48TJE,TJF004
48TJD,TJE,TJF005-007
Single-Package Rooftop Heating/Cooling Units

Installation, Start-Up and Service Instructions

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SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

⚠ CAUTION

Ensure voltage listed on unit data plate agrees with electrical supply provided for the unit.

⚠ WARNING

Disconnect gas piping from unit when leak testing at pressure greater than $^1/_2$ psig. Pressures greater than $^1/_2$ psig will cause gas valve damage resulting in hazardous condition. If gas valve is subjected to pressure greater than $^1/_2$ psig, it *must* be replaced before use. When pressure testing field-supplied gas piping at pressures of $^1/_2$ psig or less, a unit connected to such piping must be isolated by manually closing the gas valve.

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit and install lockout tag. Electrical shock could cause personal injury.

INSTALLATION

Unit is shipped in the vertical discharge configuration. To convert to horizontal configuration, remove screws from side duct opening covers and remove covers. Using the same screws, install covers on vertical duct openings with the insulation side down. Seals around duct openings must be tight. See Fig. 1.

Step 1 — Provide Unit Support

ROOF CURB — Assemble and install accessory roof curb in accordance with instructions shipped with curb. See Fig. 2. Install insulation, cant strips, roofing felt, and counter flashing as shown. *Ductwork must be attached to curb, not to the unit. The accessory thru-the-bottom power and gas connection package must be installed before the unit is set on the roof curb.* If field-installed (thru-the-roof curb) gas connections are desired, use factory-supplied $^3/_4$ in. pipe coupling and gas plate assembly to mount the thru-the-roof curb connection to the roof curb. Gas connections and power connections to the unit must be field installed after the unit is installed on the roof curb.

If electric and control wiring is to be routed through the basepan, attach the accessory thru-the-bottom service connections to the basepan in accordance with the accessory installation instructions.

IMPORTANT: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket supplied with the roof curb as shown in Fig. 2. Improperly applied gasket can also result in air or water leaks and poor unit performance.

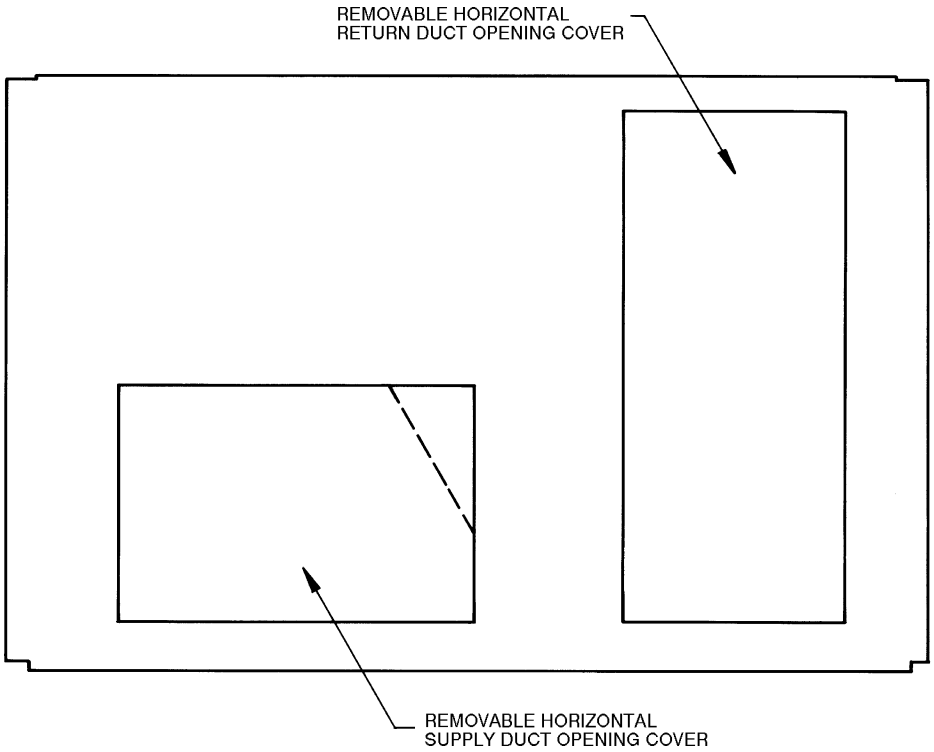


Fig. 1 — Horizontal Conversion Panels (Viewed from Duct End)

Curb should be level. Unit leveling tolerances are shown in Fig. 3. This is necessary for unit drain to function properly. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

SLAB MOUNT (Horizontal Units Only) — Provide a level concrete slab that extends a minimum of 6 in. beyond unit cabinet. Install a gravel apron in front of condenser coil air inlet to prevent grass and foliage from obstructing airflow.

NOTE: Horizontal units may be installed on a roof curb if required.

Step 2 — Field Fabricate Ductwork — Secure all ducts to roof curb and building structure on vertical units. *Do not connect ductwork to unit.* For horizontal applications, field-supplied flanges should be attached to horizontal discharge openings and all ductwork should be secured to the flanges. Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

Ducts passing through an unconditioned space must be insulated and covered with a vapor barrier.

If a plenum return is used on a vertical unit, the return should be ducted through the roof deck to comply with applicable fire codes.

A minimum clearance is not required around ductwork. Cabinet return air static shall not exceed –.30 in. wg with EconoMi$er, or –.35 in. wg with Durablade Economizer, or –.45 in. wg without economizer.

These units are designed for a minimum continuous return-air temperature of 50 F (dry bulb), or an intermittent operation down to 45 F (dry bulb) (in heating mode), such as when used with a night set-back thermostat.

Step 3 — Install External Trap for Condensate Drain — The unit's 3/4-in. condensate drain connections are located on the bottom and side of the unit. Unit discharge connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal applications.

When using the standard side drain connection, make sure the plug (Red) in the alternate bottom connection is tight before installing the unit.

To use the bottom drain connection for a roof curb installation, relocate the factory-installed plug (Red) from the bottom connection to the side connection. See Fig. 4. The piping for the condensate drain and external trap can be completed after the unit is in place.

All units must have an external trap for condensate drainage. Install a trap at least 4-in. deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1 in. per 10 ft of run. Do not use a pipe size smaller than the unit connection (3/4 in.).

Step 4 — Rig and Place Unit — Inspect unit for transportation damage. File any claim with transportation agency. Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. See Table 1 and Fig. 5 for additional information.

Lifting holes are provided in base rails as shown in Fig. 6. Refer to rigging instructions on unit.

⚠ CAUTION

All panels must be in place when rigging and lifting.

"B"	"C"	"D" ALT DRAIN HOLE	"E" Gas	"F" Power	"G" Control	CONNECTOR PKG ACY
1′-9 11/16″ [551]	1′-4″ [406]	1 3/4″ [44.5]	3/4″ [19] NPT	3/4″ [19] NPT	1/2″ [12.7] NPT	CRBTMPWR001A00
				1 1/4″ [31.7]		CRBTMPWR002A00
			1/2″ [12.7] NPT	3/4″ [19] NPT		CRBTMPWR003A00
			3/4″ [19] NPT	1 1/4″ [31.7]		CRBTMPWR004A00

ROOF CURB ACCESSORY	"A"	UNIT SIZE 48TJ
CRRFCURB001A00	1′-2″ [356]	004-007
CRRFCURB002A00	2′-0″ [610]	

NOTES:
1. Roof curb accessory is shipped disassembled.
2. Insulated panels:
3. Dimensions in [ ] are in millimeters.
4. Roof curb: galvanized steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance 4′ on each side.
7. Direction of airflow.
8. Connector packages CRBTMPWR001A00 and 2A00 are for thru-the-curb type. Packages CRBTMPWR003A00 and 4A00 are for the thru-the-bottom type connections.

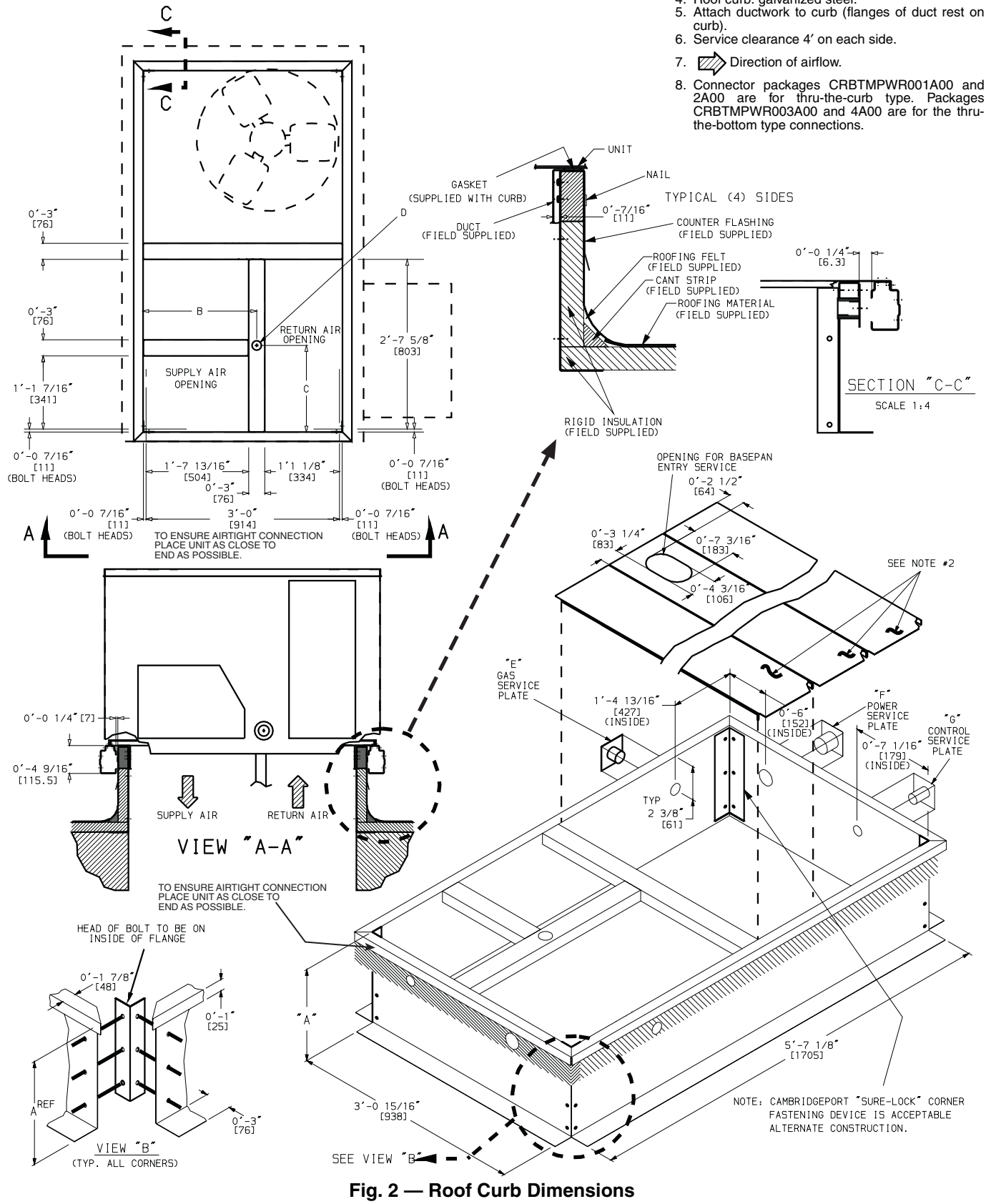
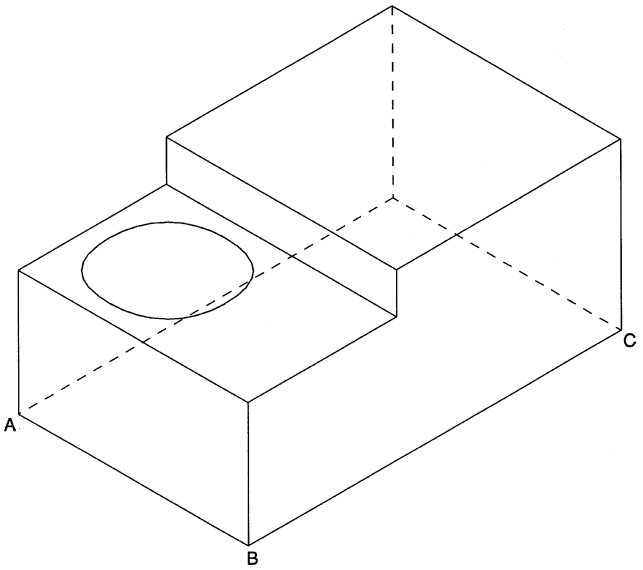


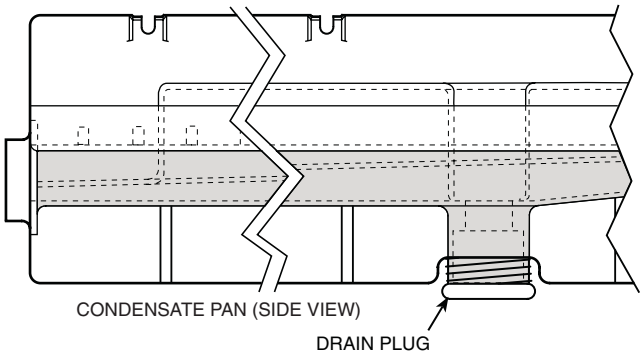
Fig. 2 — Roof Curb Dimensions



MAXIMUM ALLOWABLE DIFFERENCE (in.)

A-B	B-C	A-C
0.5	1.0	1.0

Fig. 3 — Unit Leveling Tolerances



NOTE: Drain plug is shown in factory-installed position.

Fig. 4 — Internal Trap Condensate Drain

POSITIONING — Maintain clearance around and above unit to provide minimum distance from combustible materials, proper airflow, and service access. See Fig. 6. A properly positioned unit will have the following clearances between unit and roof curb: 1/4-in. clearance between roof curb and base rails on each side and duct end of unit; 1/4-in. clearance between roof curb and condenser coil end of unit. (See Fig. 2, section C-C.)

Do not install unit in an indoor location. Do not locate unit air inlets within 10 ft of exhaust vents or other sources of contaminated air or as local codes require.

Be sure that unit is installed so that snow will not block the combustion intake or flue outlet.

Unit may be installed directly on wood flooring or on Class A, B, or C roof-covering material when roof curb is used.

Although unit is weatherproof, guard against water from higher level runoff and overhangs.

Flue vent discharge must have a minimum horizontal clearance of 4 ft from electric and gas meters, gas regulators, and gas relief equipment.

Minimum distance between unit and other electrically live parts is 48 inches.

Flue gas can deteriorate building materials. Orient unit such that flue gas will not affect building materials.

Adequate combustion-air space must be provided for proper operation of this equipment. Be sure that installation complies with all local codes and Section 5.3, Air for Combustion and Ventilation, NFGC (National Fuel Gas Code), and ANSI (American National Standards Institute) Z223.1, and NFPA (National Fire Protection Association) 54 TIA-54-84-1. In Canada, installation must be in accordance with the CAN1- B149 installation codes for gas burning appliances.

After unit is in position, remove rigging skids and shipping materials.

Step 5 — Install Flue Hood — Flue hood is shipped screwed to the burner compartment access panel. Remove from shipping location and using screws provided, install flue hood and screen in location shown in Fig. 7.

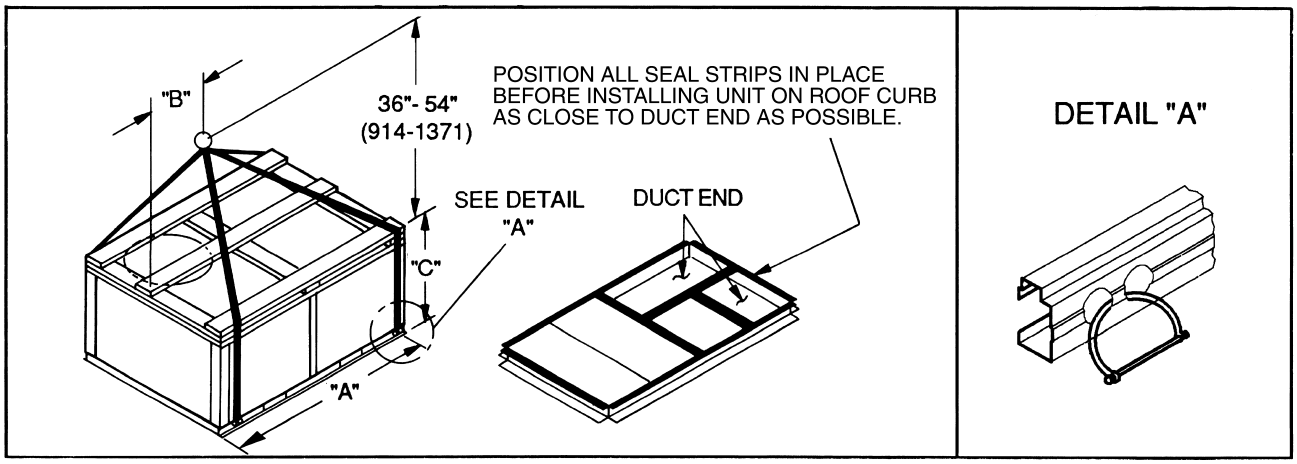
For units size 004-006 being installed in California Air Quality Management Districts, which require NOx emissions of 40 nanograms/joule or less, a field-installed low NOx kit must be used.

Step 6 — Install Gas Piping — Unit is equipped for use with type of gas shown on nameplate. Refer to local building codes, or in the absence of local codes, to ANSI Z223.1 entitled National Fuel Gas Code. In Canada, installation must be in accordance with the CAN1.B149.1 and CAN1.B149.2 installation codes for gas burning appliances.

For natural gas applications, gas pressure at unit gas connection must not be less than 4 in. wg or greater than 13.0 in. wg while unit is operating. On 48TJ005,006,007 high heat units, the gas pressure at unit gas connection must not be less than 5 in. wg or greater than 13 in. wg while the unit is operating. For propane applications, the gas pressure must not be less than 5 in. wg or greater than 13 in. wg at the unit connection.

Size gas sully piping for 0.5 in. wg maximum pressure drop. Do not use supply pipe small than unit gas connection. Support gas piping as shown in the table in Fig. 8. For example, a 3/4-in. gas pipe must have one field-fabricated support beam every 8 ft. Therefore, an 18-ft long gas pipe would have a minimum of 2 support beams, a 48-ft long pipe would have a minimum of 6 support beams.

See Fig. 8 for typical pipe guide and locations of external manual main shutoff valve.



NOTES:
1. Dimension in ( ) is in millimeters.
2. Hook rigging shackles through holes in base rail, as shown in detail "A." Holes in base rails are centered around the unit center of gravity. Use wooden top skid when rigging to prevent rigging straps from damaging unit.
3. Unit weights do not include economizer. See Table 1 for economizer weights.

⚠ CAUTION

All panels must be in place when rigging.

UNIT	MAX WEIGHT		DIMENSIONS					
			"A"		"B"		"C"	
	lb	kg	in.	mm	in.	mm	in.	mm
48TJE,TJF004	510	231	73.69	1872	37.50	953	33.35	847
48TJD,TJE,TJF005	520	236						
48TJD,TJE,TJF006	540	245						
48TJD,TJE,TJF007	615	279						

Fig. 5 — Rigging Details

Step 7 — Make Electrical Connections

⚠ WARNING

Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code), ANSI/NFPA, latest edition, and local electrical codes. *Do not use gas piping as an electrical ground.* Failure to follow this warning could result in the installer being liable for personal injury of others.

DISCONNECT BOX LOCATION — The field-supplied disconnect box may be mounted on the unit's end panel or on the corner post. Mount disconnect box on the left side of the rating plate when mounting on the unit's end panel. *Do not mount the disconnect box over the unit rating plate.* When mounting disconnect box on corner post, secure disconnect box to corner post and condenser coil top cover. See Fig. 7.

A disconnect box mounting space is available when an optional or accessory condenser coil grille is used. Mount the disconnect on the sheet metal provided with the condenser coil grille. The sheet metal is located adjacent to the corner post on the left side of the power wiring access panel.

FIELD POWER SUPPLY — All units except 208/230-v units are factory wired for the voltage shown on the nameplate. If the 208/230-v unit is to be connected to a 208-v power supply, the transformer *must* be rewired by disconnecting the black wire from the 230-v terminal wire on the transformer and connecting it to the 200-v red terminal of the transformer.

Refer to unit label diagram for additional information. Wiring leads are provided for field service. Use copper conductors only when splice connectors are used.

When installing units, provide a disconnect per NEC.

All field wiring must comply with NEC and local requirements. In Canada, electrical connections must be in accordance with CSA (Canadian Standards Association) C22.1 Canadian Electrical Code Part One.

Install field wiring as follows:

1. Connect ground lead to chassis ground connection when using separate ground ties.
2. Install conduit between disconnect and side panel. Insert conduit through power supply knockout opening. See Fig. 9.
3. Connect power lines to power wiring leads.
4. Pigtails are provided for field power connections and are located inside the burner access panel. See Fig. 10 and 11. Use factory-supplied splices or Underwriters' Laboratories (UL) approved copper connector.

Table 1 — Physical Data

UNIT SIZE 48TJ		E/F004	D/E/F005	D/E/F006	D/E/F007
NOMINAL CAPACITY (tons)		3	4	5	6
OPERATING WEIGHT (lb)					
Unit					
Al/Al*		460	470	490	565
Al/Cu*		465	476	497	576
Cu/Cu*		468	482	505	587
Economizer					
Durablade		34	34	34	34
EconoMi$er		47	47	47	47
Roof Curb†		115	115	115	115
COMPRESSOR		Reciprocating			Scroll
Quantity		1	1	1	1
No. Cylinders (per Circuit)		2	2	2	2
Oil (oz)		50	50	50	54
REFRIGERANT TYPE		R-22			
Expansion Device		Acutrol™ Metering Device			
Operating Charge (lb-oz)					
Circuit 1		4-4	6-6	6-14	9-0
Circuit 2		—	—	—	—
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Rows...Fins/in.		1...17	2...17	2...17	2...17
Total Face Area (sq ft)		8.36	8.36	10.42	10.42
CONDENSER FAN		Propeller Type			
Nominal Cfm		3500	4000	4000	4000
Quantity...Diameter (in.)		1...22.0	1...22.0	1...22.0	1...22.0
Motor Hp...Rpm		1/4...1100	1/4...1100	1/4...1100	1/4...1100
Watts Input (Total)		325	325	325	325
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins			
Rows...Fins/in.		2...15	2...15	3...15	4...15
Total Face Area (sq ft)		4.17	5.5	5.5	5.5
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)	**Std**	1...10 x 10	1...10 x 10	1...11 x 10	1...10 x 10
	Alt	1...10 x 10	1...10 x 10	1...10 x 10	—
	High-Static	1...10 x 10	1...10 x 10	1...11 x 10	1...10 x 10
Type Drive	**Std**	Direct	Direct	Direct	Belt
	Alt	Belt	Belt	Belt	—
	High-Static	Belt	Belt	Belt	Belt
Nominal Cfm		1200	1600	2000	2400
Maximum Continuous Bhp	**Std**	.34	.75	1.20	2.40
	Alt	1.00	1.00	1.30/2.40**	—
	High-Static	2.40	2.40	2.90	2.90
Motor Frame Size	**Std**	48	48	48	56
	Alt	48	48	56	—
	High-Static	56	56	56	56
Nominal Rpm High/Low	**Std**	860/800	1075/970	1075/970	—
	Alt	1620	1620	1725	—
	High-Static	1725	1725	1725	1725
Fan Rpm Range	**Std**	—	—	—	1070-1460
	Alt	760-1000	835-1185	900-1300	—
	High-Static	1075-1455	1075-1455	1300-1685	1300-1685
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	**Std**	—	—	—	2.8/3.8
	Alt	1.9/2.9	1.9/2.9	2.4/3.4	—
	High-Static	2.8/3.8	2.8/3.8	3.4/4.4	3.4/4.4
Nominal Motor Shaft Diameter (in.)	**Std**	1/2	1/2	1/2	5/8
	Alt	1/2	1/2	5/8	—
	High-Static	5/8	5/8	5/8	5/8
Fan Pulley Pitch Diameter (in.)	**Std**	—	—	—	4.5
	Alt	4.5	4.0	4.5	—
	High-Static	4.5	4.5	4.5	4.5
Belt, Quantity...Type...Length (in.)	**Std**	—	—	—	1...A...40
	Alt	1...A...34	1...A...34	1...A...39	—
	High-Static	1...A...39	1...A...39	1...A...40	1...A...40
Pulley Center Line Distance (in.)	**Std**	—	—	—	14.7-15.5
	Alt	10.0-12.4	10.0-12.4	14.7-15.5	—
	High-Static	10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
Speed Change per Full Turn of Movable Pulley Flange (rpm)	**Std**	—	—	—	80
	Alt	48	70	80	—
	High-Static	65	65	60	60
Movable Pulley Maximum Full Turns From Closed Position	**Std**	—	—	—	5
	Alt	5	5	5	—
	High-Static	6	6	5	5
Factory Setting	**Std**	—	—	—	3
	Alt	3	3	3	—
	High-Static	3 1/2	3 1/2	3 1/2	3 1/2
Factory Speed Setting (rpm)	**Std**	—	—	—	1225
	Alt	856	975	1060	—
	High-Static	1233	1233	1396	1396
Fan Shaft Diameter at Pulley (in.)		5/8	5/8	5/8	5/8

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper

*Evaporator coil fin material/condenser coil fin material. Contact your local representative for details about coated fins.
†Weight of 14-in. roof curb.
**Single phase/three-phase.

††Rollout switch lockout is manually reset by interrupting power to unit or resetting thermostat.

NOTES:
1. The 48TJ004-007 units have a loss-of-charge (low pressure) switch located in the liquid line.
2. High-static motor not available on single-phase units.

Table 1 — Physical data (cont)

UNIT SIZE 48TJ		E/F004	D/E/F005	D/E/F006	D/E/F007
FURNACE SECTION					
Rollout Switch Cutout Temp (F)††		195	195	195	195
Burner Orifice Diameter (in. ...drill size)					
Natural Gas	Std	.113...33	.113...33/.113...33/.129...30	.113...33/.113...33/.129...30	.113...33/.113...33/.129...30
Liquid Propane	Alt	.089...43	.089...43/.089...43/.102...38	.089...43/.089...43/.102...38	.089...43/.089...43/.102...38
Thermostat Heat Anticipator Setting (amps)					
208/230 v and 575 Stage 1		.14	.14	.14	.14
Stage 2		.14	.14	.14	.14
460 v Stage 1		.14	.14	.14	.14
Stage 2		.14	.14	.14	.14
Gas Input (Btuh) Stage 1		74,000/82,000	74,000/115,000/120,000	74,000/115,000/120,000	74,000/115,000/120,000
Stage 2		—/115,000	—/—/150,000	—/—/150,000	—/—/150,000
Efficiency (Steady State) (%)		80	80	80	80
Temperature Rise Range		25-55/55-85	25-55/35-65/50-80	25-55/35-65/50-80	25-55/35-65/50-80
Manifold Pressure (in. wg)					
Natural Gas	Std	3.5	3.5	3.5	3.5
Liquid Propane	Alt	3.5	3.5	3.5	3.5
Gas Valve Quantity		1	1	1	1
Gas Valve Pressure Range					
Psig		0.180-0.487	0.180-0.487	0.180-0.487	0.180-0.487
in. wg		5.0-13.5	5.0-13.5	5.0-13.5	5.0-13.5
Field Gas Connection Size (in.)		1/2	1/2	1/2	1/2
HIGH-PRESSURE SWITCH (psig)					
Standard Compressor			450 ± 50		500 ± 50
Internal Relief (Differential)					
Cutout			428		428
Reset (Auto.)			320		320
LOSS-OF-CHARGE (LOW PRESSURE) SWITCH (psig)					
Cutout			7 ± 3		
Reset (Auto.)			22 ± 7		
FREEZE PROTECTION THERMOSTAT (F)					
Opens			30 ± 5		
Closes			45 ± 5		
OUTDOOR-AIR INLET SCREENS					
Quantity...Size (in.)			Cleanable 1...20 x 24 x 1		
RETURN-AIR FILTERS					
Quantity...Size (in.)			Throwaway 2...16 x 25 x 2		

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper

*Evaporator coil fin material/condenser coil fin material. Contact your local representative for details about coated fins.
†Weight of 14-in. roof curb.

