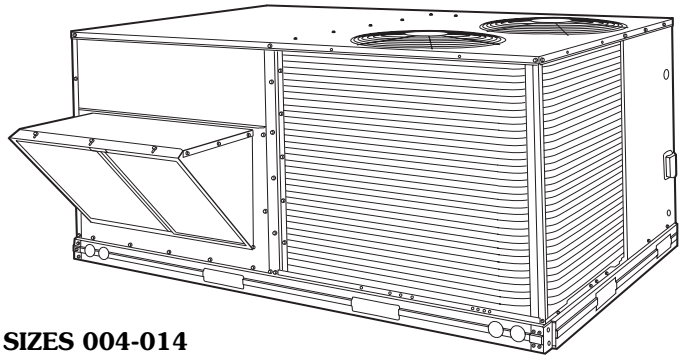
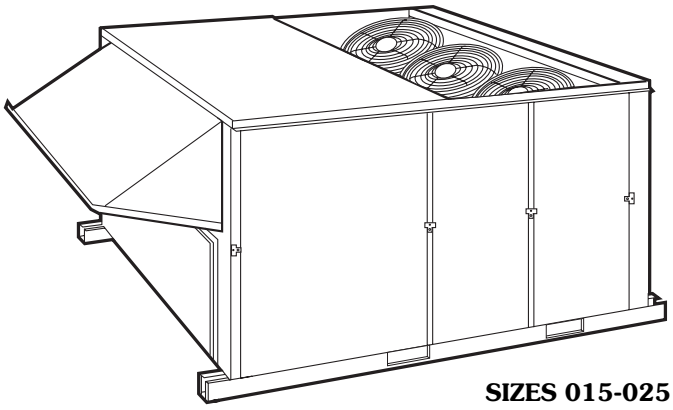
Product Data

WEATHERMAKER® 48TM004-028
WEATHERMASTER® 48HJ004-017
Single-Package Rooftop Units
Gas Heating/Electric Cooling

3 to 25 Nominal Tons



SIZES 004-014



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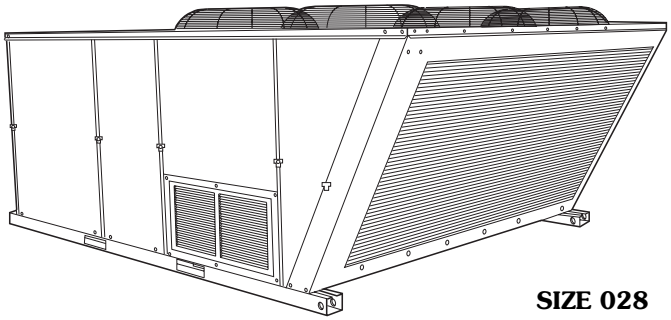


SIZE 028

ASHRAE 90.1 COMPLIANT

Standard-Efficiency (TM) units meet minimum ASHRAE 90.1 energy efficiency requirements. High-Efficiency (HJ) units well exceed ASHRAE 90.1 energy efficiency requirements. Gas heating with electric cooling rooftop units offer:

- Pre-painted galvanized steel cabinet for long life and quality appearance
- Commercial strength base rails with built-in rigging capability
- Convertible design for vertical or horizontal supply/return (004-014 only)
- Non-corrosive, sloped condensate drain pan, meets ASHRAE 62 (IAQ)
- Two-inch return-air filters
- A wide assortment of factory-installed options available, including high-static drives that provide additional performance range
- Optional factory-installed COBRA™ energy recovery unit (option on 48HJ004-014 units only)
- Factory-installed PremierLink™ digital communicating controls
- Factory-installed optional gear driven EconoMi$er+ (vertical return only) for use with standard rooftop unit controls (includes CO_2 sensor control capability)
- Factory-installed optional gear driven EconoMi$er2 (vertical return only) for use with PremierLink DDC controls (includes 4 to 20 mA actuator for demand control ventilation)
- MoistureMi$er™ dehumidification package

Heat Options

- Exclusive integrated gas control board with diagnostics
- Alumagard™ heat exchanger coating
- Induced-draft fan for gas combustion
- Tubular, dimpled heat exchangers
- Natural gas
- LP conversion kits
- Low NO_X (size 004-006 only)
- Optional stainless steel heat exchangers.

Table of contents

Carrier Comfort System PremierLink

Features/Benefits

Every compact one-piece unit arrives fully assembled, charged, tested, and ready to run.

48 Series — gas heat models

All ignition components are contained in the compact IGC (integrated gas controller) 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.

Tubular, dimpled gas 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. The dimpled design creates a turbulent gas flow to maximize heating efficiency.

The efficient in-shot burners and all ignition components are contained in an easily removable, compact assembly.

The California Air Quality Management Districts NO_x requirement of 40 nanograms/joule or less is met on 004-006 size Low NO_x models.

The extra thick Alumagard™ heat exchanger coating provides corrosion resistance and ensures long life (optional stainless steel heat exchangers are available).

The unsightly appearance of flue stacks is eliminated and the effects of wind on heating operations are diminished by the induced draft combustion

system. The inducer fan draws hot combustion gas through the heat exchanger at the optimum rate for the most effective heat transfer. The heat exchanger operates under negative pressure, preventing flue gas leakage into the indoor supply air.

During the Heating mode, the evaporator-fan relay automatically starts the evaporator fan after the heat exchanger warms up to a suitable temperature. The 30-second fan delay prevents cold air from entering the supply duct system when the conditioned space is calling for heat to maximize efficiency.

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

All standard units are designed for natural gas, but an accessory LP (liquid propane) conversion kit is available.

All 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.

Quiet, efficient operation and dependable performance

Compressors have vibration isolators for quiet operation. Efficient fan and motor design permits operation at low sound levels.

Unit sizes 008-028 offer lower utility costs through part-load operation using 2 stages of cooling.

Quiet and efficient operation is provided by belt-driven evaporator fans (standard on all units over 5 tons). The belt-driven evaporator-fan is equipped with variable-pitch pulleys which allow adjustment within the rpm ranges of the factory-supplied pulleys.

Increased operating efficiency is achieved through computer-designed coils featuring staggered internally enhanced copper tubes. Fins are ripple-edged for strength, lanced, and double waved for higher heat transfer.

Durable, dependable construction

Designed for durability in any climate, the weather-resistant cabinets are constructed of galvanized steel and bonderized, and all exterior panels are coated with a prepainted baked enamel finish. The paint finish is non-chalking, and is capable of withstanding ASTM (American Society for Testing and Materials) B117 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, all size 004-014 units are designed with a single, continuous top piece to eliminate any possible leaks at seams or gasketing. Totally enclosed condenser-fan motors and permanently lubricated bearings provide additional unit dependability.

Easy installation and conversion

All units are shipped in the vertical duct configuration for fit-up to standard roof curbs. (3 different curb sizes fit unit sizes 004-007, 008-014, and 015-028 respectively.) The contractor can order and install the roof curb early in the construction stage, before decisions on size requirements are made.

All units feature a base rail design with forklift slots 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 duct configuration by relocating the panels supplied with the unit (size 004-014 only).

To convert 004-014 units from vertical to horizontal discharge, simply relocate 2 panels. The same basic unit can be used for a variety of applications and can be quickly modified at the jobsite.

To convert 015-028 units from vertical to horizontal discharge, use the optional horizontal supply/return adapter roof curb.

Convenient duct openings in the unit basepans permit side-by-side or concentric duct connections (see Application data section) without requiring internal unit modification.

NOTE: On units using horizontal supply and return, the accessory barometric relief or power exhaust MUST be installed on the return ductwork.

Thru-the-bottom service connection capability comes standard with the rooftop unit to allow power and control wiring and gas connections to be routed through the unit's basepan, thereby minimizing roof penetrations (to prevent water leaks). (Thru-the-bottom gas connection requires thru-the-bottom accessory kit.) Power, gas and control connections are made on the same side of the unit to simplify installation.

The non-corrosive sloped condensate drain pan (size 004-014) permits either an external horizontal side condensate drain (outside the roof curb) or an internal vertical bottom drain (inside the roof curb). Both options require an external, field-supplied P-trap.

Standard 2-in. throwaway filters are easily accessed through a removable panel located above the air intake hood. No tools are required to change unit filters.

Belt-driven evaporator-fan motors (optional on TM units under 6 tons) allow maximum on-site flexibility without changing motors or drives.

Low voltage wiring connections are easily made thanks to the large terminal board which is located for quick, convenient access.

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.

Features/Benefits (cont)

All units have Carrier's exclusive Acutrol™ (004-014) or TXV (thermostatic expansion valve) metering device (015-028) which precisely controls refrigerant flow, preventing slugging and flood-back, while maintaining optimum unit performance. Refrigerant filter driers are standard.

Integrated economizers and outdoor-air dampers

Available as options or accessories, economizers and manual outdoor-air dampers introduce outdoor air which mixes with the conditioned air, improving indoor-air quality and often reducing energy consumption.

During a first stage call for cooling, if the outdoor-air temperature is below the economizer control changeover set point, the mixed-air sensor modulates the economizer outdoor-air damper open to take advantage of free cooling provided by the outside air. When second-stage cooling is called for, the compressor is energized in addition to the economizer. If the outdoor-air temperature is above the changeover set point, the first stage of compression is activated and the economizer damper stays at minimum position.

Accessory upgrade kits allow for control by differential dry-bulb temperature (outdoor vs return), outdoor air enthalpy changeover, or more precise differential enthalpy control.

Units can be equipped with different economizer options to meet specific controls applications. The factory or field-installed EconoMi$er+ and EconoMi$er2 are available. The EconoMi$er+ is used with the standard rooftop unit controls and includes a state-of-the-art, stand-alone, microprocessor-based control. The control can be used with a CO_2 sensor for DCV (demand control ventilation) operation. For direct digital control (DDC) applications, the EconoMi$er2 can be operated using PremierLink controls or a third party controller. The EconoMi$er2 includes 4 to 20 mA actuator capability for demand control ventilation applications.

All economizers incorporate a parallel blade, gear-driven damper system for efficient air mixing and reliable control. In addition, the standard damper actuator includes a spring return to provide reliable closure on power loss. The economizers for sizes 004-014 are equipped with up to 100% barometric relief capability for high outdoor airflow operations. An optional field-installed barometric relief package is available for size 015-028 units.

In addition, single-stage power exhaust is available as a field-installed accessory for EconoMi$er+ to help maintain proper building pressure.

For units without economizer, year-round ventilation is enhanced by an optional manual outdoor-air damper. On 004-014 units, a 25% or 50% manual damper is available as a field-installed accessory. Unit sizes 015 and 017 are equipped with a manual 25% damper.

Service options

Servicing a rooftop unit has never been easier with the factory-installed service options for these rooftop units. These options include the following:

- Hinged access panels are provided for the filter/indoor-fan motor, compressors, evaporator fan, and control box areas. Quick access to major components is accomplished by simply unlatching and swinging open the various panels. Each hinged panel is permanently mounted to the unit, thereby eliminating the concern of a dropped or wind-blown panel puncturing delicate roof materials. The 4 extended access panels are also equipped with ''tie back'' retaining devices to hold the door in the open position while servicing the unit.
- An external, covered, 115-v Ground Fault Interrupt (GFI) receptacle is provided as a convenient power source for drills, lights, refrigerant recovery units, or other electrical service tools. A factory-supplied step down transformer is connected to the "load" side of the unit main power connection (size 004-014). For sizes 015 and 017, connect the outlet to a field-supplied and properly fused branch circuit power supply.
- Slide out "motor-drive-blower" reduces service time (only on 48HJ017).
- An integral non-fused disconnect switch within the rooftop unit reduces installation time, labor and material costs. Safety is assured by an interlock which prevents access to the control box unless the switch is in the OFF position. In addition, the externally mounted handle incorporates power lockout capability to further protect service personnel.

Carrier PremierLink™ controls add reliability, efficiency, and simplification

The PremierLink direct digital controls can be ordered as a factory-installed option or as a field-installed accessory. Designed and manufactured exclusively by Carrier, the controls can be used to actively monitor and control all modes of operations, as well as monitor the following diagnostics and features: unit number, zone temperature, zone set point, zone humidity set point, discharge air temperatures, fan status, stages of heating, stages of cooling, damper position, outdoor-air temperature, outdoor humidity level, filter status, fire shutdown status, IAQ set point, enthalpy status, differential enthalpy status, heat/cool lockout, cfm set point, pre-occupancy purge, economizer controls and early morning warm-up.

This controller has a 38.4K baud communications capability and is compatible with *Comfort*Link™ Controls, CCN and ComfortVIEW™ Software. The Scrolling Marquee and Navigator are optional tools that can be used for programming and monitoring the unit for optimal performance. The addition of the Carrier CO_2 sensor in the conditioned space provides ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) 62-99 compliance and Demand Control Ventilation.

The PremierLink peer-to-peer, Internet ready communicating control is designed specifically for Constant Volume (CV) and Variable Volume and Temperature (VVT®) applications. This comprehensive controls system allows all Carrier 3 to 25 ton rooftops with a 3-wire communications bus to be daisy chained together on a roof to create a fully functional HVAC (heating, ventilation, and air conditioning) automation system.

Indoor-air quality (IAQ) begins with Carrier rooftops

Sloped condensate pans minimize biological growth in rooftop units in accordance with ASHRAE Standard 62. Two-inch filters with optional dirty filter indicator switch provide for greater particle reduction in the return air. The face-split evaporator coils improve the dehumidification capability of standard units, maximize building humidity control.

Optional proportional reacting CO_2 sensor is available with the Econo-Mi$er+ outdoor air damper option/ accessory to aid the IAQ benefits.

Exclusive MoistureMi$er™ dehumidification package (48HJ004-017 and 48TM016-028 only)

The MoistureMi$er dehumidification package is a result of recent advances by Carrier in controlling comfort levels. This factory-installed option significantly improves the dehumidification capability of the rooftop unit and helps control humidity levels in the building.

This option provides increased dehumidification by cooling the hot liquid refrigerant leaving the condenser coil. The MoistureMi$er package consists of a subcooling coil located on the leaving-air side of the evaporator coil. The location of this coil in the indoor airstream enhances the latent capacity of the 48HJ004-017 and 48TM016-028 units by as much as 40%. Many buildings suffer from humidity damage or poor indoor air quality due to humid conditions. The improved latent capacity provided by the MoistureMi$er option reduces the building's humidity, eliminating potential property damage and making the space more comfortable.

The MoistureMi$er option is the ideal IAQ option for hot and humid regions. The operation of the MoistureMi$er package can be controlled by a field-installed, wall mounted humidistat or thermidistat. The circuit activates only when needed (using the accessory humidistat) as opposed to some dehumidification systems that operate continuously. The humidistat can be set for any humidity level between 20% and 80% relative humidity.The thermidistat can be set for any humidity level between 50% and 90% relative humidity.

COBRA™ energy recovery units (sizes 004-014 only)

Carrier's factory-installed optional COBRA units recover energy from the building exhaust air and pre-condition ventilation air for the rooftop unit during winter and summer operation. These units are designed to satisfy the higher ventilation requirements and other building codes while minimizing energy costs.

Factory installation of the 62AQ section provides the benefit of reduced field-installation time, single point power connections, and the assurance of a factory test for the complete COBRA unit. The COBRA energy recovery section requires less maintenance than other energy recovery systems and can be serviced by any qualified refrigeration technician.

The COBRA energy recovery units utilize Carrier's high-efficiency 48HJ004-014 rooftop units and provide 3 to $12\frac{1}{2}$ tons of cooling capacity with the capability to pre-condition 600 to 3000 cfm of outdoor air.

Indoor-air quality (IAQ) generally refers to the level of pollutants inside a building. These pollutants include cigarette smoke, carbon dioxide exhaled by occupants, radon gas, car exhaust, paint fumes, and odors.

Concern over increased indoor air pollutants has been spurred by several issues: 1) changes in new building construction methods and retrofit of older buildings have reduced air infiltration rates; 2) Synthetic materials release airborne particles, odors, and chemicals; and 3) HVAC systems that bring in minimal fresh air.

In 1989, IAQ concerns caused ASHRAE to recommend increased ventilation for all public buildings. Simply introducing fresh air into a building, however, is not always practical or cost effective. Additional ventilation can overload HVAC systems and increase energy costs.

Carrier's COBRA Energy Recovery unit solves this dilemma by providing increased fresh air while keeping increased costs to a minimum. In addition, the COBRA Energy Recovery unit helps reduce humidity levels, which helps to prevent deterioration of building materials and retards the growth of mold and mildew.

The COBRA Energy Recovery unit provides the best solution to retaining the energy-conserving benefits of today's tighter building construction while improving indoor-air quality.

Model number nomenclature

48TM004-014

Example: **48 TM D 006 P M F 6 - 1 HA**

48 – Packaged Rooftop Electric Cooling/ Natural Gas Heat

TM – Constant Volume, Standard Efficiency

Heat Options:

49 States	California Compliant
D – Low Heat	**L –** Low NOx Low Heat
E – Medium Heat	**M –** Low NOx Medium Heat
F – High Heat	**N –** Low NOx High Heat

Tons Nominal Capacity
004 – 3 Tons
005 – 4 Tons
006 – 5 Tons
007 – 6 Tons
008 – 7-1/2 Tons
009 – 8-1/2 Tons
012 – 10 Tons
014 – 12-1/2 Tons

Controls and Sensors
– – None
N – Novar ETM3051 Control*
P – PremierLink™ DDC Control

Indoor Motor Options
– – Standard Motor & Drive
A – Alternate Motor
M – High-Static Indoor Motor

Coil Protection Options (fin/tube)
– – Al/Cu Cond & Evap (Standard Unit)
B – Cu/Cu Cond & Evap
C – Cu/Cu Cond & Al/Cu Evap
F – E-Coat Al/Cu Cond & Al/Cu Evap
G – E-Coat Cu/Cu Cond & Al/Cu Evap
V – Al/Cu Pre-Coat Cond Fin & Al/Cu Evap

Design Changes

Voltage
1 – 575-3-60
3 – 208/230-1-60
5 – 208/230-3-60
6 – 460-3-60

Packaging
1 – Domestic
3 – Export

FIOP†

LEGEND

Al	—	Aluminum
Cu	—	Copper
DDC	—	Direct Digital Controls
FIOP	—	Factory-Installed Option

*Contact factory for availability and application information.
†Refer to 48TM Price Pages, Quote Builder, or contact your local Carrier representative for FIOP code table.

Quality Assurance

Carrier Corporation
UL REGISTERED FIRM
ISO 9001:2000 #A2325

48TM016-028

Example: **48 TM D 025 G – F 6 1 1 YA**

48 – Packaged Rooftop Electric Cooling/ Natural Gas Heat

TM – Constant Volume, Standard Efficiency

Heat Options
D – Low Heat
F – High Heat
M – Low Heat, Stainless Steel Heat Exchanger
N – High Heat, Stainless Steel Heat Exchanger

Nominal Capacity – Tons
016 – 15 Tons
020 – 18 Tons
025 – 20 Tons
028 – 25 Tons

Control/Service Options
– – Standard Controls
G – Service Option with 6 Hinged Access Panels, Non-Fused Disconnect, and Non-Powered 115-V GFI Convenience Outlet
J – Hinged Access Panels
S – Hinged Access Panels with Apollo Control
Y – Service Option with Apollo Control
Z – Apollo Control Option

Fan Drive Position (Standard Motor)
– – Standard Motor and Drive

Coil Protection Options (fin/tube)
– – Al/Cu Condenser and Evaporator
B – Cu/Cu Condenser and Evaporator
C – Cu/Cu Condenser and Al/Cu Evaporator
F – E-Coated Al/Cu Condenser
G – E-Coated Cu/Cu Condenser
V – Black Pre-Coated Condenser Fins

Voltage
1 – 575-3-60
5 – 208/230-3-60
6 – 460-3-60

Design Series
1 – Design with Gear-Driven EconoMi$er+

Packaging
1 – Domestic
3 – Export

Factory-Installed Options Code*

LEGEND

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

*Refer to 48TM Price Pages or contact your local Carrier representative for FIOP code table.

Quality Assurance

Carrier Corporation UL REGISTERED FIRM ISO 9001:2000 #A2260

BSI REGISTERED FIRM NATIONAL ACCREDITATION OF CERTIFICATION BODIES

Certificate No FM 21837

Approvals:
ISO 9001
EN 9000:2000

Model number nomenclature (cont)

48HJ004-014

Example: 48 HJ D 006 P M F 6 4 1 HA

48 – Packaged Rooftop Electric Cooling/ Natural Gas Heat

HJ – Constant Volume, High Efficiency

Heat Options:
49 States
D – Low Heat
E – Medium Heat
F – High Heat
S – Low Heat / Stainless Steel
R – Med Heat / Stainless Steel
T – High Heat / Stainless Steel

California Compliant
G – Non NOx Low Heat (3 Ph, Single Stg)
H – Non NOx Medium Heat (3 Ph, Single Stg)
K – Non NOx High Heat (3 Ph, Single Stg)
L – Low NOx Low Heat (Single Stg)
M – Low NOx Medium Heat (Single Stg)
N – Low NOx High Heat (Single Stg)

Tons Nominal Capacity
004 – 3 Tons
005 – 4 Tons
006 – 5 Tons
007 – 6 Tons
008 – 7-1/2 Tons
009 – 8-1/2 Tons
012 – 10 Tons
014 – 12-1/2 Tons

Controls and Sensors*
Standard Unit
– – None
G – Hinged Access Panels
H – Hinged Panels & PremierLink™ Control
N – Novar ETM3051 Control*
P – PremierLink DDC Control
R – Novar ETM3051 & Hinged Panels*

COBRA™ Energy Recovery Unit
B – COBRA Unit & Std. RTU Controls
C – COBRA Unit & Hinged Access Panels
D – COBRA Unit & Hinged Panels & PremierLink Control
E – COBRA Unit & PremierLink Control

LEGEND
Al — Aluminum
Cu — Copper
DDC — Direct Digital Controls
E-Ctd — E-Coated
FIOP — Factory-Installed Option

*Contact factory for availability and applications.
†Refer to 48HJ Price Pages, Quote Builder software or contact your local Carrier Representative for FIOP code table.

NOTE: Hinged Access Panels include: Filter Panel, Control Box Panel, Fan Motor Panel, Compressor Panel.

Quality Assurance

48HJ004-012 UNITS ARE ENERGY STAR QUALIFIED

FIOPs†

Packaging
1 – Domestic
3 – Export

Design Changes

Voltage
1 – 575-3-60
3 – 208/230-1-60
5 – 208/230-3-60
6 – 460-3-60

Coil Protection Options (fin/tube)
Standard Unit
– – Al/Cu Cond & Evap
B – Cu/Cu Cond & Evap
C – Cu/Cu Cond & Al/Cu Evap
E – E-Coat Al/Cu Cond & E-Coat Al/Cu Evap
F – E-Coat Al/Cu Cond & Al/Cu Evap
G – E-Coat Cu/Cu Cond & Al/Cu Evap
V – Al/Cu Pre-Coat Cond Fin & Al/Cu Evap

COBRA™ Energy Recovery Unit
H – 62AQ060 Al/Cu Supply & Exhaust / Al/Cu Cond & Evap
J – 62AQ100 Al/Cu Supply & Exhaust / Al/Cu Cond & Evap
K – 62AQ200 Al/Cu Supply & Exhaust / Al/Cu Cond & Evap
L – 62AQ300 Al/Cu Supply & Exhaust / Al/Cu Cond & Evap
M – 62AQ060 Cu/Cu Supply & Exhaust / Cu/Cu Cond & Evap
N – 62AQ100 Cu/Cu Supply & Exhaust / Cu/Cu Cond & Evap
P – 62AQ200 Cu/Cu Supply & Exhaust / Cu/Cu Cond & Evap
Q – 62AQ300 Cu/Cu Supply & Exhaust / Cu/Cu Cond & Evap
R – 62AQ060 Cu/Cu Supply & Exhaust / Cu/Cu Cond & Evap
S – 62AQ100 Cu/Cu Supply & Exhaust / Al/Cu Cond & Evap
T – 62AQ200 Cu/Cu Supply & Exhaust / Al/Cu Cond & Evap
W – 62AQ300 Cu/Cu Supply & Exhaust / Al/Cu Cond & Evap
X – 62AQ060 E-Ctd Al/Cu Supply,Std. Al/Cu Exhaust / E-Ctd Al/Cu Cond & Std. Al/Cu Evap
Y – 62AQ100 E-Ctd Al/Cu Supply,Std. Al/Cu Exhaust / E-Ctd Al/Cu Cond & Std. Al/Cu Evap
Z – 62AQ200 E-Ctd Al/Cu Supply,Std. Al/Cu Exhaust / E-Ctd Al/Cu Cond & Std. Al/Cu Evap
1 – 62AQ300 E-Ctd Al/Cu Supply,Std. Al/Cu Exhaust / E-Ctd Al/Cu Cond & Std. Al/Cu Evap
2 – 62AQ060 E-Ctd Al/Cu Supply & Exhaust / E-Ctd Al/Cu Cond & Std. Al/Cu Evap
3 – 62AQ100 E-Ctd Al/Cu Supply & Exhaust / E-Ctd Al/Cu Cond & Std. Al/Cu Evap
4 – 62AQ200 E-Ctd Al/Cu Supply & Exhaust / E-Ctd Al/Cu Cond & Std. Al/Cu Evap
5 – 62AQ300 E-Ctd Al/Cu Supply & Exhaust / E-Ctd Al/Cu Cond & Std. Al/Cu Evap
6 – 62AQ060 E-Ctd Al/Cu Supply & Exhaust / E-Ctd Al/Cu Cond & Evap
7 – 62AQ100 E-Ctd Al/Cu Supply & Exhaust / E-Ctd Al/Cu Cond & Evap
8 – 62AQ200 E-Ctd Al/Cu Supply & Exhaust / E-Ctd Al/Cu Cond & Evap
9 – 62AQ300 E-Ctd Al/Cu Supply & Exhaust / E-Ctd Al/Cu Cond & Evap

Indoor Motor Options
– – Standard Motor & Drive
M – High-Static Indoor Motor
S – MoistureMi$er™ Dehumidification Pkg.
T – MoistureMi$er & High Static Indoor Motor
W – MoistureMi$er – Cu/Cu Coil
X – MoistureMi$er, Cu/Cu with/High-Static Motor
Y – E-coated MoistureMi$er with High Static Indoor Motor

48HJ015,017

48 HJ D 017 Z – C 6 – – YA

48 – Single Package Rooftop Units, Gas Heating/Electric Cooling

HJ – Constant Volume, High Efficiency

Heat Options
D – Low Heat
F – High Heat
M – Low Heat, Stainless Steel Heat Exchangers
N – High Heat, Stainless Steel Heat Exchangers

Nominal Capacity – Tons
015 – 12 Tons
017 – 15 Tons

Service/Control Options
– – Standard Controls
G – Service Option with 6 Hinged Access Panels, Non-Fused Disconnect, and Non-Powered 115-v GFI Convenience Outlet
J – Hinged Access Panels

Outdoor Air and Fan Drive Options
AA – EconoMi$er+ and High Fan Drive Static Capability
BA – Manual 25% Outside Air Damper and High Fan Drive Static Capability
QA – EconoMi$er+ and Low-Medium Fan Drive Static Capability
YA – Manual 25% Outside Air Damper and Low-Medium Fan Drive Static Capability

Voltage Description
1 – 575-3-60
5 – 208/230-3-60
6 – 460-3-60

Coil Protection Options (fin/tube)
– – Al/Cu Condenser and Evaporator
B – Cu/Cu Condenser and Evaporator
C – Cu/Cu Condenser and Al/Cu Evaporator
F – E-Coated Al/Cu Condenser and Al/Cu Evaporator
G – E-Coated Cu/Cu Condenser and Al/Cu Evaporator
V – Al/Cu Pre-Coated Condenser Fins

LEGEND
Al — Aluminum
Cu — Copper

ENERGY STAR

Quality Assurance

Carrier Corporation UL REGISTERED FIRM ISO 9001:2000 #A2260

BSI REGISTERED FIRM

Certificate No FM 21837

Approvals:
ISO 9001
EN 9000:2000

ARI* capacity ratings

ARI* CAPACITY RATINGS — 48TM004-014

UNIT 48TM	NOMINAL TONS	NET COOLING CAPACITY (Btuh)	TOTAL kW	SEER†	EER**	SOUND RATING (decibels)	IPLV††
004	3	35,000	4.0	10.0	8.7	81	N/A
005	4	47,000	5.3	10.0	8.8	81	N/A
006	5	57,000	6.7	10.0	8.5	81	N/A
007	6	71,000	7.0	—	10.1	80	N/A
008	7 1/2	88,000	8.7	—	10.1	82	10.5
009	8 1/2	100,000	9.9	—	10.1	82	10.4
012	10	114,000	11.3	—	10.1	84	11.0
014	12 1/2	136,000	14.3	—	9.5	86	9.7

LEGEND

db — Dry Bulb
EER — Energy Efficiency Ratio
IPLV — Integrated Part-Load Values
SEER — Seasonal Energy Efficiency Ratio
wb — Wet Bulb

*Air Conditioning and Refrigeration Institute.
†The SEER values shown for sizes 004, 005, and 006 are for units with the optional belt drive motors; SEER rating for these units with the standard direct drive motor is 9.7.
**ARI does not require EER ratings for units with capacity below 65,000 Btuh. For these units, the EER rating at ARI standard conditions is provided for information only.
††The IPLV applies only to two-stage cooling units.

