



# Product Data

## 48TJ008-014 Single-Package Rooftop Units Electric Cooling/Gas Heating 50 Hz

Nominal Capacity: 21.5 kW to 35.9 kW  
(6.1 to 10.2 Tons)

### Quality Assurance



Certificate No FM 22838

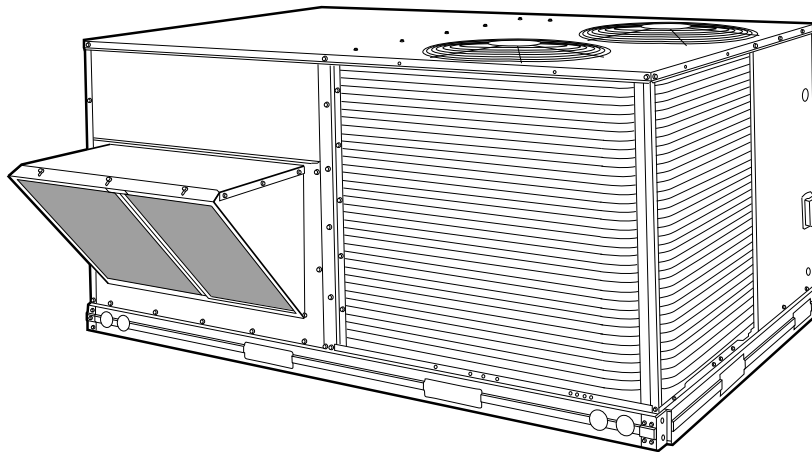
#### Approvals:

ISO 9002

EN 29002

BS5750 PART 2

ANSI/ASQC Q92



#### Single-Package Rooftop Units with:

- Alumagard™ heat exchanger coating
- Induced-draft fan for gas combustion
- Tubular-dimpled heat exchangers
- Exclusive integrated gas control board with diagnostics
- Galvanized prepainted steel cabinet
- Fifty-one mm (2-in.) return-air filters
- Commercial strength base rails
- Exclusive tool-less filter access panel
- Corrosion-resistant sloped condensate pan
- Single power entry to unit
- Commercial duty motors with permanently lubricated bearings
- Standard cooling operation at outdoor ambient temperatures as low as -4 C (25 F)
- Meets ASHRAE Standard 62 for indoor air quality

## Features/Benefits

**Compact, vertical discharge units convert to horizontal discharge, combining installation flexibility with efficient performance and easy maintenance.**

### **Easy installation and conversion**

All units are shipped in the vertical discharge configuration for fit-up to standard roof curbs. The contractor can order and install the roof curb early in the construction stage, before decisions on size requirements are made.



All units feature roll-formed baserail design with forklift slots on all 3 sides and rigging holes for easier maneuvering. Durable packaging protects all units during shipment and storage.

The units can be easily converted from a vertical to a horizontal discharge configuration by interchanging the panels supplied with the unit.

All units feature a non-corrosive sloped condensate drain pan in accordance with ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers) Standard 62. Also, the new, sloped condensate pan permits either an external side condensate drain (outside the roof curb) or an internal bottom drain (inside the roof curb). Both options require a field-supplied P-trap. Plus, the new condenser coil grille (available as a field-installed accessory) provides a metal plate as an alternate location for the field-supplied disconnect, if desired.

In addition, the units have a standard filter access door, which permits tool-less filter changes.

**Efficient, dependable gas heat operation**

Dimpled heat exchangers optimize heat transfer for improved efficiency. The tubular design permits hot gases to make multiple passes across the path of the supply air. In addition, dimpled heat exchanger tubes act as baffles, forcing the hot gases to stay in close contact with the cell walls to maximize heat transfer and efficiency.

The induced draft combustion system eliminates the unsightly appearance of flue stacks, and diminishes the effects of winds on heating operation. The inducer fan draws hot combustion gas through the heat exchanger at the optimum rate for the most effective heat transfer. The induced draft also prevents contaminants from entering the supply air if a leak in the heat exchanger occurs.

Dual-stage gas heat on all size units maximizes efficiency and customizes comfort.

The direct spark ignition system saves operating expense when compared to old-style pilot ignition systems. No crossover tube is required, therefore no sooting or pilot fouling problems can occur.

Standard units are designed for natural gas. An LP (liquid propane) Conversion Kit is available as an accessory, if required. Installation of the accessory LP kit simply involves changing the gas orifices to accommodate liquid propane gas.

**Simple electrical connections**

Terminal boards, located in the base unit control box, facilitate connections to room thermostat, outdoor thermostat(s), economizer, and electric heat. Service panels are quickly removed, permitting easy servicing.

Thru-the-bottom service connection capability allows power and control wiring to be routed through the unit basepan, minimizing roof penetrations. Both power and control connections are made on the same side of the unit to simplify installation. In addition, color-coded wires permit easy tracing and diagnostics.

**Proven compressor reliability**

Design techniques feature computer-programmed balance between compressor, condenser, and evaporator. Carrier-specified hermetic compressors are equipped with compressor overcurrent and overtemperature protection to ensure dependability.

Carrier's exclusive Acutrol™ metering device precisely controls refrigerant flow, preventing slugging and flood-back, while maintaining optimum unit performance.

**Durable, dependable construction**

Designed for durability in any climate, the weather-resistant cabinets are

manufactured using prepainted steel. The cabinet is constructed of galvanized steel and bonderized, and all exterior panels are coated with a pre-painted baked enamel finish. The paint finish is non-chalking, and is capable of withstanding Federal (U.S.A.) Test Method Standard No. 141 (Method 6061) 500-hour salt spray test. All internal cabinet panels are primed, permitting longer life and a more attractive appearance for the entire unit. In addition, the units are designed with a single, continuous top piece to eliminate any possible leaks. Totally-enclosed condenser-fan motors and permanently-lubricated bearings provide additional unit dependability.

**Integrated economizers and outdoor air**

During a first stage call for cooling, if the outdoor-air temperature is below the control set point, the leaving-air sensor modulates the economizer outdoor-air damper open to achieve the set point. When second-stage cooling is called for, the compressor is energized in addition to the economizer. If the outdoor-air temperature is above the set point, the first stage of compression is activated and the economizer stays at minimum vent position. Economizer operation is controlled by Accusensor™ I dry-bulb thermostat that senses outdoor-air temperature. Accessory upgrade kits include solid-state enthalpy control and differential enthalpy sensor.

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# Features/Benefits (cont)



The newly designed Durablade economizer has a reliable sliding plate damper which is easily adjusted for 100% outdoor air, 100% return air, or any proportions of mixed air.

## **Quiet, efficient operation and dependable performance**

Compressors have vibration isolators for extremely quiet operation. Efficient fan and motor design permits operation at very low sound levels, and all units are mounted on independent mounting rails.

The 48TJ units offer high energy efficiency and lower utility costs through part load operation using 2 stages of cooling.

Quiet and efficient operation is provided by belt-driven evaporator fans (standard). The belt-driven evaporator-fan motor allows adjustment to available static pressure to meet the job requirements of even the most demanding applications.

## **Integrated gas unit controller (IGC)**

All ignition components are contained in the compact IGC which is easily accessible for servicing. The IGC control board, designed and manufactured exclusively for Carrier rooftop units, provides built-in diagnostic capability. An LED (light-emitting diode) simplifies troubleshooting by providing visual fault notification and system status confirmation.

The IGC also contains an exclusive anti-cycle protection for gas heat operation. After 4 continuous cycles on the unit high-temperature limit switch, the gas heat operation is disabled, and an error code is issued. This feature greatly improves reliability of the rooftop unit.

The IGC also contains burner control logic for accurate and dependable gas ignition. The LED is visible without removing the unit control box access panel. This LED fault-notification system reduces service

person troubleshooting time and minimizes service costs. The IGC also maximizes heating efficiency by controlling evaporator-fan on and off delays.

## **Safety is built in**

All 48TJ units have a flame rectification sensor to quickly sense the burner flame and ignite burners almost immediately. Fast shutdown is a certainty since the sensor reacts quickly to any flame outage or system failure. In the event of a shutdown, an error code is issued at the IGC board.

Safety is also assured due to the heating safety controls which will shut down the unit if there is a problem. If excessive temperatures develop, limit switches shut off the gas valve. After 4 continuous short cycles of the high-temperature limit switch, the IGC board locks out the gas heat cycle to prevent any further short cycles. This safety feature is provided exclusively on Carrier rooftop units. The rollout switch also deenergizes the gas valve in the event of a flame rollout.

## **Carrier Apollo controls add reliability, efficiency, and simplification**

Apollo direct digital controls are ordered as a factory-installed option. Designed and manufactured exclusively by Carrier, the controls can be used to actively monitor and control all modes of operation, as well as to monitor evaporator-fan status, filter status, indoor-air quality (humidity and carbon dioxide), supply-air temperature, and outdoor-air temperature.

The Apollo communicating control is factory-installed into the rooftop unit control box, and comes equipped with built-in diagnostic capabilities. Light-emitting diodes (LEDs) simplify troubleshooting by indicating thermostat commands for both stages of

heating and cooling, evaporator-fan operation, and economizer operation. The Apollo communicating control is designed to work specifically with the Carrier TEMP and VVT® (variable volume and temperature) thermostats. The Apollo control combined with Carrier thermostats incorporate a 5-minute recycle delay timer between modes of operation to prevent short cycling.

The standard rooftop control system is readily adaptable to all conventional and programmable thermostats. In addition, units with Apollo controls are suitable for integration into building monitor control systems if required. This system gives the 48TJ units the flexibility to communicate with almost any thermostat or building control system.

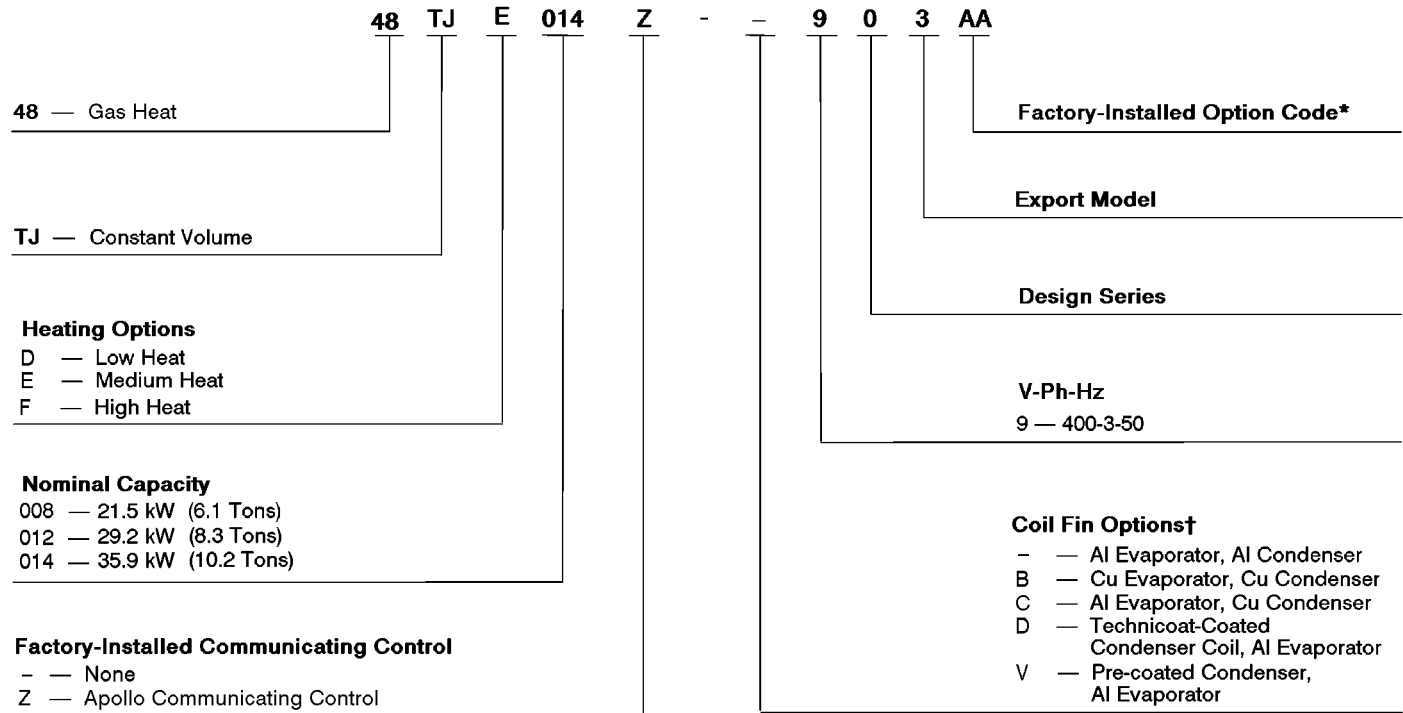
## **Indoor-air quality begins with Carrier rooftops**

Sloped condensate pans minimize biological growth in rooftop units in accordance with ASHRAE Standard 62. Two-in. filters with accessory dirty filter indicator switch provide for greater particle reduction in the return air. The face-split evaporator coils improve the dehumidification capability of the standard units, and standard enthalpy controls provided with the optional or accessory economizers maximize building humidity control. The 48TJ units also have an accessory, 100% open, two-position damper to meet all your fresh outdoor air requirements.

For units without economizer, year-round ventilation can be enhanced by a manual outdoor-air damper (ordered as an accessory.) The damper can be preset to admit up to 25% outdoor air.

In addition, the barometric relief damper can be utilized to help maintain proper building pressure.

# Model number nomenclature



**LEGEND**

- Al** — Aluminum
- Cu** — Copper
- FIOP** — Factory-Installed Option

\*Refer to 48TJ Product Ordering Data or contact your local Carrier representative for 48TJ FIOP code table.

†All coils have copper tubes.

## Capacities

### HEATING CAPACITIES AND EFFICIENCIES

UNIT	HEATING INPUT kW (Btuh)		OUTPUT CAPACITY kW (Btuh)		TEMPERATURE RISE °C (°F)	AFUE (%)	STEADY STATE EFFICIENCY (%)
	First Stage/Second Stage	First Stage/Second Stage	First Stage/Second Stage	First Stage/Second Stage			
<b>48TJD008</b>	21.1/31.4 (72,000/107,000)	17.3/25.7 (59,000/87,700)	-6 to 10 (20 to 50)	82	82		
<b>48TJE008</b>	31.9/50.4 (109,000/172,000)	25.5/40.3 (87,200/137,600)	2 to 18 (35 to 65)	80	80		
<b>48TJF008</b>	39.8/59.8 (136,000/204,000)	31.9/47.8 (108,800/163,200)	7 to 24 (45 to 75)	80	80		
<b>48TJD012</b>	31.9/50.4 (109,000/172,000)	25.5/40.3 (87,200/137,600)	2 to 18 (35 to 65)	80	80		
<b>48TJE012</b>	39.8/59.8 (136,000/204,000)	31.9/47.8 (108,800/163,000)	7 to 24 (45 to 75)	80	80		
<b>48TJF012</b>	43.9/65.6 (150,000/224,000)	35.2/52.5 (120,000/179,200)	4 to 21 (40 to 70)	80	80		
<b>48TJD014</b>	39.8/59.8 (136,000/204,000)	31.9/47.8 (108,800/163,000)	7 to 24 (45 to 75)	80	80		
<b>48TJE014</b>	43.9/65.6 (150,000/224,000)	35.2/52.5 (120,000/179,200)	4 to 21 (40 to 70)	80	80		

AFUE — Annual Fuel Utilization Efficiency

# Physical data — 48TJ008-014 (SI)



UNIT SIZE	D/E/F008	D/E/F012	D/E014
<b>NOMINAL CAPACITY (kW)</b>	21.5	29.2	35.9
<b>OPERATING WEIGHT (kg)</b>			
Unit	395	469	476
Economizer (Durablade)	20	20	20
Roof Curb*	65	65	65
<b>COMPRESSOR</b>		Hermetic	
Quantity	2	2	2
Oil (ml)	1479 ea	1479 ea	1922 ea
<b>REFRIGERANT TYPE</b>		R-22	
Operating Charge (kg)			
Circuit 1	2.10	2.49	4.22
Circuit 2	2.13	2.55	3.90
<b>CONDENSER COIL</b>		Enhanced Copper Tubes, Aluminum Lanced Fins	
Rows...Fins/m	1...669	2...669	2...669
Total Face Area (sq m)	1.90	1.62	2.30
<b>CONDENSER FAN</b>		Propeller Type	
Nominal L/s	2880	3050	3050
Quantity...Diameter (mm)	2...559	2...559	2...559
Motor BkW...r/s	.19...15.5	.19...15.5	.19...15.5
<b>EVAPORATOR COIL</b>		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Acutrol™ Feed Device	
Rows...Fins/m	3...590	3...590	4...590
Total Face Area (sq m)	0.74	0.93	1.03
<b>EVAPORATOR FAN</b>		Centrifugal Type	
Quantity...Size (mm x mm)	1...381 x 381	1...381 x 381	1...381 x 381
Type Drive	Belt	Belt	Belt
Nominal L/s	1230	1700	1980
Motor kW	1.12	1.50	2.24
Maximum Continuous BkW	1.79	1.79	2.76
Motor Frame Size	56	56	56
Fan r/s Range	8.2-11.7	9.5-13.0	12.0-15.0
Motor Bearing Type	Ball	Ball	Ball
Maximum Allowable r/s	26.7	26.7	26.7
Motor Pulley Pitch Diameter Min/Max (mm)	61/86	86/112	102/127
Nominal Motor Shaft Diameter (mm)	16	16	22
Fan Pulley Pitch Diameter (mm)	140	178	203
Nominal Fan Shaft Diameter (mm)	25	25	25
Belt, Quantity...Type...Length (mm)	1...A...1219	1...A...1219	1...A...1448
Pulley Center Line Distance (mm)	406	495	495
Speed Change per Full Turn of Movable Pulley Flange (r/s)	.70	.70	.60
Movable Pulley Maximum Full Turns From Closed Position	5	5	5
Factory Setting	5	5	5
Factory Speed Setting (r/s)	8.2	9.5	12.0
Fan Shaft Diameter at Pulley (mm)	25	25	25
<b>FURNACE SECTION</b>			
Rollout Switch Cutout (Temp C)	90.6	90.6	90.6
Burner Orifice Diameter (mm)			
Natural Gas — Std	3.05	3.05	3.05
Liquid Propane — Alt	2.44	2.44	2.44
Thermostat Heat Anticipator Setting (amps)			
400 v Stage 1	.14	.14	.14
Stage 2	.20	.20	.20
Gas Input (kW) Stage 1	21.1/31.9/39.8	31.9/39.8/43.9	39.8/43.9
Stage 2	31.4/50.4/59.8	50.4/59.8/65.6	59.8/65.6
Efficiency (Steady State) (%)	82/80/80	80/80/80	80/80
Temperature Rise Range (C)	-6-10/2-18/7-24	2-18/7-24/4-21	7-24/4-21
Manifold Pressure (kPa)			
Natural Gas — Std	8.3	8.3	8.3
Liquid Propane — Alt	8.3	8.3	8.3
Field Gas Connection Size (NPT)	.50/.75/.75	.75/.75/.75	.75/.75
<b>HIGH-PRESSURE SWITCH (kPa)†</b>			
Standard Compressor Internal Relief (Differential)		3103 ± 345	3448 ± 345
Cutout		2951	
Reset (Auto.)		2206	
<b>LOW-PRESSURE SWITCH (kPa)†</b>			
Cutout		48 ± 21	
Reset (Auto.)		152 ± 48	
<b>FREEZE PROTECTION THERMOSTAT†</b>			
Opens (C)		-1	
Closes (C)		7	
<b>OUTDOOR-AIR INLET SCREENS</b>		Cleanable	
Quantity...Size (mm)		1...508 x 635 x 25	
		1...406 x 635 x 25	
<b>RETURN-AIR FILTERS</b>		Throwaway	
Quantity...Size (mm)	4...406 x 508 x 51	4...508 x 508 x 51	4...508 x 508 x 51

## LEGEND

**Bhp** — Brake Horsepower  
**BkW** — Fan Input Watts x Motor Efficiency

\*Weight of 356 mm (14-in.) roof curb.  
 †Requires the accessory/optional controls upgrade kit.

NOTE: The 48TJ units have a loss-of-charge/low-pressure switch (option or accessory) located in the liquid line.

# Physical data — 48TJ008-014 (English)



UNIT SIZE	008	012	014
<b>NOMINAL CAPACITY (tons)</b>	6.1	8.3	10.2
<b>OPERATING WEIGHT (lb)</b>			
Unit	870	1035	1050
Economizer (Durablade)	44	44	44
Roof Curb*	143	143	143
<b>COMPRESSOR</b>		Hermetic	
Quantity	2	2	2
Oil (oz)	50 ea	50 ea	65 ea
<b>REFRIGERANT TYPE</b>		R-22	
Operating Charge (lb-oz)			
Circuit 1	4-10	5-8	9-5
Circuit 2	4-11	5-10	8-7
<b>CONDENSER COIL</b>		Enhanced Copper Tubes, Aluminum Lanced Fins	
Rows...Fins/in.	1...17	2...17	2...17
Total Face Area (sq ft)	20.50	17.42	25.00
<b>CONDENSER FAN</b>		Propeller Type	
Nominal Cfm	6100	6500	6500
Quantity...Diameter (in.)	2...22	2...22	2...22
Motor Hp...Rpm	1/4...930	1/4...930	1/4...930
<b>EVAPORATOR COIL</b>		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Acutrol™ Feed Device	
Rows...Fins/in.	3...15	3...15	4...15
Total Face Area (sq ft)	8.0	10.0	11.1
<b>EVAPORATOR FAN</b>		Centrifugal Type	
Quantity...Size (in.)	1...15 x 15	1...15 x 15	1...15 x 15
Type Drive	Belt	Belt	Belt
Nominal Cfm	2600	3500	4200
Motor Hp	1 1/2	2	3
Maximum Continuous Bhp	2.40	2.40	3.70
Motor Frame Size	56	56	56
Fan Rpm Range	492-700	571-779	717-900
Motor Bearing Type	Ball	Ball	Ball
Maximum Allowable Rpm	1600	1600	1600
Motor Pulley Pitch Diameter Min/Max (in.)	2.4/3.4	3.4/4.4	4.0/5.0
Nominal Motor Shaft Diameter (in.)	5/8	5/8	7/8
Fan Pulley Pitch Diameter (in.)	5.5	7.0	8.0
Nominal Fan Shaft Diameter (in.)	—	—	—
Belt, Quantity...Type...Length (in.)	1...A...48	1...A...48	1...A...51
Pulley Center Line Distance (in.)	16	19.5	19.5
Speed Change per Full Turn of Movable Pulley Flange (rpm)	41	41	36
Movable Pulley Maximum Full Turns From Closed Position	5	5	5
Factory Setting	5	5	5
Factory Speed Setting (rpm)	492	571	717
Fan Shaft Diameter at Pulley (in.)	1	1	1
<b>FURNACE SECTION</b>			
Rollout Switch Cutout Temp (F)	195	195	195
Burner Orifice Diameter (in. ...drill size)			
Natural Gas	Std .120...31	.120...31/.120...31/.129...30	.120...31/.129...30
Liquid Propane	Alt .096...41	.096...41/.096...41/.102...38	.096...41/.102...38
Thermostat Heat Anticipator Setting (amps)			
400 v Stage 1	.14	.14	.14
Stage 2	.20	.20	.20
Gas Input (Btuh) Stage 1	72,000/109,000/136,000	109,000/136,000/150,000	136,000/150,000
Stage 2	107,000/172,000/204,000	172,000/204,000/224,000	204,000/224,000
Efficiency (Steady State) (%)	80	80	80
Temperature Rise Range	20-50/35-65/45-75	35-65/45-75/40-70	45-75/40-70
Manifold Pressure (in. wg)			
Natural Gas	Std 3.5	3.5	3.5
Liquid Propane	Alt 3.5	3.5	3.5
Gas Valve Quantity	1	1	1
Gas Valve Pressure Range			
Psig	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
Field Gas Connection Size (in.)	1/2/3/4/3/4	3/4/3/4/3/4	3/4/3/4
<b>HIGH-PRESSURE SWITCH (psig)†</b>			
Standard Compressor Internal Relief Differential)		450 ± 50	500 ± 50
Cutout		428	
Reset (Auto.)		320	
<b>LOW-PRESSURE SWITCH (psig)†</b>			
Cutout		7 ± 3	
Reset (Auto.)		22 ± 7	
<b>FREEZE PROTECTION THERMOSTAT†</b>			
Opens		30 ± 5	
Closes		45 ± 5	
<b>OUTDOOR-AIR INLET SCREENS</b>		Cleanable	
Quantity...Size (in.)		1...20 x 25 x 1	
		1...16 x 25 x 1	
<b>RETURN-AIR FILTERS</b>		Throwaway	
Quantity...Size (in.)	4...16 x 20 x 2	4...20 x 20 x 2	4...20 x 20 x 2

## LEGEND

**Bhp** — Brake Horsepower  
**BkW** — Fan Input Watts x Motor Efficiency

\*Weight of 356 mm (14-in.) roof curb.