**Single phase/three-phase.
††Rollout switch lockout is manually reset by interrupting power to unit or resetting thermostat.

NOTES:
1. The 48TJ004-007 units have a loss-of-charge (low-pressure) switch located in the liquid line.
2. High-static motor not available on single-phase units.

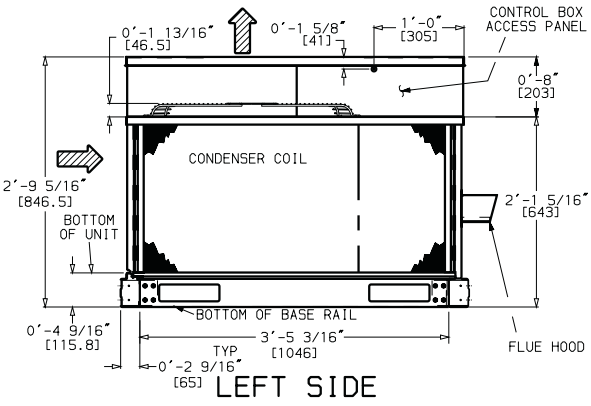
UNIT 48TJ	STANDARD UNIT WEIGHT		DURABLADE ECONOMIZER WEIGHT		ECONOMI$ER WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg
E/F004	460	209	34	15.4	47	21.3	140	63.5	105	47.6	159	72.1	56	25.4
D/E/F005	470	213	34	15.4	47	21.3	142	64.4	106	48.1	162	73.5	60	27.2
D/E/F006	490	222	34	15.4	47	21.3	150	68.0	115	52.2	160	72.6	65	29.5
D/E/F007	565	256	34	15.4	47	21.3	165	74.8	136	61.7	200	90.7	64	29.0

BOTTOM POWER CHART, THESE HOLES REQUIRED FOR USE WITH ACCESSORY PACKAGES — CRBTMPWR001A00, (POWER AND CONTROL) AND CRBTMPWR003A00 (POWER, CONTROL, AND GAS)

THREADED CONDUIT SIZE	WIRE USE	REQURED HOLE SIZES (MAX.)
1/2″	24 V	7/8″ [22.2]
3/4″	Power	1 1/8″ [28.4]
1/2″ FPT	Gas	1 1/4″ [31.8]

	CONNECTION SIZES
A	1 1/16″ Dia [27] Field Power Supply Hole
B	3/4″-14 NPT Condensate Drain
C	1/2″-14 NPT Gas Connection

NOTES:
1. Dimensions in [ ] are in millimeters.
2. Center of gravity.
3. Direction of airflow.
4. On vertical discharge units, ductwork to be attached to accessory roof curb only. For horizontal discharge units, field-supplied flanges should be attached to horizontal discharge openings, and all ductwork should be attached to the flanges.
5. Minimum clearance (local codes or jurisdiction may prevail):
   a. Between unit, flue side and combustible surfaces, 36 inches.
   b. Bottom of unit to combustible surfaces (when not using curb), 1 inch. Bottom of base rail to combustible surfaces (when not using curb) 0 inches.
   c. Condenser coil, for proper airflow, 36 in. one side, 12 in. the other. The side getting the greater clearance is optional.
   d. Overhead, 60 in. to assure proper condenser fan operation.
   e. Between units, control box side, 42 in. per NEC.
   f. Between unit and ungrounded surfaces, control box side, 36 in. per NEC.
   g. Between unit and block or concrete walls and other grounded surfaces, control box side, 42 in. per NEC.
   h. Horizontal supply and return end, 0 inches.
6. With the exception of the clearance for the condenser coil and combustion side as stated in notes 5a, b and c, a removable fence or barricade requires no clearance.
7. Units may be installed on combustible floors made from wood or Class A, B, or C roof covering material if set on base rail.
8. The vertical center of gravity is 1′-6″ [457] up from the bottom of the base rail.



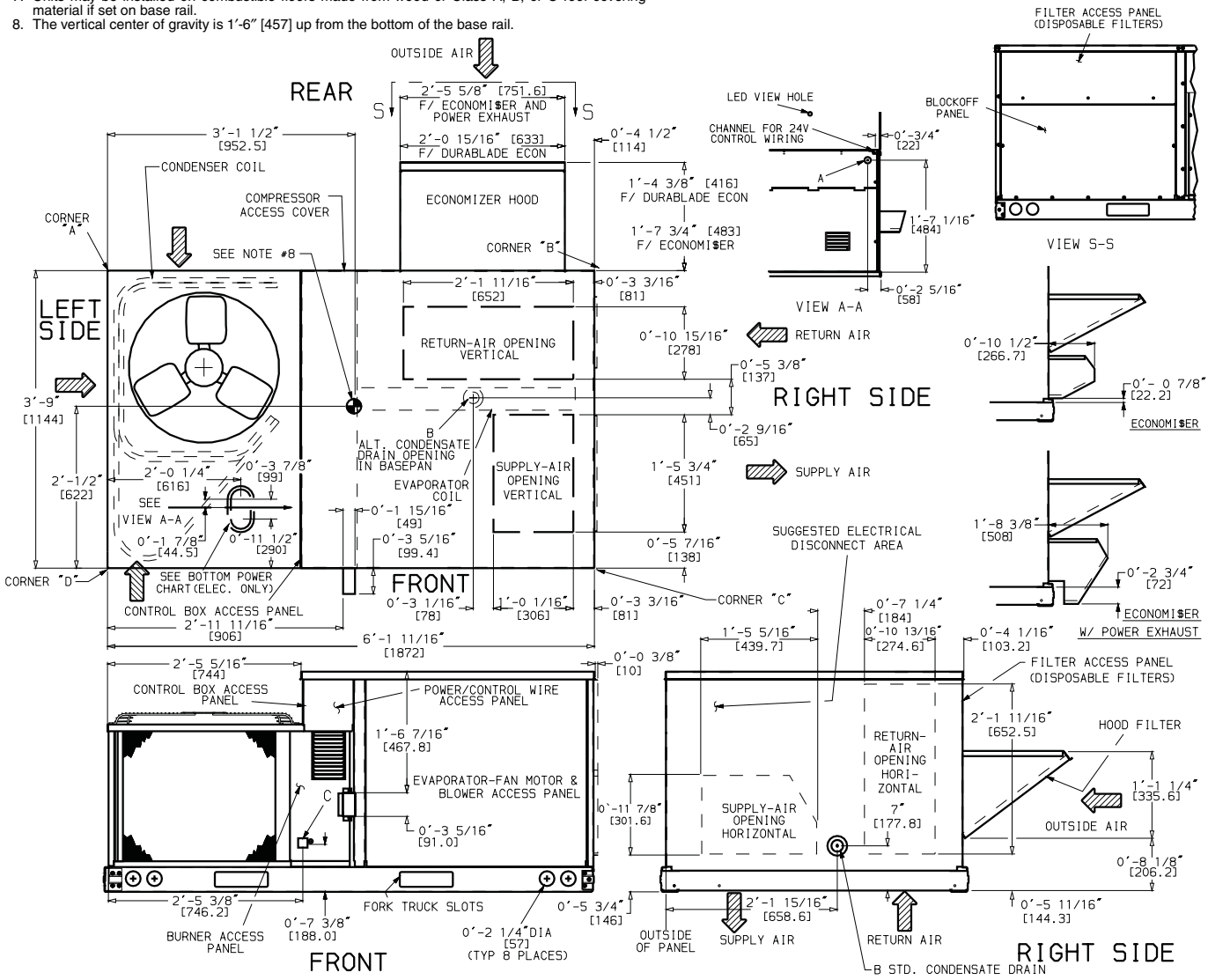


Fig. 6 — Base Unit Dimensions

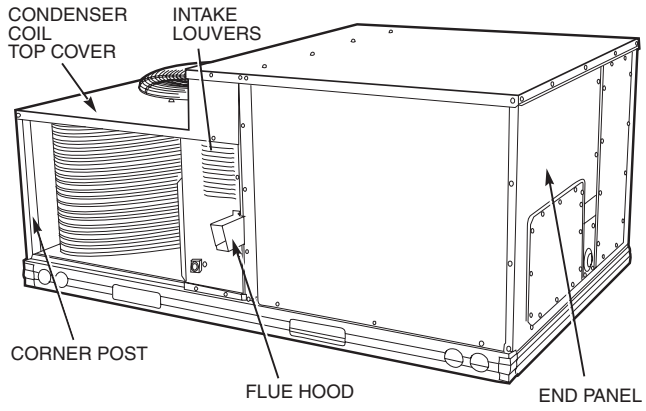
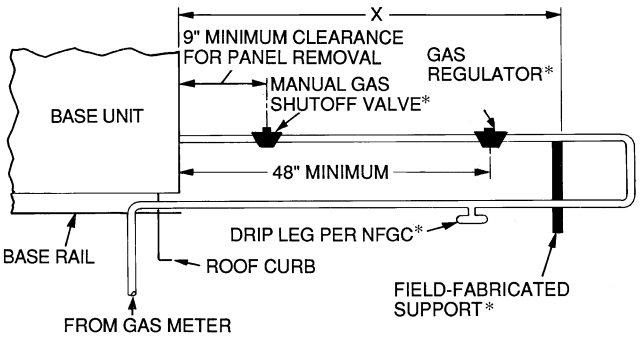


Fig. 7 — Flue Hood Details



LEGEND

NFGC — National Fuel Gas Code

*Field supplied.

NOTE: Follow all local codes.

SPACING OF SUPPORTS

STEEL PIPE NOMINAL DIAMETER (in.)	X DIMENSIONS (feet)
1/2	6
3/4 or 1	8
1 1/4 or larger	10

Fig. 8 — Gas Piping Guide (With Accessory Thru-the-Curb Service Connections)

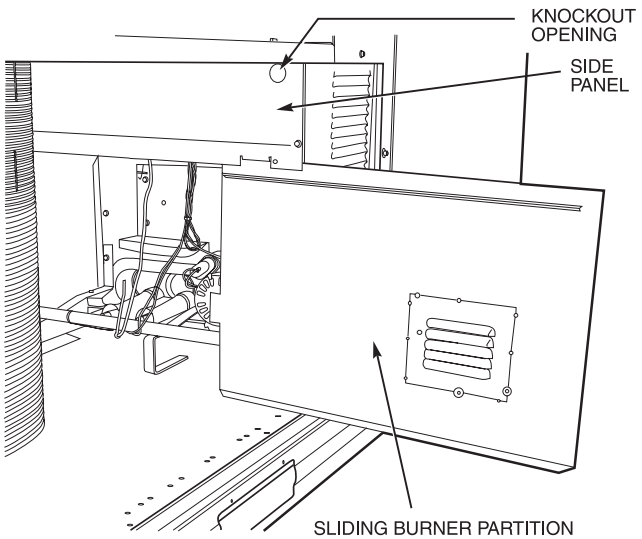
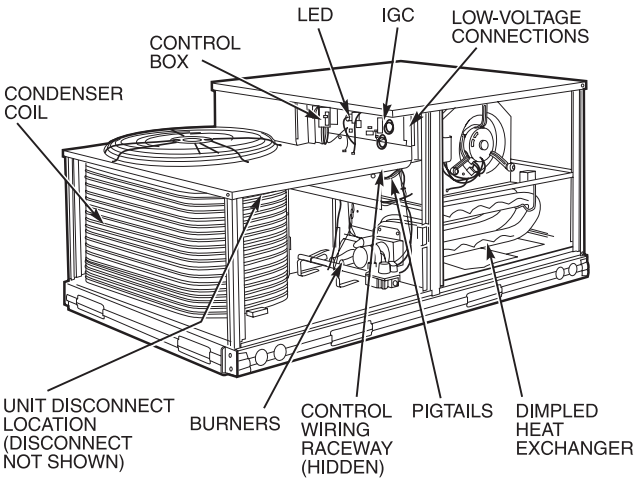


Fig. 9 — Conduit Installation



LEGEND

IGC — Integrated Gas Unit Controller

LED — Light-Emitting Diode

Fig. 10 — Component Location

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate (see Table 2). On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in the legend for Table 2, Note 2 to determine the percent of voltage imbalance. Operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation would invalidate any applicable Carrier warranty.

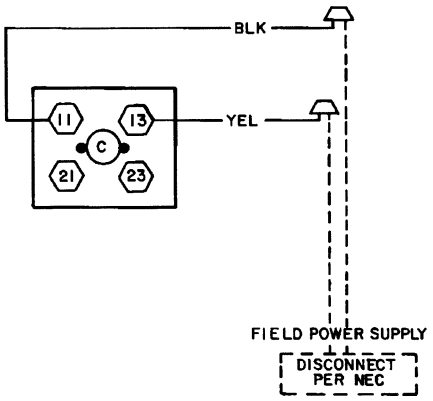
FIELD CONTROL WIRING — Install a Carrier-approved accessory thermostat assembly according to installation instructions included with the accessory. Locate thermostat assembly on a solid wall in the conditioned space to sense average temperature in accordance with thermostat installation instructions. Connect thermostat wires to terminal board.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals through connector on unit to low-voltage connections (shown in Fig. 12).

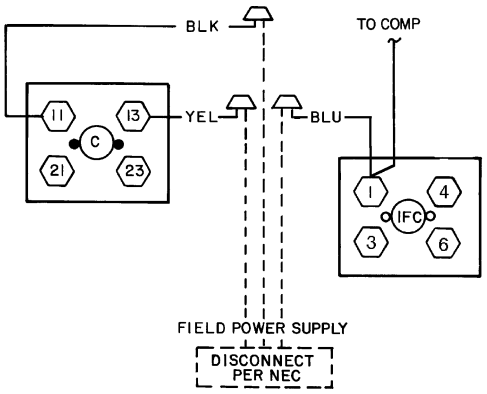
NOTE: For wire runs up to 50 ft, use no. 18 AWG (American Wire Gage) insulated wire (35 C minimum). For 50 to 75 ft, use no. 16 AWG insulated wire (35 C minimum). For over 75 ft, use no. 14 AWG insulated wire (35 C minimum). All wire larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.

Feed control wires through the raceway located between the condenser coil top cover and burner side panel. See Fig. 10. Connect control wires to corresponding screw terminals, the low-voltage connections located inside low-voltage access panel. See Fig. 12 for connections. The low-voltage connections provide the UL required clearance between high- and low-voltage wiring.

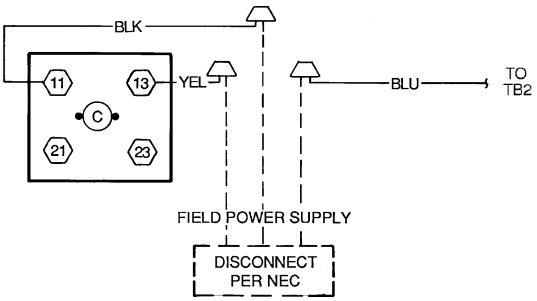
HEAT ANTICIPATOR SETTINGS — Set heat anticipator settings at .14 amp for the first stage and .14 amp for second-stage heating, when available.



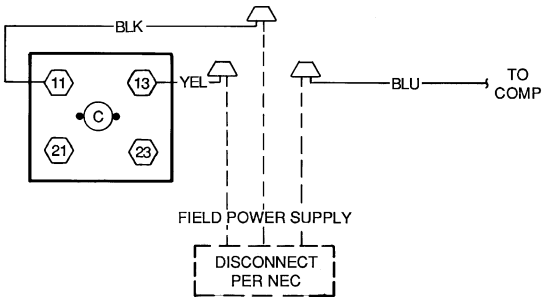
208/230-1-60



208/230-3-60
460-3-60
(SIZE 007 ONLY)



575-3-60
(SIZE 007 ONLY)

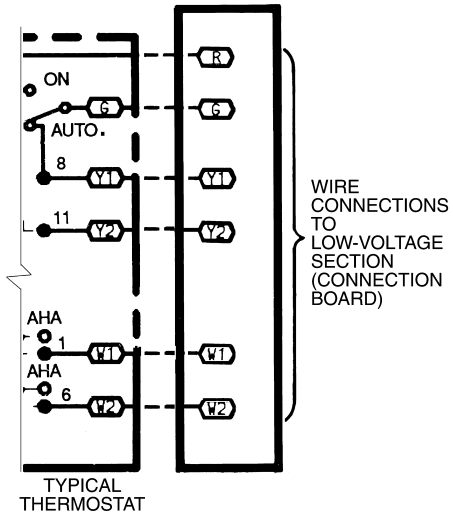


208/230-3-60
575-3-60, 460-3-60
(SIZES 004-006)

LEGEND

C — Contactor
COMP — Compressor
NEC — National Electrical Code
TB — Terminal Block

Fig. 11 — Power Wiring Connections



LEGEND

AHA — Adjustable Heat Anticipator
– – – – Field Wiring
——— Factory Wiring

Fig. 12 — Low-Voltage Connections

Table 2 — Electrical Data

UNIT 48TF	NOMINAL V-Ph-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)		OFM (ea)			IFM FLA	COMBUSTION FAN MOTOR FLA	POWER SUPPLY		DISCONNECT SIZE*	
			Min	Max	RLA	LRA	Qty	Hp	FLA			MCA	MOCP†	FLA	LRA
004	208/230-1-60	Std	187	254	16.2	96.0	1	1/4	1.4	3.5	.6	24.5/24.5	30/30	23/23	106/106
		Alt								4.9		26.6/26.6	35/35	26/26	111/111
	208/230-3-60	Std	187	254	10.2	75.0	1	1/4	1.4	3.5	.6	17.7/17.7	25/25	17/17	85/85
		Alt								4.9		19.1/19.1	25/25	19/19	90/90
		High								5.2		19.4/19.4	25/25	19/19	109/109
	460-3-60	Std	414	508	4.4	40.0	1	1/4	0.8	1.3	.3	7.6	15	7	48/48
		Alt								2.1		8.4	15	8	48/48
		High								2.6		8.9	15	9	57/57
	575-3-60	Std	518	632	3.7	31.0	1	1/4	0.8	1.3	.3	6.3	15	7	35
		Alt								2.1		6.9	15	8	37
		High								2.6		7.3	15	7	45
005	208/230-1-60	Std	187	254	23.3	118.0	1	1/4	1.4	3.5	.6	34.0/34.0	40/40	32/32	129/129
		Alt								4.9		35.4/35.4	45/45	34/34	133/133
	208/230-3-60	Std	187	254	15.4	90.0	1	1/4	1.4	3.5	.6	24.2/24.2	30/30	23/23	101/101
		Alt								4.9		25.6/25.6	30/30	25/25	105/105
		High								5.2		25.9/25.9	30/30	25/25	124/124
	460-3-60	Std	414	508	8.3	45.0	1	1/4	0.8	1.8	.3	13.0	20	13	51
		Alt								2.1		13.3	20	13	53
		High								2.6		13.8	20	13	62
	575-3-60	Std	518	632	6.4	36.0	1	1/4	0.8	1.8	.3	10.1	15	10	41
		Alt								2.1		10.3	15	11	42
		High								2.6		10.7	15	10	50
006	208/230-1-60	Std	187	254	28.8	147.0	1	1/4	1.4	5.9	.6	43.3/43.3	60/60	42/42	161/161
		Alt								6.6		44.0/44.0	60/60	42/42	184/184
	208/230-3-60	Std	187	254	16.3	114.0	1	1/4	1.4	5.9	.6	27.3/27.3	35/35	29/29	128/128
		Alt								5.2		26.6/26.6	35/35	26/26	148/148
		High								7.5		28.9/28.9	35/35	29/29	174/174
	460-3-60	Std	414	508	7.4	64.0	1	1/4	0.8	3.1	.3	13.2	20	13	72
		Alt								2.6		12.7	15	12	81
		High								3.4		13.5	20	13	94
	575-3-60	Std	518	632	6.2	62.0	1	1/4	0.8	3.1	.3	10.9	15	11	58
		Alt								3.0		10.5	15	10	66
		High								3.4		12.6	15	11	76
007	208/230-3-60	Std	187	254	23.6	146.0	1	1/4	1.4	5.2	.6	30.2/30.2	35/35	29/29	180/180
		High								7.5		32.5/32.5	40/40	32/32	205/205
	460-3-60	Std	414	508	10.6	73.0	1	1/4	0.6	2.6	.3	15.4	20	15	90
		High								3.4		16.1	20	16	103
	575-3-60	Std	518	632	8.5	58.4	1	1/4	0.6	2.6	.3	12.3	15	13	72
		High								3.4		12.9	20	14	82

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

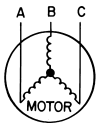
*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

   $$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Step 8 — Make Outdoor-Air Adjustments and Install Outdoor-Air Hood

MANUAL OUTDOOR-AIR DAMPER — The outdoor-air hood and screen are attached to the basepan at the bottom of the unit for shipping.

Assembly:

1. Determine quantity of ventilation required for building. Record amount for use in Step 8.
2. Remove and save outdoor air opening panel and screws. See Fig. 13.
3. Separate hood and screen from basepan by removing the 4 screws securing them. Save all screws.
4. Replace outdoor air opening panel.
5. Place hood on front of outdoor air opening panel. See Fig. 14 for hood details. Secure top of hood with the 4 screws removed in Step 3. See Fig. 15.
6. Remove and save 6 screws (3 on each side) from sides of the manual outdoor-air damper.
7. Align screw holes on hood with screw holes on side of manual outdoor-air damper. See Fig. 14 and 15. Secure hood with 6 screws from Step 6.
8. Adjust minimum position setting of the damper blade by adjusting the manual outdoor-air adjustment screws on the front of the damper blade. See Fig. 13. Slide blade vertically until it is in the appropriate position determined by Fig. 16. Tighten screws.
9. Remove and save screws currently on sides of hood. Insert screen. Secure screen to hood using the screws. See Fig. 15.

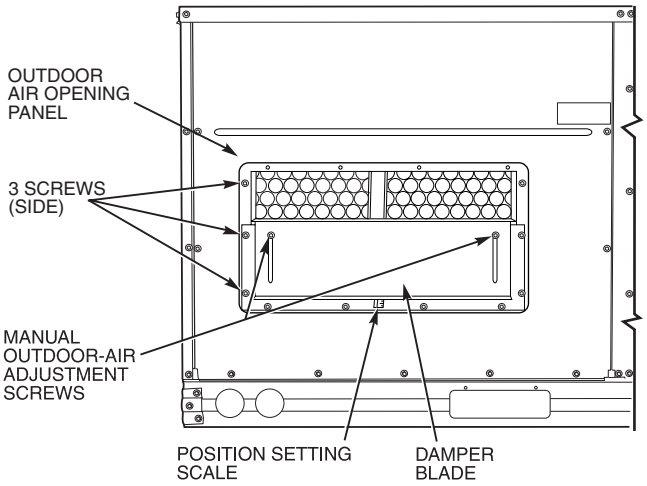


Fig. 13 — Damper Panel with Manual Outdoor-Air Damper Installed

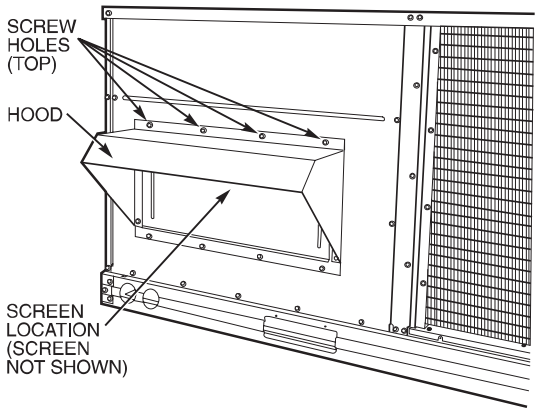


Fig. 15 — Outdoor-Air Damper with Hood Attached

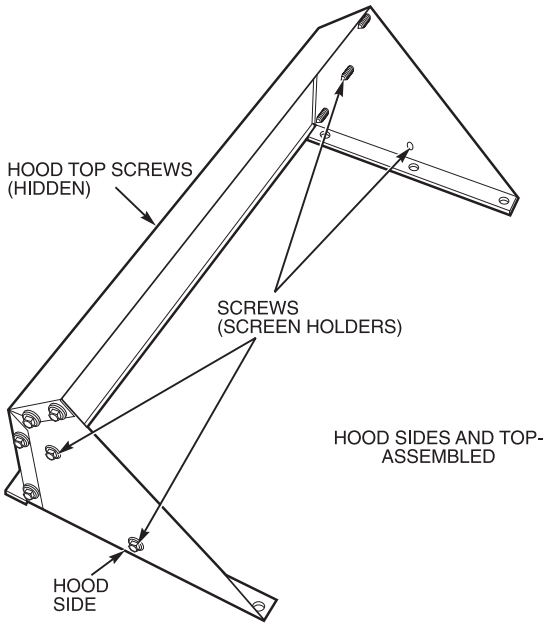


Fig. 14 — Outdoor-Air Hood Details

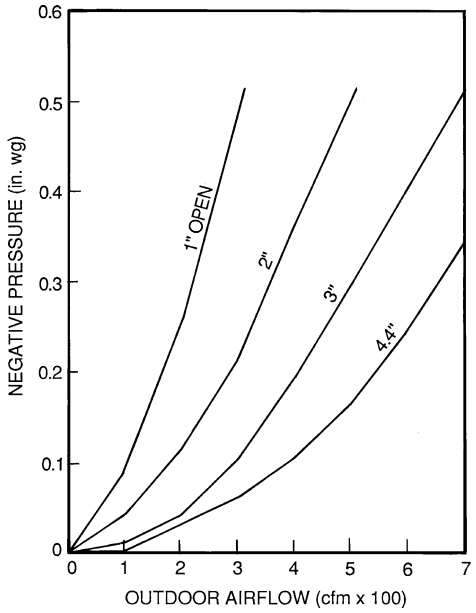


Fig. 16 — Position Setting

OPTIONAL DURABLADE ECONOMIZER — The optional economizer hood assembly is packaged and shipped in the filter section. Damper blades and control boards are installed at the factory and the economizer is shipped in the vertical discharge position.

NOTE: Horizontal discharge block-off plate is shipped with the air hood package. If unit is to be used for vertical discharge application, discard this plate.

NOTE: Be sure to engage Durablade economizer flange under tabs in return-air opening of the unit base.

Assembly:

1. Determine if ventilation air is required in building. If so, determine the minimum amount to be supplied by each unit and record quantity of ventilation air needed for use in Step 6.
2. Remove filter access panel by raising panel and swinging panel outward. Panel is now disengaged from track and can be removed. No tools are required to remove filter access panel. Remove outdoor-air opening panel. Save panels and screws. See Fig. 17. Remove optional economizer and outdoor-air damper hood package from filter section.
3. Assemble outdoor-air hood top and side plates as shown in Fig. 18. Install seal strips on hood top and sides. Put aside screen retainer and screws for later assembly. *Do not attach hood to unit at this time.*
4. To convert to horizontal discharge application:
   a. Rotate economizer 90 degrees until the economizer motor faces the condenser section (see Fig. 19).
   b. Remove screws and tape from damper then rotate the barometric relief damper hinge 90 degrees. Barometric relief damper should open vertically to operate properly.
   c. Install horizontal discharge block-off plate over the opening on the access panel. (Block-off plate MUST be installed before installing hood assembly.) See Fig. 20. Remove 12-pin blue and yellow wire jumper plug and store.
5. Insert economizer plug into economizer harness. Remove tape from barometric relief damper. See Fig. 21. Remove shipping screw (see Fig. 19).
6. If ventilation air is not required, proceed to Step 7. If ventilation air is required, determine the minimum position setting for required airflow. See Fig. 22. Adjust minimum position setting by adjusting the screws on the position setting bracket. Slide bracket until the top screw is in the position determined by Fig. 22. Tighten screws.
7. Remove tape from outdoor-air thermostat (OAT). Fasten OAT to inside of hood using screws and speed clips provided. See Fig. 23. Make sure OAT terminals are positioned up.
8. Replace outdoor-air opening panel using screws from Step 2. Replace filter access panel. Ensure the filter access panel slides along the tracks and is securely engaged.
9. Fasten hood top and side plate assembly (Fig. 18) to outdoor-air opening panel with screws provided.
10. Place knob supplied with economizer on OAT. See Fig. 23. Set OAT for 3° F below indoor room thermostat setting. If accessory enthalpy control (EC) is used in place of OAT, see instructions shipped with EC for installation and adjustment. See Fig. 23.
11. Connect OAT per Fig. 24.
12. Slide outdoor-air inlet screens into screen track on hood side plate. While holding screen in place, fasten screen retainer to hood using screws provided.