NOTES:
1. Rated in accordance with ARI Standards 210/240-94, (for sizes 004-012) or 360-93, (for size 014) and 270-95.
2. ARI ratings are net values, reflecting the effects of circulating fan heat.
3. Ratings are based on:

Cooling Standard: 80 F db, 67 F wb indoor entering-air temperature and 95 F db air entering outdoor unit.
IPLV Standard: 80 F db, 67 F wb indoor entering-air temperature and 80 F db outdoor entering-air temperature.
4. All 48TM004-014 units are in compliance with ASHRAE 90.1 2001 Energy Standard for minimum SEER and EER requirements. Refer to state and local codes or visit the following website: http://solstice.crest.org/efficiency/bcap to determine if compliance with this standard pertains to a given geographical area of the United States.

HEATING CAPACITIES AND EFFICIENCIES — 48TM004-014

208/230-1-60 — SINGLE-STAGE GAS HEAT

UNIT 48TM	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
E004	74,000	—	57,000	—	25-35	1004	80	80
F004	115,000	—	89,000	—	55-85	1002	80	80
D005	74,000	—	57,000	—	25-55	1004	80	80
E005	115,000	—	91,000	—	35-65	1327	80	80
F005	150,000	—	118,000	—	50-80	1396	80	80
D006	74,000	—	57,000	—	25-55	1004	80	80
E006	115,000	—	91,000	—	35-65	1327	80	80
F006	150,000	—	118,000	—	50-80	1314	80	80

208/230-1-60 — SINGLE-STAGE GAS HEAT — LOW NOx

UNIT 48TM	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
M004	60,000	—	49,000	—	20-50	910	80	80
N004	90,000	—	73,000	—	30-60	1130	80	80
L005	60,000	—	49,000	—	20-50	910	80	80
M005	90,000	—	73,000	—	30-60	1130	80	80
N005	120,000	—	98,000	—	40-70	1300	80	80
L006	60,000	—	49,000	—	20-50	910	80	80
M006	90,000	—	73,000	—	30-60	1130	80	80
N006	120,000	—	98,000	—	40-70	1300	80	80

208/230/460-3-60 — SINGLE-STAGE GAS HEAT — LOW NOx

UNIT 48TM	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
M004	60,000	—	49,000	—	20-50	910	80	80
N004	90,000	—	73,000	—	30-60	1130	80	80
L005	60,000	—	49,000	—	20-50	910	80	80
M005	90,000	—	73,000	—	30-60	1130	80	80
N005	120,000	—	98,000	—	40-70	1300	80	80
L006	60,000	—	49,000	—	20-50	910	80	80
M006	90,000	—	73,000	—	30-60	1130	80	80
N006	120,000	—	98,000	—	40-70	1300	80	80

AFUE — Annual Fuel Utilization Efficiency

HEATING CAPACITIES AND EFFICIENCIES — 48TM004-014 (cont)

208/230/460/575-3-60 — SINGLE-STAGE GAS HEAT

UNIT 48TM	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
E004	74,000	—	59,200	—	15-45	1220	80	80
D005	74,000	—	59,200	—	15-45	1220	80	80
E005	115,000	—	92,000	—	35-65	1320	80	80
D006	74,000	—	59,200	—	15-45	1220	80	80
E006	115,000	—	92,000	—	35-65	1320	80	80
D007	74,000	—	59,200	—	15-45	1220	80	80
E007	115,000	—	92,000	—	35-65	1320	80	80
D008	125,000	—	100,000	—	20-50	1860	80	80
D009	125,000	—	100,000	—	20-50	1860	80	80

208/230/460/575-3-60 — 2-STAGE GAS HEAT

UNIT 48TM	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
F004	82,000	115,000	65,600	92,000	55-85	1004	80	80
F005	120,000	150,000	96,000	120,000	50-80	1396	80	80
F006	120,000	150,000	96,000	120,000	50-80	1314	80	80
F007	120,000	150,000	96,000	120,000	50-80	1390	80	80
E008	120,000	180,000	96,000	144,000	35-65	2060	80	80
F008	180,000	224,000	144,000	179,200	45-75	2230	80	80
E009	120,000	180,000	96,000	144,000	35-65	2060	80	80
F009	180,000	224,000	144,000	179,200	45-75	2180	80	80
D012	120,000	180,000	90,000	144,000	35-65	2060	80	80
E012	180,000	224,000	144,000	179,200	35-65	2510	80	80
F012	200,000	250,000	160,000	200,000	40-70	2650	80	80
D014	180,000	224,000	144,000	179,200	35-65	2510	80	80
E014	200,000	250,000	160,000	200,000	40-70	2650	80	80

AFUE — Annual Fuel Utilization Efficiency

ARI* capacity ratings (cont)

ARI* CAPACITY RATINGS — 48TM016-028

UNIT SIZE 48TMD	NOMINAL TONS	NET COOLING CAPACITY (Btuh)	TOTAL WATTS	EER	SOUND RATING (decibels)	IPLV
016	15	176,000	17,064	9.5	88	9.5
020	18	202,000	21,166	9.7	88	10.2
025	20	236,000	24,832	9.5	94	10.1
028	25	278,000	28,535	9.7	94	10.4

UNIT SIZE 48TMF	NOMINAL TONS	NET COOLING CAPACITY (Btuh)	TOTAL WATTS	EER	SOUND RATING (decibels)	IPLV
016	15	176,000	17,179	9.5	88	9.5
020	18	202,000	21,301	9.7	88	10.1
025	20	236,000	24,832	9.5	94	10.0
028	25	277,000	29,067	9.5	94	10.0

LEGEND

db — Dry Bulb
EER — Energy Efficiency Ratio
IPLV — Integrated Part-Load Values
wb — Wet Bulb

*Air Conditioning and Refrigeration Institute.

NOTES:
1. Rated in accordance with ARI Standards 360-93 and 270-95.
2. ARI ratings are net values, reflecting the effects of circulating fan heat.
3. Ratings are based on:
   Cooling Standard: 80 F db, 67 F wb indoor entering-air temperature and 95 F db air entering outdoor unit.
   IPLV Standard: 80 F db, 67 F wb indoor entering-air temperature and 80 F db outdoor entering-air temperature.
4. All 48TM016-028 units are in compliance with ASHRAE 90.1 2001 Energy Standard for minimum EER requirements. Refer to state and local codes or visit the following website: http://solstice.crest.org/efficiency/bcap to determine if compliance with this standard pertains to a given geographical area of the United States.

HEATING CAPACITIES AND EFFICIENCIES — 48TM016-028

UNIT 48TM	HEATING INPUT (Btuh) Stage 2/Stage 1*	OUTPUT CAPACITY (Btuh)	TEMPERATURE RISE (F)	STEADY-STATE EFFICIENCY (%)	MINIMUM HEATING CFM
D,M016	275,000/206,000	223,000	15-45	81.0	3750
F,N016	360,000/270,000	292,000	20-50	81.0	3830
D,M020	275,000/206,000	223,000	15-45	81.0	4580
F,N020	360,000/270,000	292,000	20-50	81.0	5400
D,M025	275,000/206,000	223,000	15-45	81.0	4580
F,N025	360,000/270,000	292,000	20-50	81.0	5400
D,M028	275,000/206,000	223,000	15-45	81.0	4580
F,N028	360,000/270,000	292,000	20-50	81.0	5400

*All units are 2-stage heat.

NOTE: Minimum allowable temperature of mixed-air entering the heat exchanger during first-stage heating is 45 F. There is no minimum mixed-air temperature limitation during second-stage heating. For entering-air temperatures below 45 F both stages of heat must be energized together to minimize condensation issues and ensure proper unit operation.

ARI* CAPACITY RATINGS — 48HJ004-014

UNIT 48HJ	NOMINAL TONS	COOLING (Btuh)	TOTAL kW	SEER†	EER	SOUND RATING (decibels)	IPLV††
004	3	36,000	3.2	13.0	11.2**	76	N/A
005	4	46,000	4.1	13.0	11.1**	76	N/A
006	5	61,000	5.5	13.0	11.0**	80	N/A
007	6	73,000	6.7	—	11.0	80	N/A
008	7.5	90,000	8.2	—	11.0	82	11.6
009	8.5	103,000	8.9	—	11.6	82	12.8
012	10	120,000	10.9	—	11.0	84	11.4
014	12.5	138,000	14.4	—	9.6	86	10.3

LEGEND

EER — Energy Efficiency Ratio
IPLV — Integrated Part-Load Value
SEER — Seasonal Energy Efficiency Ratio

*Air-Conditioning & Refrigeration Institute.
†Applies only to units with capacity of 65,000 Btuh or less.
**ARI does not require EER ratings for unit with capacity below 65,000 Btuh. For these units, the EER rating at ARI standard conditions is provided for information only.
††The IPLV is not applicable to single-compressor units.

NOTES:
1. Rated in accordance with ARI Standard 210/240-94 (004-012 units) or 360-93 (014 units) and 270-95 (004-014 units).
2. Ratings are net values, reflecting the effects of circulating fan heat.
3. Ratings are based on:
   Cooling Standard: 80 F db, 67 wb indoor entering-air temperature and 95 F db outdoor entering-air temperature.
   IPLV Standard: 80 F db, 67 F wb indoor entering-air temperature and 80 F db outdoor entering-air temperature.

Sizes 004-012 Only

Size 014 Only

4. All 48HJ004-014 units are in compliance with ASHRAE 90.1 2001 Energy Standard for minimum SEER and EER requirements. Refer to state and local codes or visit the following website: http://solstice.crest.org/efficiency/bcap to determine if compliance with this standard pertains to a given geographical area of the United States.

HEATING CAPACITIES AND EFFICIENCIES — 48HJ004-014

208/230-1-60 — SINGLE-STAGE GAS HEAT

UNIT 48HJ	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
E/R004	72,000	—	58,000	—	25-55	1004	82.8%	82.0
F/T004	115,000	—	90,000	—	55-85	1002	80.0%	80.0
D/S005	72,000	—	58,000	—	25-55	1004	82.8%	82.0
E/R005	115,000	—	92,000	—	35-65	1320	81.0%	81.0
F/T005	150,000	—	118,000	—	50-80	1396	80.4%	80.0
D/S006	72,000	—	58,000	—	25-55	1004	82.8%	82.0
E/R006	115,000	—	92,000	—	35-65	1327	81.0%	81.0
F/T006	150,000	—	118,000	—	50-80	1314	80.4%	80.0

208/230-1-60 — SINGLE-STAGE GAS HEAT — LOW NOx

UNIT 48HJ	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
M004	60,000	—	50,000	—	20-50	930	80.2%	81.2
N004	90,000	—	74,000	—	30-60	1150	81.0%	81.4
L005	60,000	—	50,000	—	20-50	930	80.2%	81.2
M005	90,000	—	74,000	—	30-60	1150	81.0%	81.4
N005	120,000	—	101,000	—	40-70	1340	80.7%	82.4
L006	60,000	—	50,000	—	20-50	930	80.2%	81.2
M006	90,000	—	74,000	—	30-60	1150	81.0%	81.4
N006	120,000	—	101,000	—	40-70	1340	80.7%	82.4

AFUE — Annual Fuel Utilization Efficiency

NOTE: Capacities for stainless steel heat exchanger units (S/R/T) are the same as standard units (D/E/F).

ARI* capacity ratings (cont)

HEATING CAPACITIES AND EFFICIENCIES — 48HJ004-014 (cont)

208/230/460-3-60 — SINGLE-STAGE GAS HEAT — LOW NOx

UNIT 48HJ	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
M004	60,000	—	50,000	—	20-50	930	80.2%	81.2
N004	90,000	—	74,000	—	30-60	1150	81.0%	81.4
L005	60,000	—	50,000	—	20-50	930	80.2%	81.2
M005	90,000	—	74,000	—	30-60	1150	81.0%	81.4
N005	120,000	—	101,000	—	40-70	1340	80.7%	82.4
L006	60,000	—	50,000	—	20-50	930	80.2%	81.2
M006	90,000	—	74,000	—	30-60	1150	81.0%	81.4
N006	120,000	—	101,000	—	40-70	1340	80.7%	82.4

208/230/460-3-60 — SINGLE-STAGE GAS HEAT

UNIT 48HJ	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
H004	72,000	—	59,040	—	25-55	1000	82.0%	82.0
K004	115,000	—	93,150	—	55-85	1020	80.0%	81.0
G005	72,000	—	59,040	—	25-55	1000	82.0%	82.0
H005	115,000	—	93,150	—	30-60	1440	81.0%	81.0
K005	150,000	—	120,000	—	50-80	1390	80.0%	80.0
G006	72,000	—	59,040	—	25-55	1220	82.0%	82.0
H006	115,000	—	93,150	—	35-65	1330	81.0%	81.0
K006	150,000	—	120,000	—	50-80	1390	80.0%	80.0

208/230/460/575-3-60 — 2-STAGE GAS HEAT

UNIT 48HJ	INPUT CAPACITY		OUTPUT CAPACITY		TEMPERATURE RISE (°F)	MINIMUM HEATING AIRFLOW (CFM)	EFFICIENCY	
	1st Stage	2nd Stage	1st Stage	2nd Stage			AFUE (%)	Steady State (%)
E004	50,000	72,000	41,000	59,040	25-55	1004	82.8%	82.0
F004	82,000	115,000	65,600	93,150	55-85	1002	80.0%	80.0
D005	50,000	72,000	41,000	59,040	25-55	1094	82.8%	82.0
E005	82,000	115,000	66,420	93,150	35-65	1330	81.0%	81.0
F005	120,000	150,000	96,000	120,000	50-80	1390	80.4%	80.0
D006	50,000	72,000	41,000	59,040	25-55	1004	82.8%	82.0
E006	82,000	115,000	66,420	93,150	35-65	1330	81.0%	81.0
F006	120,000	150,000	96,000	120,000	50-80	1370	80.4%	80.0
D007	50,000	72,000	41,000	59,040	25-55	1220	82.0%	82.0
E007	82,000	115,000	66,420	93,150	35-65	1330	81.0%	81.0
F007	120,000	150,000	96,000	120,000	50-80	1390	80.0%	80.0
D008	90,000	125,000	73,800	102,500	20-50	1900	82.0%	82.0
E008	120,000	180,000	98,400	147,600	35-65	1440	82.0%	82.0
F008	180,000	224,000	147,600	183,680	45-75	2230	82.0%	82.0
D009	90,000	125,000	73,800	102,500	20-50	1900	82.0%	82.0
E009	120,000	180,000	98,400	147,600	35-65	1440	82.0%	82.0
F009	180,000	224,000	147,600	183,680	45-75	2230	82.0%	82.0
D012	120,000	180,000	98,400	147,600	35-65	1440	82.0%	82.0
E012	180,000	224,000	147,600	183,680	35-65	2570	82.0%	82.0
F012	200,000	250,000	160,000	200,000	40-70	2650	80.0%	80.0
D014	180,000	224,000	147,600	183,680	35-65	2570	82.0%	82.0
E014	200,000	250,000	160,000	200,000	40-70	2650	80.0%	80.0

AFUE — Annual Fuel Utilization Efficiency

NOTE: Capacities for stainless steel heat exchanger units (S/R/T) are the same as standard units (D/E/F).

ARI* CAPACITY RATINGS — 48HJ015,017

UNIT 48HJD	NOMINAL TONS	CFM	NET COOLING CAPACITY (Btuh)	TOTAL WATTS	EER	SOUND RATING (decibels)	IPLV
015	12	3750	152,000	14,074	10.8	88	11.8
017	15	4500	176,000	16,296	10.8	88	11.7

UNIT 48HJF	NOMINAL TONS	CFM	NET COOLING CAPACITY (Btuh)	TOTAL WATTS	EER	SOUND RATING (decibels)	IPLV
015	12	3750	152,000	14,074	10.8	88	11.8
017	15	4500	176,000	16,296	10.8	88	11.7

LEGEND

db — Dry Bulb
EER — Energy Efficiency Ratio
IPLV — Integrated Part-Load Values
wb — Wet Bulb

*Air Conditioning and Refrigeration Institute.

NOTES:
1. Rated in accordance with ARI Standards 360-93 and 270-95.
2. ARI ratings are net values, reflecting the effects of circulating fan heat.
3. Ratings are based on:

Cooling Standard: 80 F db, 67 F wb indoor entering-air temperature and 95 F db air entering outdoor unit.
IPLV Standard: 80 F db, 67 F wb indoor entering-air temperature and 80 F db outdoor entering-air temperature.

4. All 48HJ015,017 units are in compliance with ASHRAE 90.1 2001 Energy Standard for minimum EER requirements. Refer to state and local codes or visit the following website: http://solstice.crest.org/efficiency/bcap to determine if compliance with this standard pertains to a given geographical area of the United States.

HEATING CAPACITIES AND EFFICIENCIES — 48HJ015,017

UNIT 48	HEATING INPUT (Btuh) Stage 2/Stage 1*	OUTPUT CAPACITY (Btuh)	TEMPERATURE RISE (F)	AGA STEADY STATE EFFICIENCY (%)	MINIMUM HEATING CFM†
HJD/M015	230,000/172,000	186,300	15-45	81.0	3750
HJF/N015	300,000/225,000	243,000	30-60	81.0	3830
HJD/M017	275,000/206,000	223,000	15-45	81.0	4580
HJF/N017	360,000/270,000	292,000	20-50	81.0	5400

*All units are 2-stage heat.
†Minimum heating cfm must be maintained to ensure proper heating operation.

NOTE: Minimum allowable temperature of mixed air entering the heat exchanger during first stage heating is 45 F. There is no minimNOTE: Minimum allowable temperature of mixed air entering the heat exchanger during first stage heating is 45 F. There is no minimum mixed-air limitation during second-stage heating.

Options and accessories

48TM004-014

ITEM	OPTION*	ACCESSORY†
100% Open Two-Position Damper		X
25% Open Two-Position Damper		X
Condenser Coil Grille		X
Condenser Coil Hail Guard Assembly		X
Convenience Outlet (Load Side)	X	
Copper Fins Indoor and Outdoor Coil	X	
Copper Fins Outdoor Coil	X	
E-Coat Outdoor Coil (Aluminum)	X	
E-Coat Outdoor Coil (Copper)	X	
EconoMi$er+ with Controller	X	X
EconoMi$er+ 5-Pin Plug (required for Remote Potentiometer and IAQ Sensor)		X
EconoMi$er+ or EconoMi$er2 575-V Transformer		X
EconoMi$er2 (for use with PremierLink or Third Party Controls)	X	X
Electronic Programmable Thermostat		X
Energy$Recycler Mounting Kit		X
Energy$Recycler Supply Air Blower		X
Energy$Recycler Transformer for 460 v		X
Energy$Recycler Transformer for 575 v		X
Energy$Recycler Unit		X
Enthalpy or Differential Enthalpy Sensor (EconoMi$er2)		X
Fan/Filter Status		X
Flue Discharge Deflector		X
Flue Shield		X
High-Static Motor and Drive	X	
Hinged Panel Kit for Economizer		X
Humidistat		X
Indoor Air Quality (CO_2) Sensor (EconoMi$er+ or EconoMi$er2 Only)		X
Light Commercial Thermidistat		X
Low NO_X (004-006)	X	
LP (Liquid Propane) Conversion Kit		X
Manual Outdoor-Air Damper		X
Motormaster® I, II, IV Head Pressure Control (Low Ambient Kit)		X
Novar Control	X	
Outdoor Air Enthalpy Sensor (EconoMi$er2 Only)		X
Outdoor Air Humidity Sensor (EconoMi$er+ Only)		X
Power Exhaust Transformer for 575 v		X
Power Exhaust with Barometric Relief		X
Pre-coat Aluminum Fins on Outdoor Coil	X	
PremierLink™ DDC Communicating Control	X	X
Return Air Enthalpy Sensor (EconoMi$er2 Only)		X
Return Air Humidity Sensor (EconoMi$er+ Only)		X
Return Air Temperature Sensor (EconoMi$er+ or EconoMi$er2 Only)		X
Roof Curbs (Vertical and Horizontal Discharge)		X
Thermostats and Subbases		X
Thru-the-Bottom Utility Connections		X
Time Guard II (Compressor Cycle Delay) Control Circuit		X
Unit-Mounted Non-Fused Disconnect	X	

*Factory-installed.
†Field-installed.

NOTES:
1. Refer to unit price pages or contact your local representative for accessory and option package information.
2. Some options may increase product lead times.

ITEM	OPTION*	ACCESSORY†
25% Open Two-Position Damper		X
Barometric Relief Damper (not for use with Horizontal Adapter Curb)		X
Condenser Coil Hail Guard Assembly (016-025)		X
Convenience Outlet (Load Side)	X	
Copper Fins Indoor and Outdoor Coil	X	
Copper Fins Outdoor Coil	X	
E-Coat Outdoor Coil (Aluminum)	X	
E-Coat Outdoor Coil (Copper)	X	
EconoMi$er+ with Controller	X	X
EconoMi$er+ 5-Pin Plug (required for Remote Potentiometer and IAQ Sensor)		X
EconoMi$er+ or EconoMi$er2 575-V Transformer		X
EconoMi$er2 (without Controller)	X	X
Electronic Programmable Thermostat		X
Enthalpy or Differential Enthalpy Sensor (EconoMi$er2)		X
Fan/Filter Status		X
High-Static Motor and Drive	X	
Hinged Access Panels	X	
Horizontal Adapter Curb (016-025)		X
Humidistat		X
Indoor Air Quality (CO_2) Sensor (EconoMi$er+ or EconoMi$er2 Only)		X
Light Commercial Thermidistat		X
LP (Liquid Propane) Conversion Kit		X
Manual Outdoor-Air Damper		X
MoistureMi$er™ Dehumidification Package	X**	
Motormaster® I, V Head Pressure Control (Low Ambient Kit)		X
Novar Control	X**	
Outdoor Air Enthalpy Sensor (EconoMi$er2 Only)		X
Outdoor Air Humidity Sensor (EconoMi$er+ Only)		X
Power Exhaust without Barometric Relief		X
Pre-coat Aluminum Fins on Outdoor Coil	X	
PremierLink™ DDC Communicating Control	X**	X
Return Air Enthalpy Sensor (EconoMi$er2 Only)		X
Return Air Humidity Sensor (EconoMi$er+ Only)		X
Return Air Temperature Sensor (EconoMi$er+ or EconoMi$er2 Only)		X
Roof Curbs (Vertical and Horizontal Discharge)		X
Thermostats and Subbases		X
Time Guard II (Compressor Cycle Delay) Control Circuit		X
Unit-Mounted Non-Fused Disconnect	X	
Winter Start Time Delay		X

*Factory-installed.
†Field-installed.
**Available as a DEC special order only.

NOTES:
1. Refer to unit price pages or contact your local representative for accessory and option package information.
2. Some options may increase product lead times.

