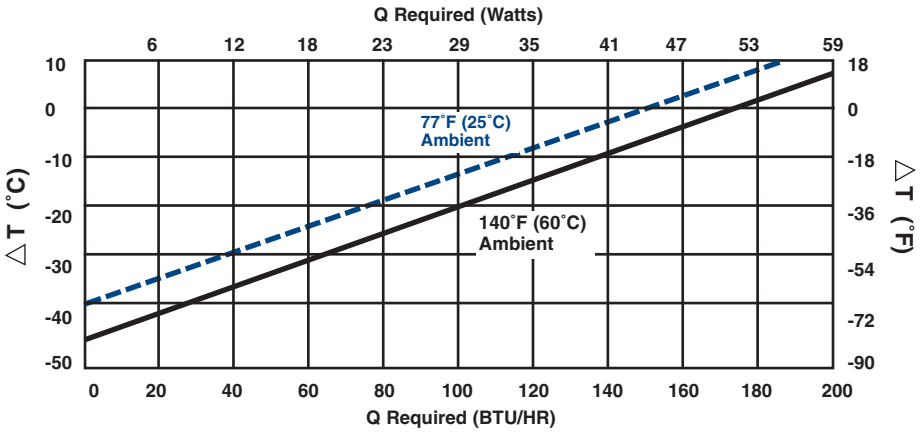
- MELCOR
- Cabinet Side (Air)
- Ambient Side (Air)
- Capacity (BTU/Hr)
- Thru Mount
- Voltage: 12 = 12 VDC, 24 = 24 VDC

Specifications:		
Model:	MAA150T-12	MAA150T-24
Capacity	150 BTU/Hr (44 Watts)	150 BTU/Hr (44 Watts)
Input Voltage	12 VDC	24VDC
Max. Ambient Temp.**	140˚F / 60˚C	140˚F / 60˚C
Current (Running)	9.5 amps	4.5 amps
Weight	4.4 lbs. (2.0 kg)	4.4 lbs. (2.0 kg)
Rating Maintained	NEMA 12	NEMA 12
Overall Dimensions	8.0" H x 5.5" W x 6.4" D 203mm x 140mm x 165mm	8.0" H x 5.5" W x 6.4" D 203mm x 140mm x 165mm

** Consult MELCOR for higher ambient temperature.

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Performance Curve: MAA150T-12/24 Series



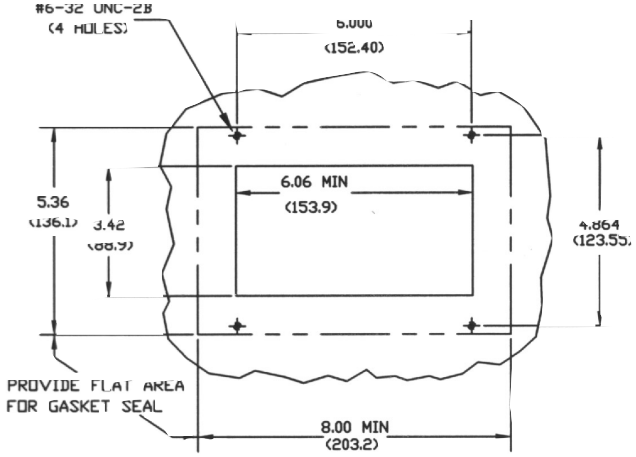
△T = Tmax Cabinet - Tmax Ambient

Important:

The air conditioner performance curves are dependent upon active and passive heat loads. To calculate passive cabinet heat gain, see the instructions on pages 6 and 7.

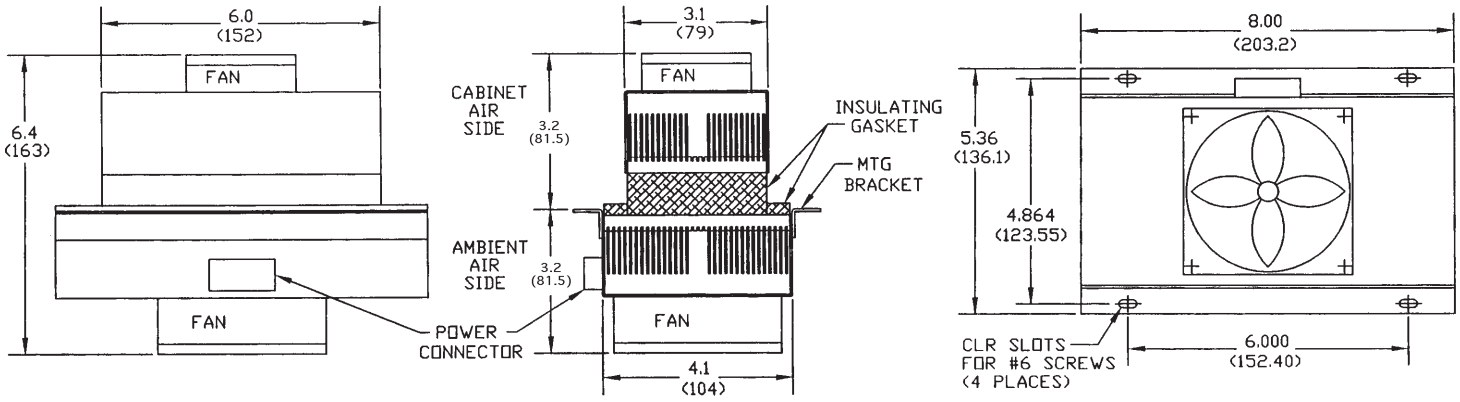
For assistance contact MELCOR.

Installation Cutout



Dimensional Drawing

Inches (mm)



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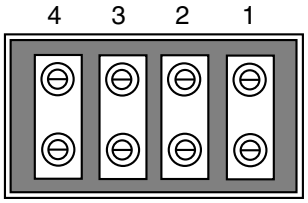


Model MAA070T-12

MAA070T-12

The MAA070T-12 Thermoelectric air conditioner is designed for small electronic cabinets and environmental chambers. It can cool to 72˚F below ambient or maintain ambient temperatures while removing up to 70 BTU/Hr (@ 77˚F ambient). Because there is no air exchanged between the cabinet and the ambient, the MAA070T-12 is ideal for NEMA 12 requirements. This air conditioner is virtually maintenance-free, with no filters to change, and can be mounted in any orientation, offering design flexibility with solid-state reliability.

Wiring Schematic (Power Connector)



Position	Description
1	TEC +
2	TEC -
3	FAN +
4	FAN -

Specifications:	
Model:	MAA070T-12
Capacity	70 BTU/Hr (21 Watts)
Input Voltage	12 VDC
Max. Ambient Temp.**	140˚F / 60˚C
Current (Running)	4.9 amps
Weight	2.3 lbs. (1.0 kg)
Rating Maintained	NEMA 12
Overall Dimensions	4.0” H x 5.33” W x 6.4” D 102mm x 135mm x 165mm

** Consult MELCOR for higher ambient temperature.

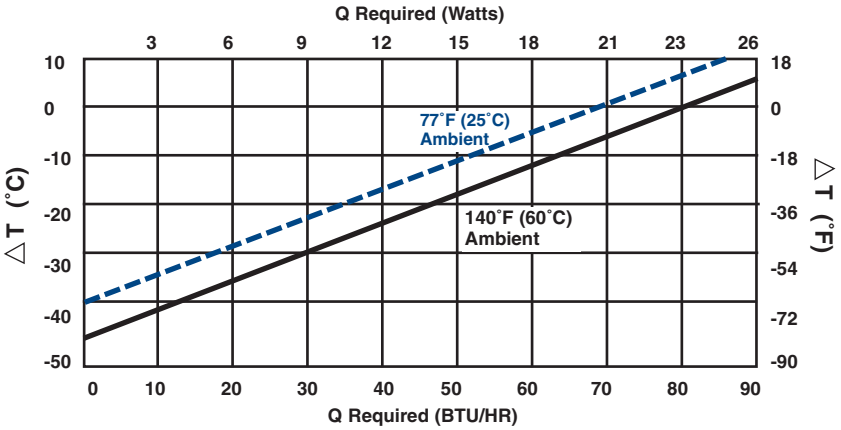
Model Number Nomenclature

M A A 070 T – 12

- 12 — DC Voltage
- T — Thru Mount
- 070 — Capacity (BTU/Hr)
- A — Ambient Side (Air)
- A — Cabinet Side (Air)
- M — MELCOR

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Performance Curve: MAA070T-12



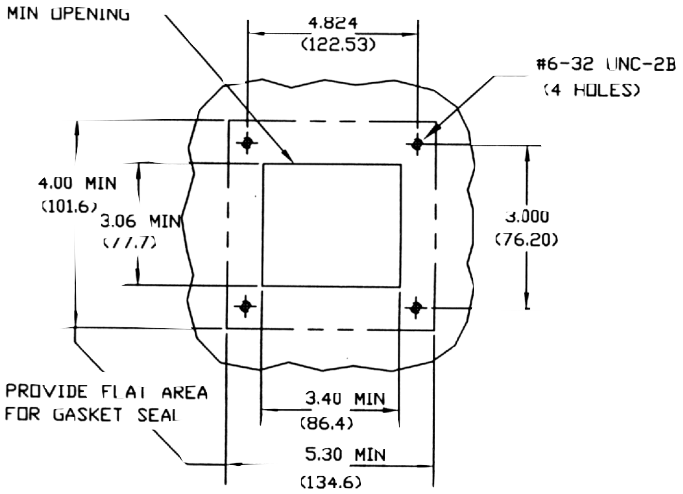
△T = Tmax Cabinet - Tmax Ambient

Important:

The air conditioner performance curves are dependent upon active and passive heat loads. To calculate passive cabinet heat gain, see the instructions on pages 6 and 7.

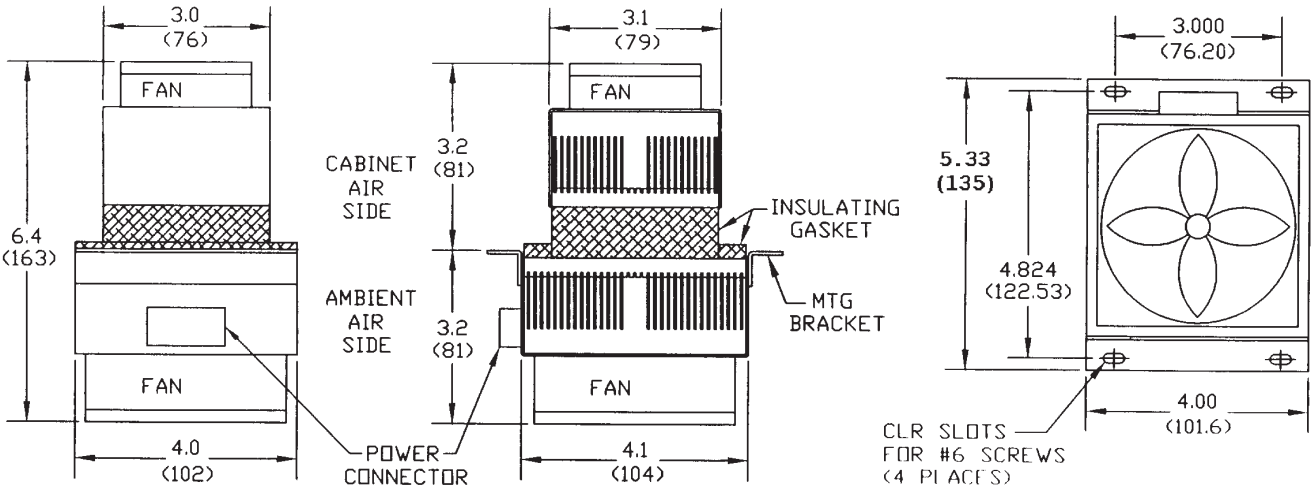
For assistance contact MELCOR.

Installation Cutout

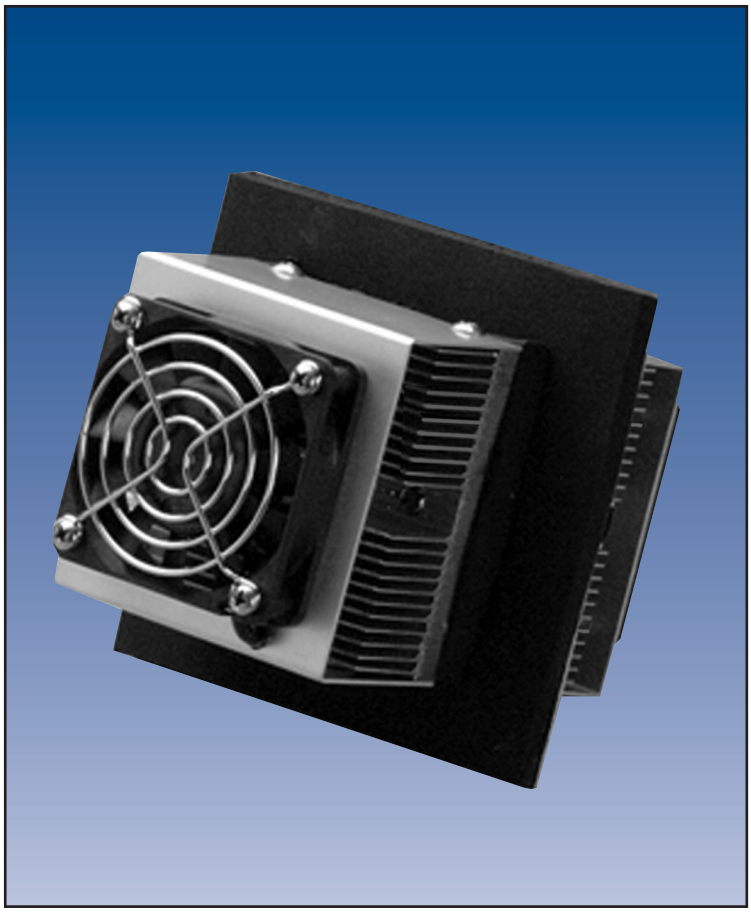


Dimensional Drawing

Inches (mm)



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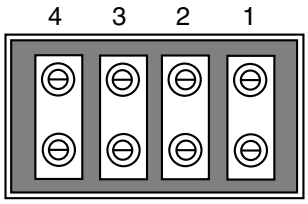


Model MAA050T-12

MAA050T-12

The MAA050T-12 Thermoelectric air conditioner is designed for small electronic cabinets and environmental chambers. It can cool to 68˚F below ambient or maintain ambient temperatures while removing up to 50 BTU/Hr (@ 77˚F ambient). Because there is no air exchanged between the cabinet and the ambient, the MAA050T-12 is ideal for NEMA 12 requirements. This air conditioner is virtually maintenance-free, with no filters to change, and can be mounted in any orientation, offering design flexibility with solid-state reliability.

Wiring Schematic (Power Connector)



Position	Description
1	TEC +
2	TEC -
3	FAN +
4	FAN -

Specifications:	
Model:	MAA050T-12
Capacity	50 BTU/Hr (15 Watts)
Input Voltage	12 VDC
Max. Ambient Temp.**	140˚F / 60˚ C
Current (Running)	3.0 amps
Weight	1.8 lbs. (0.82 kg)
Rating Maintained	NEMA 12
Overall Dimensions	4.5” H x 4.5” W x 6.0” D (114mm x 114mm x 152mm)

** Consult MELCOR for higher ambient temperature.

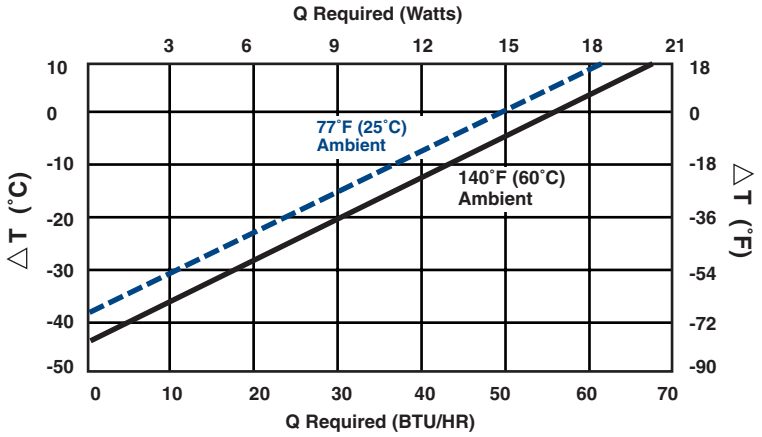
Model Number Nomenclature

M A A 050 T – 12

- 12 — DC Voltage
- T — Thru Mount
- 050 — Capacity (BTU/Hr)
- A — Ambient Side (Air)
- A — Cabinet Side (Air)
- M — MELCOR

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Performance Curve: MAA050T-12



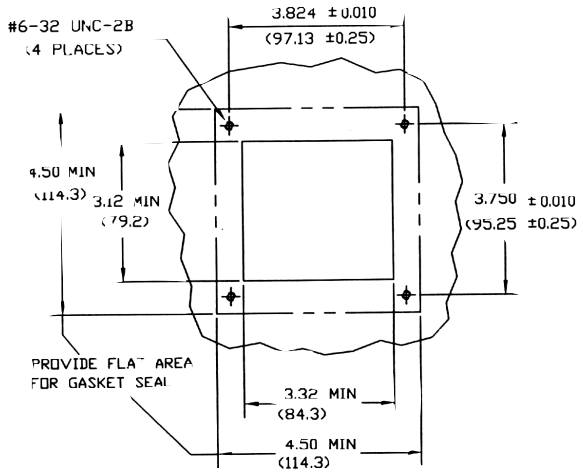
△T = Tmax Cabinet - Tmax Ambient

Important:

The air conditioner performance curves are dependent upon active and passive heat loads. To calculate passive cabinet heat gain, see the instructions on pages 6 and 7.

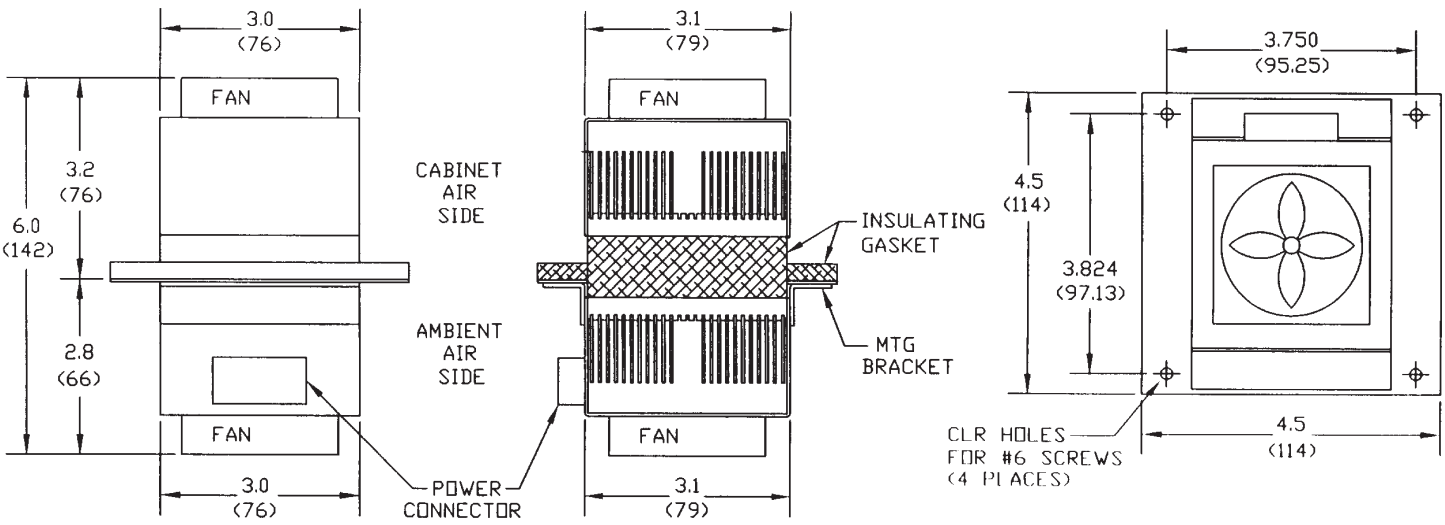
For assistance contact MELCOR.

Installation Cutout



Dimensional Drawing

Inches (mm)



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Now…Space-Saving, Solid-State, Thermoelectric Recirculating Chillers!

Now MELCOR, the world leader in thermoelectric cooling technology, has introduced a new dimension in liquid chillers. MELCOR has expanded its line of solid-state appliances to include recirculating liquid chillers for a variety of applications such as laser cooling, process liquids, medical equipment and scientific instruments.

Features:

- Precision temperature control
- Solid-state reliability
- Economical
- Compact design
- 115 and 230 VAC (dual voltage)
- Quiet operation
- UL, CSA and CE approved.
  Also approved for medical application.
- Digital temperature control
- Low fluid indicator
- Quick disconnect valves (1/4" flow)
- No CFC or HCFC
- RS232 standard (RS485 optional)
- Convenient carrying handle



MELCOR Chiller Control Features

MELCOR's Liquid Chillers include digital temperature control with a wide range of user setable features to include:

- High accuracy temperature control ±0.25° C
- Set point limits (upper and lower)
- Sensor offset
- Anti-short cycling
- Set point differential
- High and low temperature alarm
- Alarm differential and time delay
- Display updating delay
- Temperature units in ˚C or ˚F



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Model MRC600DH2-DV

MRC600 Dual Voltage Chiller

The MRC 600 Series, is a 600-Watt, 115 or 230 VAC, free standing thermoelectric liquid chiller suitable for laser and medical laboratory applications. Standard features include: pump, reservoir, low fluid level detector, quick disconnect valves and 7' power cord (with plug). Also featured is a built-in digital temperature controller that can control temperature to within ±.25°C. The controller is available in various serial port configurations. This solid-state chiller is designed to use water or a coolant solution and offers a variety of benefits listed below over traditional compressor-based chillers.

- **No** ozone depleting CFCs
- 600 Watts of cooling (ΔT=0)
- Quieter and compact
- Lower maintenance
- More accurate temperature control
- High accuracy control to ±.25°C.
- RS232 or RS485 serial communicaton

Features:

- Dual Voltage (115/230) for global use
- Adjustable alarm for low & high temperature limits

Specifications (Preliminary):	
Model	MRC600/DH-DV
Capacity	600 Watts (2047.3 BTU/HR)
Input Voltage	115 VAC / 230 VAC
Operating Temperature Range*	40˚F (4.4˚C) to 113˚F (45˚C)*
Control Temperature Range*†	35˚F (2˚C) to 104˚F (40˚C)*†
Running Current	9 amps / 4.5 amps
Weight	52 lbs.
High Control Accuracy	±0.25˚C
Reservoir Capacity	0.26 Gallons / 1.0 Liter
Chiller Fluid Capacity	0.37 Gallons / 1.4 Liters
Frequency	50 / 60 Hz
Overall Dimensions	15.0" H x 11.0" W x 21.0" D 381mm x 280mm x 533mm

* For higher or lower ambient or control temperatures consult MELCOR.

† ***NOTE: This unit is designed for cooling only.***

Model Number Nomenclature

M R C 600 ___ - DV __

- **M** — MELCOR
- **R** — Recirculating
- **C** — Chiller
- **600** — Capacity (Watts)
- **___** — High-Accuracy Digital Controller ±0.25˚C
  - **DH2** = With RS232 Serial Communication
  - **DH4** = With RS485 Serial Communication
- **DV** — Voltage: Dual Voltage (115/230 VAC)
- **__** — Cord Set Options
  - A = 115 VAC (North American)
  - N = 230 VAC (North American)
  - E = 230 VAC (European)

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Model MRC300DH2-DV

MRC300 Dual Voltage Chiller

The MRC 300 Series, is a 300-Watt, 115 or 230 VAC, free standing thermoelectric liquid chiller suitable for laser and medical laboratory applications. Standard features include: pump, reservoir, low fluid level detector, quick disconnect valves and 7' power cord (with plug). Also featured is a built-in digital temperature controller that can control temperature to within ±.25°C. The controller is available in various serial port configurations. This solid-state chiller is designed to use water or a coolant solution and offers a variety of benefits listed below over traditional compressor-based chillers.

- **No** ozone depleting CFCs
- 300 Watts of cooling (ΔT=0)
- Quieter and compact
- Lower maintenance
- More accurate temperature control
- High accuracy control to ±.25°C.
- RS232 or RS485 serial communicaton

Features:

- Dual Voltage (115/230) for global use
- Adjustable alarm for low & high temperature limits

Specifications:	
Model	MRC300/DH-DV
Capacity	300 Watts (1023.3 BTU/HR)
Input Voltage	115 VAC / 230 VAC
Operating Temperature Range*	40˚F (4.4˚C) to 113˚F (45˚C)*
Control Temperature Range*†	35˚F (2˚C) to 104˚F (40˚C)*†
Running Current	5.2 amps / 2.6 amps
Weight	30 lbs. (13.6 kgs)
High Control Accuracy	±0.25˚C
Reservoir Capacity	0.08 Gallons / 300ml
Chiller Fluid Capacity	0.12 Gallons / 450ml
Frequency	50 / 60 Hz
Overall Dimensions	13.75" H x 8.0" W x 13.26" D 349mm x 203mm x 337mm

* For higher or lower ambient or control temperatures consult MELCOR.

† ***NOTE: This unit is designed for cooling only.***

Model Number Nomenclature

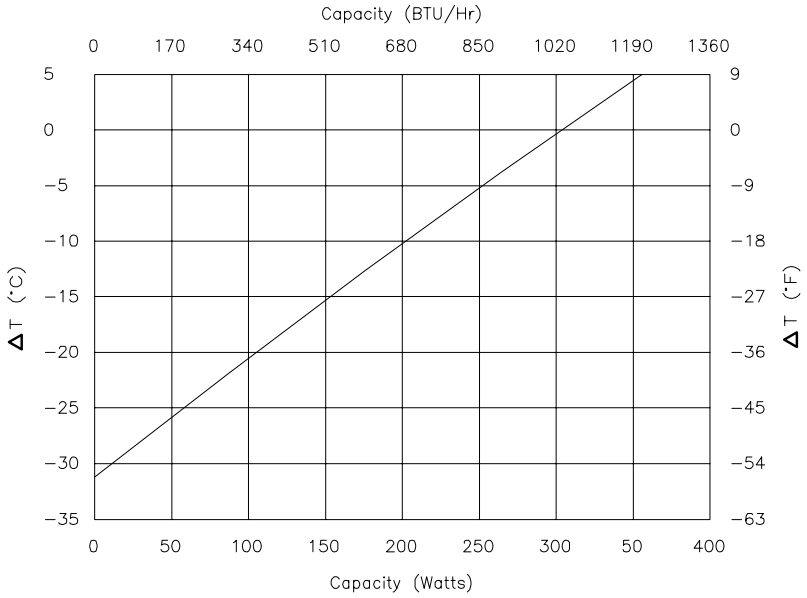
M R C 300 ___ - DV __

- M — MELCOR
- R — Recirculating
- C — Chiller
- 300 — Capacity (Watts)
- ___ — High-Accuracy Digital Controller ±0.25˚C
  - **DH2** = With RS232 Serial Communication
  - **DH4** = With RS485 Serial Communication
- DV — Voltage: Dual Voltage (115/230 VAC)
- __ — Cord Set Options
  - A = 115 VAC (North American)
  - N = 230 VAC (North American)
  - E = 230 VAC (European)

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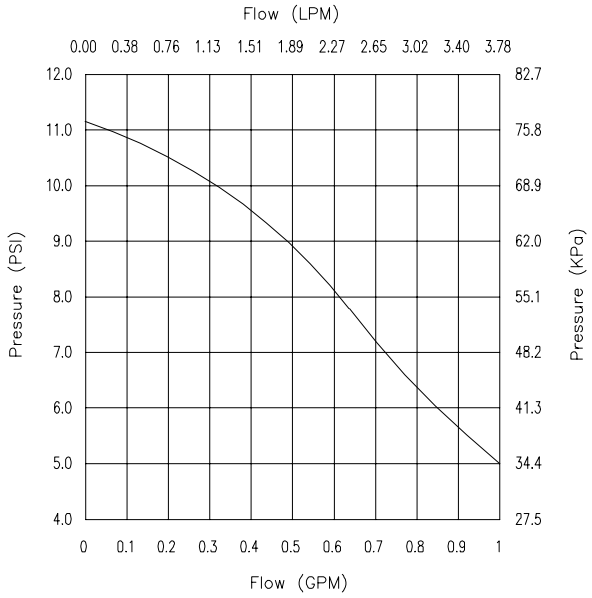
MRC300 Dual Voltage Series Performance Curves:

Chiller Capacity



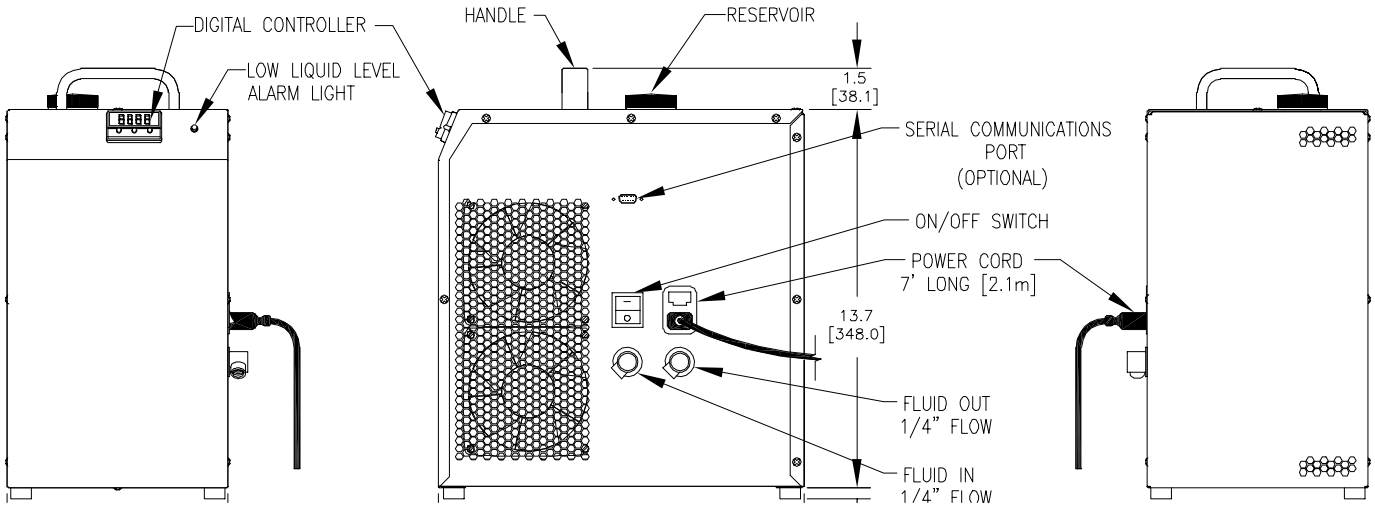
Δ T = Outlet Fluid Temperature − Ambient Temperature

Pumping Capacity



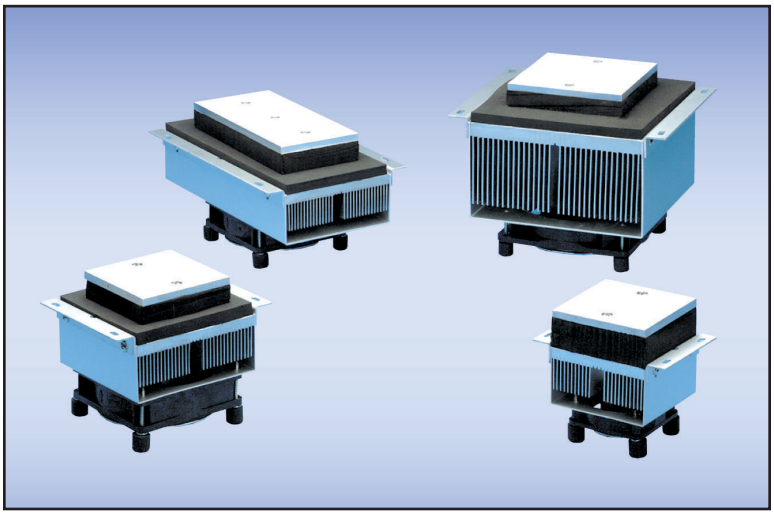
Dimensional Drawing

Inches (mm)



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Solid-State Plate-to-Air Heat Pump Assemblies



Advantages:

- Ease of installation
- Compact design
- Low cost
- High reliability
- Electronic enclosures cooling
- Cooling capacities from 20W to more than 70W (70 to 250 BTU/hr.)
- Heating capabilities in excess of 150W (510 BTU/hr.)
- Custom designs available including High Temperature Assemblies for heating to 200°C

Melcor now offers the MPA Series of solid-state air/plate heat pumps. This extensive product addition is part of the TechniCOOL line of thermoelectric assemblies, and is ideal for cooling and heating various materials or flat surfaces, as well as for a variety of laboratory and industrial applications.

These applications include laboratory hot/cold plates, spot cooling and heating and liquid container temperature control. High temperature versions (+200°C) are available for applications involving soldering and other higher temperature reflow and processing needs.

Standard cooling capacities range from 20W to more than 70W (70 BTU/hr to 250 BTU/hr) with heating capabilities in excess of 150W (510 BTU/hr). Customized assemblies are also available for specific heat pumping and size requirements.

Based upon Melcor's renowned thermoelectric cooling modules, the MPA Series features the inherent reliability of solid-state technology and are easily controlled by varying the input power. The heat exchangers are manufactured with high-density aluminum bonded fin technology, and aluminum base plates.

Model No.	Qmax (BTU/hr. / watts)	Nom. Input (VDC / A)	Max Input (VDC / A)	Wt. (lbs. / kg)
MPA075-12	73 / 21	12 / 3.2	14.4 / 3.9	1.3 / 0.06
MPA100-12	112 / 33	12 / 3.2	14.4 / 3.9	1.3 / 0.60
MPA200-12	200 / 58	12 / 10.0	14.4 / 12.0	3.5 / 1.60
MPA200-24	200 / 58	24 / 5.0	28.8 / 6.0	3.5 / 1.60
MPA250-12	250 / 74	12 / 10.9	15.4 / 14.0	6.0 / 2.70

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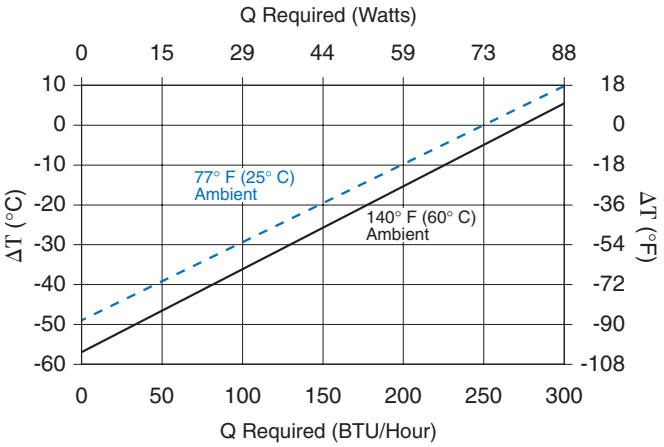
Model MPA250-12

MPA250-12

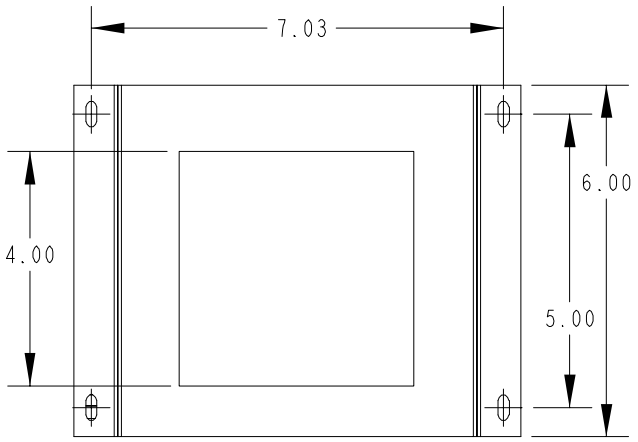
The MPA250-12 Plate-to-Air Heat Pump is designed for cooling and heating various materials or flat surfaces, as well as for a variety of laboratory and industrial applications. It offers compact design and a broad range of temperature control (25°C control at 25°C ambient) rated at 250 BTU/hr. (74W). High temperature versions are available for applications including soldering and other higher temperature reflow and processing needs. This plate-to-air assembly can be controlled with a variable power supply or one of our MTCA Temperature Controllers.

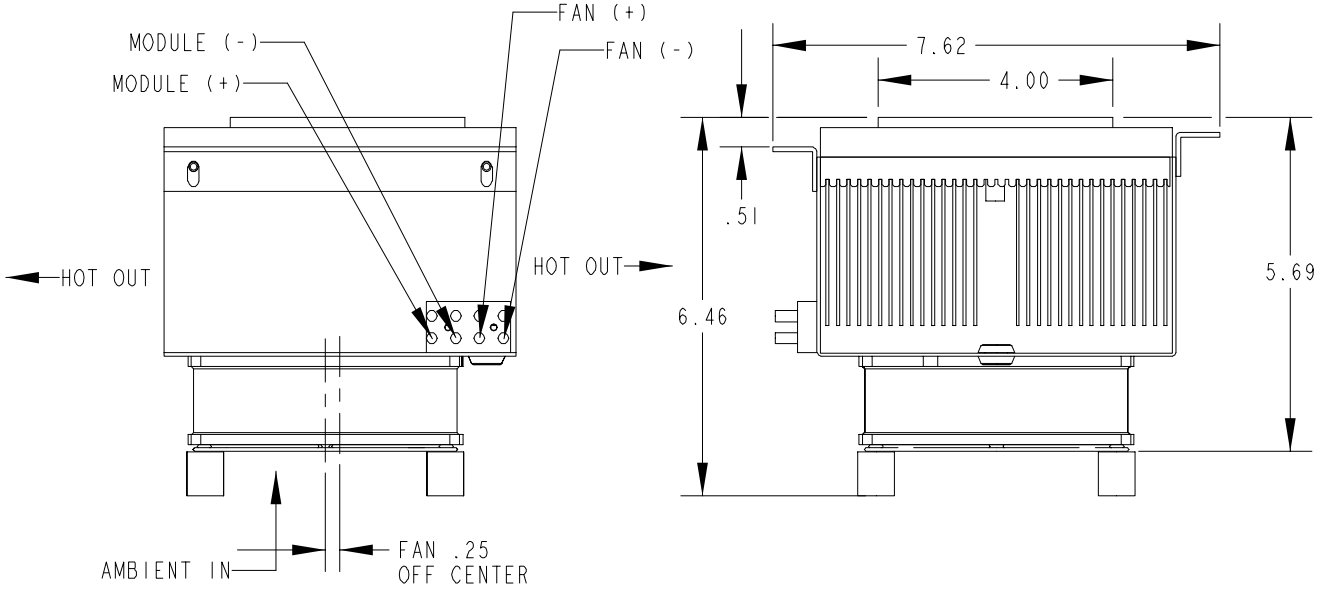
Specifications:	
Model	MPA250-12
Qmax (BTU/hr. / Watts)	250 / 74
Nominal Input (VDC / A)	12 / 10.9
Maximum Input (VDC / A)	15.4 / 14.0
Weight (lbs. / kg)	6.0 / 2.70

Performance Curve: MPA250

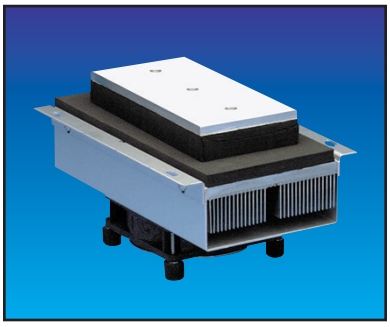


ΔT = Tmax Cabinet - Tmax Ambient





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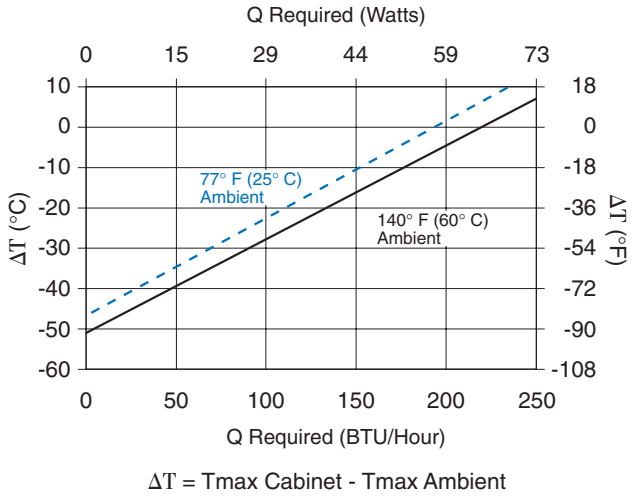
Model MPA200-12

MPA200-12 and MPA200-24

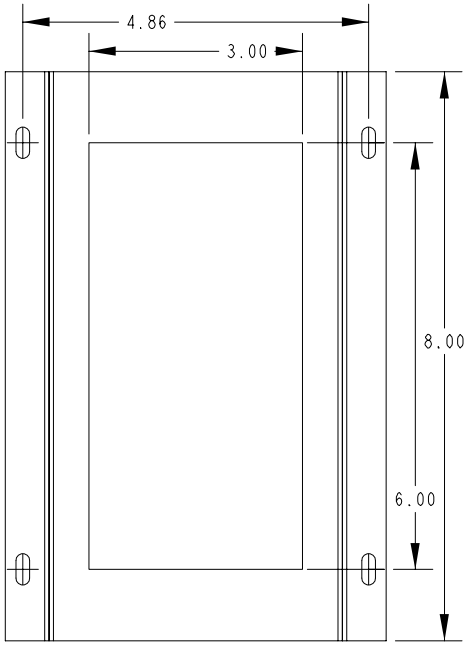
The MPA200 Plate-to-Air Heat Pump is designed for cooling and heating various materials or flat surfaces, as well as for a variety of laboratory and industrial applications. It offers compact design and a broad range of temperature control (25°C control at 25°C ambient) rated at 200 BTU/hr. (58W). High temperature versions are available for applications including soldering and other higher temperature reflow and processing needs. This plate-to-air assembly can be controlled with a variable power supply or one of our MTCA Temperature Controllers.

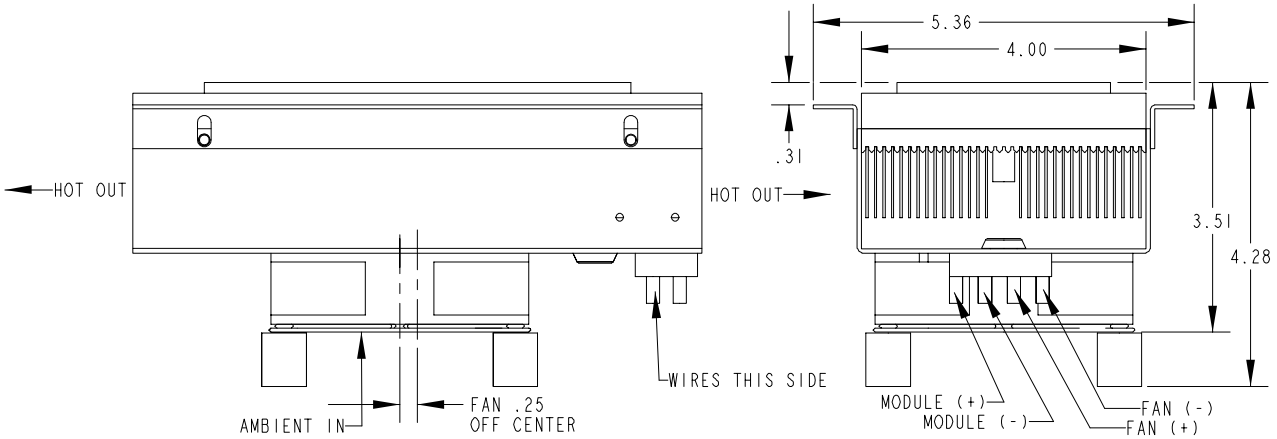
Specifications:		
Model	MPA200-12	MPA200-24
Qmax (BTU/hr. / Watts)	200 / 58	200 / 58
Nominal Input (VDC / A)	12 / 10.0	24 / 5.0
Maximum Input (VDC / A)	14.4 / 12.0	28.8 / 6.0
Weight (lbs. / kg)	3.5 / 1.60	3.5 / 1.60

Performance Curve: MPA200

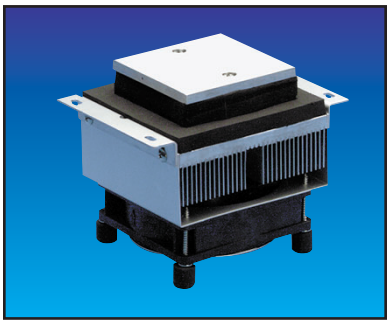


ΔT = Tmax Cabinet - Tmax Ambient





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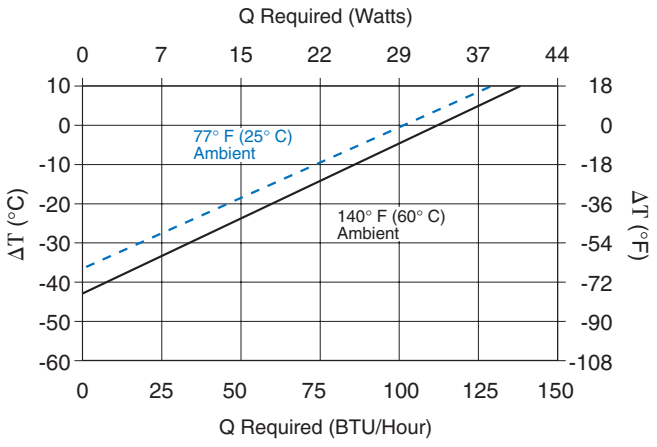


Model MPA100-12

MPA100-12

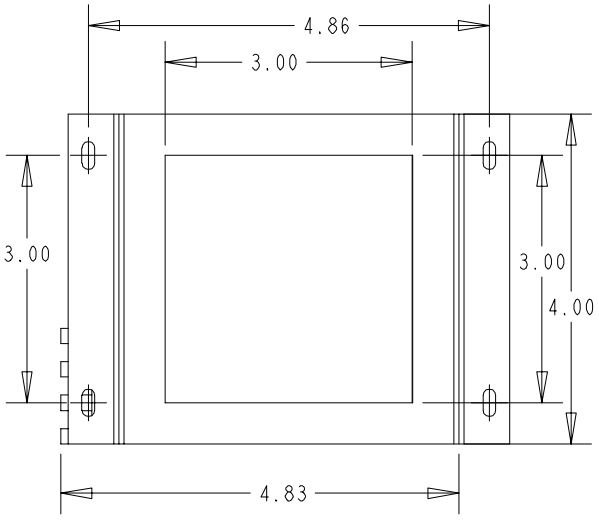
The MPA100 Plate-to-Air Heat Pump is designed for cooling and heating various materials or flat surfaces, as well as for a variety of laboratory and industrial applications. It offers compact design and a broad range of temperature control (25°C control at 25°C ambient) rated at 112 BTU/hr. (33W). High temperature versions are available for applications including soldering and other higher temperature reflow and processing needs. This plate-to-air assembly can be controlled with a variable power supply or one of our MTCA Temperature Controllers.

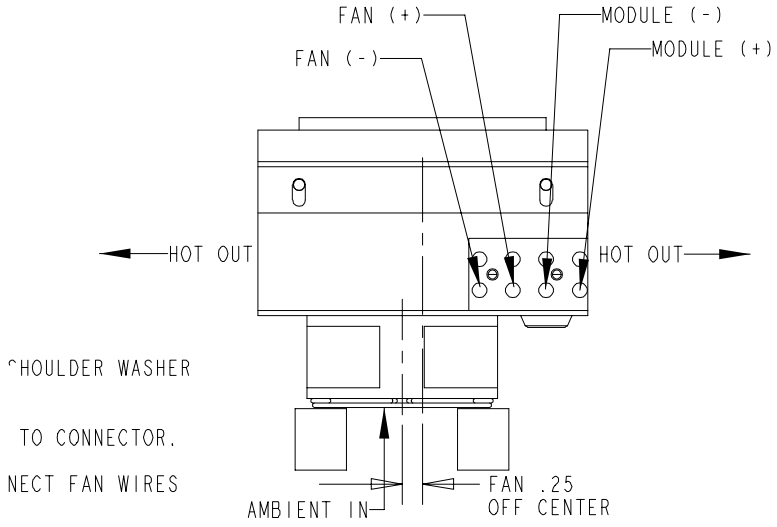
Performance Curve: MPA100

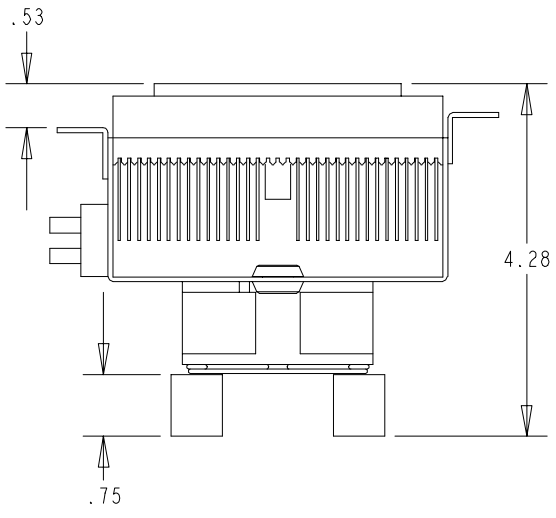


ΔT = Tmax Cabinet - Tmax Ambient

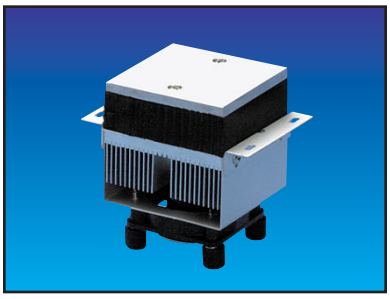
Specifications:	
Model	MPA100-12
Qmax (BTU/hr. / Watts)	112 / 33
Nominal Input (VDC / A)	12 / 3.2
Maximum Input (VDC / A)	14.4 / 3.9
Weight (lbs. / kg)	1.3 / 0.60







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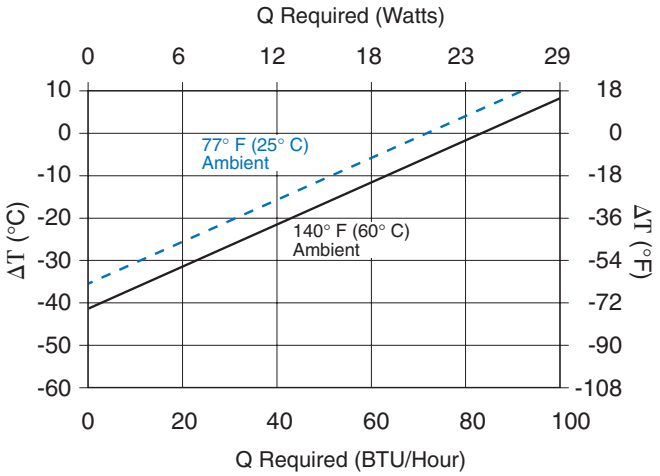


Model MPA075-12

MPA075-12

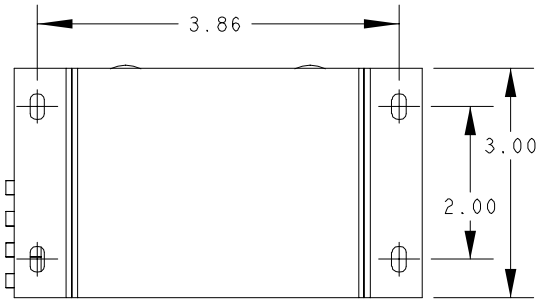
The MPA075 Plate-to-Air Heat Pump is designed for cooling and heating various materials or flat surfaces, as well as for a variety of laboratory and industrial applications. It offers compact design and a broad range of temperature control (25°C control at 25°C ambient) rated at 73 BTU/hr. (21W). High temperature versions are available for applications including soldering and other higher temperature reflow and processing needs. This plate-to-air assembly can be controlled with a variable power supply or one of our MTCA Temperature Controllers.

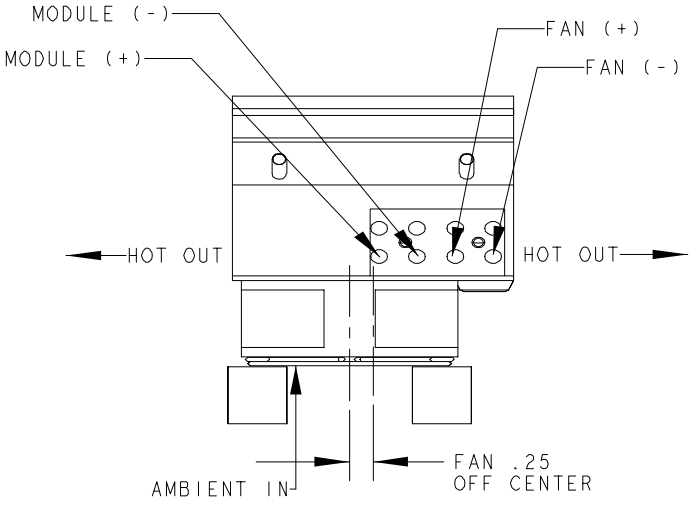
Performance Curve: MPA075

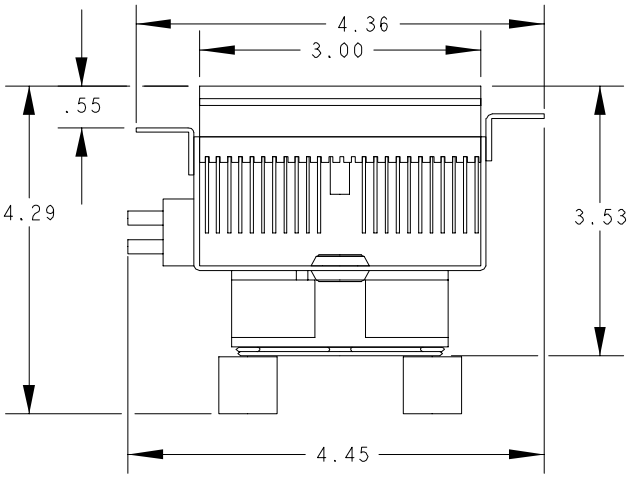


ΔT = Tmax Cabinet - Tmax Ambient

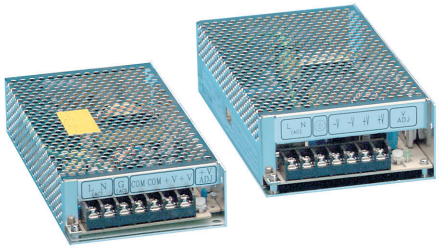
Specifications:	
Model	MPA075-12
Qmax (BTU/hr. / Watts)	73 / 21
Nominal Input (VDC / A)	12 / 3.2
Maximum Input (VDC / A)	14.4 / 3.9
Weight (lbs. / kg)	1.3 / 0.60







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MES Series Features

- Switching power supply for 115 VAC or 230 VAC input
- Single output
- UL approved (UL 1950)
- 100-600 Watts Output

100 Watt Series

Power Supply Model #	Output			Input				Dimensions	Corresponding MAA/MPA Model Number
	Watts	Volts (DC)	Amps	Volts (AC)	Amps	Volts (AC)	Amps		
MES-12-08	100	12	8.5	115	1.9	230	1.0	7.83"L x 3.85"W x 1.49"H 198mm x 98mm x 38mm	MAA070T-12 MAA050T-12 MAA025T-12 MPA075-12 MPA100-12