NOTE: Refer to Fig. 25 for economizer barometric relief damper characteristics.

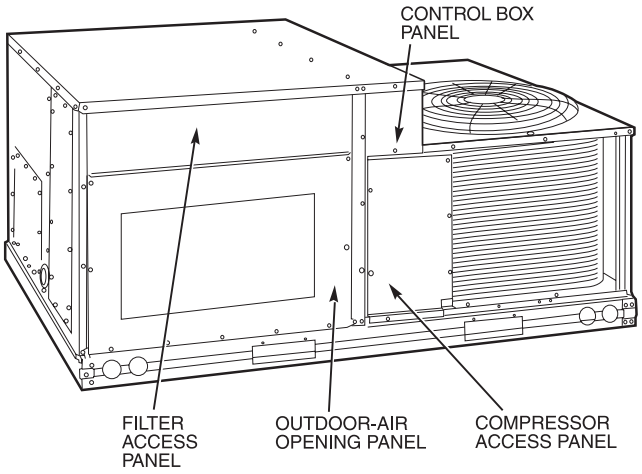
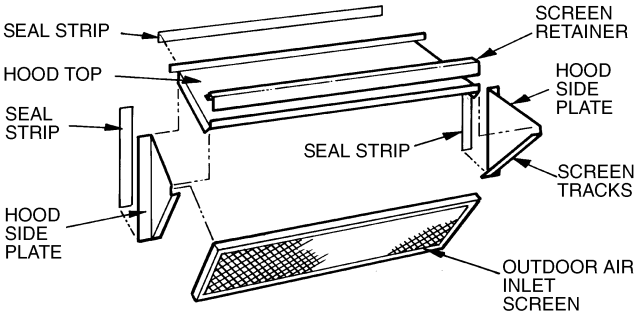


Fig. 17 — Typical Access Panel Locations



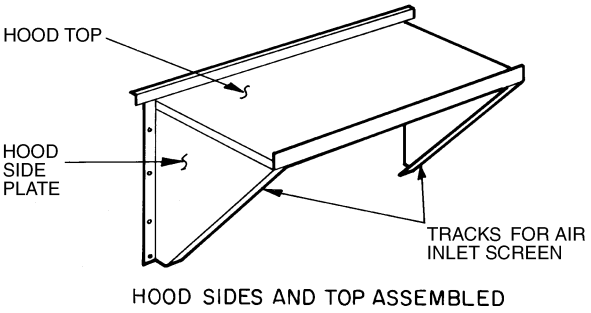


Fig. 18 — Outdoor-Air Hood Details

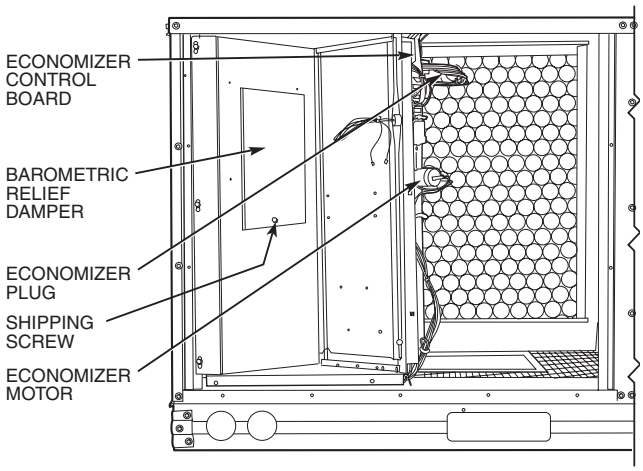


Fig. 19 — Horizontal Durablade Economizer Installation

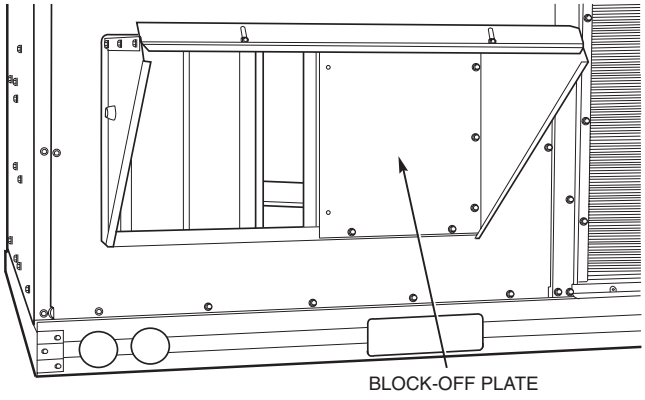
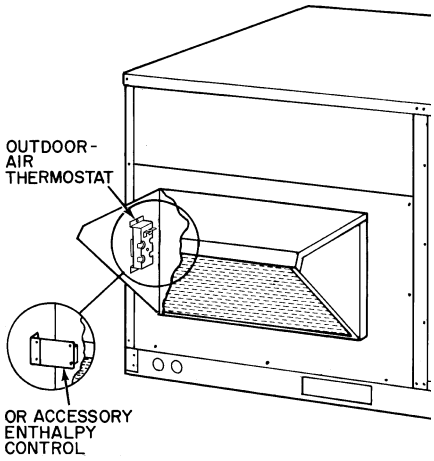


Fig. 20 — Horizontal Discharge Block-Off Plate



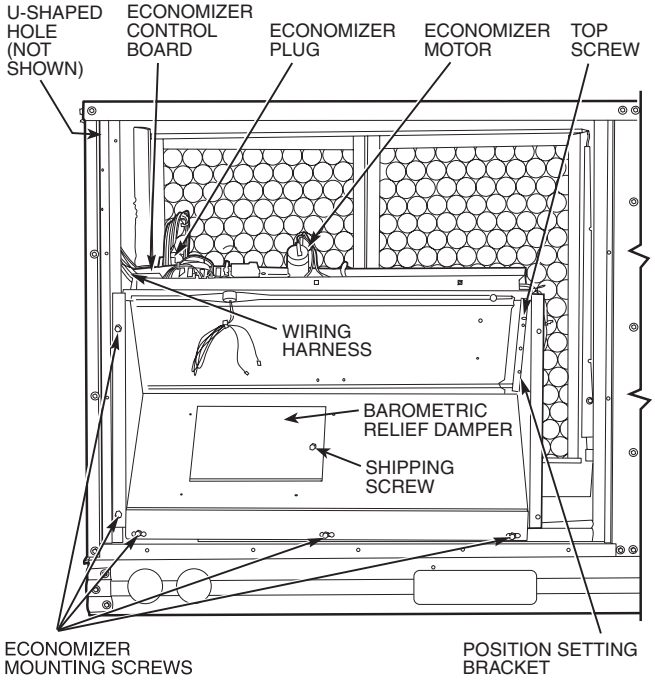
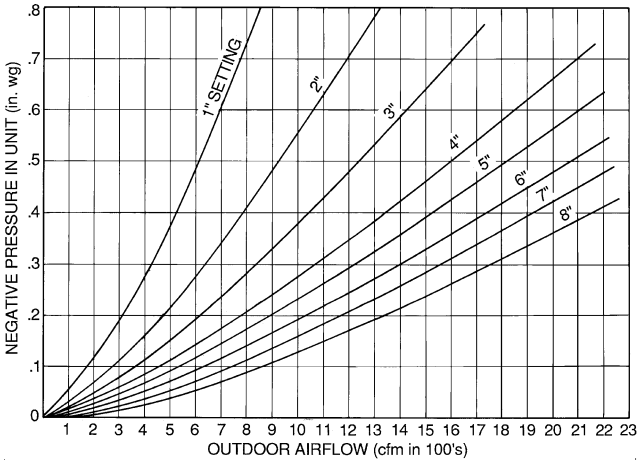
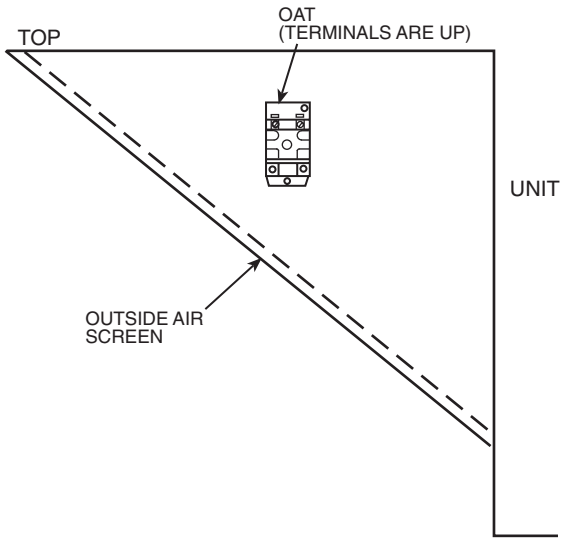


Fig. 21 — Durablade Economizer Installed in Unit



Example:
Given — Negative Pressure. . . . . 0.2 in. wg
Outdoor Air . . . . . 900 cfm
Determine — Setting = 5 in.

Fig. 22 — Durablade Economizer Minimum Position Setting



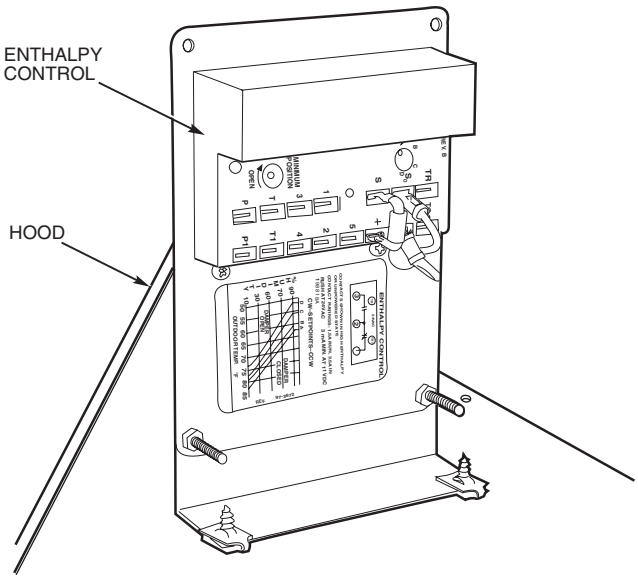
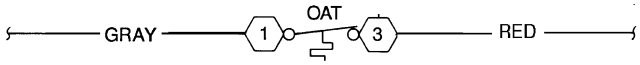


Fig. 23 — Outdoor-Air Thermostat/ Enthalpy Control Installation



LEGEND

OAT — Outdoor-Air Thermostat

NOTE: See unit wiring diagram for details.

Fig. 24 — Wiring Connections for Outdoor-Air Thermostat

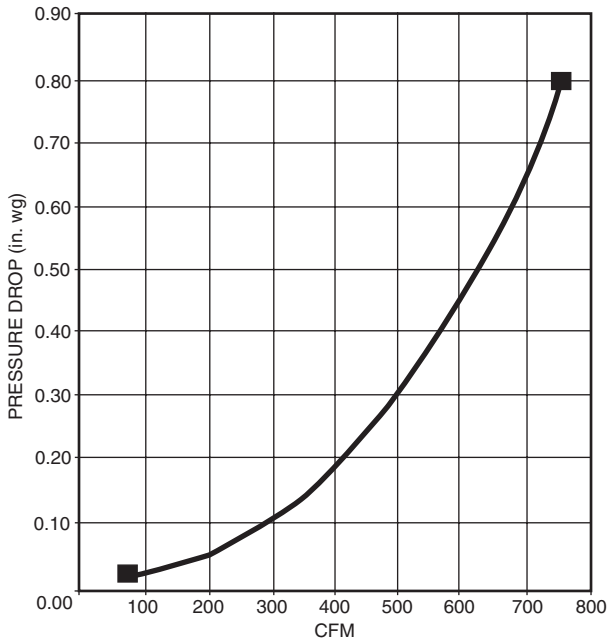


Fig. 25 — Durablade Economizer Barometric Relief Damper Characteristics

OPTIONAL ECONOMI$ER — See Fig. 26 for EconoMi$er component locations.

1. To remove the existing unit filter access panel, raise the panel and swing the bottom outward. The panel is now disengaged from the track and can be removed. Remove the indoor coil access panel and discard. See Fig. 27.

   If installing an optional Power Exhaust Assembly, refer to the *EconoMi$er Power Exhaust Installation Instructions*.

   Controller should be mounted in vertical position as shown in Fig. 26.

2. Assemble the hood assembly as follows:

   Remove the EconoMi$er hood from its packaging. Remove shipping brackets holding hood package to EconoMi$er. Locate the outdoor-air opening panel. See Fig. 28. Remove hood assembly shipping brackets located on the back (sloped) side of the EconoMi$er assembly. These brackets are used to retain the hood assembly during shipping only.

3. Install the $^1/_8$ x $^3/_4$-in. seal strip on the exhaust air hood side panels and the bottom bracket. Assemble the exhaust air hood to the outdoor-air opening panel as shown in Fig. 28, using the screws provided. *Do not attach hood assembly to unit at this time.*

4. Install the $^1/_8$ x $^3/_4$-in. seal strip on the outdoor-air hood top and side panels. Assemble the outdoor-air hood to the outdoor-air opening panel as shown in Fig. 29, using the screws provided. *Do not attach hood assembly to the unit at this time.*

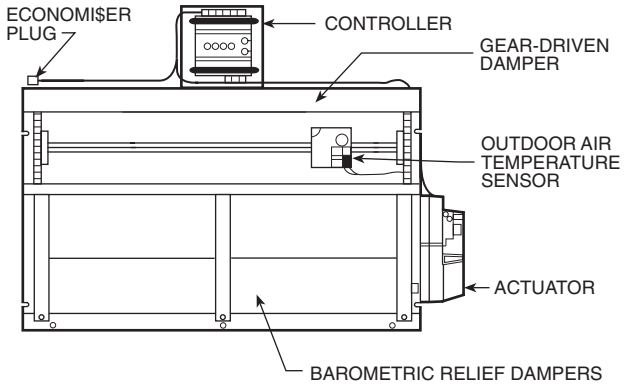


Fig. 26 — EconoMi$er Component Locations

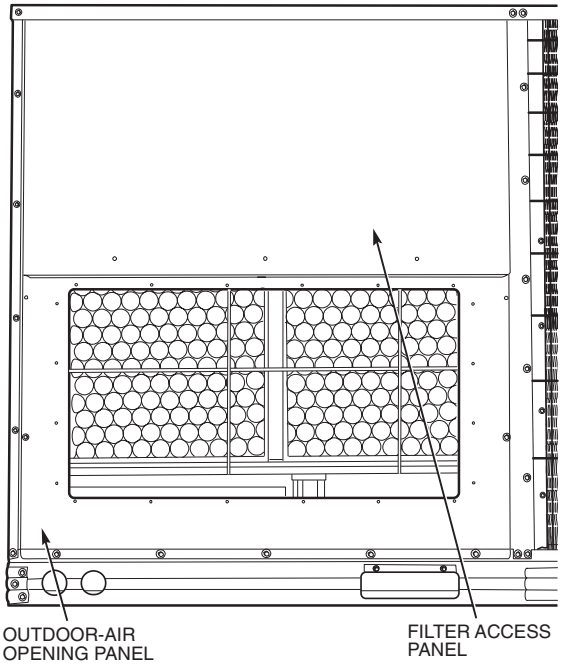


Fig. 27 — Typical Access Panel Locations

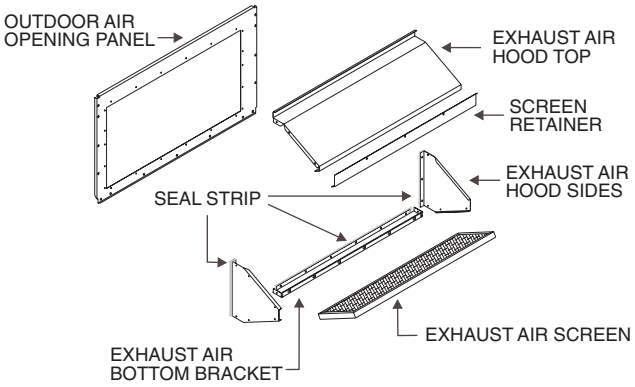


Fig. 28 — Exhaust Air Hood Assembly

5. Slide the outdoor-air inlet screens into the screen track on the hood side panels. While holding the screens in place, fasten the screen retainer to the hood using the screws provided. Repeat the process for the barometric exhaust air screen. *Do not attach completed (Fig. 30) hood assembly to unit at this time.*
6. Slide the EconoMi$er assembly into the rooftop unit. See Fig. 31 and 32.

NOTE: Be sure to engage rear EconoMi$er flange under tabs in return-air opening of the unit base. See Fig. 31.

7. Install the outdoor-air block-off plate, then secure the EconoMi$er with the screws provided. See Fig. 32.
8. Remove and discard the 12-pin jumper plug from the unit wiring harness located in the upper left corner and insert the EconoMi$er plug into the unit wiring harness. Refer to wiring diagrams Fig. 33 and 34. Also refer to Fig. 35 if installing an accessory power exhaust.
9. Install the complete hood assembly on the unit and secure using the screws provided.
10. Remove the indoor fan motor access panel. See Fig. 36.
11. Mount the supply-air temperature sensor to the lower left portion of the indoor blower housing with the two (2) screws provided (see Fig. 37). Connect the violet and pink wires to the corresponding connections on the supply-air temperature sensor. Replace the indoor fan motor access panel.

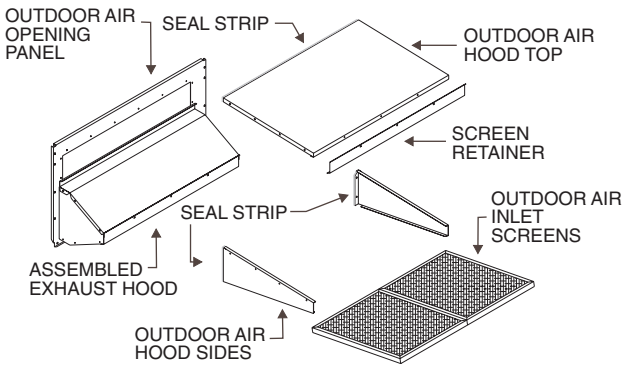


Fig. 29 — Outdoor-Air Hood Assembly

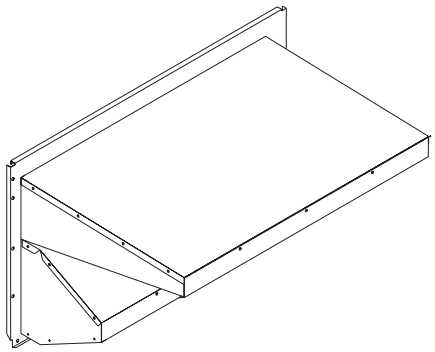


Fig. 30 — Completed Hood Assembly

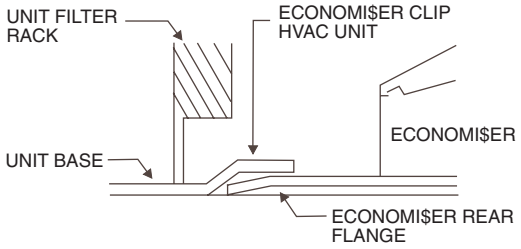


Fig. 31 — Rear EconoMi$er Flange Installation

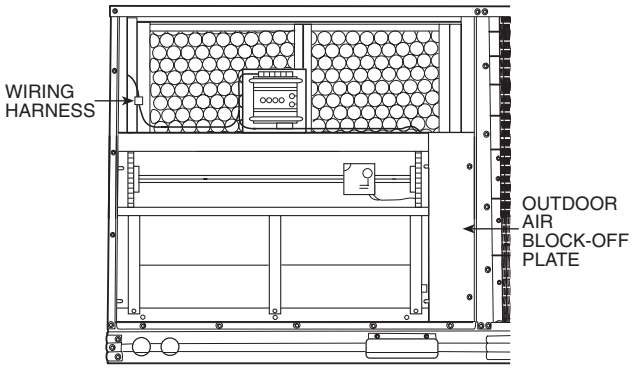
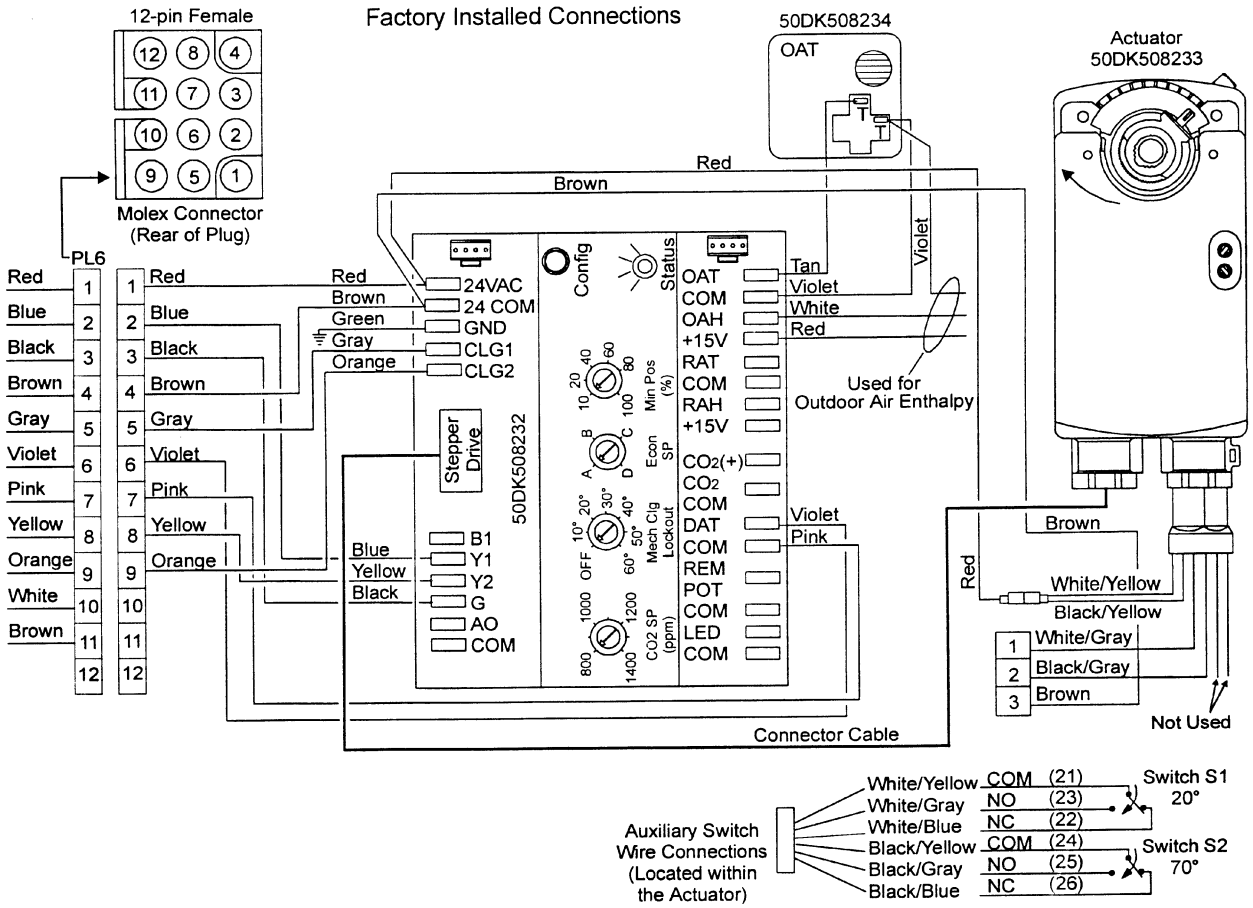


Fig. 32 — EconoMi$er Installed



LEGEND

OAT — Outdoor-Air Thermostat

Fig. 33 — EconoMi$er Wiring

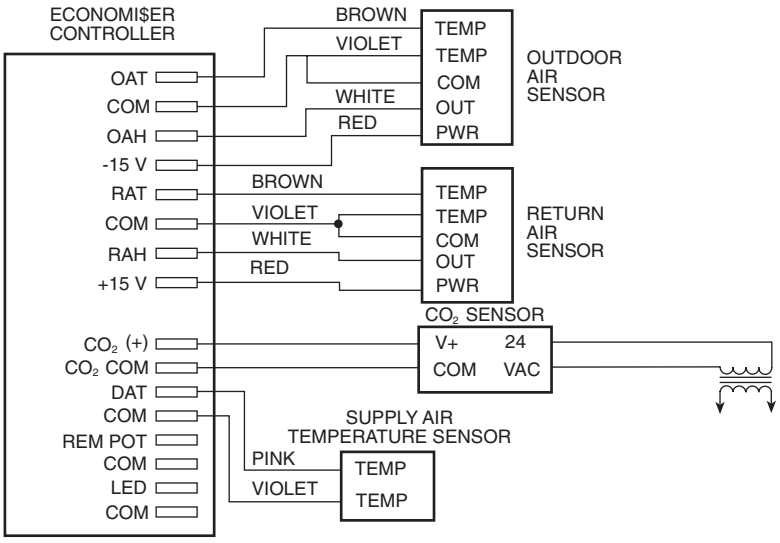


Fig. 34 — EconoMi$er Sensor Wiring

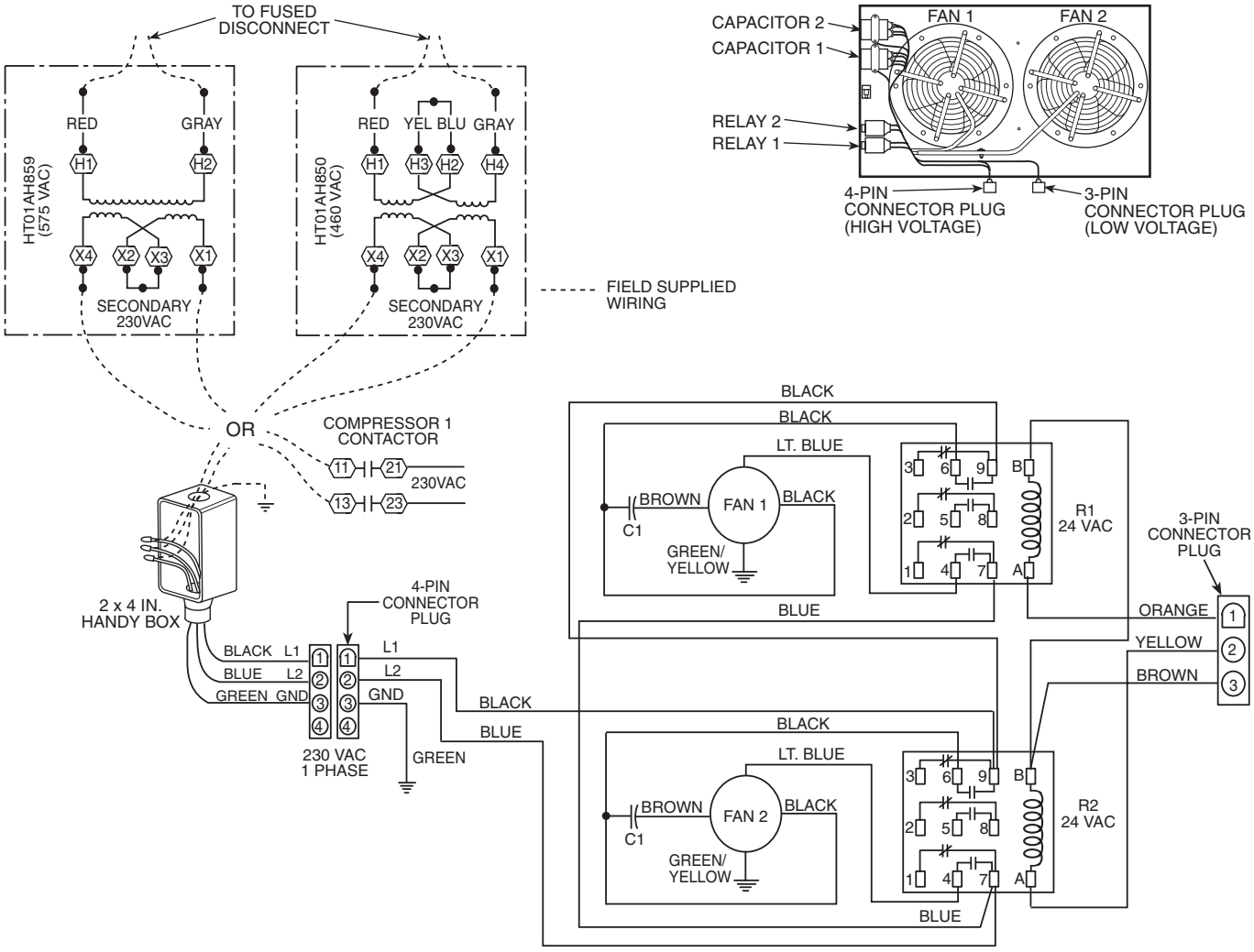


Fig. 35 — Wiring Diagram for Power Exhaust System

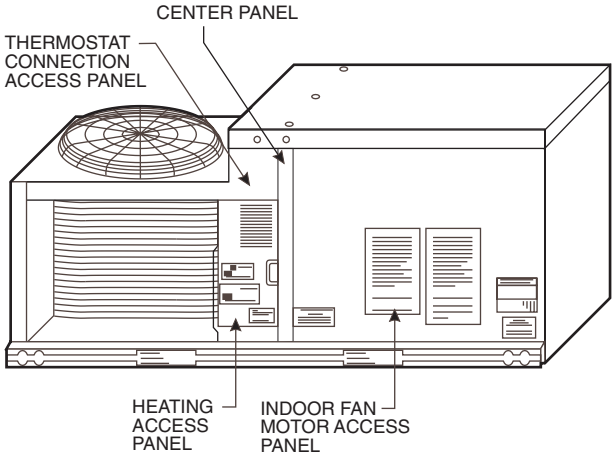


Fig. 36 — Typical Access Panel Locations (Standard Efficiency Unit Shown)

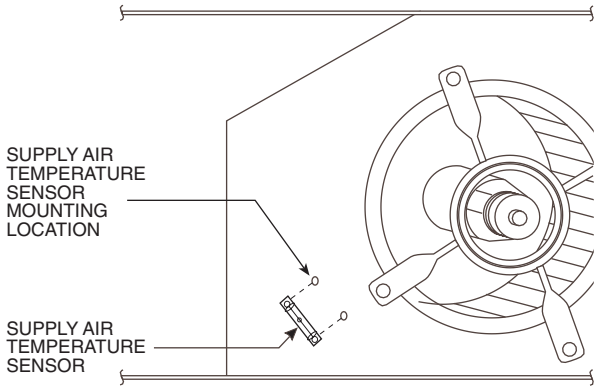


Fig. 37 — Supply-Air Sensor Placement

CO_2 Control Set Up — If a CO_2 sensor is not being used, proceed to the next section. If a CO_2 sensor is being used, perform the following:

1. Determine the value at which you want the minimum position of the dampers to begin opening to allow a greater amount of outdoor air to enter. The range is 800 to 1,400 ppm.
2. Locate the CO_2 SP (PPM) potentiometer and adjust to the desired set point. See Fig. 38.