Options and accessories (cont)

48HJ004-014

ITEM	OPTION*	ACCESSORY†
100% Open Two-Position Damper		X
25% Open Two-Position Damper		X
COBRA™ Energy Recovery Unit	X	
COBRA Full Perimeter Roof Curb		X
COBRA Sleeper Rail (for use with Standard Unit Roof Curb)		X
Condenser Coil Grille		X
Condenser Coil Hail Guard Assembly		X
Convenience Outlet (Load Side)	X	
Copper Fins Indoor and Outdoor Coil	X	
Copper Fins Outdoor Coil	X	
E-Coat Outdoor Coil (Aluminum)	X	
E-Coat Outdoor Coil (Copper)	X	
EconoMi$er+ with Controller	X	X
EconoMi$er+ 5-Pin Plug (required for Remote Potentiometer and IAQ Sensor)		X
EconoMi$er+ or EconoMi$er2 575-V Transformer		X
EconoMi$er2 (without controller)	X	X
Electronic Programmable Thermostat		X
Energy$Recycler Mounting Kit		X
Energy$Recycler Supply Air Blower		X
Energy$Recycler Transformer for 460 v		X
Energy$Recycler Transformer for 575 v		X
Energy$Recycler Unit		X
Enthalpy or Differential Enthalpy Sensor (EconoMi$er2)		X
Fan/Filter Status		X
Flue Discharge Deflector		X
Flue Shield		X
High-Static Motor and Drive	X	
Hinged Access Panels	X	
Hinged Panel Kit for Economizer		X
Humidistat		X
Indoor Air Quality (CO_2) Sensor (EconoMi$er+ or EconoMi$er2 Only)		X
Light Commercial Thermidistat		X
Low NO_X (004-006)	X	
LP (Liquid Propane) Conversion Kit		X
Manual Outdoor-Air Damper		X
MoistureMi$er™ Dehumidification Package	X	
Motormaster® I, II, IV Head Pressure Control Low Ambient Kit)		X
Novar Control	X	
Outdoor Air Enthalpy Sensor (EconoMi$er2 Only)		X
Outdoor Air Humidity Sensor (EconoMi$er+ Only)		X
Power Exhaust Transformer for 575 v		X
Power Exhaust with Barometric Relief		X
Pre-coat Aluminum Fins on Outdoor Coil	X	
PremierLink™ DDC Communicating Control	X	X
Return Air Enthalpy Sensor (EconoMi$er2 Only)		X
Return Air Humidity Sensor (EconoMi$er+ Only)		X
Return Air Temperature Sensor (EconoMi$er+ or EconoMi$er2 Only)		X
Roof Curbs (Vertical and Horizontal Discharge)		X
Thermostats and Subbases		X
Thru-the-Bottom Utility Connections		X
Time Guard II (Compressor Cycle Delay) Control Circuit		X
Unit-Mounted Non-Fused Disconnect	X	

*Factory-installed.
†Field-installed.

NOTES:
1. Refer to unit price pages or contact your local representative for accessory and option package information.
2. Some options may increase product lead times.

ITEM	OPTION*	ACCESSORY†
25% Open Two-Position Damper		X
Barometric Relief Damper (Not for use with horizontal roof curb)		X
Condenser Coil Hail Guard Assembly		X
Convenience Outlet (Load Side)	X	
Copper Fins Indoor and Outdoor Coil	X	
Copper Fins Outdoor Coil	X	
E-Coat Outdoor Coil (Aluminum)	X	
E-Coat Outdoor Coil (Copper)	X	
EconoMi$er+ with Controller	X	X
EconoMi$er+ 5-Pin Plug (required for Remote Potentiometer and IAQ Sensor)		X
EconoMi$er+ or EconoMi$er2 575-V Transformer		X
EconoMi$er2 (without controller)	X	X
Electronic Programmable Thermostat		X
Enthalpy or Differential Enthalpy Sensor (EconoMi$er2)		X
Fan/Filter Status		X
High-Static Motor and Drive	X	
Hinged Access Panels	X	
Horizontal Adapter Curb		X
Humidistat		X
Indoor Air Quality (CO_2) Sensor (EconoMi$er+ or EconoMi$er2 Only)		X
Light Commercial Thermidistat		X
LP (Liquid Propane) Conversion Kit		X
Manual Outdoor-Air Damper		X
MoistureMi$er™ Dehumidification Package	X**	
Motormaster® I, V Head Pressure Control (Low Ambient Kit)		X
Novar Control	X**	
Outdoor Air Enthalpy Sensor (EconoMi$er2 Only)		X
Outdoor Air Humidity Sensor (EconoMi$er+ Only)		X
Power Exhaust without Barometric Relief		X
Pre-coat Aluminum Fins on Outdoor Coil	X	
PremierLink™ DDC Communicating Control	X**	X
Return Air Enthalpy Sensor (EconoMi$er2 Only)		X
Return Air Humidity Sensor (EconoMi$er+ Only)		X
Return Air Temperature Sensor (EconoMi$er+ or EconoMi$er2 Only)		X
Roof Curbs (Vertical and Horizontal Discharge)		X
Thermostats and Subbases		X
Time Guard II (Compressor Cycle Delay) Control Circuit		X
Unit-Mounted Non-Fused Disconnect	X**	
Winter Start Time Delay		X

*Factory-installed.
†Field-installed.
**Available as a DEC special order only.

NOTES:
1. Refer to unit price pages or contact your local representative for accessory and option package information.
2. Some options may increase product lead times.

Options and accessories (cont)

Carrier PremierLink™ controls are available as a factory-installed or as a field-installed accessory. The controls can be used to actively monitor and control all modes of operations.

Roof curbs (horizontal and vertical) permit installation and securing of ductwork to curb prior to mounting unit on the curb. Both 14-in. and 24-in. roof curbs are available as field-installed accessories.

**EconoMi$er+** is available as a factory-installed option in vertical supply/return configuration only. (The EconoMi$er+ is available as a field-installed accessory for horizontal and/or vertical supply return configurations.) The EconoMi$er+ is provided with a stand-alone microprocessor controller for non-DDC applications. The EconoMi$er+ is equipped with a barometric relief damper capable of relieving up to 100% return air. Dry bulb outdoor-air temperature sensor is provided as standard. The return air sensor, indoor humidity sensor, and outdoor humidity sensor are provided as field-installed accessories to provide enthalpy control, differential enthalpy control, and differential dry bulb temperature control.

EconoMi$er2 is available as a factory-installed option in vertical supply/return configuration only. (The EconoMi$er2 is available as a field-installed accessory for horizontal and/or vertical supply return configurations.) The EconoMi$er2 is provided without a controller for use with factory-installed PremierLink controls or field-installed third-party controls. The EconoMi$er2 is equipped with a barometric relief damper capable of relieving up to 100% return air. Dry bulb outdoor-air temperature sensor is provided as standard. The enthalpy, differential temperature (adjustable), and differential enthalpy control are provided as field-installed accessories. The EconoMi$er2 is capable of control from a 4 to 20 mA signal through optional 4 to 20 mA design without microprocessor control (required for PremierLink™ or third party control interface).

Manual outdoor-air damper can be preset to admit up to 50% outdoor air for year round ventilation and is available as a field-installed accessory.

Two-position damper package is available as an accessory. Both 25% or 100% outdoor air dampers are available.

Head pressure control (Motormaster) accessory package maintains condensing temperature between 90 F and 110 F at outdoor ambient temperatures down to –20 F by condenser-fan speed modulation or condenser-fan cycling and wind baffles.

Unit-mounted, non-fused disconnect switch provides unit power shutoff. The switch is accessible from outside the unit, provides power off lockout capability and is available as a factory-installed option.

Convenience outlet is factory-installed and internally mounted with easily accessible 115-v female receptacle.

Compressor cycle delay (Time Guard II) accessory prevents unit from restarting for minimum of 5 minutes after shutdown.

Thru-the-bottom utility connectors permit electrical connections to be brought to the unit through the basepan. Connectors are available as field-installed accessories.

Fan/filter status switch accessory provides status of indoor (evaporator) fan (ON/ OFF) or filter (CLEAN/ DIRTY).

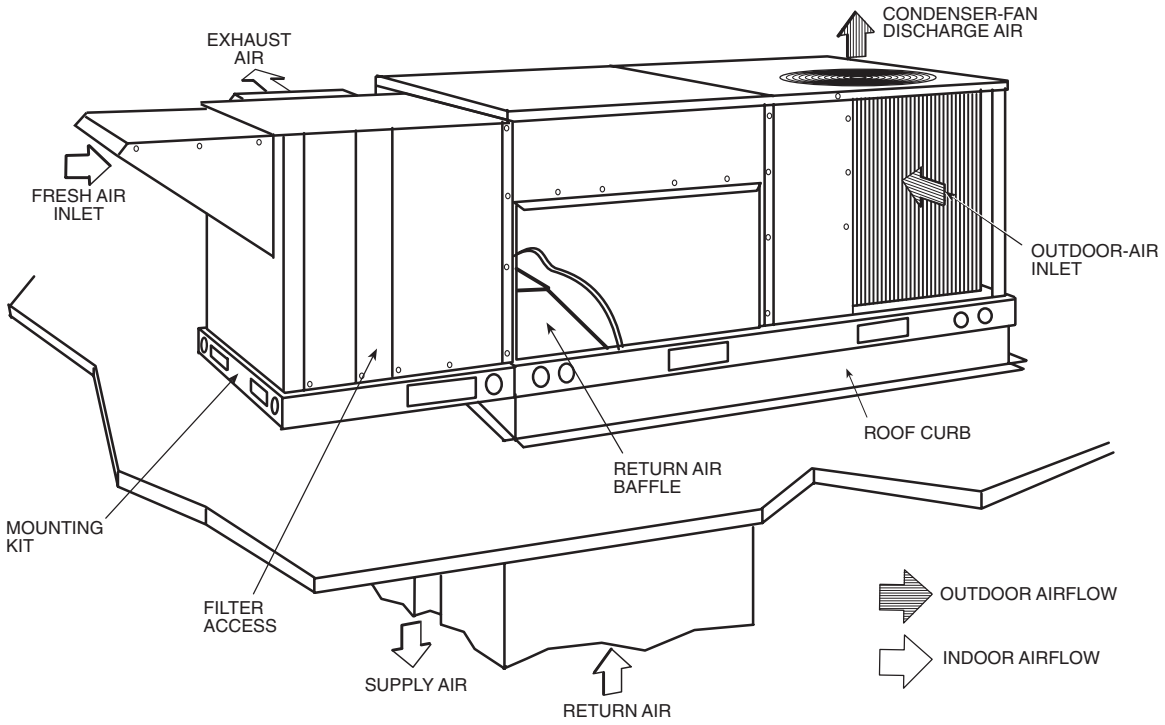
Energy$Recycler recovers energy from building exhaust air and pre-conditions ventilation air to allow higher ventilation requirements and minimizing energy cost. Energy$Recycler is a field-installed accessory.

Power exhaust accessory will provide system exhaust of up to 100% of return air (vertical only). The power exhaust is a field-installed accessory (separate vertical and horizontal design).

Ultra-violet germicidal lamps eliminate odor causing mold and fungus that may develop in the wet area of the evaporator section of the unit. The high output, low temperature germicidal lamps are field installed in the evaporator section of the unit, aimed at the evaporator coil and condensate pan.

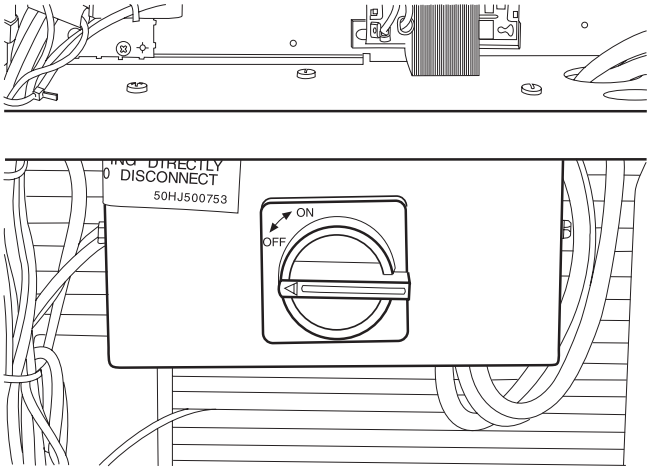
Hinged panel option provides hinged access panels for the filter, compressor, evaporator fan, and control box areas. Filter hinged panels permit tool-less entry for changing filters. Each hinged panel is permanently attached to the rooftop unit. Hinged panels are a factory-installed option.

ACCESSORY ENERGY$RECYCLER (3 TO 12 1/2 TON UNITS ONLY)

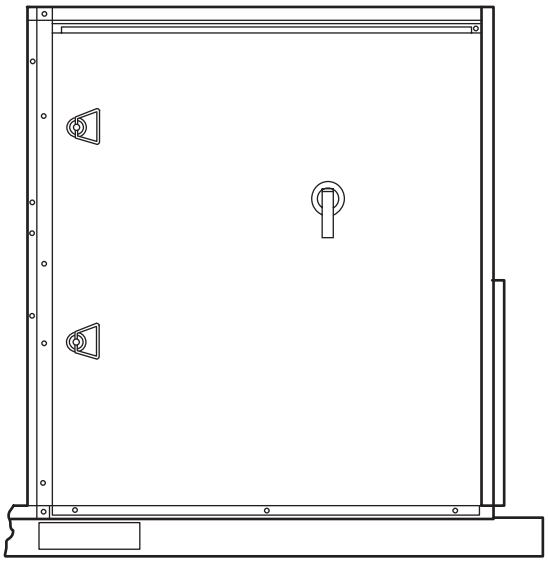


Options and accessories (cont)

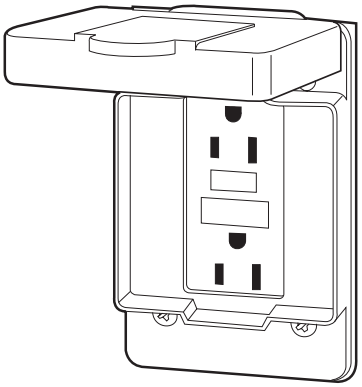
UNIT-MOUNTED DISCONNECT (Sizes 004-014)

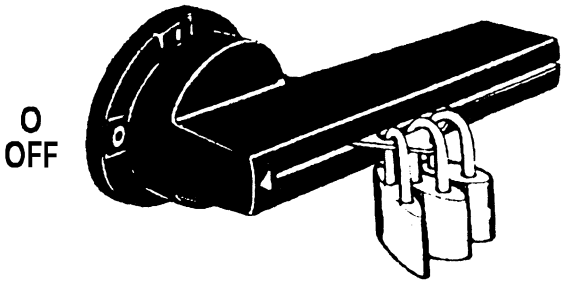


UNIT-MOUNTED DISCONNECT (Sizes 015-028)

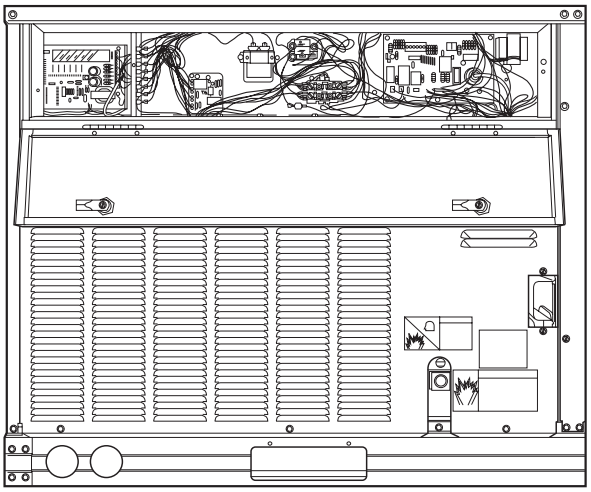


CONVENIENCE OUTLET

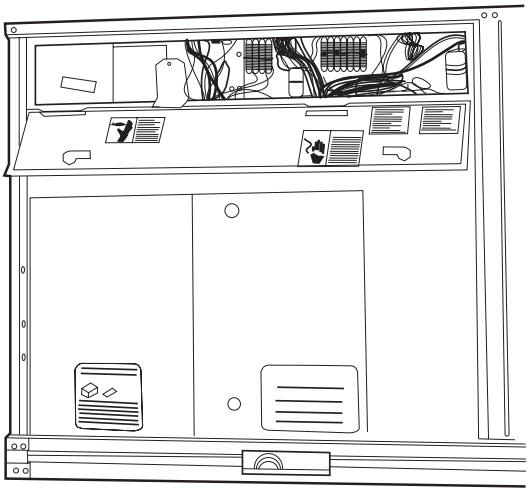




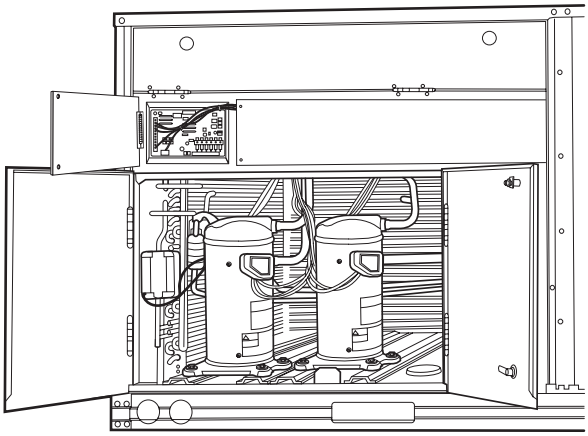
CONTROL BOX HINGED PANEL OPTION*, 48HJ004-007 UNITS SHOWN



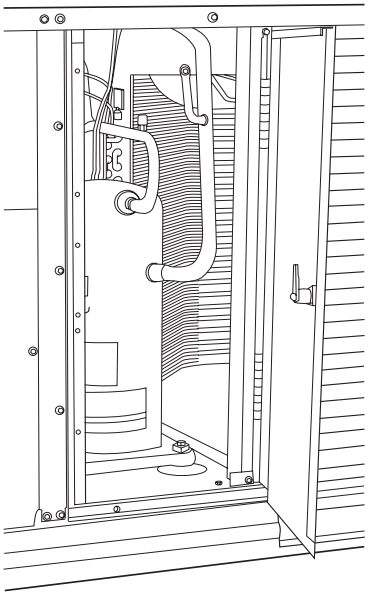
CONTROL BOX HINGED PANEL OPTION*, 48HJ008-014 UNITS SHOWN



COMPRESSOR HINGED PANEL OPTION*, 48HJ008-014 UNITS SHOWN



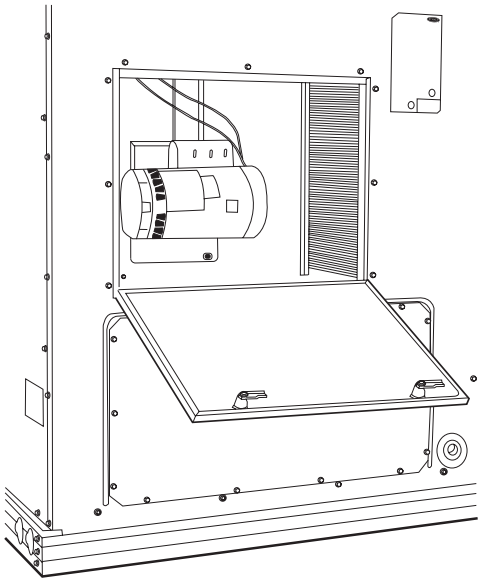
COMPRESSOR HINGED PANEL OPTION*, 48HJ004-006 UNITS SHOWN



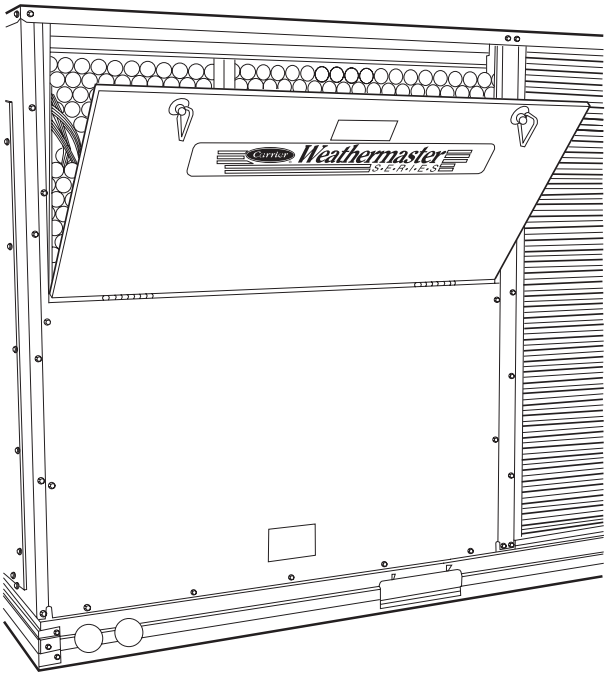
*Hinged panels not available on TM sizes 004-014.

Options and accessories (cont)

EVAPORATOR-FAN HINGED PANEL OPTION*

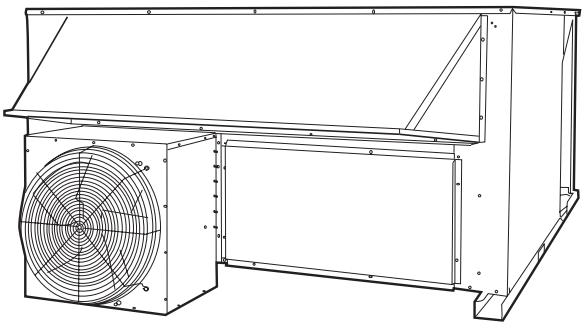


FILTER HINGED PANEL OPTION*

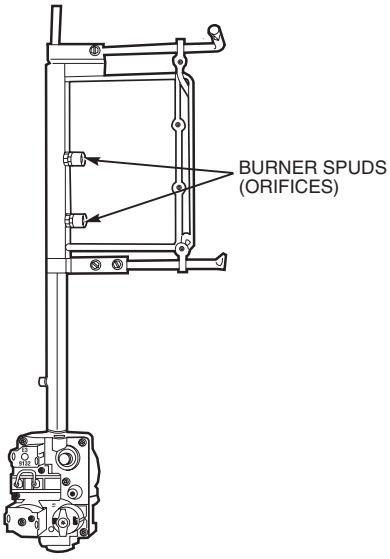


*Hinged panels not available on TM004-014 sizes.

BAROMETRIC RELIEF OR POWER EXHAUST (015-028 Shown)



LP CONVERSION KIT



Physical data — 48TM004-007

UNIT SIZE 48TM		E/F/M/N004	D/E/F/L/M/N005	D/E/F/L/M/N006	D/E/F007
NOMINAL CAPACITY (tons)		3	4	5	6
OPERATING WEIGHT (lb)					
Unit					
Al/Al*		460	470	490	615
Al/Cu*		465	476	497	626
Cu/Cu*		468	482	505	637
EconoMi$er+		50	50	50	50
EconoMi$er2		46	46	46	46
Roof Curb†		115	115	115	115
COMPRESSOR		Reciprocating			Scroll
Quantity		1	1	1	1
No. Cylinders (per Circuit)		2	2	2	2
Oil (oz)		50	50	50	60
REFRIGERANT TYPE		R-22			
Expansion Device		Acutrol™ Metering Device			
Operating Charge (lb-oz)					
Circuit 1		4-5	6-6	7-14	11-0
Circuit 2		—	—	—	—
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Rows...Fins/in.		1...17	2...17	2...17	2...17
Total Face Area (sq ft)		8.36	8.36	10.42	16.5
CONDENSER FAN		Propeller Type			
Nominal Cfm		3500	4000	4000	4100
Quantity...Diameter (in.)		1...22.0	1...22.0	1...22.0	1...22.0
Motor Hp...Rpm		1/4...1100	1/4...1100	1/4...1100	1/4...1100
Watts Input (Total)		325	325	325	320
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins			
Rows...Fins/in.		2...15	2...15	3...15	4...15
Total Face Area (sq ft)		4.17	5.5	5.5	5.5
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)	**Std**	1...10 x 10	1...10 x 10	1...11 x 10	1...10 x 10
	Alt	1...10 x 10	1...10 x 10	1...10 x 10	—
	High-Static	1...10 x 10	1...10 x 10	1...10 x 10	1...10 x 10
Type Drive	**Std**	Direct	Direct	Direct	Belt
	Alt	Belt	Belt	Belt	—
	High-Static	Belt	Belt	Belt	Belt
Nominal Cfm		1200	1600	2000	2100
Maximum Continuous Bhp	**Std**	.34	.75	1.20	2.40
	Alt	1.20	1.20	1.30/2.40**	—
	High-Static	2.40	2.40	2.90	2.90
Motor Frame Size	**Std**	48	48	48	56
	Alt	48	48	56	—
	High-Static	56	56	56	56
Nominal Rpm High/Low	**Std**	860/800	1075/970	1075/1040	—
	Alt	1620	1620	1725	—
	High-Static	1725	1725	1725	1725
Fan Rpm Range	**Std**	—	—	—	1070-1460
	Alt	685-1045	770-1175	900-1300	—
	High-Static	1075-1455	1075-1455	1300-1685	1300-1685
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	**Std**	—	—	—	2.8/3.8
	Alt	1.9/2.9	1.9/2.9	2.8/3.8	—
	High-Static	2.8/3.8	2.8/3.8	3.4/4.4	3.4/4.4
Nominal Motor Shaft Diameter (in.)	**Std**	1/2	1/2	1/2	5/8
	Alt	1/2	1/2	5/8	—
	High-Static	5/8	5/8	7/8	7/8
Fan Pulley Pitch Diameter (in.)	**Std**	—	—	—	4.5
	Alt	4.5	4.0	5.5	—
	High-Static	4.5	4.5	4.5	4.5
Belt, Quantity...Type...Length (in.)	**Std**	—	—	—	1...A...39
	Alt	1...A...36	1...A...36	1...A...40	—
	High-Static	1...A...39	1...A...39	1...A...40	1...A...40
Pulley Center Line Distance (in.)	**Std**	—	—	—	14.7-15.5
	Alt	10.0-12.4	10.0-12.4	14.7-15.5	—
	High-Static	10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
Speed Change per Full Turn of Movable Pulley Flange (rpm)	**Std**	—	—	—	80
	Alt	48	70	80	—
	High-Static	65	65	60	60
Movable Pulley Maximum Full Turns From Closed Position	**Std**	—	—	—	5
	Alt	5	5	5	—
	High-Static	6	6	5	5
Factory Setting	**Std**	—	—	—	3
	Alt	3	3	3	—
	High-Static	3 1/2	3 1/2	3 1/2	3 1/2
Factory Speed Setting (rpm)	**Std**	—	—	—	1226
	Alt	829	932	1100	—
	High-Static	1233	1233	1416	1416
Fan Shaft Diameter at Pulley (in.)		5/8	5/8	5/8	5/8

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper

*Evaporator coil fin material/condenser coil fin material. Contact your local representative for details about coated fins.
†Weight of 14-in. roof curb.
**Single phase/three-phase.
††Rollout switch lockout is manually reset by interrupting power to unit or resetting thermostat.
***Three-phase standard high heat models have heating input values as shown. Single-phase standard high heat models have one-stage heating with heating input values as follows:
48TMF004 — 115,000 Btuh
48TMF005,006 — 150,000 Btuh
†††California SCAQMD compliant Low NO_x models have combustion products that are controlled to 40 nanograms per joule or less.

NOTES:
1. High-static motor not available on single-phase units.
2. An LP kit is available as an accessory. Kit may be used at elevations as high as 2000 ft. LP kit is not used with Low Nox units.