†Requires the accessory/optional controls upgrade kit.

NOTE: The 48TJ units have a loss-of-charge/low-pressure switch (option or accessory) located in the liquid line.

# Options and accessories



ITEM	OPTION*	ACCESSORY†
Apollo Communicating Controls	X	
Durablade Integrated Economizer (Includes Hood)	X	X
Manual Outdoor-Air Damper		X
Controls Upgrade Kit	X**	X
Condenser Coil Grille		X
Electronic Programmable Thermostat		X
25% Open Two-Position Damper		X
100% Open Two-Position Damper		X
Roof Curbs (Vertical and Horizontal Discharge)		X
Remote Control Panel		X
Thermostats and Subbases		X
Motormaster® Head Pressure Control		X
Time Guard® II Control Circuit		X
Thru-the-Bottom Service Connections		X
Accusensor™ II Enthalpy Control		X
Accusensor III Enthalpy Sensor		X
Condenser Coil Hail Guard Assembly		X
LP (Liquid Propane) Conversion Kit		X
NO <sub>x</sub> Reduction Kit		X
Flue Discharge Deflector		X
Flue Shield		X
Fan/Filter Status		X
Salt Spray Protection Grille		X

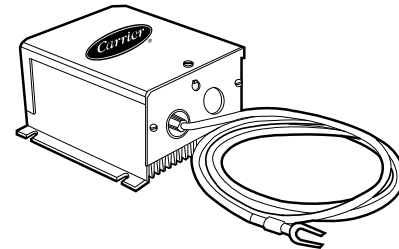
\*Factory installed.

†Field installed.

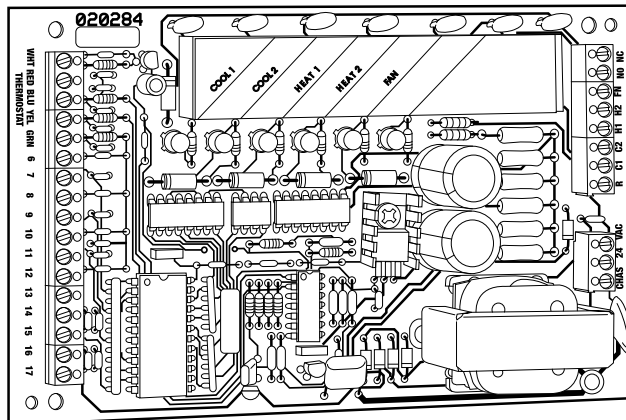
\*\*Includes high-pressure, loss of charge/low pressure, and freeze protection switches.

## HEAD PRESSURE CONTROL

The 48TJ standard units are designed to operate in cooling at outdoor temperatures down to 25 F. With accessory Motormaster control (condenser-fan speed modulation), -20 F low-ambient kit, units can operate at outdoor temperatures down to -20 F. The head pressure controls, which mount in the condenser section, control the condenser-fan motor to maintain correct condensing temperature. Refer to Product Ordering Data or contact your local Carrier representative for appropriate accessory combinations for desired outdoor ambient temperature operation.

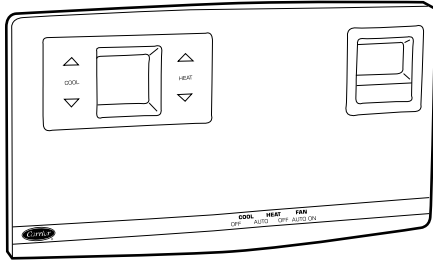


## FACTORY-INSTALLED APOLLO COMMUNICATING CONTROLS



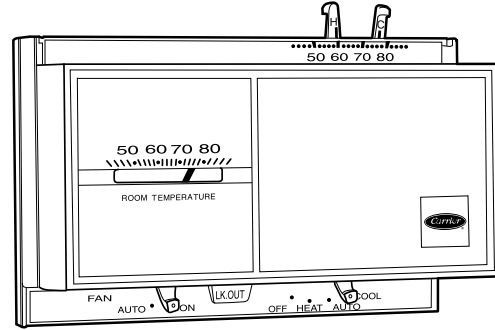
The Apollo direct digital controls are designed exclusively by Carrier, and are used to actively monitor and control all modes of operation as well as to monitor evaporator-fan status, filter status, supply-air temperature, outdoor-air temperature, and indoor-air quality. They are designed to work in conjunction with Carrier TEMP and VVT® system thermostats.

## ELECTRONIC PROGRAMMABLE THERMOSTAT



Carrier's electronic programmable thermostat provides efficient temperature control by allowing you to program heating and cooling setbacks and set-ups with provisions for weekends and holidays. Accessory remote sensing package is also available to provide tamperproof control in high traffic spaces. Used in conjunction with factory-installed Apollo control, this thermostat provides a 5-minute recycle timer between modes of operation for short-cycle protection.

## THERMOSTAT

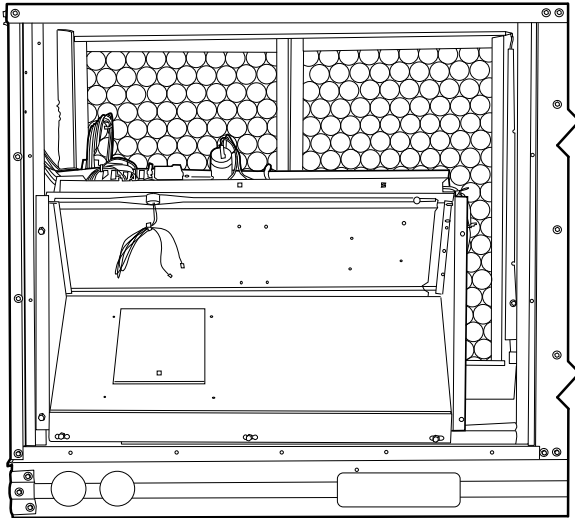


Zone thermostat (24 v) provides one- or 2-stage cooling for control of unit. Matching subbases are available with or without tamperproof switches and automatic changeover.

## TIME GUARD® II CONTROL

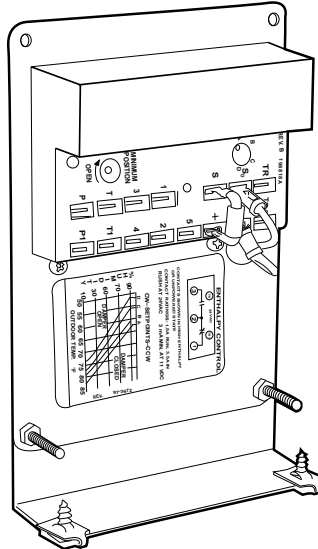
Time Guard II control automatically prevents compressor from re-starting for at least 5 minutes after a shutdown. Accessory prevents short cycling of compressor if thermostat is changed rapidly. Time Guard II control mounts in the control compartment of unit.

## DURABLADE ECONOMIZER

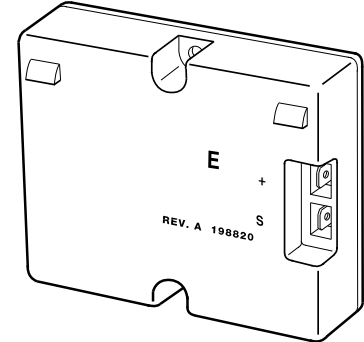


Exclusive Durablade economizer damper design saves energy while providing economical and reliable cooling. A sliding plate on the face of the economizer controls the amount of outdoor air entering the system. Closed, it provides a leak-proof seal which prevents ambient air from seeping in or conditioned air from seeping out. It can be adjusted easily for 100% outdoor air or any proportions of mixed air. Like the base unit, the economizer is converted easily for horizontal discharge applications.

## ACCUSENSOR™ II CONTROLS



## ACCUSENSOR III CONTROLS



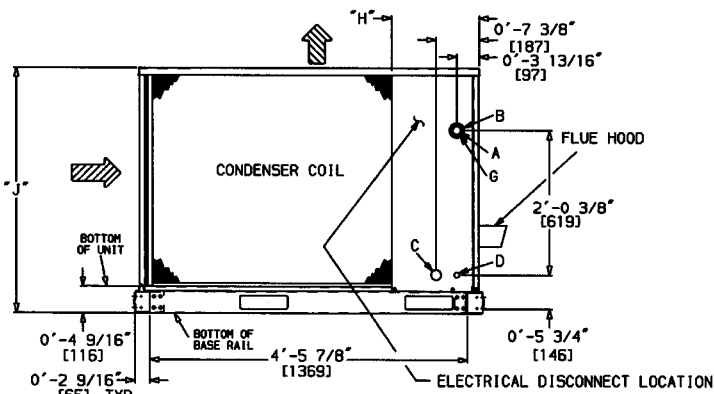
Accusensor economizer controls help provide efficient, economical economizer operation. Accusensor II solid-state enthalpy control includes the logic and one sensor to calculate both dry- and wet-bulb of the outdoor air to provide an accurate enthalpy reading. It then decides when to energize the economizer based on this reading. A second Accusensor III sensor compares outdoor temperature and humidity to return-air temperature and humidity and determines the most economical mixture of air (purchased in addition to first solid-state enthalpy sensor for differential enthalpy sensing).

# Base unit dimensions — 48TJ008-014

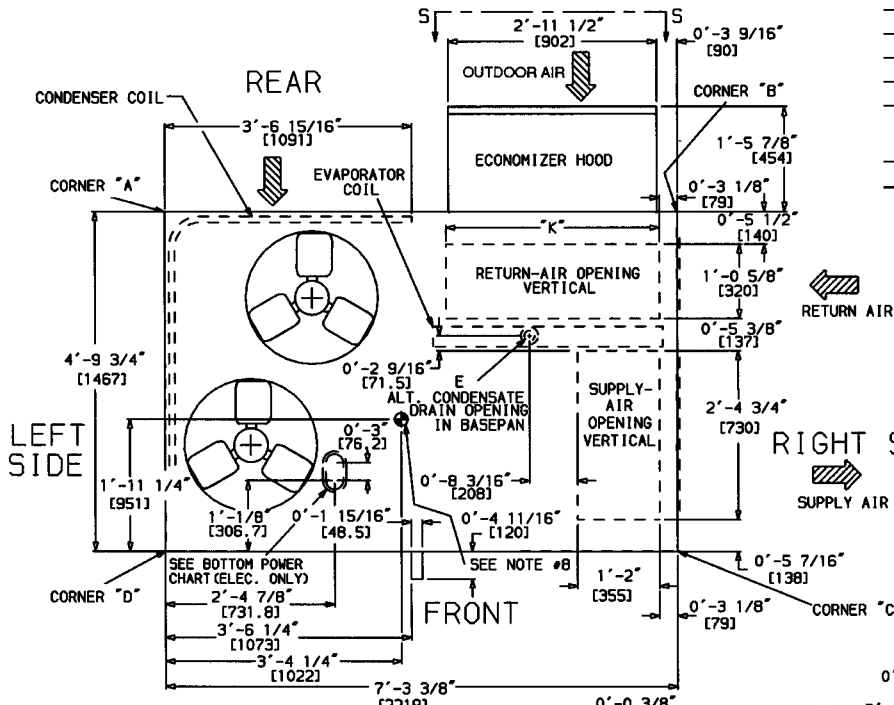


UNIT 48TJ	STD UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		"H"		"J"		"K"		"L"	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Ft-in.	mm	Ft-in.	mm	Ft-in.	mm	Ft-in.	mm
D/E/F008	870	395	189	86	161	73	239	109	280	127	1-2 <sup>5</sup> / <sub>8</sub>	378	3-5 <sup>5</sup> / <sub>16</sub>	1050	2-9 <sup>11</sup> / <sub>16</sub>	856	2-2 <sup>7</sup> / <sub>16</sub>	672
D/E/F012	1035	469	225	102	192	87	285	129	333	151	2-5 <sup>7</sup> / <sub>8</sub>	759	4-1 <sup>5</sup> / <sub>16</sub>	1253	3-0 <sup>3</sup> / <sub>8</sub>	924	2-10 <sup>7</sup> / <sub>16</sub>	875
D/E014	1050	476	228	103	195	88	289	131	338	153	1-2 <sup>7</sup> / <sub>8</sub>	378	4-1 <sup>5</sup> / <sub>16</sub>	1253	3-0 <sup>3</sup> / <sub>8</sub>	924	2-10 <sup>7</sup> / <sub>16</sub>	875

- NOTES:
- Dimensions in [ ] are in millimeters.
  - Center of gravity.
  - Direction of airflow.
  - 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.
  - Minimum clearance (local codes or jurisdiction may prevail):
    - Between unit (flue side) and combustible surfaces, 48 inches.
    - 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.
    - Condenser coil, for proper airflow, 36 in. one side, 12 in. the other. The side getting the greater clearance is optional.
    - Overhead, 60 in. to assure proper condenser fan operation.
    - Between units, control box side, 42 in. per NEC (National Electrical Code U.S.A.).
    - Between unit and ungrounded surfaces, control box side, 36 in. per NEC.
    - Between unit and block or concrete walls and other grounded surfaces, control box side, 42 in. per NEC.
    - Horizontal supply and return end, 0 inches.
  - 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.
  - Units may be installed on combustible floors made from wood or class A, B, or C roof covering material if set on base rail.
  - The vertical center of gravity is 1'-7<sup>1</sup>/<sub>2</sub>" [483] up from the bottom of the base rail. Horizontal center of gravity is shown.



LEFT SIDE

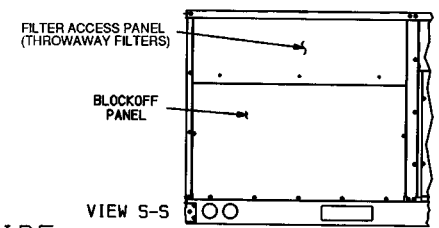


REAR

LEFT SIDE

RIGHT SIDE

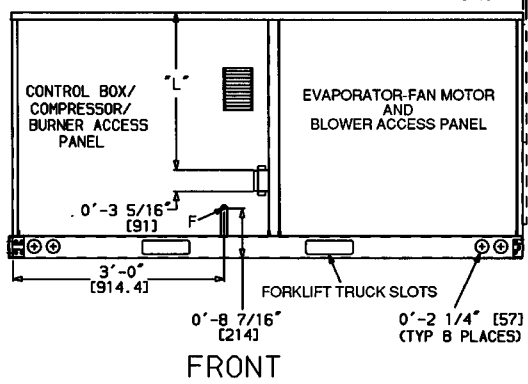
CONNECTION SIZES	
A	1 <sup>3</sup> / <sub>8</sub> " Dia [35] Field Power Supply Hole
B	2 <sup>1</sup> / <sub>2</sub> " Dia [64] Power Supply Knockout
C	1 <sup>3</sup> / <sub>4</sub> " Dia [44] Charging Port Hole
D	7/8" [22] Field Control Wiring Hole
E	3/4" — 14 NPT Condensate Drain
F	1/2" — 14 NPT Gas Connection 48TJD008 3/4" — 14 NPT Gas Connection 48TJE/F008 48TJD/E012,014, 48TJF012
G	2" Dia [51] Power Supply Knockout



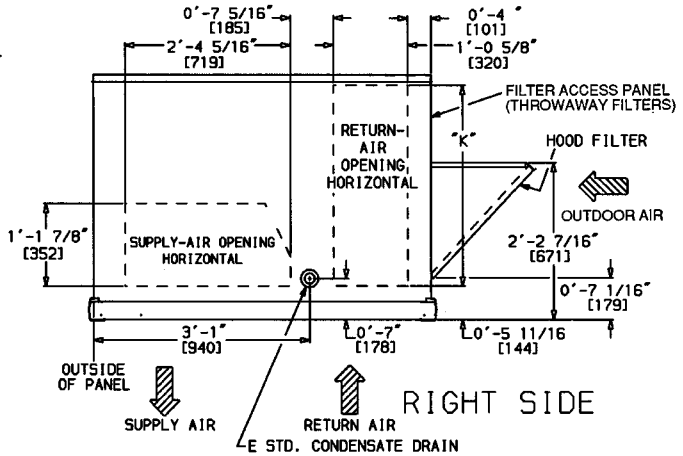
BOTTOM POWER CHART: THESE HOLES REQUIRED FOR USE WITH ACCESSORY PACKAGES — CRBTMPWR001A00 (1/2", 3/4") OR CRBTMPWR002A00 (1/2", 1 1/4")

THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
1/2"	24 V Power*	7/8" [22.2]
3/4"	Power*	1 1/8" [28.4]
1 1/4"	Power*	1 3/4" [44.4]

\*Select either 3/4" or 1 1/4" for power, depending on wire size.



FRONT



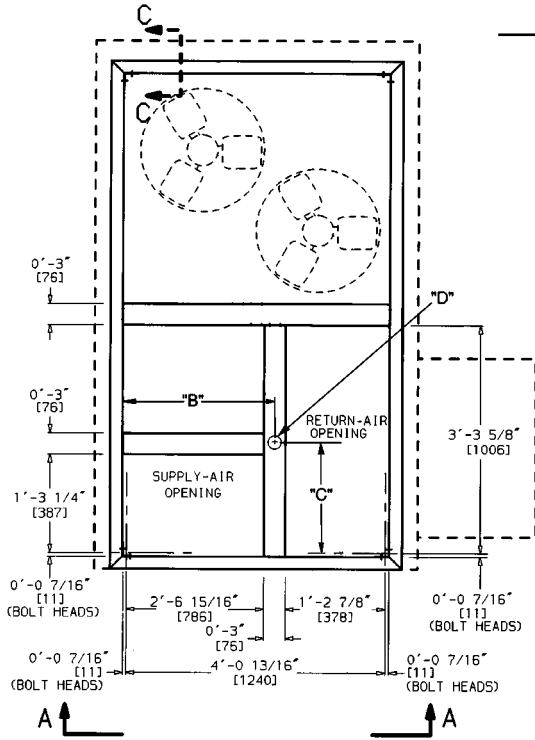
RIGHT SIDE



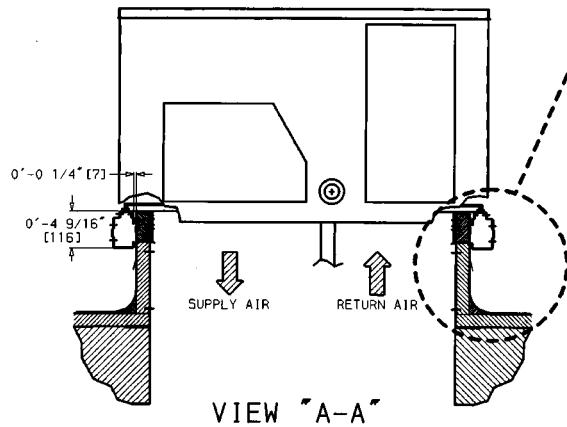
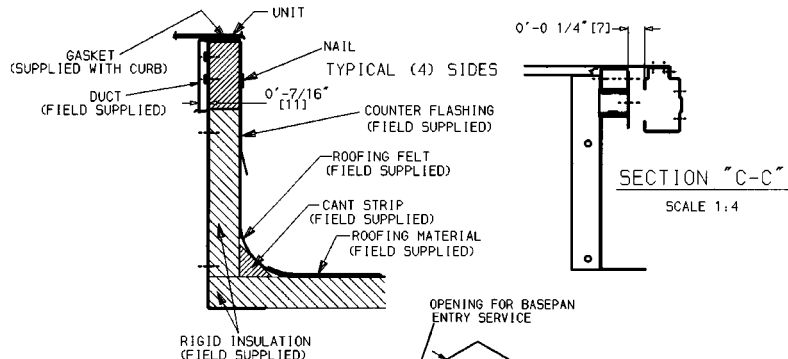
## ROOF CURB — 48TJ008-014

ROOF CURB ACCESSORY	"A"	UNIT SIZE
CRRFCURB003A00	1'-2" [356]	48TJ008-014
CRRFCURB004A00	2'-0" [610]	

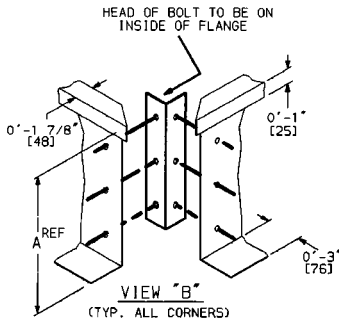
UNIT SIZE	"B"	"C"	"D" ALT DRAIN HOLE	"E" GAS	POWER	CONTROL	CONNECTOR PKG ACY
48TJ008-014	2'-87/16" [827]	1'-10 <sup>15</sup> / <sub>16</sub> " [583]	13/4" [45]	3/4" NPT	3/4" NPT	1/2" NPT	CRBTMPWR001A00 (THRU-THE-BOTTOM)
				3/4" NPT	1 1/4" NPT	1/2" NPT	CRBTMPWR002A00 (THRU-THE-BOTTOM)



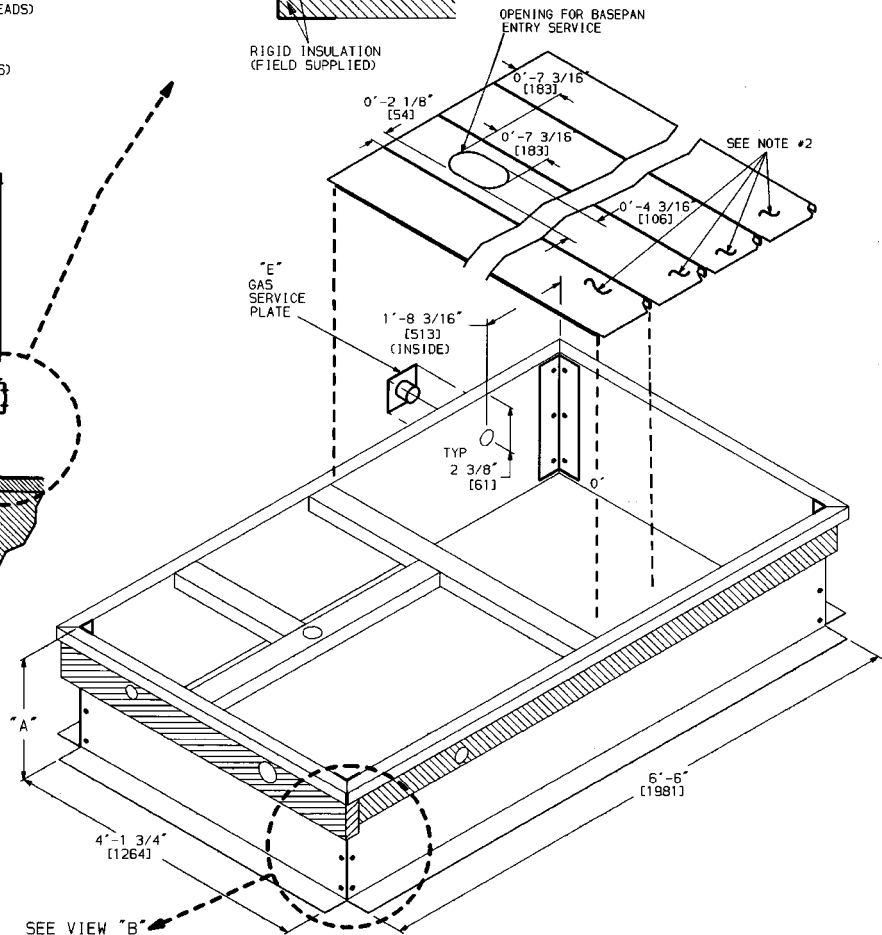
- NOTES:
1. Roof curb accessory is shipped unassembled.
  2. Insulated panels.
  3. Dimensions in [ ] are in millimeters.
  4. Roof curb: galvanized steel.
  5. Attach ductwork to curb (Flanges of duct rest on curb).
  6. Service clearance 4 ft on each side.
  7. Direction of airflow.