Mechanical Cooling Lockout — Determine the outdoor-air temperature at which you want the mechanical cooling (compressors) to be disabled. Locate the mechanical cooling lockout (MECH CLG LOCKOUT) potentiometer. To disable this feature, turn the potentiometer counterclockwise (CCW) to the OFF position. Otherwise, set the value between 10 and 60 F. Mechanical cooling will not operate when the outdoor air temperature is below this value. See Fig. 38.

Dry Bulb Changeover Set Up — Determine the dry bulb changeover set point from Table 3. The settings are A, B, C and D. Locate the ECON SP potentiometer and set the dry bulb changeover set point. See Fig. 38. When the OAT is above this set point, the damper is limited to minimum position setting.

Table 3 — Changeover Set Points

SETTINGS	A	B	C	D
Dry Bulb (°F)	73	69	66	63
Single Enthalpy* (Btu/lb)	27	25	24	22
Differential Temperature* (°F, Not Adjustable)	2	2	2	2
Differential Enthalpy* (Btu/lb, Not Adjustable)	1	1	1	1

*Field-installed accessory.

If a potentiometer fails, its setting will default to the values in Table 4.

Table 4 — Default Potentiometer Settings

POTENTIOMETER	DEFAULT SETTING
CO_2 SP (PPM)	1,000
MECH CLG LOCKOUT	47°
ECON SP	D
MIN POS (%)	20

Ventilation Air (Minimum Position Set up) — If ventilation air is not required, proceed to Step 5. If ventilation air is required, perform the following:

1. The indoor fan must be on to set the ventilation air. Either put the thermostat in the continuous fan mode or jumper the R and G terminals at the rooftop unit connection board.
2. Locate the minimum position (MIN POS) potentiometer. Turn the potentiometer full CCW to fully close the outdoor air dampers. Turn the potentiometer gradually clockwise (CW) to the desired position. See Fig. 38.
3. Replace the filter access panel. See Fig. 26. Ensure the filter access panel slides along the tracks and is securely engaged.
4. Calculate the minimum airflow across the EconoMi$er.
   a. Calculate % of outside air using the following formula.

      % Outdoor air through EconoMi$er

      $$\%\ \text{Outdoor air} = \frac{\text{Mixture Temp} - \text{Return Air Temp}}{\text{Outdoor Temp} - \text{Return Air Temp}}$$

   b. Divide total CFM by percentage outdoor air, this gives outdoor air volume in CFM.
5. Turn on base unit power.

   NOTE: The EconoMi$er begins operation three minutes after power up.

⚠ WARNING

Personal Injury Hazard. Avoid possible injury by keeping fingers away from damper blades.

6. See Fig. 39 for barometric relief damper characteristics.

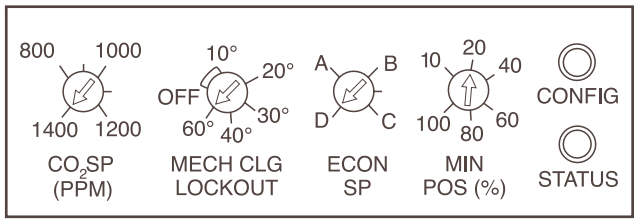


Fig. 38 — EconoMi$er Control Adjustment Potentiometers (Factory Settings)

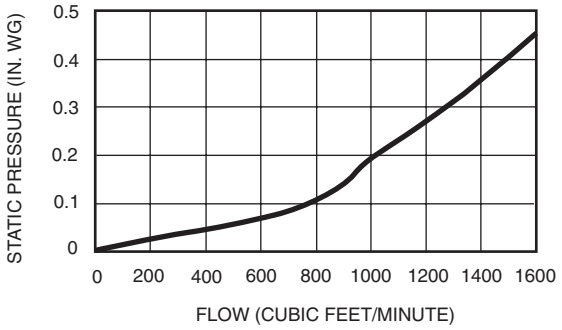


Fig. 39 — Barometric Relief Capacity

Step 9 — Adjust Evaporator-Fan Speed — Adjust evaporator-fan rpm to meet jobsite conditions. Table 5 shows fan rpm at motor pulley settings. Table 6 shows motor performance. See Table 7 for Accessory/FIOP Static Pressure. Refer to Tables 8-29 to determine fan speed settings.

DIRECT-DRIVE MOTORS — The evaporator-fan motor factory speed setting is shown on label diagram affixed to base unit. If other than factory setting is desired, refer to label diagram for motor reconnection. See Fig. 40 for direct drive motor location.

BELT-DRIVE MOTORS — Fan motor pulleys are factory set for speed shown in Table 1. See Fig. 41 for belt drive location.

NOTE: Before adjusting fan speed, make sure the new fan speed will provide an air temperature rise range as shown in Table 1.

To change fan speed:

1. Shut off unit power supply and tag disconnect.
2. Loosen belt by loosening fan motor mounting nuts. See Fig. 41.
3. Loosen movable pulley flange setscrew (see Fig. 42).
4. Screw movable flange toward fixed flange to increase speed and away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed maximum speed specified in Table 1.
5. Set movable flange at nearest keyway of pulley hub and tighten setscrew. (See Table 1 for speed change for each full turn of pulley flange.)

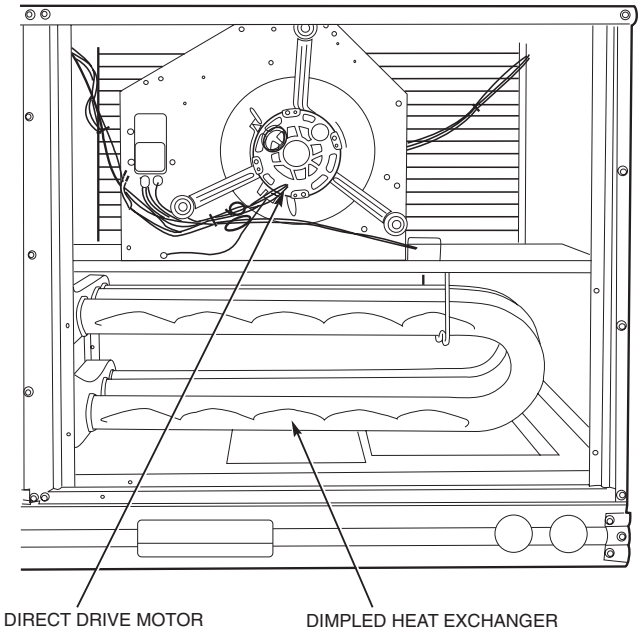


Fig. 40 — Direct-Drive Motor Mounting

To align fan and motor pulleys:

1. Loosen fan pulley setscrews.
2. Slide fan pulley along fan shaft.
3. Make angular alignment by loosening motor from mounting.

To adjust belt tension:

1. Loosen fan motor mounting nuts.
2. Slide motor mounting plate away from fan scroll for proper belt tension ($^1/_2$-in. deflection with 8 to 10 lbs of force).
3. Tighten motor mounting nuts.
4. Adjust bolt and tighten nut to secure motor in fixed position.

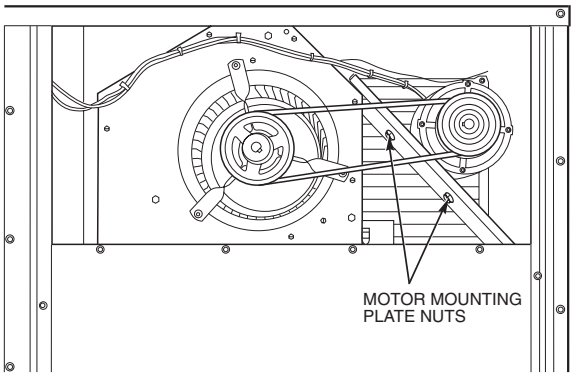


Fig. 41 — Belt Drive Motor Mounting

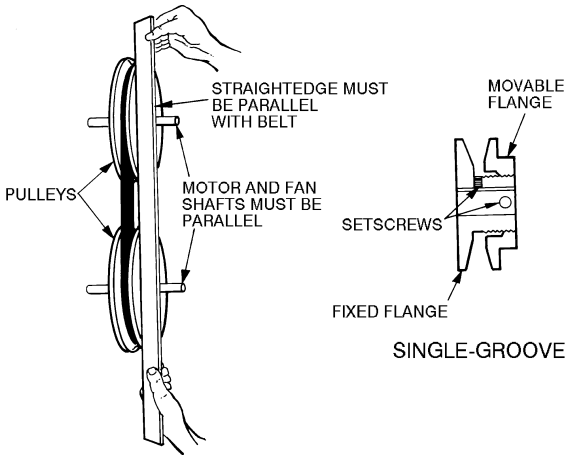


Fig. 42 — Evaporator-Fan Pulley Adjustment

Table 5 — Fan Rpm at Motor Pulley Settings*

UNIT 48TJ	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
004†	1000	976	952	928	904	880	856	832	808	784	760	—	—
004**	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
005†	1185	1150	1115	1080	1045	1010	975	940	905	870	835	—	—
005**	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
006†	1300	1260	1220	1180	1140	1100	1060	1020	980	940	900	—	—
006**	1685	1589	1557	1525	1493	1460	1428	1396	1364	1332	1300	—	—
007††	1460	1420	1380	1345	1305	1265	1225	1185	1150	1110	1070	—	—
007**	1685	1589	1557	1525	1493	1460	1428	1396	1364	1332	1300	—	—

*Approximate fan rpm shown.
†Indicates alternate motor and drive package.
**Indicates high-static motor and drive package.
††Indicates standard motor and drive package.

Table 6 — Motor Data

UNIT 48TJ	EVAPORATOR-FAN MOTOR	UNIT VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE OPERATING WATTS	MAXIMUM AMP DRAW
004	Standard	208/230	0.34	440	2.8
		460			1.3
		575			1.3
	Alternate	208/230	1.00	1000	4.9
		460			2.1
		575			2.1
	High Static	208/230	2.40	2120	6.0
		460			3.0
		575			3.0
005	Standard	208/230	0.75	850	3.5
		460			1.8
		575			1.8
	Alternate	208/230	1.00	1000	4.9
		460			2.1
		575			2.1
	High Static	208/230	2.40	2120	6.0
		460			3.0
		575			3.0
006	Standard	208/230	1.20	1340	5.9
		460			3.2
		575			3.2
	Alternate	208/230	1.30/2.40†	2120	10.1/6.7†
		460			3.0
		575			3.0
	High Static	208/230	2.90	2562	8.6
		460			3.9
		575			3.9
007	Standard	208/230	2.40	2120	6.7
		460			3.0
		575			3.0
	High Static	208/230	2.90	2562	8.6
		460			3.9
		575			3.9

LEGEND
BHP — Brake Horsepower
*Extensive motor and electrical testing on these units ensures that the full horsepower range of the motors can be utilized with confidence. Using your fan motors up to the horsepower ratings shown in this table will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
†Single phase/three-phase.

NOTES:
1. All indoor-fan motors 5 hp and larger meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT) effective October 24, 1997.
2. High-static motor not available on single-phase units.

Table 7 — Accessory/FIOP Static Pressure* (in. wg) — 48TJ004-007

COMPONENT	CFM									
	900	1200	1400	1600	1800	2000	2200	2400	2600	3000
Durablade Economizer	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
EconoMi$er	0.05	0.09	0.13	0.17	0.22	0.27	0.32	0.39	0.45	0.53

LEGEND
FIOP — Factory-Installed Option

*The static pressure must be added to external static pressure. The sum and the evaporator entering-air cfm should then be used in conjunction with the Fan Performance tables to determine blower rpm and watts.

Table 8 — Fan Performance 48TJ004 — Vertical Discharge Units, Standard Motor

48TJ004 (3 TONS) — STANDARD MOTOR (DIRECT DRIVE)

Airflow (Cfm)	Low Speed						High Speed					
	208 V			230, 460, 575 V			208 V			230, 460, 575 V		
	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts
900	0.49	0.21	253	0.50	0.23	277	0.51	0.26	307	0.55	0.31	363
1000	0.42	0.23	270	0.43	0.25	292	0.43	0.27	321	0.51	0.32	374
1100	0.37	0.24	287	0.38	0.26	307	0.39	0.28	335	0.46	0.33	385
1200	0.33	0.26	304	0.33	0.27	323	0.34	0.29	349	0.40	0.34	397
1300	0.27	0.27	321	0.28	0.29	338	0.28	0.31	364	0.34	0.34	408
1400	0.20	0.29	338	0.23	0.30	354	0.25	0.32	378	—	—	—
1500	0.16	0.30	355	0.18	0.31	369	0.20	0.33	392	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Esp — External Static Pressure (in. wg)
FIOP — Factory-Installed Option

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 9 —Fan Performance 48TJ004 — Vertical Discharge Units, Alternate Motor

48TJ004 (3 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.1			0.2			0.3			0.4			0.5			0.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**581**	**0.12**	**119**	**673**	**0.18**	**179**	**736**	**0.22**	**219**	805	0.25	249	865	0.29	288	911	0.34	338
1000	**644**	**0.19**	**189**	**709**	**0.22**	**219**	782	0.28	279	835	0.30	298	900	0.35	348	937	0.38	378
1100	**687**	**0.22**	**219**	**746**	**0.26**	**259**	806	0.30	298	867	0.35	348	929	0.40	398	964	0.40	398
1200	**733**	**0.26**	**259**	785	0.32	318	843	0.35	348	903	0.41	408	960	0.47	467	994	0.50	497
1300	**754**	**0.29**	**288**	826	0.38	378	891	0.43	428	942	0.48	477	991	0.53	527	**1047**	**0.60**	**597**
1400	810	0.35	348	868	0.45	448	937	0.51	507	984	0.57	567	**1032**	**0.62**	**617**	**1067**	**0.67**	**666**
1500	841	0.42	418	911	0.53	527	985	0.61	607	**1029**	**0.66**	**656**	**1073**	**0.72**	**716**	**1109**	**0.77**	**766**

48TJ004 (3 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.7			0.8			0.9			1.0			1.1			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	957	0.39	388	988	0.43	428	**1039**	**0.47**	**448**	**1061**	**0.51**	**487**	**1083**	**0.54**	**527**	**1105**	**0.58**	**567**
1000	992	0.44	438	**1039**	**0.49**	**487**	**1061**	**0.55**	**507**	**1088**	**0.60**	**547**	**1111**	**0.66**	**587**	**1136**	**0.72**	**627**
1100	**1013**	**0.49**	**487**	**1068**	**0.55**	**547**	**1091**	**0.61**	**577**	**1109**	**0.66**	**607**	**1127**	**0.73**	**637**	**1145**	**0.80**	**666**
1200	**1045**	**0.56**	**557**	**1090**	**0.64**	**637**	**1109**	**0.68**	**647**	**1156**	**0.73**	**676**	**1203**	**0.81**	**706**	**1250**	**0.86**	**736**
1300	**1075**	**0.64**	**637**	**1122**	**0.70**	**696**	**1152**	**0.76**	**716**	**1190**	**0.82**	**756**	**1228**	**0.87**	**796**	**1266**	**0.94**	**836**
1400	**1110**	**0.73**	**726**	**1160**	**0.78**	**766**	**1181**	**0.83**	**806**	**1237**	**0.88**	**845**	**1293**	**0.94**	**885**	**1349**	**0.99**	**925**
1500	**1150**	**0.78**	**816**	**1190**	**0.84**	**855**	**1225**	**0.89**	**895**	**1271**	**0.95**	**945**	**1317**	**1.00**	**995**	1383	1.05	1044

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 760 to 1000 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Shaded cells indicate field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 1.0 and the maximum continuous watts are 1000. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 10 — Fan Performance 48TJ004 — Vertical Discharge Units, High-Static Motor

48TJ004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**673**	**0.18**	**179**	**805**	**0.25**	**249**	**911**	**0.34**	**338**	**988**	**0.43**	**428**	**1061**	**0.47**	**487**
1000	**709**	**0.22**	**219**	**835**	**0.30**	**298**	**937**	**0.38**	**378**	**1039**	**0.49**	**487**	1086	0.55	547
1100	**746**	**0.26**	**259**	**867**	**0.35**	**348**	**964**	**0.40**	**398**	**1068**	**0.55**	**547**	1109	0.61	607
1200	**785**	**0.32**	**318**	**903**	**0.41**	**408**	**994**	**0.50**	**497**	1090	0.64	637	1156	0.68	676
1300	**826**	**0.38**	**378**	**942**	**0.48**	**477**	**1047**	**0.60**	**597**	1122	0.70	696	1190	0.76	756
1400	**868**	**0.45**	**448**	**984**	**0.57**	**567**	**1067**	**0.67**	**666**	1160	0.84	766	1237	0.85	845
1500	**911**	**0.53**	**527**	**1029**	**0.66**	**656**	1109	0.77	766	1190	1.00	855	1271	0.95	945

48TJ004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1105	0.57	567	1140	0.63	622	1170	0.68	674	1198	0.73	723	1224	0.77	771
1000	1136	0.63	627	1172	0.69	688	1203	0.75	745	1232	0.80	799	1258	0.86	852
1100	1145	0.67	666	1181	0.73	731	1213	0.80	792	1242	0.85	850	1268	0.91	906
1200	1210	0.74	736	1248	0.81	808	1282	0.88	875	1312	0.94	939	1340	1.01	1000
1300	1266	0.84	836	1306	0.92	917	1341	1.00	993	1373	1.07	1066	1402	1.14	1136
1400	1349	0.93	925	1391	1.02	1015	1492	1.11	1100	**1463**	**1.19**	**1180**	**1494**	**1.26**	**1257**
1500	1383	1.05	1044	1426	1.15	1146	**1465**	**1.25**	**1242**	**1500**	**1.34**	**1332**	**1532**	**1.43**	**1419**

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1075 to 1455 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
3. Maximum continuous bhp is 2.4 and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 11 — Fan Performance 48TJ005 — Vertical Discharge Units, Standard Motor

48TJ005 (4 TONS) — STANDARD MOTOR (DIRECT DRIVE)

Airflow (Cfm)	Low Speed						High Speed					
	208 V			230, 460, 575 V			208 V			230, 460, 575 V		
	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts
1200	0.68	0.41	458	0.74	0.45	506	0.74	0.51	572	0.85	0.56	632
1300	0.61	0.42	471	0.67	0.46	521	0.66	0.52	589	0.78	0.58	651
1400	0.53	0.45	503	0.59	0.49	556	0.59	0.54	616	0.70	0.60	681
1500	0.45	0.47	536	0.51	0.52	593	0.52	0.56	631	0.63	0.62	698
1600	0.36	0.49	557	0.42	0.54	616	0.45	0.58	654	0.56	0.64	723
1700	0.26	0.52	584	0.32	0.57	646	0.37	0.60	678	0.48	0.66	750
1800	0.15	0.54	610	0.22	0.60	674	0.30	0.62	698	0.41	0.68	772
1900	0.04	0.56	629	0.11	0.62	696	0.23	0.64	720	0.34	0.70	796
2000	—	—	—	—	—	—	0.16	0.66	744	0.26	0.73	823

LEGEND

Bhp — Brake Horsepower Input to Fan
Esp — External Static Pressure (in. wg)
FIOP — Factory-Installed Option

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 12 — Fan Performance 48TJ005 — Vertical Discharge Units, Alternate Motor

48TJ005 (4 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																				
	0.1			0.2			0.3			0.4			0.6			0.7			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**596**	**0.20**	**210**	**665**	**0.25**	**263**	**722**	**0.31**	**320**	**779**	**0.36**	**378**	872	0.48	504	915	0.54	567	957	0.60	630
1300	**633**	**0.24**	**252**	**699**	**0.30**	**315**	**754**	**0.36**	**378**	**809**	**0.42**	**441**	902	0.55	578	943	0.61	641	984	0.67	704
1400	**672**	**0.30**	**315**	**735**	**0.36**	**378**	**788**	**0.42**	**441**	840	0.48	504	933	0.62	651	972	0.69	720	1011	0.75	788
1500	**711**	**0.35**	**368**	**770**	**0.42**	**441**	**822**	**0.49**	**510**	873	0.55	578	963	0.69	725	1002	0.77	804	1041	0.84	858
1600	**751**	**0.42**	**441**	835	0.49	515	871	0.56	588	907	0.63	662	993	0.77	787	1033	0.85	869	1072	0.93	950
1700	**791**	**0.49**	**515**	873	0.57	599	907	0.65	678	941	0.72	757	1024	0.87	889	1064	0.96	976	1103	1.04	1063
1800	**831**	**0.58**	**609**	881	0.66	693	929	0.74	772	976	0.81	851	1057	0.97	991	1095	1.06	1078	1132	1.14	1165
1900	872	0.67	704	919	0.75	788	965	0.84	877	1011	0.92	967	1091	1.08	1104	1127	1.17	1191	1162	1.25	1277
2000	913	0.77	809	958	0.86	904	1002	0.95	993	1046	1.03	1082	1125	1.21	1237	1160	1.30	1323	1195	1.38	1410

48TJ005 (4 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)																				
	0.9			1.0			1.1			1.2			1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	993	0.65	678	1028	0.69	725	1056	0.72	751	1083	0.74	778	1134	0.80	935	1185	0.88	965	**1331**	**0.99**	**1000**
1300	1021	0.74	772	1058	0.80	841	1090	0.85	888	1121	0.89	935	1171	0.94	988	**1219**	**1.00**	**999**	1268	1.10	1029
1400	1049	0.82	837	1086	0.89	885	1120	0.96	950	1153	1.00	976	1210	1.12	1071	1257	1.17	1105	1307	1.25	1190
1500	1077	0.92	922	1113	0.99	985	1147	1.06	1054	1180	1.13	1081	1241	1.27	1215	1295	1.37	1294	1339	1.43	1350
1600	1107	1.00	998	1141	1.09	1084	1174	1.17	1134	1207	1.25	1196	1269	1.40	1339	1326	1.54	1454	1376	1.65	1558
1700	1137	1.12	1128	1171	1.20	1194	1203	1.29	1278	1235	1.37	1310	1296	1.53	1463	1354	1.70	1605	1407	1.84	1738
1800	1167	1.23	1239	1202	1.32	1313	1233	1.41	1398	1263	1.49	1425	1323	1.67	1597	1381	1.85	1747	1436	2.02	1907
1900	1197	1.35	1360	1232	1.45	1442	1263	1.54	1532	1294	1.63	1559	1351	1.81	1731	1408	2.00	1889	1463	2.19	2068
2000	1229	1.48	1491	1262	1.58	1572	1294	1.68	1671	1325	1.78	1702	1362	1.97	1884	1436	2.16	2040	1489	2.36	2229

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 835 to 1185 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 1.0 and the maximum continuous watts are 1000. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 13 — Fan Performance 48TJ005 — Vertical Discharge Units, High-Static Motor

48TJ005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**665**	**0.25**	**263**	**779**	**0.36**	**378**	**872**	**0.48**	**504**	**957**	**0.60**	**630**	**1028**	**0.69**	**725**
1300	**699**	**0.30**	**315**	**809**	**0.42**	**441**	**902**	**0.55**	**578**	**984**	**0.67**	**704**	**1058**	**0.80**	**841**
1400	**735**	**0.36**	**378**	**840**	**0.48**	**504**	**933**	**0.62**	**651**	**1011**	**0.75**	**788**	1086	0.89	885
1500	**770**	**0.42**	**441**	**873**	**0.55**	**578**	**963**	**0.69**	**725**	**1041**	**0.84**	**858**	1113	0.99	985
1600	**835**	**0.49**	**515**	**907**	**0.63**	**662**	**993**	**0.77**	**787**	**1072**	**0.93**	**950**	1141	1.09	1084
1700	**873**	**0.57**	**599**	**941**	**0.72**	**757**	**1024**	**0.87**	**889**	1103	1.04	1063	1171	1.20	1194
1800	**881**	**0.66**	**693**	**976**	**0.81**	**851**	**1057**	**0.97**	**991**	1132	1.14	1165	1202	1.32	1313
1900	**919**	**0.75**	**788**	**1011**	**0.92**	**967**	1091	1.08	1104	1162	1.25	1277	1232	1.45	1442
2000	**958**	**0.86**	**904**	**1046**	**1.03**	**1082**	1125	1.21	1237	1195	1.38	1410	1262	1.58	1572

