

**Panel Mounted Air Conditioners  
by Dantherm Inc.**

**iA/C T-Series**



**iA/C T- B19000  
with USACG-6 Control  
PRODUCT INFORMATION MANUAL**

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## **1 GENERAL SAFETY & WARNING INSTRUCTIONS**

- \* Certain parts of electrical systems are inevitably live or have a high operating temperatures. Observe caution at all times.
- \* Failure to observe these conditions and installation instructions can cause injury and damage.
- \* The system is to be installed and maintained only by trained and qualified personnel.
- \* Do not apply power until all ground connections have been made.
- \* The unit is fitted with pressed and folded metal parts, which could have sheared metal edges. Be cautious handling the unit, especially when working in poorly accessible places.
- \* Check that no tools, test equipment, torches etc. have been left in or on the equipment on completion of work.
- \* Ensure the cover(s) and all mounting hardware are firmly secured before leaving installation.
- \* All cable and connectors must conform to UL standards.
- \* Most models are UL recognized and tested to UL484. It will comply where necessary with the safety requirements as defined in UL484.
- \* When servicing the unit, do not remove the cover(s) for 5 minutes after switching the unit off to allow pipe work (compressor discharge) to cool.

## **2 UNPACKING, HANDLING & INITIAL INSPECTION**

The air conditioner should be inspected on initial delivery and any damage to packaging noted. The unit should be maintained in the upright position at all times. Special consideration should be given to correctness of external packing damage or abrasion, loose components, surface marks and oil leakage. Any damage should be noted on the freight bill and a claim should be immediately filed with the freight company. All packaging materials should be retained for inspection.

***Under no circumstances must the unit be inverted, as the oil will drain from the compressor into the refrigerant piping system.***

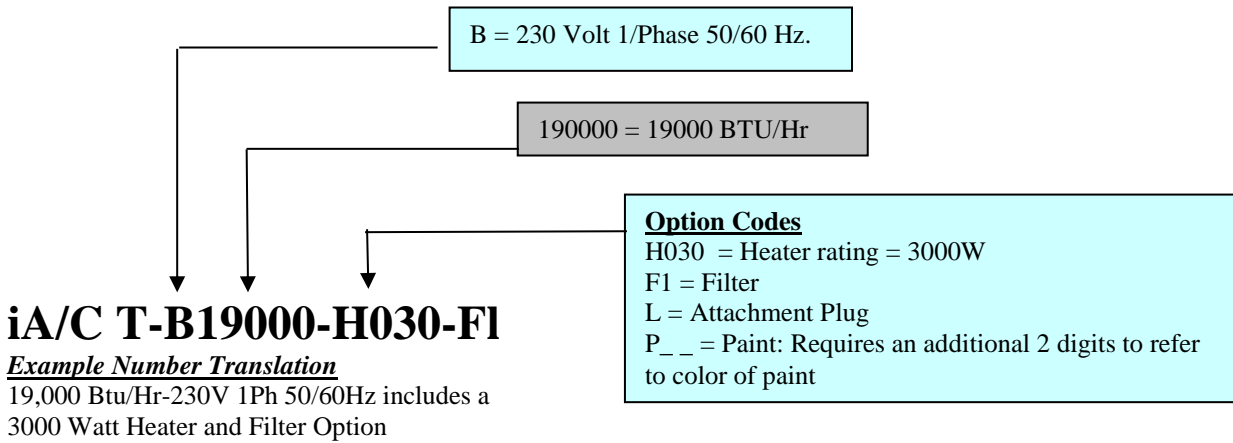
***Do not attempt to operate the unit if it appears to be damaged from being dropped.***

***Do not attempt to operate the unit in a horizontal position (on its side, back or front). Place the unit in an upright or vertical position for at least 5 minutes before operating.***

### 3 MODELS COVERED BY THIS MANUAL

#### 3.1 Model Identification

The model numbering format is detailed below.