Physical data — 48TM004-007 (cont)

UNIT SIZE 48TM			E/F/M/N004	D/E/F/L/M/N005	D/E/F/L/M/N006	D/E/F007
FURNACE SECTION						
Rollout Switch Cutout Temp (F)††			195	195	195	195
Burner Orifice Diameter (in. ...drill size)						
Natural Gas	Std	TMD	—	.113...33	.113...33	.113...33
		TME	.113...33	.113...33	.113...33	.113...33
		TMF	.113...33	.129...30	.129...30	.129...30
		TML	—	.102...38	.102...38	—
		TMM	.102...38	.102...38	.102...38	—
		TMN	.102...38	.116...32	.116...32	—
Liquid Propane	Alt	TMD	—	.089...43	.089...43	.089...43
		TME	.089...43	.089...43	.089...43	.089...43
		TMF	.089...43	.104...37	.104...37	.104...37
Thermostat Heat Anticipator Setting (amps)						
208/230 v and 575 Stage 1			.14	.14	.14	.14
Stage 2			.14	.14	.14	.14
460 v Stage 1			.14	.14	.14	.14
Stage 2			.14	.14	.14	.14
Gas Input (Btuh) Standard Units		TMD	—	—/74,000	—/74,000	—/74,000
(Stage 1/Stage 2)		TME	—/74,000	—/115,000	—/115,000	—/115,000
		TMF***	82,000/115,000	120,000/150,000	120,000/150,000	120,000/150,000
Low NOx Units		TML†††	—	60,000	60,000	—
		TMM†††	60,000	90,000	90,000	—
		TMN†††	90,000	120,000	120,000	—
Efficiency (Steady State) (%)			80	80	80	80
Temperature Rise Range		TMD	—	15-45	15-45	15-45
		TME	15-45	35-65	35-65	35-65
		TMF	55-85	50-80	50-80	50-80
		TML	—	20-50	20-50	—
		TMM	20-50	30-60	30-60	—
		TMN	30-60	40-70	40-70	—
Manifold Pressure (in. wg)						
Natural Gas	Std		3.5	3.5	3.5	3.5
Liquid Propane	Alt		3.5	3.5	3.5	3.5
Gas Valve Quantity			1	1	1	1
Gas Valve Pressure Range						
Psig			0.180-0.487	0.180-0.487	0.180-0.487	0.180-0.487
in. wg			5.0-13.5	5.0-13.5	5.0-13.5	5.0-13.5
Field Gas Connection Size (in.)			1/2	1/2	1/2	1/2
HIGH-PRESSURE SWITCH (psig)						
Standard Compressor			450 ± 50			500 ± 50
Internal Relief (Differential)						
Cutout			428			428
Reset (Auto.)			320			320
LOW-PRESSURE SWITCH (psig)						
Cutout			7 ± 3			
Reset (Auto.)			22 ± 7			
FREEZE PROTECTION THERMOSTAT (F)						
Opens			30 ± 5			
Closes			45 ± 5			
OUTDOOR-AIR INLET SCREENS			Cleanable			
Quantity...Size (in.)			Varies by Option Selected			
RETURN-AIR FILTERS			Throwaway			
Quantity...Size (in.)			2...16 x 25 x 2			

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper

*Evaporator coil fin material/condenser coil fin material. Contact your local representative for details about coated fins.
†Weight of 14-in. roof curb.
**Single phase/three-phase.
††Rollout switch lockout is manually reset by interrupting power to unit or resetting thermostat.
***Three-phase standard high heat models have heating input values as shown. Single-phase standard high heat models have one-stage heating with heating input values as follows:
48TMF004 — 115,000 Btuh
48TMF005,006 — 150,000 Btuh
†††California SCAQMD compliant Low NO_x models have combustion products that are controlled to 40 nanograms per joule or less.

NOTES:
1. High-static motor not available on single-phase units.
2. An LP kit is available as an accessory. Kit may be used at elevations as high as 2000 ft. LP kit is not used with Low Nox units.

Physical data — 48TM008-014

UNIT SIZE 48TM		D/E/F008	D/E/F009	D/E/F012	D/E014
NOMINAL CAPACITY (tons)		7 1/2	8 1/2	10	12 1/2
OPERATING WEIGHT (lb)					
Unit					
Al/Al*		870	880	1035	1050
Al/Cu*		881	896	1057	1077
Cu/Cu*		893	907	1080	1100
EconoMi$er+		75	75	75	75
EconoMi$er2		71	71	71	71
Roof Curb†		143	143	143	143
COMPRESSOR		Reciprocating	Scroll	Scroll	Scroll
Quantity		2	2	2	2
No. Cylinders (per Circuit)		2	2	2	2
Oil (oz) (each compressor)		42	53	50	60
REFRIGERANT TYPE		R-22			
Expansion Device		Acutrol™ Metering Device			
Operating Charge (lb-oz)					
Circuit 1		7-10	7-14	8-10	9-8
Circuit 2		8-2	8-5	8-8	9-5
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Rows...Fins/in.		2...17	2...17	2...17	2...17
Total Face Area (sq ft)		20.50	20.50	25.00	25.00
CONDENSER FAN		Propeller Type			
Nominal Cfm		6500	6500	7000	7000
Quantity...Diameter (in.)		2...22	2...22	2...22	2...22
Motor Hp...Rpm		1/4...1100	1/4...1100	1/4...1100	1/4...1100
Watts Input (Total)		650	650	650	650
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Face Split			
Rows...Fins/in.		3...15	3...15	3...15	4...15
Total Face Area (sq ft)		8.9	8.9	10.0	11.1
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)	**Std**	1...15 x 15	1...15 x 15	1...15 x 15	1...15 x 15
	Alt	1...15 x 15	—	1...15 x 15	1...15 x 15
	High-Static	1...15 x 15	1...15 x 15	1...15 x 15	—
Type Drive	**Std**	Belt	Belt	Belt	Belt
	Alt	Belt	—	Belt	Belt
	High-Static	Belt	Belt	Belt	—
Nominal Cfm		2900	3000	3200	5000
Maximum Continuous Bhp	**Std**	2.40	2.40	2.40	3.70
	Alt	2.40	—	2.90	5.25
	High-Static	3.70	3.70	5.25	—
Motor Frame Size	**Std**	56	56	56	56
	Alt	56	—	56	56
	High-Static	56	56	56	—
Fan Rpm Range	**Std**	590-840	685-935	685-935	860-1080
	Alt	685-935	—	835-1085	830-1130
	High-Static	860-1080	860-1080	830-1130	—
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		1500	1500	1500	1500
Motor Pulley Pitch Diameter Min/Max (in.)	**Std**	2.4/3.4	2.8/3.8	2.8/3.8	4.0/5.0
	Alt	2.8/3.8	—	3.4/4.4	3.1/4.1
	High-Static	4.0/5.0	4.0/5.0	2.8/3.8	—
Nominal Motor Shaft Diameter (in.)	**Std**	5/8	5/8	5/8	7/8
	Alt	5/8	—	7/8	7/8
	High-Static	7/8	7/8	7/8	—
Fan Pulley Pitch Diameter (in.)	**Std**	7.0	7.0	7.0	8.0
	Alt	7.0	—	7.0	5.9
	High-Static	8.0	8.0	5.8	—
Belt, Quantity...Type...Length (in.)	**Std**	1...A...48	1...A...48	1...A...49	1...A...53
	Alt	1...A...48	—	1...A...51	1...BX...48
	High-Static	1...A...53	1...A...53	1...BX...48	—
Pulley Center Line Distance (in.)	**Std**	16.75-19.25	16.75-19.25	15.85-17.50	15.85-17.50
	Alt	16.75-19.25	—	15.85-17.50	15.85-17.50
	High-Static	16.75-19.25	16.75-19.25	15.85-17.50	—
Speed Change per Full Turn of Movable Pulley Flange (rpm)	**Std**	50	50	50	44
	Alt	50	—	50	50
	High-Static	60	60	60	—
Movable Pulley Maximum Full Turns From Closed Position	**Std**	5	5	5	5
	Alt	5	—	5	6
	High-Static	5	5	6	—
Factory Setting	**Std**	5	5	5	5
	Alt	5	—	5	5
	High-Static	5	5	5	—
Factory Speed Setting (rpm)	**Std**	590	685	685	860
	Alt	685	—	835	887
	High-Static	860	860	887	—
Fan Shaft Diameter at Pulley (in.)		1	1	1	1

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper

*Evaporator coil fin material/condenser coil fin material. Contact your local representative for details about coated fins.
†Weight of 14-in. roof curb.
**Rollout switch lockout is manually reset by interrupting power to unit or resetting thermostat.

Physical data — 48TM008-014 (cont)

UNIT SIZE 48TM			D/E/F008	D/E/F009	D/E/F012	D/E014
FURNACE SECTION						
Rollout Switch Cutout Temp (F)**			195	195	195	195
Burner Orifice Diameter (in. ...drill size)						
Natural Gas	**Std**	**TMD**	.120...31	.120...31	.120...31	.120...31
		TME	.120...31	.120...31	.120...31	.129...30
		TMF	.120...31	.120...31	.129...30	—
Liquid Propane	**Alt**	**TMD**	.096...41	.096...41	.096...41	.096...41
		TME	.096...41	.096...41	.096...41	.102...38
		TMF	.096...41	.096...41	.102...38	—
Thermostat Heat Anticipator Setting (amps)						
208/230 v and 575 Stage 1			.14	.14	.14	.14
Stage 2			.20	.20	.20	.20
460 v Stage 1			.14	.14	.14	.14
Stage 2			.20	.20	.20	.20
Gas Input (Btuh) Stage 1		**TMD**	125,000	125,000	120,000	180,000
		TME	120,000	120,000	180,000	200,000
		TMF	180,000	180,000	200,000	—
Stage 2		**TMD**	—	—	180,000	224,000
		TME	180,000	180,000	224,000	250,000
		TMF	224,000	224,000	250,000	—
Efficiency (Steady State) (%)			80	80	80	80
Temperature Rise Range		**TMD**	20-50	20-50	35-65	35-65
		TME	35-65	35-65	35-65	40-70
		TMF	45-75	45-75	40-70	—
Manifold Pressure (in. wg)						
Natural Gas	**Std**		3.5	3.5	3.5	3.5
Liquid Propane	**Alt**		3.5	3.5	3.5	3.5
Gas Valve Quantity			1	1	1	1
Gas Valve Pressure Range						
Psig			0.180-0.487	0.180-0.487	0.180-0.487	0.180-0.487
in. wg			5.0-13.5	5.0-13.5	5.0-13.5	5.0-13.5
Field Gas Connection Size (in.)		**TMD**	1/2	1/2	3/4	3/4
		TME	3/4	3/4	3/4	3/4
		TMF	3/4	3/4	3/4	—
HIGH-PRESSURE SWITCH (psig)						
Standard Compressor Internal Relief (Differential)				450 ± 50		500 ± 50
Cutout				428		428
Reset (Auto.)				320		320
LOW-PRESSURE SWITCH (psig)						
Cutout				7 ± 3		
Reset (Auto.)				22 ± 7		
FREEZE PROTECTION THERMOSTAT (F)						
Opens				30 ± 5		
Closes				45 ± 5		
OUTDOOR-AIR INLET SCREENS				Cleanable		
Quantity...Size (in.)				Varies by Option Selected		
RETURN-AIR FILTERS				Throwaway		
Quantity...Size (in.)			4...16 x 20 x 2	4...20 x 20 x 2	4...20 x 20 x 2	4...20 x 20 x 2

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper

*Evaporator coil fin material/condenser coil fin material. Contact your local representative for details about coated fins.
†Weight of 14-in. roof curb.
**Rollout switch lockout is manually reset by interrupting power to unit or resetting thermostat.

Physical data — 48TM016-028

UNIT 48TM		016D/F	020D/F	025D/F	028D/F
NOMINAL CAPACITY (tons)		15	18	20	25
OPERATING WEIGHT (lb)		1800	1850	1900	2270
EconoMi$er+		90	90	90	90
EconoMi$er2		85	85	85	85
MoistureMi$er™ Dehumidification Package		40	40	40	40
COMPRESSOR/MANUFACTURER		Scroll, Copeland			
Quantity...Model (Ckt 1, Ckt 2)		1...ZR94KC, 1...ZR72KC	1...ZR108KC, 1...ZR94KC	1...ZR125KC, 1...ZR108KC	1...ZRU140KC,* 1...ZR144KC
Capacity Stages (%)		60, 40	55, 45	55, 45	50, 50
Number of Refrigerant Circuits		2	2	2	2
Oil (oz) (Ckt 1, Ckt 2)		85, 60	106, 81	106,106	136, 106
REFRIGERANT TYPE		R-22			
Expansion Device		TXV			
Operating Charge (lb-oz)					
Circuit 1†		19-8	19-8	19-11	26-13
Circuit 2		13-8	19-2	13-14	25-10
CONDENSER COIL		Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins			
Rows...Fins/in.		4...15	4...15	4...15	3...15 (2 coils)
Total Face Area (sq ft)		21.7	21.7	21.7	43.4
CONDENSER FAN		Propeller Type			
Nominal Cfm		10,500	10,500	14,200	21,000
Quantity...Diameter (in.)		3...22	3...22	2...30	6...22
Motor Hp...Rpm		1/2...1050	1/2...1050	1...1075	1/2...1050
Watts Input (Total)		1100	1100	3400	2200
EVAPORATOR COIL		Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced or Copper Plate Fins, Face Split			
Rows...Fins/in.		4...15	4...15	4...15	4...15
Total Face Area (sq ft)		17.5	17.5	17.5	17.5
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)		2...12 x 12	2...12 x 12	2...12 x 12	2...12 x 12
Type Drive		Belt	Belt	Belt	Belt
Nominal Cfm		6000	7200	8000	10,000
Motor Hp		5	5	7 1/2	10
Motor Nominal Rpm		1745	1745	1745	1740
Maximum Continuous Bhp		6.13	5.90	8.7 [208/230, 575 v] 9.5 [460 v]	10.2 [208/230, 575 v] 11.8 [460 v]
Motor Frame Size		184T	184T	213T	215T
Nominal Rpm High/Low		—	—	—	—
Fan Rpm Range	**Low-Medium Static**	873-1021	910-1095	1002-1151	1066-1283
	High Static	1025-1200	1069-1287	1193-1369	1332-1550
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		1550	1550	1550	1550
Motor Pulley Pitch Diameter	**Low-Medium Static**	4.9/5.9	4.9/5.9	5.4/6.6	4.9/5.9
Min/Max (in.)	**High Static**	4.9/5.9	4.9/5.9	5.4/6.6	4.9/5.9
Nominal Motor Shaft Diameter (in.)		1 1/8	1 1/8	1 3/8	1 3/8
Fan Pulley Pitch Diameter (in.)	**Low-Medium Static**	9.4	9.4	9.4	8.0
	High Static	8.0	8.0	7.9	6.4
Nominal Fan Shaft Diameter (in.)		1 7/16	1 7/16	1 7/16	1 7/16
Belt, Quantity...Type...Length (in.)	**Low-Medium Static**	1...BX...50	1...BX...50	1...BX...53	2...BX...50
	High Static	1...BX...48	1...BX...48	1...BX...50	2...BX...47
Pulley Center Line Distance (in.)		13.3-14.8	13.3-14.8	14.6-15.4	14.6-15.4
Speed Change per Full Turn of	**Low-Medium Static**	37	37	37	36
Movable Pulley Flange (rpm)	**High Static**	44	34	44	45
Movable Pulley Maximum Full Turns From Closed Position		6**	6††	6**	6††
Factory Speed		3 1/2	3 1/2	3 1/2	3 1/2
Factory Speed Setting (rpm)	**Low-Medium Static**	965	1002	1095	1182
	High Static	1134	1178	1303	1470
Fan Shaft Diameter at Pulley (in.)		1 7/16	1 7/16	1 7/16	1 7/16

LEGEND

Bhp — Brake Horsepower
TXV — Thermostatic Expansion Valve

*The ZRU140KC compressor is a tandem compressor, consisting of a ZR72KC (25% total capacity) and a ZR68KC (24% total capacity).
†Circuit 1 uses the lower portion of the condenser coil and lower portion of the evaporator coils; and Circuit 2 uses the upper portion of both coils.
**Pulley has 6 turns. Due to belt and pulley size, movable pulley cannot be set to 0 to 1 1/2 turns open.
††Pulley has 6 turns. Due to belt and pulley size, movable pulley cannot be set to 0 to 1/2 turns open.
***Rollout switch is manual reset.
†††The 48TM028 unit requires 2-in. industrial-grade filters capable of handling face velocities up to 625 ft/min (such as American Air Filter no. 5700 or equivalent).

NOTES:
1. The 48TM016-028 units have a low-pressure switch (standard) located on the suction side.
2. A Liquid Propane kit is available as an accessory. Kit may be used at elevations as high as 2000 ft.
3. Data for 48TMM unit is the same as 48TMD. Data for 48TMN unit is the same as 48TMF.

Physical data — 48TM016-028 (cont)

UNIT 48TM		016D/F	020D/F	025D/F	028D/F
FURNACE SECTION					
Rollout Switch Cutout Temp (F)* **		190	190	190	190
Burner Orifice Diameter (in. ...drill size)					
Natural Gas	**Std**	0.1285...30/0.136...29	0.1285...30/0.136...29	0.1285...30/0.136...29	0.1285...30/0.136...29
Liquid Propane	**Alt**	0.1065...36/0.1065...36	0.1065...36/0.1065...36	0.1065...36/0.1065...36	0.1065...36/0.1065...36
Thermostat Heat Anticipator Setting (amps)					
208/230, 575 v **Stage 1**		0.98	0.98	0.98	0.98
Stage 2		0.44	0.44	0.44	0.44
460 v **Stage 1**		0.80	0.80	0.80	0.80
Stage 2		0.44	0.44	0.44	0.44
Gas Input **Stage 1**		206,000/270,000	206,000/270,000	206,000/270,000	206,000/270,000
Stage 2		275,000/360,000	275,000/360,000	275,000/360,000	275,000/360,000
Efficiency (Steady-State) (%)		81	81	81	81
Temperature Rise Range		15-45/20-50	15-45/20-50	15-45/20-50	15-45/20-50
Manifold Pressure (in. wg)					
Natural Gas	**Std**	3.3	3.3	3.3	3.3
Liquid Propane	**Alt**	3.3	3.3	3.3	3.3
Gas Valve Quantity		1	1	1	1
Gas Valve Pressure Range					
in. wg		5.5-13.5	5.5-13.5	5.5-13.5	5.5-13.5
psig		0.235-0.487	0.235-0.487	0.235-0.487	0.235-0.487
Field Gas Connection Size (in.-FPT)		3/4	3/4	3/4	3/4
HIGH-PRESSURE SWITCH (psig)					
Cutout		426			
Reset (Auto)		320			
LOW-PRESSURE SWITCH (psig)					
Cutout		27			
Reset (Auto)		44			
FREEZE PROTECTION THERMOSTAT (F)					
Opens		30 ± 5			
Closes		45 ± 5			
OUTDOOR-AIR INLET SCREENS		Cleanable			
Quantity...Size (in.)		2...20 x 25 x 1 1...20 x 20 x 1			
RETURN-AIR FILTERS		Throwaway†††			
Quantity...Size (in.)		4...20 x 20 x 2 4...16 x20 x 2			
POWER EXHAUST		1/2 Hp, 208/230-460 v Motor Direct Drive, Propeller-Fan (Factory-Wired for 460 v)			

LEGEND

Bhp — Brake Horsepower
TXV — Thermostatic Expansion Valve

*The ZRU140KC compressor is a tandem compressor, consisting of a ZR72KC (25% total capacity) and a ZR68KC (24% total capacity).
†Circuit 1 uses the lower portion of the condenser coil and lower portion of the evaporator coils; and Circuit 2 uses the upper portion of both coils.
**Pulley has 6 turns. Due to belt and pulley size, movable pulley cannot be set to 0 to 1 1/2 turns open.
††Pulley has 6 turns. Due to belt and pulley size, movable pulley cannot be set to 0 to 1/2 turns open.
***Rollout switch is manual reset.
†††The 48TM028 unit requires 2-in. industrial-grade filters capable of handling face velocities up to 625 ft/min (such as American Air Filter no. 5700 or equivalent).

NOTES:
1. The 48TM016-028 units have a low-pressure switch (standard) located on the suction side.
2. A Liquid Propane kit is available as an accessory. Kit may be used at elevations as high as 2000 ft.
3. Data for 48TMM unit is the same as 48TMD. Data for 48TMN unit is the same as 48TMF.

OPERATING AND RIGGING WEIGHTS

UNIT	BASE UNIT OPERATING WEIGHTS*							
	016		020		025		028	
	lb	kg	lb	kg	lb	kg	lb	kg
48TMD/F	1800	816	1850	839	1900	862	2270	1030

*Base unit weight does not include copper coils, economizer, power exhaust, barometric relief or crating. See Options and Accessories table below for more information.

NOTE: For 016,020 unit, add 75 lb (34 kg) for domestic crating. For 025 unit, add 135 lb (61 kg). For 028 unit, add 175 lb (79 kg) for domestic crating. For export crating add 500 lb (227 kg).

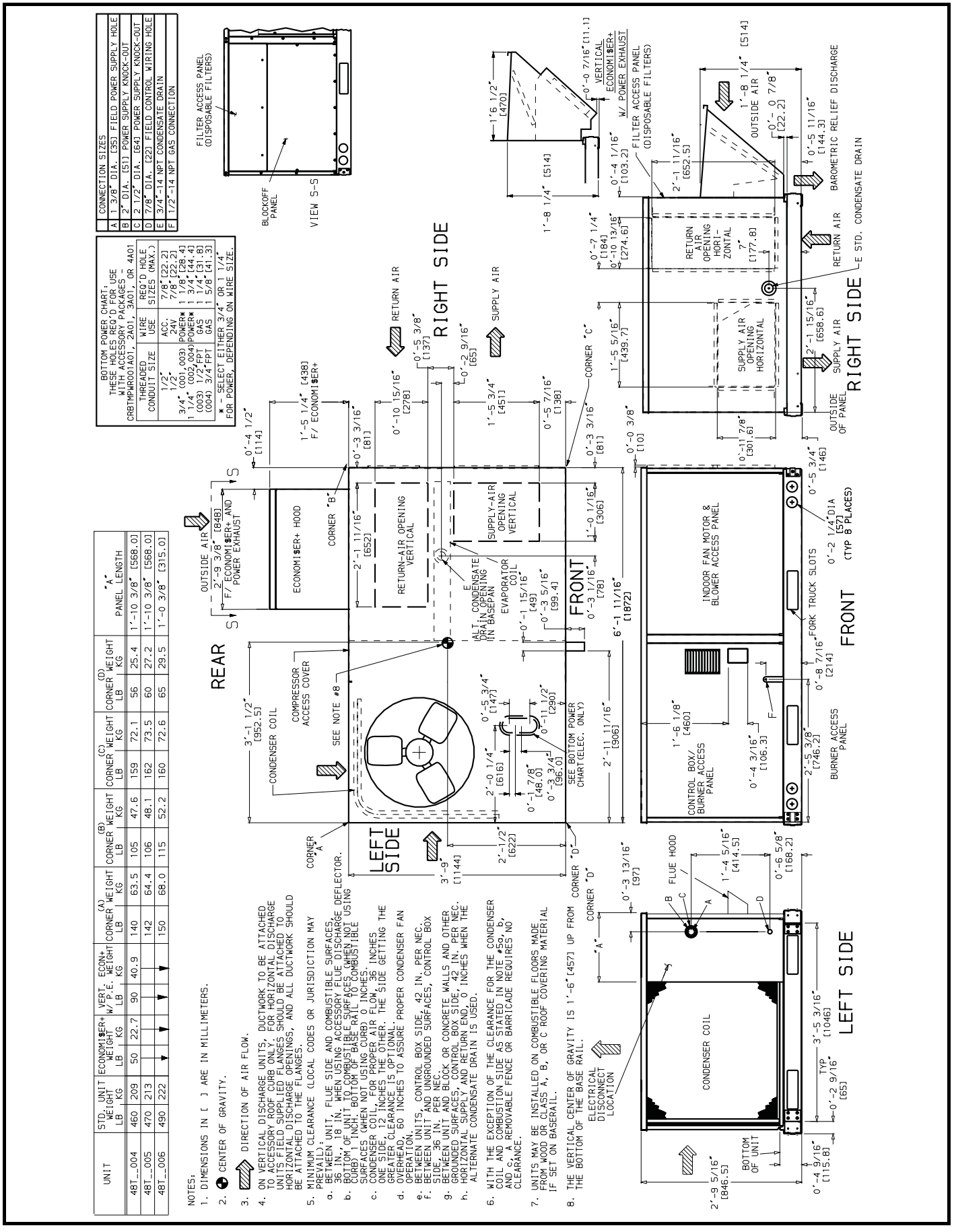
OPTIONS AND ACCESSORIES (Weight Adders)

OPTION/ ACCESSORY	OPTION/ACCESSORY WEIGHTS							
	016		020		024		028	
	lb	kg	lb	kg	lb	kg	lb	kg
Barometric Relief Damper	50	23	50	23	50	23	50	23
Power Exhaust	85	39	85	39	85	39	85	39
EconoMi$er+	90	41	90	41	90	41	90	41
EconoMi$er2	85	39	85	39	85	39	85	39
Cu Condenser Coil	150	68	150	68	150	68	150	68
Cu Condenser and Evaporator Coils	280	127	280	127	280	127	280	127
Roof Curb (14-in. curb)	200	91	200	91	200	91	200	91
Horizontal Adapter Curb (Pre-Assembled)	250	113	250	113	250	113	250	113
Horizontal Adapter Curb (Field-Assembled)	348	156	343	156	343	156	343	156
Hail Guard	60	27	60	27	60	27	—	—
MoistureMi$er™ Dehumidification Package	40	18	40	18	40	18	40	18

LEGEND

Cu — Copper

Base unit dimensions — 48TM004-006



UNIT	STD. UNIT WEIGHT LB	STD. UNIT WEIGHT KG	ECONOMI$ER+ WEIGHT LB	ECONOMI$ER+ WEIGHT KG	VERT. ECON+ W/ P.E. WEIGHT LB	VERT. ECON+ W/ P.E. WEIGHT KG	(A) CORNER WEIGHT LB	(A) CORNER WEIGHT KG	(B) CORNER WEIGHT LB	(B) CORNER WEIGHT KG	(C) CORNER WEIGHT LB	(C) CORNER WEIGHT KG	(D) CORNER WEIGHT LB	(D) CORNER WEIGHT KG	"A" PANEL LENGTH
48T_-004	460	209	50	22.7	90	40.9	140	63.5	105	47.6	159	72.1	56	25.4	1'-10 3/8" [568.0]
48T_-005	470	213					142	64.4	106	48.1	162	73.5	60	27.2	1'-10 3/8" [568.0]
48T_-006	490	222					150	68.0	115	52.2	160	72.6	65	29.5	1'-0 3/8" [315.0]

NOTES:
1. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. ⊕ CENTER OF GRAVITY.
3. ⇨ DIRECTION OF AIR FLOW.
4. ON VERTICAL DISCHARGE UNITS, DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY. FOR HORIZONTAL DISCHARGE UNITS FIELD SUPPLIED FLANGES SHOULD BE ATTACHED TO HORIZONTAL DISCHARGE OPENINGS, AND ALL DUCTWORK SHOULD BE ATTACHED TO THE FLANGES.
5. MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL).
   a. BETWEEN UNIT, FLUE SIDE AND COMBUSTIBLE SURFACES, 36 IN., 18 IN. WHEN USING ACCESSORY FLUE DISCHARGE DEFLECTOR.
   b. BOTTOM OF UNIT TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 1 INCH. BOTTOM OF BASE RAIL TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES.
   c. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   d. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   e. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   f. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   g. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   h. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL AND COMBUSTION SIDE AS STATED IN NOTE #5g, b, AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL IF SET ON BASERAIL.
8. THE VERTICAL CENTER OF GRAVITY IS 1'-6" [457] UP FROM THE BOTTOM OF THE BASE RAIL.