48TJ005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1083	0.74	778	1134	0.80	935	1185	0.88	965	1331	0.99	1000	1374	1.09	1083
1300	1121	0.89	935	1171	0.94	988	1219	1.00	999	1268	1.10	1029	1309	1.21	1203
1400	1153	1.00	967	1210	1.12	1071	1257	1.17	1105	1307	1.25	1190	1349	1.37	1367
1500	1180	1.13	1081	1241	1.27	1215	1295	1.37	1294	1339	1.43	1350	1382	1.57	1564
1600	1207	1.25	1196	1269	1.40	1339	1326	1.54	1454	1376	1.65	1558	1420	1.81	1805
1700	1235	1.37	1310	1296	1.53	1463	1354	1.70	1605	1407	1.84	1738	1452	2.02	2013
1800	1263	1.49	1425	1323	1.67	1597	1381	1.85	1747	1436	2.02	1907	**1482**	**2.22**	**2210**
1900	1294	1.63	1559	1351	1.81	1731	1408	2.00	1889	**1463**	**2.19**	**2068**	—	—	—
2000	1325	1.78	1702	1362	1.97	1894	1436	2.16	2040	**1489**	**2.36**	**2229**	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1075 to 1455 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
3. Maximum continuous bhp is 2.4 and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 14 — Fan Performance 48TJ006 — Vertical Discharge Units, Standard Motor

48TJ006 (5 TONS) — STANDARD MOTOR (DIRECT DRIVE)

Airflow (Cfm)	Low Speed						Medium Speed						High Speed					
	208 V			230,460,575 V			208 V			230,460,575 V			208 V			230,460,575 V		
	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts
1500	0.69	0.67	750	1.01	0.71	791	1.00	0.70	782	1.20	0.76	845	1.22	0.79	875	1.28	0.85	949
1600	0.49	0.70	780	0.85	0.74	824	0.85	0.74	821	1.06	0.79	883	1.09	0.82	913	1.17	0.89	988
1700	0.29	0.73	810	0.70	0.77	857	0.70	0.77	861	0.93	0.83	921	0.97	0.85	950	1.06	0.92	1027
1800	0.09	0.75	839	0.54	0.80	891	0.55	0.81	900	0.80	0.86	959	0.84	0.89	988	0.95	0.96	1066
1900	—	—	—	0.39	0.83	924	0.40	0.84	940	0.67	0.90	997	0.72	0.92	1025	0.84	0.99	1105
2000	—	—	—	0.23	0.86	957	0.25	0.88	979	0.54	0.93	1035	0.59	0.95	1063	0.73	1.03	1144
2100	—	—	—	0.08	0.89	990	0.10	0.91	1018	0.41	0.96	1073	0.46	0.99	1101	0.62	1.06	1183
2200	—	—	—	—	—	—	—	—	—	0.28	1.00	1111	0.34	1.02	1138	0.51	1.10	1222
2300	—	—	—	—	—	—	—	—	—	0.15	1.03	1149	0.21	1.06	1176	0.40	1.13	1261
2400	—	—	—	—	—	—	—	—	—	0.02	1.07	1187	0.09	1.09	1213	0.29	1.17	1300
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.18	1.20	1340

LEGEND

Bhp — Brake Horsepower Input to Fan
Esp — External Static Pressure (in. wg)
FIOP — Factory-Installed Option

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for Additional information.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 15 — Fan Performance 48TJ006 — Vertical Discharge Units, Alternate Motor

48TJ006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.1			0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**729**	**0.36**	**368**	**788**	**0.42**	**429**	**896**	**0.56**	**572**	981	0.69	705	1070	0.85	869	1144	1.01	1032
1600	**770**	**0.42**	**429**	**826**	**0.49**	**501**	930	0.64	654	1015	0.78	797	1098	0.94	961	1173	1.11	1134
1700	**811**	**0.50**	**511**	**864**	**0.57**	**582**	964	0.72	736	1051	0.88	899	1124	1.03	1053	1203	1.21	1237
1800	**852**	**0.58**	**593**	903	0.66	674	999	0.82	838	1085	0.98	1001	1155	1.13	1155	1231	1.32	1349
1900	**893**	**0.68**	**695**	942	0.76	777	1035	0.92	940	1119	1.10	1124	1191	1.26	1288	1288	1.43	1461
2000	935	0.78	797	982	0.87	889	1070	1.04	1063	1153	1.22	1247	1227	1.40	1431	1287	1.57	1604
2100	977	0.89	910	1022	0.99	1012	1107	1.17	1196	1187	1.35	1380	1260	1.54	1574	**1323**	**1.72**	**1758**
2200	1019	1.02	1042	1063	1.12	1145	1144	1.30	1328	1222	1.49	1523	1294	1.70	1737	**1359**	**1.89**	**1931**
2300	1061	1.16	1185	1104	1.26	1288	1182	1.47	1502	1258	1.65	1686	**1328**	**1.80**	**1901**	**1393**	**2.07**	**2115**
2400	1103	1.30	1328	1145	1.41	1441	1220	1.61	1645	1293	1.80	1860	**1362**	**2.03**	**2074**	**1426**	**2.26**	**2310**
2500	1145	1.46	1492	1186	1.57	1604	1259	1.78	1819	**1329**	**2.00**	**2044**	**1397**	**2.22**	**2269**	1460	2.45	2504

48TJ006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)								
	1.2			1.4			1.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1226	1.19	1216	**1301**	**1.46**	**1492**	**1380**	**1.69**	**1757**
1600	1242	1.28	1308	**1318**	**1.49**	**1523**	**1392**	**1.78**	**1800**
1700	1270	1.39	1420	**1335**	**1.58**	**1615**	**1408**	**1.80**	**1850**
1800	1300	1.52	1553	**1361**	**1.71**	**1747**	**1423**	**1.91**	**1952**
1900	**1329**	**1.64**	**1676**	**1391**	**1.80**	**1891**	**1448**	**2.05**	**2095**
2000	**1355**	**1.77**	**1809**	**1420**	**1.99**	**2034**	**1477**	**2.21**	**2258**
2100	**1381**	**1.91**	**1952**	**1449**	**2.14**	**2167**	—	—	—
2200	**1413**	**2.08**	**2126**	**1474**	**2.30**	**2350**	—	—	—
2300	**1449**	**2.26**	**2310**	—	—	—	—	—	—
2400	1485	2.47	2524	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 900 to 1300 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. [ ] indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 1.30 for single-phase units and 2.40 for 3-phase units and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 16 — Fan Performance 48TJ006 — Vertical Discharge Units, High-Static Motor

48TJ006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**808**	**0.42**	**429**	**914**	**0.56**	**572**	**1001**	**0.69**	**705**	**1084**	**0.85**	**869**	**1168**	**1.01**	**1032**
1600	**846**	**0.49**	**501**	**950**	**0.64**	**645**	**1034**	**0.78**	**797**	**1111**	**0.94**	**961**	**1194**	**1.11**	**1134**
1700	**884**	**0.57**	**592**	**983**	**0.72**	**736**	**1068**	**0.88**	**899**	**1145**	**1.03**	**1053**	**1218**	**1.21**	**1237**
1800	**942**	**0.66**	**674**	**1018**	**0.82**	**838**	**1105**	**0.98**	**1001**	**1179**	**1.13**	**1155**	**1246**	**1.32**	**1349**
1900	**965**	**0.78**	**777**	**1057**	**0.92**	**940**	**1143**	**1.10**	**1124**	**1212**	**1.26**	**1288**	**1280**	**1.43**	**1481**
2000	**1008**	**0.87**	**889**	**1096**	**1.04**	**1063**	**1177**	**1.22**	**1247**	**1247**	**1.40**	**1431**	1300	1.57	1604
2100	**1051**	**0.99**	**1012**	**1136**	**1.17**	**1196**	**1210**	**1.35**	**1380**	**1284**	**1.54**	**1574**	1347	1.72	1758
2200	**1095**	**1.12**	**1145**	**1173**	**1.30**	**1328**	**1245**	**1.49**	**1523**	1322	1.70	1737	1380	1.89	1931
2300	**1140**	**1.28**	**1288**	**1210**	**1.47**	**1502**	**1284**	**1.65**	**1686**	1356	1.80	1901	1418	2.07	2115
2400	**1185**	**1.41**	**1441**	**1249**	**1.61**	**1645**	1323	1.80	1860	1389	2.03	2074	1456	2.26	2310
2500	**1231**	**1.57**	**1604**	**1289**	**1.78**	**1819**	1363	2.00	2044	1424	2.22	2269	1500	2.45	2504

48TJ006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**1199**	**1.19**	**1216**	**1126**	**1.46**	**1492**	**1250**	**1.69**	**1757**	1301	1.91	1944	1349	2.12	2164
1600	**1263**	**1.28**	**1308**	**1275**	**1.49**	**1523**	**1299**	**1.78**	**1800**	1352	2.01	2047	1401	2.23	2280
1700	**1295**	**1.39**	**1420**	1351	1.58	1615	1352	1.80	1850	1407	2.03	2070	1459	2.26	2305
1800	1319	1.52	1553	1389	1.71	1747	1453	1.91	1952	1494	2.15	2197	1548	2.40	2446
1900	1343	1.64	1676	1415	1.80	1891	1478	2.05	1095	1538	2.31	2358	1594	2.57	2625
2000	1374	1.77	1809	1438	1.99	2034	1505	2.21	2258	1566	2.49	2542	1624	2.77	2830
2100	1409	1.91	1952	1465	2.14	2167	1533	2.45	2501	1596	2.77	2821	1654	3.08	3141
2200	1442	2.08	2126	1498	2.30	2350	1568	2.64	2688	1632	2.97	3031	1691	3.31	3375
2300	1475	2.26	2310	1554	2.64	2698	1627	3.03	3091	1693	3.42	3486	1755	3.81	3881
2400	1565	2.47	2524	1649	2.89	2948	1726	3.31	3379	—	—	—	—	—	—
2500	1596	2.95	3010	1682	3.45	3522	1760	3.96	4036	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1300 to 1685 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Shaded cells indicate field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2562. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 17 — Fan Performance 48TJ007 — Vertical Discharge Units, Standard Motor

48TJ007 (6 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.1			0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**942**	**0.70**	**646**	**978**	**0.66**	**700**	**1063**	**0.82**	**771**	1147	0.97	891	1248	1.20	1081	1322	1.33	1190
1900	**982**	**0.80**	**739**	**1023**	**0.78**	**779**	1097	0.91	843	1175	1.11	1006	1266	1.29	1156	1356	1.47	1310
2000	**1022**	**0.91**	**835**	**1068**	**0.90**	**867**	1132	1.01	924	1218	1.23	1106	1303	1.41	1258	1397	1.52	1353
2100	**1063**	**0.99**	**916**	1115	1.00	998	1180	1.17	1056	1261	1.35	1207	1340	1.53	1361	1428	1.66	1473
2200	1104	1.13	1039	1159	1.15	1081	1214	1.28	1148	1310	1.52	1353	1375	1.63	1447	1459	1.80	1595
2300	1130	1.26	1156	1202	1.29	1140	1248	1.38	1233	1358	1.69	1499	1410	1.72	1526	**1488**	**1.93**	**1709**
2400	1174	1.37	1258	1237	1.41	1224	1292	1.55	1378	1392	1.81	1604	1460	1.90	1683	**1532**	**2.14**	**1892**
2500	1201	1.48	1361	1272	1.53	1335	1335	1.71	1517	1427	1.94	1718	**1518**	**2.16**	**1910**	**1575**	**2.35**	**2076**
2600	1246	1.62	1491	1320	1.68	1482	1368	1.81	1604	1458	2.06	1823	1562	2.42	2136	1620	2.59	2283
2700	1285	1.75	1613	1361	1.82	1595	1400	1.91	1691	**1490**	**2.19**	**1936**	1602	2.64	2326	1666	2.85	2504
2800	1304	1.87	1726	1402	1.95	1639	1439	2.08	1840	1543	2.43	2145	1642	2.86	2512	—	—	—
2900	1345	2.07	1910	1446	2.16	1814	**1477**	**2.16**	**1989**	1585	2.65	2335	—	—	—	—	—	—
3000	1378	2.26	2084	**1489**	**2.36**	**2032**	1529	2.52	2223	1598	2.73	2444	—	—	—	—	—	—

48TJ007 (6 TONS) — STANDARD MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in.wg)								
	1.2			1.4			1.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1395	1.46	1301	**1475**	**1.56**	**1387**	**1542**	**1.71**	**1517**
1900	1430	1.58	1404	**1504**	**1.69**	**1499**	**1556**	**1.82**	**1613**
2000	1459	1.67	1482	**1532**	**1.82**	**1613**	**1588**	**1.97**	**1744**
2100	**1489**	**1.80**	**1595**	**1567**	**1.99**	**1761**	**1626**	**2.16**	**1910**
2200	**1528**	**1.95**	**1726**	**1603**	**2.17**	**1919**	**1666**	**2.37**	**2093**
2300	**1561**	**2.13**	**1884**	**1637**	**2.35**	**2076**	1710	2.54	2272
2400	**1584**	**2.28**	**2015**	1671	2.55	2249	1756	2.70	2467
2500	1633	2.53	2232	1698	2.72	2405	—	—	—
2600	1675	2.77	2436	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1070 to 1460 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.40 and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 18 — Fan Performance 48TJ007 — Vertical Discharge Units, High-Static Motor

48TJ007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**978**	**0.66**	**700**	**1063**	**0.82**	**771**	**1147**	**0.97**	**891**	**1248**	**1.20**	**1081**	1322	1.33	1190
1900	**1023**	**0.78**	**779**	**1097**	**0.91**	**843**	**1175**	**1.11**	**1006**	**1266**	**1.29**	**1156**	1356	1.47	1310
2000	**1068**	**0.90**	**867**	**1132**	**1.01**	**924**	**1218**	**1.23**	**1106**	1303	1.41	1258	1397	1.52	1353
2100	**1115**	**1.00**	**988**	**1180**	**1.17**	**1056**	**1261**	**1.35**	**1207**	1340	1.53	1361	1428	1.66	1473
2200	**1159**	**1.15**	**1081**	**1214**	**1.28**	**1148**	1310	1.52	1353	1375	1.63	1447	1459	1.80	1595
2300	**1202**	**1.29**	**1140**	**1248**	**1.38**	**1233**	1358	1.69	1499	1410	1.72	1526	1488	1.93	1709
2400	**1237**	**1.41**	**1224**	**1292**	**1.55**	**1378**	1392	1.81	1604	1460	1.90	1683	1532	2.14	1892
2500	**1272**	**1.53**	**1335**	1335	1.71	1517	1427	1.94	1718	1518	2.16	1910	1575	2.35	2076
2600	1320	1.68	1482	1368	1.81	1604	1458	2.06	1823	1562	2.42	2136	1620	2.59	2283
2700	1361	1.82	1595	1400	1.91	1691	1490	2.19	1936	1602	2.64	2326	1666	2.85	2504
2800	1402	1.95	1639	1439	2.08	1840	1543	2.43	2145	1642	2.86	2512	1775	3.62	3290
2900	1446	2.16	1814	1477	2.16	1989	1585	2.65	2335	1753	3.58	3262	—	—	—
3000	1489	2.36	2032	1529	2.52	2223	1598	2.73	2444	1767	3.69	3360	—	—	—

48TJ007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1395	1.46	1301	1475	1.56	1387	1542	1.71	1517	1607	1.94	1761	1667	2.16	1967
1900	1430	1.58	1404	1504	1.69	1499	1556	1.82	1613	1621	2.06	1874	1682	2.30	2093
2000	1459	1.67	1482	1532	1.82	1613	1588	1.97	1744	1655	2.23	2029	**1717**	**2.49**	**2266**
2100	1489	1.80	1595	1567	1.99	1761	1626	2.16	1910	**1694**	**2.44**	**2224**	**1758**	**2.73**	**2485**
2200	1528	1.95	1726	1603	2.17	1919	1666	2.37	2093	**1736**	**2.68**	**2441**	—	—	—
2300	1561	2.13	1884	1637	2.35	2076	**1710**	**2.54**	**2272**	**1782**	**2.87**	**2616**	—	—	—
2400	1584	2.28	2015	1671	2.55	2249	**1756**	**2.70**	**2467**	—	—	—	—	—	—
2500	1633	2.53	2232	**1698**	**2.72**	**2405**	1779	3.13	2848	—	—	—	—	—	—
2600	1675	2.77	2436	1768	3.26	2964	—	—	—	—	—	—	—	—	—
2700	1776	3.45	3141	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1300 to 1685 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Shaded cells indicate field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2562. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 19 — Fan Performance 48TJ004 — Horizontal Discharge Units, Standard Motor

48TJ004 (3 TONS) — STANDARD MOTOR (DIRECT DRIVE)

Airflow (Cfm)	Low Speed						High Speed					
	208 V			230, 460, 575 V			208 V			230, 460, 575 V		
	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts
900	0.54	0.21	253	0.57	0.23	277	0.55	0.26	307	0.60	0.31	363
1000	0.49	0.23	270	0.51	0.25	292	0.52	0.27	321	0.53	0.32	374
1100	0.43	0.24	287	0.45	0.26	307	0.46	0.28	335	0.49	0.33	385
1200	0.39	0.26	304	0.40	0.27	323	0.38	0.29	349	0.43	0.34	397
1300	0.33	0.27	321	0.35	0.29	338	0.35	0.31	364	0.36	0.34	408
1400	0.26	0.29	338	0.28	0.30	354	0.29	0.32	378	—	—	—
1500	0.21	0.30	355	0.23	0.31	369	0.24	0.33	392	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Esp — External Static Pressure (in. wg)
FIOP — Factory-Installed Option

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for Additional information.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 20 — Fan Performance 48TJ004 — Horizontal Discharge Units, Alternate Motor

48TJ004 (3 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.1			0.2			0.3			0.4			0.5			0.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**526**	**0.06**	**70**	**584**	**0.08**	**99**	**656**	**0.12**	**139**	**734**	**0.22**	**219**	818	0.25	269	875	0.27	269
1000	**570**	**0.09**	**109**	**627**	**0.13**	**149**	**738**	**0.19**	**189**	800	0.26	259	848	0.29	288	895	0.31	308
1100	**614**	**0.13**	**149**	**670**	**0.16**	**189**	**758**	**0.23**	**229**	812	0.29	288	863	0.32	308	914	0.35	348
1200	**658**	**0.16**	**189**	**710**	**0.23**	**229**	780	0.28	279	840	0.32	318	889	0.36	358	938	0.40	398
1300	**703**	**0.20**	**239**	**752**	**0.27**	**269**	808	0.32	318	868	0.37	368	916	0.41	408	963	0.45	448
1400	**725**	**0.29**	**288**	776	0.31	308	845	0.38	378	891	0.42	418	937	0.47	467	983	0.51	507
1500	**755**	**0.33**	**328**	816	0.38	378	870	0.43	428	924	0.48	477	969	0.53	527	1014	0.58	577

48TJ004 (3 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.7			0.8			0.9			1.0			1.1			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	924	0.32	308	953	0.35	348	989	0.38	388	**1028**	**0.42**	**438**	**1074**	**0.45**	**487**	**1120**	**0.50**	**537**
1000	936	0.35	348	977	0.39	388	**1020**	**0.44**	**438**	**1064**	**0.48**	**477**	**1124**	**0.52**	**537**	**1185**	**0.55**	**597**
1100	960	0.39	388	**1005**	**0.43**	**428**	**1052**	**0.49**	**487**	**1100**	**0.52**	**527**	**1163**	**0.56**	**587**	**1225**	**0.60**	**647**
1200	988	0.45	448	**1038**	**0.50**	**497**	**1076**	**0.53**	**527**	**1136**	**0.59**	**577**	**1201**	**0.61**	**647**	**1266**	**0.64**	**716**
1300	**1012**	**0.51**	**507**	**1061**	**0.56**	**557**	**1094**	**0.61**	**607**	**1172**	**0.65**	**647**	**1239**	**0.69**	**716**	**1306**	**0.72**	**786**
1400	**1027**	**0.56**	**557**	**1071**	**0.60**	**597**	**1108**	**0.67**	**666**	**1208**	**0.70**	**706**	**1278**	**0.75**	**786**	**1347**	**0.79**	**865**
1500	**1056**	**0.63**	**627**	**1097**	**0.68**	**676**	**1117**	**0.70**	**696**	**1245**	**0.74**	**776**	**1315**	**0.80**	**865**	**1385**	**0.85**	**955**

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 760 to 1000 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
3. Maximum continuous bhp is 1.00 and maximum continuous watts are 1000. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 21 — Fan Performance 48TJ004 — Horizontal Discharge Units, High-Static Motor

48TJ004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**584**	**0.08**	**99**	**734**	**0.22**	**219**	**875**	**0.27**	**269**	**953**	**0.36**	**348**	**1028**	**0.42**	**438**
1000	**627**	**0.13**	**149**	**800**	**0.26**	**259**	**895**	**0.31**	**308**	**977**	**0.39**	**388**	**1064**	**0.48**	**477**
1100	**670**	**0.16**	**189**	**812**	**0.29**	**288**	**914**	**0.35**	**348**	**1005**	**0.43**	**428**	1000	0.52	527
1200	**710**	**0.23**	**229**	**840**	**0.32**	**318**	**938**	**0.40**	**398**	**1038**	**0.50**	**497**	1136	0.59	577
1300	**752**	**0.27**	**269**	**868**	**0.37**	**368**	**963**	**0.45**	**448**	**1061**	**0.56**	**557**	1172	0.65	647
1400	**776**	**0.31**	**308**	**891**	**0.42**	**418**	**983**	**0.51**	**507**	**1071**	**0.60**	**597**	1208	0.70	706
1500	**816**	**0.38**	**378**	**924**	**0.48**	**477**	**1014**	**0.58**	**577**	1097	0.68	676	1245	0.74	776

48TJ004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1120	0.54	537	1155	0.59	589	1186	0.64	639	1215	0.69	685	1240	0.73	730
1000	1185	0.60	597	1222	0.66	655	1255	0.71	709	1285	0.77	761	1312	0.82	811
1100	1225	0.65	647	1263	0.71	709	1298	0.77	769	1328	0.83	825	1357	0.88	879
1200	1266	0.72	716	1306	0.79	786	1341	0.86	851	1373	0.92	914	1402	0.98	973
1300	1306	0.79	786	1347	0.87	862	1383	0.94	934	1416	1.01	1003	1446	1.07	1068
1400	1347	0.87	865	1389	0.95	950	1427	1.03	1029	**1461**	**1.11**	**1104**	**1492**	**1.18**	**1176**
1500	1385	0.96	955	1428	1.05	1048	**1467**	**1.14**	**1135**	**1502**	**1.22**	**1218**	**1534**	**1.30**	**1298**

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1075 to 1455 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
3. Maximum continuous bhp is 2.4 and maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 22 — Fan Performance 48TJ005 — Horizontal Discharge Units, Standard Motor

48TJ005 (4 TONS) — STANDARD MOTOR (DIRECT DRIVE)

Airflow (Cfm)	Low Speed						High Speed					
	208 V			230, 460, 575 V			208 V			230, 460, 575 V		
	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts
1200	0.75	0.41	458	0.81	0.45	506	0.87	0.51	572	0.92	0.56	632
1300	0.68	0.42	471	0.74	0.46	521	0.79	0.52	589	0.85	0.58	651
1400	0.60	0.45	503	0.66	0.49	556	0.71	0.54	616	0.77	0.60	681
1500	0.51	0.47	536	0.58	0.52	593	0.64	0.56	631	0.70	0.62	698
1600	0.42	0.49	557	0.49	0.54	616	0.56	0.58	654	0.63	0.64	723
1700	0.32	0.52	584	0.39	0.57	646	0.48	0.60	678	0.55	0.66	750
1800	0.21	0.54	610	0.29	0.60	674	0.41	0.62	698	0.48	0.68	772
1900	0.09	0.56	629	0.18	0.62	696	0.33	0.64	720	0.41	0.70	796
2000	—	—	—	0.06	0.65	731	0.26	0.66	744	0.33	0.73	823

LEGEND

Bhp — Brake Horsepower Input to Fan
Esp — External Static Pressure (in. wg)
FIOP — Factory-Installed Option

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for Additional information.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 23 — Fan Performance 48TJ005 — Horizontal Discharge Units, Alternate Motor

48TJ005 (4 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																				
	0.1			0.2			0.3			0.4			0.6			0.7			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**569**	**0.18**	**189**	**641**	**0.23**	**242**	**701**	**0.29**	**299**	**761**	**0.34**	**357**	859	0.46	483	901	0.52	546	943	0.58	609
1300	**604**	**0.22**	**231**	**673**	**0.28**	**294**	**731**	**0.34**	**352**	**788**	**0.39**	**410**	887	0.52	546	928	0.59	615	968	0.65	683
1400	**640**	**0.27**	**284**	**705**	**0.33**	**347**	**761**	**0.39**	**410**	**817**	**0.45**	**473**	914	0.59	620	955	0.66	688	996	0.72	757
1500	**676**	**0.32**	**336**	**738**	**0.38**	**399**	**793**	**0.45**	**468**	847	0.51	536	940	0.65	683	982	0.73	767	1024	0.81	851
1600	**713**	**0.38**	**399**	**772**	**0.44**	**462**	**825**	**0.51**	**536**	877	0.58	609	967	0.73	767	1009	0.81	851	1051	0.89	935
1700	**750**	**0.45**	**473**	**806**	**0.51**	**536**	857	0.59	615	908	0.66	693	997	0.81	851	1037	0.90	940	1077	1.01	1030
1800	**788**	**0.52**	**546**	841	0.59	620	890	0.67	704	939	0.75	788	1026	0.91	956	1065	1.01	1040	1104	1.07	1124
1900	**826**	**0.60**	**630**	876	0.68	714	924	0.76	799	971	0.84	883	1056	1.01	1061	1094	1.10	1151	1132	1.18	1240
2000	864	0.70	735	912	0.77	809	958	0.86	898	1004	0.94	988	1087	1.12	1177	1125	1.21	1271	1162	1.30	1366

48TJ005 (4 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)																				
	0.9			1.0			1.1			1.2			1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	987	0.64	652	1030	0.70	695	1068	0.79	792	1106	0.87	889	1134	0.98	998	1189	1.12	1138	1245	1.21	1358
1300	1006	0.71	709	1044	0.77	736	1086	0.84	833	1128	0.91	930	1183	1.10	1052	1226	1.23	1215	1297	1.35	1406
1400	1033	0.79	797	1069	0.86	838	1104	0.93	925	1139	1.01	1012	1218	1.14	1090	1286	1.34	1282	1320	1.48	1463
1500	1060	0.88	891	1095	0.95	930	1129	1.02	1022	1162	1.09	1114	1228	1.24	1186	1303	1.40	1339	1343	1.60	1530
1600	1087	1.01	1001	1123	1.05	1073	1156	1.13	1150	1185	1.20	1226	1250	1.35	1291	1319	1.51	1444	1382	1.68	1607
1700	1114	1.07	1108	1151	1.15	1185	1183	1.23	1262	1215	1.31	1339	1276	1.48	1415	1334	1.64	1569	1398	1.80	1722
1800	1141	1.17	1221	1178	1.26	1318	1211	1.35	1390	1243	1.43	1461	1303	1.61	1540	1359	1.78	1702	1418	1.95	1865
1900	1168	1.28	1371	1204	1.37	1502	1238	1.47	1548	1271	1.56	1594	1330	1.74	1664	1386	1.93	1846	1439	2.11	2018
2000	1197	1.39	1485	1231	1.48	1604	1265	1.59	1666	1298	1.69	1727	1358	1.89	1808	1413	2.08	1989	1466	2.27	2171

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 835 to 1185 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 1.00 and the maximum continuous watts are 1000. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 24 — Fan Performance 48TJ005 — Horizontal Discharge Units, High-Static Motor