VIEW "A-A"



VIEW "B" (TYP. ALL CORNERS)



SEE VIEW "B"

# Selection procedure (with 48TJD012 example) — SI



## I Determine cooling and heating requirements at design conditions.

Given:

Required Cooling Capacity (TC) .....	27 kW
Sensible Heat Capacity (SHC) .....	18 kW
Required Heating Capacity .....	35 kW
Condenser Entering-Air Temperature .....	36 C
Evaporator Entering-Air Temperature ....	28 C edb, 20 C ewb
Evaporator Air Quantity .....	1520 L/s
External Static Pressure (ESP) .....	300 Pa
Electrical Characteristics .....	400-3-50

Based on the above requirements, a 48TJD012 vertical discharge unit is chosen to best fit the design conditions.

## II Select unit based on required cooling capacity.

Enter the 48TJD012 Cooling Capacities table on page 14 with a condenser entering temperature of 36 C, evaporator air entering at 1520 L/s, 28 C db (dry bulb) and 20 C wb (wet bulb). The 48TJD012 unit will provide a cooling capacity of 30.1 kW and a sensible heat capacity of 21.2 kW. For evaporator-air temperature other than 26.7 C edb, calculate the sensible heat capacity correction, as required, using the formula found in the notes following the Cooling Capacity table on page 15. The corrected SHC is 23.4 kW.

NOTE: Unit ratings are gross capacities and do not include the effect of evaporator-fan motor heat. To calculate net capacities, see Step V.

## III Select heating capacity of unit to provide design condition requirements.

In Heating Capacities and Efficiencies table on page 4, note that unit 48TJD012 will provide output heating capacity of 40.3 kW which is adequate for the given application.

## IV Determine fan speed and power requirements at design conditions.

Before entering the Fan Performance tables, calculate the total static pressure required based on unit

components. From the given and Pressure Drop tables (page 31), find:

External static pressure	300 Pa
Durablade economizer	9 Pa
Total static pressure	<u>309 Pa</u>

Enter the Fan Performance table for the 48TJD012 vertical discharge unit on page 19. Find the fan r/s and BkW at 309 Pa and 1520 L/s (interpolation required). Note that the fan speed is 15.0 r/s and power required is 1.20 kW. The standard 1.5 kW power will adequately handle the job requirements (field-supplied drive is required).

To determine the input power of the motor, use the Evaporator-Fan Motor Efficiency table found on page 30.

$$\begin{aligned} \text{IFM Watts} &= \frac{\text{BkW}}{\text{Motor Efficiency}} \\ &= \frac{1.20}{.80} \\ &= 1.5 \text{ kW} \end{aligned}$$

## V Determine net capacities.

Capacities are gross and do not include the effect of evaporator-fan motor heat.

Determine net cooling capacity as follows:

$$\begin{aligned} \text{Net capacity} &= \text{gross capacity} - \text{IFM Heat} \\ &= 30.1 \text{ kW} - 1.5 \text{ kW} \\ &= 28.6 \text{ kW} \end{aligned}$$

$$\begin{aligned} \text{Net Sensible Capacity} &= 23.4 \text{ kW} - 1.5 \text{ kW} \\ &= 21.9 \text{ kW} \end{aligned}$$

Determine net heating capacity as follows:

$$\begin{aligned} \text{Net Capacity} &= \text{gross capacity} + \text{IFM heat} \\ &= 40.3 \text{ kW} + 1.5 \text{ kW} \\ &= 41.8 \text{ kW} \end{aligned}$$

# Selection procedure (with 48TJD012 example) — English



## I Determine cooling and heating requirements at design conditions.

Given:

Required Cooling Capacity (TC) . . . . . 95,000 Btuh  
 Sensible Heat Capacity (SHC) . . . . . 68,000 Btuh  
 Required Heating Capacity . . . . . 110,000 Btuh  
 Condenser Entering-Air Temperature . . . . . 95 F  
 Evaporator Entering-Air Temperature . . . . . 80 F edb,  
 67 F ewb  
 Evaporator Air Quantity . . . . . 3200 cfm  
 External Static Pressure (ESP) . . . . . 1.10 in. wg  
 Electrical Characteristics . . . . . 400-3-50

Based on the above requirements, a 48TJD012 vertical discharge unit is chosen to best fit the design conditions.

## II Select unit based on required cooling capacity.

Enter the 48TJD012 Cooling Capacities table on page 16 with a condenser entering temperature of 95 F, evaporator air entering at 3200 cfm, 80 F db (dry bulb) and 67 F wb (wet bulb). The 48TJD012 unit will provide a cooling capacity of 102,500 Btuh and a sensible heat capacity of 76,000 Btuh. For evaporator-air temperature other than 80 F edb, calculate the sensible heat capacity correction, as required, using the formula found in the notes following the Cooling Capacity table on page 16.

NOTE: Unit ratings are gross capacities and do not include the effect of evaporator-fan motor heat. To calculate net capacities, see Step V.

## III Select heating capacity of unit to provide design condition requirements.

In Heating Capacities and Efficiencies table on page 4, note that unit 48TJD012 will provide output heating capacity of 137,600 Btuh which is adequate for the given application.

## IV Determine fan speed and power requirements at design conditions.

Before entering the Fan Performance tables, calculate the total static pressure required based on unit components. From the given and Pressure Drop tables (page 31), find:

External static pressure	1.10 in. wg
Durablade economizer	<u>0.04 in. wg</u>
Total static pressure	1.14 in. wg

Enter the Fan Performance table for the 48TJD012 vertical discharge unit on page 25. Find the fan rpm and Bhp at 1.14 in. wg and 3200 cfm (interpolation required). Note that the fan speed is 886 rpm and power required is 1.72 Bhp. The standard 2 hp power will adequately handle the job requirements (field-supplied drive is required).

To determine the input power of the motor, use the Evaporator-Fan Motor Efficiency table found on page 30.

$$\begin{aligned} \text{IFM Watts} &= \frac{\text{Bhp} \times 746}{\text{Motor Efficiency}} \\ &= \frac{1.72 \times 746}{.80} \\ &= \frac{1283}{.80} \end{aligned}$$

$$\text{IFM Watts} = 1604 \text{ Watts}$$

## V Determine net capacities.

Capacities are gross and do not include the effect of evaporator-fan motor heat.

Determine net cooling capacity as follows:

$$\begin{aligned} \text{Net capacity} &= \text{gross capacity} - \text{IFM Heat} \\ &= 102,500 - (1604 \text{ Watts} \times 3.413 \\ &\quad \text{Btuh/Watt}) \\ &= 97,026 \text{ Btuh} \end{aligned}$$

$$\begin{aligned} \text{Net Sensible Capacity} &= 76,000 \text{ Btuh} - 5474 \text{ Btuh} \\ &= 70,526 \text{ kW} \end{aligned}$$

Determine net heating capacity as follows:

$$\begin{aligned} \text{Net Capacity} &= \text{gross capacity} + \text{IFM heat} \\ &= 137,600 \text{ Btuh} + 5474 \text{ Btuh} \\ &= 143,074 \text{ Btuh} \end{aligned}$$

# Performance data



## COOLING CAPACITIES — SI

48TJ008 (21.5 kW)											
Temp (C) Air Entering Condenser (Edb)		Air Entering Evaporator — L/s BF									
		850/0.05					1130/0.075				
		Air Entering Evaporator — Ewb (C)									
		14	16	18	20	22	14	16	18	20	22
20	TC	19.5	20.9	22.5	24.3	26.0	21.6	22.3	23.7	25.3	27.0
	SHC	19.4	18.0	16.2	14.3	12.3	21.4	20.5	18.5	16.1	13.4
	kW	5.02	5.16	5.34	5.54	5.72	5.28	5.37	5.52	5.70	5.88
24	TC	19.1	20.4	21.9	23.7	25.4	21.0	21.7	23.1	24.7	26.4
	SHC	18.9	17.7	16.0	14.1	12.1	21.0	20.2	18.3	15.9	13.3
	kW	5.25	5.38	5.56	5.76	5.96	5.51	5.58	5.74	5.92	6.12
28	TC	18.6	19.8	21.3	23.0	24.8	20.5	21.1	22.4	24.1	25.9
	SHC	18.4	17.3	15.7	13.9	11.9	20.5	19.8	18.0	15.7	13.1
	kW	5.49	5.61	5.78	5.98	6.19	5.74	5.8	5.96	6.15	6.36
32	TC	18.0	19.1	20.6	22.2	23.9	19.9	20.3	21.5	23.2	25.0
	SHC	17.8	16.9	15.4	13.6	11.6	19.8	19.4	17.7	15.4	12.9
	kW	5.77	5.88	6.04	6.25	6.47	6.03	6.07	6.22	6.43	6.64
36	TC	17.3	18.2	19.6	21.3	23.0	18.2	19.4	20.6	22.3	24.0
	SHC	17.2	16.4	15.0	13.2	11.3	19.1	18.9	17.3	15.0	12.5
	kW	6.09	6.18	6.34	6.55	6.77	6.33	6.37	6.61	6.73	6.94
40	TC	16.6	18.3	18.7	20.3	22.0	18.4	18.6	19.6	21.3	23.0
	SHC	16.6	15.9	14.6	12.8	10.9	18.4	18.3	16.9	14.7	12.3
	kW	6.40	6.48	6.63	6.84	7.07	6.65	6.67	6.81	7.02	7.24
44	TC	15.9	16.4	17.7	19.4	21.0	17.7	17.7	18.7	20.2	21.9
	SHC	15.9	15.4	14.2	12.5	10.6	17.7	17.6	16.4	14.3	11.9
	kW	6.71	6.77	6.92	7.13	7.36	6.97	6.97	7.10	7.30	7.53
48	TC	15.2	15.5	16.7	18.3	19.9	16.9	16.9	17.7	19.1	20.7
	SHC	15.2	14.9	13.8	12.1	10.2	16.9	16.9	15.8	13.9	11.5
	kW	7.02	7.05	7.20	7.41	7.64	7.27	7.27	7.39	7.57	7.81
52	TC	14.4	14.5	15.6	17.3	18.8	16.1	16.1	16.8	18.0	19.6
	SHC	14.4	14.3	13.3	11.7	9.9	16.1	16.1	15.2	13.5	11.2
	kW	7.33	7.33	7.47	7.67	7.91	7.56	7.57	7.67	7.85	8.08

48TJ008 (21.5 kW) (cont)											
Temp (C) Air Entering Condenser (Edb)		Air Entering Evaporator — L/s BF									
		1180/0.075					1400/0.095				
		Air Entering Evaporator — Ewb (C)									
		14	16	18	20	22	14	16	18	20	22
20	TC	21.8	22.5	23.9	25.5	27.1	22.9	23.1	24.3	26.1	27.7
	SHC	21.8	20.9	18.9	16.4	13.6	22.8	22.4	20.5	17.7	14.5
	kW	5.33	5.41	5.55	5.73	5.91	5.49	5.51	5.65	5.83	5.99
24	TC	21.3	21.9	23.3	24.9	26.5	22.4	22.5	23.7	25.4	27.0
	SHC	21.2	20.6	18.7	16.2	13.5	22.3	22.0	20.2	17.5	14.3
	kW	5.55	5.62	5.77	5.96	6.14	5.72	5.73	5.86	6.05	6.22
28	TC	20.8	21.2	22.5	24.2	25.9	21.8	21.9	23.1	24.7	26.4
	SHC	20.7	20.2	18.4	16.0	13.3	21.8	21.7	20.0	17.3	14.1
	kW	5.78	5.84	5.98	6.17	6.38	5.94	5.96	6.08	6.28	6.46
32	TC	20.2	20.5	21.7	23.4	25.2	21.2	21.2	22.2	23.8	25.6
	SHC	20.2	19.8	18.1	15.7	13.0	21.2	21.0	19.5	17.0	13.9
	kW	6.07	6.11	6.25	6.45	6.66	6.23	6.23	6.36	6.54	6.74
36	TC	19.5	19.6	20.7	22.4	24.1	20.4	20.4	20.7	22.8	24.6
	SHC	19.4	19.2	17.7	15.3	12.7	20.4	20.4	19.0	16.6	13.6
	kW	6.39	6.41	6.55	6.75	6.96	6.54	6.54	6.66	6.84	7.05
40	TC	18.7	18.7	19.8	21.3	23.1	19.6	19.6	20.4	21.7	23.4
	SHC	18.7	18.6	17.2	15.0	12.4	19.6	19.6	18.4	16.3	13.3
	kW	6.69	6.70	6.83	7.04	7.26	6.86	6.86	6.95	7.12	7.34
44	TC	17.9	17.9	18.8	20.3	22.0	18.8	18.8	19.4	20.6	22.3
	SHC	17.9	17.9	16.7	14.6	12.1	18.8	18.8	17.8	15.9	13.0
	kW	7.01	7.01	7.13	7.33	7.55	7.16	7.16	7.25	7.41	7.64
48	TC	17.1	17.1	17.9	19.2	20.8	17.9	17.9	18.5	19.5	21.2
	SHC	17.1	17.1	16.1	14.2	11.7	17.9	17.9	17.2	15.5	12.7
	kW	7.31	7.31	7.42	7.59	7.83	7.46	7.47	7.54	7.69	7.92
52	TC	16.3	16.3	16.9	18.0	19.6	17.1	17.1	17.4	18.3	19.9
	SHC	16.3	16.3	15.4	13.9	11.4	17.1	17.1	16.5	15.1	12.3
	kW	7.61	7.61	7.70	7.87	8.1	7.76	7.77	7.82	7.95	8.18

See Legend and Notes on page 15.

# Performance data (cont)



## COOLING CAPACITIES — SI (cont)

48TJ012 (29.2 kW)											
Temp (C) Air Entering Condenser (Edb)		Air Entering Evaporator — L/s BF									
		1140/0.08					1520/0.105				
		Air Entering Evaporator — Ewb (C)									
		14	16	18	20	22	14	16	18	20	22
20	TC	26.6	28.2	30.5	33.1	34.7	30.5	31.4	32.7	34.3	36.3
	SHC	26.4	24.8	22.8	20.3	17.3	30.4	29.3	26.2	22.2	18.7
	kW	6.82	6.98	7.17	7.35	7.42	7.09	7.17	7.27	7.39	7.60
24	TC	25.8	27.0	29.4	32.1	33.8	29.6	30.4	31.8	33.5	35.3
	SHC	25.6	24.2	22.3	19.9	16.8	29.5	28.7	25.9	22.2	18.4
	kW	7.20	7.34	7.54	7.73	7.82	7.47	7.53	7.65	7.80	7.99
28	TC	24.7	25.8	28.2	30.8	32.8	28.5	29.1	30.7	32.6	34.4
	SHC	24.6	23.5	21.7	19.4	16.4	28.5	27.9	25.4	21.9	18.2
	kW	7.61	7.93	8.11	8.32	8.45	8.09	8.12	8.26	8.46	8.64
32	TC	23.6	24.5	26.6	29.4	31.8	27.3	27.7	29.4	31.5	33.3
	SHC	23.5	22.7	21.1	18.8	16.1	27.3	27.0	24.8	21.6	17.8
	kW	8.03	8.13	8.31	8.53	8.67	8.30	8.32	8.47	8.67	8.85
36	TC	22.4	23.0	25.0	27.9	30.7	26.1	26.3	27.9	30.1	32.0
	SHC	22.3	21.8	20.3	18.2	17.8	26.0	26.0	24.1	21.2	17.4
	kW	8.47	8.53	8.73	8.96	9.15	8.74	8.74	8.89	9.11	9.30
40	TC	21.1	21.5	23.4	26.2	29.5	24.7	24.7	26.4	28.7	30.8
	SHC	21.1	20.9	19.6	17.5	15.3	24.7	24.7	23.3	20.7	17.2
	kW	8.95	8.97	9.15	9.40	9.64	9.20	9.20	9.34	9.56	9.80
44	TC	20.0	20.1	21.7	24.4	27.9	23.1	23.1	24.4	26.6	29.4
	SHC	20.0	19.9	18.7	16.8	14.8	23.1	23.1	22.0	20.0	16.7
	kW	9.40	9.40	9.60	9.86	10.11	9.70	9.71	9.82	10.03	10.29
48	TC	19.1	19.1	20.3	22.6	26.0	21.5	21.5	22.4	24.3	27.6
	SHC	10.1	19.1	17.9	16.2	14.2	21.5	21.5	20.7	19.1	16.2
	kW	9.89	9.89	10.06	10.32	10.59	10.22	10.22	10.31	10.50	10.79
52	TC	18.3	18.3	19.1	20.9	24.0	20.0	20.0	20.4	21.9	25.5
	SHC	18.3	18.3	17.2	15.5	13.5	20.0	20.0	18.4	18.1	15.5
	kW	10.37	10.37	10.52	10.77	11.07	10.74	10.74	10.81	10.98	11.28

48TJ012 (29.2 kW) (cont)											
Temp (C) Air Entering Condenser (Edb)		Air Entering Evaporator — L/s BF									
		1800/0.125					1880/0.13				
		Air Entering Evaporator — Ewb (C)									
		14	16	18	20	22	14	16	18	20	22
20	TC	31.5	31.9	33.3	35.3	37.2	31.7	23.1	33.5	35.3	37.3
	SHC	31.4	30.6	27.8	24.0	19.9	31.7	31.1	28.3	24.4	20.2
	kW	7.12	7.16	7.30	7.50	7.70	7.15	7.18	7.32	7.51	7.71
24	TC	30.8	31.0	32.4	34.2	36.2	31.0	31.2	32.5	34.4	36.2
	SHC	30.8	30.1	27.4	23.6	19.6	31.0	30.5	27.9	24.0	19.7
	kW	7.53	7.54	7.68	7.88	8.10	7.54	7.57	7.71	7.90	8.09
28	TC	30.0	30.1	31.4	33.2	35.2	30.3	30.4	31.6	33.3	35.0
	SHC	30.0	29.6	27.2	23.4	19.3	30.2	30.1	27.6	23.7	19.5
	kW	7.95	7.97	8.11	8.30	8.51	7.99	7.99	8.13	8.31	8.51
32	TC	29.1	29.1	30.3	32.1	34.0	29.4	29.4	30.5	32.2	34.0
	SHC	29.1	29.0	26.7	23.1	18.9	29.4	29.4	27.1	23.5	19.2
	kW	8.40	8.41	8.54	8.73	8.95	8.44	8.44	8.56	8.75	8.95
36	TC	28.1	28.0	29.1	30.8	32.8	28.3	28.3	29.3	31.0	32.9
	SHC	27.9	28.0	26.1	22.8	18.5	28.3	28.3	26.5	23.3	18.9
	kW	8.87	8.87	8.89	9.17	9.40	8.91	8.91	9.01	9.19	9.42
40	TC	26.5	26.5	27.7	29.5	31.5	27.0	27.0	28.0	29.7	31.6
	SHC	14.7	26.5	25.1	22.5	18.3	26.9	27.0	25.6	23.0	18.6
	kW	9.37	9.36	9.46	9.64	9.88	9.41	9.40	9.50	9.66	9.89
44	TC	24.8	24.8	25.7	27.5	30.0	25.2	25.2	26.1	27.7	30.1
	SHC	24.8	24.8	23.8	21.8	18.0	25.2	25.2	24.4	22.3	18.2
	kW	9.87	9.87	9.96	10.12	10.36	9.92	9.92	9.99	10.13	10.38
48	TC	23.0	23.0	23.7	25.3	28.3	23.4	23.4	24.0	25.5	28.4
	SHC	23.0	23.0	22.4	20.9	17.5	23.4	23.4	23.0	21.4	17.8
	kW	10.39	10.39	10.45	10.59	10.86	10.43	10.43	10.49	10.61	10.90
52	TC	21.3	21.3	21.6	22.8	26.5	21.6	21.6	21.8	23.0	26.7
	SHC	21.3	21.3	21.0	19.9	17.0	21.6	21.6	21.4	20.4	17.4
	kW	10.93	10.93	10.95	11.07	11.38	10.97	10.97	10.99	11.10	11.41



### COOLING CAPACITIES — SI (cont)

48TJ014 (35.9 kW)													
Temp (C) Air Entering Condenser (Edb)		Air Entering Evaporator — L/s BF											
		1500/0.13				2000/0.17				2500/0.22			
		Air Entering Evaporator — Ewb (C)											
		13	16	19	22	13	16	19	22	13	16	19	22
20	TC	34.7	38.0	41.4	44.4	37.0	40.0	43.2	46.3	36.7	40.1	43.7	46.9
	SHC	34.7	33.8	28.1	22.0	37.0	39.9	31.7	24.0	36.7	40.1	34.2	25.4
	kW	8.92	8.99	9.08	9.13	9.00	9.06	9.13	9.22	8.85	8.97	9.12	9.26
24	TC	32.1	35.8	39.6	43.0	34.8	38.2	41.6	44.9	35.8	38.9	42.3	45.6
	SHC	32.1	32.8	27.4	21.6	34.8	38.2	31.1	23.7	35.8	38.9	33.7	25.2
	kW	9.34	9.46	9.60	9.70	9.47	9.57	9.68	9.80	9.40	9.55	9.69	9.85
28	TC	29.4	33.6	37.9	41.6	32.9	36.3	40.0	43.4	35.0	37.8	40.9	44.3
	SHC	29.4	31.9	26.7	21.1	32.9	36.3	30.5	23.3	35.0	37.8	33.3	25.1
	kW	9.78	9.94	10.12	10.27	9.95	10.08	10.22	10.39	9.98	10.11	10.26	10.43
32	TC	26.7	31.5	36.2	40.2	30.8	34.5	38.3	42.0	34.0	36.7	39.5	43.0
	SHC	26.7	30.9	26.0	20.7	30.8	34.5	29.9	22.9	34.0	36.7	32.8	24.9
	kW	10.20	10.42	10.64	10.85	10.40	10.59	10.76	10.96	10.53	10.68	10.84	11.03
35	TC	24.7	29.9	34.9	39.1	29.2	33.1	37.0	40.9	33.3	35.8	38.4	42.0
	SHC	24.7	29.7	25.5	20.3	29.2	33.1	29.4	22.7	33.3	35.8	32.4	24.8
	kW	10.52	10.80	11.03	11.30	10.77	11.00	11.18	11.40	10.95	11.10	11.27	11.50
40	TC	21.1	26.8	32.3	37.1	26.9	30.8	34.7	38.8	32.0	34.1	36.3	39.9
	SHC	21.1	26.8	24.4	19.7	26.9	30.8	28.3	22.1	32.0	34.1	31.6	24.4
	kW	11.10	11.40	11.71	12.00	11.42	11.64	11.88	12.13	11.73	11.86	11.99	12.23
44	TC	20.5	25.3	30.2	35.2	25.7	28.8	32.2	36.9	30.5	32.0	33.9	37.9
	SHC	20.5	25.3	23.5	19.1	25.7	28.8	27.1	21.5	30.5	32.0	30.4	23.9
	kW	11.62	11.93	12.25	12.58	12.05	12.24	12.44	12.73	12.35	12.44	12.56	12.82
48	TC	20.4	24.1	27.9	33.2	24.5	26.9	29.6	34.9	29.0	29.9	31.3	35.7
	SHC	20.4	24.1	27.9	33.2	24.5	26.9	25.8	21.0	29.0	29.9	29.1	23.3
	kW	12.15	12.45	12.78	13.17	12.68	12.84	13.00	13.33	12.96	13.03	13.14	13.41
52	TC	20.1	22.8	25.8	31.3	23.3	24.9	27.0	33.1	27.5	27.8	28.7	33.6
	SHC	20.1	22.8	21.4	17.8	23.3	24.9	24.5	20.3	27.1	27.7	27.7	22.8
	kW	12.67	12.98	13.31	13.75	13.34	13.43	13.56	13.93	13.56	13.63	13.71	13.99

#### LEGEND AND NOTES FOR COOLING CAPACITY TABLES — SI

##### LEGEND

- BF** — Bypass Factor
- Edb** — Entering Dry Bulb Temperature (C)
- Ewb** — Entering Wet Bulb Temperature (C)
- kW** — Compressor Input (kW)
- SHC** — Sensible Heat Capacity (kW)
- TC** — Total Capacity (kW)

##### NOTES:

1. Ratings are gross, and do not account for the effects of the evaporator-fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. SHC is based on 26.7 C db temperature of air entering the unit. At any other temperature, correct the SHC read from the table of cooling capacities as follows:

$$\text{Corrected SHC}_{kW} = \text{SHC} + [1.23 \times 10^{-3} \times (1 - \text{BF}) \times (\text{C}_{db} - 26.7) \times \text{L/s}]$$

Observe the rule of sign. Above 26.7 C, SHC correction will be positive; add it to SHC. Below 26.7 C, SHC correction will be negative; subtract it from SHC.

##### 4. Formulas:

$$C_{ldb} = C_{edb} - \frac{\text{SHC}_{kW} \times 1000}{1.23 \times \text{L/s}}$$

Leaving wet bulb = wet bulb temperature corresponding to enthalpy of air leaving coil ( $h_{lwb}$ ).

$$h_{lwb} = h_{ewb} - \frac{\text{TC}_{kW} \times 1000}{1.20 \times \text{L/s}}$$

Where  $h_{ewb}$  is enthalpy of air entering evaporator coil (kJ/kg).

# Performance data (cont)



## COOLING CAPACITIES — ENGLISH

48TJ008 (6.1 TONS)													
Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		1950/0.06			2400/0.075			2500/0.075			3000/0.095		
		Air Entering Evaporator — Ewb (F)											
		62	67	72	62	67	72	62	67	72	62	67	72
75	TC	71.9	80.1	88.3	74.9	83.0	90.9	75.3	83.6	91.3	77.4	85.2	92.9
	SHC	56.3	46.6	55.1	62.3	50.5	57.0	63.6	51.2	60.4	69.1	55.3	23.7
	kW	5.47	5.73	6.02	5.60	5.86	6.14	5.64	5.90	6.14	5.74	6.00	6.24
85	TC	69.0	77.1	85.4	71.7	79.8	88.2	72.2	80.2	88.5	74.3	82.0	90.0
	SHC	59.7	50.5	40.6	66.6	55.6	43.6	68.0	56.6	44.1	73.8	62.0	47.0
	kW	5.77	6.04	6.34	5.90	6.17	6.47	5.93	6.19	6.49	6.05	6.31	6.57
95	TC	64.9	72.7	80.8	67.4	75.2	83.5	67.8	75.6	83.8	70.7	77.1	85.5
	SHC	57.9	48.8	39.1	64.6	54.0	42.1	65.8	55.1	42.7	70.5	60.2	45.9
	kW	6.32	6.61	6.54	6.45	6.75	6.60	6.48	6.76	6.69	6.60	6.86	3.46
105	TC	60.4	68.1	76.2	63.0	70.4	78.6	63.5	70.8	78.8	66.7	72.0	80.1
	SHC	55.7	47.2	37.5	62.2	52.4	40.8	63.2	53.4	41.3	66.7	58.6	44.1
	kW	6.59	6.86	7.19	6.71	7.00	7.32	6.74	7.02	7.34	6.90	7.11	7.40
115	TC	55.9	63.4	71.1	59.0	65.4	73.2	59.7	65.6	73.5	62.5	66.8	75.0
	SHC	53.2	45.4	35.9	59.0	50.6	39.0	59.7	51.6	39.6	62.7	56.8	43.0
	kW	6.99	7.26	7.58	7.13	7.39	7.71	7.17	7.41	7.72	7.34	7.49	7.83
125	TC	51.1	58.4	65.8	55.1	60.0	67.7	55.8	60.3	67.9	58.7	61.3	69.0
	SHC	50.4	43.5	34.1	55.0	48.6	37.3	55.8	49.8	37.9	58.6	54.8	41.3
	kW	7.37	7.63	7.95	7.54	7.75	8.08	7.58	7.77	8.10	7.75	7.87	8.20

48TJ012 (8.3 TONS)													
Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		2500/0.09			3200/0.105			3800/0.12			4000/0.13		
		Air Entering Evaporator — Ewb (F)											
		62	67	72	62	67	72	62	67	72	62	67	72
75	TC	95.1	108.3	116.7	104.5	112.8	121.4	106.2	114.9	124.4	107.0	115.8	124.2
	SHC	77.4	64.2	77.2	87.6	70.1	82.0	101.9	74.6	84.7	95.0	75.9	32.4
	kW	7.39	7.69	7.83	7.55	7.74	8.00	7.50	7.81	8.10	7.56	7.84	8.10
85	TC	88.9	102.3	112.0	98.5	108.3	116.9	101.8	110.3	119.2	102.7	110.8	119.0
	SHC	79.9	69.3	55.1	93.5	77.7	60.0	100.3	83.4	63.7	102.2	85.1	64.4
	kW	7.91	8.24	8.42	8.08	8.34	8.60	8.10	8.39	8.69	8.15	8.41	8.67
95	TC	81.8	94.7	107.2	91.2	102.5	110.9	96.8	104.4	113.7	98.0	105.0	114.2
	SHC	76.4	66.2	53.8	89.5	76.0	58.1	96.7	82.1	61.4	98.0	83.9	63.2
	kW	8.64	8.94	8.85	8.77	9.08	8.96	8.80	9.15	9.03	8.91	9.17	4.60
105	TC	74.2	86.4	101.8	83.4	95.2	105.3	89.7	98.2	107.6	91.3	98.7	108.0
	SHC	72.1	62.8	51.8	83.4	73.4	56.9	89.7	80.5	60.8	91.3	82.6	61.7
	kW	9.06	9.42	9.74	9.26	9.56	9.88	9.40	9.65	9.96	9.48	9.66	9.98
115	TC	67.4	77.2	94.2	75.6	83.8	99.0	81.3	87.4	100.6	82.8	88.4	101.0
	SHC	67.3	59.1	49.5	75.6	68.9	55.1	81.2	76.3	59.0	82.7	78.7	60.1
	kW	9.71	10.04	10.42	9.97	10.19	10.59	10.10	10.28	10.66	10.19	10.31	10.68
125	TC	63.2	69.2	84.4	68.5	71.8	88.8	73.1	75.0	92.3	74.2	76.0	93.0
	SHC	63.2	56.0	46.0	68.5	64.3	51.9	73.0	70.9	56.9	74.2	73.0	58.4
	kW	10.37	10.68	11.09	10.69	10.85	11.27	10.90	10.95	11.37	10.93	10.97	11.41

See Legend and Notes on page 17.



**COOLING CAPACITIES — ENGLISH (cont)**

48TJ014 (10.2 TONS)										
Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF								
		3150/0.13			4200/0.17			5250/0.22		
		Air Entering Evaporator — Ewb (F)								
		62	67	72	62	67	72	62	67	72
75	TC	125.1	137.3	147.5	133.0	143.5	154.1	135.4	145.9	156.4
	SHC	107.5	90.6	71.7	125.8	101.9	78.7	135.4	111.0	83.8
	kW	9.48	9.60	9.69	9.58	9.67	9.79	9.56	9.69	9.84
85	TC	115.4	129.6	140.9	124.4	135.9	147.3	129.6	139.0	150.3
	SHC	103.1	87.7	69.8	120.8	99.8	77.0	129.6	110.1	83.0
	kW	10.15	10.33	10.49	10.29	10.43	10.61	10.35	10.49	10.67
95	TC	105.5	122.0	134.4	115.8	128.2	140.4	123.8	132.0	144.1
	SHC	98.9	84.8	67.8	115.7	97.8	75.3	123.8	109.2	82.2
	kW	10.83	11.06	11.30	11.01	11.20	11.41	11.13	11.28	11.48
105	TC	94.1	112.2	126.9	106.5	118.9	132.4	116.6	123.2	136.4
	SHC	92.7	81.2	65.3	106.5	94.8	73.2	116.5	107.4	80.4
	kW	11.54	11.83	12.10	11.76	11.98	12.22	11.95	12.07	12.33
115	TC	86.9	100.4	117.9	96.5	105.3	123.7	105.9	109.9	126.6
	SHC	86.8	76.4	62.5	96.5	89.8	70.5	105.9	102.2	78.3
	kW	12.26	12.55	12.91	12.58	12.74	13.07	12.76	12.85	13.15
125	TC	79.9	88.5	108.8	86.4	91.7	115.0	95.4	96.7	116.8
	SHC	79.9	71.7	59.6	96.3	84.8	67.8	95.4	96.2	76.0
	kW	13.00	13.29	13.72	13.40	14.49	13.91	13.57	13.64	13.97

LEGEND AND NOTES FOR COOLING CAPACITY TABLES — ENGLISH

LEGEND

- BF** — Bypass Factor
- Edb** — Entering Dry Bulb Temperature (F)
- Ewb** — Entering Wet Bulb Temperature (F)
- kW** — Compressor Motor Power Input
- SHC** — Sensible Heat Capacity (1000 Btuh)
- TC** — Total Capacity (1000 Btuh)

NOTES:

1. Ratings are gross, and do not account for the effects of the evaporator-fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. SHC is based on 80 F db temperature of air entering the unit. At any other temperature, correct the SHC read from the table of cooling capacities as follows:

$$\text{Corrected SHC}_{\text{Btuh}} = \text{SHC} + [1.10 \times (1 - \text{BF}) \times (F_{\text{db}} - 80) \times \text{cfm}]$$

Observe the rule of sign. Above 80 F, SHC correction will be positive; add it to SHC. Below 80 F, SHC correction will be negative; subtract it from SHC.

4. Formulas:

$$F_{\text{ldb}} = F_{\text{edb}} - \frac{\text{SHC}_{\text{Btuh}}}{1.09 \times \text{cfm}}$$

Leaving wet bulb = wet bulb temperature corresponding to enthalpy of air leaving coil ( $h_{\text{lwb}}$ ).

$$h_{\text{lwb}} = h_{\text{ewb}} - \frac{\text{TC}_{\text{Btuh}}}{4.50 \times \text{cfm}}$$

Where  $h_{\text{ewb}}$  is enthalpy of air entering evaporator coil (Btu/lb).

# Performance data (cont)



## FAN PERFORMANCE (SI) — VERTICAL DISCHARGE UNITS

48TJ008 (21.5 kW) — STANDARD MOTOR (BELT DRIVE)								
Airflow (L/s)	External Static Pressure (Pa)							
	50		100		150		200	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1150	8.8	0.45	10.1	0.62	11.2	0.79	<b>12.2</b>	<b>0.96</b>
1200	9.0	0.47	10.3	0.65	11.4	0.82	<b>12.4</b>	<b>1.02</b>
1275	9.3	0.53	10.5	0.70	11.6	0.89	<b>12.6</b>	<b>1.08</b>
1300	9.6	0.58	10.8	0.78	<b>11.9</b>	<b>0.96</b>	<b>12.8</b>	<b>1.17</b>
1400	9.9	0.63	11.1	0.85	<b>12.1</b>	<b>1.02</b>	<b>13.1</b>	<b>1.26</b>
1450	10.1	0.68	11.3	0.86	<b>12.3</b>	<b>1.09</b>	<b>13.2</b>	<b>1.29</b>
1500	10.4	0.78	11.5	0.96	<b>12.6</b>	<b>1.18</b>	<b>13.5</b>	<b>1.38</b>
1550	10.7	0.81	<b>11.8</b>	<b>1.06</b>	<b>12.8</b>	<b>1.25</b>	<b>13.7</b>	<b>1.48</b>
1600	11.0	0.90	<b>12.0</b>	<b>1.10</b>	<b>13.0</b>	<b>1.35</b>	<b>14.0</b>	<b>1.56</b>
1650	11.3	0.99	<b>12.4</b>	<b>1.22</b>	<b>13.3</b>	<b>1.43</b>	<b>14.2</b>	<b>1.67</b>
1700	11.5	1.06	<b>12.6</b>	<b>1.30</b>	<b>13.6</b>	<b>1.54</b>	<b>14.4</b>	<b>1.78</b>
1750	<b>11.8</b>	<b>1.16</b>	<b>12.9</b>	<b>1.38</b>	<b>13.8</b>	<b>1.65</b>	14.7	1.88
1800	<b>12.2</b>	<b>1.24</b>	<b>13.2</b>	<b>1.49</b>	<b>14.1</b>	<b>1.75</b>	14.9	2.00
1850	<b>12.4</b>	<b>1.35</b>	<b>13.4</b>	<b>1.60</b>	14.4	1.84	15.1	2.10
1900	<b>12.8</b>	<b>1.47</b>	<b>13.7</b>	<b>1.70</b>	14.6	1.97	15.4	2.24

48TJ008 (21.5 kW) — STANDARD MOTOR (BELT DRIVE)								
Airflow (L/s)	External Static Pressure (Pa)							
	250		300		350		400	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1150	<b>13.2</b>	<b>1.15</b>	<b>14.1</b>	<b>1.39</b>	<b>15.1</b>	<b>1.73</b>	15.8	1.96
1200	<b>13.3</b>	<b>1.21</b>	<b>14.1</b>	<b>1.41</b>	<b>15.2</b>	<b>1.76</b>	15.9	2.00
1275	<b>13.5</b>	<b>1.28</b>	<b>14.3</b>	<b>1.46</b>	<b>15.3</b>	<b>1.76</b>	16.1	2.17
1300	<b>13.8</b>	<b>1.37</b>	<b>14.6</b>	<b>1.55</b>	<b>15.2</b>	<b>1.72</b>	16.3	2.17
1400	<b>14.0</b>	<b>1.45</b>	<b>14.7</b>	<b>1.65</b>	15.5	1.84	16.5	2.10
1450	<b>14.1</b>	<b>1.53</b>	<b>14.9</b>	<b>1.73</b>	15.6	1.88	16.7	2.10
1500	<b>14.4</b>	<b>1.61</b>	15.2	1.84	15.8	2.04	16.4	2.18
1550	<b>14.5</b>	<b>1.72</b>	15.4	1.95	16.1	2.15	16.7	2.34
1600	14.8	1.80	15.6	2.07	16.3	2.29	17.0	2.49
1650	15.0	1.92	15.8	2.15	16.6	2.42	17.2	2.66
1700	15.2	2.01	16.0	2.27	16.7	2.56	17.5	2.80
1750	15.5	2.14	16.2	2.41	16.9	2.65	17.6	2.92
1800	15.7	2.24	16.4	2.52	17.2	2.82	—	—
1850	15.9	2.37	16.7	2.66	17.4	2.92	—	—
1900	16.2	2.51	16.9	2.78	—	—	—	—

### LEGEND

**BkW** — Fan Input kW × Motor Efficiency  
**R/s** — Revolutions Per Second of Blower Wheel

### NOTES:

- Boldface** indicates field-supplied drive required. (See Note 5.)
- indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

- Standard drive range is 8.2 to 11.7 r/s. All other speeds require a field-supplied drive.
- Maximum continuous BkW is 1.79. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.



**FAN PERFORMANCE (SI) — VERTICAL DISCHARGE UNITS (cont)**

**48TJ012 (29.2 kW) — STANDARD MOTOR (BELT DRIVE)**

Airflow (L/s)	External Static Pressure (Pa)									
	50		100		150		200		250	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1500	9.8	0.55	10.9	0.67	12.0	0.79	12.9	0.92	<b>13.8</b>	<b>1.04</b>
1550	10.0	0.60	11.2	0.74	12.2	0.86	<b>13.1</b>	<b>0.98</b>	<b>13.9</b>	<b>1.11</b>
1600	10.3	0.66	11.4	0.80	12.4	0.92	<b>13.3</b>	<b>1.05</b>	<b>14.2</b>	<b>1.18</b>
1650	10.6	0.72	11.7	0.86	12.6	0.98	<b>13.6</b>	<b>1.12</b>	<b>14.4</b>	<b>1.25</b>
1700	10.9	0.78	12.0	0.93	12.8	1.06	<b>13.7</b>	<b>1.20</b>	<b>14.6</b>	<b>1.34</b>
1750	11.1	0.86	12.2	1.00	<b>13.1</b>	<b>1.14</b>	<b>14.0</b>	<b>1.28</b>	<b>14.8</b>	<b>1.42</b>
1800	11.4	0.93	12.5	1.08	<b>13.3</b>	<b>1.22</b>	<b>14.2</b>	<b>1.36</b>	<b>15.0</b>	<b>1.52</b>
1850	11.7	1.00	12.7	1.15	<b>13.6</b>	<b>1.31</b>	<b>14.4</b>	<b>1.44</b>	<b>15.2</b>	<b>1.60</b>
1900	12.0	1.08	12.9	1.23	<b>13.8</b>	<b>1.40</b>	<b>14.6</b>	<b>1.53</b>	<b>15.4</b>	<b>1.70</b>
1950	12.2	1.16	<b>13.2</b>	<b>1.31</b>	<b>14.1</b>	<b>1.49</b>	<b>14.8</b>	<b>1.63</b>	<b>15.6</b>	<b>1.79</b>
2000	12.5	1.25	<b>13.4</b>	<b>1.40</b>	<b>14.3</b>	<b>1.59</b>	<b>15.1</b>	<b>1.74</b>	15.9	1.90
2050	12.8	1.34	<b>13.7</b>	<b>1.50</b>	<b>14.6</b>	<b>1.69</b>	15.3	1.85	16.1	2.00
2100	<b>13.1</b>	<b>1.44</b>	<b>13.9</b>	<b>1.60</b>	14.9	1.80	15.6	1.97	16.3	2.12
2150	<b>13.3</b>	<b>1.53</b>	<b>14.2</b>	<b>1.71</b>	15.1	1.91	15.8	2.09	16.5	2.24
2200	<b>13.6</b>	<b>1.64</b>	14.5	1.82	15.3	2.02	16.1	2.21	16.8	2.37
2250	<b>13.9</b>	<b>1.75</b>	14.7	1.94	15.6	2.13	16.3	2.34	—	—
2300	14.2	1.86	15.0	2.06	15.8	2.25	16.6	2.47	—	—
2400	14.5	1.98	15.3	2.19	16.1	2.38	—	—	—	—
2450	14.8	2.10	15.6	2.32	—	—	—	—	—	—

**48TJ012 (29.2 kW) — STANDARD MOTOR (BELT DRIVE) (cont)**

Airflow (L/s)	External Static Pressure (Pa)									
	300		350		400		450		500	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1500	14.6	1.15	15.3	1.26	16.1	1.38	16.9	1.45	17.7	1.68
1550	14.8	1.23	15.5	1.35	16.2	1.47	17.1	1.60	17.8	1.81
1600	15.0	1.30	15.7	1.44	16.4	1.55	17.1	1.68	17.9	1.86
1650	15.1	1.39	15.9	1.52	16.6	1.65	17.3	1.77	18.0	1.91
1700	15.3	1.47	16.1	1.61	16.8	1.74	17.4	1.88	18.1	2.00
1750	15.5	1.56	16.3	1.70	17.0	1.85	17.6	1.98	18.2	2.11
1800	15.8	1.66	16.4	1.80	17.2	1.95	17.8	2.09	18.4	2.22
1850	16.0	1.75	16.6	1.90	17.3	2.05	18.0	2.20	18.6	2.34
1900	16.2	1.86	16.9	2.01	17.5	2.16	18.2	2.31	—	—
1950	16.4	1.96	17.1	2.12	17.7	2.27	18.4	2.43	—	—
2000	16.6	2.07	17.3	2.24	17.9	2.39	—	—	—	—
2050	16.8	2.18	17.5	2.36	—	—	—	—	—	—
2100	17.0	2.30	—	—	—	—	—	—	—	—
2150	17.2	2.41	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—
2250	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—
2450	—	—	—	—	—	—	—	—	—	—

LEGEND

**BkW** — Fan Input kW × Motor Efficiency  
**R/s** — Revolutions Per Second of Blower Wheel

NOTES:

- Boldface** indicates field-supplied drive required. (See Note 5.)
- █ indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.
- Standard drive range is 9.5 to 13.0 r/s. All other speeds require a field-supplied drive.
- Maximum continuous BkW is 1.79. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.

# Performance data (cont)



## FAN PERFORMANCE (SI) — VERTICAL DISCHARGE UNITS (cont)

48TJ014 (35.9 kW) — STANDARD MOTOR (BELT DRIVE)										
Airflow (L/s)	External Static Pressure (Pa)									
	50		100		150		200		250	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1900	12.5	1.10	13.5	1.27	14.4	1.42	<b>15.3</b>	<b>1.63</b>	<b>16.1</b>	<b>1.81</b>
1950	12.7	1.18	13.7	1.36	14.6	1.52	<b>15.5</b>	<b>1.73</b>	<b>16.4</b>	<b>1.92</b>
2000	13.0	1.27	14.0	1.46	14.9	1.62	<b>15.7</b>	<b>1.81</b>	<b>16.6</b>	<b>2.02</b>
2050	13.3	1.36	14.3	1.56	<b>15.1</b>	<b>1.72</b>	<b>16.0</b>	<b>1.91</b>	<b>16.8</b>	<b>2.14</b>
2100	13.6	1.46	14.5	1.66	<b>15.4</b>	<b>1.84</b>	<b>16.2</b>	<b>2.01</b>	<b>17.0</b>	<b>2.25</b>
2150	13.9	1.56	14.8	1.78	<b>15.7</b>	<b>1.95</b>	<b>16.5</b>	<b>2.13</b>	<b>17.3</b>	<b>2.37</b>
2250	14.2	1.67	<b>15.1</b>	<b>1.89</b>	<b>15.9</b>	<b>2.07</b>	<b>16.7</b>	<b>2.24</b>	<b>17.5</b>	<b>2.48</b>
2300	14.5	1.78	<b>15.4</b>	<b>2.00</b>	<b>16.2</b>	<b>2.19</b>	<b>17.0</b>	<b>2.37</b>	<b>17.7</b>	<b>2.60</b>
2350	14.8	1.89	<b>15.7</b>	<b>2.13</b>	<b>16.4</b>	<b>2.32</b>	<b>17.2</b>	<b>2.51</b>	<b>18.0</b>	<b>2.72</b>
2400	15.0	2.01	<b>15.9</b>	<b>2.25</b>	<b>16.7</b>	<b>2.46</b>	<b>17.5</b>	<b>2.64</b>	18.2	2.85
2450	<b>15.4</b>	<b>2.16</b>	<b>16.2</b>	<b>2.38</b>	<b>17.0</b>	<b>2.60</b>	17.7	2.79	18.5	2.99
2500	<b>15.7</b>	<b>2.28</b>	<b>16.5</b>	<b>2.52</b>	<b>17.3</b>	<b>2.75</b>	18.0	2.95	18.7	3.13
2550	<b>15.9</b>	<b>2.43</b>	<b>16.8</b>	<b>2.65</b>	17.5	2.90	18.2	3.10	18.9	3.29
2600	<b>16.2</b>	<b>2.58</b>	17.1	2.81	17.8	3.05	18.5	3.26	19.2	3.47
2650	<b>16.5</b>	<b>2.72</b>	17.3	2.95	18.1	3.22	18.8	3.43	19.4	3.64
2700	16.8	2.89	17.6	3.12	18.4	3.39	19.0	3.60	19.7	3.83
2750	17.1	3.05	17.9	3.28	18.7	3.56	19.3	3.80	20.0	4.01
2800	17.4	3.21	18.2	3.45	18.9	3.74	19.6	3.98	20.2	4.19
2850	17.7	3.40	18.5	3.64	19.2	3.93	19.9	4.18	20.5	4.41
2900	18.0	3.57	18.8	3.81	19.5	4.11	20.2	4.37	—	—
2950	18.3	3.76	19.1	4.02	19.8	4.29	—	—	—	—
3000	18.6	3.96	19.4	4.21	20.1	4.51	—	—	—	—
3050	18.9	4.15	19.6	4.40	—	—	—	—	—	—
3100	19.2	4.38	—	—	—	—	—	—	—	—

48TJ014 (35.9 kW) — STANDARD MOTOR (BELT DRIVE) (cont)										
Airflow (L/s)	External Static Pressure (Pa)									
	300		350		400		450		500	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1900	<b>17.0</b>	<b>2.00</b>	<b>17.9</b>	<b>2.21</b>	<b>18.7</b>	<b>2.39</b>	<b>19.4</b>	<b>2.58</b>	<b>20.1</b>	<b>2.74</b>
1950	<b>17.2</b>	<b>2.11</b>	<b>18.0</b>	<b>2.31</b>	<b>18.8</b>	<b>2.51</b>	<b>19.6</b>	<b>2.71</b>	20.3	2.88
2000	<b>17.4</b>	<b>2.22</b>	<b>18.2</b>	<b>2.43</b>	<b>19.0</b>	<b>2.63</b>	19.8	2.84	20.5	3.02
2050	<b>17.6</b>	<b>2.33</b>	<b>18.4</b>	<b>2.54</b>	<b>19.2</b>	<b>2.76</b>	19.9	2.97	20.7	3.17
2100	<b>17.8</b>	<b>2.45</b>	<b>18.6</b>	<b>2.66</b>	19.3	2.89	20.1	3.10	20.8	3.32
2150	<b>18.0</b>	<b>2.59</b>	18.8	2.79	19.5	3.01	20.3	3.24	21.0	3.46
2250	<b>18.2</b>	<b>2.71</b>	19.0	2.93	19.7	3.15	20.4	3.37	21.2	3.60
2300	18.5	2.85	19.2	3.05	19.9	3.29	20.6	3.52	21.3	3.76
2350	18.7	2.99	19.4	3.21	20.1	3.43	20.8	3.67	21.5	3.92
2400	18.9	3.12	19.6	3.36	20.3	3.59	21.0	3.82	21.7	4.08
2450	19.2	3.27	19.8	3.53	20.5	3.74	21.2	3.99	—	—
2500	19.4	3.38	20.1	3.67	20.7	3.93	21.4	4.15	—	—
2550	19.6	3.54	20.3	3.83	21.0	4.09	21.6	4.33	—	—
2600	19.9	3.69	20.5	4.01	21.2	4.27	—	—	—	—
2650	20.1	3.86	20.8	4.16	21.4	4.44	—	—	—	—
2700	20.4	4.03	21.0	4.32	—	—	—	—	—	—
2750	20.6	4.21	—	—	—	—	—	—	—	—
2800	20.9	4.40	—	—	—	—	—	—	—	—
2850	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—
2950	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—
3050	—	—	—	—	—	—	—	—	—	—
3100	—	—	—	—	—	—	—	—	—	—

### LEGEND

**BkW** — Fan Input kW × Motor Efficiency  
**R/s** — Revolutions Per Second of Blower Wheel

### NOTES:

- Boldface** indicates field-supplied drive required. (See Note 5.)
- █ indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

- Standard drive range is 12.0 to 15.0 r/s. All other speeds require a field-supplied drive.
- Maximum continuous BkW is 2.76. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.