BOTTOM POWER CHART; THESE HOLES REQ'D FOR USE WITH ACCESSORY PACKAGES – CRBTMPWR001A01, 2A01, 3A01, OR 4A01

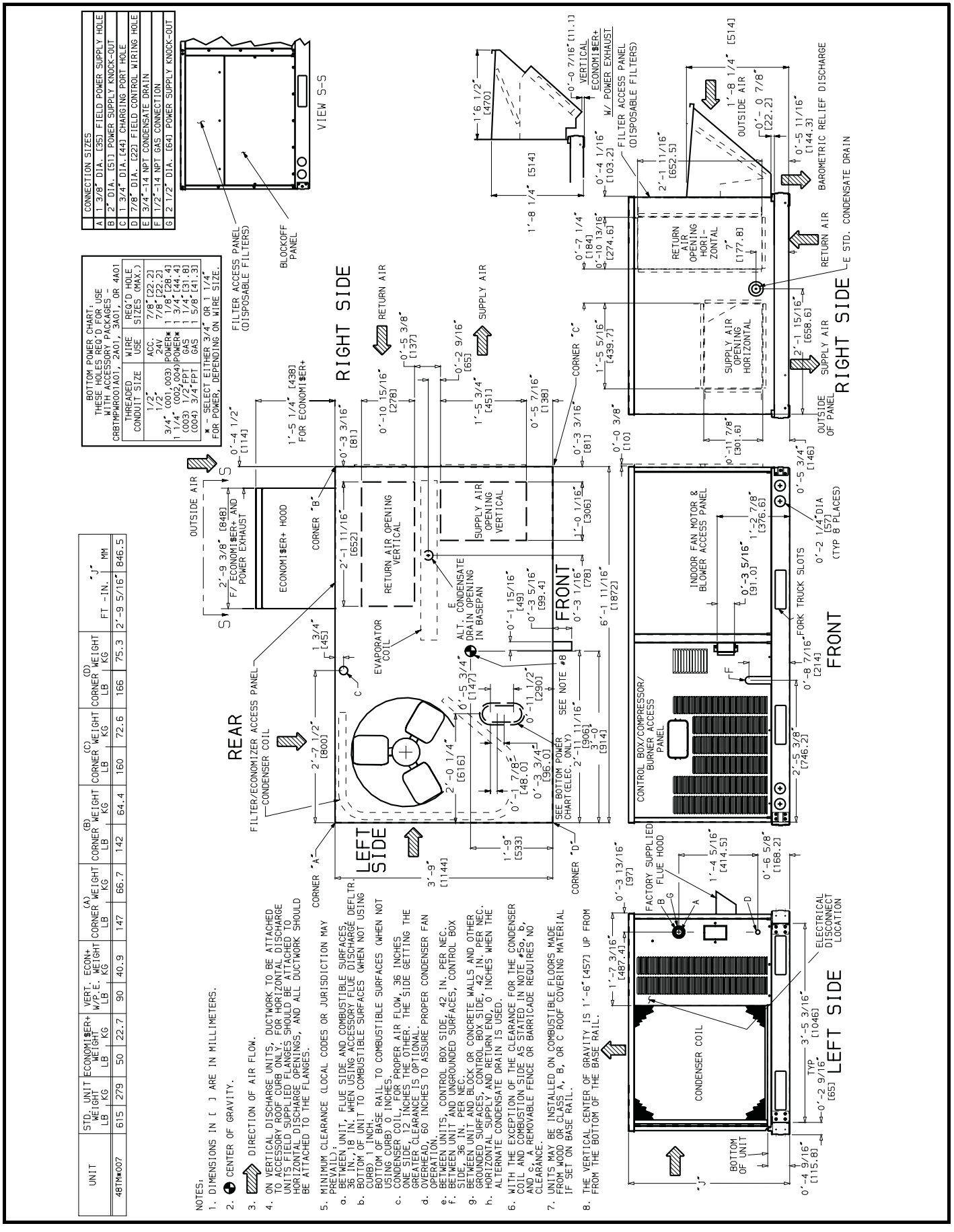
THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
1/2"	ACC. 24V	7/8" [22.2]
3/4" (001, 003) 1 1/4" (002, 004)	POWER*	7/8" [22.2] 1 1/8" [28.4]
(003) 1/2" FPT	GAS	1 3/4" [44.4] 1 1/4" [31.8]
(004) 3/4" FPT	GAS	1 5/8" [41.3]

* – SELECT EITHER 3/4" OR 1 1/4" FOR POWER, DEPENDING ON WIRE SIZE.

	CONNECTION SIZES
A	1 3/8" DIA. [35] FIELD POWER SUPPLY HOLE
B	2" DIA. [51] POWER SUPPLY KNOCK-OUT
C	2 1/2" DIA. [64] POWER SUPPLY KNOCK-OUT
D	7/8" DIA. [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	1/2"-14 NPT GAS CONNECTION

48TM

Base unit dimensions — 48TM007



UNIT	STD. UNIT WEIGHT LB	STD. UNIT WEIGHT KG	ECONOMI$ER+ WEIGHT LB	ECONOMI$ER+ WEIGHT KG	VERT. W/P.E. WEIGHT LB	VERT. W/P.E. WEIGHT KG	ECON+ WEIGHT LB	ECON+ WEIGHT KG	(A) CORNER WEIGHT LB	(A) CORNER WEIGHT KG	(B) CORNER WEIGHT LB	(B) CORNER WEIGHT KG	(C) CORNER WEIGHT LB	(C) CORNER WEIGHT KG	(D) CORNER WEIGHT LB	(D) CORNER WEIGHT KG	"J" FT -IN.	"J" MM
48TM*007	615	279	50	22.7	90	40.9	147	66.7	142	64.4	160	72.6	166	75.3	2'-9 5/16"	846.5

BOTTOM POWER CHART: THESE HOLES REQ'D FOR USE WITH ACCESSORY PACKAGES CRBTMPAROO1(A01, 2A01, 3A01, OR 4A01			
THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)	
1/2"	ACC.	7/8" [22.2]	
1/2"	24V	7/8" [22.2]	
3/4" (001,003)	POWER*	1 1/8" [28.4]	
1 1/4" (002,004)	POWER*	1 3/4" [44.4]	
(003) 1/2" FPT	GAS	1 1/4" [31.8]	
(004) 3/4" FPT	GAS	1 5/8" [41.3]	

* – SELECT EITHER 3/4" OR 1 1/4" FOR POWER, DEPENDING ON WIRE SIZE.

	CONNECTION SIZES
A	1 3/8" DIA. [35] FIELD POWER SUPPLY HOLE
B	2" DIA. [51] POWER SUPPLY KNOCK-OUT
C	1 3/4" DIA. [44] CHARGING PORT HOLE
D	7/8" DIA. [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	1/2"-14 NPT GAS CONNECTION
G	2 1/2" DIA. [64] POWER SUPPLY KNOCK-OUT

Base unit dimensions — 48TM008-014

UNIT	STD. UNIT WEIGHT LB	STD. UNIT WEIGHT KG	ECONOMI$ER+ WEIGHT LB	ECONOMI$ER+ WEIGHT KG	VERT. ECON+ W/ P.E. WEIGHT LB	VERT. ECON+ W/ P.E. WEIGHT KG	CORNER WEIGHT (A) LB	CORNER WEIGHT (A) KG	CORNER WEIGHT (B) LB.	CORNER WEIGHT (B) KG	CORNER WEIGHT (C) LB	CORNER WEIGHT (C) KG	CORNER WEIGHT (D) LB	CORNER WEIGHT (D) KG	"H" FT -IN.	"H" MM	"J" FT -IN.	"J" MM	"K" FT -IN.	"K" MM	"L" FT -IN.	"L" MM
48TM*008	870	395	75	34.1	145	65.9	189	86	161	73	239	109	280	127	2'-0 7/8"	632	3'-5 5/16"	1050	2'-9 11/16"	856	2'-2 7/16"	672
48TM*009	880	399	↓	↓	↓	↓	191	87	163	74	242	110	284	129	1' -2 7/8"	378	3'-5 5/16"	1050	2'-9 11/16"	856	2'-2 7/16"	672
48TM*012	1035	469	↓	↓	↓	↓	225	102	192	87	285	129	333	151	1' -2 7/8"	378	4'-1 5/16"	1253	3'-0 3/8"	924	2'-10 7/16"	875
48TM*014	1050	476	↓	↓	↓	↓	228	103	195	88	289	131	338	153	1'-2 7/8"	378	4'-1 5/16"	1253	3'-0 3/8"	924	2'-10 7/16"	875

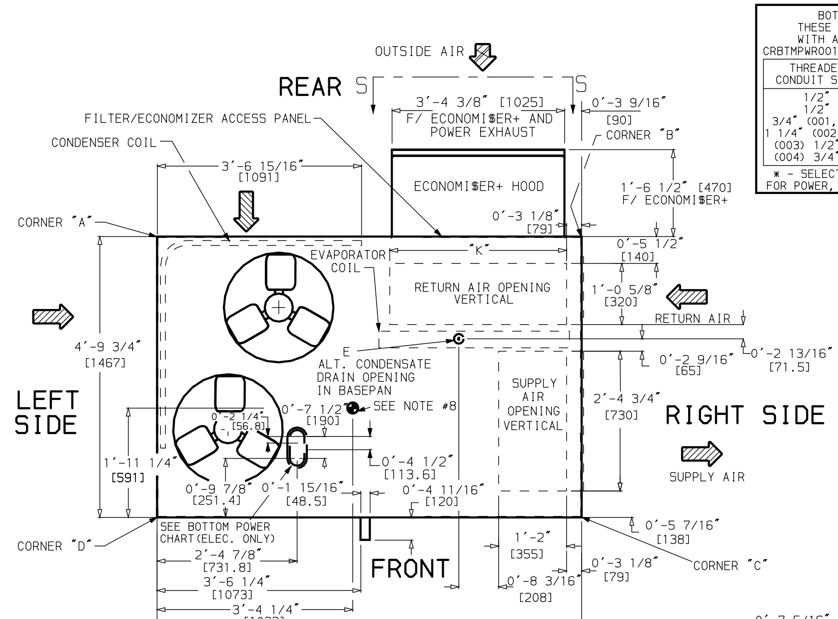
NOTES:
1. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. ⊕ CENTER OF GRAVITY.
3. ⇨ DIRECTION OF AIR FLOW.
4. ON VERTICAL DISCHARGE UNITS, DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY. FOR HORIZONTAL DISCHARGE UNITS FIELD SUPPLIED FLANGES SHOULD BE ATTACHED TO HORIZONTAL DISCHARGE OPENINGS, AND ALL DUCTWORK SHOULD BE ATTACHED TO THE FLANGES.
5. MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
 a. BETWEEN UNIT, FLUE SIDE AND COMBUSTIBLE SURFACES, 48 INCHES. 18 INCHES WHEN USING ACCESSORY FLUE DISCHARGE DEFLECTOR.
 b. BOTTOM OF UNIT TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 1 INCH.
 BOTTOM OF BASE RAIL TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES.
 c. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
 d. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
 e. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
 f. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
 g. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
 h. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL AND COMBUSTION SIDE AS STATED IN NOTE #5a, b, AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL IF SET ON BASE RAIL.
8. THE VERTICAL CENTER OF GRAVITY IS 1'-7" [483] FOR 008 AND 009, 1'-11" [584] FOR 012 AND 014 UP FROM THE BOTTOM OF THE BASE RAIL.

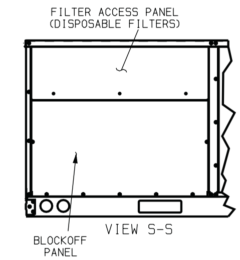
CONNECTION SIZES	
A	1 3/8" DIA. [35] FIELD POWER SUPPLY HOLE
B	2 1/2" DIA [64] POWER SUPPLY KNOCK-OUT
C	1 3/4" DIA [44] CHARGING PORT HOLE
D	7/8" DIA. [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	1/2"-14 NPT GAS CONN; 48TMD008 3/4"-14 NPT GAS CONN.; 48TMD/TME012,014; 48TMF012; 48TME/TMF008
G	2" DIA [51] POWER SUPPLY KNOCK-OUT

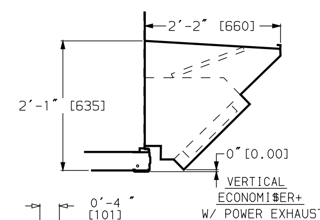
BOTTOM POWER CHART:
THESE HOLES REQ'D FOR USE WITH ACCESSORY PACKAGES - CRBTMPWR001A01, 2A01, 3A01, OR 4A01

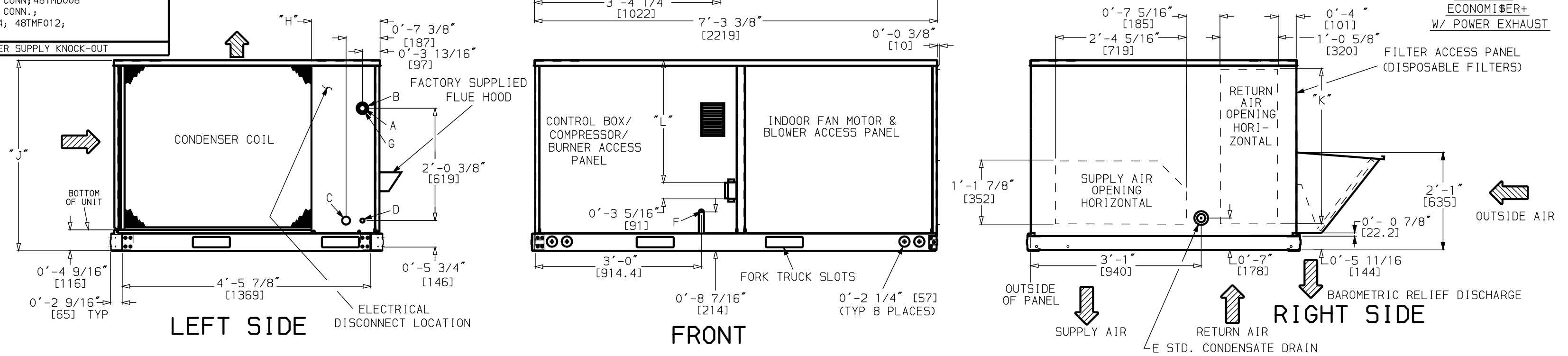
THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
1/2"	ACC.	7/8" [22.2]
1/2"	24V	7/8" [22.2]
3/4" (001,003)	POWER*	1 1/8" [28.4]
1 1/4" (002,004)	POWER*	1 3/4" [44.4]
(003) 1/2" FPT	GAS	1 1/4" [31.8]
(004) 3/4" FPT	GAS	1 5/8" [41.3]

* - SELECT EITHER 3/4" OR 1 1/4" FOR POWER, DEPENDING ON WIRE SIZE.



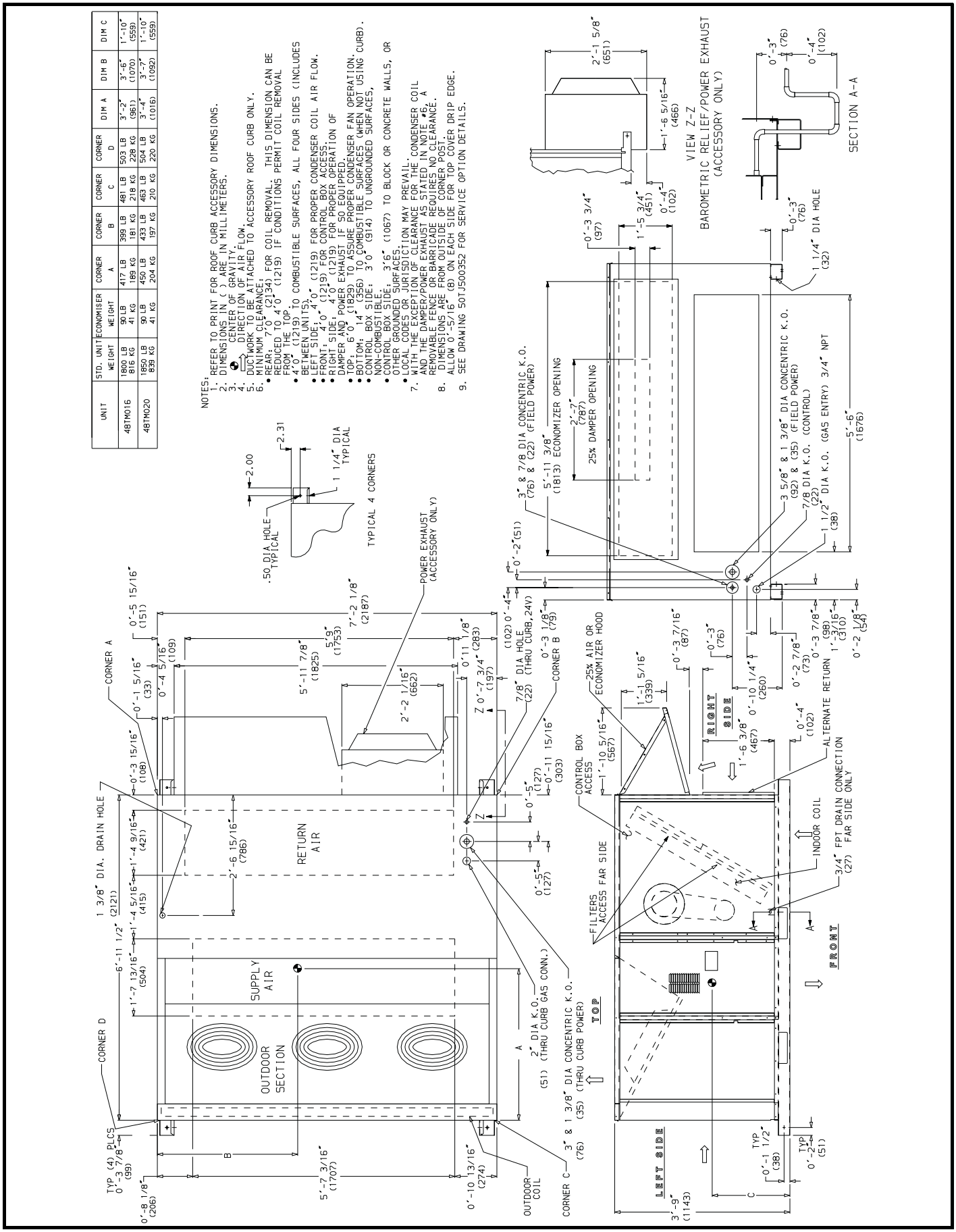






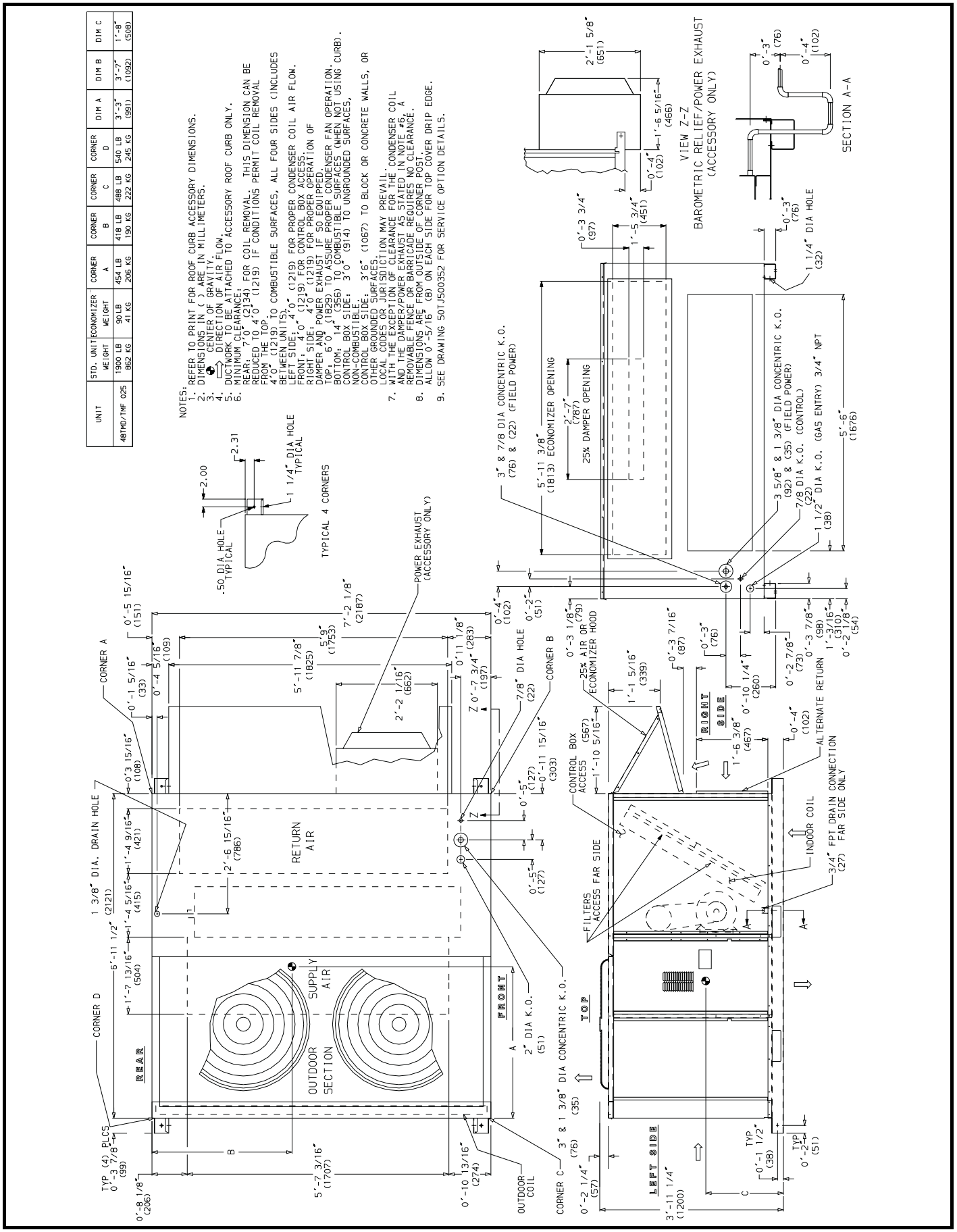
48TM

Base unit dimensions — 48TM016,020

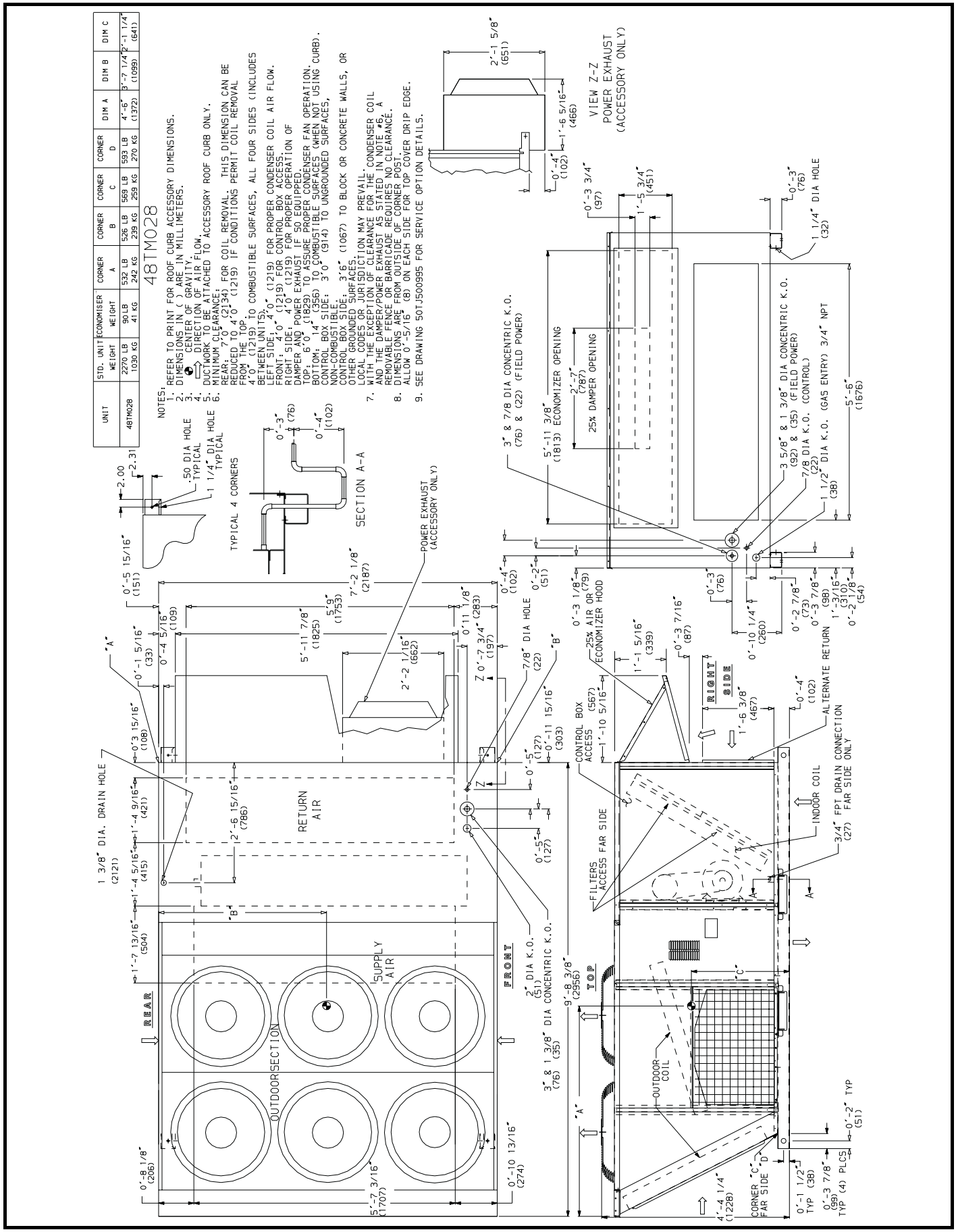


UNIT	STD. UNIT WEIGHT	ECONOMISER WEIGHT	CORNER A	CORNER B	CORNER C	CORNER D	DIM A	DIM B	DIM C
48TM016	1800 LB 816 KG	90 LB 41 KG	417 LB 189 KG	399 LB 181 KG	481 LB 218 KG	503 LB 228 KG	3'-2" (961)	3'-6" (1070)	1'-10" (559)
48TM020	1850 LB 839 KG	90 LB 41 KG	450 LB 204 KG	433 LB 197 KG	463 LB 210 KG	504 LB 220 KG	3'-4" (1016)	3'-7" (1092)	1'-10" (559)

Base unit dimensions — 48TM025

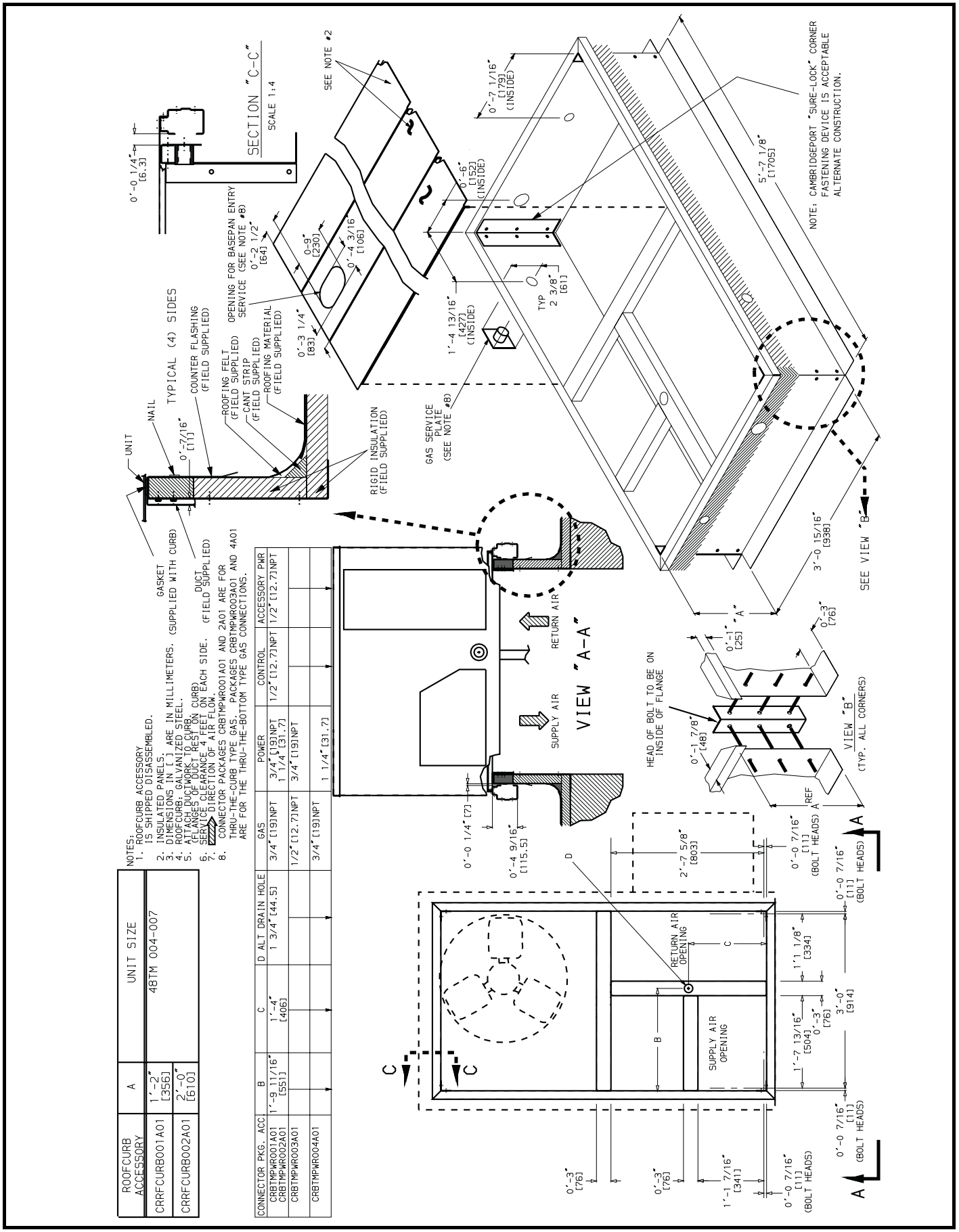


Base unit dimensions — 48TM028



UNIT	STD. UNIT WEIGHT	ECONOMISER WEIGHT	CORNER A	CORNER B	CORNER C	CORNER D	DIM A	DIM B	DIM C
48TM028	2270 LB 1030 KG	90 LB 41 KG	532 LB 242 KG	526 LB 239 KG	569 LB 259 KG	593 LB 270 KG	4'-6" (1372)	3'-7 1/4" (1099)	2'-1 1/4" (641)

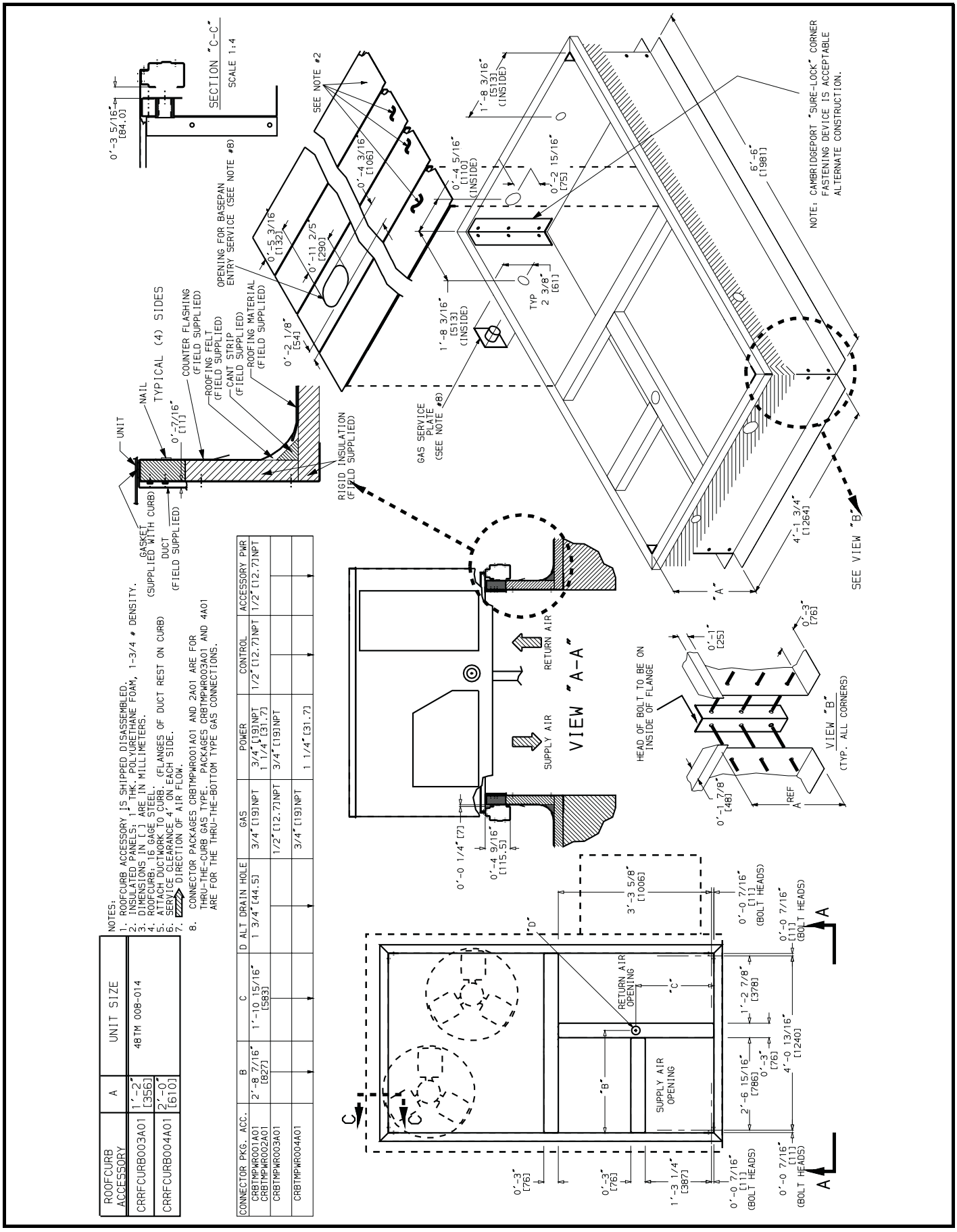
Accessory dimensions — 48TM004-007



ROOFCURB ACCESSORY	A	UNIT SIZE
CRRFCURB001A01	1'-2" [356]	48TM 004-007
CRRFCURB002A01	2'-0" [610]	

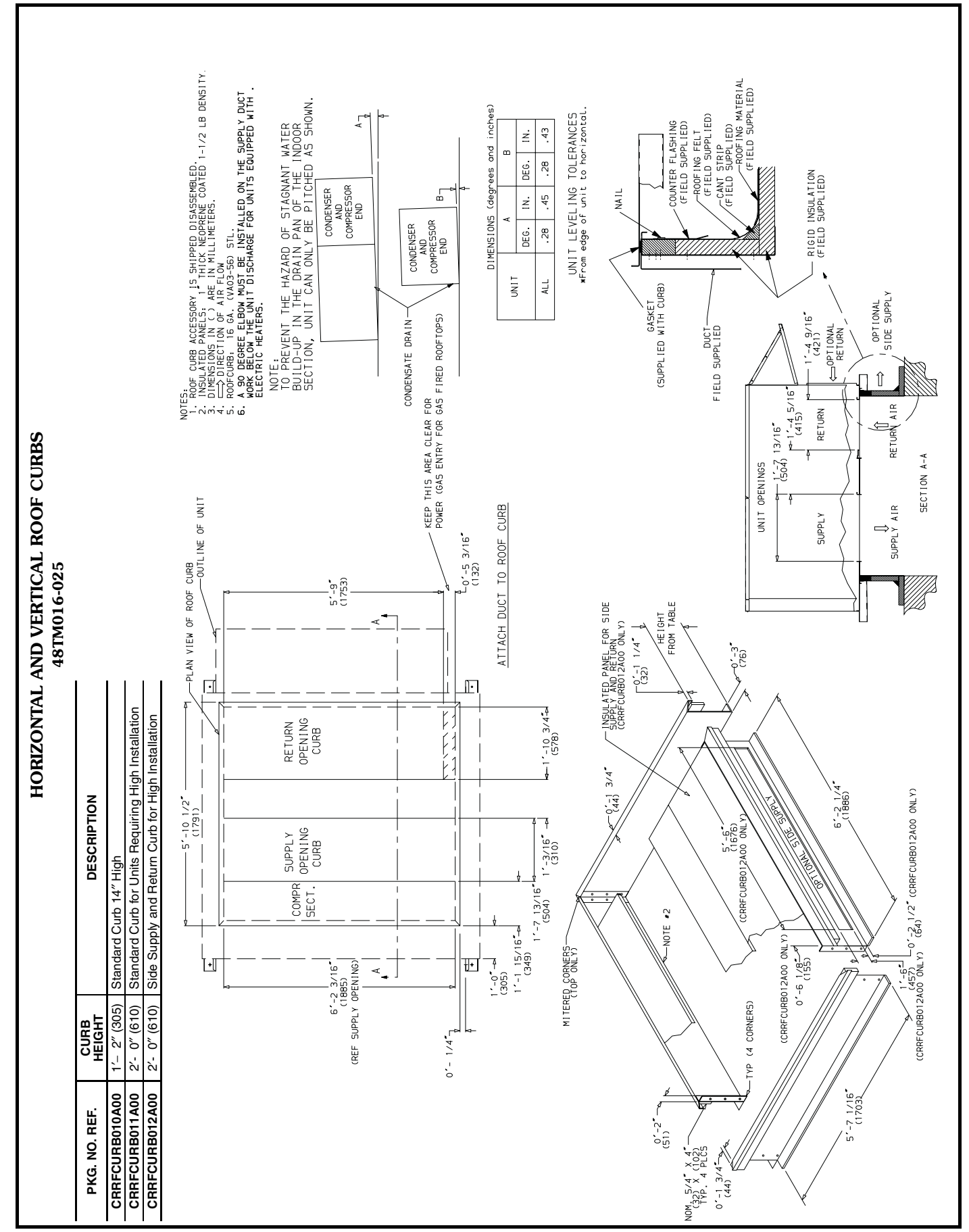
CONNECTOR PKG. ACC	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY PWR
CRBTMPWR001A01 CRBTMPWR002A01	1'-9 11/16" [551]	1'-4" [406]	1 3/4" [44.5]	3/4" [19]NPT	3/4" [19]NPT 1 1/4" [31.7]	1/2" [12.7]NPT	1/2" [12.7]NPT
CRBTMPWR003A01				1/2" [12.7]NPT	3/4" [19]NPT		
CRBTMPWR004A01				3/4" [19]NPT	1 1/4" [31.7]		

Accessory dimensions — 48TM008-014

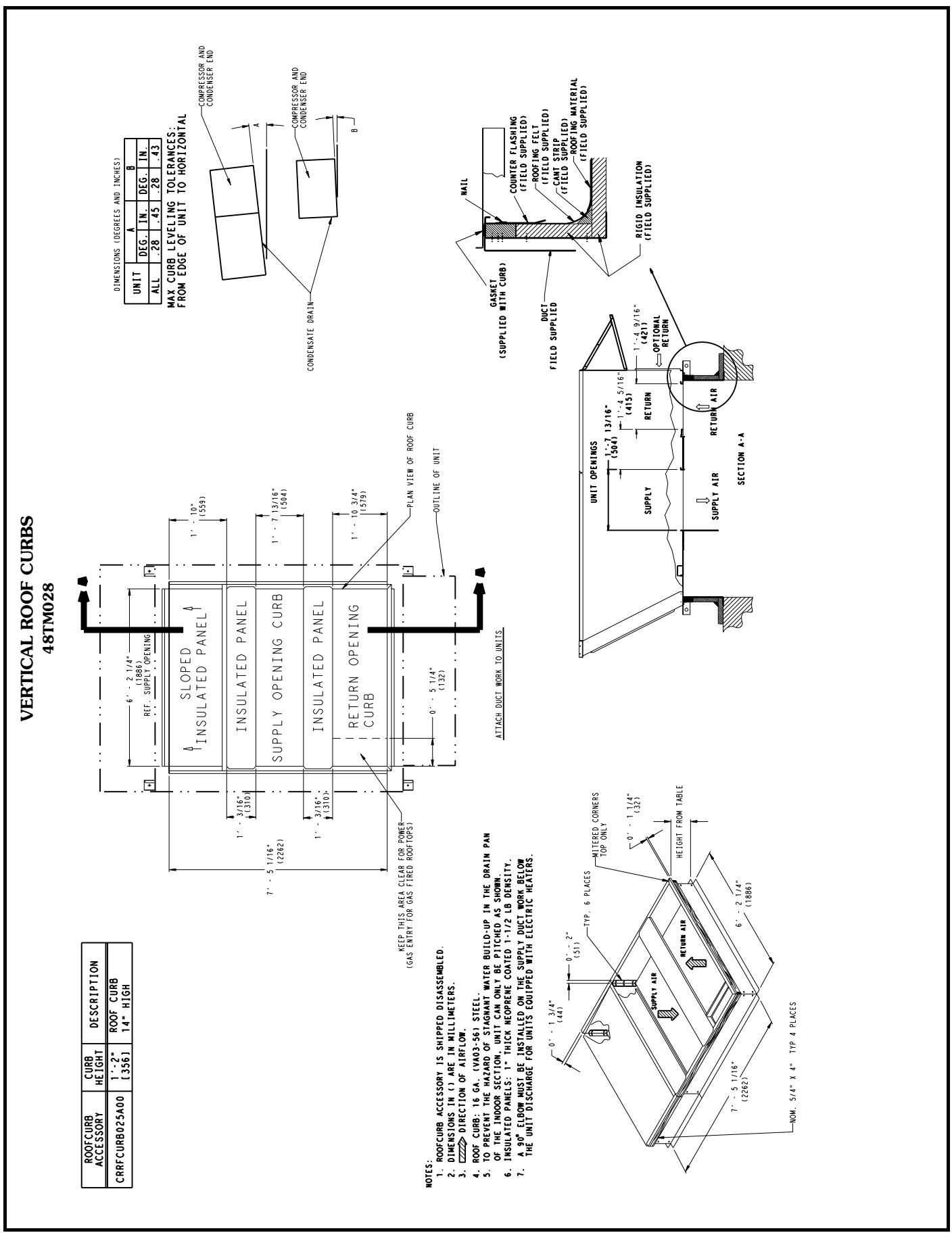


HORIZONTAL AND VERTICAL ROOF CURBS
48TM016-025

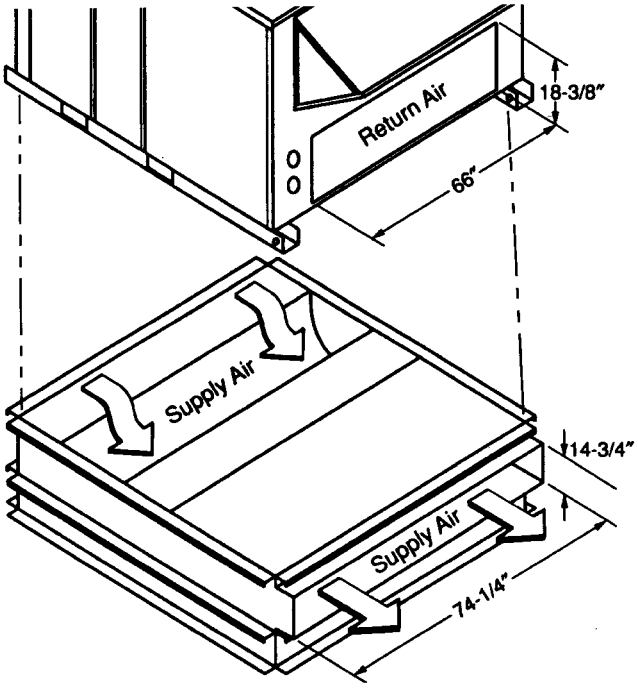
PKG. NO. REF.	CURB HEIGHT	DESCRIPTION
CRRFCURB010A00	1′– 2″ (305)	Standard Curb 14″ High
CRRFCURB011A00	2′- 0″ (610)	Standard Curb for Units Requiring High Installation
CRRFCURB012A00	2′- 0″ (610)	Side Supply and Return Curb for High Installation

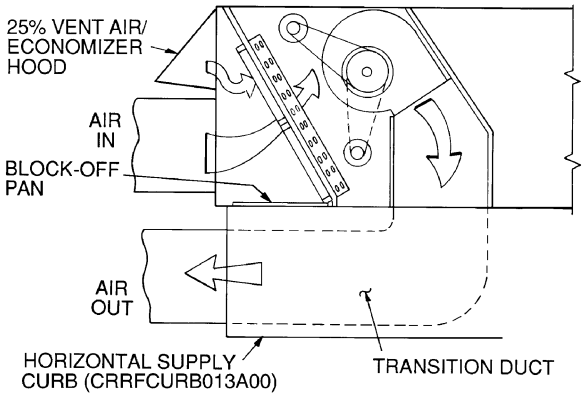


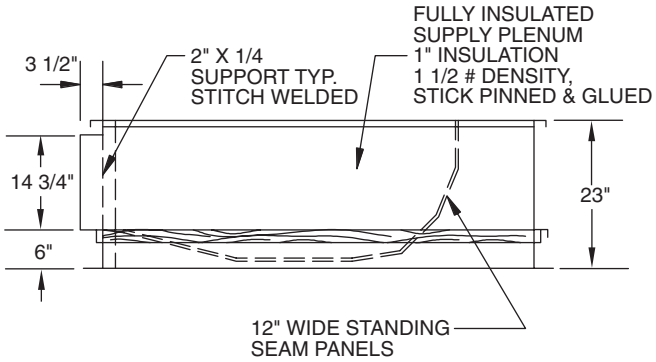
Accessory dimensions — 48TM028



HORIZONTAL SUPPLY/RETURN ADAPTER INSTALLATION (48TM016-025)





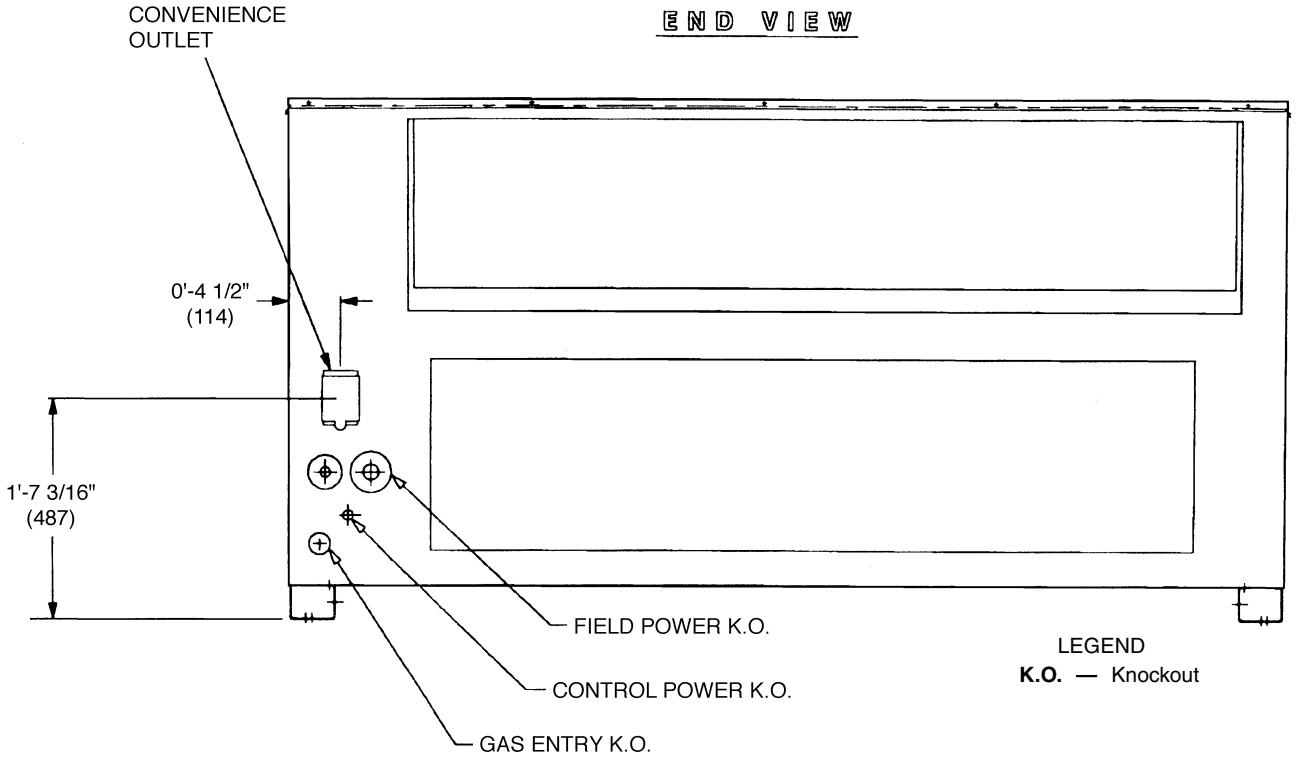


NOTE: CRRFCURB013A00 is a fully factory preassembled horizontal adapter and includes an insulated transition duct. The pressure drop through the adapter curb is negligible.

For horizontal return applications: The power exhaust and barometric relief dampers must be installed in the return air duct.