48TJ005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**641**	**0.23**	**242**	**761**	**0.34**	**357**	**859**	**0.46**	**483**	**943**	**0.58**	**609**	**1030**	**0.70**	**695**
1300	**673**	**0.28**	**294**	**788**	**0.39**	**410**	**887**	**0.52**	**546**	**968**	**0.65**	**683**	**1044**	**0.77**	**736**
1400	**705**	**0.33**	**347**	**817**	**0.45**	**473**	**914**	**0.59**	**620**	**996**	**0.72**	**757**	**1069**	**0.86**	**838**
1500	**738**	**0.38**	**399**	**847**	**0.51**	**536**	**940**	**0.65**	**683**	**1024**	**0.81**	**851**	1095	0.95	930
1600	**772**	**0.44**	**462**	**877**	**0.58**	**609**	**967**	**0.73**	**767**	**1051**	**0.89**	**935**	1123	1.05	1073
1700	**806**	**0.51**	**536**	**908**	**0.66**	**693**	**997**	**0.81**	**851**	1077	1.01	1030	1151	1.15	1185
1800	**841**	**0.59**	**620**	**939**	**0.75**	**789**	**1026**	**0.91**	**956**	1104	1.07	1124	1178	1.26	1318
1900	**876**	**0.68**	**714**	**971**	**0.84**	**883**	**1056**	**1.01**	**1061**	1132	1.18	1240	1204	1.37	1502
2000	**912**	**0.77**	**809**	**1004**	**0.94**	**988**	1087	1.12	1177	1162	1.30	1366	1231	1.48	1604

48TJ005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1106	0.87	889	1134	0.98	998	1189	1.12	1138	1245	1.21	1358	1292	1.35	1345
1300	1128	0.91	930	1183	1.10	1052	1226	1.23	1215	1297	1.35	1406	1346	1.51	1500
1400	1139	1.01	1012	1218	1.14	1090	1286	1.34	1282	1320	1.48	1463	1370	1.65	1645
1500	1162	1.09	1114	1228	1.24	1186	1303	1.40	1339	1343	1.60	1530	1393	1.79	1778
1600	1185	1.20	1226	1250	1.35	1291	1319	1.51	1444	1382	1.68	1607	1434	1.88	1867
1700	1215	1.31	1339	1276	1.48	1415	1334	1.64	1569	1389	1.80	1722	1451	2.01	2001
1800	1243	1.43	1461	1303	1.61	1540	1359	1.78	1702	1418	1.95	1865	**1471**	**2.18**	**2167**
1900	1271	1.56	1594	1330	1.74	1664	1386	1.93	1846	1439	2.11	2018	**1493**	**2.36**	**2345**
2000	1298	1.69	1727	1358	1.89	1808	1413	2.08	1989	**1468**	**2.27**	**2171**	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1075 to 1455 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
3. Maximum continuous bhp is 2.4 and maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 25 — Fan Performance 48TJ006 — Horizontal Discharge Units, Standard Motor

48TJ006 (5 TONS) — STANDARD MOTOR (DIRECT DRIVE)

Airflow (Cfm)	Low Speed						Medium Speed						High Speed					
	208V			230, 460, 575 V			208 V			230, 460, 575 V			208 V			230, 460, 575 V		
	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts	Esp	Bhp	Watts
1500	0.74	0.67	750	1.06	0.71	791	1.07	0.70	782	1.27	0.76	845	1.26	0.79	875	1.33	0.85	949
1600	0.54	0.70	780	0.90	0.74	824	0.92	0.74	821	1.13	0.79	883	1.14	0.82	913	1.22	0.89	988
1700	0.34	0.73	810	0.75	0.77	857	0.77	0.77	861	1.00	0.83	921	1.01	0.85	950	1.11	0.92	1027
1800	0.14	0.75	839	0.59	0.80	891	0.62	0.81	900	0.87	0.86	959	0.89	0.88	988	1.00	0.96	1066
1900	—	—	—	0.44	0.83	924	0.47	0.84	940	0.74	0.90	997	0.77	0.92	1025	0.89	0.99	1105
2000	—	—	—	0.28	0.86	957	0.32	0.88	979	0.61	0.93	1035	0.64	0.95	1063	0.78	1.03	1144
2100	—	—	—	0.13	0.89	990	0.17	0.91	1018	0.48	0.96	1073	0.51	0.99	1101	0.67	1.06	1183
2200	—	—	—	—	—	—	0.02	0.95	1058	0.35	1.00	1111	0.39	1.02	1138	0.56	1.10	1222
2300	—	—	—	—	—	—	—	—	—	0.22	1.03	1149	0.26	1.06	1176	0.45	1.13	1261
2400	—	—	—	—	—	—	—	—	—	0.09	1.07	1187	0.14	1.09	1213	0.34	1.17	1300
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.23	1.20	1340

LEGEND

Bhp — Brake Horsepower Input to Fan
Esp — External Static Pressure (in. wg)
FIOP — Factory-Installed Option

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for Additional information.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 26 — Fan Performance 48TJ006 — Horizontal Discharge Units, Alternate Motor

48TJ006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.1			0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**730**	**0.34**	**357**	**789**	**0.40**	**420**	**896**	**0.53**	**557**	990	0.67	704	1072	0.83	872	1153	1.00	1051
1600	**770**	**0.40**	**420**	**826**	**0.46**	**483**	931	0.61	641	1020	0.75	788	1101	0.91	956	1178	1.09	1145
1700	**811**	**0.47**	**494**	**865**	**0.54**	**567**	966	0.69	725	1051	0.84	883	1133	1.01	1061	1205	1.18	1240
1800	**852**	**0.55**	**578**	905	0.62	651	1002	0.78	820	1084	0.93	977	1163	1.10	1156	1235	1.29	1355
1900	**894**	**0.54**	**567**	945	0.72	757	1037	0.88	925	1119	1.04	1093	1194	1.21	1271	1266	1.40	1471
2000	936	0.74	778	984	0.82	862	1072	0.98	1030	1154	1.16	1219	1226	1.33	1397	1297	1.53	1608
2100	978	0.85	893	1024	0.93	977	1108	1.10	1156	1192	1.29	1355	1259	1.47	1545	**1327**	**1.66**	**1744**
2200	1021	0.97	1019	1064	1.05	1103	1145	1.22	1282	1225	1.43	1503	1294	1.62	1702	**1359**	**1.80**	**1902**
2300	1064	1.10	1156	1104	1.18	1240	1183	1.36	1429	1260	1.57	1650	**1330**	**1.78**	**1870**	**1392**	**1.97**	**2070**
2400	1107	1.24	1303	1145	1.32	1387	1222	1.45	1524	1296	1.73	1818	**1365**	**1.94**	**2038**	1426	2.15	2259
2500	1150	1.39	1460	1186	1.48	1555	1262	1.68	1765	**1331**	**1.89**	**1986**	1400	2.12	2227	1461	2.34	2459

48TJ006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)											
	1.2			1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1221	1.17	1229	1256	1.30	1366	1283	1.32	1387	**1303**	**1.22**	**1282**
1600	1252	1.27	1334	**1311**	**1.45**	**1524**	**1340**	**1.58**	**1660**	**1330**	**1.61**	**1692**
1700	1278	1.37	1439	**1345**	**1.57**	**1650**	**1397**	**1.76**	**1849**	**1424**	**1.89**	**1986**
1800	**1303**	**1.48**	**1555**	**1371**	**1.69**	**1776**	**1433**	**1.90**	**1996**	1480	2.09	2196
1900	**1330**	**1.59**	**1671**	**1396**	**1.80**	**1902**	1460	2.03	2133	1517	2.25	2364
2000	**1362**	**1.73**	**1818**	**1422**	**1.94**	**2038**	1485	2.16	2270	1544	2.40	2522
2100	**1393**	**1.87**	**1965**	1452	2.08	2185	1510	2.31	2427	1570	2.55	2674
2200	1423	2.02	2122	1483	2.24	2354	1538	2.46	2585	1594	2.71	2821
2300	1454	2.18	2291	1515	2.41	2532	1571	2.64	2758	1623	2.88	2976
2400	1485	2.36	2480	1544	2.59	2721	1604	2.84	2947	1657	3.07	3152
2500	1518	2.55	2679	1574	2.78	2905	1633	3.03	3134	1692	3.28	3345

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 900 to 1300 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Shaded cells indicate field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 1.30 for single-phase units and 2.40 for 3-phase units and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 27 — Fan Performance 48TJ006 — Horizontal Discharge Units, High-Static Motor

48TJ006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**789**	**0.40**	**420**	**896**	**0.53**	**557**	**990**	**0.67**	**704**	**1072**	**0.83**	**872**	**1153**	**1.00**	**1051**	**1221**	**1.17**	**1229**
1600	**826**	**0.46**	**483**	**931**	**0.61**	**641**	**1020**	**0.75**	**788**	**1101**	**0.91**	**956**	**1178**	**1.09**	**1145**	**1252**	**1.27**	**1334**
1700	**865**	**0.54**	**567**	**966**	**0.69**	**725**	**1051**	**0.84**	**883**	**1133**	**1.01**	**1061**	**1205**	**1.18**	**1240**	**1278**	**1.37**	**1439**
1800	**905**	**0.62**	**661**	**1002**	**0.78**	**820**	**1084**	**0.93**	**977**	**1163**	**1.10**	**1156**	**1235**	**1.29**	**1355**	1303	1.48	1555
1900	**945**	**0.72**	**757**	**1037**	**0.88**	**925**	**1119**	**1.04**	**1093**	**1194**	**1.21**	**1271**	**1266**	**1.40**	**1471**	1330	1.59	1671
2000	**984**	**0.82**	**862**	**1072**	**0.98**	**1030**	**1154**	**1.16**	**1219**	**1226**	**1.33**	**1397**	**1297**	**1.53**	**1608**	1362	1.73	1818
2100	**1024**	**0.93**	**977**	**1108**	**1.10**	**1156**	**1192**	**1.29**	**1355**	**1259**	**1.47**	**1545**	1327	1.66	1744	1393	1.87	1965
2200	**1064**	**1.05**	**1103**	**1145**	**1.22**	**1282**	**1225**	**1.43**	**1503**	**1294**	**1.62**	**1702**	1359	1.80	1902	1423	2.02	2122
2300	**1104**	**1.18**	**1240**	**1183**	**1.36**	**1429**	**1260**	**1.57**	**1650**	1330	1.78	1870	1392	1.97	2070	1454	2.18	2291
2400	**1145**	**1.32**	**1387**	**1222**	**1.45**	**1524**	**1296**	**1.73**	**1818**	1365	1.94	2038	1426	2.15	2259	1485	2.36	2480
2500	**1186**	**1.48**	**1555**	**1262**	**1.68**	**1765**	1331	1.89	1986	1400	2.12	2227	1461	2.34	2459	1518	2.55	2679

48TJ006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)											
	1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**1256**	**1.30**	**1366**	**1283**	**1.32**	**1387**	1303	1.22	1282	1345	1.34	1390
1600	1311	1.45	1524	1340	1.58	1660	1330	1.61	1692	1373	1.77	1834
1700	1345	1.57	1650	1397	1.76	1849	1424	1.89	1986	1470	2.08	2153
1800	1371	1.69	1776	1433	1.90	1996	1480	2.09	2196	1528	2.30	2381
1900	1396	1.80	1902	1460	2.03	2133	1517	2.25	2364	1566	2.47	2563
2000	1422	1.94	2038	1485	2.16	2270	1544	2.40	2522	1594	2.64	2734
2100	1452	2.08	2185	1510	2.31	2427	1570	2.55	2674	1620	2.80	2905
2200	1483	2.24	2354	1538	2.46	2585	1594	2.71	2821	1645	2.98	3087
2300	1515	2.41	2532	1571	2.64	2758	1623	2.88	2976	1675	3.17	3280
2400	1544	2.59	2721	1604	2.84	2947	1657	3.07	3152	1710	3.38	3497
2500	1574	2.78	2905	1633	3.03	3134	1692	3.28	3345	1746	3.61	3736

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1300 to 1685 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Shaded cells indicate field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2562. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 28 — Fan Performance 48TJ007 — Horizontal Discharge Units, Standard Motor

48TJ007 (6 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.1			0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**885**	**0.63**	**623**	**942**	**0.73**	**700**	**1047**	**0.90**	**835**	1139	1.05	956	1193	1.14	1031	1276	1.30	1165
1900	**928**	**0.73**	**700**	**982**	**0.83**	**779**	1084	1.02	932	1160	1.11	1006	1223	1.24	1114	1301	1.38	1233
2000	**971**	**0.84**	**787**	**1022**	**0.94**	**867**	1121	1.12	1014	1188	1.22	1097	1254	1.36	1216	1329	1.44	1284
2100	**1015**	**0.97**	**891**	**1063**	**1.10**	**998**	1140	1.18	1064	1196	1.27	1140	1272	1.45	1292	1354	1.58	1404
2200	**1060**	**1.10**	**998**	1104	1.20	1081	1159	1.23	1106	1229	1.41	1258	1306	1.53	1361	1363	1.70	1508
2300	1104	1.25	1123	1130	1.27	1140	1196	1.37	1224	1264	1.56	1387	1340	1.66	1473	1397	1.86	1648
2400	1138	1.30	1165	1174	1.37	1224	1245	1.57	1396	1305	1.63	1447	1373	1.84	1630	1440	1.95	1726
2500	1183	1.43	1275	1201	1.50	1335	1284	1.65	1465	1338	1.75	1552	1402	1.99	1761	**1469**	**2.04**	**1805**
2600	1210	1.58	1404	1246	1.67	1482	1312	1.76	1560	1366	1.96	1735	1435	2.10	1858	**1494**	**2.19**	**1936**
2700	1254	1.76	1560	1285	1.80	1595	1354	1.95	1726	1403	2.14	1892	**1474**	**2.21**	**1954**	1536	2.46	2171
2800	1274	1.82	1613	1304	1.85	1639	1374	2.12	1875	1459	2.25	1989	1514	2.42	2136	1570	2.66	2343
2900	1318	1.95	1726	1345	2.05	1814	1412	2.32	2050	1496	2.54	2240	1529	2.61	2300	1603	2.87	2521
3000	1362	2.20	1945	1378	2.30	2032	1451	2.40	2119	1534	2.66	2343	1560	2.81	2470	1611	3.01	2648

48TJ007 (6 TONS) — STANDARD MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)								
	1.2			1.4			1.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1341	1.40	1250	1413	1.55	1378	**1474**	**1.58**	**1404**
1900	1374	1.53	1361	1437	1.62	1439	**1490**	**1.67**	**1482**
2000	1396	1.66	1473	1460	1.68	1491	**1509**	**1.77**	**1569**
2100	1413	1.75	1552	**1475**	**1.73**	**1534**	**1529**	**1.92**	**1700**
2200	1434	1.81	1604	**1487**	**1.85**	**1639**	**1554**	**2.07**	**1831**
2300	1459	1.88	1665	**1520**	**2.07**	**1831**	**1576**	**2.24**	**1980**
2400	**1502**	**2.06**	**1823**	**1552**	**2.24**	**1980**	1604	2.42	2136
2500	**1524**	**2.24**	**1980**	1585	2.42	2136	1638	2.60	2292
2600	**1552**	**2.40**	**2119**	1616	2.63	2317	1671	2.80	2462
2700	1584	2.61	2300	1646	2.83	2487	1706	2.97	2653
2800	1624	2.85	2504	1677	2.99	2661	—	—	—
2900	1671	3.03	2725	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1070 to 1460 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Shaded cells indicate field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.4 and maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 29 — Fan Performance 48TJ007 — Horizontal Discharge Units, High-Static Motor

48TJ007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**942**	**0.73**	**700**	**1047**	**0.90**	**835**	**1139**	**1.05**	**956**	**1193**	**1.14**	**1031**	**1276**	**1.30**	**1165**	1341	1.40	1250
1900	**982**	**0.83**	**779**	**1084**	**1.02**	**932**	**1160**	**1.11**	**1006**	**1223**	**1.24**	**1114**	1301	1.38	1233	1374	1.53	1361
2000	**1022**	**0.94**	**867**	**1121**	**1.12**	**1014**	**1188**	**1.22**	**1097**	**1254**	**1.36**	**1216**	1329	1.44	1284	1396	1.66	1473
2100	**1063**	**1.10**	**998**	**1140**	**1.18**	**1064**	**1196**	**1.27**	**1140**	**1272**	**1.45**	**1292**	1354	1.58	1404	1413	1.75	1552
2200	**1104**	**1.20**	**1081**	**1159**	**1.23**	**1106**	**1229**	**1.41**	**1258**	1306	1.53	1361	1363	1.70	1508	1434	1.81	1604
2300	**1130**	**1.27**	**1140**	**1196**	**1.37**	**1224**	**1264**	**1.56**	**1387**	1340	1.66	1473	1397	1.86	1648	1459	1.88	1665
2400	**1174**	**1.37**	**1224**	**1245**	**1.57**	**1396**	1305	1.63	1447	1373	1.84	1630	1440	1.95	1726	1502	2.06	1823
2500	**1201**	**1.50**	**1335**	**1284**	**1.65**	**1465**	1338	1.75	1552	1402	1.99	1761	1469	2.04	1805	1524	2.24	1980
2600	**1246**	**1.67**	**1482**	1312	1.76	1560	1366	1.96	1735	1435	2.10	1858	1494	2.19	1936	1552	2.40	2119
2700	**1285**	**1.80**	**1595**	1354	1.95	1726	1403	2.14	1892	1474	2.21	1954	1536	2.46	2171	1584	2.61	2300
2800	1304	1.85	1639	1374	2.12	1875	1459	2.25	1989	1514	2.42	2136	1570	2.66	2343	1624	2.85	2504
2900	1345	2.05	1814	1412	2.32	2050	1496	2.54	2240	1529	2.61	2300	1603	2.87	2521	1671	3.03	2725
3000	1378	2.30	2032	1451	2.40	2119	1534	2.66	2343	1560	2.81	2470	1611	3.01	2648	1692	3.49	3140

48TJ007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)											
	1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1413	1.55	1378	1474	1.58	1404	1522	1.74	1564	1566	1.89	1704
1900	1437	1.62	1439	1490	1.67	1482	1538	1.84	1653	1583	2.00	1801
2000	1460	1.68	1491	1509	1.77	1569	1558	1.95	1752	1603	2.12	1909
2100	1475	1.73	1534	1529	1.92	1700	1578	2.11	1901	1624	2.30	2070
2200	1478	1.85	1639	1554	2.07	1831	1604	2.28	2049	1651	2.48	2232
2300	1520	2.07	1831	1576	2.24	1980	1627	2.46	2218	1674	2.68	2415
2400	1552	2.24	1980	1604	2.42	2136	1656	2.66	2396	**1704**	**2.90**	**2609**
2500	1585	2.42	2136	1638	2.60	2292	**1691**	**2.86**	**2574**	1740	3.12	2804
2600	1616	2.63	2317	1671	2.80	2462	1725	3.08	2772	1775	3.35	3019
2700	1646	2.83	2487	1706	2.97	2653	1761	3.27	2941	—	—	—
2800	1677	2.99	2661	1739	3.33	2998	1795	3.67	3299	—	—	—
2900	1742	3.43	3090	—	—	—	—	—	—	—	—	—
3000	1764	3.95	3558	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range is 1300 to 1685 rpm. All other rpms require a field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Shaded cells indicate field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2562. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 — Motor Data for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

START-UP

Unit Preparation — Make sure that unit has been installed in accordance with these installation instructions and applicable codes.

Return-Air Filters — Make sure correct filters are installed in filter tracks. See Table 1. Do not operate unit without return-air filters.

Compressor Mounting — Compressors are internally spring mounted. Do not loosen or remove compressor hold-down bolts.

Internal Wiring — Check all electrical connections in unit control boxes. Tighten as required. Ensure electrical wires do not come in contact with refrigerant tubing or sharp edges.

Refrigerant Service Ports — To service refrigerant service ports, remove refrigerant service port access panel. See Fig. 43. Each unit system has 4 Schrader-type service gage ports: one on the suction line, one on the liquid line, and two on the compressor discharge line. Be sure that caps on the ports are tight. When a controls upgrade package is used, one Schrader-type valve is located under both the high-pressure switch and the low-pressure switch.

High Flow Valves — Located on the compressor hot gas and suction tubes are High Flow Valves. Large black plastic caps distinguish these valves with o-rings located inside the caps. These valves can not be accessed for service in the field. Ensure the plastic caps are in place and tight or the possibility of refrigerant leakage could occur.

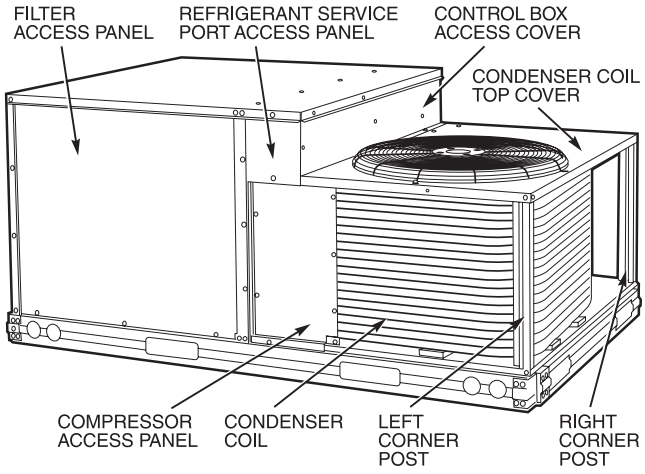


Fig. 43 — Service Panel Location

Compressor Rotation — On 3-phase units with scroll compressors, it is important to be certain compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

1. Connect service gages to suction and discharge pressure fittings.
2. Energize the unit.
3. The suction pressure should drop and the discharge pressure should rise, as is normal on any start-up.

If the suction pressure does not drop and the discharge pressure does not rise to normal levels:

1. Note that the evaporator fan is probably also rotating in the wrong direction.
2. Turn off power to the unit and install lockout tag.
3. Reverse any two of the unit power leads.
4. Reapply power to unit and recheck pressures.

The suction and discharge pressure levels should now move to their normal start-up levels.

NOTE: When the compressor is rotating in the wrong direction, the unit makes an elevated level of noise and does not provide cooling.

Cooling — Set space thermostat of OFF position. To start unit, turn on main power supply. Set system selector switch at COOL position and fan switch at AUTO. position. Adjust thermostat to a setting below room temperature. Compressor starts on closure of contactor.

Check unit charge. Refer to Service, Refrigerant Charge section, page 41. Allow unit to operate a minimum of 10 minutes before checking charge.

Reset thermostat at a position above room temperature. Compressor will shut off. Evaporator fan will shut off after 30-second delay.

TO SHUT OFF UNIT — Set system selector switch at OFF position. Resetting thermostat at a position above room temperature shuts unit off temporarily until space temperature exceeds thermostat setting.

Main Burners — Main burners are factory set and should require no adjustment.

TO CHECK ignition of main burners and heating controls, move thermostat set point above room temperature and verify that the burners light and evaporator fan is energized. After ensuring that the unit continues to heat the building, lower the thermostat setting below room temperature and verify that the burners and evaporator fan turn off. (Fan will turn off only if fan selector switch is in the AUTO. position and after a 45-second delay has elapsed.)

Refer to Table 30 for the correct orifice to use at high altitudes.

Table 30 — Altitude Compensation*

ELEVATION (ft)	74,000 AND 115,000 BTUH NOMINAL INPUT		150,000 BTUH NOMINAL INPUT	
	Natural Gas Orifice Size†	Liquid Propane Orifice Size†	Natural Gas Orifice Size†	Liquid Propane Orifice Size†
0-2,000	33	43	30	38
2,000	34	43	30	39
3,000	35	44	31	40
4,000	36	44	32	41
5,000	36	44	33	42
6,000	37	45	34	43
7,000	37	45	35	43
8,000	38	46	36	44
9,000	39	47	37	44
10,000	41	48	38	45
11,000	43	48	39	45
12,000	44	49	40	46
13,000	44	49	41	47
14,000	45	50	42	47

*As the height above sea level increases, there is less oxygen per cubic foot of air. Therefore, heat input rate should be reduced at higher altitudes.
†Orifices available through your Carrier distributor.

Heating

1. Purge gas supply line of air by opening union ahead of gas valve. If gas odor is detected, tighten union and wait 5 minutes before proceeding.
2. Turn on electrical supply and open manual gas valve.
3. Set system switch selector at HEAT position and fan switch at AUTO. or ON position. Set heating temperature lever above room temperature.
4. The induced-draft motor will start.
5. After a call for heating, the main burners should light within 5 seconds. If the burner does not light, then there is a 22-second delay before another 5-second try. If the burner still does not light, the time delay is repeated. If the burner does not light within 15 minutes, there is a lockout. To reset the control, break the 24 v power to W1.

ADJUST GAS INPUT — The gas input to the unit is determined by measuring the gas flow at the meter or by measuring the manifold pressure. Measuring the gas flow at the meter is recommended for natural gas units. The manifold pressure must be measured to determine the input of propane gas units.

Measure Gas Flow (Natural Gas Units) — Minor adjustment to the gas flow can be made by changing the manifold pressure. The manifold pressure must be maintained between 3.4 and 3.6 in. wg. If larger adjustments are required, change main burner orifices following the recommendations of national and local codes. Unit must be operating with both W1 and W2 energized (high-fire).

NOTE: All other appliances that use the same meter must be turned off when gas flow is measured at the meter.

Proceed as follows:

1. Turn off gas supply to unit. Turn off electric supply to unit and install lockout tag.
2. Remove pipe plug on manifold (see Fig. 44) then connect manometer at this point. Turn on gas to unit.
3. Turn on electrical power.
4. Energize W1, and/or W2 at thermostat. Ensure gas valve, if 2-stage style, is in “High Fire.”

Observe manifold pressure and proceed as follows to adjust gas input:

1. Remove cover screw over regulator adjustment screw on gas valve.
2. Turn regulator adjustment screw clockwise to increase gas input, or turn regulator adjustment screw counterclockwise to decrease input. Manifold pressure must be 3.5 in. wg while in high fire.

⚠ WARNING

Unsafe operation of the unit may result if manifold pressure is outside this range. Personal injury or unit damage may result.

3. Replace cover screw cap on gas valve.
4. Turn off gas supply to unit. Remove manometer from pressure tap and replace pipe plug on gas valve. Turn on gas to unit and check for leaks.

Measure Manifold Pressure (Propane Units) — The main burner orifices on a propane gas unit are sized for the unit rated input when the manifold pressure reading is 3.5 in. wg.

Ensure unit is operating in High-Fire operation mode (W1 and W2 energized) before adjusting manifold pressure.

Proceed as follows to adjust gas input on a propane gas unit:

1. Turn off gas to unit.
2. Remove pipe plug on manifold (see Fig. 44), then connect manometer at this point.

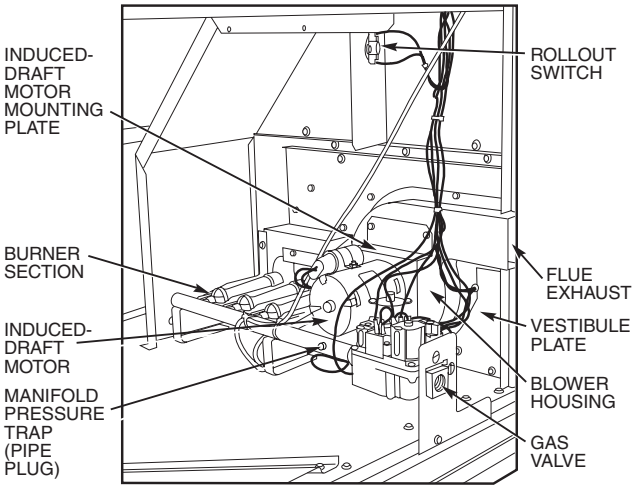


Fig. 44 — Burner Section Details

3. Turn on gas to unit.
4. Remove cover screw over regulator adjustment screw on gas valve.
5. Adjust regulator adjustment screw to the correct manifold pressure, 3.5 in wg. Turn adjusting screw clockwise to increase manifold pressure, or turn adjusting screw counterclockwise to decrease manifold pressure.
6. Replace cover screw.
7. Turn off gas to unit. Remove manometer from pressure tap. Replace pipe plug on gas valve, then turn on gas to unit. Check for gas leaks.
8. The evaporator-fan motor will turn on 45 seconds after the burners are ignited.
9. The evaporator-fan motor will turn off 45 seconds after thermostat temperature is satisfied.
10. Adjust airflow to obtain a temperature rise within the range specified on the unit nameplate.