**FAN PERFORMANCE (SI) — HORIZONTAL DISCHARGE UNITS**

48TJ008 (21.5 kW) — STANDARD MOTOR (BELT DRIVE)										
Airflow (L/s)	External Static Pressure (Pa)									
	50		100		150		200		225	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1075	8.1	<b>0.34</b>	9.5	0.49	10.7	0.66	<b>11.8</b>	<b>0.81</b>	<b>12.4</b>	<b>0.92</b>
1125	8.4	0.39	9.7	0.53	10.9	0.71	<b>12.0</b>	<b>0.89</b>	<b>12.5</b>	<b>0.98</b>
1150	8.6	0.42	9.9	0.58	11.1	0.76	<b>12.2</b>	<b>0.96</b>	<b>12.7</b>	<b>1.05</b>
1200	8.9	0.46	10.2	0.64	11.3	0.81	<b>12.4</b>	<b>1.02</b>	<b>12.8</b>	<b>1.11</b>
1250	9.1	0.51	10.4	0.70	11.5	0.87	<b>12.6</b>	<b>1.08</b>	<b>13.0</b>	<b>1.19</b>
1300	9.4	0.56	10.7	0.75	11.7	0.93	<b>12.7</b>	<b>1.14</b>	<b>13.2</b>	<b>1.25</b>
1400	9.7	0.62	10.9	0.82	<b>12.0</b>	<b>0.99</b>	<b>12.9</b>	<b>1.22</b>	<b>13.4</b>	<b>1.33</b>
1450	10.0	0.67	11.2	0.88	<b>12.2</b>	<b>1.07</b>	<b>13.2</b>	<b>1.27</b>	<b>13.6</b>	<b>1.40</b>
1500	10.2	0.74	11.4	0.94	<b>12.4</b>	<b>1.15</b>	<b>13.4</b>	<b>1.36</b>	<b>13.8</b>	<b>1.48</b>
1550	10.5	0.80	11.7	1.02	<b>12.7</b>	<b>1.23</b>	<b>13.6</b>	<b>1.44</b>	<b>14.0</b>	<b>1.56</b>
1600	10.8	0.88	<b>11.9</b>	<b>1.09</b>	<b>12.9</b>	<b>1.32</b>	<b>13.8</b>	<b>1.53</b>	<b>14.2</b>	<b>1.65</b>
1650	11.1	0.97	<b>12.2</b>	<b>1.17</b>	<b>13.2</b>	<b>1.41</b>	<b>14.0</b>	<b>1.63</b>	<b>14.4</b>	<b>1.75</b>
1700	11.4	1.04	<b>12.4</b>	<b>1.25</b>	<b>13.4</b>	<b>1.51</b>	<b>14.3</b>	<b>1.73</b>	14.7	1.85
1750	11.7	1.12	<b>12.7</b>	<b>1.35</b>	<b>13.7</b>	<b>1.61</b>	14.5	1.85	14.9	1.97
1800	<b>12.0</b>	<b>1.23</b>	<b>13.0</b>	<b>1.45</b>	<b>13.9</b>	<b>1.70</b>	14.8	1.95	15.1	2.07
1850	<b>12.2</b>	<b>1.33</b>	<b>13.2</b>	<b>1.54</b>	14.2	1.81	15.0	2.08	15.4	2.20
1900	<b>12.5</b>	<b>1.42</b>	<b>13.5</b>	<b>1.65</b>	14.4	1.92	15.2	2.20	15.6	2.34

48TJ008 (21.5 kW) — STANDARD MOTOR (BELT DRIVE) (cont)								
Airflow (L/s)	External Static Pressure (Pa)							
	250		300		350		400	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1075	<b>12.9</b>	<b>1.03</b>	<b>13.9</b>	<b>1.29</b>	<b>15.0</b>	<b>1.60</b>	15.7	1.89
1125	<b>13.0</b>	<b>1.08</b>	<b>14.0</b>	<b>1.34</b>	<b>15.1</b>	<b>1.68</b>	15.9	1.92
1150	<b>13.1</b>	<b>1.13</b>	<b>14.1</b>	<b>1.38</b>	<b>15.2</b>	<b>1.69</b>	16.0	1.96
1200	<b>13.3</b>	<b>1.21</b>	<b>14.3</b>	<b>1.42</b>	<b>15.2</b>	<b>1.74</b>	16.1	2.01
1250	<b>13.5</b>	<b>1.29</b>	<b>14.4</b>	<b>1.48</b>	<b>15.3</b>	<b>1.78</b>	16.2	2.06
1300	<b>13.7</b>	<b>1.37</b>	<b>14.5</b>	<b>1.56</b>	15.4	1.81	16.3	2.09
1400	<b>13.9</b>	<b>1.44</b>	<b>14.7</b>	<b>1.66</b>	15.5	1.84	16.4	2.19
1450	<b>14.1</b>	<b>1.52</b>	<b>14.9</b>	<b>1.77</b>	15.7	1.97	16.5	2.18
1500	<b>14.3</b>	<b>1.60</b>	15.1	1.86	15.9	2.08	16.6	2.29
1550	<b>14.2</b>	<b>1.68</b>	15.3	1.94	16.1	2.21	16.8	2.43
1600	<b>14.8</b>	<b>1.77</b>	15.5	2.04	16.3	2.31	17.0	2.55
1650	14.9	1.86	15.7	2.13	16.5	2.42	17.2	2.70
1700	15.1	1.97	15.9	2.24	16.6	2.52	17.4	2.82
1750	15.3	2.08	16.1	2.35	16.8	2.64	17.6	2.94
1800	15.5	2.20	16.3	2.45	17.0	2.76	17.7	3.05
1850	15.8	2.32	16.5	2.58	17.2	2.87	17.9	3.19
1900	16.0	2.46	16.7	2.70	17.5	2.99	18.1	3.31

LEGEND

**BkW** — Fan Input kW × Motor Efficiency  
**R/s** — Revolutions Per Second of Blower Wheel

NOTES:

- Boldface** indicates field-supplied drive required. (See Note 5.)
- █ indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.
- Standard drive range is 8.2 to 11.7 r/s. All other speeds require a field-supplied drive.
- Maximum continuous BkW is 1.79. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.

# Performance data (cont)



## FAN PERFORMANCE (SI) — HORIZONTAL DISCHARGE UNITS (cont)

### 48TJ012 (29.2 kW) — STANDARD MOTOR (BELT DRIVE)

Airflow (L/s)	External Static Pressure (Pa)									
	50		100		150		200		250	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1500	9.1	<b>0.49</b>	10.5	0.63	11.6	0.77	12.6	0.89	<b>13.5</b>	<b>0.99</b>
1550	<b>9.4</b>	<b>0.54</b>	10.7	0.68	11.8	0.82	12.8	0.96	<b>13.7</b>	<b>1.06</b>
1600	9.6	0.59	10.9	0.73	12.0	0.88	13.0	1.02	<b>13.9</b>	<b>1.14</b>
1650	9.8	0.65	11.1	0.80	12.2	0.95	<b>13.2</b>	<b>1.09</b>	<b>14.1</b>	<b>1.22</b>
1700	10.1	0.71	11.3	0.86	12.4	1.01	<b>13.4</b>	<b>1.16</b>	<b>14.2</b>	<b>1.30</b>
1750	10.3	0.77	11.5	0.92	12.6	1.07	<b>13.5</b>	<b>1.23</b>	<b>14.4</b>	<b>1.38</b>
1800	10.6	0.84	11.7	0.98	12.8	1.14	<b>13.7</b>	<b>1.30</b>	<b>14.6</b>	<b>1.47</b>
1850	10.8	0.92	11.9	1.04	13.0	1.21	<b>13.9</b>	<b>1.39</b>	<b>14.8</b>	<b>1.55</b>
1900	11.1	1.00	12.1	1.14	<b>13.2</b>	<b>1.29</b>	<b>14.1</b>	<b>1.47</b>	<b>15.0</b>	<b>1.64</b>
1950	11.3	1.09	12.3	1.22	<b>13.4</b>	<b>1.38</b>	<b>14.3</b>	<b>1.55</b>	<b>15.2</b>	<b>1.72</b>
2000	11.6	1.18	12.6	1.31	<b>13.6</b>	<b>1.47</b>	<b>14.5</b>	<b>1.64</b>	15.3	1.82
2050	11.9	1.28	12.8	1.40	<b>13.8</b>	<b>1.56</b>	<b>14.7</b>	<b>1.73</b>	15.5	1.92
2100	12.1	1.38	13.0	1.50	<b>14.0</b>	<b>1.64</b>	14.9	1.82	15.8	2.02
2150	12.4	1.49	<b>13.2</b>	<b>1.60</b>	<b>14.2</b>	<b>1.73</b>	15.1	1.93	15.9	2.13
2200	12.7	1.61	<b>13.4</b>	<b>1.70</b>	14.4	1.83	15.3	2.04	16.1	2.24
2300	12.9	1.74	13.7	1.81	14.6	1.93	15.5	2.15	—	—
2350	13.2	1.86	13.9	1.93	14.8	2.03	15.7	2.27	—	—
2400	13.5	2.00	14.2	2.05	15.0	2.14	—	—	—	—
2500	—	—	14.4	2.14	15.2	2.25	—	—	—	—

### 48TJ012 (29.2 kW) — STANDARD MOTOR (BELT DRIVE) (cont)

Airflow (L/s)	External Static Pressure (Pa)									
	300		350		400		450		500	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1500	14.5	1.13	15.2	1.22	16.1	1.40	16.8	1.54	17.7	1.82
1550	14.6	1.20	15.4	1.30	16.2	1.43	16.9	1.60	17.8	1.86
1600	14.8	1.26	15.6	1.40	16.3	1.50	17.1	1.68	17.9	1.91
1650	14.9	1.33	15.7	1.48	16.5	1.60	17.2	1.72	18.0	1.97
1700	15.0	1.42	15.9	1.56	16.7	1.70	17.3	1.81	18.0	1.97
1750	15.2	1.51	16.0	1.64	16.8	1.79	17.5	1.91	18.2	2.04
1800	15.4	1.61	16.2	1.73	17.0	1.89	17.7	2.03	18.3	2.15
1850	15.6	1.71	16.3	1.84	17.1	1.98	17.8	2.15	18.5	2.27
1900	15.8	1.80	16.5	1.94	17.2	2.07	18.0	2.24	18.7	2.40
1950	16.0	1.91	16.7	2.06	17.4	2.19	—	—	—	—
2000	16.2	2.01	16.9	2.17	17.6	2.31	—	—	—	—
2050	16.3	2.10	17.1	2.29	—	—	—	—	—	—
2100	16.5	2.21	—	—	—	—	—	—	—	—
2150	16.7	2.32	—	—	—	—	—	—	—	—
2200	16.9	2.43	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—
2350	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—

#### LEGEND

**BkW** — Fan Input kW × Motor Efficiency  
**R/s** — Revolutions Per Second of Blower Wheel

#### NOTES:

- Boldface** indicates field-supplied drive required. (See Note 5.)
- indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

- Standard drive range is 9.5 to 13.0 r/s. All other speeds require a field-supplied drive.
- Maximum continuous BkW is 1.79. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.



**FAN PERFORMANCE (SI) — HORIZONTAL DISCHARGE UNITS (cont)**

48TJ014 (35.9 kW) — STANDARD MOTOR (BELT DRIVE)										
Airflow (L/s)	External Static Pressure (Pa)									
	50		100		150		200		250	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1900	<b>11.5</b>	<b>0.96</b>	12.7	1.14	13.7	1.32	14.7	1.49	<b>15.6</b>	<b>1.71</b>
1950	<b>11.8</b>	<b>1.04</b>	12.9	1.22	13.9	1.40	14.9	1.57	<b>15.8</b>	<b>1.80</b>
2000	12.1	1.12	13.2	1.29	14.2	1.49	<b>15.1</b>	<b>1.65</b>	<b>16.0</b>	<b>1.89</b>
2050	12.3	1.18	13.4	1.38	14.4	1.59	<b>15.3</b>	<b>1.75</b>	<b>16.2</b>	<b>1.96</b>
2100	12.6	1.27	13.6	1.46	14.6	1.68	<b>15.5</b>	<b>1.86</b>	<b>16.4</b>	<b>2.05</b>
2150	12.8	1.36	13.9	1.56	14.9	1.78	<b>15.7</b>	<b>1.96</b>	<b>16.6</b>	<b>2.15</b>
2200	13.1	1.44	14.1	1.66	<b>15.1</b>	<b>1.88</b>	<b>16.0</b>	<b>2.07</b>	<b>16.8</b>	<b>2.26</b>
2250	13.3	1.53	14.4	1.75	<b>15.3</b>	<b>1.99</b>	<b>16.2</b>	<b>2.20</b>	<b>17.0</b>	<b>2.36</b>
2325	13.6	1.63	14.6	1.87	<b>15.5</b>	<b>2.10</b>	<b>16.4</b>	<b>2.30</b>	<b>17.2</b>	<b>2.50</b>
2400	13.9	1.74	14.9	1.98	<b>15.8</b>	<b>2.20</b>	<b>16.6</b>	<b>2.44</b>	<b>17.4</b>	<b>2.64</b>
2450	14.1	1.84	<b>15.1</b>	<b>2.10</b>	<b>16.0</b>	<b>2.31</b>	<b>16.8</b>	<b>2.56</b>	17.6	2.77
2500	14.4	1.95	<b>15.4</b>	<b>2.22</b>	<b>16.2</b>	<b>2.44</b>	<b>17.1</b>	<b>2.69</b>	17.8	2.90
2550	14.7	2.07	<b>15.6</b>	<b>2.34</b>	<b>16.5</b>	<b>2.56</b>	17.3	2.83	18.1	3.05
2600	14.9	2.18	<b>15.8</b>	<b>2.47</b>	<b>16.7</b>	<b>2.69</b>	17.5	2.96	18.3	3.20
2650	<b>15.2</b>	<b>2.32</b>	<b>16.1</b>	<b>2.60</b>	16.9	2.83	17.8	3.11	18.5	3.34
2700	<b>15.4</b>	<b>2.44</b>	<b>16.4</b>	<b>2.74</b>	17.2	2.96	18.0	3.26	18.7	3.51
2750	<b>15.7</b>	<b>2.57</b>	16.6	2.89	17.4	3.11	18.2	3.38	19.0	3.67
2800	<b>15.9</b>	<b>2.71</b>	16.9	3.03	17.7	3.27	18.4	3.55	19.2	3.84
2850	16.2	2.86	17.1	3.18	17.9	3.46	18.7	3.70	—	—
2900	16.5	2.98	17.3	3.32	18.2	3.57	18.9	3.85	—	—
2950	16.7	3.11	17.6	3.46	18.4	3.72	—	—	—	—
3000	17.0	3.25	17.8	3.60	18.7	3.87	—	—	—	—
3050	17.3	3.38	18.1	3.74	—	—	—	—	—	—
3100	17.5	3.52	18.3	3.89	—	—	—	—	—	—

48TJ014 (35.9 kW) — STANDARD MOTOR (BELT DRIVE) (cont)										
Airflow (L/s)	External Static Pressure (Pa)									
	300		350		400		450		500	
	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW	R/s	BkW
1900	16.6	1.91	17.5	2.11	18.2	2.29	18.9	2.44	19.3	2.55
1950	16.7	2.00	17.6	2.21	18.4	2.41	19.1	2.58	19.6	2.71
2000	16.9	2.11	17.8	2.31	18.6	2.52	19.3	2.71	19.9	2.87
2050	17.1	2.20	17.9	2.42	18.7	2.64	19.5	2.84	20.1	3.02
2100	17.2	2.30	18.1	2.53	18.9	2.76	19.6	2.97	20.3	3.17
2150	17.4	2.42	18.2	2.64	19.0	2.88	19.8	3.10	20.5	3.31
2200	17.6	2.52	18.4	2.76	19.2	2.99	20.0	3.23	20.7	3.45
2250	17.8	2.61	18.6	2.88	19.4	3.11	20.1	3.37	20.9	3.60
2325	18.0	2.71	18.8	3.00	19.5	3.26	20.3	3.49	21.0	3.75
2400	18.2	2.83	18.9	3.13	19.7	3.39	20.5	3.64	21.2	3.89
2450	18.4	2.97	19.1	3.24	19.9	3.52	20.6	3.77	—	—
2500	18.6	3.09	19.3	3.35	20.0	3.66	20.8	3.93	—	—
2550	18.8	3.25	19.5	3.49	20.2	3.81	—	—	—	—
2600	19.0	3.42	19.7	3.63	20.4	3.95	—	—	—	—
2650	19.2	3.58	19.9	3.81	—	—	—	—	—	—
2700	19.4	3.73	20.1	3.92	—	—	—	—	—	—
2750	19.7	3.91	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—
2850	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—
2950	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—
3050	—	—	—	—	—	—	—	—	—	—
3100	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**BkW** — Fan Input kW × Motor Efficiency  
**R/s** — Revolutions Per Second of Blower Wheel

**NOTES:**

- Boldface** indicates field-supplied drive required. (See Note 5.)
- █ indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.
- Standard drive range is 12.0 to 15.0 r/s. All other speeds require a field-supplied drive.
- Maximum continuous BkW is 2.76. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.

# Performance data (cont)



## FAN PERFORMANCE (ENGLISH) — VERTICAL DISCHARGE UNITS

48TJ008 (6.1 TONS) — STANDARD MOTOR (BELT DRIVE)								
Airflow Cfm	External Static Pressure (in. wg)							
	0.2		0.4		0.6		0.8	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2200	506	0.52	586	0.72	656	0.95	<b>718</b>	<b>1.18</b>
2250	514	0.55	593	0.76	662	0.99	<b>724</b>	<b>1.22</b>
2300	521	0.57	600	0.79	668	1.02	<b>730</b>	<b>1.26</b>
2400	536	0.63	613	0.85	680	1.09	<b>741</b>	<b>1.34</b>
2500	551	0.69	626	0.93	693	1.17	<b>753</b>	<b>1.43</b>
2550	559	0.72	634	0.97	700	1.21	<b>759</b>	<b>1.48</b>
2600	567	0.75	641	1.00	<b>706</b>	<b>1.25</b>	<b>764</b>	<b>1.52</b>
2700	582	0.83	655	1.08	<b>719</b>	<b>1.34</b>	<b>776</b>	<b>1.61</b>
2800	598	0.90	670	1.17	<b>732</b>	<b>1.43</b>	<b>789</b>	<b>1.71</b>
2900	614	0.98	684	1.25	<b>745</b>	<b>1.53</b>	<b>802</b>	<b>1.81</b>
3000	630	1.07	699	1.35	<b>759</b>	<b>1.63</b>	<b>815</b>	<b>1.92</b>
3100	646	1.16	<b>714</b>	<b>1.45</b>	<b>773</b>	<b>1.74</b>	<b>828</b>	<b>2.04</b>
3200	662	1.26	<b>729</b>	<b>1.55</b>	<b>787</b>	<b>1.86</b>	<b>841</b>	<b>2.16</b>
3300	679	1.36	<b>744</b>	<b>1.66</b>	<b>801</b>	<b>1.98</b>	<b>854</b>	<b>2.29</b>
3400	695	1.47	<b>759</b>	<b>1.78</b>	<b>816</b>	<b>2.10</b>	867	2.42
3500	<b>712</b>	<b>1.59</b>	<b>774</b>	<b>1.90</b>	<b>830</b>	<b>2.23</b>	881	2.56
3600	<b>729</b>	<b>1.71</b>	<b>790</b>	<b>2.03</b>	<b>845</b>	<b>2.37</b>	895	2.71
3700	<b>745</b>	<b>1.84</b>	<b>805</b>	<b>2.17</b>	860	2.52	909	2.87
3750	<b>754</b>	<b>1.91</b>	<b>813</b>	<b>2.24</b>	868	2.59	917	2.95

48TJ008 (6.1 TONS) — STANDARD MOTOR (BELT DRIVE) (cont)								
Airflow Cfm	External Static Pressure (in. wg)							
	1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2200	<b>776</b>	<b>1.43</b>	<b>838</b>	<b>1.78</b>	<b>898</b>	<b>2.21</b>	935	2.58
2250	<b>781</b>	<b>1.78</b>	<b>841</b>	<b>1.81</b>	<b>902</b>	<b>2.25</b>	939	2.60
2300	<b>786</b>	<b>1.50</b>	<b>843</b>	<b>1.83</b>	<b>905</b>	<b>2.28</b>	943	2.62
2400	<b>796</b>	<b>1.59</b>	<b>849</b>	<b>1.88</b>	<b>910</b>	<b>2.31</b>	952	2.74
2500	<b>808</b>	<b>1.69</b>	<b>859</b>	<b>1.96</b>	<b>912</b>	<b>2.31</b>	963	2.81
2550	<b>814</b>	<b>1.74</b>	<b>864</b>	<b>2.01</b>	<b>915</b>	<b>2.34</b>	968	2.81
2600	<b>819</b>	<b>1.79</b>	<b>869</b>	<b>2.06</b>	<b>918</b>	<b>2.37</b>	973	2.81
2700	<b>831</b>	<b>1.89</b>	<b>880</b>	<b>2.17</b>	927	2.47	976	2.84
2800	<b>842</b>	<b>2.00</b>	<b>892</b>	<b>2.29</b>	938	2.58	983	2.92
2900	<b>854</b>	<b>2.11</b>	903	2.42	949	2.71	993	3.03
3000	<b>866</b>	<b>2.23</b>	915	2.54	961	2.85	1003	3.17
3100	<b>878</b>	<b>2.35</b>	926	2.67	972	3.00	1015	3.32
3200	891	2.48	938	2.81	983	3.14	1026	3.47
3300	904	2.61	950	2.95	995	3.30	—	—
3400	917	2.75	963	3.10	1007	3.45	—	—
3500	930	2.90	976	3.25	—	—	—	—
3600	943	3.05	988	3.41	—	—	—	—
3700	956	3.22	—	—	—	—	—	—
3750	963	3.30	—	—	—	—	—	—

### LEGEND

**Bhp** — Brake Horsepower at Motor Shaft  
**Rpm** — Revolutions Per Minute of Blower Wheel

### NOTES:

- Boldface** indicates field-supplied drive required. (See Note 5.)
- █ indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.
- Standard drive range is 492 to 700 rpm. All other rpms require a field-supplied drive.
- Maximum continuous bhp is 2.4. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.



**FAN PERFORMANCE (ENGLISH) — VERTICAL DISCHARGE UNITS (cont)**

48TJ012 (8.3 TONS) — STANDARD MOTOR (BELT DRIVE)										
Airflow Cfm	External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	592	0.76	661	0.93	722	1.09	779	1.26	829	1.42
3100	607	0.83	676	1.01	734	1.17	791	1.34	840	1.51
3200	622	0.90	690	1.09	746	1.25	803	1.43	852	1.60
3300	638	0.98	705	1.17	759	1.33	815	1.52	864	1.70
3400	653	1.06	719	1.26	772	1.43	826	1.62	876	1.81
3500	669	1.15	733	1.35	786	1.53	838	1.72	888	1.91
3600	684	1.24	747	1.44	800	1.64	850	1.82	900	2.03
3700	700	1.33	760	1.54	814	1.75	863	1.92	912	2.14
3800	715	1.43	774	1.64	828	1.86	875	2.04	924	2.26
3900	731	1.54	787	1.74	843	1.98	888	2.16	936	2.38
4000	747	1.64	801	1.85	857	2.10	902	2.30	948	2.51
4100	763	1.76	816	1.97	872	2.23	916	2.44	960	2.64
4200	778	1.88	831	2.10	886	2.36	929	2.58	972	2.78
4300	794	2.00	846	2.23	900	2.50	943	2.73	985	2.93
4400	810	2.13	861	2.37	913	2.64	958	2.89	999	3.09
4500	826	2.27	876	2.52	927	2.78	973	3.04	1012	3.26
4600	842	2.41	892	2.67	940	2.92	987	3.21	—	—
4700	858	2.55	907	2.83	954	3.08	1002	3.38	—	—
4800	874	2.70	922	2.99	968	3.24	—	—	—	—
4900	890	2.86	938	3.16	—	—	—	—	—	—
5000	906	3.03	953	3.33	—	—	—	—	—	—

48TJ012 (8.3 TONS) — STANDARD MOTOR (BELT DRIVE) (cont)										
Airflow Cfm	External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	880	1.58	924	1.73	970	1.89	1019	2.00	1066	2.30
3100	890	1.68	935	1.84	977	2.00	1026	2.17	1070	2.44
3200	900	1.77	946	1.95	987	2.11	1029	2.28	1075	2.51
3300	910	1.88	957	2.06	998	2.23	1037	2.40	1082	2.58
3400	921	1.98	967	2.17	1009	2.35	1047	2.53	1087	2.70
3500	933	2.10	976	2.29	1020	2.48	1058	2.66	1095	2.84
3600	945	2.22	986	2.41	1030	2.61	1069	2.80	1106	2.98
3700	957	2.34	998	2.54	1039	2.74	1081	2.94	1117	3.13
3800	969	2.47	1010	2.67	1049	2.87	1091	3.08	1128	3.29
3900	981	2.60	1022	2.81	1060	3.02	1100	3.23	—	—
4000	993	2.74	1034	2.96	1072	3.17	1110	3.38	—	—
4100	1005	2.88	1046	3.11	1084	3.32	—	—	—	—
4200	1016	3.03	1058	3.26	—	—	—	—	—	—
4300	1028	3.17	—	—	—	—	—	—	—	—
4400	1040	3.32	—	—	—	—	—	—	—	—
4500	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—

LEGEND

**Bhp** — Brake Horsepower at Motor Shaft  
**Rpm** — Revolutions Per Minute of Blower Wheel

NOTES:

- Boldface** indicates field-supplied drive required. (See Note 5.)
- █ indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.
- Standard drive range is 571 to 779 rpm. All other rpms require a field-supplied drive.
- Maximum continuous bhp is 2.4. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.

# Performance data (cont)



## FAN PERFORMANCE (ENGLISH) — VERTICAL DISCHARGE UNITS (cont)

48TJ014 (10.2 TONS) — STANDARD MOTOR (BELT DRIVE)										
Airflow Cfm	External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3700	729	1.36	790	1.58	847	1.79	<b>902</b>	<b>2.06</b>	<b>955</b>	<b>2.29</b>
3800	745	1.46	805	1.69	861	1.89	<b>915</b>	<b>2.17</b>	<b>967</b>	<b>2.41</b>
3900	761	1.56	820	1.80	875	2.01	<b>928</b>	<b>2.29</b>	<b>979</b>	<b>2.55</b>
4000	777	1.67	836	1.92	889	2.14	<b>941</b>	<b>2.40</b>	<b>991</b>	<b>2.68</b>
4100	793	1.79	851	2.05	<b>904</b>	<b>2.27</b>	<b>955</b>	<b>2.52</b>	<b>1004</b>	<b>2.82</b>
4200	810	1.91	867	2.18	<b>918</b>	<b>2.41</b>	<b>968</b>	<b>2.65</b>	<b>1017</b>	<b>2.96</b>
4300	826	2.04	883	2.32	<b>933</b>	<b>2.55</b>	<b>982</b>	<b>2.79</b>	<b>1030</b>	<b>3.11</b>
4400	842	2.17	898	2.46	<b>948</b>	<b>2.70</b>	<b>996</b>	<b>2.93</b>	<b>1043</b>	<b>3.25</b>
4500	859	2.31	<b>914</b>	<b>2.60</b>	<b>962</b>	<b>2.85</b>	<b>1010</b>	<b>3.09</b>	<b>1056</b>	<b>3.40</b>
4600	876	2.46	<b>930</b>	<b>2.76</b>	<b>977</b>	<b>3.01</b>	<b>1024</b>	<b>3.26</b>	<b>1070</b>	<b>3.55</b>
4700	892	2.60	<b>945</b>	<b>2.91</b>	<b>992</b>	<b>3.18</b>	<b>1039</b>	<b>3.43</b>	1083	3.71
4800	<b>909</b>	<b>2.77</b>	<b>961</b>	<b>3.07</b>	<b>1008</b>	<b>3.36</b>	<b>1053</b>	<b>3.61</b>	1097	3.88
4900	<b>926</b>	<b>2.93</b>	<b>977</b>	<b>3.24</b>	<b>1024</b>	<b>3.54</b>	1068	3.80	1111	4.06
5000	<b>942</b>	<b>3.11</b>	<b>993</b>	<b>3.41</b>	1039	3.73	1080	3.90	1126	4.25
5100	<b>959</b>	<b>3.29</b>	<b>1009</b>	<b>3.60</b>	1055	3.92	1097	4.19	1139	4.46
5200	<b>976</b>	<b>3.47</b>	1025	3.78	1071	4.12	1112	4.40	1153	4.67
5300	<b>993</b>	<b>3.67</b>	1041	3.98	1086	4.33	1127	4.61	1168	4.90
5400	1010	3.87	1057	4.18	1102	4.54	1142	4.84	1182	5.13
5500	1027	4.07	1073	4.39	1118	4.76	1157	5.07	1197	5.36
5600	1043	4.29	1090	4.61	1133	4.99	1173	5.31	1211	5.61
5700	1060	4.51	1106	4.83	1149	5.22	1189	5.55	—	—
5800	1077	4.74	1122	5.07	1165	5.46	—	—	—	—
5900	1094	4.98	1139	5.31	1181	5.70	—	—	—	—
6000	1111	5.22	1155	5.55	—	—	—	—	—	—
6100	1128	5.48	—	—	—	—	—	—	—	—
6200	1145	5.74	—	—	—	—	—	—	—	—

48TJ014 (10.2 TONS) — STANDARD MOTOR (BELT DRIVE) (cont)										
Airflow Cfm	External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3700	<b>1008</b>	<b>2.55</b>	<b>1060</b>	<b>2.80</b>	<b>1108</b>	<b>3.05</b>	<b>1152</b>	<b>3.27</b>	<b>1190</b>	<b>3.46</b>
3800	<b>1019</b>	<b>2.67</b>	<b>1070</b>	<b>2.94</b>	<b>1118</b>	<b>3.19</b>	<b>1163</b>	<b>3.44</b>	<b>1203</b>	<b>3.65</b>
3900	<b>1029</b>	<b>2.80</b>	<b>1079</b>	<b>3.07</b>	<b>1128</b>	<b>3.34</b>	<b>1173</b>	<b>3.60</b>	1214	3.83
4000	<b>1040</b>	<b>2.94</b>	<b>1089</b>	<b>3.22</b>	<b>1137</b>	<b>3.49</b>	1183	3.76	1225	4.00
4100	<b>1052</b>	<b>3.08</b>	<b>1100</b>	<b>3.36</b>	<b>1147</b>	<b>3.65</b>	1193	3.93	1236	4.19
4200	<b>1064</b>	<b>3.23</b>	<b>1110</b>	<b>3.51</b>	1157	3.81	1202	4.09	1245	4.38
4300	<b>1076</b>	<b>3.40</b>	<b>1121</b>	<b>3.67</b>	1167	3.97	1212	4.27	1255	4.56
4400	<b>1088</b>	<b>3.56</b>	1133	3.84	1178	4.14	1222	4.44	1265	4.74
4500	1101	3.73	1144	4.00	1188	4.31	1232	4.62	1274	4.93
4600	1114	3.90	1157	4.19	1199	4.49	1242	4.81	1284	5.13
4700	1126	4.07	1169	4.38	1210	4.68	1252	5.00	1294	5.33
4800	1140	4.25	1181	4.58	1222	4.87	1263	5.20	—	—
4900	1153	4.41	1194	4.77	1234	5.09	1274	5.40	—	—
5000	1166	4.59	1207	4.97	1247	5.30	1286	5.62	—	—
5100	1180	4.78	1220	5.18	1259	5.52	—	—	—	—
5200	1194	4.98	1233	5.38	1272	5.74	—	—	—	—
5300	1208	5.19	1246	5.58	—	—	—	—	—	—
5400	1221	5.41	—	—	—	—	—	—	—	—
5500	1235	5.64	—	—	—	—	—	—	—	—
5600	—	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—

### LEGEND

**Bhp** — Brake Horsepower at Motor Shaft  
**Rpm** — Revolutions Per Minute of Blower Wheel

### NOTES:

- 1. Boldface** indicates field-supplied drive required. (See Note 5.)
- indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

- Standard drive range is 717 to 900 rpm. All other rpms require a field-supplied drive.
- Maximum continuous bhp is 3.7. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.



**FAN PERFORMANCE (ENGLISH) — HORIZONTAL DISCHARGE UNITS**

48TJ008 (6.1 TONS) — STANDARD MOTOR (BELT DRIVE)										
Airflow Cfm	External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		0.9	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2200	499	0.50	580	0.70	652	0.94	717	1.17	748	1.30
2250	507	0.53	586	0.73	658	0.97	722	1.22	752	1.34
2300	513	0.55	592	0.76	663	1.00	727	1.26	756	1.38
2400	528	0.60	606	0.83	674	1.06	738	1.34	766	1.46
2500	542	0.66	619	0.90	686	1.13	748	1.41	777	1.55
2550	550	0.69	627	0.94	692	1.17	754	1.45	783	1.60
2600	557	0.72	634	0.97	698	1.21	759	1.49	787	1.64
2700	573	0.79	648	1.05	711	1.29	770	1.58	798	1.73
2800	588	0.86	662	1.13	723	1.38	782	1.66	809	1.82
2900	604	0.94	676	1.21	737	1.48	794	1.76	821	1.92
3000	620	1.02	690	1.30	750	1.58	806	1.86	832	2.02
3100	636	1.11	704	1.39	764	1.69	818	1.97	844	2.13
3200	652	1.21	718	1.49	778	1.80	831	2.09	856	2.25
3300	668	1.31	732	1.59	793	1.92	844	2.21	869	2.37
3400	684	1.41	747	1.70	807	2.04	857	2.35	882	2.51
3500	701	1.53	762	1.82	821	2.16	871	2.48	895	2.64
3600	717	1.65	777	1.94	835	2.29	885	2.63	908	2.79
3700	733	1.77	792	2.07	849	2.42	899	2.78	922	2.95
3750	742	1.84	800	2.14	856	2.49	907	2.86	929	3.03

48TJ008 (6.1 TONS) — STANDARD MOTOR (BELT DRIVE) (cont)								
Airflow Cfm	External Static Pressure (in. wg)							
	1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2200	779	1.43	839	1.78	905	2.21	951	2.57
2250	783	1.46	843	1.81	908	2.25	955	2.59
2300	786	1.49	846	1.84	910	2.25	959	2.61
2400	795	1.58	853	1.88	912	2.31	967	2.68
2500	806	1.68	859	1.94	919	2.37	971	2.73
2550	812	1.74	864	1.99	920	2.39	974	2.76
2600	816	1.79	868	2.04	921	2.41	976	2.78
2700	827	1.88	878	2.16	928	2.45	983	2.88
2800	837	1.98	889	2.29	937	2.57	986	2.91
2900	848	2.08	900	2.41	947	2.70	993	3.01
3000	849	2.18	910	2.52	958	2.85	1002	3.15
3100	870	2.29	920	2.64	968	2.99	1012	3.30
3200	882	2.40	931	2.76	979	3.13	1023	3.47
3300	894	2.53	942	2.89	989	3.26	1034	3.63
3400	907	2.66	954	3.02	1000	3.40	1044	3.79
3500	919	2.80	966	3.15	1011	3.55	1054	3.94
3600	932	2.95	978	3.30	1022	3.69	1065	4.10
3700	945	3.11	990	3.45	1034	3.84	1076	4.28
3750	952	3.20	997	3.54	1040	3.93	1082	5.27

**LEGEND**

**Bhp** — Brake Horsepower at Motor Shaft  
**Rpm** — Revolutions Per Minute of Blower Wheel

**NOTES:**

- 1. Boldface** indicates field-supplied drive required. (See Note 5.)
- indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

- Standard drive range is 492 to 700 rpm. All other rpms require a field-supplied drive.
- Maximum continuous bhp is 2.4. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.

# Performance data (cont)



## FAN PERFORMANCE (ENGLISH) — HORIZONTAL DISCHARGE UNITS (cont)

48TJ012 (8.3 TONS) — STANDARD MOTOR (BELT DRIVE)										
Airflow Cfm	External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	552	<b>0.68</b>	632	0.87	701	1.05	761	1.22	<b>816</b>	<b>1.36</b>
3100	565	<b>0.74</b>	644	0.93	711	1.12	772	1.31	<b>825</b>	<b>1.45</b>
3200	578	0.81	656	1.00	723	1.20	<b>782</b>	<b>1.39</b>	<b>835</b>	<b>1.55</b>
3300	591	0.88	668	1.08	734	1.28	<b>793</b>	<b>1.47</b>	<b>845</b>	<b>1.65</b>
3400	605	0.96	680	1.16	745	1.36	<b>803</b>	<b>1.56</b>	<b>856</b>	<b>1.75</b>
3500	519	1.04	691	1.23	755	1.44	<b>813</b>	<b>1.65</b>	<b>867</b>	<b>1.86</b>
3600	633	1.13	703	1.31	766	1.52	<b>824</b>	<b>1.74</b>	<b>877</b>	<b>1.97</b>
3700	648	1.23	714	1.39	777	1.61	<b>835</b>	<b>1.85</b>	<b>887</b>	<b>2.07</b>
3800	662	1.33	726	1.51	<b>789</b>	<b>1.72</b>	<b>846</b>	<b>1.95</b>	<b>897</b>	<b>2.18</b>
3900	677	1.44	738	1.61	<b>801</b>	<b>1.82</b>	<b>857</b>	<b>2.06</b>	<b>908</b>	<b>2.29</b>
4000	692	1.55	750	1.73	<b>813</b>	<b>1.94</b>	<b>868</b>	<b>2.17</b>	<b>918</b>	<b>2.40</b>
4100	707	1.67	762	1.84	<b>825</b>	<b>2.05</b>	<b>878</b>	<b>2.28</b>	929	2.53
4200	722	1.80	775	1.97	<b>837</b>	<b>2.16</b>	<b>889</b>	<b>2.40</b>	941	2.66
4300	737	1.94	<b>787</b>	<b>2.09</b>	<b>848</b>	<b>2.27</b>	900	2.52	952	2.80
4400	752	2.08	<b>800</b>	<b>2.21</b>	<b>860</b>	<b>2.39</b>	912	2.66	962	2.93
4500	768	2.24	<b>814</b>	<b>2.35</b>	871	2.51	924	2.80	973	3.07
4600	<b>783</b>	<b>2.40</b>	827	2.50	883	2.64	937	2.95	983	3.21
4700	799	2.56	841	2.64	894	2.77	949	3.10	994	3.36
4800	814	2.74	855	2.80	906	2.91	961	3.26	—	—
4900	—	—	868	2.90	918	3.05	972	3.40	—	—
5000	—	—	883	3.10	931	3.21	—	—	—	—

48TJ012 (8.3 TONS) — STANDARD MOTOR (BELT DRIVE) (cont)										
Airflow Cfm	External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	871	1.54	918	1.67	967	1.89	1010	2.09	1063	2.46
3100	879	1.63	928	1.78	973	1.94	1018	2.17	1070	2.51
3200	887	1.71	937	1.90	981	2.04	1026	2.26	1075	2.57
3300	895	1.80	946	2.00	991	2.16	1032	2.32	1080	2.64
3400	904	1.91	953	2.10	1000	2.29	1041	2.44	1083	2.65
3500	914	2.03	961	2.20	1009	2.41	1051	2.57	1090	2.74
3600	924	2.15	970	2.32	1017	2.53	1061	2.72	1099	2.88
3700	935	2.28	980	2.45	1024	2.64	1069	2.87	1109	3.03
3800	946	2.40	989	2.58	1033	2.76	1077	2.99	1118	3.20
3900	956	2.53	1000	2.73	1042	2.91	1085	3.12	1127	3.36
4000	967	2.66	1010	2.87	1052	3.06	1093	3.24	—	—
4100	977	2.78	1021	3.02	1062	3.22	1102	3.41	—	—
4200	987	2.91	1032	3.17	1072	3.38	—	—	—	—
4300	999	3.04	1042	3.32	—	—	—	—	—	—
4400	1008	3.19	—	—	—	—	—	—	—	—
4500	1019	3.34	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—

### LEGEND

**Bhp** — Brake Horsepower at Motor Shaft  
**Rpm** — Revolutions Per Minute of Blower Wheel

### NOTES:

- 1. Boldface** indicates field-supplied drive required. (See Note 5.)
- indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.
- Standard drive range is 571 to 779 rpm. All other rpms require a field-supplied drive.
- Maximum continuous bhp is 2.4. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.



**FAN PERFORMANCE (ENGLISH) — HORIZONTAL DISCHARGE UNITS (cont)**

48TJ014 (10.2 TONS) — STANDARD MOTOR (BELT DRIVE)										
Airflow Cfm	External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3700	<b>677</b>	<b>1.20</b>	748	1.43	810	1.65	869	1.89	<b>928</b>	<b>2.17</b>
3800	<b>691</b>	<b>1.28</b>	761	1.52	822	1.75	880	1.98	<b>937</b>	<b>2.28</b>
3900	<b>705</b>	<b>1.37</b>	773	1.62	834	1.86	891	2.08	<b>947</b>	<b>2.39</b>
4000	720	1.47	786	1.71	847	1.97	<b>902</b>	<b>2.19</b>	<b>957</b>	<b>2.50</b>
4100	734	1.56	800	1.82	860	2.09	<b>914</b>	<b>2.31</b>	<b>967</b>	<b>2.60</b>
4200	749	1.66	813	1.92	873	2.21	<b>926</b>	<b>2.44</b>	<b>978</b>	<b>2.71</b>
4300	764	1.77	826	2.04	886	2.33	<b>938</b>	<b>2.57</b>	<b>989</b>	<b>2.83</b>
4400	779	1.88	840	2.16	899	2.46	<b>951</b>	<b>2.71</b>	<b>1000</b>	<b>2.96</b>
4500	793	1.99	854	2.28	<b>912</b>	<b>2.59</b>	<b>963</b>	<b>2.86</b>	<b>1012</b>	<b>3.09</b>
4600	808	2.11	868	2.42	<b>925</b>	<b>2.73</b>	<b>975</b>	<b>3.00</b>	<b>1024</b>	<b>3.25</b>
4700	822	2.24	882	2.56	<b>937</b>	<b>2.86</b>	<b>988</b>	<b>3.16</b>	<b>1036</b>	<b>3.42</b>
4800	837	2.37	896	2.71	<b>950</b>	<b>3.00</b>	<b>1001</b>	<b>3.32</b>	<b>1048</b>	<b>3.59</b>
4900	852	2.51	<b>910</b>	<b>2.86</b>	<b>963</b>	<b>3.15</b>	<b>1014</b>	<b>3.48</b>	1060	3.76
5000	867	2.65	<b>924</b>	<b>3.01</b>	<b>977</b>	<b>3.30</b>	<b>1027</b>	<b>3.65</b>	1073	3.94
5100	882	2.79	<b>938</b>	<b>3.17</b>	<b>990</b>	<b>3.46</b>	1040	3.82	1085	4.12
5200	896	2.95	<b>952</b>	<b>3.33</b>	<b>1003</b>	<b>3.63</b>	1053	4.00	1098	4.30
5300	<b>911</b>	<b>3.11</b>	<b>967</b>	<b>3.50</b>	1017	3.80	1066	4.18	1111	4.50
5400	<b>926</b>	<b>3.27</b>	<b>981</b>	<b>3.68</b>	1030	3.98	1079	4.35	1124	4.70
5500	<b>940</b>	<b>3.44</b>	995	3.86	1044	4.17	1092	4.54	1137	4.91
5600	<b>955</b>	<b>3.62</b>	1010	4.04	1058	4.38	1105	4.73	1150	5.12
5700	970	3.80	1024	4.23	1072	4.59	1118	4.93	1163	5.34
5800	985	3.99	1039	4.42	1086	4.80	1131	5.14	1176	5.56
5900	1000	4.18	1053	4.62	1100	5.02	1144	5.36	—	—
6000	1015	4.39	1068	4.83	1114	5.25	1158	5.58	—	—
6100	1030	4.59	1083	5.04	1128	5.48	—	—	—	—
6200	1046	4.81	1097	5.26	1142	5.71	—	—	—	—

48TJ014 (10.2 TONS) — STANDARD MOTOR (BELT DRIVE) (cont)										
Airflow Cfm	External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3700	<b>984</b>	<b>2.43</b>	<b>1036</b>	<b>2.68</b>	<b>1080</b>	<b>2.90</b>	<b>1114</b>	<b>3.07</b>	<b>1135</b>	<b>3.17</b>
3800	<b>993</b>	<b>2.55</b>	<b>1046</b>	<b>2.81</b>	<b>1092</b>	<b>3.05</b>	<b>1129</b>	<b>3.25</b>	<b>1156</b>	<b>3.39</b>
3900	<b>1002</b>	<b>2.66</b>	<b>1055</b>	<b>2.94</b>	<b>1102</b>	<b>3.20</b>	<b>1143</b>	<b>3.42</b>	<b>1174</b>	<b>3.59</b>
4000	<b>1011</b>	<b>2.79</b>	<b>1064</b>	<b>3.07</b>	<b>1112</b>	<b>3.34</b>	<b>1155</b>	<b>3.59</b>	1190	3.80
4100	<b>1021</b>	<b>2.91</b>	<b>1072</b>	<b>3.20</b>	<b>1121</b>	<b>3.49</b>	1165	3.76	1203	3.99
4200	<b>1030</b>	<b>3.04</b>	<b>1081</b>	<b>3.34</b>	<b>1130</b>	<b>3.64</b>	1175	3.92	1215	4.18
4300	<b>1040</b>	<b>3.18</b>	<b>1090</b>	<b>3.48</b>	1139	3.79	1185	4.08	1226	4.36
4400	<b>1050</b>	<b>3.31</b>	<b>1100</b>	<b>3.63</b>	1148	3.94	1194	4.25	1236	4.54
4500	<b>1061</b>	<b>3.43</b>	1109	3.78	1157	4.09	1203	4.42	1246	4.72
4600	<b>1071</b>	<b>3.56</b>	1119	3.93	1166	4.26	1212	4.58	1255	4.91
4700	<b>1082</b>	<b>3.70</b>	1129	4.09	1175	4.43	1221	4.76	1264	5.09
4800	1093	3.86	1139	4.24	1185	4.60	1230	4.93	1273	5.28
4900	1105	4.02	1150	4.38	1194	4.77	1239	5.12	1282	5.47
5000	1117	4.20	1161	4.54	1204	4.95	1248	5.31	1291	5.66
5100	1129	4.40	1172	4.71	1214	5.13	1257	5.61	—	—
5200	1141	4.60	1183	4.91	1225	5.29	1267	5.70	—	—
5300	1153	4.80	1194	5.08	1236	5.47	—	—	—	—
5400	1166	5.01	1206	5.29	1247	5.65	—	—	—	—
5500	1178	5.22	1218	5.52	—	—	—	—	—	—
5600	1190	5.44	1230	5.75	—	—	—	—	—	—
5700	1203	5.67	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** — Brake Horsepower at Motor Shaft  
**Rpm** — Revolutions Per Minute of Blower Wheel

**NOTES:**

- 1. Boldface** indicates field-supplied drive required. (See Note 5.)
- indicates field-supplied motor and drive required.
- Values include losses for filters, unit casing, and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

- Standard drive range is 717 to 900 rpm. All other rpms require a field-supplied drive.
- Maximum continuous bhp is 3.7. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
- Interpolation is permissible. Do not extrapolate.

# Performance data (cont)



## EVAPORATOR-FAN MOTOR PERFORMANCE

UNIT 48TJ	UNIT RATED VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BkW*	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE OPERATING WATTS	MAXIMUM AMP DRAW
008	400	1.79	2.40	2120	2.7
012	400	1.79	2.40	2120	2.7
014	400	2.76	3.70	3326	5.7

### LEGEND

**Bhp** — Brake Horsepower  
**BkW** — kW x Motor Efficiency

\*Extensive motor and electrical testing on these units ensures that the full range of the motors can be utilized with confidence. Using your fan motors up to the ratings shown in this table will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.

## FAN R/s AT MOTOR PULLEY SETTINGS (SI)

UNIT 48TJ	MOTOR PULLEY TURNS OPEN										
	0	½	1	1½	2	2½	3	3½	4	4½	5
008	11.70	11.35	11.00	10.65	10.30	9.95	9.60	9.25	8.90	8.55	8.20
012	13.00	12.65	12.30	11.95	11.60	11.25	10.90	10.55	10.20	9.85	9.50
014	15.00	14.70	14.40	14.10	13.80	13.50	13.20	12.90	12.60	12.30	12.00

## FAN RPM AT MOTOR PULLEY SETTINGS (ENGLISH)

UNIT 48TJ	MOTOR PULLEY TURNS OPEN										
	0	½	1	1½	2	2½	3	3½	4	4½	5
008	700	681	660	639	618	597	576	555	534	513	492
012	779	760	739	718	697	676	655	634	613	592	571
014	900	883	865	843	825	807	789	771	753	735	717

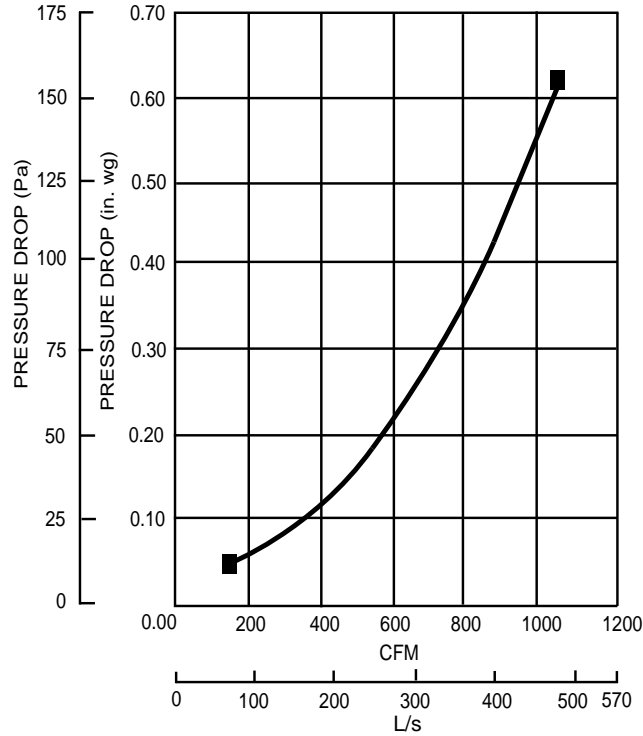
## EVAPORATOR-FAN MOTOR EFFICIENCY

MOTOR	EFFICIENCY (%)
48TJD/TJE/TJF008	80
48TJD/TJE/TJF012	80
48TJD/TJE014	85

NOTE: Convert watts to bhp using the following formula:

$$\text{bhp} = \frac{\text{watts input} \times \text{motor efficiency}}{746}$$

### DURABLADE ECONOMIZER BAROMETRIC RELIEF DAMPER CHARACTERISTICS



#### ACCESSORY/FIOP STATIC PRESSURE DROP (Pa) — 48TJ008-014

UNIT 48TJ	RATED VOLTAGE	L/s	DURABLADE ECONOMIZER PRESSURE DROP
008-014	All	1100	5
		1200	6
		1300	7
		1400	8
		1500	9
		1600	10
		1700	11
		1800	12
		1900	13
		2000	14
		2100	15
		2200	16
		2300	17

#### ACCESSORY/FIOP STATIC PRESSURE DROP (in. wg) — 48TJ008-014

UNIT 48TJ	RATED VOLTAGE	CFM	DURABLADE ECONOMIZER PRESSURE DROP
008-014	All	2200	.02
		2500	.02
		3000	.03
		3500	.04
		4000	.05
		4500	.06
		5000	.07
		5500	.08
		6000	.09

FIOP — Factory-Installed Option

FIOP — Factory-Installed Option



UNIT 48TJ	NOMINAL VOLTAGE (50 Hz)	VOLTAGE RANGE		COMPR (ea)		OFM (ea)		IFM	COMBUSTION FAN MOTOR	POWER SUPPLY		MINIMUM UNIT DISCONNECT	
		Min	Max	RLA	LRA	FLA	FLA			FLA	MCA	MOCP*	FLA
008	400 (3 phase)	360	440	6.2	37.7	0.8	2.6		.22	18.0	25	19	99
012	400 (3 phase)	360	440	8.6	55.0	0.8	3.4		.22	23.4	30	24	134
014	400 (3 phase)	360	440	9.6	72.0	0.8	6.2		.22	29.6	35	31	190

### 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 (U.S.A.)
- OFM** — Outdoor (Condenser) Fan Motor
- RLA** — Rated Load Amps

\*Fuse or HACR circuit breaker.

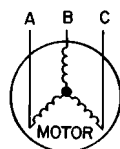
### NOTES:

1. In compliance with NEC requirements (U.S.A. Standard) for multi-motor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. The 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 400-3-50.



- AB = 393 v
- BC = 403 v
- AC = 396 v

$$\begin{aligned} \text{Average Voltage} &= \frac{393 + 403 + 396}{3} \\ &= \frac{1192}{3} \\ &= 397 \end{aligned}$$

Determine maximum deviation from average voltage:

- (AB) 397 - 393 = 4 v
- (BC) 403 - 397 = 6 v
- (AC) 397 - 396 = 1 v

Maximum deviation is 6 v.

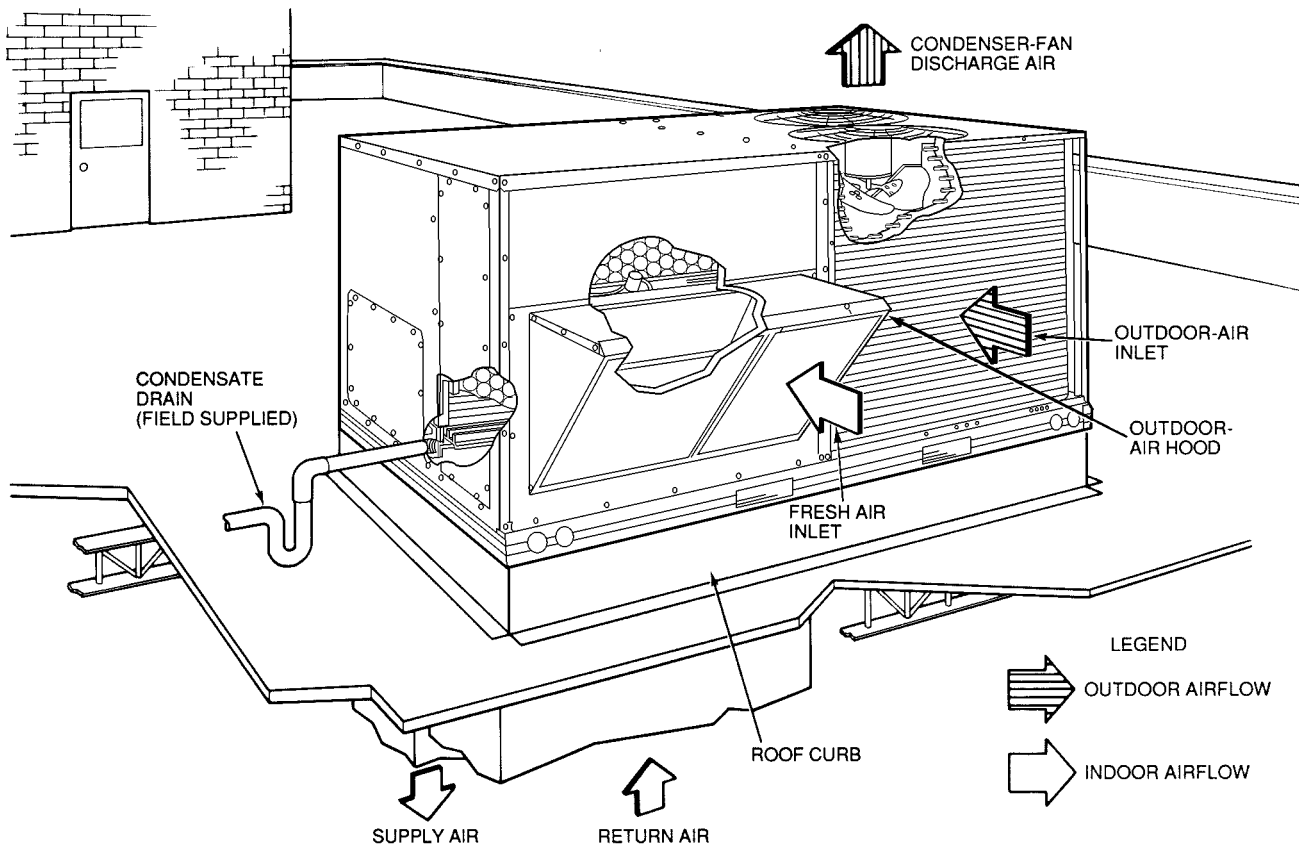
Determine percent voltage imbalance.

$$\begin{aligned} \% \text{ Voltage imbalance} &= 100 \times \frac{6}{397} \\ &= 1.5\% \end{aligned}$$

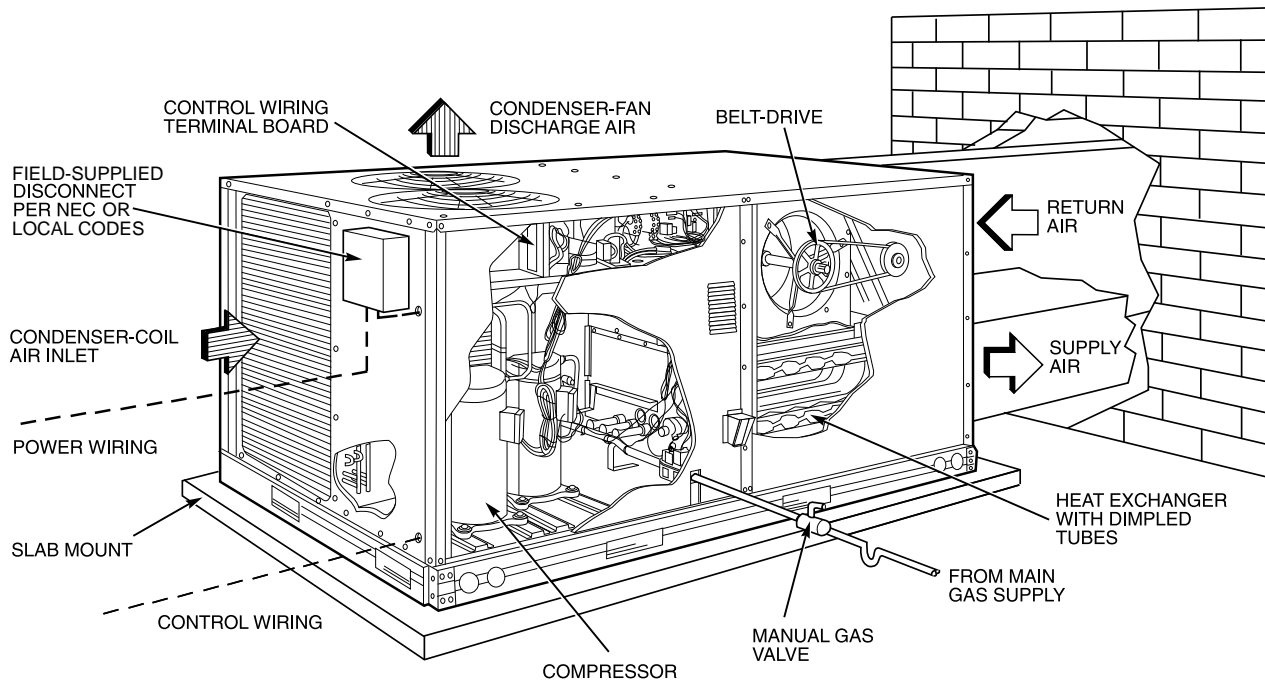
This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

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

## VERTICAL DISCHARGE DUCTING

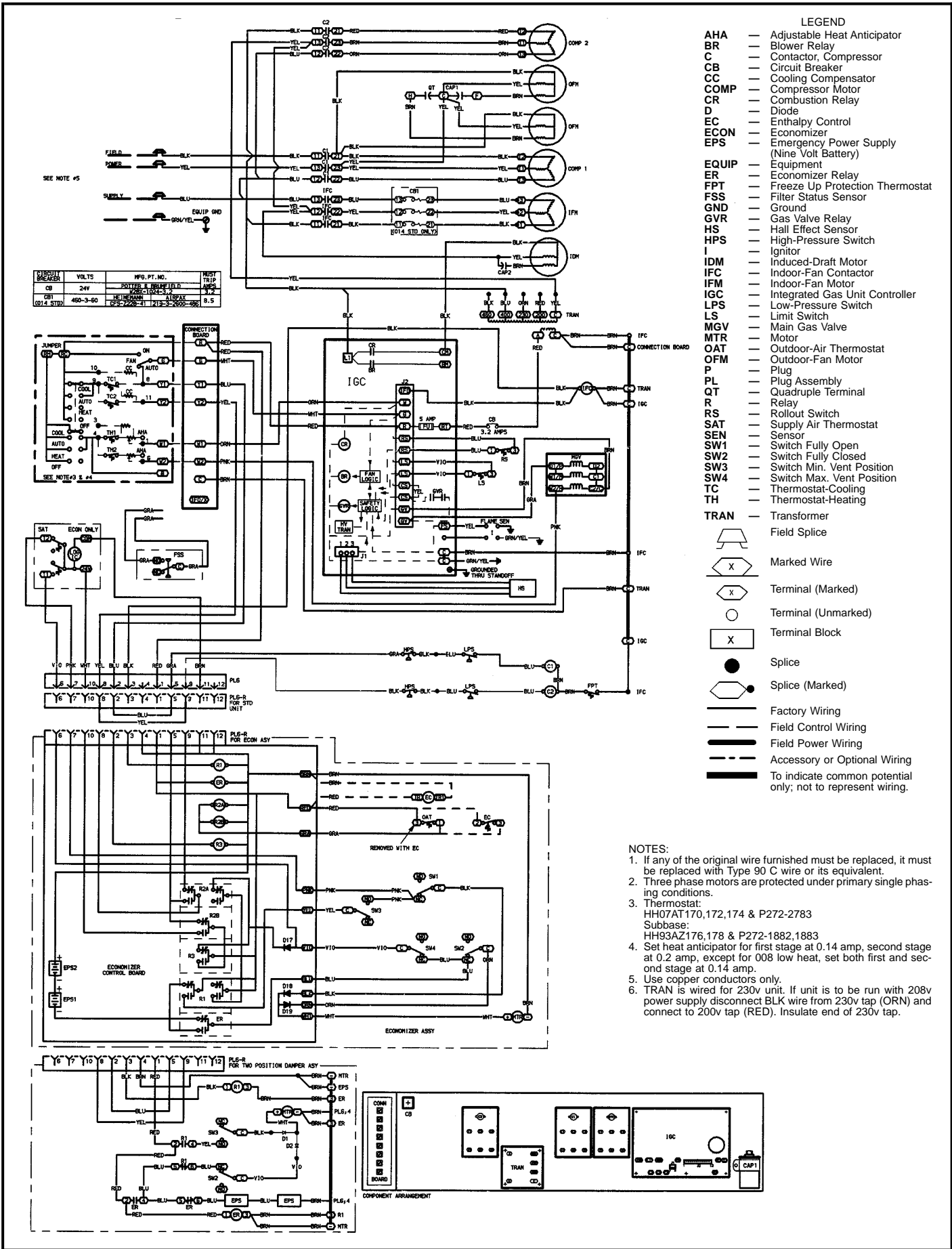


## HORIZONTAL DISCHARGE DUCTING



NEC — National Electrical Code (U.S.A. Standard)

# Typical wiring schematic



### LEGEND

- AHA — Adjustable Heat Anticipator
  - BR — Blower Relay
  - C — Contactor, Compressor
  - CB — Circuit Breaker
  - CC — Cooling Compensator
  - COMP — Compressor Motor
  - CR — Combustion Relay
  - D — Diode
  - EC — Enthalpy Control
  - ECON — Economizer
  - EPS — Emergency Power Supply (Nine Volt Battery)
  - EQUIP — Equipment
  - ER — Economizer Relay
  - FPT — Freeze Up Protection Thermostat
  - FSS — Filter Status Sensor
  - GND — Ground
  - GVR — Gas Valve Relay
  - HS — Hall Effect Sensor
  - HPS — High-Pressure Switch
  - I — Ignitor
  - IDM — Induced-Draft Motor
  - IFC — Indoor-Fan Contactor
  - IFM — Indoor-Fan Motor
  - IGC — Integrated Gas Unit Controller
  - LPS — Low-Pressure Switch
  - LS — Limit Switch
  - MGV — Main Gas Valve
  - MTR — Motor
  - OAT — Outdoor-Air Thermostat
  - OFM — Outdoor-Fan Motor
  - PL — Plug
  - PLA — 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 & P272-2783  
Subbase:  
HH93AZ176,178 & P272-1882,1883
4. Set heat anticipator for first stage at 0.14 amp, second stage at 0.2 amp, except for 008 low heat, set both first and second stage at 0.14 amp.
5. Use copper conductors only.
6. TRAN is wired for 230v unit. If unit is to be run with 208v power supply disconnect BLK wire from 230v tap (ORN) and connect to 200v tap (RED). Insulate end of 230v tap.

## Operating sequence

**Cooling, units without economizer** — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC), and compressor contactor no. 1 (C1) are energized and evaporator-fan motor, compressor no. 1, and condenser fans start. The condenser-fan motor runs continuously while unit is cooling. If the thermostat calls for a second stage of cooling by energizing Y2, compressor contactor no. 2 (C2) is energized and compressor no. 2 starts.

**Heating, units without economizer** — When the thermostat calls for heating, terminal W1 is energized. In order 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 (IDM) is then 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 no. 1 is energized to start compressor no. 1 and the condenser-fan motor. The evaporator-fan motor is energized and the economizer damper moves to the minimum position. Upon a further call for cooling, compressor contactor no. 2 will be energized, starting compressor no. 2. After the thermostat is satisfied, the damper moves to the fully closed position.

When the outdoor-air temperature is below the OAT setting and the thermostat calls for cooling, the economizer dampers move to the minimum position. If the supply-air temperature is above 13.9 C (57 F), the damper continues to open until it reaches the fully open position or until the supply-air temperature drops below 13.9 C (57 F).

When the supply-air temperature falls to between 13.9 C (57 F) and 11.1 C (52 F), the damper will remain at an intermediate open position. If the supply-air temperature falls below 11.1 C (52 F), the damper will modulate closed until it reaches the minimum position or until the supply-air temperature is above 11.1 C (52 F). When the thermostat is satisfied, the damper will move to the fully closed position.

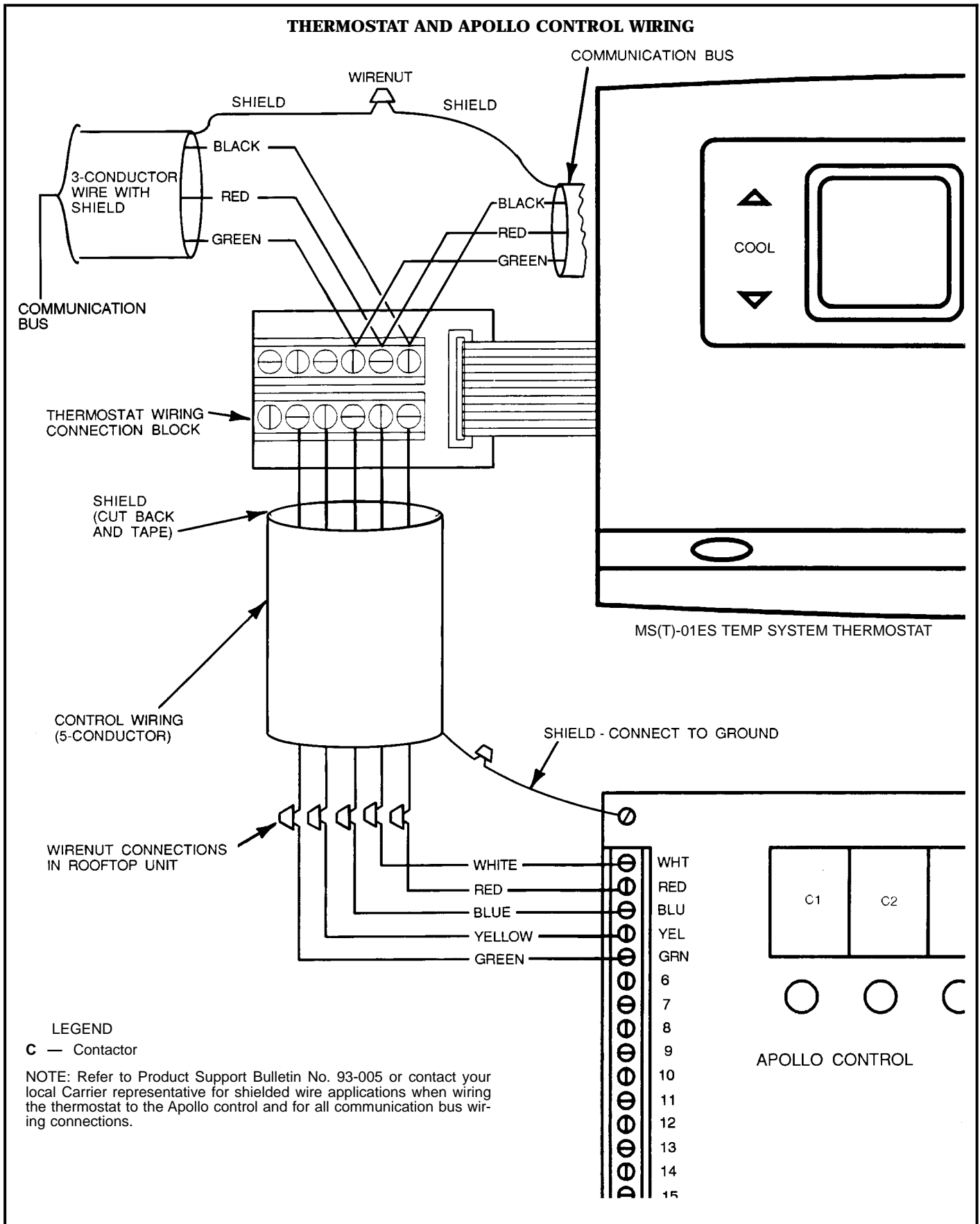
If the outdoor air alone cannot satisfy the cooling requirements of the conditioned space, economizer cooling is integrated with mechanical cooling, providing second-stage cooling. Compressor no. 1 and the condenser fan will be energized and the position of the economizer damper will be determined by the supply-air temperature. Compressor no. 2 is locked out.

When the second stage of cooling is satisfied, the compressor and condenser-fan motor will be deenergized. The damper position will be determined by the supply-air temperature.

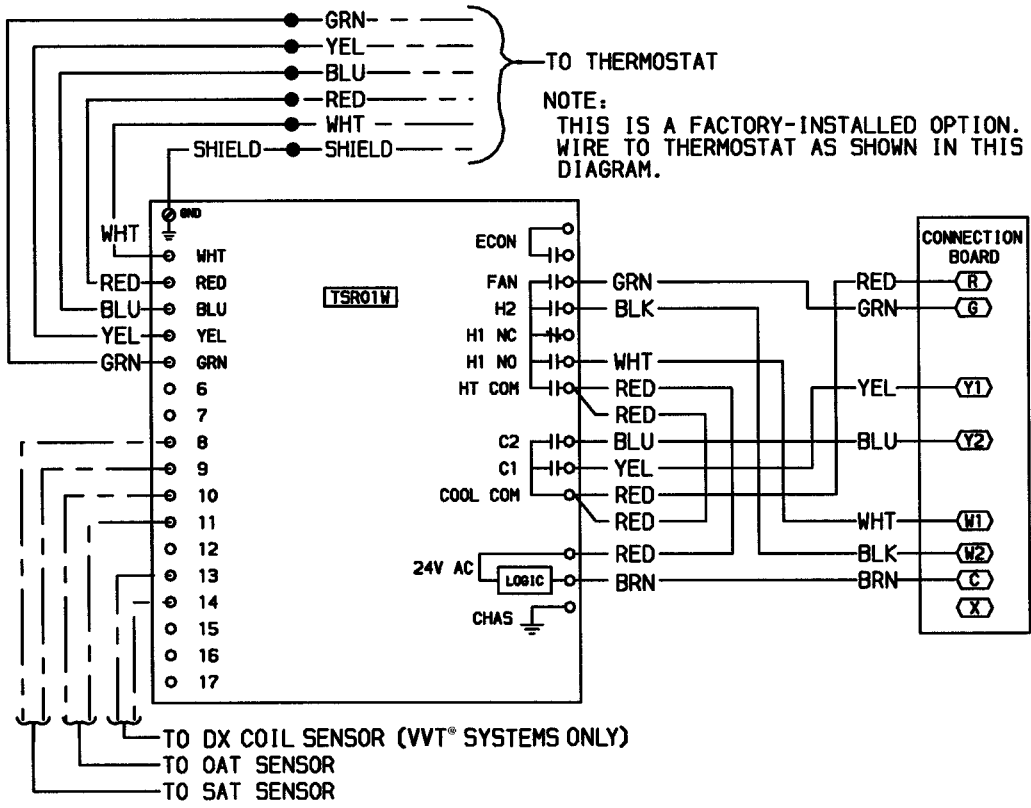
When the first stage of cooling is satisfied, the damper will move to fully closed position.

**Heating, units with economizer** — When the thermostat calls for heating, terminal W1 is energized. In order 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 then 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.

## THERMOSTAT AND APOLLO CONTROL WIRING



### APOLLO COMMUNICATING CONTROL WIRING SCHEMATIC



# Controls (cont)

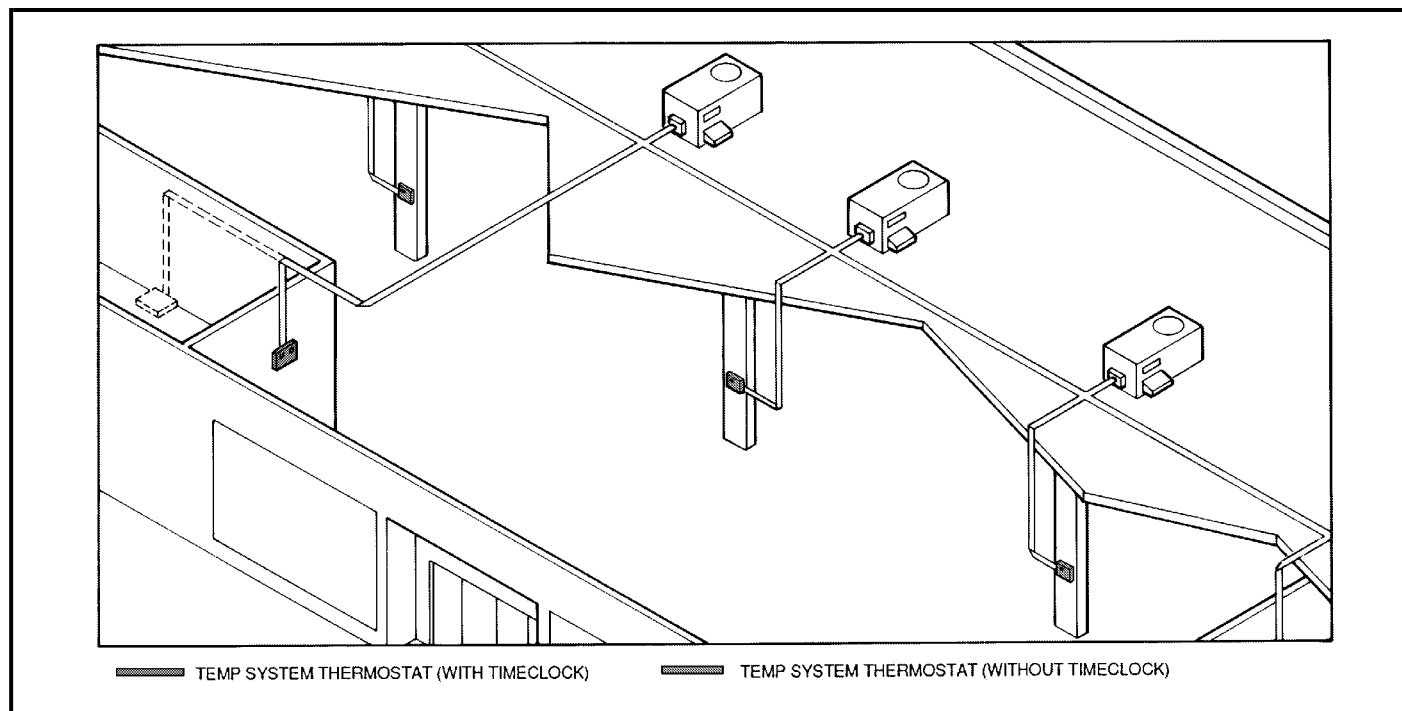


## TEMP systems

A TEMP System is a network of communicating Carrier TEMP System Thermostats and rooftop, factory-mounted Apollo direct digital controls, each serving its own zone and heating/cooling unit. Networking allows your building manager to easily access each of your systems from a single location...whether they are in the same building or located throughout town.

The TEMP System's inherently flexible, modular base design supports the *exact* number of independent, single zone systems you require...no more, no less, no compromises.

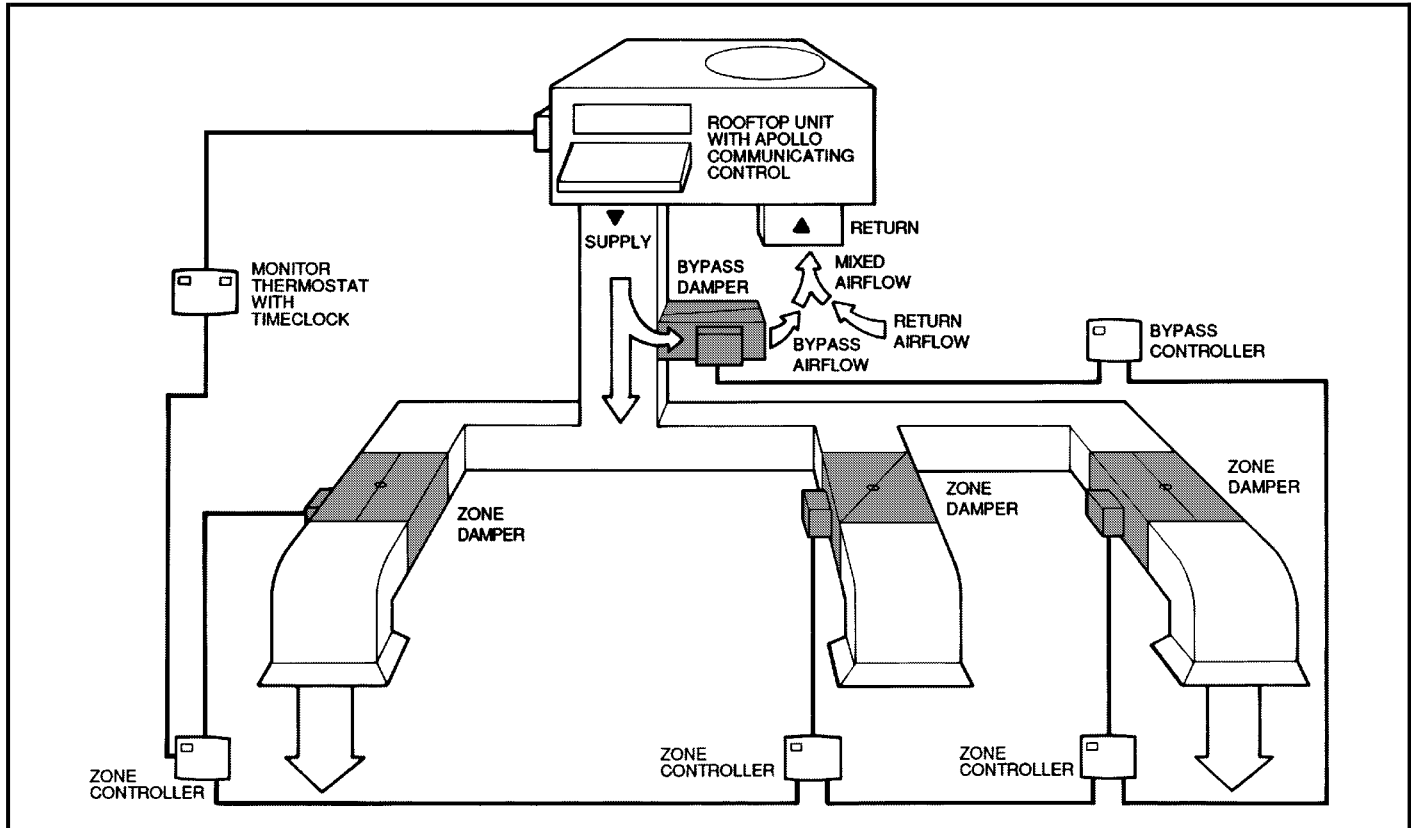
Ideal for department stores, small office buildings, fast food chains, schools and hotels, a TEMP System is a cost-effective way to maintain comfortable building environments.



### Variable Volume/Variable Temperature (VVT®) Systems

Carrier's VVT Systems are dedicated to total building comfort. Carrier thermostats, zone dampers, and HVAC equipment with factory-mounted direct digital controls continually monitor and adjust their operation to ensure uninterrupted and personalized comfort for all occupants.

Through the use of communicating electronic controls, VVT Systems are able to provide the comfort of a multiple zone system while using the installation, operating and maintenance economics of single zone equipment...virtually putting an end to the cost vs comfort compromise.



**Outdoor installation** — Units approved for outdoor installation only.

**Ductwork** — Secure vertical discharge ductwork to roof curb. For horizontal discharge applications, either attach ductwork to unit, or use field-supplied flanges attached to the horizontal discharge openings and attach all ductwork to flanges.

**Horizontal discharge** — To convert from vertical discharge to horizontal discharge:

1. Remove economizer or two-position damper to gain access to return duct opening.
2. Move the horizontal-discharge duct opening covers to the vertical discharge openings.
3. Rotate economizer or two-position damper 90 degrees.
4. Rotate the barometric relief damper 90 degrees.
5. Install block-off plate over the opening on the access panel.

**Thru-the-curb service connections** — Roof curb connections allow field power wires, control wires, and gas supply to enter through the roof curb opening.

**Thru-the-bottom service connections** — Power connections made through the bottom of the unit must utilize an accessory Carrier roof curb and accessory thru-the-bottom power connection accessory kit.

**Thermostat** — Use of 2-stage heating and cooling thermostat is recommended for all units. A 2-stage cooling thermostat is required on units with accessory economizer to provide integrated cooling.

**Heating-to-cooling changeover** — All units are automatic changeover from heating to cooling when automatic changeover thermostat and subbase are used.

**Airflow** — Units are draw-thru on cooling and blow-thru on heating.

**Maximum airflow** — To minimize the possibility of condensate blow-off from evaporator, airflow through units should not exceed 236 L/s per kW (500 cfm/ton).

**Minimum airflow** — For cooling minimum airflow is 142 L/s per kW (300 cfm/ton).

**Minimum ambient cooling operating temperature** — The minimum temperature for standard units is  $-4\text{ C}$  ( $25\text{ F}$ ). With accessory Motormaster® control, units can operate at outdoor temperatures down to  $-29\text{ C}$  ( $-20\text{ F}$ ).

**Internal unit design** — Due to Carrier's internal unit design (draw-thru over the motor), air path, and specially designed motors, the full kW horsepower (maximum continuous bkW and bhp) listed in the Physical Data tables and the notes following each Fan Performance table can be utilized with confidence.

Using Carrier motors with the values listed in the Physical and Fan Performance Data tables *will not* result in nuisance tripping or premature motor failure. The unit warranty will not be affected.

**Apollo direct digital controls** — The Apollo direct digital controls must be used with either a Carrier master or monitor thermostat.

## Packaged Rooftop Gas Heating, Electric Cooling Unit — Constant Volume Application

### HVAC Guide Specifications

Size Range: **21.5 to 35.9 kW (6.1 to 10.2 Tons)**

#### Nominal Cooling

Carrier Model Number: **48TJ**

#### Part 1 — General

##### 1.01 SYSTEM DESCRIPTION

- A. Outdoor rooftop- or slab-mounted, electrically controlled heating and cooling unit utilizing hermetic compressors for cooling duty and gas combination for heating duty. Unit shall discharge supply air vertically or horizontally as shown on contract drawings.

##### 1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with ARI Standards 210/240 or 360 and 270 (U.S.A.).
- B. Unit shall be designed to conform to ASHRAE 15, latest revision, and in accordance with UL 1995. (U.S.A. Standards).
- C. Unit shall be manufactured in a facility registered to ISO 9002/BS5750, Part 2.
- D. Roof curb shall be designed to conform to NRCA Standards (U.S.A.).
- E. Insulation and adhesive shall meet NFPA 90A requirements (U.S.A. Standard) for flame spread and smoke generation.
- F. Unit casing shall be capable of withstanding Federal Test Method (U.S.A. Standard) Standard No. 141 (Method 6061) 500-hour salt spray test.
- G. Unit shall comply with ASHRAE 62 (U.S.A. Standard) for indoor air quality.

##### 1.03 DELIVERY, STORAGE, AND HANDLING

- A. Unit(s) shall be stored and handled per manufacturer's recommendations.

#### Part 2 — Products

##### 2.01 EQUIPMENT (STANDARD)

###### A. General:

Factory-assembled, single-piece heating and cooling unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, refrigerant charge (R-22), and special features required prior to field start-up.

###### B. Unit Cabinet:

- 1. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a baked enamel finish on all externally exposed surfaces.
- 2. Evaporator fan cabinet interior shall be insulated with a minimum 13-mm (1/2-in.) thick flexible fiberglass insulation coated on the air side. Aluminum foil-faced fiberglass insulation shall be used in the gas heat compartment.
- 3. Cabinet panels shall be easily removable for servicing.
- 4. Holes shall be provided in the base rails for rigging shackles to facilitate overhead rigging, and

forklift slots shall be provided to facilitate maneuvering.

- 5. Unit shall have a factory-installed, sloped condensate drain pan made of a non-corrosive material, providing a minimum 19-mm (3/4-in.) connection with both vertical and horizontal drains and shall comply with ASHRAE 62 (U.S.A. Standard).
- 6. Unit shall have factory-installed filter access panel to provide filter access with tool-less removal.
- 7. Unit shall have standard thru-the-bottom power connection capability.

###### C. Fans:

- 1. Indoor blower (evaporator fan) shall be of the belt-driven, double inlet, forward-curved centrifugal type. Belt drive shall include an adjustable-pitch motor pulley.
- 2. Indoor blower (evaporator-fan) shall be made from steel with a corrosion-resistant finish and shall be dynamically balanced.
- 3. Bearings shall be of the sealed, permanently lubricated, ball-bearing type for longer life and lower maintenance.
- 4. Condenser fan shall be of the direct-driven propeller type and shall discharge air vertically.
- 5. Condenser fan shall have aluminum blades riveted to corrosion-resistant steel spiders and shall be dynamically balanced.

###### D. Compressor(s):

- 1. Fully hermetic type, internally protected.
- 2. Factory spring-mounted and internally spring mounted for vibration isolation.
- 3. On independent mounting circuits.

###### E. Coils:

- 1. Condenser coils shall have aluminum plate fins mechanically bonded to enhanced copper tubes with all joints brazed.
- 2. Tube sheet openings shall be belled to prevent tube wear.
- 3. Evaporator coil shall be of the full face active design.

###### F. Heating Section:

- 1. Induced-draft combustion type with energy saving direct-spark ignition system and redundant main gas valve.
- 2. The heat exchanger shall be of the tubular-section type constructed of a minimum of 20-gage steel coated with a nominal 1.2 mil aluminum-silicone alloy for corrosion resistance.
- 3. Burners shall be of the in-shot type constructed of aluminum-coated steel.
- 4. All gas piping shall enter the unit cabinet at a single location.
- 5. The integrated gas controller (IGC) board shall include gas heat operation fault notification using an LED (light-emitting diode).



6. Unit shall be equipped with anti-cycle protection with one short cycle on unit flame rollout switch or 4 continuous short cycles on the high-temperature limit switch. Fault indication shall be made using an LED.
  7. The IGC board shall contain algorithms that modify evaporator-fan operation to prevent future cycling on high-temperature limit switch.
  8. The LED shall be visible without removal of control box access panel.
- G. Refrigerant Components:
- Refrigerant circuit components shall include:
1. Acutrol™ feed system.
  2. Refrigerant strainer.
  3. Service gage connections on suction, discharge, and liquid line.
- H. Filter Section:
1. Standard filter section shall consist of factory-installed low-velocity, throwaway 51-mm (2-in.) thick fiberglass filters of commercially available sizes.
  2. Filter face velocity shall not exceed 1.64 m/s (320 fpm) at nominal airflows.
  3. Filter section shall use only one size filter.
  4. Filters shall be accessible through an access panel with “no-tool” removal.
- I. Controls and Safeties:
1. Unit Controls:  
Unit shall be complete with self-contained low-voltage control circuit.
  2. Standard Safeties:
    - a. Unit shall incorporate compressor overtemperature and overcurrent safety devices to shut off compressor.
    - b. Heating section shall be provided with the following minimum protections:
      - 1) High-temperature limit switches.
      - 2) Induced-draft motor speed sensor.
      - 3) Flame rollout switch.
      - 4) Flame proving controls.
- J. Operating Characteristics:
1. Unit shall be capable of starting and running at 46.1 C (115 F) ambient outdoor temperature, meeting maximum load criteria of ARI Standard 210/240 or 360 (U.S.A. Standard) at ±10% voltage.
  2. Compressor with standard controls shall be capable of operation down to -4 C (25 F) ambient outdoor temperature.
- K. Electrical Requirements:
- All unit power wiring shall enter unit cabinet at a single factory-predrilled location.
- L. Motors:
1. Compressor motors shall be cooled by refrigerant passing through motor windings and shall have line break thermal and current overload protection.
  2. Indoor blower (evaporator-fan) motor shall have permanently lubricated bearings and inherent automatic-reset thermal overload protection.
  3. Totally-enclosed condenser-fan motor shall have permanently lubricated bearings, and inherent automatic-reset thermal overload protection.
- M. Special Features:
- Certain features are not applicable when the features designated by \* are specified. For assistance in amending the specifications, your local Carrier Sales Office should be contacted.
- \* 1. Direct Digital Controls:
- a. Shall be available as a factory-installed option.
  - b. Shall actively monitor all modes of operation, as well as evaporator-fan status, filter status, indoor-air quality, supply-air temperature, and outdoor-air temperature.
  - c. Shall work with Carrier TEMP and VVT® systems.
  - d. Shall have built-in diagnostics for thermostat commands for both staged heating and cooling, evaporator-fan operation, and economizer operation.
  - e. Shall be equipped with a 5-minute time delay between modes of operation.
2. Roof Curbs: (Horizontal and Vertical)
- a. Formed galvanized steel with wood nailer strip and capable of supporting entire unit weight.
  - b. Allows for installing and securing ductwork to curb prior to mounting unit on the curb.
- \* 3. Integrated Economizer:
- a. Integrated integral-modulating type capable of simultaneous economizer and compressor operation.
  - b. Includes all hardware and controls to provide cooling with outdoor air.
  - c. Equipped with low-leakage dampers not to exceed 3% leakage, at 249 Pa (1 in. wg) pressure differential.
  - d. Capable of introducing up to 100% outdoor air in both minimum and fully-open positions.
  - e. Equipped with a gravity relief sliding plate damper. Damper shall close upon unit shutoff.
  - f. The economizer shall be equipped with 30% of return-air relief.
  - g. Designed to close damper during loss-of-power situations with emergency power supply.
  - h. Dry bulb outdoor-air thermostat shall be provided as standard.
  - i. Economizer shall have a guillotine-style damper.

- \* 4. Manual Outdoor-Air Damper:  
Manual damper package shall consist of damper, birdscreen, and rainhood which can be preset to admit up to 50% outdoor air for year-round ventilation.
- \* 5. 100% Two-Position Damper:
  - a. Two-position damper package shall include single blade damper and motor. Admits up to 100% outdoor air.
  - b. Damper shall close upon indoor (evaporator) fan shutoff.
  - c. Designed to close damper during loss of power situations.
  - d. Equipped with barometric relief damper.
- \* 6. 25% Two-Position Damper:
  - a. Two-position damper package shall include single blade damper and motor. Admits up to 25% outdoor air.
  - b. Damper shall close upon indoor (evaporator) fan shutoff.
  - c. Designed to close damper during loss of power situations.
  - d. Equipped with barometric relief damper.
- \* 7. Solid-State Enthalpy Control:
  - a. For use with economizer package.
  - b. Capable of sensing outdoor-air enthalpy content (temperature and humidity) and controlling economizer cut-in point to have minimum heat content air passing over the evaporator coil for most efficient system operation.
- \* 8. Differential Enthalpy Sensor:
  - a. For use with economizer package.
  - b. Capable of comparing enthalpy content (temperature and humidity) of outdoor and indoor air and controlling economizer cut-in point at the most economical level.
- \* 9. Head Pressure Control Package:  
Consists of solid-state control and condenser-coil temperature sensor to maintain condensing temperature between 32.2 C and 43.3 C (90 F and 110 F) at outdoor ambient temperatures down to -28.9 C (-20 F) by condenser-fan speed modulation.
- \* 10. Remote Control Panel:  
Panel shall be a decorative, indoor, wall-mounted panel consisting of:
  - a. Two-stage heat/2-stage cool thermostat.
  - b. Automatic changeover.
  - c. System switch with HEAT-COOL-AUTO.-OFF settings.
  - d. Fan switch with ON-AUTO. settings.
  - e. Ventilation control for remote variation of the amount of outdoor-air intake.
  - f. Indicator lights for HEAT-COOL-FAN operation.
  - g. Three unused indicator lights for field use.
- \* 11. Thermostat and Subbase:  
Provides staged cooling and heating automatic (or manual) changeover, fan control, and indicator light.
- \* 12. Thru-The-Bottom Service Connectors:  
Kit shall provide connectors to permit electrical connections to be brought to the unit through the basepan.
- 13. Electronic Programmable Thermostat:  
Capable of using deluxe full-featured electronic thermostat. Shall use built-in compressor cycle delay control for both heating and cooling duty. Capable of working with Carrier direct digital controls.
- 14. Condenser Coil Hail Guard Assembly:  
Hail guard shall protect against damage from hail and flying debris.
- \* 15. Controls Upgrade Kit:  
Kit shall contain high-pressure, loss-of-charge/low-pressure, and freeze protection switches. It shall mount on factory-installed Schrader fittings.
- 16. Condenser Coil Grille:  
The grille protects the condenser coil from damage by large objects without increasing unit clearances.
- 17. Compressor Cycle Delay:  
Unit shall be prevented from restarting for a minimum of 5 min. after shutdown.
- 18. Salt Spray Protection Package:  
Coil guard protects coil from corrosion in coastal areas and in areas with high sulfur emissions.
- 19. Fan/Filter Status Switch:  
Provides status of indoor fan (ON/OFF) or filter (CLEAN/DIRTY). Status shall be displayed over communication bus when used with direct digital controls or with an indicator light at the thermostat.
- 20. NO<sub>x</sub> Reduction Kit:  
Package shall contain all necessary hardware and instructions to convert a standard natural gas unit to reduce the nitrous oxide (NO<sub>x</sub>) emissions to a level of 40 nanograms/joule.
- 21. Flue Discharge Deflector:  
Flue discharge deflector directs unit exhaust vertically instead of horizontally.
- 22. LP (Liquid Propane) Gas Conversion Kit:  
Package shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane gas.
- 23. Flue Shield:  
Provides protection from the hot sides of the gas flue hood.