150 Watt Series

Power Supply Model #	Output			Input				Dimensions	Corresponding MAA/MPA Model Number
	Watts	Volts (DC)	Amps	Volts (AC)	Amps	Volts (AC)	Amps		
MES-24-06	150	24	6.5	115	3.2	230	1.6	7.83"L x 4.33"W x 1.97"H 198mm x 110mm x 50mm	MAA260T-24 MAA150T-24 MPA200-24
MES-12-12	150	12	12.5	115	3.2	230	1.6	7.83"L x 4.33"W x 1.97"H 198mm x 110mm x 50mm	MAA150T-12 MPA250-12 MPA200-12

400-600 Watt Series

Power Supply Model #	Output			Input				Dimensions	Corresponding MAA/MPA Model Number
	Watts	Volts (DC)	Amps	Volts (AC)	Amps	Volts (AC)	Amps		
MES-48-12	600	48	12.5	115	9.3	230	4.7	11.46"L x 5.18"W x 2.68"H 291mm x 132mm x 68mm	MAA640T-48
MES-12-50	600	12	50.0	115	9.3	230	4.7	11.46"L x 5.18"W x 2.68"H 291mm x 132mm x 68mm	MAA550T-12
MES-24-17	400	24	17.0	115	6.2	230	3.1	11.46"L x 5.18"W x 2.68"H 291mm x 132mm x 68mm	MAA510T-24 MAA600T-24
MES-48-8	400	48	8.5	115	6.2	230	3.1	11.46"L x 5.18"W x 2.68"H 291mm x 132mm x 68mm	MAA510T-48
MES-12-34	400	12	34.0	115	6.2	230	3.1	11.46"L x 5.18"W x 2.68"H 291mm x 132mm x 68mm	MAA280T-12

AC Power Cords



CORD-125-NA



CORD-250-EU

AC Power Cords

Model Number	Rating	Plug Type	Termination	Length
CORD-125-NA	10 A / 125 VAC (105˚C)	NEMA 5-15P	Stripped	7.0 ft. (2.1m)
CORD-250-EU	10 A / 250 VAC (65˚C)	CEE 7/7	Stripped	8.2 ft. (2.5m)

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MPS Series Laboratory Power Supplies

MELCOR offers four DC power supplies designed for bench-top and portable applications. These supplies may be used as either voltage sources or current sources.



MPS Series Features:

- Universal AC Input - 100V/120V/220V/240V
- Constant Voltage/Constant Current
  (Automatic crossover dependent on load)
- $3\frac{1}{2}$ digit LED display
- Series/Parallel operation
  (Multiple power supplies can be connected to extend voltage range)

Model	Voltage (VDC)	Current (Amps)	Voltage Load Regulation	Dimensions (inches)	Dimensions (mm)	Weight (lb)	Weight (kg)
MPS-18-05	0 to 18	0 to 5	≤0.01% + 5mV	5 x 5.7 x 11.2	128 x 145 x 285	12.1	5.5
MPS-18-10	0 to 18	0 to 10	≤0.01% + 5mV	10 x 5.7 x 11.2	255 x 145 x 335	23.5	11.5
MPS-18-20	0 to 18	0 to 20	≤0.02% + 5mV	8.9 x 5.7 x 16.5	255 x 145 x 420	40.8	18.5
MPS-35-10	0 to 35	0 to 10	≤0.01% + 5mV	8.9 x 5.7 x 16.5	255 x 145 x 420	40.8	18.5



AC/DC Converter

For a simple, low cost supply of DC power, MCV-001A converts standard 120 VAC current to 12VDC. This unit comes with a 6' long input cord, a $9\frac{1}{2}$"universal (cigarette) socket, and ± binding posts/banana jacks.

Model	Dimensions - W x H x D (inches)	Dimensions - W x H x D (mm)	Weight (lb)	Weight (kg)
MCV-001A	5 x 5.7 x 11.2	28 x 145 x 285	0.93	0.42

Input: 50/60Hz / 120VAC / 1.2A / 144VA

Output: 12VDC / 5ADC (maximum)

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MTCA controller and Power Boost Module

For accurate thermoelectric temperature control, Melcor provides five instruments with excellent temperature stability (<0.002˚C). Each controller features PID control and comes with a 10kΩ and 100kΩ thermistor.

Features

- Adjustable current and temperature limits
- High long-term stability, <0.002˚C
- Auto-tune function sets PID terms based on your system
- Optional RS-232 or RS-485 interface with TECView graphical Windows software
- Compatible with thermistors, RTDs, and certain IC sensors; Compatible with type J, K, or T thermocouples by request
- Two thermistors included: 10 kΩ and 100 kΩ resistances
- Simultaneous LED display of both measured value and set point value
- Fast control with overshoot suppression
- Proportional, integral, and derivative terms adjustable
- Power Boost Modules for additional output power
- Optional ramp and soak function to set rate of temperature change and time at setpoint
- 115 or 230 VAC operation

Temperature Controllers

Model	Maximum Output Power[1]	Maximum Current	Compliance Voltage	Stability[2] 1 hour	Stability[2] 24 hours	Control Range[3]	AC Input
MTCA-3020	30 Watts	± 2.0 Amps	± 15 Volts	< 0.002˚C	< 0.004˚C	-50 to > 150˚C	115/230
MTCA-6040	60 Watts	± 4.0 Amps	± 15 Volts	< 0.002˚C	< 0.004˚C	-50 to > 150˚C	115/230
MTCA-9060	90 Watts	± 6.0 Amps	± 15 Volts	< 0.002˚C	< 0.004˚C	-50 to > 150˚C	115/230
MTCA-12080	120 Watts	± 8.0 Amps	± 15 Volts	< 0.002˚C	< 0.004˚C	-50 to > 150˚C	115/230
MTCA-15100	150 Watts	± 10.0 Amps	± 15 Volts	< 0.002˚C	< 0.004˚C	-50 to > 150˚C	115/230

1. Note that this refers to the power output of the controller, not the heat pumping capacity of the thermoelectric.
2. Stability quoted for a typical 10kΩ thermistor at 110μA
3. Higher temperatures can be set when using RTDs

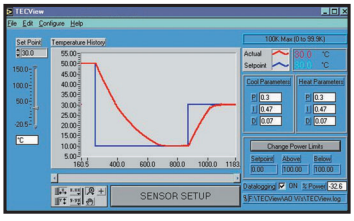
Model	Dimensions - W x H x D (Inches)	Dimensions - W x H x D (mm)	Weight (lb)	Weight (kg)
MTCA-3020	7.2 x 4.9 x 10.6	183 x 125 x 270	10	4.5
MTCA-6040	7.2 x 4.9 x 10.6	183 x 125 x 270	10	4.5
MTCA-9060	7.2 x 4.9 x 10.6	183 x 125 x 270	10	4.5
MTCA-12080	7.2 x 4.9 x 10.6	183 x 125 x 270	11	5.0
MTCA-15100	7.2 x 4.9 x 10.6	183 x 125 x 270	11	5.0

Power Boost Modules

Model	Maximum Output Power	Maximum Current	Dimensions - W x H x D (Inches)	Dimensions - W x H x D (mm)	Weight (lb)	Weight (kg)
PBM-030	30 Watts	±2.0 Amps	7.2 x 4.9 x 10.6	183 x 125 x 270	10	4.5
PBM-060	60 Watts	±4.0 Amps	7.2 x 4.9 x 10.6	183 x 125 x 270	10	4.5
PBM-090	90 Watts	±6.0 Amps	7.2 x 4.9 x 10.6	183 x 125 x 270	10	4.5
PBM-120	120 Watts	±8.0 Amps	7.2 x 4.9 x 10.6	183 x 125 x 270	11	5.0
PBM-150	150 Watts	±10.0 Amps	7.2 x 4.9 x 10.6	183 x 125 x 270	11	5.0

Thermistors

Controller Type	Resistance @ 25°C	10μA Range	100μA Range
MTCA	10kΩ 100kΩ	-55°C to +120°C -20°C to +120°C	-25°C to +120°C +25°C to +120°C



Optional TECView graphical interface software enables control and data acquisition from a PC.

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