

Installation, Operation and
Maintenance Information
for:
T Bar Units

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Multitherm[®] HEAT TRANSFER FLUIDS
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CONCERN

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Operating and Maintenance Instructions

Operation

Cooling

The cooling cycle of the T Bar Unit is controlled by the thermostat connected to the unit. When the temperature rises to the point set on the thermostat, the relay contacts close, energizing the cooling circuit. When the temperature in the area being cooled falls below the point set on the thermostat, the relay contacts open, de-energizing the cooling circuit.

Evaporator Blower

The T Bar Unit evaporator blower can operate in either the continuous or automatic mode. A switch on the thermostat selects either mode. This switch is labeled "ON" and "AUTO."

When the switch is in the "ON" position, the evaporator blower runs continuously, despite any other control setting. When the switch is in the "AUTO" position, the evaporator blower cycles on and off with operation of the cooling unit circuit (see above).

Humidification (optional)

The humidification option of the T Bar Unit is controlled by the humidity level set on a humidistat connected to the T Bar Unit. When the relative humidity in the room drops below the setting on the humidistat, the evaporator fan starts. Simultaneously, the water valve solenoid is energized to supply water to the evaporative humidification pad.

The water flow to the pad is regulated by a stainless steel orifice installed in the humidification valve. Water supplied to the T Bar Unit for humidification should be a minimum of 140°F.

When the humidity in the room reaches the desired point, the evaporator fan and water valve solenoid de-energize, and humidification ceases.

Reheat (optional)

When the humidity in the room reaches the point set on the humidistat, the T Bar Unit starts its cooling cycle. If the room temperature falls below the temperature set on the T Bar Unit's thermostat before the desired humidity level is attained, the reheat coil is energized until the proper humidity and temperature levels are attained.

Water Regulating Valve

The Water Cooled unit is equipped with a pressure activated water regulating valve. This valve has been adjusted at the factory to maintain a refrigerant head pressure of 230 PSI \pm 10%.

Should field adjustments be necessary, the valve can be adjusted with a screwdriver via a slot in the casing.

Maintenance

Periodic maintenance required on the T Bar Unit consists of: changing the air filter, lubricating the fan motors, and changing the evaporative humidifier pad (optional).

Changing Air Filters

The 20" x 20" x 1" disposable air filter located above the return air grille of the T Bar Unit should be replaced at least four times a year. More frequent filter changes may be necessary, depending on the particular environment in which the T Bar Unit operates.

Change the filter by lowering the hinged return air grille, removing the old filter, and replacing it with a new one.

Motor Lubrication

The evaporator or condenser fan motors in the T Bar Unit should be oiled annually. Lubricate each motor using an SAE #10 or #20 non-detergent type oil in the oilports located at each end of the motors.

Changing Humidifier Pad

T Bar Unit units equipped with an evaporative humidifier pad should be inspected periodically for replacement. Replace the pad as necessary.

Operating Safety

The T Bar Unit includes the following protection devices for safe operation: refrigeration system high and low pressure switches, condensate overflow switches, and compressor motor/fan motor overload protection.

Should a low or high pressure condition exist in the refrigeration system, the corresponding safety switch trips and shuts down the T Bar Unit. The high pressure switch must be manually reset; the low pressure switch automatically resets. If the condensate in the drain pan rises to an unsafe level, the condensate overflow switches trip, interrupting the low voltage power supply to the 24 V transformer, which shuts down the unit. The compressor motor and fan motors have internal, automatic reset thermal switches for overload protection.

Installation Instructions

A. Hanging the Unit

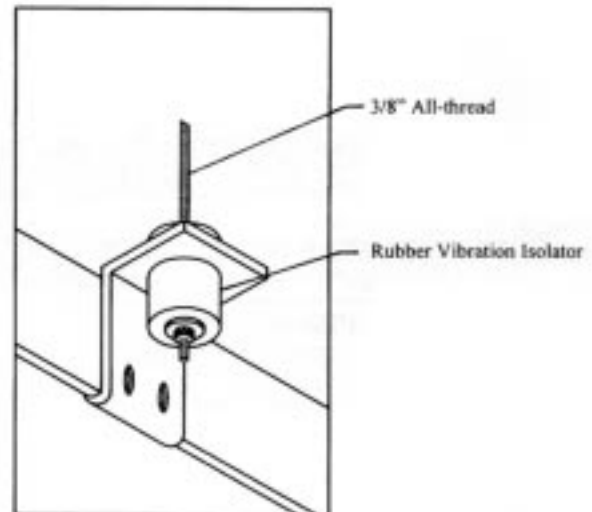
1. Remove ceiling tile where unit is to be located and remove adjacent tiles that would be helpful in handling the unit while positioning in the ceiling.
2. Secure suitable type material (such as slotted angle) in place. The material should be capable of supporting the weight of the unit (approximately 400 lb.). Now attach all thread rods (3/8" field supplied) to angle. The rods should be double nutted. See Diagram #1 for spacing of rods to ensure they will line up hangers when unit is raised into ceiling.
3. Hanger positions are marked on the sides of the units. Do not mount hangers to the unit at this time.

NOTE: If it is possible, remove one of the 48" T-bar sections from the ceiling, then the hangers can be mounted prior to lifting the unit into the ceiling.

4. Now raise unit into the ceiling. The use of a high jack is recommended. Once unit is above the ceiling, attach all-thread rods to hangers. Once all-thread rods are attached to hangers, raise unit several inches above the ceiling to allow placement of grille into ceiling grid. After grille is in place, lower unit onto foam backing attached to grille. The unit should be lowered just far enough for the frame to form an airtight seal with the foam. Secure hanger to unit.

B. Installing Separate Condenser Blower (Air Cooled Model Only)

1. The separate condenser blower fan section can be mounted using hanger strap or with hangers provided with the blower and short pieces of angle iron (field supplied). It is recommended that a field supplied flexible duct connector be attached to the main unit.
2. Attach wiring harness to condenser blower section and connect blower motor wires to wiring harness.



C. Electrical

1. All field wiring should conform to all applicable national and local codes and should be installed by a qualified electrician.
2. All wiring entrances are located in the top of the unit directly above the electrical control box. Electrical fittings are provided for conduit connections.
3. A wiring diagram is located on the inside of the electrical control box. Refer to this diagram for the connection of the thermostat and humidistat. Control wiring is 24V AC. Controls are intended to be wall mounted.
4. A wiring harness is provided with Air Cooled Models to connect the condenser blower box to the base unit. Attach the female fastener on receptacle to the male tab. Route the end of the harness through the opening in the top of the cabinet and secure the electrical flex connector fitting to the cabinet. Connect the female crimp connection to the male tab on the load side of the compressor contactor. Route the other end of the harness through the opening in the condenser blower box and secure the electrical flex connector to the blower box cabinet. Splice the harness leads to the purple and blue motor leads (common and medium speed).

D. Condensate Drain

1. A 3/4" FPT stainless steel fitting is supplied on each side of the unit. Plug the fitting that will not be used. A suitable trap should be installed on the Condensate line close to the unit. Pitch the drain line 1"/50 ft. of run. Trap is essential for proper operation of the unit.
2. The optional low profile Condensate pump should be mounted to the side of the unit as low as possible. Connect to trap (field supplied). Trap is essential for proper operation of the unit.

E. Water Regulating Valve

(Water Cooled Units)

1. The factory supplied water regulating valve has been set to maintain an approximate head pressure of 230 lb. PSIG. A small opening on the end of the unit allows for adjustments with a screwdriver.

F. Humidifier (When Furnished)

1. The evaporative type humidifier pad is factory installed. Field connection of water lines and humidifier water valve assembly is made on the fan panel side of the unit. Humidifier should be connected to a 140° water supply to insure effective operation. See humidifier valve assembly diagram.

G. Chilled Water Control Valve

1. A 2-Way or 3-Way solenoid valve is available from the factory. Valve is to be mounted to the WATER inlets fitting (1/2 MPT) and electrical connections. Secure to factory wiring.