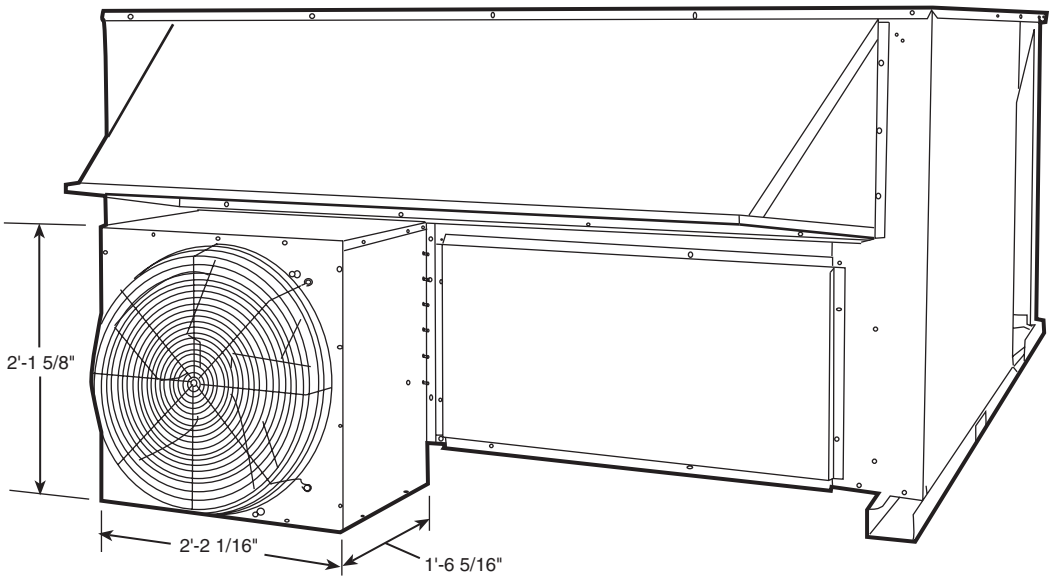
ACCESSORY PACKAGE NO.	CURB HEIGHT	DESCRIPTION
CRRFCURB013A00	1′-11″ (584)	Pre-Assembled, Roof Curb, Horizontal Adapter

FACTORY-INSTALLED CONVENIENCE OUTLET (48TM016-028)

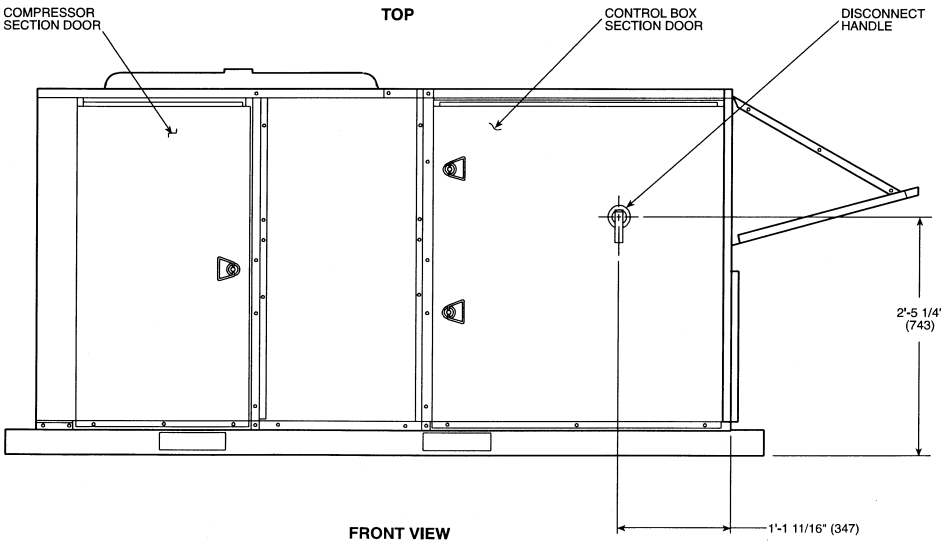


Accessory dimensions — 48TM016-028

BAROMETRIC RELIEF/POWER EXHAUST (48TM016-028)



FACTORY-INSTALLED UNIT MOUNTED DISCONNECT (48TM016-028)



Selection procedure (with 48TM007 example)

I Determine cooling and heating loads at design conditions.

Given:

Required Gross Cooling Capacity (TC). .83,000 Btuh
Gross Sensible Heat Capacity (SHC) . . .46,000 Btuh
Required Heating Capacity. . . . . .60,000 Btuh
Outdoor Entering-Air Temperature db . . . . . .95 F
Outdoor Entering-Air Temperature wb. . . . . .75 F
Outdoor-Air Entering Airflow Cfm . . . . . 450 cfm
Outdoor-Air Winter Design Temperature . . . . . 0° F
Indoor-Air Winter Design Temperature . . . . . .70 F
Air to room including outdoor air . . . . . 2000 cfm
External Static Pressure . . . . . Supply — 0.60 in. wg
Return — 0.2 in. wg
Indoor-Air Temperature db (room air) . . . . . .78 F
Indoor-Air Temperature wb (room air) . . . . . .65 F
Indoor-Air Exhaust Cfm . . . . . 450 cfm
Electrical Characteristics (V-Ph-Hz) 230-3-60

Vertical discharge unit with Energy$Recycler required.

II Determine fan speed and power requirements at design conditions.

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

NOTE: When the Energy$Recycler is used, an economizer is not needed. From the given find:

External static pressure supply	0.6 in. wg
External static pressure return	0.2 in. wg
Accessory static — None	0.0 in. wg
Total Static	0.8 in. wg

Enter the Fan Performance table for vertical discharge, standard motor, 48TM007 at 0.80 in. wg and 2000 cfm. The rpm is 1326, bhp is 1.37, and Watts is 1219.

NOTE: Convert to Fan Heat using the formula below.

Indoor Fan Heat = watts x 3.413 Btuh/watt
= 1219 x 3.413 = 4160 Btuh

III Select Energy$Recycler based on Outdoor Entering Cfm.

Refer to the Energy$Recycler Product Data literature and enter the Cooling Ratings table in the Capacities section. At 450 cfm entering outdoor airflow, choose Model 62AQ060.

Using 450 cfm outdoor supply airflow, 95 F OD DB, and 75 F OD WB find performance of the 62AQ060 at these conditions:

Energy$Recycler Gross Cooling Capacity is	13,000 Btuh
Energy$Recycler Gross Sensible Capacity is	10,090 Btuh
Compressor power is	1.06 kW
Energy$Recycler Leaving db is	73.0 F
Energy$Recycler Leaving wb is	66.9 F

IV Using the simplified* method below, calculate the approximate mixed air temperature for the rooftop unit evaporator coil.

Using the outdoor-air entering cfm, the room cfm and the room exhaust airflow with their respective db and wb temperatures, determine the db and wb entering the rooftop evaporator coil.

a) Estimate the mixed air db to the evaporator coil.

t mix db = ((cfm oa x t oa db) + ((cfm ra – cfm exh) x t ra db)) / (cfm oa + (cfm ra – cfm exh))

((450 cfm x 73.0 F) + ((2000 cfm – 450 cfm) x 78 F)) / (450 cfm + (2000 cfm – 450 cfm))

Mixed air into the rooftop evaporator coil
= 76.9 F db

b) Estimate the mixed air wb to the evaporator coil.

t mix wb* = ((cfm oa x t oa wb) + ((cfm ra – cfm exh) x t ra wb)) / (cfm oa + (cfm ra – cfm exh))

((450 cfm x 66.9 F) + ((2000 cfm – 450 cfm) x 65 F)) / (450 cfm + (2000 cfm – 450 cfm))

Mixed air temperature into the rooftop evaporator = 65.40 F wb

*Simplified method of determining wet bulb (wb) temperature of mixture. This approximation is used because the wb lines in the area of the psychrometric chart in the area used in the calculation is relatively linear, providing a close approximation. A more accurate solution can be found using the E-Cat program.

LEGEND

cfm — cubic feet per minute of air
db — dry bulb
exh — Energy$Recycler discharge
mix — mixture of outdoor + return air
oa — outside air leaving Energy$Recycler
ra — return air
sa — supply air at coil (sa = oa + ra – exh)
t — temperature
wb — wet bulb

V Determine the cooling load requirement for the rooftop unit.

Customer load is	83,000 Btuh
Less TC supplied by the Energy$Recycler	–13,000 Btuh
Rooftop cooling load required is	70,000 Btuh

VI Select the rooftop unit based on mixed air entering conditions and cooling load.

Enter cooling capacity table at outdoor entering temperature 95 F, mixed air entering evaporator at 2000 cfm, 76.9 F db, and 65.4 F wb. Interpolation is required.

The 48TM007 will provide a total gross cooling capacity of 72,200 Btuh, a sensible cooling of 49,200 Btuh, and a kW rating of 5.76.

Since these values were not at 80 F entering db, they were calculated based on the notes following the Cooling Capacity tables.

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

Selection procedure (with 48TM007 example) (cont)

VII Select net heating capacity of unit to meet design condition requirements.

Enter the Heating Capacities and Efficiencies rating table. The 48TMD007 unit will provide 59,200 Btuh of heating.

Enter the 62AQ060 Heating rating table at 450 cfm. At 70 F and 0° F find the heating value for the Energy$Recycler to be 15.2 MBtuh.

The customer heat requirement is 60,000 Btuh.

Rooftop Heat Capacity	59,200 Btuh
Rooftop fan heat from Step II	4,160 Btuh
Energy$Recycler Heat Capacity	15,200 Btuh
add Energy$Recycler optional supply fan heat if supplied	0 Btuh
Total Unit heat with Energy$Recycler	78,560 Btuh

The required heating capacity is 60,000 Btuh. The total unit net heating capacity is 78,560 Btuh. The 48TMD007 unit is sufficient.

VIII Determine net cooling capacity.

Cooling capacities are gross capacities and do not include indoor (evaporator) or optional Energy$Recycler supply fan heat.

Determine net cooling capacity using the following formula:

Net Capacity = (Gross Capacity Rooftop Unit + Energy$Recycler) – (Indoor [evaporator] fan motor [IFM] Heat + Optional Energy$Recycler Supply Fan Motor Heat)

Gross Total Cooling	
Rooftop unit	72,200 Btuh
Energy$Recycler	13,000 Btuh
Total	85,200 Btuh
Less	
IFM heat (from Step II)	<4,160> Btuh
Opt. Energy$Recycler Supply Fan Motor Heat	none
Net Total Capacity	81,040 Btuh
Gross Sensible Cooling	
Rooftop unit	49,200 Btuh
Energy$Recycler	10,090 Btuh
Total	59,290 Btuh
Less	
IFM heat (from Step II)	<4,160> Btuh
Opt. Energy$Recycler Supply Fan Motor Heat	none
Net Sensible Capacity	55,130 Btuh

IX Determine the operating watts of the rooftop unit and Energy$Recycler unit.

Cooling with Energy$Recycler in operation:

a) Rooftop unit:

Using the 48TM007 cooling capacity table and the calculations described in Step VI of this procedure, determine:

compressor watts	5,760 watts
Indoor fan motor from Step II	1,219 watts

Outdoor fan motor from Physical Data table find 1/4 hp†

Assume OD motor efficiency is 0.75.

Watts = (746 x hp)/(motor Eff)
= (746 x 1/4)/(0.75)
= 249 watts

†Dual circuit units will have two outdoor fans, double values.

b) Energy$Recycler:

Compressor watts from 62AQ060 Cooling Ratings table	1,060 watts
Optional supply fan from fan curves	none selected
Exhaust fan operating watts from 62AQ060 Exhaust Fan Performance Curve at 230-v, 450 cfm, 0.2 in. wg, Static =	110 watts
Total watts for the unit in operation at design conditions	8,398 watts

X Electrical data RLA, FLA, LRA, MCA and MOCP.

Separate Power Supply:

If the 62AQ is wired for separate power see the Electrical Data table.

Single Power Supply with Unit:

The unit is 230 v-3-60 Hz, so from the 48TM Electrical Data table, find unit electrical data. For the rooftop unit with standard indoor fan motor the data is MCA = 32.4 amps, MOCP = 40 amps, Min Unit Disconnect Size FLA = 31, and LRA = 180.

For this example follow the steps outlined in the Application Data section of the Energy$Recycler Product Data for single power supply for all rooftop units except 62AQ on 460-v power supply. For other size and voltage conditions follow corresponding steps also outlined in the Energy$Recycler Product Data Application data section.

From the Single Power Supply table (Electrical Data, Energy$Recycler Product Data) find 230 v, for 62AQ060300, "X" = 8.1 amps and "Y" = 9.3 amps.

Add "X" amps to the MCA and MOCP and add "Y" amps to the minimum disconnect size.

	MCA	MOCP	FLA	LRA
48TM	32.4	40	31	180
62AQ	8.1	8.1	9.0	31.7
Total	40.5	48.1	40.0	211.7

(MOCP calculation is 48.1. Round the value down to 45. 45 is greater than the MCA of 40.5, therefore 45 is the correct MOCP.)

The wiring to the unit must be suitable for the MCA calculated above.

The overcurrent protective device for the combination load is equal to 45, thus a single non-fused disconnect may be used for BOTH the MAIN UNIT and the 62AQ provided that the wire supplying the 62AQ is sized for at least 20 amps. No further subfusing is required.

In this example a 60-amp disconnect would be used for the combined load of the 48TM007 and the 62AQ060 Energy$Recycler unit.

Performance data — 48TM

COOLING CAPACITIES — STANDARD UNITS

48TM004 (3 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF								
		900/0.11			1200/0.14			1500/0.17		
		Air Entering Evaporator — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	42.8	38.9	35.0	44.8	40.8	37.0	45.8	41.9	38.2
	SHC	20.0	24.5	28.7	21.8	27.5	32.8	23.0	30.0	36.0
	kW	2.91	2.81	2.70	2.99	2.88	2.78	3.02	2.92	2.82
85	TC	40.8	36.9	33.3	42.5	38.7	35.0	43.6	39.9	36.1
	SHC	19.4	23.7	27.9	21.0	26.8	31.8	22.6	29.7	35.1
	kW	3.14	3.01	2.90	3.20	3.08	2.97	3.24	3.14	3.02
95	TC	38.7	34.9	31.4	40.4	36.6	33.0	41.4	37.6	34.1
	SHC	18.6	22.9	27.0	20.3	26.0	30.9	22.0	28.8	34.0
	kW	3.35	3.21	3.09	3.42	3.29	3.16	3.47	3.35	3.22
105	TC	36.5	32.8	29.2	38.1	34.3	30.9	39.0	35.2	32.4
	SHC	17.8	22.1	25.9	19.6	25.2	29.8	21.2	28.0	32.3
	kW	3.55	3.41	3.27	3.63	3.49	3.35	3.68	3.54	3.43
115	TC	34.3	30.7	26.9	35.7	32.1	28.8	36.5	32.9	30.6
	SHC	17.0	21.3	24.8	19.0	24.4	28.8	20.5	27.1	30.6
	kW	3.76	3.60	3.45	3.84	3.68	3.54	3.88	3.74	3.64

48TM005 (4 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF								
		1200/0.12			1600/0.15			2000/0.18		
		Air Entering Evaporator — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	57.9	53.1	48.3	60.4	55.9	51.3	62.2	57.3	52.9
	SHC	27.2	33.3	39.2	29.4	37.2	44.8	31.4	40.3	49.1
	kW	4.07	3.93	3.79	4.17	4.03	3.90	4.24	4.08	3.96
85	TC	55.7	50.8	45.3	57.7	53.4	48.5	59.4	55.0	50.2
	SHC	26.4	32.5	37.8	28.4	36.7	43.6	30.5	40.3	47.9
	kW	4.40	4.24	4.08	4.47	4.35	4.20	4.54	4.42	4.25
95	TC	52.9	48.1	42.5	55.2	50.5	45.7	56.7	52.0	47.4
	SHC	25.5	31.5	36.4	27.6	35.6	42.2	29.7	39.2	46.7
	kW	4.70	4.54	4.36	4.78	4.63	4.47	4.87	4.70	4.56
105	TC	50.1	45.3	39.8	52.3	47.6	42.8	53.6	48.9	44.9
	SHC	24.4	30.3	35.1	26.7	34.5	40.7	28.8	38.1	44.6
	kW	5.00	4.81	4.62	5.10	4.91	4.73	5.17	4.99	4.84
115	TC	47.3	42.6	37.2	49.3	44.6	40.0	50.5	45.9	42.4
	SHC	23.4	29.2	33.7	25.9	33.3	39.3	27.8	37.1	42.4
	kW	5.30	5.07	4.88	5.42	5.19	4.99	5.48	5.28	5.12

48TM006 (5 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF								
		1500/0.07			2000/0.09			2500/0.12		
		Air Entering Evaporator — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	71.0	63.8	55.4	74.5	67.2	59.2	76.5	69.7	62.1
	SHC	33.9	41.5	47.9	37.4	47.4	55.8	40.6	52.8	61.8
	kW	5.04	4.82	4.62	5.20	4.97	4.76	5.29	5.06	4.87
85	TC	69.2	61.0	54.2	72.9	65.6	57.2	75.2	68.1	61.5
	SHC	33.4	40.5	47.3	37.0	46.9	54.9	40.1	52.3	61.3
	kW	5.50	5.27	5.02	5.66	5.41	5.18	5.75	5.50	5.29
95	TC	65.5	56.6	50.4	69.4	60.9	53.1	71.2	63.3	57.8
	SHC	32.1	38.8	45.6	35.8	45.3	52.6	39.1	50.9	57.8
	kW	5.88	5.62	5.37	6.01	5.76	5.53	6.12	5.87	5.67
105	TC	61.9	53.1	47.1	65.4	56.6	50.5	67.1	58.8	54.5
	SHC	30.8	37.5	44.1	34.5	43.7	50.2	37.9	49.3	54.5
	kW	6.25	5.99	5.72	6.38	6.13	5.91	6.50	6.23	6.06
115	TC	58.2	49.7	43.7	61.4	52.3	47.8	63.0	54.3	51.2
	SHC	29.5	36.1	42.5	33.2	42.1	47.8	36.7	47.6	51.2
	kW	6.63	6.35	6.08	6.75	6.49	6.29	6.88	6.59	6.46

48TM007 (6 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		1800/0.06			2100/0.07			2400/0.09			3000/0.11		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	81.3	77.8	71.3	82.7	78.7	72.9	84.2	79.7	74.6	85.3	82.5	76.7
	SHC	38.2	51.3	61.6	40.2	54.2	65.9	42.3	57.1	70.2	43.7	64.0	76.4
	kW	4.69	4.63	4.52	4.73	4.65	4.56	4.77	4.67	4.60	4.80	4.75	4.63
85	TC	78.8	75.6	69.0	81.1	77.1	70.7	83.3	78.6	72.3	85.0	80.5	75.0
	SHC	37.7	50.4	60.5	40.0	53.9	64.9	42.2	57.5	69.2	44.3	63.6	74.9
	kW	5.21	5.16	5.05	5.27	5.20	5.09	5.34	5.24	5.13	5.39	5.29	5.17
95	TC	77.1	73.3	66.9	79.2	74.8	68.5	81.3	76.2	70.1	82.0	78.0	73.3
	SHC	37.0	49.9	59.7	39.4	53.3	64.0	41.8	56.8	68.3	43.5	63.4	73.2
	kW	5.80	5.78	5.65	5.87	5.81	5.70	5.94	5.85	5.74	5.95	5.88	5.8
105	TC	75.4	70.7	62.9	76.6	72.1	64.8	77.9	73.4	66.7	79.7	74.9	70.9
	SHC	36.7	48.7	58.2	38.6	52.3	62.2	40.6	55.9	66.3	43.0	62.4	70.9
	kW	6.49	6.45	6.26	6.53	6.48	6.32	6.56	6.51	6.38	6.61	6.53	6.46
115	TC	72.1	67.9	59.0	73.6	69.0	61.1	75.2	70.1	63.3	76.7	71.9	68.1
	SHC	35.3	47.5	57.2	37.6	51.2	60.2	39.9	54.8	63.3	42.2	61.5	68.1
	kW	7.20	7.17	6.94	7.25	7.18	7.01	7.29	7.20	7.08	7.35	7.26	7.15

LEGEND

BF — Bypass Factor
Edb — Entering Dry-Bulb
Ewb — Entering Wet-Bulb
kW — Compressor Motor Power Input
Ldb — Leaving Dry-Bulb
Lwb — Leaving Wet-Bulb
SHC — Sensible Heat Capacity (1000 Btuh) Gross
TC — Total Capacity (1000 Btuh) Gross

NOTES:
1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil. Below 80 F edb, subtract (corr factor x cfm) from SHC. *Above 80 F edb, add (corr factor x cfm) to SHC.*

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMP (F)					
	79	78	77	76	75	under 75
	81	*82*	*83*	*84*	*85*	*over 85*
	Correction Factor					
.05	1.04	2.07	3.11	4.14	5.18	Use formula shown below.
.10	.98	1.96	2.94	3.92	4.90	
.20	.87	1.74	2.62	3.49	4.36	
.30	.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

Performance data — 48TM (cont)

COOLING CAPACITIES — STANDARD UNITS (cont)

48TM008 (7 1/2 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		2250/0.10			2800/0.11			3000/0.11			3750/0.14		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	105.8	97.6	88.7	108.9	101.1	92.6	109.5	101.9	93.5	112.4	104.6	96.4
	SHC	50.9	63.6	75.4	54.1	69.8	84.0	55.2	71.9	86.5	59.9	79.7	94.9
	kW	6.34	6.05	5.77	6.46	6.19	5.93	6.50	6.25	5.96	6.62	6.37	6.09
85	TC	101.1	92.9	84.0	104.8	96.4	87.7	105.6	97.2	88.5	107.7	99.6	92.2
	SHC	49.4	62.0	73.3	53.1	68.4	81.9	54.4	70.6	84.4	58.5	78.2	92.0
	kW	6.80	6.51	6.21	6.94	6.66	6.37	6.98	6.69	6.41	7.08	6.82	6.57
95	TC	96.6	87.7	78.9	99.9	91.0	82.4	100.5	91.6	83.6	102.3	93.9	87.7
	SHC	47.8	59.9	70.8	51.7	66.5	79.5	52.9	68.8	81.3	57.2	76.6	87.7
	kW	7.26	6.96	6.64	7.42	7.10	6.78	7.46	7.14	6.83	7.54	7.24	7.03
105	TC	91.0	82.1	72.9	93.7	85.2	76.8	94.3	85.9	78.2	96.6	87.9	83.0
	SHC	45.9	57.9	67.9	49.6	64.4	76.4	50.9	66.7	77.8	55.8	74.5	83.0
	kW	7.70	7.37	7.08	7.81	7.51	7.22	7.86	7.54	7.28	7.97	7.67	7.47
115	TC	85.2	76.0	67.9	87.7	79.1	71.6	88.1	79.7	73.1	90.2	81.7	78.2
	SHC	43.9	55.4	65.1	47.8	62.2	71.6	49.2	64.4	73.1	54.4	72.5	78.0
	kW	8.13	7.79	7.47	8.25	7.92	7.67	8.29	7.95	7.74	8.41	8.08	7.93

48TM009 (8 1/2 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		2550/0.08			3000/0.09			3400/0.11			4250/0.13		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	117.7	104.1	93.4	121.3	107.5	97.2	122.9	109.0	98.7	124.4	111.1	101.8
	SHC	55.7	64.7	76.6	59.3	70.6	85.0	61.3	74.7	91.4	66.8	82.1	99.7
	kW	6.42	6.34	6.26	6.46	6.38	6.30	6.47	6.39	6.33	6.50	6.41	6.35
85	TC	113.8	100.4	89.2	117.9	103.8	93.4	119.6	105.3	94.7	122.1	107.5	97.2
	SHC	54.3	63.3	75.0	58.0	69.4	83.8	60.4	73.4	89.1	65.2	81.7	97.0
	kW	7.35	7.26	7.17	7.41	7.31	7.24	7.43	7.33	7.24	7.46	7.37	7.28
95	TC	109.6	96.2	85.3	113.3	99.7	89.2	115.4	101.1	90.3	118.3	103.2	93.1
	SHC	52.9	61.9	73.1	56.5	67.9	81.7	59.1	71.9	87.3	64.0	80.3	93.1
	kW	8.37	8.27	8.16	8.42	8.33	8.24	8.46	8.34	8.22	8.51	8.40	8.31
105	TC	105.6	92.1	81.3	108.8	95.2	84.6	110.4	96.4	86.3	113.2	98.4	89.1
	SHC	51.4	60.4	71.6	55.2	66.4	80.0	57.5	70.3	85.3	62.5	78.3	89.1
	kW	9.49	9.37	9.27	9.55	9.44	9.34	9.57	9.45	9.35	9.61	9.49	9.41
115	TC	100.4	87.9	76.8	103.1	90.4	80.3	105.1	91.7	82.1	107.6	93.5	85.0
	SHC	49.4	58.6	69.6	52.9	64.7	78.3	55.8	68.5	81.9	60.6	76.6	85.0
	kW	10.63	10.56	10.46	10.70	10.62	10.55	10.74	10.62	10.54	10.80	10.68	10.58
125	TC	95.8	83.0	72.0	98.5	85.5	74.9	99.8	86.6	77.5	101.4	88.2	80.7
	SHC	48.0	56.8	67.5	51.6	62.9	74.9	54.0	66.9	77.5	58.2	74.6	80.7
	kW	11.97	11.83	11.61	12.02	11.89	11.73	12.05	11.92	11.80	12.09	11.97	11.86

48TM012 (10 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF								
		3000/0.095			4000/0.125			5000/0.15		
		Air Entering Evaporator — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	138.2	127.0	114.0	145.0	132.9	122.0	149.1	136.6	125.9
	SHC	68.0	84.1	99.1	74.5	95.1	114.7	81.1	106.3	125.3
	kW	8.37	8.07	7.80	8.57	8.24	7.95	8.72	8.36	8.07
85	TC	132.3	121.7	105.9	138.4	127.2	116.6	142.5	130.2	120.9
	SHC	65.5	81.9	95.5	72.4	93.3	112.2	78.9	103.6	120.8
	kW	8.92	8.63	8.35	9.15	8.81	8.52	9.29	8.92	8.65
95	TC	126.3	115.7	98.4	131.8	121.0	108.8	135.2	124.2	116.1
	SHC	63.3	79.8	91.6	70.3	91.4	107.8	76.2	101.9	116.0
	kW	9.54	9.24	8.91	9.75	9.42	9.11	9.87	9.55	9.28
105	TC	120.2	106.5	89.5	124.9	113.8	100.3	128.3	117.2	109.9
	SHC	61.5	76.2	86.7	68.1	89.3	100.3	74.4	100.1	109.9
	kW	10.23	9.87	9.51	10.40	10.06	9.78	10.52	10.19	9.99
115	TC	117.1	99.8	85.7	122.2	105.7	95.1	124.8	111.8	104.6
	SHC	60.5	73.7	84.9	67.6	86.3	95.1	74.1	98.6	104.6
	kW	10.51	10.13	9.77	10.70	10.34	10.10	10.80	10.46	10.29