NOTE: The default value for the evaporator-fan motor ON/OFF delay is 45 seconds. The Integrated Gas Unit Controller (IGC) modifies this value when abnormal limit switch cycles occur. Based upon unit operating conditions, the ON delay can be reduced to 0 seconds and the OFF delay can be extended to 180 seconds. When one flash of the LED is observed, the evaporator-fan ON/OFF delay has been modified.

If the limit switch trips at the start of the heating cycle during the evaporator ON delay, the time period of the ON delay for the next cycle will be 5 seconds less than the time at which the switch tripped. (Example: If the limit switch trips at 30 seconds, the evaporator-fan ON delay for the next cycle will occur at 25 seconds.) To prevent short-cycling, a 5-second reduction will only occur if a minimum of 10 minutes has elapsed since the last call for heating.

The evaporator-fan OFF delay can also be modified. Once the call for heating has ended, there is a 10-minute period during which the modification can occur. If the limit switch trips during this period, the evaporator-fan OFF delay will increase by 15 seconds. A maximum of 9 trips can occur, extending the evaporator-fan OFF delay to 180 seconds.

To restore the original default value, reset the power to the unit.

TO SHUT OFF UNIT — Set system selector switch at OFF position. Resetting heating selector lever below room temperature will shut unit off until space temperature falls below thermostat setting.

Safety Relief — A soft solder joint at the suction service Schrader port provides pressure relief under abnormal temperature and pressure conditions (i.e., fire in building). Use backup wrench when tightening flare cap.

High Flow Valves — Located on the compressor hot gas and suction tubes are High Flow Valves. Large black plastic caps distinguish these valves with O-rings located inside the caps. These valves cannot be accessed for service in the field. Ensure the plastic caps are in place and tight or the possibility of refrigerant leakage could occur.

Ventilation (Continuous Fan) — Set fan and system selector switches at ON and OFF positions, respectively. Evaporator fan operates continuously to provide constant air circulation. When the evaporator-fan selector switch is turned to the OFF position, there is a 30-second delay before the fan turns off.

Operating Sequence

COOLING, UNITS WITHOUT ECONOMIZER — When thermostat calls for cooling, terminals G and Y1 are energized, and the indoor (evaporator) fan motor (IFM), compressor, and outdoor (condenser) fan motor (OFM start. The OFM runs continuously while the unit is in cooling. When the thermostat is satisfied, compressor contactor (C) is deenergized and the compressor and OFM shut off. After a 30-second delay, the IFM shuts off. If the thermostat fan selector switch is the ON position, the evaporator motor will run continuously.

HEATING, UNITS WITHOUT ECONOMIZER — When the thermostat calls for heating, terminal W1 is energized. To prevent thermostat short-cycling, the unit is locked into the Heating mode for at least 1 minute when W1 is energized. The induced-draft motor is energized and the burner ignition sequence begins. The indoor (evaporator) fan motor (IFM) is energized 45 seconds after a flame is ignited. On units equipped for two stages of heat, when additional heat is needed, W2 is energized and the high-fire solenoid on the main gas valve (MGV) is energized. When the thermostat is satisfied and W1 is deenergized, the IFM stops after a 45-second time-off delay.

COOLING, UNITS WITH DURABLADE ECONOMIZER — When the outdoor-air temperature is above the outdoor-air thermostat (OAT) setting and the room thermostat calls for cooling, compressor contactor is energized to start compressor and the outdoor (condenser) fan motor (OFM). The indoor (evaporator) fan motor (IFM) is energized and the economizer damper moves to the minimum position. After the thermostat is satisfied, there is a 30-second delay before the evaporator fan turns off. The damper then moves to the fully closed position. When using continuous fan, the damper moves to the minimum position.

When the outdoor-air temperature is below the OAT setting and the thermostat calls for cooling, the economizer damper moves to the minimum position. If the supply-air temperature is above 57 F, the damper continues to open until it reaches the fully open position or until the supply-air temperature drops below 52 F.

When the supply-air temperature falls to between 57 F and 52 F, the damper will remain at an intermediate open position. If the supply-air temperature falls below 52 F, the damper will modulate closed until it reaches the minimum position or until the supply-air temperature is above 52 F. When the thermostat is satisfied, the damper will move to the fully closed position when using AUTO. fan or to the minimum position when using a continuous fan.

If the outdoor air alone cannot satisfy the cooling requirements of the conditioned space, economizer cooling is integrated with mechanical cooling, providing two stages of cooling. Compressor and the condenser fan will be energized and the position of the economizer damper will be determined by the supply-air temperature. When the second stage of cooling is satisfied, the compressor and OFM will be deenergized. The damper position will be determined by the supply-air temperature. When the first stage of cooling is satisfied, there is a 30-second delay before the evaporator fan shuts off. The damper then moves to the fully closed position. When using a continuous fan, the damper moves to the minimum position.

COOLING, UNITS WITH ECONOMI$ER — When the outdoor-air temperature (OAT) is above the ECON SP set point and the room thermostat calls for Stage 1 cooling (R to G + Y1), the indoor (evaporator) fan motor (IFM) is energized and the EconoMi$er damper modulates to minimum position. The compressor contactor is energized to start the compressor and outdoor (condenser) fan motor (OFM). After the thermostat is satisfied, the damper modulates to the fully closed position when the IFM is deenergized.

When the OAT is below the ECON SP setting and the room thermostat calls for Stage 1 cooling (R to G + Y1), the EconoMi$er modulates to the minimum position when the IFM is energized. The EconoMi$er provides Stage 1 of cooling by modulating the return and outdoor air dampers to maintain a 55 F supply air set point. If the supply-air temperature (SAT) is greater than 57 F, the EconoMi$er modulates open, allowing a greater amount of outdoor air to enter the unit. If the SAT drops below 53 F, the outdoor air damper modulates closed to reduce the amount of outdoor air. When the SAT is between 53 and 57 F, the EconoMi$er maintains its position.

If outdoor air alone cannot satisfy the cooling requirements of the conditioned space, and the OAT is above the MECH CLG LOCKOUT set point, the EconoMi$er integrates free cooling with mechanical cooling. This is accomplished by the strategies below.

NOTE: Compressor has a 2-minute Minimum On, Minimum Off, and Interstage delay timer.

1. If Y1 is energized, and the room thermostat calls for Y2 (2-stage thermostat), the compressor and OFM are energized. The EconoMi$er damper is maintained at its current position.
2. If Y1 is energized for more than 20 minutes, and Y2 is not energized (whether or not a 2-stage thermostat is used), the compressor and OFM are energized. The EconoMi$er damper is maintained at its current position.
3. If Y1 is energized, and the compressor is already energized (see Step 2) and the room thermostat calls for Y2, the compressor continues to operate.
4. If the compressor is energized and the thermostat is satisfied, the compressor, the OFM, and IFM are deenergized and the EconoMi$er modulates closed.

When the OAT is below the MECH CLG LOCKOUT set point, the compressors remain off.

HEATING, UNITS WITH ECONOMI$ER — When the thermostat calls for heating, terminal W1 is energized. To prevent thermostat short-cycling, the unit is locked into the Heating mode for at least 1 minute when W1 is energized. The induced-draft motor is energized and the burner ignition sequence begins. The indoor (evaporator) fan motor (IFM) is energized 45 seconds after a flame is ignited and the damper moves to the minimum position. On units equipped for two stages of heat, when additional heat is needed, W2 is energized and the high-fire solenoid on the main gas valve (MGV) is energized. When the thermostat is satisfied and W1 is deenergized, the IFM stops after a 45-second time-off delay. The economizer damper then moves to the fully closed position. When using continuous fan, the damper will remain in the minimum position.

SERVICE

⚠ CAUTION

When servicing unit, shut off all electrical power to unit to avoid shock hazard or injury from rotating parts.

Cleaning — Inspect unit interior at the beginning of heating and cooling season and as operating conditions require.

EVAPORATOR COIL

1. Turn unit power off and tag disconnect. Remove evaporator coil access panel.
2. If economizer is installed, remove economizer by disconnecting 12-pin Molex plug and removing economizer mounting screws. Refer to accessory economizer installation instructions or Optional Economizer sections on pages 13 and 15 for more details.
3. Slide filters out of unit.
4. Clean coil using a commercial coil cleaner or dishwasher detergent in a pressurized spray canister. Wash both sides of coil and flush with clean water. For best results, backflush toward return-air section to remove foreign material. Flush condensate pan after completion.
5. Reinstall economizer and filters.
6. Reconnect wiring.
7. Replace access panels.

CONDENSER COIL — Inspect coil monthly. Clean condenser coil annually, and as required by location and outdoor air conditions.

One-Row Coil Cleaning (Size 004) — To access one-row coils, remove screws securing condenser-fan grille to condenser fan top cover. Place grille on top of condenser fan top cover as shown in Fig. 45. It is not necessary to remove the top cover.

Use a water hose or other suitable equipment to remove dirt and debris. Clean the outer surfaces with a stiff brush in the normal manner.

Reverse the procedure outlined above to reinstall the condenser-fan grille and condenser fan top cover.

Two-Row Coil Cleaning (Sizes 005-007)

NOTE: Save all screws removed in this section. The screws must be used when reinstalling the equipment.

1. To access 2-row coils, remove screws securing condenser-fan grille to condenser coil top cover. Place grille on top of condenser fan top cover as shown in Fig. 45 and 46. It is not necessary to remove the top cover.
2. Remove 3 screws on right side of compressor access panel. Remove one screw securing condenser coil top cover to compressor access panel. Remove lower screws securing condenser coil to compressor mounting plate.
3. Remove 4 screws securing control box access panel. Remove three screws (located in front of the control box access cover) securing condenser coil top cover.
4. Remove screws securing low-voltage access panel. Remove 2 screws inside low-voltage access panel. Tilt sheet metal (located on left side of low-voltage connections) back 45 degrees.
5. Remove screw securing refrigerant service port access panel.
6. Remove 2 wire ties securing 2-row coils together at hairpin end.
7. Remove screws securing two corner posts. Remove two corner posts.
8. Use right corner post to prop up right side of condenser coil top cover. Slide condenser coil partially out of condenser fan housing. See Fig. 46.

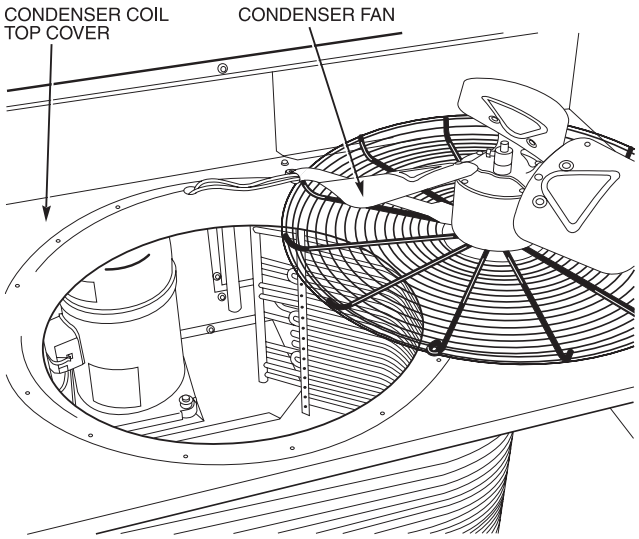


Fig. 45 — Coil Cleaning

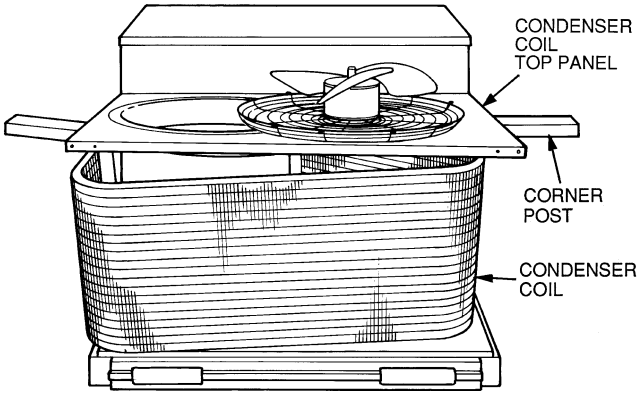


Fig. 46 — Propping Up Condenser Coil Top Cover

9. Use left corner post to prop up left side of condenser coil top cover.
10. Carefully separate the outer coil section 3 to 4 in. from the inner coil section. See Fig. 47.
11. Use a water hose or other suitable equipment to flush down between the 2 coil sections to remove dirt and debris. Clean the outer surfaces with a stiff brush in the normal manner.
12. Secure inner and outer coils together with 2 wire ties.
13. Reposition the outer and inner coil section.
14. Reverse the procedure outlined above to reinstall equipment.

CONDENSATE DRAIN — Check and clean each year at start of cooling season. In winter, keep drain dry or protect against freeze-up.

FILTERS — Clean or replace at start of each heating and cooling season, or more often if operating conditions require it. Replacement filters must be same dimensions as original filters.

OUTDOOR-AIR INLET SCREENS — Clean screens with steam or hot water and a mild detergent. Do not use disposable filters in place of screens.

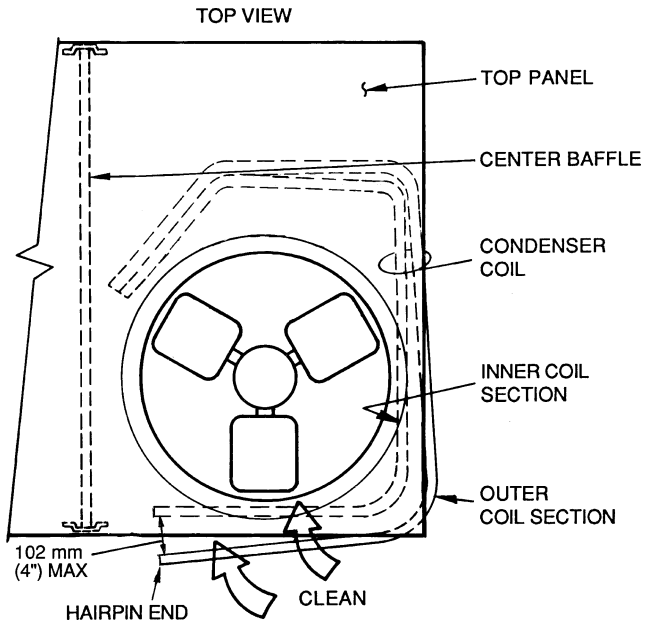


Fig. 47 — Separating Coil Sections

Lubrication

COMPRESSORS — Each compressor is charged with the correct amount of oil at the factory.

FAN-MOTOR BEARINGS — Fan-motor bearings are of the permanently lubricated type. No further lubrication is required. No lubrication of condenser or evaporator fan motors is required.

Manual Outdoor-Air Damper — If outdoor-air damper blade adjustment is required, see Manual Outdoor-Air Damper section on page 12.

Economizer Adjustment — Refer to Optional Economizer sections on pages 13 and 15.

Condenser Fan Adjustment (Fig. 48) — Shut off unit power supply and tag disconnect. Remove condenser-fan assembly (grille, motor, and fan) and loosen fan hub setscrews. Adjust fan height as shown in Fig. 48. Tighten setscrews and replace condenser-fan assembly.

Belt/Pulley Adjustment — Inspect once each season, or if conditions warrant to verify belt tension and pulley alignment are correct. Replace belt if necessary.

Refrigerant Charge — Amount of refrigerant charge is listed on unit nameplate (also refer to Table 1). Refer to Carrier GTAC2-5 Charging. Recovery, Recycling, and Reclamation training manual and the following procedures.

Unit panels must be in place when unit is operating during charging procedure. Unit must operate a minimum of 10 minutes before checking or adjusting charge.

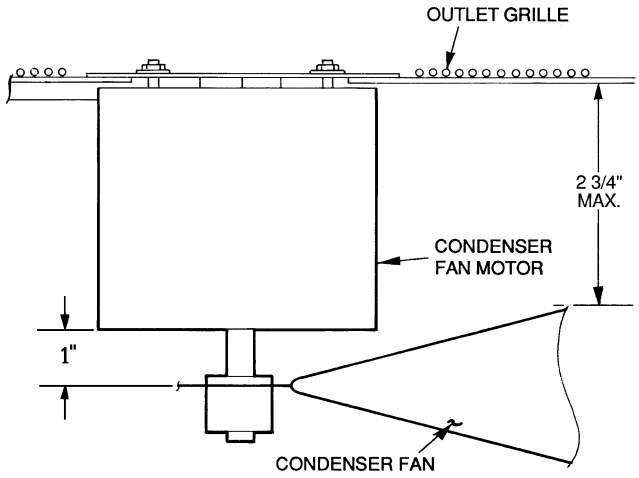


Fig. 48 — Condenser-Fan Adjustment

NO CHARGE — Use standard evacuating techniques. After evacuating system, weigh in the specified amount of refrigerant. (Refer to Table 1.)

LOW-CHARGE COOLING — Using Cooling Charging Charts, Fig. 49-52, vary refrigerant until the conditions of the appropriate chart are met. Note the charging charts are different from type normally used. Charts are based on charging the units to the correct superheat for the various operating conditions. Accurate pressure gage and temperature sensing device are required. Connect the pressure gage to the service port on the suction line. Mount the temperature sensing device on the suction line and insulate it so that outdoor ambient temperature does not affect the reading. Indoor-air cfm must be within the normal operating range of the unit.

TO USE COOLING CHARGING CHART — Take the outdoor ambient temperature and read the suction pressure gage. Refer to chart to determine what suction temperature should be. If suction temperature is high, add refrigerant. If suction temperature is low, carefully recover some of the charge. Recheck the suction pressure as charge is adjusted.

EXAMPLE: (Fig. 51)

Outdoor Temperature. . . . . .85 F
Suction Pressure. . . . . 80 psig
Suction Temperature should be. . . . . .68 F
(Suction Temperature may vary 5 F.)

Flue Gas Passageways — To inspect the flue collector box and upper areas of the heat exchanger:

1. Remove the combustion blower wheel and motor assembly according to directions in Combustion-Air Blower section on page 43.
2. Remove the flue cover to inspect the heat exchanger.
3. Clean all surfaces as required using a wire brush.

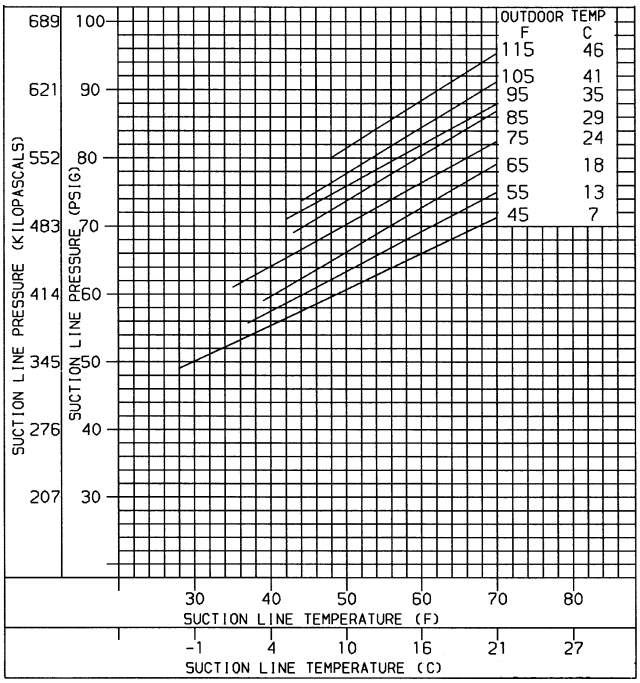


Fig. 49 — Cooling Charging Chart, 48TJ004

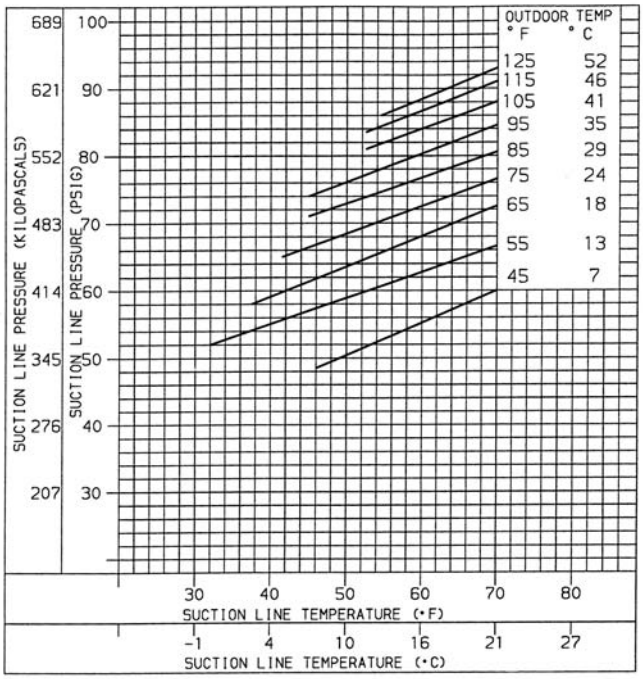


Fig. 51 — Cooling Charging Chart, 48TJ006

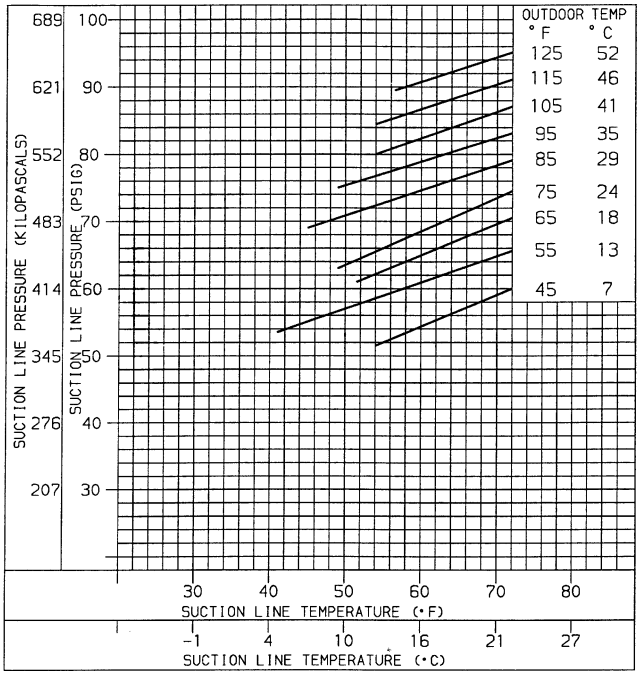


Fig. 50 — Cooling Charging Chart, 48TJ005

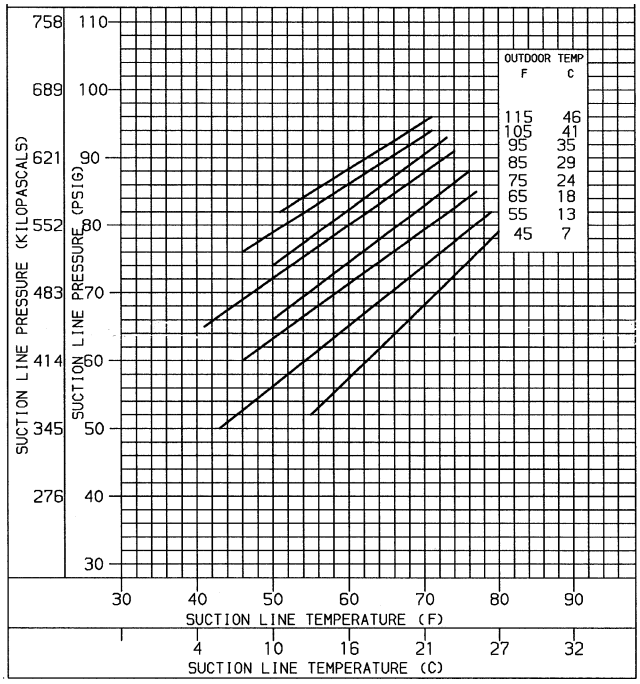


Fig. 52 — Cooling Charging Chart, 48TJ007

Combustion-Air Blower — Clean periodically to assure proper airflow and heating efficiency. Inspect blower wheel every fall and periodically during heating season. For the first heating season, inspect blower wheel bimonthly to determine proper cleaning frequency.

To access burner section, slide the sliding burner partition out of the unit.

To inspect blower wheel, shine a flashlight into draft hood opening. If cleaning is required, remove motor and wheel as follows:

1. Slide burner access panel out.
2. Remove the 7 screws that attach induced-draft motor housing to vestibule plate (Fig. 53).
3. The blower wheel can be cleaned at this point. If additional cleaning is required, continue with Steps 4 and 5.
4. To remove blower from the motor shaft, remove 2 setscrews.
5. To remove motor, remove the 4 screws that hold the motor to mounting plate. Remove the motor cooling fan by removing one setscrew. Then remove nuts that hold motor to mounting plate.
6. To reinstall, reverse the procedure outlined above.

Limit Switch — Remove blower access panel (Fig. 6). Limit switch is located on the fan deck.

Burner Ignition — Unit is equipped with a direct spark ignition 100% lockout system. Integrated Gas Unit Controller (IGC) is located in the control box (Fig. 10). The IGC contains a self-diagnostic LED (light-emitting diode). A single LED on the IGC provides a visual display of operational or sequential problems when the power supply is uninterrupted. When a break in power occurs, the IGC will be reset (resulting in a loss of fault history) and the indoor (evaporator) fan ON/OFF times will be reset. The LED error code can be observed through the viewport. During servicing refer to the label on the control box cover or Table 31 for an explanation of LED error code descriptions.

If lockout occurs, unit may be reset by interrupting power supply to unit for at least 5 seconds.

Table 31 — LED Error Code Description*

LED INDICATION	ERROR CODE DESCRIPTION
ON	Normal Operation
OFF	Hardware Failure
1 Flash†	Evaporator Fan On/Off Delay Modified
2 Flashes	Limit Switch Fault
3 Flashes	Flame Sense Fault
4 Flashes	4 Consecutive Limit Switch Faults
5 Flashes	Ignition Lockout Fault
6 Flashes	Induced-Draft Motor Fault
7 Flashes	Rollout Switch Fault
8 Flashes	Internal Control Fault

LEGEND

LED — Light-Emitting Diode

*A 3-second pause exists between LED error code flashes. If more than one error code exists, all applicable codes will be displayed in numerical sequence.

†Indicates a code that is not an error. The unit will continue to operate when this code is displayed.

IMPORTANT: Refer to Troubleshooting Tables 32-36 for additional information.

Main Burners — To access burners, remove burner access panel and slide out burner partition. See Fig. 9. At the beginning of each heating season, inspect for deterioration or blockage due to corrosion or other causes. Observe the main burner flames and adjust, if necessary.

⚠ CAUTION

When working on gas train, do not hit or plug orifice spuds.

REMOVAL AND REPLACEMENT OF GAS TRAIN (Fig. 53-55)

1. Shut off manual gas valve.
2. Shut off power to unit.
3. Slide out burner partition. See Fig. 9.
4. Disconnect gas piping at unit gas valve.
5. Remove wires connected to gas valve. Mark each wire.
6. Remove ignitor wires and sensor wires at the Integrated Gas Unit Controller (IGC) (see Fig. 10).
7. Remove the 2 screws that attach the burner rack to the vestibule plate (Fig. 53).
8. Slide the burner tray out of the unit (Fig. 54).
9. To reinstall, reverse the procedure outlined above.

CLEANING AND ADJUSTMENT

1. Remove burner rack from unit as described in Removal and Replacement of Gas Train section, above.
2. Inspect burners; if dirty, remove burners from rack.
3. Using a soft brush, clean burners and cross-over port as required.
4. Adjust spark gap. See Fig. 55.
5. Reinstall burners on rack.
6. Reinstall burner rack as described in Removal and Replacement of Gas Train section, this page.

Replacement Parts — A complete list of replacement parts may be obtained from any Carrier distributor upon request.