H. Low Ambient Control

(Air Cooled Option)

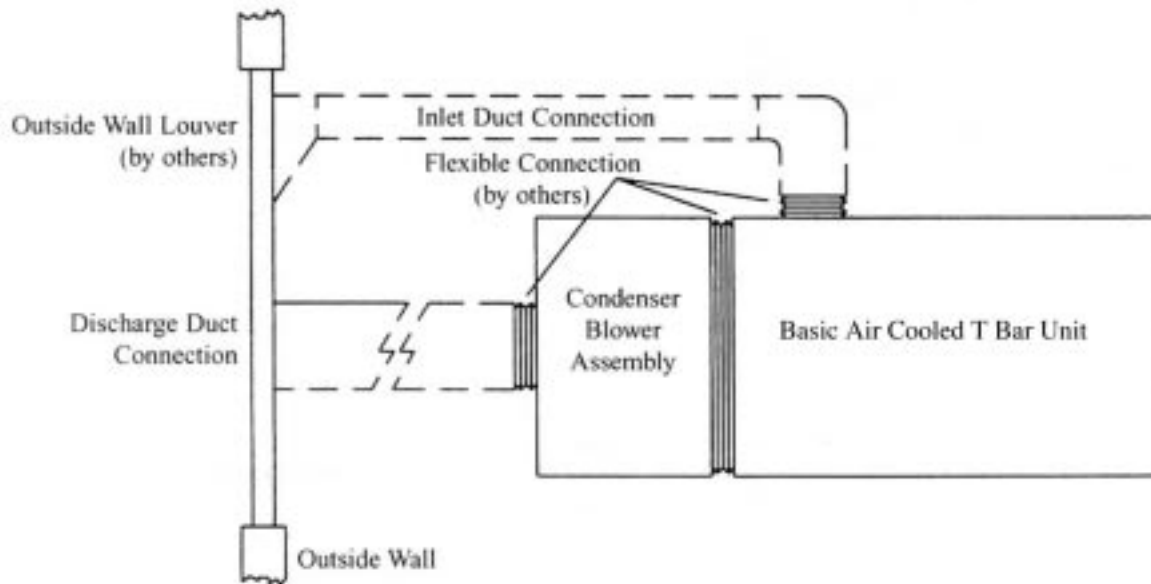
1. Low Ambient control is provided by means of a pressure activated switch mounted in the compressor section of the unit. The control is factory adjusted but may be field adjusted if necessary.

I. Motor Speed (Adjustment)

1. All units are shipped with 3 speed evaporator blower motors. The motor speed may be changed by changing motor leads in evaporator blower section of the unit. Access to leads is through electrical box access door. Leads will be color coded.

To change speed, disconnect power to unit. Disconnect speed now in use and cap this lead with suitable device. Reconnect lead to speed desired.

Condenser Duct/Outside Air Only Air Cooled Models – Plan View ACGD, ACSD, ACDD



Ducted Condenser Air Guidelines*

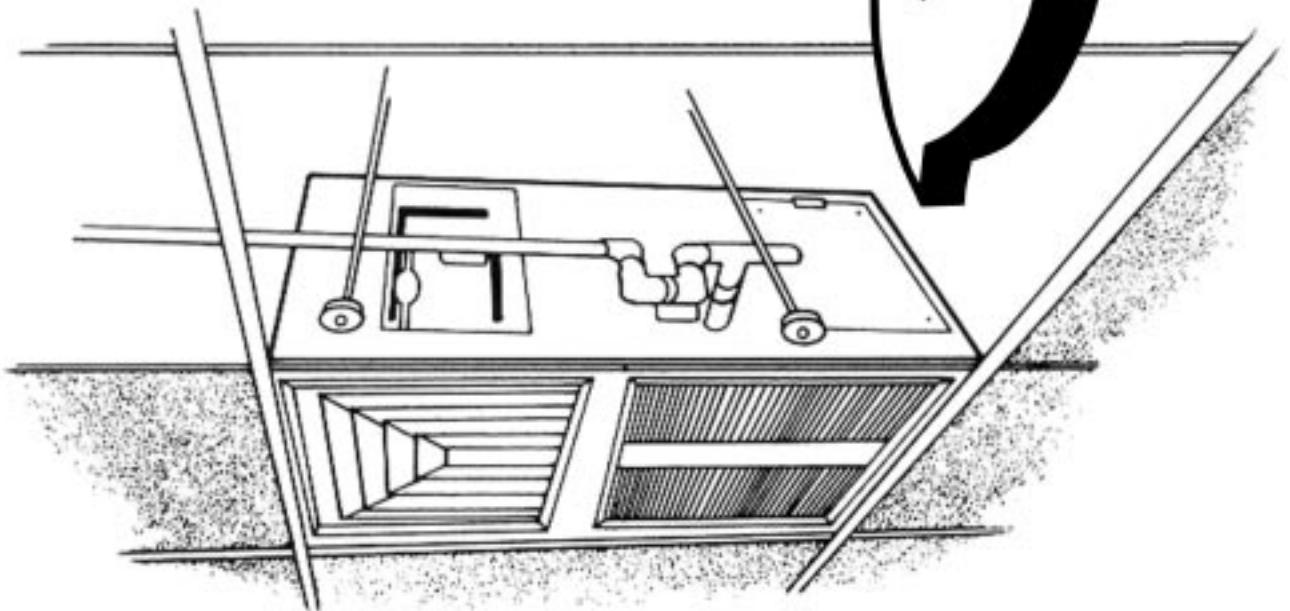
Unit Size	Cutout for Inlet Duct Connection	Cutout for Discharge Duct Connection	Max. E.S.P. Condenser Air Ducts*
2 Ton	8 (W) x 15-3/4 (H)	14 (W) x 12 (H)	.25" (Water)
1-1/2 Ton	8 (W) x 15-3/4 (H)	14 (W) x 12 (H)	.25" (Water)
1 Ton	8 (W) x 15-3/4 (H)	14 (W) x 12 (H)	.25" (Water)

*Cutout only supplied by Multitherm. All duct work by others in field.

T BAR UNIT TROUBLESHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	CHECK OR REMEDY
High head pressure	Condenser fan not operating	Check power to motor.
	Dirty condenser coil	Clean coil.
	Insufficient open air around condenser	Clear area 3 feet all around condenser air inlet and discharge duct.
	Condenser discharge air recirculation	Duct discharge air away from inlet to condenser.
	Condenser water not circulating	Check pump and water regulation valve.
Room temperature too high	Thermostat set too high	Reset thermostat to lower setting. Check for fan and compressor symptoms.
Room temperature too low	Thermostat set too low	Reset thermostat to higher setting.
Low air flow	Dirty filter	Change filter.
Compressor will not operate when cooling is called for	Thermal overloads in compressor open	Wait 5 minutes for automatic reset to operate: Open disconnect. Remove cover from compressor. Check with ohm meter on control circuit leads and isolate the defective overload.
	Compressor out on high head pressure	See symptoms "high head pressure." Reset Manual High Pressure Switch.
	Low head pressure, low on refrigerant, or dirty filter	Change filter or recharge after fixing leak.
	Low pressure switch defective	Check low pressure switch by disconnecting one of the wires and using an ohm meter to read continuity.
	SAFETY SWITCH in condensate pan senses high condensate level. Entire system shuts down.	Check for restriction in condensate drain pan. CHECK CONDENSATE PUMP.
Main fan will not operate	Power not on	Check high voltage disconnect.
	Overload tripped on motor	Wait 5 minutes for automatic reset and determine cause of tripping.
	SAFETY SWITCH in condensate pan senses high condensate level. Entire system shuts down.	Check for restriction in condensate drain pan. CHECK CONDENSATE PUMP.
Reheat not operating	Heater safety open	Check continuity through safety.
	Defective holding coil	Check for 24V at holding coil.
	Thermostat not operating	Check thermostat on heating
High humidity	Compressor not operating on dehumidistat	Check compressor for operating as in previous steps. Check dehumidistat.
	Humidistat set too high	Reset humidistat lower.
	Poor vapor seal in room	If the control is functioning properly by calling for dehumidification, check the room for proper vapor seal.
Low humidity	No water flowing	Turn on water. Check strainer valve and solenoid.
	Pad not clean	Clean/replace pad.
	Humidistat set too low	Reset humidistat higher.
	Cold water	Heat water to 140°F.

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