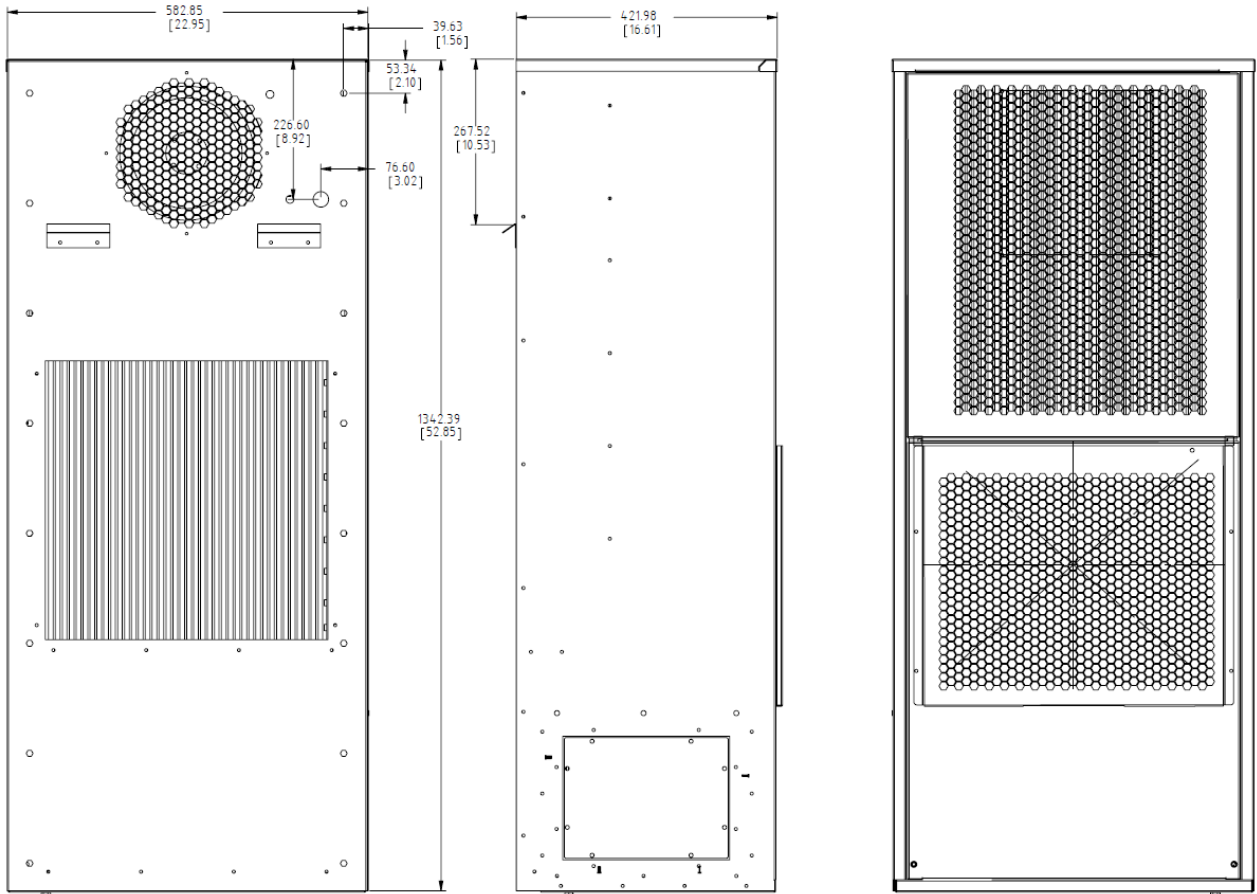
#### 3.2 General performance Data

Model #	BTU/Hr **	Watts Removal **	Voltage	Hz	Ph	Cooling Current Amps	Heating Current Amps	Approx. Weight (lbs/Kg)
iA/C T-B19000	19,000	5560	230V	50/60	1	16.0	13.0	250/113

\*\* Rating capacity shown based on 95°F return air temperature to cabinet in 95°F ambient conditions at nominal voltage and unimpeded resistance to air flow.

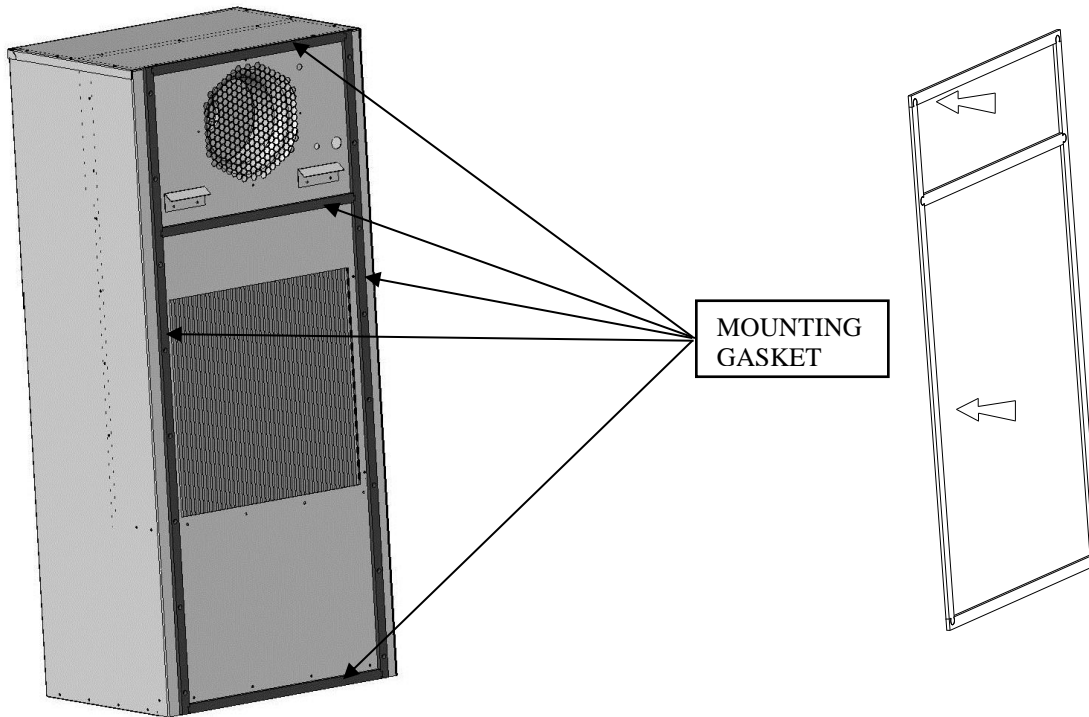
## 4 DIMENSIONS & INSTALLATION

### 4.1 Product Drawing





### 4.3 Gasket installation



### 4.4 Installation and Connections

- The enclosure shall be checked for correctness of cutouts, mounting holes and electrical supply.
- Install the gaskets as shown in section 4.3. A gasket kit is provided with each unit.
- Utilize an appropriate and safe lifting device.
- Mount the Air Conditioner to the cabinet using hardware supplied with unit. (16 ¼-20 screws, 16 flat washers & 16 lock washers). Custom air conditioner may require different size of bolts and washers.
  - The maximum torque is 130 in-lbs with a recommended assembly torque of 75 in-lbs.
- Connect the Air Conditioning Unit power lead to the mains supply located in the cabinet/enclosure. **Refer to the product label on the bottom right hand side panel of the unit for the proper voltage/amp requirement. Make sure a properly grounded power supply is used. All installations are to be completed in accordance with local NEC codes and guidelines.**
- The electrical circuit should be protected by a slow blow breaker or fuse of suitable rating.
- The alarm is a Form C type relay (50 VDC / 0.1A Max). The connections for alarm are the red (Common), black (Normally open) and white (Normally closed) wires only. The green wire is not used.
- If the interconnect function is to be used, connect the black and red wires on the small two wire interconnect cable to the corresponding interconnect cable supplied with each unit. Contact Dantherm for additional information.
- The Air Conditioning Unit is supplied with a condensate drain hose. Secure the hose to the drain nipple and route away to suitable position/location.

### 4.5 Unit Operation

- Turn the main power on to unit, the evaporator fan (internal circuit) should run immediately.
- Functionality may be verified by initiating “TEST” sequence located in section 5.5.2 of this manual. Access the controller by removing the service cover on the side of the unit.

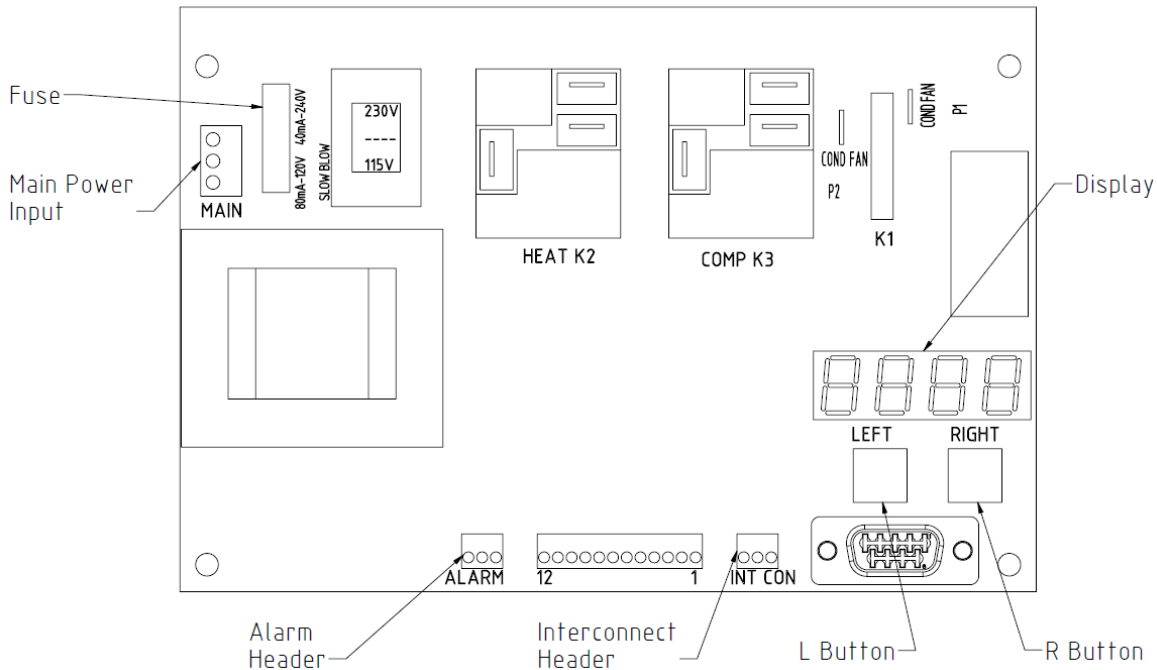
- Check for the following:
  - Airflow through both condenser and evaporator
  - Abnormal vibration
  - Temperature of cabinet supply air should be less than 70°F (21°C) when the ambient air is 80°F (27°C) or below.
- Replace the cover after completion.

## 5 USACG-6 INTELLIGENT CONTROLLER OPERATION

The intelligent controller installed in the air conditioner has two levels of operation. Limited functionality from the integrated four position LED display allows the user to debug the system, change heating set point, change cooling set point, and change unit of measure (°F or °C). More settings are available to customize a unit for an application by accessing the controller via the RS-232 serial port connected to a PC with HyperTerminal. Access the controller by removing the service cover on the side of the unit.

*Adjusting the factory controller settings may alter performance and affect warranty.*

### 5.1 USACG-6 Controller diagram



### 5.2 Modify heating set point

1. Press L button for 2 seconds and release (Display will begin "Display Mode")
2. Press L&R button simultaneously for 2 seconds and release (Display will show "test")
3. Press R button for 2 seconds and release (Display will show "H SP")
4. Press L button for 2 seconds and release (Display will show current Heater Set Point)
  - a. Press and hold R button to raise setting (Maximum is 59°F/15°C)
  - b. Press and hold L button to lower setting (Minimum is 41°F/5°C)
5. Do nothing for 10 seconds to accept new setting OR Press L&R button simultaneously for 2 seconds to accept new setting (Display will show main menu again)



### **5.3 Modify cooling set point**

1. Press L button for 2 seconds and release (Display will begin “Display Mode”)
2. Press L&R button simultaneously for 2 seconds and release (Display will show “test”)
3. Press R button for 2 seconds and release (Display will show “H SP”)
4. Press R button for 2 seconds and release (Display will show “C SP”)
5. Press L button for 2 seconds and release (Display will show current Cooling Set Point)
  - a. Press and hold R button to raise setting (Maximum is 104°F/40°C)
  - b. Press and hold L button to lower setting (Minimum is 68°F/20°C)
6. Do nothing for 10 seconds to accept new setting OR Press L&R button simultaneously for 2 seconds to accept new setting (Display will show main menu again)

### **5.4 Change unit of measure**

1. Press L button for 2 seconds and release (Display will begin “Display Mode”)
2. Press L&R button simultaneously for 2 seconds and release (Display will show “test”)
3. Press R button for 2 seconds and release (Display will show “H SP”)
4. Press R button for 2 seconds and release (Display will show “C SP”)
5. Press R button for 2 seconds and release (Display will show “unit”)
6. Press L button for 2 seconds and release (Display will show current Unit of measure)
  - a. Press and hold R button to toggle raise setting (°C or °F)
7. Do nothing for 10 seconds to accept new setting OR Press L&R button simultaneously for 2 seconds to accept new setting (Display will show main menu again)

### **5.5 Debugging the system**

#### *5.5.1 Observing the return temperature and fault codes*

The temperature and fault codes are displayed through the four position LED. The return temperature is displayed if the unit is operating normally. If there is an alarm, the fault code is displayed. The following faults may be shown:

- F=01 (missing compressor current)
- F=02 (High Pressure)
- F=03 (Low Pressure after start up)
- F=04 (Low Pressure before start up)
- F=05 (High Temperature)
- F=06 (Low Temperature)
- F=07 (Missing Sensor)

5.5.2 *Initiating the “TEST” sequence*

1. Press L button for 2 seconds and release (Display will begin “Display Mode”)
2. Press L&R button simultaneously for 2 seconds and release (Display will show “test”)
3. Press L button for 2 seconds and release (Display will show test step)
4. TEST steps

STEP	DESCRIPTION	LED	INT. FAN	HEATER	COMP	COND. FAN	DURATION
0	Display S/W Revision Level	X.XX	ON	OFF	OFF	OFF	10 SEC
1	Int. Fan only	T01	ON	OFF	OFF	OFF	30 SEC
2	Heater	T02	ON	ON	OFF	OFF	35 SEC
3	Int. Fan only	T03	ON	OFF	OFF	OFF	20 SEC
4	Con Fan	T04	ON	OFF	OFF	Cycle	30 SEC
5	Comp. and cond.	T04	ON	OFF	ON	ON	75 SEC
6	Int. Fan only	T05	ON	OFF	OFF	OFF	30 SEC

5.5.3 *Resetting the controller to factory defaults*

1. Ensure return temperature is displayed otherwise wait 30 seconds
2. Press L&R button for 15 seconds and release (Display will show “----”)

## 6 MAINTENANCE

### 6.1 Preventative Maintenance Schedule

**Dantherm Air Handling Inc Air Conditioner Preventative Maintenance Schedule**

	Maintenance Item	3 or 6 Monthly	6 Monthly	Yearly	5 Yearly
1	Check enclosure air or ambient air filter (if applicable)	X*			
2	Condenser coil cleaning	X*			
3	Rotating component current check		X		
4	Functional Check		X		
5	Fan/Blower Inspection		X		
6	Evaporator coil cleaning			X	
7	Cabinet cleaning & Corrosion Check			X	
8	Condensate drains			X	
9	Refrigerant charge			X	
10	Lubrication				X

\* Can be extended to 6 months after initial visits if no cleaning is required.

**Notes:**

- 1 The internal/external filter (if applicable) shall be checked on a regular basis dependent on environmental conditions and replaced as necessary.
- 2 Periodically the coils should be cleaned. Once the coils become visibly coated with dust it is recommended that they be cleaned with a brush or compressed air. Both sides of the coils should be inspected. The condenser coil may be washed with a commercial coil cleaning solution.
- 3 Check run amps on rotating components and record to enable assessment of potential failure.
- 4 Perform Self Test Function in accordance with Operation Manual. Complete general check of component mounting.
- 5 Condenser and evaporator blowers require no maintenance other than periodic inspection. In the event of dust build-up clean the blowers.
- 6 The cabinet can be cleaned with a sponge and warm, soapy water or a mild detergent. Do not use bleach, abrasive chemicals or harmful solvents. Check for signs of corrosion and treat as necessary.
- 7 Check the drain and drain tube for obstructions. If a commercial drain solvent is used, flush out the drain pan and system with fresh water to prevent corrosion.
- 8 Under no circumstance must the access port covers be removed, adjusted, or tampered with other than by a certified technician.
- 9 Rotating component bearings must be lubricated using SAE20 weight non detergent oil.
- 10 All maintenance inspections must be recorded with time, date & details of activity.

## **6.2 Evaporator and Condenser Coil Cleaning**

Periodically the coils should be cleaned. No fixed period for cleaning can be provided due to the varying environments in which the air conditioner may be installed. However once the coils become visibly coated with dust it is recommended that they be cleaned with a brush or compressed air. Both sides of the coils should be inspected regularly.

## **6.3 Compressor & Refrigerant System**

The compressor is a hermetically sealed and factory lubricated unit and therefore requires no maintenance. If the compressor fails it is recommended that the unit be returned to Dantherm Inc. for servicing. In the event that the unit cannot be returned it is possible, using suitably qualified personnel, to repair the unit in the field.

If the refrigerant charge is lost the means of leakage should be established and repaired by a reputable refrigeration repair company. Ports are provided for checking suction and discharge pressures and recharging if required. The type of refrigerant and charge amount is detailed on the product label attached to the unit.

**Note: Under no circumstance must the access port covers be removed, adjusted, or tampered with other than by a certified technician.**

## **6.4 Blowers**

Condenser and evaporator blowers require no maintenance other than periodic inspection. In the event of dust build-up clean the blowers.

## **6.5 Filters**

The external filter shall be checked on a regular basis dependent on environmental conditions and replaced as necessary.

## 6.6 Troubleshooting

The air conditioners are designed for trouble free life as long as the ambient filter (if applicable) is maintained in a clean condition. To aid in service definition the service personnel can initially identify probable cause by referring to the following trouble shooting chart.

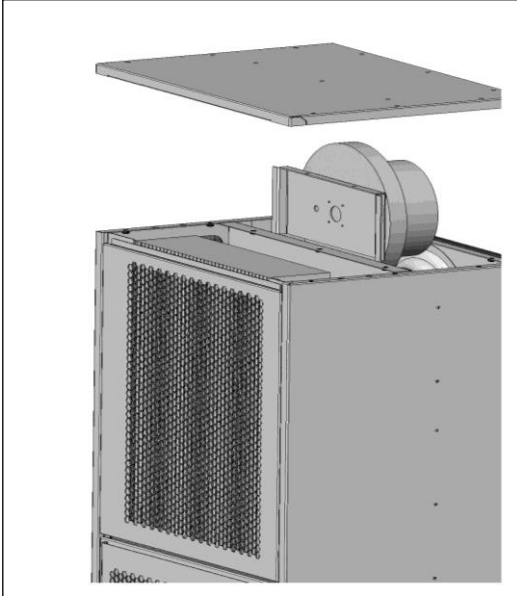
**If in doubt contact Dantherm Air Handling Inc. for assistance. Always have the Model #, Serial # available before you call.**

Problem	Potential Cause	Solution
Unit not running	No Power	Check power source and electrical connections
	Fuse Blown on Control Board	Replace with fuse
	Faulty control components	Carry out self test
Unit not cooling sufficiently	Filter (if applicable) clogged	Clean or replace filter
	Blocked evaporator or condenser coil	Clean coil
	Evaporator or condenser blower not operating	Replace motor, capacitor or entire assembly
	Loss of refrigerant or oil leaks	Locate and repair leak. Replace charge
	Insufficient capacity	Contact Dantherm Air Handling, Inc.
Ice on evaporator coil	Insufficient heat load or unit oversized for application	Contact Dantherm Air Handling, Inc.
	Failed evaporator blower	Replace evaporator blower motor or assembly
Condensate draining continuously	Enclosure not properly sealed	Check and seal all openings
Excessive vibration	Loose compressor, fans or tubing	Locate and correct
Missing Compressor Current (F=01)	Wire detached or improperly installed	Secure wiring or install wiring properly according to diagram
	Broken current sensor	Replace Control Board
	Faulty compressor	Replace compressor
High Pressure Alarm (F=02)	Faulty condenser fan or wiring loose	Replace fan or check wiring to fan
	Faulty condenser fan capacitor or wiring loose	Replace capacitor or check wiring to capacitor
	Faulty condenser fan switch or high pressure switch	Replace appropriate switch
Low Pressure Alarm after start (F=03)	Slow leak in system	Locate and repair leak. Replace charge
Low Pressure Alarm before start (F=04)	No refrigerant in system (Large leak)	Locate and repair leak. Replace charge
	Low charge in system	Locate and repair leak. Replace charge
High Temperature Alarm (F=05)	Unit undersized for application	Contact Dantherm Air Handling, Inc.
Low Temperature Alarm (F=06)	Insufficient heat load or unit oversized for application	Contact Dantherm Air Handling, Inc.
Faulty Temperature Sensor (F=07)	Sensor not connected	Reconnect sensor
	Faulty sensor	Replace sensor

### **6.7 Component Removal**

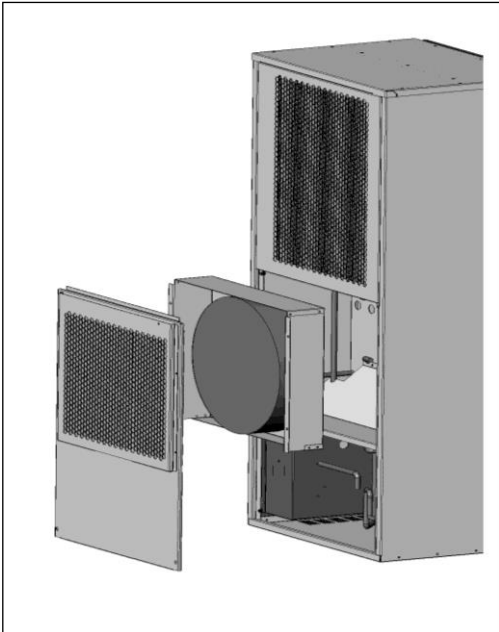
#### Internal Fan Removal

Remove 12 Torx security screws to remove top cover. Unfasten fan wire terminals. Remove 2 Torx security screws to remove internal fan assembly.



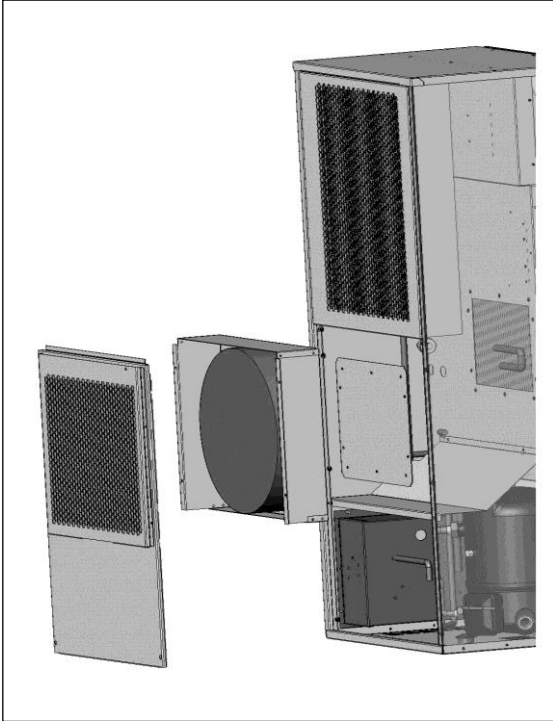
#### External Fan Removal

Remove 2 Torx security screws to remove bottom front cover. Remove 4 Torx security screws to remove condenser fan assembly. Unfasten fan wire terminals.

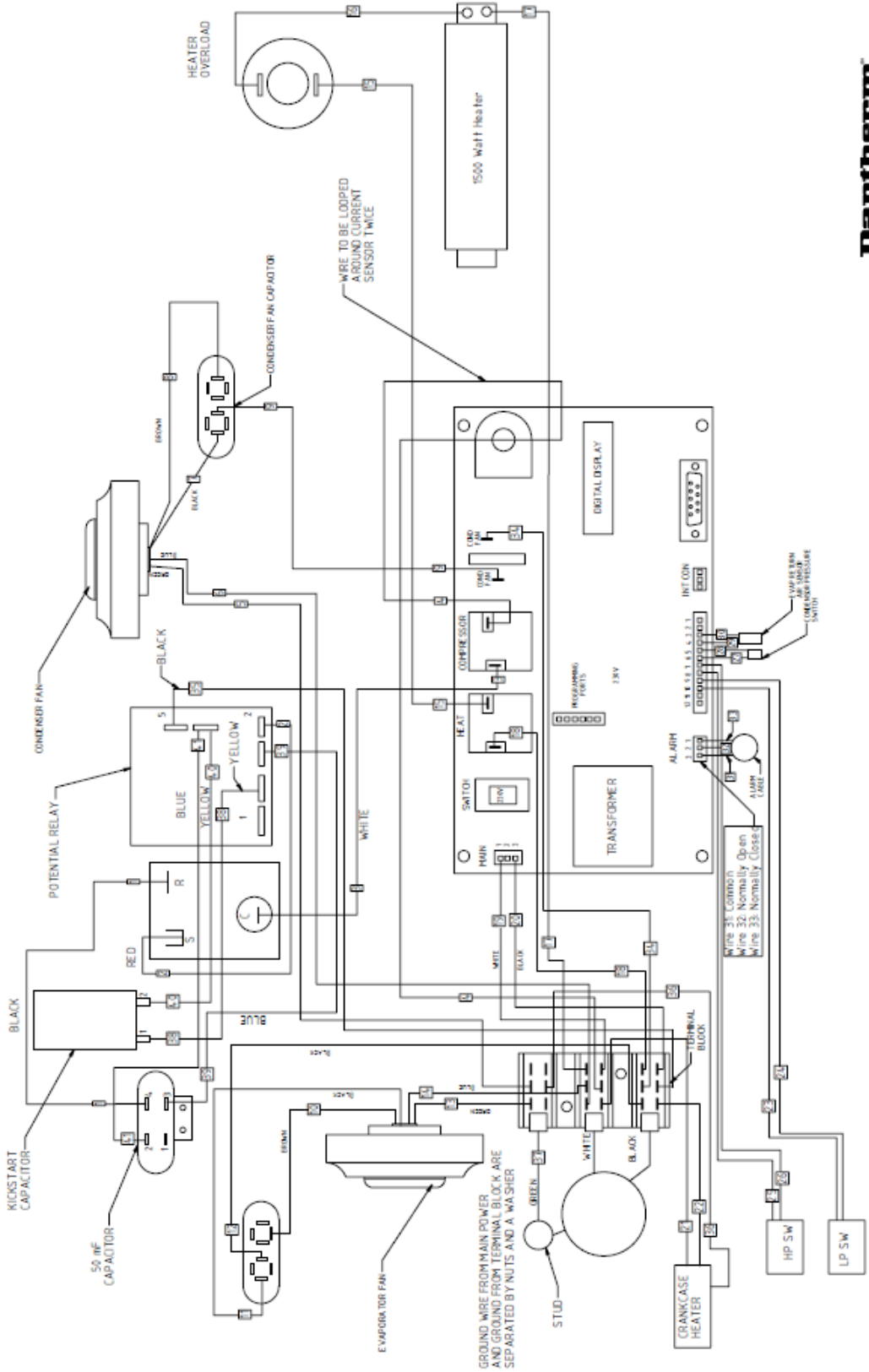


### **6.8 Overload Temperature Limiting Device**

The overload temperature limiting device is located below the heater element. Remove 2 Torx security screws to remove bottom front cover. Remove 4 Torx security screws to remove condenser fan assembly. Remove 8 torx screws to remove TXV access panel and reset the overload device.



**6.9 Wiring Diagram**





## 7 WARRANTY

### DANTHERM, INC., HEAT EXCHANGER AND AIR CONDITIONING UNITS LIMITED WARRANTY

DANTHERM, INC.'s ("DANTHERM") limited warranty extends to the original purchaser only of any DANTHERM heat exchanger and air conditioning unit, and to no other person or entity. DANTHERM warrants that such DANTHERM products will be free from defects in materials and workmanship in normal use for a period of twelve (12) months from the date of the original purchase. Should any part of your DANTHERM product fail because of a manufacturing defect within such twelve (12) month period, DANTHERM terms are set out below:

PRODUCT WARRANTY				SHIPMENT LIABILITY	
PRODUCT	WARRANTY PERIOD*	IN FIELD WARRANTY**	RETURN TO BASE WARRANTY	IN FIELD	RETURN TO BASE
AIR CONDITIONER	12 months	PARTS SUPPLY ONLY	PARTS & LABOR	Supply part freight pre-paid by Dantherm. Return of defective part pre-paid by customer	Return of item freight pre-paid by customer Supply of item freight pre-paid by Dantherm.
HEAT EXCHANGER	12 months	PARTS SUPPLY ONLY	PARTS & LABOR	Supply part freight pre-paid by Dantherm. Return of defective part pre-paid by customer	Return freight pre-paid by customer Supply freight pre-paid by Dantherm.

- \*\* Using Dantherm nominated service contractors – warranty on product continues  
Using Dantherm non-approved service contractors – warranty on product becomes void
- \* Warranty period starts from date of dispatch – warranty of replacement parts shall only apply for the remainder of the warranty period of the original product.

*Any transportation, related service labor, diagnosis calls, filters, driers, and refrigerant are not included. In the event all related service labor is performed by DANTHERM nominated service contractors, the replacement part shall be warranted by DANTHERM for the remainder of the warranty period of the original product.*

This warranty does not cover damages or repairs caused by improper installation, misuse of the product, negligent servicing, improper applications, unauthorized modifications, improper electrical supply, failure to follow manufacturer's instructions and rating plate information, accidents, natural disasters, damage in transportation, lack of normal preventive maintenance, or other events beyond DANTHERM's control. This warranty is also subject to the following operating conditions: 1) voltage variation not greater than 10%, 2) frequency variation not greater than 3Hz from nameplate rating, 3) cooling load is not greater than product label under rated conditions 4) unit is not restarted for a period of five minutes after accidental or intentional shut-off, 5) operation is not subject to abnormal conditions or customer, user misapplication, 6) customer or user does not modify, abuse, or neglect the product, 7) refrigerant specified on nameplate is only refrigerant used, and 8) customer or user complies with all other installation, maintenance, and operating instructions. Cost of repair or replacement of consumable parts is not covered under the terms of this warranty.

**THIS WARRANTY CONSTITUTES THE EXCLUSIVE REMEDY OF ANY PURCHASER OF A DANTHERM PINNACLE HEAT EXCHANGER AND CLASSIC AIR CONDITIONING UNIT AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR USE, OR FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR USE, OR FOR A PARTICULAR PURPOSE EXCEED THE TERMS OF THE APPLICABLE WARRANTY STATED ABOVE, AND DANTHERM SHALL HAVE NO OTHER OBLIGATION OR LIABILITY, EXPRESS OR IMPLIED. IN NO EVENT SHALL DANTHERM BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

**THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. SOME STATES DO NOT ALLOW LIMITATIONS OR EXCLUSIONS, SO THE ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY TO YOU.**

## **8 RETURN MATERIAL AUTHORIZATION PROCEDURE**

In the unlikely event of unit failure the following return procedure shall be adopted.

- All product returns require a Return Material Authorization number regardless of reason.
- The customer is required to contact the Quality Department at Dantherm Inc. in Spartanburg, SC at +1 864 595 9800 to obtain an RMA number.
- The following information must be provided prior to a RMA number being issued:
  - Dantherm Inc. part number(s) of product to be returned.
  - Dantherm Inc. serial number(s) of product to be returned.
  - Number of units requested to be returned.
  - Reason for return.
  - Contact name, phone and fax number.
  - Date of product receipt.
  - Invoice number and purchase order number covering the unit(s).
- The customer is responsible for suitably packaging the unit(s) securely, ideally in the original packaging, marking all cartons with the RMA number and shipping them prepaid to the designated site specified by Dantherm Inc.

**IN NO EVENT SHALL DANTHERM INC. ACCEPT ANY SHIPMENT WHICH DOES NOT COMPLY WITH THE ABOVE PROCEDURES.**

**REMOVE THE EMERGENCY HOSE AND ADAPTER FROM THE BOTTOM OF THE UNITS PRIOR TO DISMANTLING THE AIR CONDITIONER AND RESTING IT ON THE GROUND.**