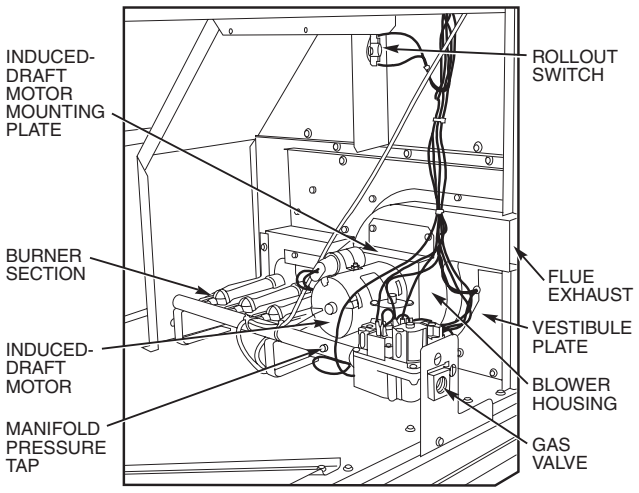


Fig. 53 — Burner Section Details

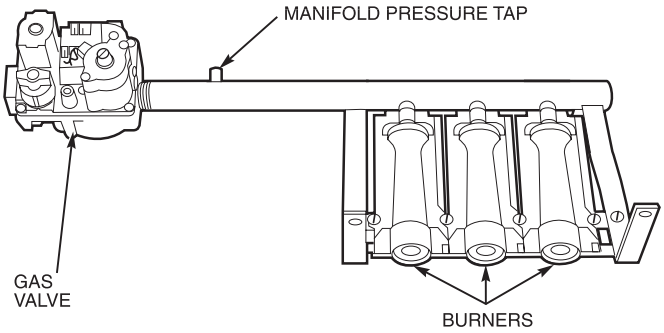
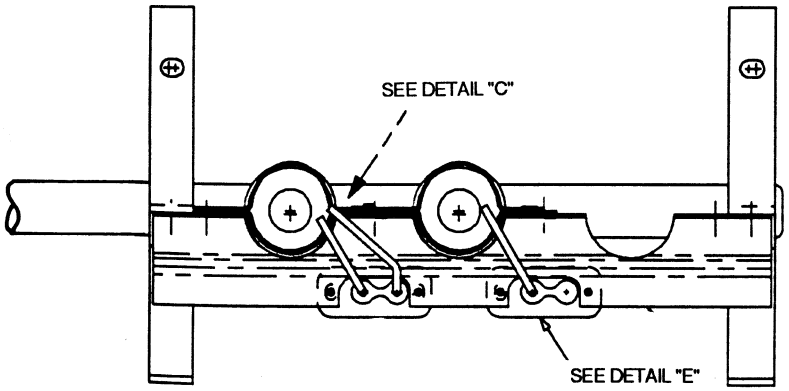
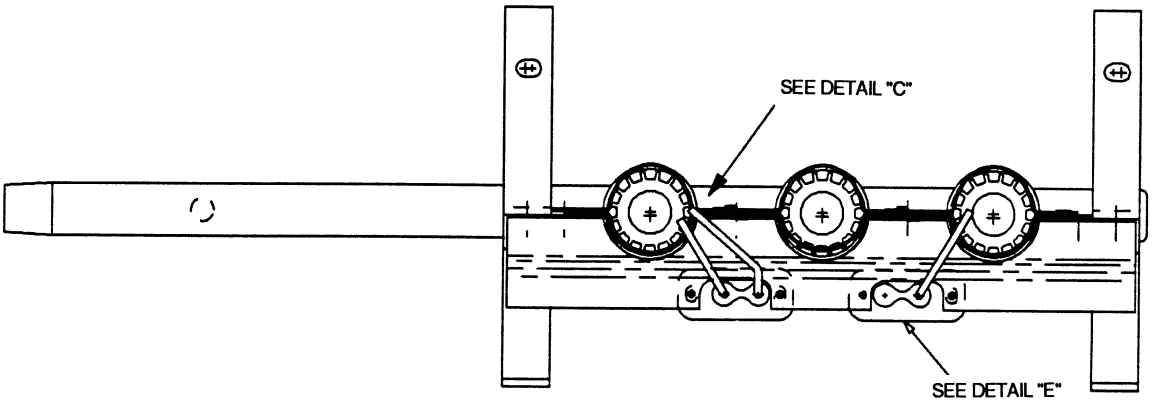


Fig. 54 — Burner Tray Details



LOW HEAT
48TJE004, 48TJD005-007 — 74,000 BTUH INPUT



MEDIUM ANDHIGH HEAT
48TJE005-007, 48TJF004 — 115,000 BTUH INPUT
48TJF005-007 — 150,000 BTUH INPUT

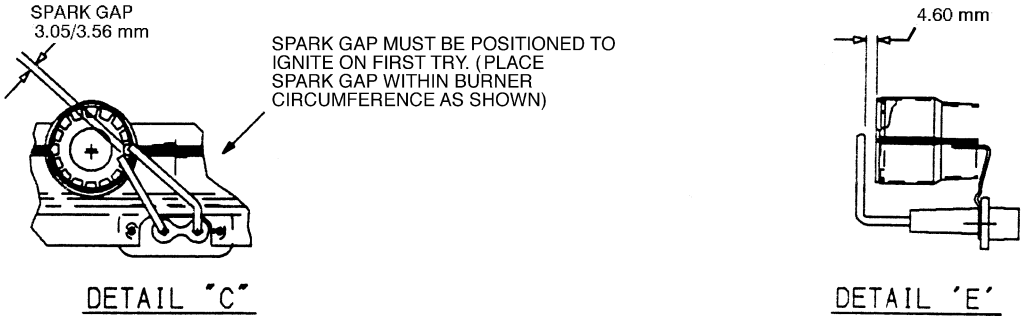


Fig. 55 — Spark Adjustment

TROUBLESHOOTING

Table 32 — LED Error Code Service Analysis

SYMPTOM	CAUSE	REMEDY
Hardware failure. (LED OFF)	Loss of power to control module (IGC).	Check 5 amp fuse on IGC, power to unit, 24-v circuit breaker, and transformer. Units without a 24-v circuit breaker have an internal overload in the 24-v transformer. If the overload trips, allow 10 minutes for automatic reset.
Fan ON/OFF delay modified (LED/FLASH)	High limit switch opens during heat exchanger warm-up period before fan-on delay expires.	Ensure unit is fired on rate and temperature rise is correct.
	Limit switch opens within three minutes after blower-off delay timing in Heating mode.	Ensure units' external static pressure is within application guidelines.
Limit switch fault. (LED 2 flashes)	High temperature limit switch is open.	Check the operation of the indoor (evaporator) fan motor. Ensure that the supply-air temperature rise is in accordance with the range on the unit nameplate.
Flame sense fault. (LED 3 flashes)	The IGC sensed flame that should not be present.	Reset unit. If problem persists, replace control board.
4 consecutive limit switch faults. (LED 4 flashes)	Inadequate airflow to unit.	Check operation of indoor (evaporator) fan motor and that supply-air temperature rise agrees with range on unit nameplate information.
Ignition lockout. (LED 5 flashes)	Unit unsuccessfully attempted ignition for 15 minutes.	Check ignitor and flame sensor electrode spacing, gaps, etc. Ensure that flame sense and ignition wires are properly terminated. Verify that unit is obtaining proper amount of gas.
Induced-draft motor fault. (LED 6 flashes)	IGC does not sense that induced-draft motor is operating.	Check for proper voltage. If motor is operating, check the speed sensor plug/IGC Terminal J2 connection. Proper connection: PIN 1— White, PIN 2 — Red, PIN 3 — Black.
Rollout switch fault. (LED 7 flashes)	Rollout switch has opened.	Rollout switch will automatically reset, but IGC will continue to lock out unit. Check gas valve operation. Ensure that induced-draft blower wheel is properly secured to motor shaft. Reset unit at unit disconnect.
Internal control fault. (LED 8 flashes)	Microprocessor has sensed an error in the software or hardware.	If error code is not cleared by resetting unit power, replace the IGC.

⚠ WARNING

If the IGC must be replaced, be sure to ground yourself to dissipate any electrical charge that may be present before handling new control board. The IGC is sensitive to static electricity and may be damaged if the necessary precautions are not taken.

IMPORTANT: Refer to Table 33 — Heating Service Analysis for additional troubleshooting analysis.

LEGEND

IGC — Integrated Gas Unit Controller
LED — Light-Emitting Diode

Table 33 — Heating Service Analysis

PROBLEM	CAUSE	REMEDY
Burners will not ignite.	Misaligned spark electrodes.	Check flame ignition and sensor electrode positioning. Adjust as needed.
	No gas at main burners.	Check gas line for air purge as necessary. After purging gas line of air, allow gas to dissipate for at least 5 minutes before attempting to relight unit.
		Check gas valve.
	Water in gas line.	Drain water and install drip leg to trap water.
	No power to furnace.	Check power supply, fuses, wiring, and circuit breaker.
	No 24 v power supply to control circuit.	Check transformer. Transformers with internal overcurrent protection require a cool down period before resetting.
	Miswired or loose connections.	Check all wiring and wirenut connections.
	Burned-out heat anticipator in thermostat.	Replace thermostat.
	Broken thermostat wires.	Run continuity check. Replace wires, if necessary.
Inadequate heating.	Dirty air filter.	Clean or replace filter as necessary.
	Gas input to unit too low.	Check gas pressure at manifold. Clock gas meter for input. If too low, increase manifold pressure, or replace with correct orifices.
	Unit undersized for application.	Replace with proper unit or add additional unit.
	Restricted airflow.	Clean filter, replace filter, or remove any restrictions.
	Blower speed too low.	Use high speed tap, increase fan speed, or install optional blower, as suitable for individual units.
	Limit switch cycles main burners.	Check rotation of blower, thermostat heat anticipator settings, and temperature rise of unit. Adjust as needed.
	Too much outdoor air.	Adjust minimum position.
		Check economizer operation.
Poor flame characteristics.	Incomplete combustion (lack of combustion air) results in:	Check all screws around flue outlets and burner compartment. Tighten as necessary.
	Aldehyde odors, CO, sooting flame, or floating flame.	Cracked heat exchanger.
		Overfired unit — reduce input, change orifices, or adjust gas line or manifold pressure.
		Check vent for restriction. Clean as necessary.
		Check orifice to burner alignment.
Burners will not turn off.	Unit is locked into Heating mode for a one minute minimum.	Wait until mandatory one minute time period has elapsed or reset power to unit.

Table 34 — Cooling Service Analysis

PROBLEM	CAUSE	REMEDY
Compressor and condenser fan will not start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Defective thermostat, contactor, transformer, or control relay.	Replace component.
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring.	Check wiring diagram and rewire correctly.
	Thermostat setting too high.	Lower thermostat setting below room temperature.
Compressor will not start but condenser fan runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace.
	One leg of three-phase power dead.	Replace fuse or reset circuit breaker. Determine cause.
Compressor cycles (other than normally satisfying thermostat).	Refrigerant overcharge or undercharge.	Recover refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor.	Replace and determine cause.
	Insufficient line voltage.	Determine cause and correct.
	Blocked condenser.	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace.
	Defective thermostat.	Replace thermostat.
	Faulty condenser-fan motor or capacitor.	Replace.
	Restriction in refrigerant system.	Locate restriction and remove.
Compressor operates continuously.	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low.	Reset thermostat.
	Low refrigerant charge.	Locate leak; repair, and recharge.
	Leaking valves in compressor.	Replace compressor.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser coil dirty or restricted.	Clean coil or remove restriction.
Excessive head pressure.	Dirty air filter.	Replace filter.
	Dirty condenser coil.	Clean coil.
	Refrigerant overcharged.	Remove excess refrigerant.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser air restricted or air short-cycling.	Determine cause and correct.
Head pressure too low.	Low refrigerant charge.	Check for leaks; repair, and recharge.
	Compressor valves leaking.	Replace compressor.
	Restriction in liquid tube.	Remove restriction.
Excessive suction pressure.	High heat load.	Check for source and eliminate.
	Compressor valves leaking.	Replace compressor.
	Refrigerant overcharged.	Recover excess refrigerant.
Suction pressure too low.	Dirty air filter.	Replace filter.
	Low refrigerant charge.	Check for leaks; repair, and recharge.
	Metering device or low side restricted.	Remove source of restriction.
	Insufficient evaporator airflow.	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Outdoor ambient below 25 F.	Install low-ambient kit.
Evaporator fan will not shut off.	Time off delay not finished.	Wait for 30-second off delay.
Compressor makes excessive noise (48TJ007 scroll only).	Compressor rotating in wrong direction.	Reverse the 3-phase power leads as described in the Start-Up section on page 37.

Table 35 — Durablade Economizer Troubleshooting

PROBLEM	CAUSE	REMEDY
Damper does not open.	Indoor (evaporator) fan is off.	1. Check to ensure that 24 vac is present at terminal C1 on the IFC or that 24 vac is present at the IFO terminal. Check whether 24 vac is present at PL6-1 (red wire) and/or PL6-3 (black wire). If 24 vac is not present, check wiring (see unit label diagram). 2. Check proper thermostat connection to G on the connection board.
	No power to economizer motor.	1. Check that SW3 is properly making contact with the damper blade. Check that SW1 is in the NC (normally closed) position. 2. Check diode D18. If diode is not functioning properly, replace control board. 3. Confirm that the economizer control board is grounded properly at PL6-4 (brown wire) and at brown terminal of the economizer control board (brown wire). The economizer motor must also be grounded properly at the negative motor terminal (brown wire). 4. Verify SW1 and SW3 are working and wired properly (see unit label diagram). 5. Check for 24 vac input at both PL6-1 (red wire) and PL6-3 (black wire). If 24 vac not present, check unit wiring (see unit label diagram). If 24 vac is found in both places, check for 24 vac at the yellow terminal of the economizer control board (yellow wire). If 24 vac power is not present, replace the economizer control board.
	Economizer motor failure.	If the indoor (evaporator) fan and economizer motor are energized, verify that there is a minimum of 18 vdc at the positive motor terminal. If the motor is not operating, replace the motor.
Economizer operation limited to minimum position.	OAT or EC set too high.	1. Set at correct temperature (3 F below indoor space temperature). 2. Check OAT or EC by setting above outdoor temperature or humidity level. If the OAT or EC switches do not close, replace OAT or EC.
	Verify economizer control board is correctly wired and works properly.	1. Perform the following tests when OAT or EC is closed, Y1 is called for and damper is at minimum position. Confirm 24 vac on gray terminal of the economizer control board (gray wire). If 24 vac is not present, check wiring (see unit label diagram). 2. Verify that SW1 and SW3 are wired correctly and working properly (see unit label diagram). 3. Check to ensure that 24 vac exists at PL6-2 (blue wire). If 24 vac is not present, check wiring (see unit wiring label diagram). 4. Check 24 vac output at PL6-10 (white wire). If 24 vac is not present, replace economizer control board.
	Check SAT.	1. After verifying that the OAT and EC settings and the economizer control board wiring are correct, check to ensure that the 24 vac terminal of the SAT has 24 vac (white wire). If OAT, EC, and control board are functioning and wired properly and no 24 vac exists, check wiring (see unit label diagram). 2. If supply-air temperature is greater than 57 F, 24 vac should be found at terminal T2 on the SAT (pink wire). If 24 vac is not present, replace SAT.
Damper does not close.	Incorrect wiring of economizer.	1. Verify that SW2 and SW4 are wired and working properly (see unit label diagram). 2. Check diode D19. If diode is not functioning properly, replace control board.
	Verify economizer control board is functioning properly.	1. After verifying that the wiring is correct, modulate the damper to the minimum position. Remove the calls for G. 2. If the damper does not move, check for 24 vac at PL6-1 (red wire). If 24 vac is not present, check wiring (see unit label diagram). 3. If damper still does not move, check for 24 vac at blue terminal of economizer control board (blue wire). If 24 vac is not present, replace the economizer circuit board.
	Check SAT.	1. After verifying that the wiring is correct and the economizer control board is functioning properly, place the OAT or EC switch in the closed position. Place a call for Y1 and open the damper to the fully open position. Confirm that the 24 vac terminal of the SAT has 24 vac (white wire). If 24 vac is not present, check wiring (see unit label diagram). 2. If supply-air temperature is less than 52 F, 24 vac should be found at terminal T1 on the SAT (violet wire). If 24 vac not found, replace SAT.
	Economizer motor failure.	If economizer control board and SAT are functioning properly, verify that there is a minimum of 18 vdc at the positive motor terminal. If a minimum if 18 vdc is present and the motor is still not operating, replace the motor.
Economizer damper does not close on power loss.	Verify that close-on-power-loss and economizer control board are functioning properly.	1. Check voltage potential across batteries. If lower than 14 vdc, replace close-on-power-loss power supply (9-v alkaline batteries). It is recommended that you check this emergency power supply on a regular basis or whenever the filters are changed. 2. If the close-on-power-loss and economizer control board are functioning properly, check for 14 vdc or higher at the blue terminal of the economizer control board (blue wire) when power is disconnected from unit. If 14 vdc is not present, replace the control board.

C1 — Common Power
EC — Enthalpy Control
IFC — Indoor (Evaporator) Fan Contactor
IFO — Indoor (Evaporator) Fan On
OAT — Outdoor-Air Thermostat
PL — Plug
SAT — Supply-Air Thermostat
SW — Economizer Position Switch

Table 36 — EconoMi$er Troubleshooting

PROBLEM	POTENTIAL CAUSE	REMEDY
Damper Does Not Open	Indoor (Evaporator) Fan is Off	Check to ensure that 24 vac is present at Terminal C1 (Common Power) on the IFC (Indoor [Evaporator] Fan Contactor) or that 24 vac is present at the IFO (Indoor [Evaporator] Fan On) terminal. Check whether 24 vac is present at PL6-1 (red wire) and/or PL6-3 (black wire). If 24 vac is not present, check wiring (see unit label diagram). Check proper thermostat connection to G on the connection board.
	No Power to EconoMi$er Controller	Check to ensure that 24 vac is present across Terminals 24 VAC and 24V COM on the EconoMi$er control. If 24 vac is not present, check wiring (see unit label diagram). If 24 vac is present, STATUS light should be on constantly.
	No Power to G Terminal	If IFM is on, check to ensure 24 vac is present on G Terminal of the EconoMi$er controller. If 24 vac is not present, check wiring (see unit label diagram).
	Controller Fault	If STATUS light is flashing one flash, the EconoMi$er controller is experiencing a fault condition. Cycle power to the controller. If condition continues, replace the EconoMi$er controller.
	Thermostat Fault	If STATUS light is flashing two flashes, the EconoMi$er controller senses the thermostat is wired incorrectly. Check wiring between the thermostat and the connection board in the electrical panel. The fault condition is caused by Y2 being energized before Y1.
	Actuator Fault	Check the wiring between the EconoMi$er controller and the actuator. Hold CONFIG button between 3 and 10 seconds to verify the actuator's operation. (This process takes 3 minutes to complete.)
EconoMi$er Operation Limited to Minimum Position	Minimum Position Set Incorrectly	Verify that the MIN POS (%) is set greater than zero. Adjust MIN POS (%) to 100% to verify operation, and then set to correct setting.
	EconoMi$er Changeover Set Point Set Too High or Too Low	Set at correct value. See Table 3.
	Supply Air Temperature Sensor Faulty	If STATUS light is flashing 4 flashes, Supply Air Temperature Sensor is faulty. Check wiring or replace sensor.
	Outdoor Air Temperature Sensor Faulty	If STATUS light is flashing 5 flashes, Outdoor Air Temperature Sensor is faulty. Check wiring or replace sensor.
Damper Position Less than Minimum Position Set Point	Supply Air Low Limit Strategy Controlling	The supply-air temperature is less than 45 F, causing the minimum position to decrease. Refer to the Start-Up instructions. Verify correct setting of MIN POS (%). If correct, EconoMi$er is operating correctly.
Damper Does Not Return to Minimum Position	CO_2 Ventilation Strategy Controlling	If a CO_2 sensor is being used, and the damper position is greater than minimum position, the ventilation control strategy is controlling. Refer to the Start-Up instructions. EconoMi$er is operating correctly.
Damper Does Not Close on Power Loss	Damper Travel is Restricted	Check to ensure the damper is not blocked.

LEGEND

PL — Plug

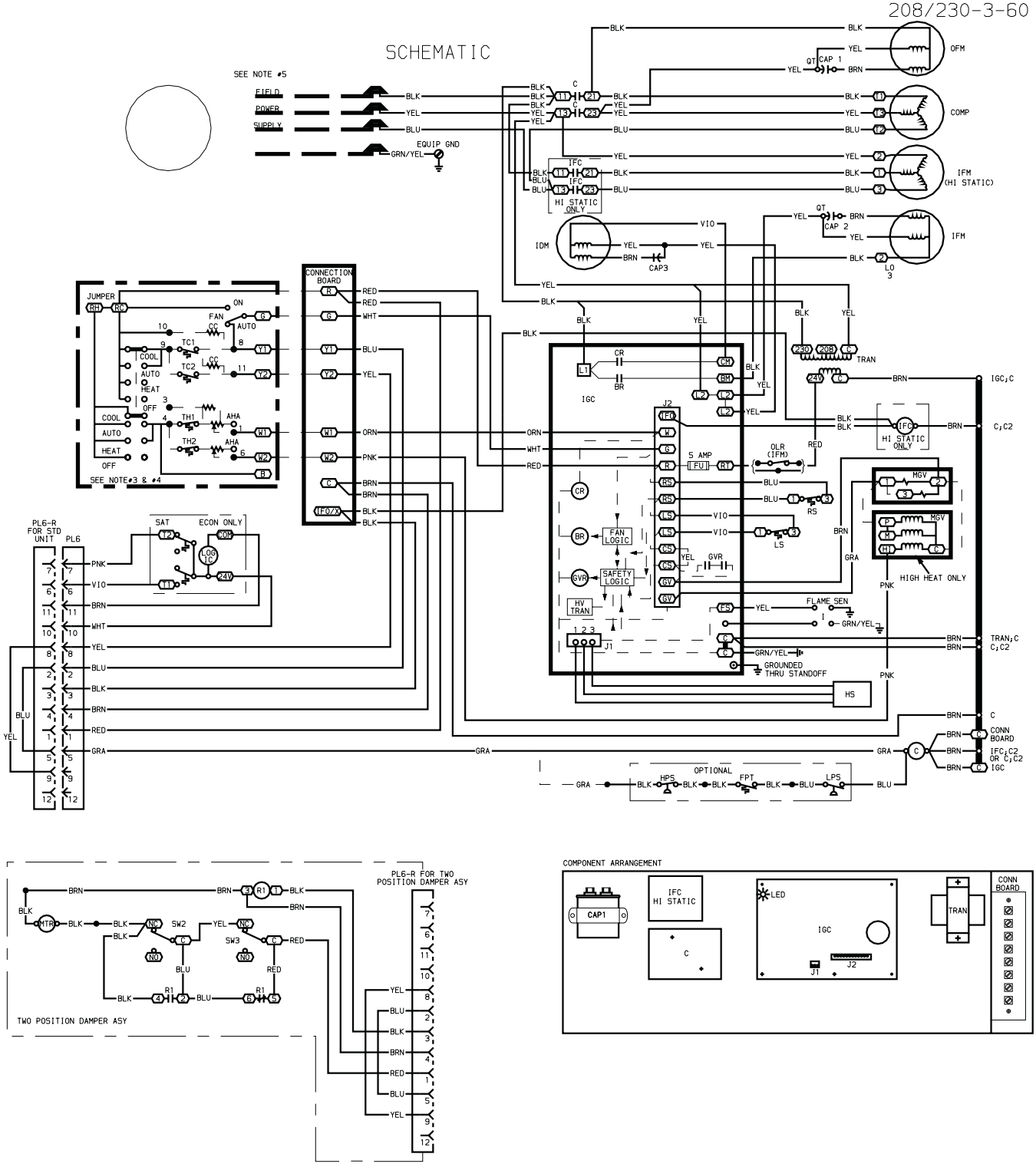


Fig. 56 — Typical Wiring Diagram and Component Arrangement

LEGEND FOR FIG. 56 — TYPICAL WIRING SCHEMATIC AND COMPONENT ARRANGEMENT

IMPORTANT: Refer to unit wiring label for actual unit wiring information.

AHA — Adjustable Heat Anticipator
BR — Burner Relay
C — Contactor, Compressor
CAP — Capacitor
CC — Cooling Compensator
COMP — Compressor Motor
CR — Combustion Relay
ECON — Economizer
EQUIP — Equipment
FPT — Freeze-Up Protection Thermostat
GND — Ground
GVR — Gas Valve Relay
HPS — High-Pressure Switch
HS — Hall-Effect Sensor
HV — High Voltage
I — Ignitor
IDM — Induced-Draft Motor
IFM — Indoor (Evaporator) Fan Motor
IGC — Integrated Gas Unit Controller
LED — Light-Emitting Diode
LPS — Low-Pressure/Loss-of-Charge Switch
LS — Limit Switch
MGV — Main Gas Valve
MTR — Motor
OFM — Outdoor (Condenser) Fan Motor
PL — Plug Assembly
QT — Quadruple Terminal
R — Relay
RS — Rollout Switch
SAT — Supply Air Thermostat
SEN — Sensor
SW1 — Switch Fully Open
SW2 — Switch Fully Closed
SW3 — Switch Min. Vent Position
SW4 — Switch Max. Vent Position
TC — Thermostat-Cooling
TH — Thermostat-Heating
TRAN — Transformer


Field Splice

Marked Wire

Terminal (Marked)


Terminal (Unmarked)

Terminal Block


Splice


Splice (Marked)

Factory Wiring

Field Control Wiring

Field Power Wiring

Accessory or Optional Wiring

To indicate common potential only.
Not to represent wiring.

NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with type 90 C wire or its equivalent.
2. Three-phase motors are protected under primary single-phasing conditions.
3. Thermostat: HH07AT170, 172, 174 and P272-2783
   Subbase: HH93AZ176, 178 and P272-1882, 1883
4. Set heat anticipator at .14 amp. For units with 2 stages of heating, set stage two anticipator at .14 amp.
5. Use copper conductors only.
6. TRAN is wired for 230-v unit. If unit is to be run with 208-v power supply, disconnect BLK wire from 230-v tap and connect to 208-v tap.

START-UP CHECKLIST
(Remove and Store in Job File)

I. PRELIMINARY INFORMATION:

MODEL NO.:_____ SERIAL NO.: _____

DATE:_____ TECHNICIAN: _____

BUILDING LOCATION:_____ DATE STARTED: _____

II. PRE-START-UP (insert checkmark in box as each item is completed)

- ☐ VERIFY THAT ALL PACKING MATERIALS HAVE BEEN REMOVED FROM UNIT
- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTALLATION INSTRUCTIONS
- ☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS
- ☐ VERIFY ELECTRICAL WIRING DOES NOT CONTACT REFRIGERANT TUBING
- ☐ CHECK GAS PIPING FOR LEAKS
- ☐ CHECK THAT INDOOR-AIR FILTER IS CLEAN AND IN PLACE
- ☐ VERIFY THAT UNIT INSTALLATION IS LEVEL
- ☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS
- ☐ CHECK BELT TENSION AND PULLEY ALIGNMENT

III. START-UP:

ELECTRICAL

SUPPLY VOLTAGE	L1-L2	_____	L2-L3	_____	L3-L1	_____
COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
INDOOR-FAN AMPS	L1	_____	L2	_____	L3	_____

TEMPERATURES AND PRESSURES

OUTDOOR-AIR TEMPERATURE	_____	DB	_____	WB
RETURN-AIR TEMPERATURE	_____	DB	_____	WB
COOLING SUPPLY AIR	_____	DB	_____	WB

GAS INLET PRESSURE	_____	IN. WG		
GAS MANIFOLD PRESSURE	_____	IN. WG (HI FIRE)		
GAS HEAT SUPPLY AIR	_____	DB		
REFRIGERANT SUCTION	_____	PSIG	_____	F (AT SUCTION SERVICE VALVE)
REFRIGERANT DISCHARGE	_____	PSIG	_____	F (AT CONDENSER LIQUID LINE OUTLET)

- ☐ VERIFY REFRIGERANT CHARGE USING CHARGING TABLES
- ☐ VERIFY THAT 3-PHASE SCROLL COMPRESSOR ROTATING IN CORRECT DIRECTION (48TJ007 ONLY)

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE