# Product Information Packet

## Model FHP-1501XE

Flush Mount, Solid State, NEMA-4X, Air Conditioner

With TC-1F Temperature Control

Part #7-21F1-4-000



Thank you for your purchase. Information has been enclosed regarding the installation, specifications, and wiring of your solid-state assembly.
Please read and follow all instructions carefully before installation. Only qualified technicians should install this equipment.

If you have any questions regarding your equipment, please do not hesitate to call us at 773-342-4900, and we will be happy to assist you. We are open from 8:00 am-4:30 pm Central Time.

Included in this packet you will find:

Installation Notes for Air Conditioners

Product Literature and Specifications

Assembly Drawing # SK050521

Wiring Drawing # SK140707

Installation Drawing # SK050520

Temperature Control Information

Warranty Information

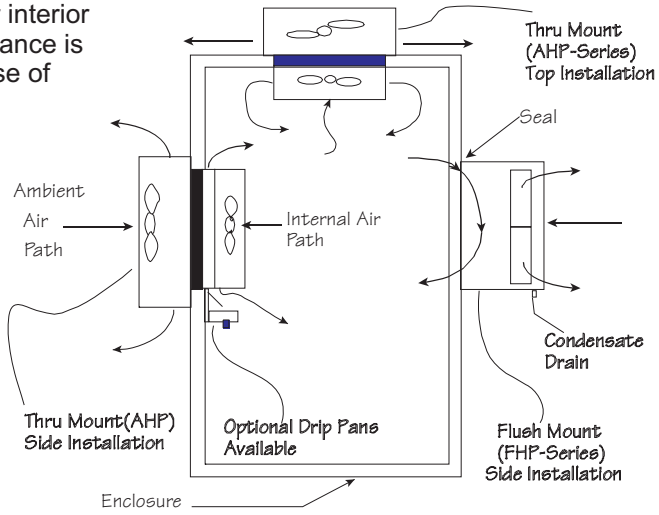
teca

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sales@thermoelectric.com www.thermoelectric.com

# Installation Notes for 1501XE Series Air Conditioners

## Mounting Styles:

Both 'thru mount' and 'flush mount' units can be positioned in any orientation and on any enclosure surface. It is important to consider interior air flow patterns when determining the mounting location. Also of importance is an unrestricted flow of ambient air thru the hot side heat exchanger. Ease of access and inspection must be considered for those applications in particularly severe environments which may require occasional maintenance.




## Vertical (Side/Front/Back) Mounting:

Vertical mounting refers to the vertical direction of the cold side or interior fins and is recommended for applications with high humidity, poor and incomplete cabinet seals or any condition which may cause the cold side fins to be maintained at temperatures below the dew point for long periods of time allowing for the formation of condensation. The vertical fin direction provides a drip path whereupon condensation can be collected via a moisture removal system (standard on FHP-units) or a drip pan positioned below the cold side fins. Drip pans are optional for thru mount units.

## Condensate Removal System:

All FHP-Series and AHP-1400 air conditioners contain a built-in condensate removal system. The condensate kit consists of a antifungal sponge with a condensate wick. Moisture is absorbed into the wick at the cold side heat exchanger and "wicked" to the hot side heat exchanger to be evaporated.

## Top Mounting:

Though often the easiest location to mount it is often the most difficult to protect from condensation in this orientation due to the fin orientation, gravity and any susceptible components below. If a drip pan is employed by the end user use caution to place the pan 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 there is a choice, the vertical orientation is preferred by most users.

## Maintenance:

Since the technology is solid-state, there are no filters, compressors, or fluorocarbons to maintain. The only moving parts are the fans. It is recommended for harsh or dirty environments that the heat sinks be cleaned from time to time. This can be accomplished by directing compressed air over the external fins or on NEMA 4 versions by hosing the unit down. This will increase the overall life and performance of the system.

## Mounting:

- Thread 10-32 mounting hardware (included) into 10-32 mounting holes on the air conditioner.
- Apply a thin bead of Dow RTV 737 Clear Silicone Adhesive or equivalent on the interface surface of the air conditioner and gasket when the mounting surface can flex.
- Install gasket on the air conditioner using 10-32 studs and clearance holes on the gasket as guide.
- Apply a thin bead of Dow RTV 737 Clear Silicone Adhesive or equivalent on the interface of gasket and enclosure when the mounting surface can flex.
- Install the air conditioner on the enclosure, use 10-32 Hex Nut (included), 10-32 Star Washers (included) and 6-32 screws (for AHP-1501 only) to secure the air conditioner on the enclosure.
- To seal the air conditioner/enclosure interface gradually increase the torque to the screws in an alternating pattern to 10-15 in-lb [1.13-1.70 N.m] or until the gasket is compressed by 1/2 it's thickness..

## Cautions:

Take care when mounting not to damage the seal between the hot and cold side sinks. Do not attempt to mount a unit to a warped surface or try to make the units mounting surface conform to an unflat surface. Do not pinch or damage any leads when mounting. Do not over tighten any installation screw, use reasonable force. Always mount with any condensate drain down. Do not compress the cold side between the hot side and any other surface. Do not obstruct the airflow on either side. When mounting consider the natural air flows of the enclosure. Connect power only after the installation is complete.

If you have any questions regarding your installation, Please feel free to contact our technical department for assistance at 773-342-4900.

# FHP-1501 | Air Conditioner

Air Cooled
Flush Mounted
NEMA-12, NEMA-4

120/240 VAC Input
950 BTU/HR



## FEATURES

- Externally mounted (no intrusion)
- Mounts in multi-unit array for incremental capacity
- Mounts in any orientation (condensate control may not work properly in all orientations)
- No moving parts except fans
- Environmentally safe
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Stainless steel exterior housing
- Dual voltage (120/240 VAC)
- Custom finishes
- Operating ambient temperature range -40/+70 °C
- Operating enclosure temperature range -10/+60 °C
- Agency approvals: UL1995, CSA22.2, CE
- Weight 55 LBS.

## POWER INPUTS

| | |
|---|---|
| Voltage | 120/240 VAC |
| Current, Active | 8.0/5.5 AMPS |

## PERFORMANCE RATINGS

| | |
|---|---|
| Cooling (Traditional) | 950 BTU/HR |
| Cooling (Din 3168) | 278 WATTS |
| Cooling COP (at L35 L35) | 0.29 |

## CONTROL TEMPERATURES

| Temp. Control | Active Heat °C | ECO-Mode °C | Active Cool °C |
|---|---|---|---|
| TC-1F | - | - | 35 |
| TC-6F | - | - | 25 or 35 |
| TC-3F | 10 | - | 35 |

## INCLUDES

- Integral power supply
- Mounting gasket and hardware
- Power input cord
- Condensate control system

CE

c ETL US LISTED Intertek

TUV Rheinland of North America, Inc. C US

TÜVRheinland EN 60335-1 EN60335-2-40

## CONFIGURATIONS

| MODEL | PART NUMBER | NOTES | TEMPERATURE CONTROL | ENVIRONMENT |
|---|---|---|---|---|
| FHP-1501 | 7-2181-0-000 | Cool only, industrial fans | TC-6F | NEMA-12, IP 52 |
| FHP-1501 | 7-21F1-0-000 | Cool only, industrial fans | TC-1F | NEMA-12, IP 52 |
| FHP-1501 | 7-2151-0-000 | Cool only, industrial fans | EXT* | NEMA-12, IP 52 |
| FHP-1501HC | 7-2131-1-000 | Heat/Cool, industrial fans | TC-3F | NEMA-12, IP 52 |
| FHP-1501HC | 7-2151-1-000 | Heat/Cool, industrial fans | EXT* | NEMA-12, IP 52 |
| FHP-1501XE | 7-2181-4-000 | Cool only, sealed hot side fan | TC-6F | NEMA-4, IP 56 |
| FHP-1501XE | 7-21F1-4-000 | Cool only, sealed hot side fan | TC-1F | NEMA-4, IP 56 |
| FHP-1501XE | 7-2151-4-000 | Cool only, sealed hot side fan | EXT* | NEMA-4, IP 56 |
| FHP-1501XEHC | 7-2131-5-000 | Heat/Cool, sealed hot side fan | TC-3F | NEMA-4, IP 56 |
| FHP-1501XEHC | 7-2151-5-000 | Heat/Cool, sealed hot side fan | EXT* | NEMA-4, IP 56 |

* Unit is set for 5-32 VDC external signal, relay(s) included

# FHP-1501

**MOUNTING STYLE**

Flush Mounted

**ENVIRONMENTS SERVED**

NEMA-12 IP 52

NEMA-4 IP 56

**RATING (TRADITIONAL)**

950 BTU/hr @ 0 °F ΔT

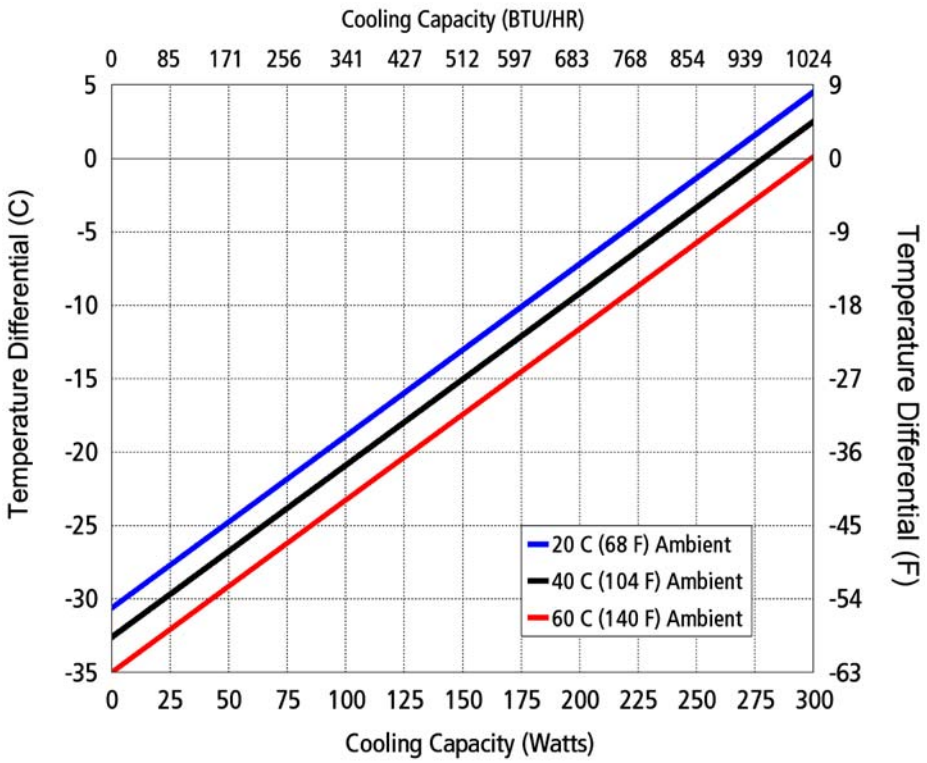
1270 BTU/hr @ +20 °F ΔT

**RATING (DIN 3168)**

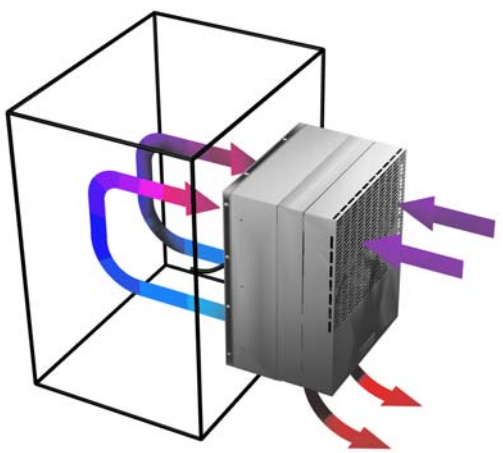
278 Watts L35 L35

162 Watts L35 L50

## PERFORMANCE CURVE

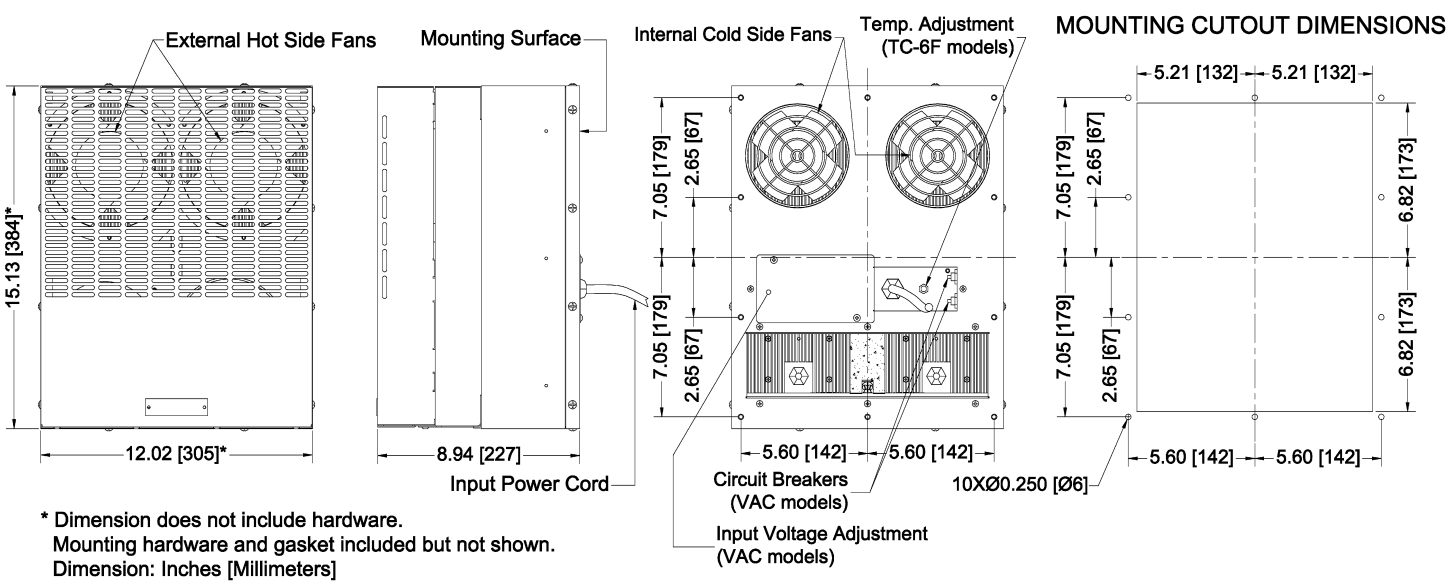



| Equation of line: y=ΔT(°C) x=Capacity (Watts) | | | |
|---|---|---|---|
| **Ambient Temp** | **20°C** | **40°C** | **60°C** |
| Enclosure Air | y=.117x-30.6 | y=.117x-32.6 | y=.117x-35.0 |
| Cold Sink | y=.093x-30.6 | y=.093x-32.6 | y=.093x-35.0 |

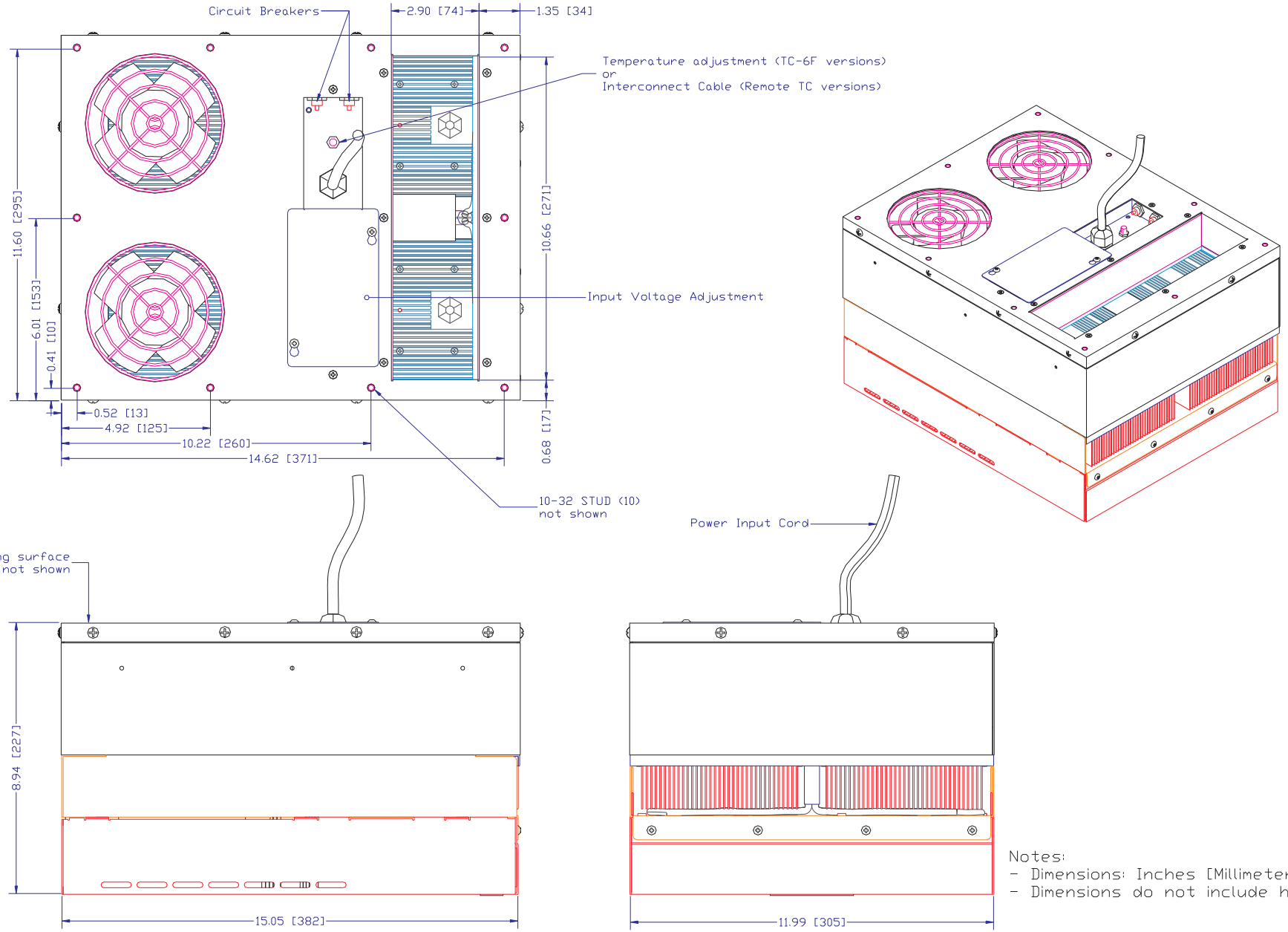


Air Flow Pattern

## DIMENSIONS




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




Notes:
- Dimensions: Inches [Millimeters]
- Dimensions do not include hardware

| REV | DESCRIPTION | Date | APPROVED |
|---|---|---|---|
| | | | |

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

| DECIMALS | ANGLE |
|---|---|
| .XX +/- .015 | +/-1° |
| .XXX+/- .005 | FRACTION +/-1/32 |

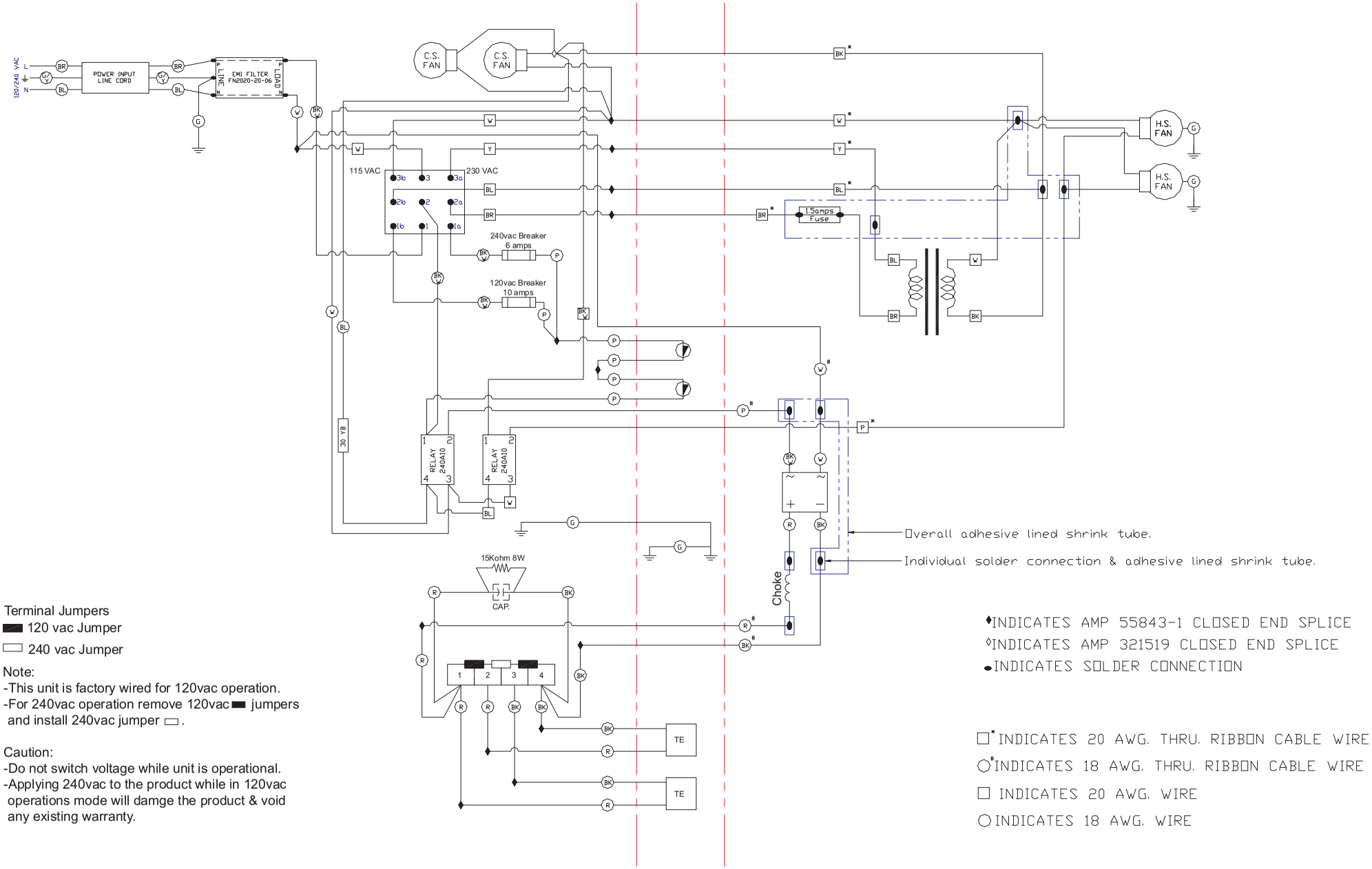
FINISH:

MATERIAL:

**THERMOELECTRIC COOLING AMERICA CORP.**

FHP-1501 / FHP-1501XE
ASSEMBLY

| DRAWN BY: | DRAWING # | REV LEVEL |
|---|---|---|
| AA | SK050521 | |
| DATE: 05/20/05 | | |
| D6448 | SCALE | SHEET |
| | MASTER: SK050106 | |




Terminal Jumpers

▬ 120 vac Jumper

▭ 240 vac Jumper

Note:

-This unit is factory wired for 120vac operation.

-For 240vac operation remove 120vac ▬ jumpers and install 240vac jumper ▭.

Caution:

-Do not switch voltage while unit is operational.

-Applying 240vac to the product while in 120vac operations mode will damge the product & void any existing warranty.

♦INDICATES AMP 55843-1 CLOSED END SPLICE

◊INDICATES AMP 321519 CLOSED END SPLICE

●INDICATES SOLDER CONNECTION

□* INDICATES 20 AWG. THRU. RIBBON CABLE WIRE

○# INDICATES 18 AWG. THRU. RIBBON CABLE WIRE

□ INDICATES 20 AWG. WIRE

○ INDICATES 18 AWG. WIRE

| REV | DESCRIPTION | Date | APPROVED |
|---|---|---|---|
| | | | |

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES ARE:

DECIMALS .XX +/- .XXX+/-

ANGLE +/-

FRACTION +/-

FINISH:

MATERIAL:

**THERMOELECTRIC COOLING AMERICA CORP.**

# FHP-1501XE WITH TC-1F WIRING DIAGRAM

DRAWN BY: AA

DATE: 07/02/14

D9301

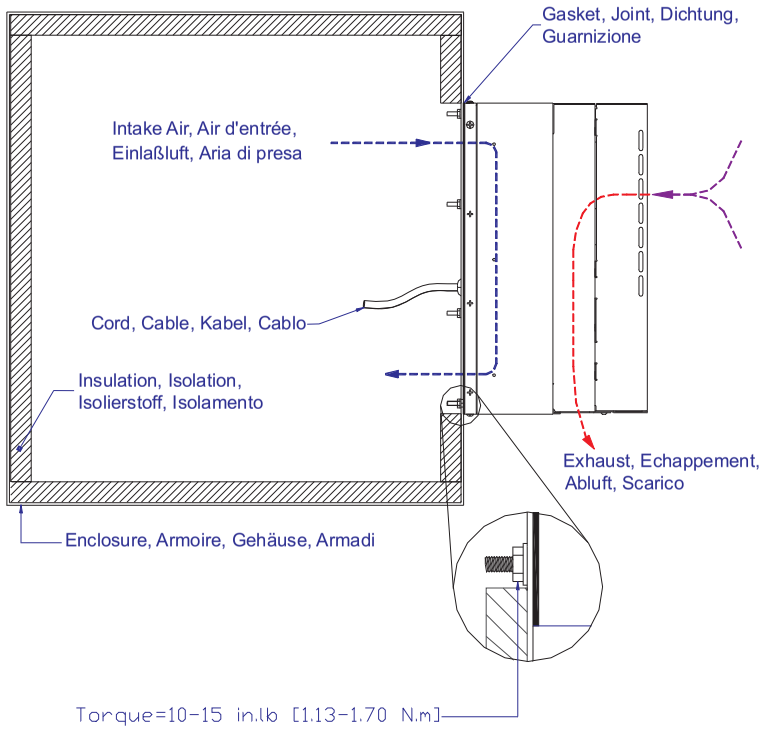
DRAWING # SK140707

REV LEVEL

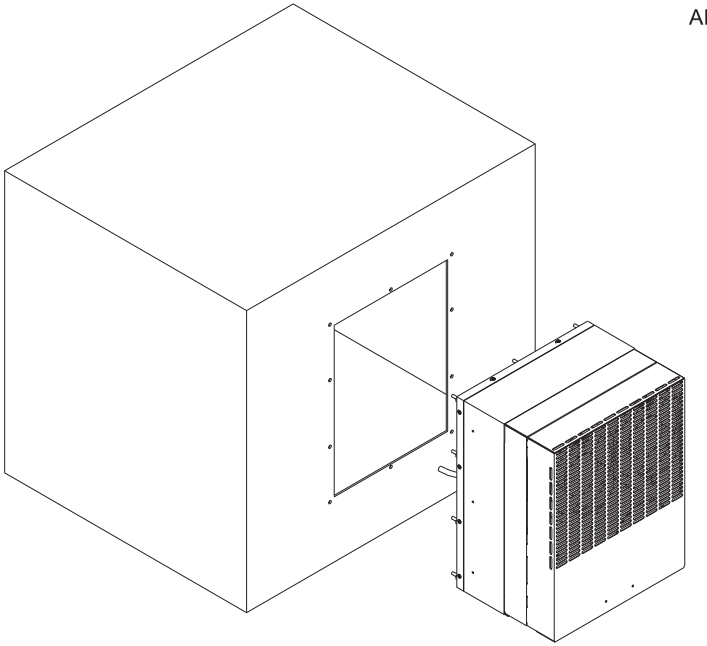
SCALE

MASTER: MASTER

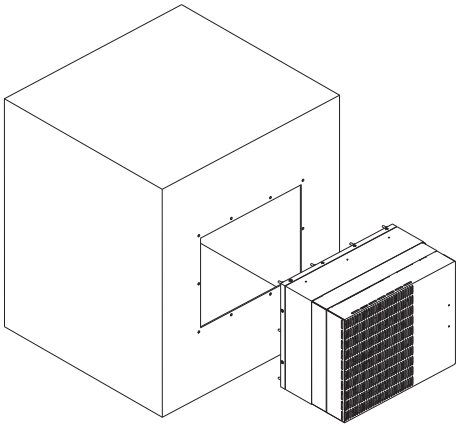
SHEET

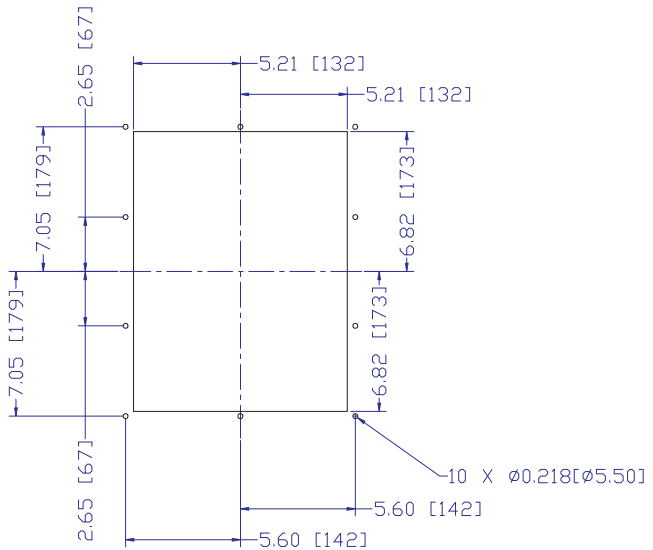



# Mounting, Monture, Montage, Montaggio



Alternate, Alternative, Alternative, Alternativa






English, Français, Deutsch, Italiano
Dimensions: Inches [Millimeters]

Warning - If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- UL 489 defines branch circuit protection of no more than 4X the rating of the supplemental protector to be used upstream. We suggest a slow reacting, 10-15 Amps circuit breaker.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.

Avertissement - Si le cordon d'alimentation est endommagé, il doit être remplacé par le fabricant, son agent de service ou de personne de qualification similaire afin d'éviter un danger.
- UL 489 définit la protection du circuit de pas plus de 4X la cote du protecteur supplémentaire pour être utilisé en amont. Nous suggérons une lente réaction, 10-15 disjoncteurs Amps.
- Cet appareil n'est pas destiné à être utilisé par des personnes (enfants compris) dont les capacités physiques, sensorielles ou mentales, ou le manque d'expérience et de connaissances, à moins qu'ils aient été donnés de surveillance ou d'instructions concernant l'utilisation de l'appareil par une personne responsable de leur sécurité.
Les enfants doivent être surveillés afin de s'assurer qu'ils ne jouent pas avec l'appareil.

Achtung - Wenn das Netzkabel beschädigt ist, muss es durch den Hersteller, seinen Kundendienst oder eine ähnlich qualifizierte Person, um eine Gefahr zu vermeiden ersetzt werden.
- UL 489 definiert den Schutz der Stromzweige nicht mehr als 4X das Rating der Beschützer weiter flussaufwärts genutzt werden. Wir empfehlen eine langsame Reaktion, 10-15 Ampere-Sicherung.
- Dieses Gerät ist nicht für die Verwendung durch Personen (einschließlich Kinder) mit eingeschränkten physischen, sensorischen oder geistigen Fähigkeiten oder Mangel an Erfahrung und Wissen, bestimmt, sofern sie eine angemessene Aufsicht oder ausführliche Anleitung zur Benutzung des Geräts durch eine verantwortliche Person für ihre Sicherheit.
Kinder sollten beaufsichtigt werden, um sicherzustellen, dass sie nicht mit dem Gerät spielen.

Attenzione - Se il cavo di alimentazione è danneggiato, esso deve essere sostituito dal produttore, dal suo agente di servizio o da un professionista al fine di evitare rischi.
- UL 489 definisce il circuito di protezione filiale di non più di 4X il rating del protettore supplementare da utilizzare a monte. Vi suggeriamo una lenta reazione, 10-15 interruttore Amp.
- Questo apparecchio non è destinato all'uso da parte di persone (bambini compresi) con ridotte capacità fisiche, sensoriali o mentali, o mancanza di esperienza e conoscenza, a meno che non siano sorvegliati o istruzioni per l'uso dell'apparecchio da una persona responsabile della loro sicurezza.
I bambini devono essere supervisionati per assicurarsi che non giochino con l'apparecchio.

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

| DECIMALS | ANGLE |
|---|---|
| .XX +/- | +/- |
| .XXX+/- | FRACTION +/- |

FINISH:

MATERIAL:

**THERMOELECTRIC COOLING AMERICA CORP.**

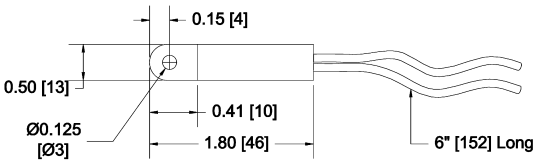
FHP-1501 SERIES
FIELD MOUNTING

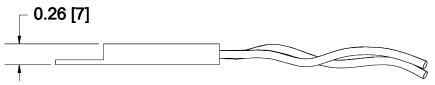
| REV | DESCRIPTION | Date | APPROVED |
|---|---|---|---|
| A | Added torque value. | 12/13/2005 | AA |
| B | Added UL489 branch circuit protection note and added unqualified operator and supervision note. | 12/16/2011 | AA |

| DRAWN BY: | DRAWING # | REV LEVEL |
|---|---|---|
| AA | SK050520 | B |
| DATE: 05/19/05 | | |
| D6447 | SCALE | MASTER: MASTER / SHEET |

## TC-1F POWER TEMPERATURE SWITCHES

Models TC-1F power temperature controller, with small tolerance and reset differential, are the simplest and most cost effective way to control a cooling or heating device (VAC or VDC) without a need for a relay. For circuits that have higher current draw simply use them in conjunction with a solid state relay.




Dimensions: Inches [Millimeters]

**Part Numbers:**

| Mode | Part Number | Note |
|---|---|---|
| Cool | TC-1C-**XX** | switch closes on temperature rise |
| Heat | TC-1H-**XX** | switch closes on temperature drop |

**XX:** Specify temperatures 20 °C, 25 °C, 30 °C, 35 °C for cool mode and 10°C, 15 °C for heat mode

*Example: TC-1C-20 and TC-1H-10*

| VOLTAGE | CURRENT AMPS | SET POINT T OLERANCE °C | RESET DIFFERENTIAL °C |
|---|---|---|---|
| 125 VAC | 2 | +/- 3 | 3 - 6 |
| 250 VAC | 1.3 | +/- 3 | 3 - 6 |
| 12 VDC | 2 | +/- 3 | 3 - 6 |
| 24 VDC | 1.3 | +/- 3 | 3 - 6 |

## TC-4F COOL ONLY WITH ECO-MODE

Model TC-4F is simillar to TC-1F plus it has a 2nd power switch for heat exchanger mode (ECO-Mode). The active cool set point for TC-4F is 35 °C and for heat exchanger mode (ECO-Mode) is 25 °C.

| MODEL NUMBER | PART NUMBER | NOTES | HX TEMP. °C | COOL TEMP. °C | RESET (MAX) °C | RESET (TYP) °C | OPERATING VOLTAGE | SWITCHING VOLTAGE | ACTIVE MODE SWITCHING CURRENT | ECO-MODE SWITCHING CURRENT |
|---|---|---|---|---|---|---|---|---|---|---|
| TC-4F-DC | 4F-24G-00-000 | 24 VDC | 25 +/- 3 | 35 +/- 3 | 6.5 | 3 | 24 VDC | 24 VDC | .02 - 20 ADC | 1.3 ADC |

## TC-6F COOL ONLY

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.

| MODEL NUMBER | PART NUMBER | NOTES | TEMP @ T1 °C | TEMP @ T2 °C | T1-T2 (MAX) °C | RESET (TYP) °C | RESET °C | TEMP @ T3 | OPERATING VOLTAGE | SWITCHING VOLTAGE | SWITCHING CURRENT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-6F | 6F-00A-00-000 | No Relay | 35 +/- 5 | 25 +/- 5 | 10 +/- 3 | 6.5 | 3 | Continuous On | NA | NA | NA |
| TC-6F-AC | 6F-03T-00-000 | VAC Version | 35 +/- 5 | 25 +/- 5 | 10 +/- 3 | 6.5 | 3 | Continuous On | 85-250 VAC | 24-280 VAC | 10 |
| TC-6F-DC | 6F-43D-00-000 | 12/24 VDC | 35 +/- 5 | 25 +/- 5 | 10 +/- 3 | 6.5 | 3 | Continuous On | 12/24 VDC | 0-100 VDC | .02-20 ADC |
| TC-6F-DC | 6F-33D-00-000 | 48 VDC | 35 +/- 5 | 25 +/- 5 | 10 +/- 3 | 6.5 | 3 | Continuous On | 48 VDC | 0-100 VDC | .02-20 ADC |

## TC-3F HEAT AND COOL

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:

| MODEL NUMBER | PART NUMBER | NOTES | COOL TEMP. °C | HEAT TEMP. °C | RESET (MAX) °C | RESET (TYP) °C | OPERATING VOLTAGE | SWITCHING VOLTAGE | SWITCHING CURRENT |
|---|---|---|---|---|---|---|---|---|---|
| TC-3F-AC | 3F-04R-00-000 | VAC Version | 35 +/- 5 | 15 +/- 5 | 6.5 | 3 | 85-280 VAC | 24-280 VAC | 10 AMPS |
| TC-3F-DC | 3F-44G-00-000 | 12/24 VDC | 35 +/- 5 | 15 +/- 5 | 6.5 | 3 | 3.5-32 VDC | 0-100 VDC | .02 - 20 ADC |
| TC-3F-DC* | 3F-44P-00-000 | 12/24 VDC | 35 +/- 5 | 15 +/- 5 | 6.5 | 3 | 3.5-32 VDC | 0-100 VDC | .02 - 20 ADC |

* H-Bridge relays included

## TC-7F HEAT/COOL WITH ECO-MODE

Model TC-7F (Heat/Cool) thermostat incorporates the same technology as the TC-3F. It contains a single setting each for both heating and cooling and a heat exchanger mode (ECO-Mode).

| MODEL NUMBER | PART NUMBER | NOTES | COOL TEMP. °C | HX TEMP. °C | HEAT TEMP. °C | RESET (MAX) °C | RESET (TYP) °C | OPERATING VOLTAGE | SWITCHING VOLTAGE | SWITCHING CURRENT |
|---|---|---|---|---|---|---|---|---|---|---|
| TC-7F-DC | 7F-24G-00-000 | 24 VDC | 35 +/- 3 | 25 +/- 3 | 10 +/- 3 | 6.5 | 3 | 24 VDC | 24 VDC | .02 - 20 ADC |

H-Bridge relays included

**For custom variations of any of the controls, contact TECA.**

# LIMITED WARRANTY

In the event a 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: (a) TECA is notified of the defect in writing by certified mail within 14 days of the date of discovery; (b) TECA may then either, at its sole discretion, inspect the product at Buyer's location, or require that the product be made available at Buyer's expense at TECA's premises for TECA's inspection within 14 days of the date of notification; and (c ) 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, or credit to buyer the 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 UPON BREACH OF EXPRESS OR IMPLIED WARRANTY OR ANY OTHER DAMAGES WHETHER SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, LOST PROFITS, BUSINESS INTERRUPTION, OR LOSS OF BUSINESS OR CUSTOMER RELATIONSHIPS.

# 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. On special equipment and custom modified equipment orders, additional incremental cancellation charges may be made.