

# Product Information Packet

Model FHP-1501

Flush Mount, Solid State, NEMA-12, Air Conditioner

With TC-1F Temperature Control

Part #7-21F1-0-000

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 # SK170313

Installation Drawing # SK050520

Temperature Control Information

Warranty Information

The logo for Teca, featuring the word "teca" in a bold, lowercase, sans-serif font. The letter "t" is stylized with a vertical line extending upwards from its stem.

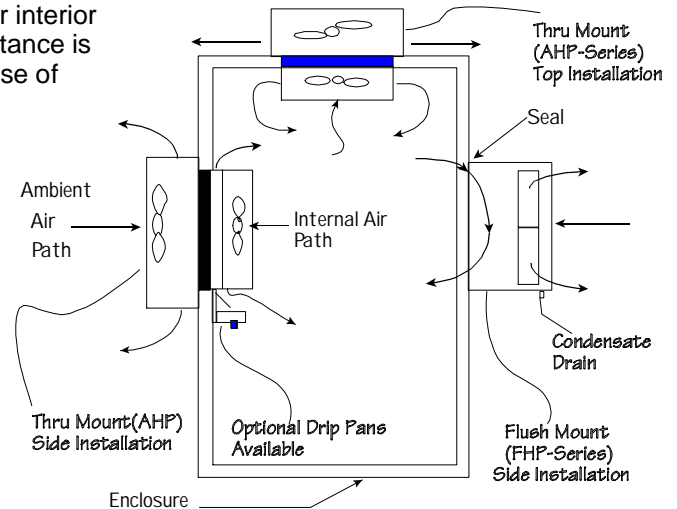
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Ph: 773/342-4900 Fx: 773/342-0191  
sales@thermoelectric.com www.thermoelectric.com

# 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

## INCLUDES

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

## 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

## 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

TECA

1-888-TECA-USA (832-2872)

[www.thermoelectric.com](http://www.thermoelectric.com)



# FHP-1501

## MOUNTING STYLE

Flush Mounted

## ENVIRONMENTS SERVED

NEMA-12 IP 52

NEMA-4 IP 56

## RATING (TRADITIONAL)

950 BTU/hr @ 0 °F ΔT

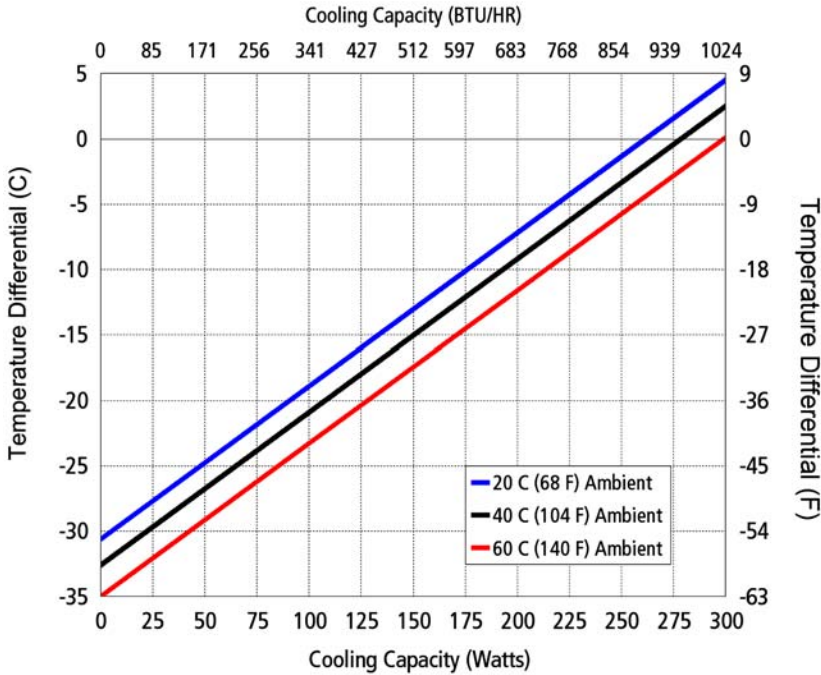
1270 BTU/hr @ +20 °F ΔT

## RATING (DIN 3168)

278 Watts L35 L35

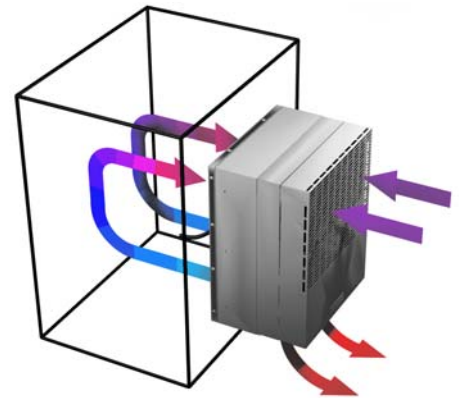
162 Watts L35 L50

## PERFORMANCE CURVE



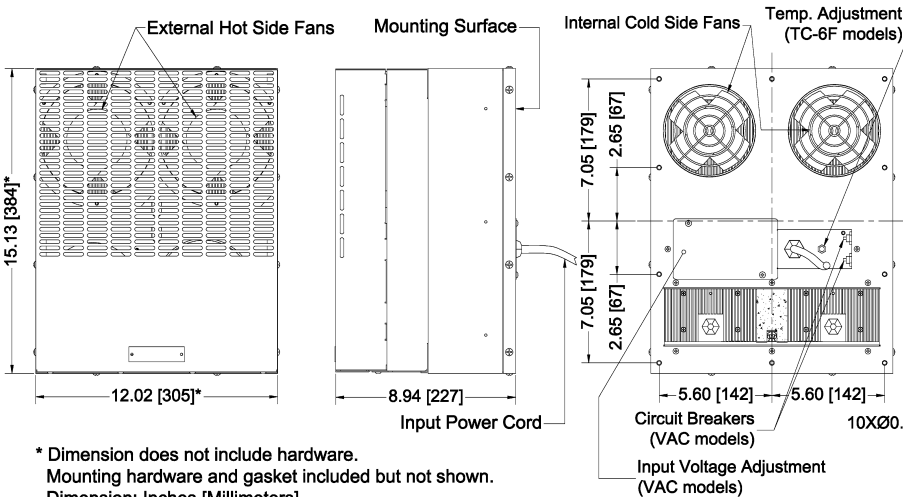
Equation of line:  $y = \Delta T(^{\circ}C) \quad x = \text{Capacity (Watts)}$

Ambient Temp	20°C	40°C	60°C
Enclosure Air	$y = .117x - 30.6$	$y = .117x - 32.6$	$y = .117x - 35.0$
Cold Sink	$y = .093x - 30.6$	$y = .093x - 32.6$	$y = .093x - 35.0$

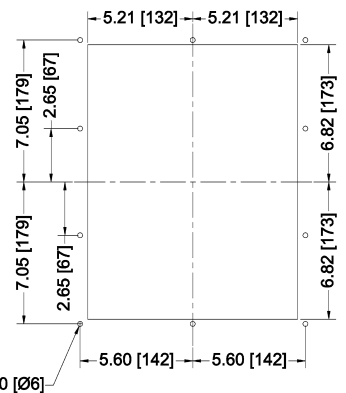


Air Flow Pattern

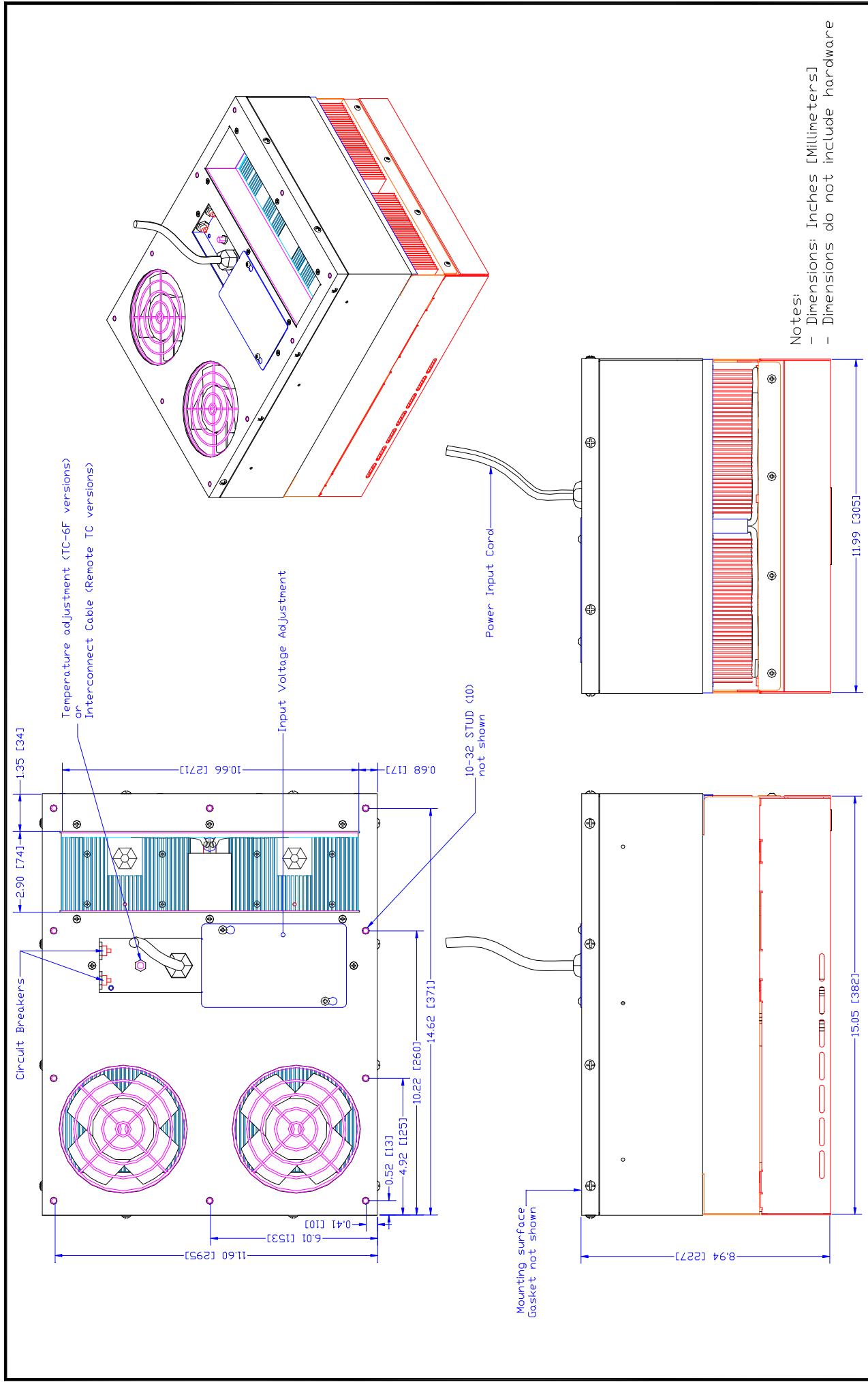
## DIMENSIONS



## MOUNTING CUTOUT DIMENSIONS

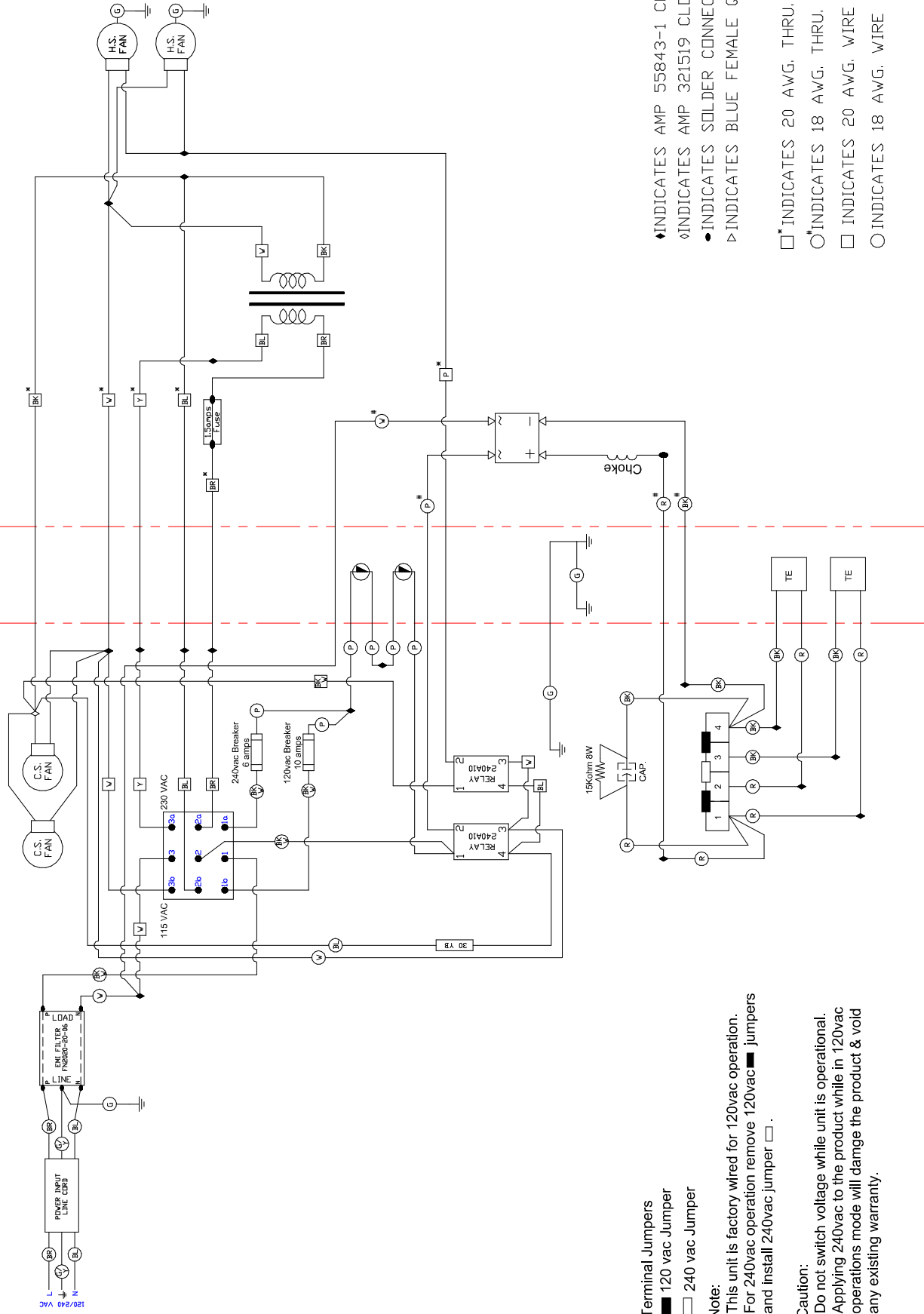


\* Dimension does not include hardware.  
Mounting hardware and gasket included but not shown.  
Dimension: Inches [Millimeters]



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

REV	DESCRIPTION	Date	APPROVED	<b>THERMoeLECTRIC COOLING AMERICA CORP.</b> FHP-1501 / FHP-1501XE ASSEMBLY		DRAWING #	REV LEVEL
				DRAWN BY: AA DATE: 05/20/05 SCALE: D6448	SK050521 MASTER: SK050106	SHEET	
INFORMATION DISCLOSED HEREIN IS THE CONFIDENTIAL PROPERTY OF TECA CORP. RECIPIENT SHALL NOT USE THE INFORMATION IN ANY UNAUTHORIZED MANNER. FINISH:				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: DECIMALS: .XX +/- .015 FRACTION: XXX +/- .005 ANGLE: +/-1° MATERIAL:			



**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 damage the product & void any existing warranty.

- ◆ INDICATES AMP 55843-1 CLOSED END SPLICE
- ◊ INDICATES AMP 321519 CLOSED END SPLICE
- INDICATES SOLDER CONNECTION
- ▷ INDICATES BLUE FEMALE QUICK CONNECT
- \* INDICATES 20 AWG. THRU. RIBBON CABLE WIRE
- \* INDICATES 18 AWG. THRU. RIBBON CABLE WIRE
- INDICATES 20 AWG. WIRE
- INDICATES 18 AWG. WIRE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:

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

INFORMATION DISCLOSED HEREIN IS THE CONFIDENTIAL PROPERTY OF TECA CORP. RECIPIENT SHALL NOT USE THE INFORMATION IN ANY UNAUTHORIZED MANNER.

FINISH:

THERMOELECTRIC COOLING AMERICA CORP.

FHP-1501 WITH TC-1F  
WIRING DIAGRAM

DRAWN BY: AA

DATE: 03/13/17

S0911

DRAWING #

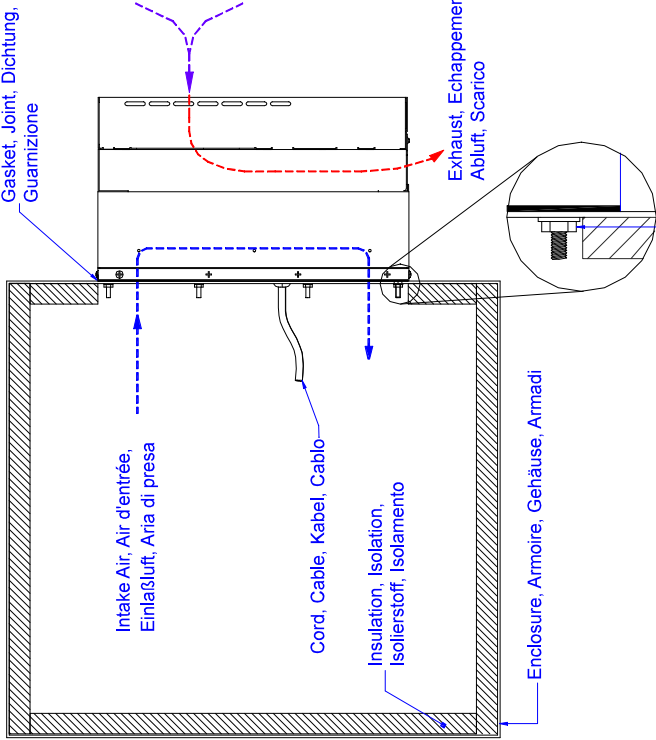
SK170313

SCALE

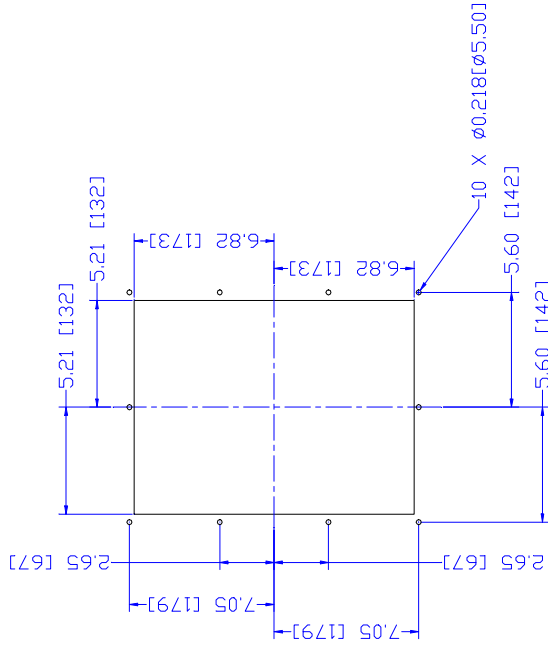
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REV	DESCRIPTION	Date	APPROVED
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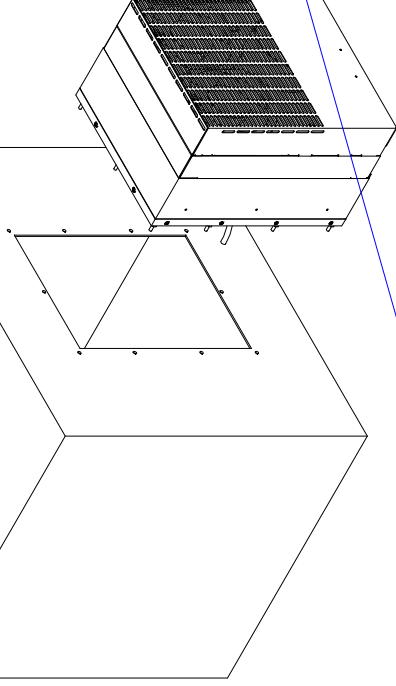
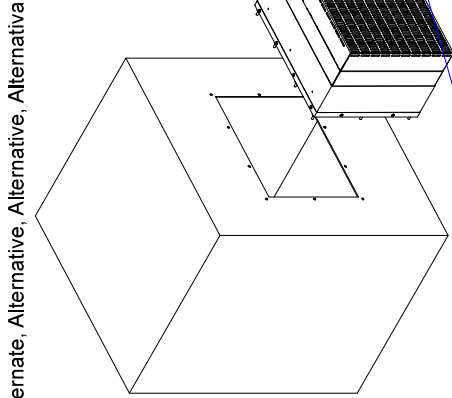
REV LEVEL	SHEET
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Torque=10-15 in.l [1.13-1.0 N.m]



# Mounting, Monture, Montage, Montaggio



## 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 dotés 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 Amperesicherung.  
 - Dieses Gerät ist nicht für die Verwendung durch Personen (einschließlich Kinder) mit eingeschränkten physischen, sensorischen oder geistigen Fähigkeiten oder Mangel an Erfahrung.

**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 filare di non più di 4X il rating del protettore supplementare da utilizzare a monte. Vi suggeriamo una lenta reazione, 10-15 interuttore 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.

<b>INFORMATION DISCLOSED</b> HEREIN IS THE CONFIDENTIAL PROPERTY OF TECA CORP. RECIPIENT SHALL NOT USE THE INFORMATION IN ANY UNAUTHORIZED MANNER.		<b>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES</b> TOLERANCES ARE: DECIMALS                    ANGLE    +/- .XX +/-                        FRACTION .XXX +/-                      +/-	
FINISH:		<b>FINISH:</b>	
AA AA		AA AA	
12/13/2005 12/16/2011		AA AA	
A Added torque value. B Added UL489 branch circuit protection note and added unqualified operator and supervision note.		Date    APPROVED	
DESCRIPTION		APPROVED	
REV			
THERMOELECTRIC COOLING AMERICA CORP.		FHP-1501 SERIES FIELD MOUNTING	
DRAWN BY: AA		DRAWING #	
DATE: 05/19/05		SK050520	
D6447		SCALE	
MASTER		MASTER	
REV LEVEL		SHEET	
B		B	

# Power Temperature Controllers

## TC-1F POWER TEMPERATURE SWITCHES

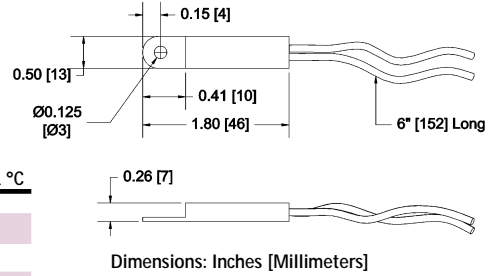
Models TC-1F power temperature controller, with small tolerance and reset differential, are the simplest and most cost effective way to control a cooling or heating device (VAC or VDC) without a need for a relay. For circuits that have higher current draw simply use them in conjunction with a solid state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

### 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 TOLERANCE °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 similar 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.