48TM014 (12 1/2 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		3750/0.08			4300/0.09			5000/0.11			6250/0.13		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	164.6	152.0	139.9	167.3	155.3	142.6	170.9	158.2	146.2	173.9	162.0	151.0
	SHC	81.3	101.9	121.7	84.5	108.1	130.0	88.9	115.9	139.8	96.7	128.7	150.8
	kW	10.24	9.96	9.71	10.31	10.05	9.78	10.42	10.12	9.84	10.50	10.23	9.95
85	TC	159.9	147.1	133.6	162.6	150.2	137.4	166.3	153.0	141.3	169.5	156.8	147.1
	SHC	79.7	99.9	119.1	83.1	106.3	128.0	88.3	114.1	137.7	96.1	127.4	146.9
	kW	11.38	11.05	10.82	11.45	11.14	10.87	11.58	11.20	10.97	11.66	11.32	11.08
95	TC	154.2	141.5	124.4	157.2	144.6	129.3	159.9	147.6	134.5	164.0	150.9	142.3
	SHC	77.9	98.0	114.8	81.8	104.5	124.1	86.3	112.5	133.8	94.4	125.8	142.2
	kW	12.59	12.26	11.95	12.68	12.36	12.04	12.75	12.44	12.15	12.88	12.54	12.31
105	TC	147.8	134.2	114.0	150.7	137.2	119.1	153.3	140.4	136.4	156.4	143.7	136.7
	SHC	75.4	95.2	109.5	79.6	101.9	118.2	84.4	110.6	126.5	92.2	124.0	136.6
	kW	13.84	13.48	13.12	13.92	13.58	13.24	14.01	13.69	13.37	14.06	13.80	13.58
115	TC	139.7	120.4	102.8	142.1	124.2	109.1	145.5	127.5	117.1	148.4	133.2	128.1
	SHC	72.5	89.8	102.6	76.7	97.0	109.1	82.1	105.7	116.6	90.4	120.1	128.0
	kW	15.03	14.70	14.34	15.12	14.80	15.24	15.24	14.90	14.65	15.35	15.04	14.86
125	TC	130.5	107.0	92.5	132.8	109.7	135.5	135.5	112.7	105.0	138.2	121.1	118.3
	SHC	69.8	84.4	92.4	73.7	91.5	99.2	79.0	99.9	104.9	87.7	114.6	118.3
	kW	16.32	15.91	15.67	16.43	16.00	15.79	16.52	16.11	15.97	16.59	16.21	16.10

LEGEND

BF — Bypass Factor
Edb — Entering Dry-Bulb
Ewb — Entering Wet-Bulb
kW — Compressor Motor Power Input
Ldb — Leaving Dry-Bulb
Lwb — Leaving Wet-Bulb
SHC — Sensible Heat Capacity (1000 Btuh) Gross
TC — Total Capacity (1000 Btuh) Gross

NOTES:
1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil. Below 80 F edb, subtract (corr factor x cfm) from SHC. *Above 80 F edb, add (corr factor x cfm) to SHC.*

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMP (F)					
	79	78	77	76	75	under 75
	81	*82*	*83*	*84*	*85*	*over 85*
	Correction Factor					
.05	1.04	2.07	3.11	4.14	5.18	
.10	.98	1.96	2.94	3.92	4.90	Use formula
.20	.87	1.74	2.62	3.49	4.36	shown below.
.30	.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

COOLING CAPACITIES — STANDARD UNITS (cont)

48TM016 (15 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF															
		4,500/0.02			5,250/0.03			6,000/0.04			6,750/0.04			7,500/0.05			
		Air Entering Evaporator — Ewb (F)															
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72	
75	TC	180	195	212	185	200	216	188	203	218	193	205	219	197	207	222	
	SHC	147	123	99	159	132	104	172	142	112	180	152	120	185	162	125	
	kW	11.2	11.6	12.0	11.3	11.7	12.1	11.4	11.8	12.1	11.6	11.9	12.2	11.7	11.9	12.2	
85	TC	174	189	204	179	193	208	183	197	211	187	199	212	191	201	213	
	SHC	144	121	96	156	130	102	167	138	106	175	148	114	179	156	119	
	kW	12.3	12.7	13.1	12.5	12.8	13.2	12.6	12.9	13.3	12.7	13.0	13.3	12.8	13.1	13.4	
95	TC	167	182	196	172	186	200	175	189	202	180	191	204	184	193	205	
	SHC	141	118	93	153	126	98	163	135	102	169	144	108	173	152	112	
	kW	13.5	13.9	14.3	13.6	14.0	14.4	13.8	14.1	14.5	13.9	14.2	14.6	14.0	14.3	14.6	
105	TC	160	173	187	164	177	190	168	180	192	172	181	193	177	183	194	
	SHC	138	114	90	149	123	94	157	132	98	162	140	102	165	147	106	
	kW	14.8	15.2	15.6	14.9	15.3	15.7	15.1	15.4	15.7	15.2	15.5	15.8	15.3	15.5	15.8	
115	TC	152	165	178	156	168	179	161	170	180	165	172	182	168	173	182	
	SHC	134	111	86	144	119	90	150	128	94	154	135	98	158	142	100	
	kW	16.1	16.5	16.9	16.2	16.6	17.0	16.4	16.7	17.0	16.6	16.8	17.1	16.7	16.9	17.1	
118	TC	149	162	174	153	165	176	158	167	—	162	168	—	166	170	—	
	SHC	133	110	86	142	118	89	148	127	—	152	133	—	155	140	—	
	kW	16.5	16.9	17.3	16.6	17.0	17.4	16.8	17.1	—	17.0	17.2	—	17.1	17.2	—	
120	TC	148	160	—	152	—	—	156	—	—	—	—	—	—	—	—	
	SHC	132	109	—	141	—	—	147	—	—	—	—	—	—	—	—	
	kW	16.8	17.2	—	16.9	—	—	17.1	—	—	—	—	—	—	—	—	

48TM020 (18 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF															
		5,400/0.095			6,000/0.105			7,000/0.120			8,000/0.140			9,000/0.150			
		Air Entering Evaporator — Ewb (F)															
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72	
75	TC	227	247	269	232	251	274	237	255	277	241	258	280	248	261	283	
	SHC	200	167	134	215	178	141	231	194	152	241	205	160	248	219	167	
	kW	15.9	16.5	17.2	16.1	16.7	17.3	16.3	16.8	17.5	16.5	16.9	17.6	16.7	17.0	17.7	
85	TC	219	238	259	224	242	265	229	247	269	235	250	272	241	252	273	
	SHC	197	164	131	210	175	137	225	188	145	234	200	153	240	214	163	
	kW	17.2	17.8	18.5	17.4	17.9	18.6	17.6	18.1	18.8	17.8	18.3	19.0	18.0	18.3	19.0	
95	TC	210	229	248	214	233	253	219	237	258	225	239	261	231	242	263	
	SHC	192	160	126	205	171	133	218	183	141	225	194	148	231	206	156	
	kW	18.5	19.2	19.9	18.7	19.3	20.0	19.0	19.5	20.2	19.2	19.6	20.3	19.4	19.7	20.4	
105	TC	200	218	237	205	222	241	210	225	245	216	228	249	221	230	250	
	SHC	186	155	123	199	166	129	210	178	136	216	190	143	221	201	150	
	kW	19.9	20.5	21.2	20.1	20.7	21.3	20.4	20.8	21.5	20.6	21.0	21.7	20.8	21.0	21.8	
115	TC	190	207	225	195	210	228	201	213	232	206	216	235	211	217	236	
	SHC	181	151	118	193	161	124	201	173	132	206	185	139	211	196	146	
	kW	21.3	21.9	22.6	21.5	22.1	22.8	21.8	22.2	22.9	22.0	22.4	23.1	22.2	22.4	23.1	
120	TC	185	200	—	189	205	—	196	207	—	201	—	—	205	—	—	
	SHC	179	149	—	189	159	—	196	171	—	201	—	—	205	—	—	
	kW	22.1	22.6	—	22.3	22.8	—	22.5	22.9	—	22.7	—	—	22.9	—	—	

48TM025 (20 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF															
		6,000/0.04			7,000/0.05			8,000/0.06			9,000/0.07			10,000/0.08			
		Air Entering Evaporator — Ewb (F)															
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72	
75	TC	237	258	282	242	264	288	247	268	291	252	271	295	258	274	298	
	SHC	204	171	138	221	184	146	237	199	156	247	210	164	257	221	172	
	kW	16.7	17.4	18.1	16.9	17.6	18.3	17.1	17.8	18.5	17.3	17.9	18.6	17.5	18.0	18.7	
85	TC	229	249	272	234	254	278	239	260	283	245	262	286	250	265	287	
	SHC	201	167	135	216	180	142	231	193	150	240	203	157	250	217	167	
	kW	18.1	18.7	19.5	18.3	18.9	19.7	18.5	19.1	19.9	18.7	19.3	20.1	18.8	19.4	20.1	
95	TC	220	239	261	225	245	267	230	249	271	235	251	275	241	255	277	
	SHC	195	163	130	211	176	138	224	188	145	233	199	152	241	210	160	
	kW	19.4	20.2	20.9	19.7	20.4	21.2	19.9	20.6	21.3	20.1	20.6	21.4	20.3	20.8	21.6	
105	TC	209	228	249	216	234	254	220	237	259	225	240	262	230	242	263	
	SHC	189	159	126	206	171	134	217	183	140	225	195	148	230	205	154	
	kW	20.9	21.5	22.3	21.2	21.8	22.5	21.4	22.0	22.7	21.6	22.1	22.9	21.8	22.2	23.0	
115	TC	200	217	237	205	222	241	211	225	244	216	227	248	221	229	249	
	SHC	185	154	122	199	166	129	209	178	136	216	189	143	221	200	150	
	kW	22.5	23.1	23.8	22.7	23.3	24.0	22.9	23.4	24.2	23.2	23.6	24.4	23.4	23.7	24.4	
120	TC	194	211	230	199	216	—	205	218	—	210	—	—	214	—	—	
	SHC	183	152	121	195	164	—	204	175	—	210	—	—	214	—	—	
	kW	23.2	23.8	24.6	23.5	24.0	—	23.7	24.2	—	23.9	—	—	24.1	—	—	

48TM028 (25 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF																			
		7,000/0.05				8,000/0.06				9,000/0.07				10,000/0.08				11,250/0.09			
		Air Entering Evaporator — Ewb (F)																			
		57	62	67	72	57	62	67	72	57	62	67	72	57	62	67	72	57	62	67	72
75	TC	256	271	299	327	267	278	305	336	276	283	309	341	285	286	313	344	294	294	316	347
	SHC	256	232	196	159	267	249	208	166	276	265	220	173	285	281	232	182	294	294	252	198
	kW	18.0	18.3	18.9	19.6	18.3	18.5	19.1	19.8	18.5	18.7	19.2	19.9	18.7	18.8	19.4	20.1	19.0	19.0	19.5	20.2
85	TC	248	262	288	316	259	267	293	322	267	273	298	328	276	276	302	331	284	285	305	336
	SHC	248	228	192	154	259	244	204	161	267	259	216	169	276	274	228	175	284	284	244	187
	kW	20.0	20.4	20.9	21.5	20.3	20.4	21	21.7	20.6	20.6	21.2	21.9	20.8	20.8	21.3	22	21	21	21.5	22.1
95	TC	241	252	277	303	251	257	281	309	259	262	286	314	266	267	290	317	274	275	293	321
	SHC	241	223	187	149	251	239	198	157	259	254	210	164	266	265	222	171	274	275	238	180
	kW	22.4	22.6	23.1	23.7	22.6	22.7	23.3	23.9	22.8	22.9	23.4	24	23	23	23.5	24.2	23.2	23.2	23.6	24.2
105	TC	233	243	266	289	242	247	270	295	250	252	273	299	256	258	277	303	264	265	280	306
	SHC	233	218	182	145	242	233	194	152	250	248	206	159	256	257	217	166	264	265	232	176
	kW	24.9	25.1	25.6	26.2	25.2	25.3	25.8	26.3	25.4	25.4	25.9	26.5	25.6	25.6	26	26.6	25.8	25.8	26.1	26.7
115	TC	225	232	254	277	234	236	258	281	241	242	261	285	247	247	264	288	254	255	267	291
	SHC	225	214	178	140	234	228	189	148	241	241	201	155	247	247	211	162	253	255	227	171
	kW	27.9	27.9	28.5	29	28	28.1	28.6	29.2	28.2	28.2	28.7	29.2	28.4	28.4	28.8	29.3	28.7	28.7	28.9	29.5
125	TC	216	221	241	263	224	225	245	267	231	231	248	269	237	236	251	273	243	242	253	276
	SHC	216	208	173	136	223	221	184	142	230	231	196	149	236	236	206	157	243	242	221	166
	kW	30.9	31.1	31.6	32	31.2	31.2	31.7	32.2	31.4	31.4	31.7	32.3	31.6	31.6	31.9	32.3	31.7	31.7	31.9	32.5

LEGEND

BF — Bypass Factor
Edb — Entering Dry-Bulb
Ewb — Entering Wet-Bulb
kW — Compressor Motor Power Input
Ldb — Leaving Dry-Bulb
Lwb — Leaving Wet-Bulb
SHC — Sensible Heat Capacity (1000 Btuh) Gross
TC — Total Capacity (1000 Btuh) Gross

NOTES:
1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil. Below 80 F edb, subtract (corr factor x cfm) from SHC. *Above 80 F edb, add (corr factor x cfm) to SHC.*

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMP (F)					
	79	78	77	76	75	under 75
	81	*82*	*83*	*84*	*85*	*over 85*
	Correction Factor					
.05	1.04	2.07	3.11	4.14	5.18	
.10	.98	1.96	2.94	3.92	4.90	Use formula
.20	.87	1.74	2.62	3.49	4.36	shown below.
.30	.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

Performance data — 48TM (cont)

COOLING CAPACITIES — UNITS WITH MOISTUREMI$ER™ OPTION

48TM016 (15 TONS) UNITS WITH MOISTUREMI$ER™ OPTION

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF														
		4500/.02			5250/.03			6000/.04			6750/.04			7500/.05		
		Air Entering Evaporator — Ewb (F)														
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	62
75	TC	—	184	202	174	190	208	178	194	211	181	197	212	185	199	215
	SHC	—	104	82	140	114	88	153	124	96	164	134	103	173	144	108
	kW	—	11.3	11.7	11.0	11.4	11.8	11.1	11.5	11.9	11.2	11.6	11.9	11.3	11.7	12.0
85	TC	—	175	192	165	182	198	169	185	201	172	188	203	176	189	204
	SHC	—	98	74	133	107	81	144	115	85	155	125	93	161	133	97
	kW	—	12.3	12.7	12.1	12.9	13.4	12.1	12.6	13.5	12.2	12.7	13.5	13	12.2	12.7
95	TC	—	167	181	155	172	186	159	175	190	162	177	193	166	180	195
	SHC	—	91	66	125	100	72	136	107	76	145	115	82	152	124	86
	kW	—	13.7	13.5	13.1	13.6	13.9	13.2	13.6	14.1	13.3	13.4	14.3	13.5	13.9	14.6
105	TC	—	155	172	144	159	174	147	161	176	150	165	177	153	166	179
	SHC	—	83	59	116	90	62	126	98	66	135	105	70	140	111	74
	kW	—	14.5	15.3	14.2	14.8	15.1	14.4	14.5	15.1	14.4	14.9	14.9	14.2	14.6	14.9
115	TC	—	140	155	129	145	159	131	149	161	134	149	163	138	151	165
	SHC	—	72	47	103	79	52	111	86	55	118	93	59	126	100	63
	kW	—	15.6	15.9	15.2	15.8	16.2	15.3	16.1	16.3	15.4	16.0	16.4	15.8	16.1	16.4
120	TC	—	133	—	123	—	—	125	—	—	—	—	—	—	—	—
	SHC	—	65	—	99	—	—	105	—	—	—	—	—	—	—	—
	kW	—	16.2	—	15.9	—	—	16.0	—	—	—	—	—	—	—	—

48TM020 (18 TONS) UNITS WITH MOISTUREMI$ER OPTION

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF														
		5400/.16			6000/.16			7000/.17			8000/.18			9000/.19		
		Air Entering Evaporator — Ewb (F)														
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72
75	TC	213	233	258	209	236	259	225	246	272	229	252	274	231	257	283
	SHC	152	122	96	152	131	101	172	140	108	184	150	116	196	161	122
	kW	15.5	16.4	17.1	15.0	15.7	14.2	16	16.8	17.5	16.3	17.0	17.2	16	17.1	17.8
85	TC	199	219	243	205	224	248	210	232	254	216	240	260	220	243	265
	SHC	136	110	83	146	116	87	158	127	93	171	139	98	184	148	105
	kW	17.3	17.4	18.1	16.9	17.5	18.6	17	17.8	18.5	17.4	18.1	18.7	19	18.1	18.8
95	TC	189	209	230	192	213	237	201	221	245	206	225	249	209	230	252
	SHC	126	100	72	134	106	76	148	116	84	162	126	88	174	136	94
	kW	18.2	19.5	20.1	18.6	19.4	19.7	19.2	19.9	20.9	19.5	20.0	21.1	18.9	20.4	21.1
105	TC	177	196	219	183	202	222	187	207	229	192	214	234	194	215	238
	SHC	116	89	62	125	96	65	138	105	71	151	115	76	161	123	84
	kW	19.5	19.9	20.9	19.7	20.4	21.3	19.7	20.3	21.0	19.8	20.8	21.2	20.4	20.6	20.3
115	TC	168	186	203	167	187	212	176	196	218	179	197	222	184	204	222
	SHC	107	80	50	112	84	55	126	95	61	138	102	65	150	112	69
	kW	21.1	21.9	22.3	20.9	21.6	22.6	21.5	22.3	23.1	21.7	22.1	23.3	21.7	22.6	22.6
120	TC	158	177	199	164	182	201	167	186	207	170	191	211	173	192	215
	SHC	100	73	46	108	79	47	120	88	53	132	97	57	142	105	63
	kW	21.5	22.0	23.0	21.8	22	22.9	21.8	22.4	23.1	22.0	22.8	23.2	22.0	22.7	23.7

48TM025 (20 TONS) UNITS WITH MOISTUREMI$ER OPTION

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF														
		5700/.17			6650/.18			7600/.18			8550/.20			9500/.20		
		Air Entering Evaporator — Ewb (F)														
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72
75	TC	—	234	257	219	241	263	224	247	272	227	249	278	234	254	283
	SHC	—	126	98	164	137	105	177	147	113	186	155	119	196	166	126
	kW	—	16.4	16.8	16.0	16.2	16.8	16	16.4	17.3	15.9	15.0	16.1	16	15.1	17.7
85	TC	—	222	243	207	230	252	213	233	257	217	239	263	222	243	269
	SHC	—	115	84	153	125	91	166	132	97	177	143	104	185	152	111
	kW	—	17.9	18.1	17.1	18.3	18.3	18	17.8	18.5	17.9	18.3	18.9	18	18.4	18.9
95	TC	—	209	233	196	216	240	201	223	244	204	227	249	210	230	253
	SHC	—	103	74	143	112	80	155	122	86	166	131	91	175	139	97
	kW	—	19.1	20.4	18.9	19.3	20.7	18.8	19.9	20.7	19.0	19.7	20.6	18.8	19.9	21.1
105	TC	—	198	218	185	205	225	189	209	232	194	213	235	199	216	240
	SHC	—	93	62	133	102	68	144	110	74	155	119	79	163	127	84
	kW	—	20.2	20.6	19.7	20.6	20.9	20.1	20.5	21.3	20.3	20.9	21.6	20.8	21.0	21.6
115	TC	—	185	209	171	189	214	176	196	215	178	199	221	181	202	222
	SHC	—	82	54	121	90	58	132	99	61	141	107	67	149	115	71
	kW	—	21.6	22.7	21.2	21.7	23.0	21.3	22.2	22.8	21.3	22.2	23.0	21.4	22.3	23.1
120	TC	—	178	198	165	184	203	168	188	209	172	191	212	177	193	216
	SHC	—	76	46	116	85	51	126	93	56	135	100	60	142	108	65
	kW	—	22.2	22.8	21.8	23	23.0	21.9	22.6	23.4	22.2	22.7	23.4	22.4	22.8	23.6

COOLING CAPACITIES — UNITS WITH MOISTUREMI$ER™ OPTION (cont)

48TM028 (25 TONS) UNITS WITH MOISTUREMI$ER™ OPTION

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF														
		7,000/.23			8,000/.25			9,000/.27			10,000/.28			11,250/.31		
		Air Entering Evaporator — Ewb (F)														
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72
75	TC	276	303	330	286	311	338	295	318	344	300	323	349	306	329	355
	SHC	213	187	155	230	198	162	246	208	169	258	218	175	272	230	183
	kW	17.0	17.5	18.1	17.3	17.7	18.2	17.3	17.8	18.3	17.4	17.9	18.4	17.6	18.0	18.5
85	TC	277	299	325	285	308	333	291	314	292	296	319	300	302	324	350
	SHC	217	184	153	231	197	160	244	207	198	256	216	201	269	228	181
	kW	19.0	19.4	20.0	19.1	19.5	19.9	19.1	19.6	28.8	19.3	19.8	23.7	19.3	19.9	20.4
95	TC	271	292	317	277	300	324	284	306	344	289	311	335	295	317	341
	SHC	213	182	150	227	193	157	241	203	169	252	213	170	265	225	178
	kW	20.9	21.5	22.0	21.1	21.6	22.3	21.2	21.6	18.3	21.3	21.8	22.4	21.4	21.9	22.5
105	TC	265	286	310	273	294	317	279	300	339	284	305	328	292	312	334
	SHC	211	180	147	225	191	154	238	201	167	250	211	168	262	223	176
	kW	23.1	23.6	24.3	23.1	23.5	24.2	22.8	23.7	20.2	23.5	23.9	24.6	22.9	23.5	24.1
115	TC	262	282	303	269	289	311	276	295	330	281	302	343	286	308	328
	SHC	209	178	145	223	188	152	236	199	164	248	210	166	260	221	173
	kW	25.0	25.8	26.6	25.7	26.4	26.7	25.8	26.3	22.3	25.9	25.8	26.6	26.0	26.8	27.6
120	TC	261	280	301	268	288	297	274	294	323	280	299	320	285	304	325
	SHC	208	177	144	223	188	147	236	298	161	247	208	165	259	220	172
	kW	26.7	27.2	28.0	26.7	27.5	28.5	27.1	27.7	24.4	26.9	27.6	28.3	27.2	27.7	28.4
125	TC	259	279	299	267	286	293	273	292	316	278	297	321	284	302	324
	SHC	207	176	143	222	187	145	235	198	160	246	208	166	258	219	172
	kW	27.9	28.4	29.2	28.1	28.7	29.9	28.1	28.8	26.8	28.1	28.9	29.5	28.4	29.0	29.5

LEGEND

BF — Bypass Factor
Edb — Entering Dry-Bulb
Ewb — Entering Wet-Bulb
kW — Compressor Motor Power Input
Ldb — Leaving Dry-Bulb
Lwb — Leaving Wet-Bulb
SHC — Sensible Heat Capacity (1000 Btuh) Gross
TC — Total Capacity (1000 Btuh) Gross

NOTES:
1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil. Below 80 F edb, subtract (corr factor x cfm) from SHC. *Above 80 F edb, add (corr factor x cfm) to SHC.*

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMP (F)					
	79	78	77	76	75	under 75
	81	*82*	*83*	*84*	*85*	*over 85*
	Correction Factor					
.05	1.04	2.07	3.11	4.14	5.18	
.10	.98	1.96	2.94	3.92	4.90	Use formula
.20	.87	1.74	2.62	3.49	4.36	shown below.
.30	.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS

48TM004 (3 TONS) — STANDARD MOTOR (DIRECT DRIVE)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)

Refer to page 70 for general Fan Performance Data notes.

48TM004 (3 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**643**	**0.15**	**152**	768	0.22	222	870	0.30	296	958	0.37	373	1037	0.46	454
1000	**683**	**0.19**	**191**	804	0.27	268	904	0.35	348	991	0.43	430	**1069**	**0.52**	**517**
1100	725	0.24	237	842	0.32	321	939	0.41	407	1025	0.50	496	**1102**	**0.59**	**588**
1200	767	0.29	291	880	0.38	382	976	0.48	474	**1060**	**0.57**	**570**	**1136**	**0.67**	**668**
1300	811	0.35	352	920	0.45	451	1013	0.55	550	**1095**	**0.66**	**652**	**1170**	**0.76**	**756**
1400	855	0.43	423	960	0.53	529	**1051**	**0.64**	**636**	**1132**	**0.75**	**744**	**1205**	**0.86**	**855**
1500	900	0.51	504	1002	0.62	617	**1090**	**0.74**	**731**	**1169**	**0.85**	**846**	**1242**	**0.97**	**963**

48TM004 (3 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**1110**	**0.54**	**538**	**1177**	**0.63**	**627**	**1239**	**0.72**	**718**	**1298**	**0.82**	**813**	**1355**	**0.92**	**911**
1000	**1141**	**0.61**	**607**	**1207**	**0.70**	**700**	**1269**	**0.80**	**796**	**1328**	**0.90**	**895**	**1384**	**1.00**	**998**
1100	**1173**	**0.69**	**683**	**1238**	**0.79**	**781**	**1300**	**0.89**	**883**	**1358**	**0.99**	**987**	**1414**	**1.10**	**1094**
1200	**1205**	**0.77**	**768**	**1270**	**0.88**	**872**	**1332**	**0.98**	**979**	**1389**	**1.09**	**1088**	—	—	—
1300	**1239**	**0.87**	**863**	**1303**	**0.98**	**972**	**1364**	**1.09**	**1084**	—	—	—	—	—	—
1400	**1273**	**0.97**	**967**	**1337**	**1.09**	**1082**	—	—	—	—	—	—	—	—	—
1500	**1309**	**1.09**	**1082**	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 685 to 1045 rpm. All other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.20.

48TM004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**643**	**0.15**	**152**	**768**	**0.22**	**222**	**870**	**0.30**	**296**	**958**	**0.37**	**373**	**1037**	**0.46**	**454**
1000	**683**	**0.19**	**191**	**804**	**0.27**	**268**	**904**	**0.35**	**348**	**991**	**0.43**	**430**	**1069**	**0.52**	**517**
1100	**725**	**0.24**	**237**	**842**	**0.32**	**321**	**939**	**0.41**	**407**	**1025**	**0.50**	**496**	1102	0.59	588
1200	**767**	**0.29**	**291**	**880**	**0.38**	**382**	**976**	**0.48**	**474**	**1060**	**0.57**	**570**	1136	0.67	668
1300	**811**	**0.35**	**352**	**920**	**0.45**	**451**	**1013**	**0.55**	**550**	1095	0.66	652	1170	0.76	756
1400	**855**	**0.43**	**423**	**960**	**0.53**	**529**	**1051**	**0.64**	**636**	1132	0.75	744	1205	0.86	855
1500	**900**	**0.51**	**504**	**1002**	**0.62**	**617**	1090	0.74	731	1169	0.85	846	1242	0.97	963

48TM004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1110	0.54	538	1177	0.63	627	1239	0.72	718	1298	0.82	813	1355	0.92	911
1000	1141	0.61	607	1207	0.70	700	1269	0.80	796	1328	0.90	895	1384	1.00	998
1100	1173	0.69	683	1238	0.79	781	1300	0.89	883	1358	0.99	987	1414	1.10	1094
1200	1205	0.77	768	1270	0.88	872	1332	0.98	979	1389	1.09	1088	1444	1.21	1200
1300	1239	0.87	863	1303	0.98	972	1364	1.09	1084	1421	1.21	1199	**1475**	**1.32**	**1316**
1400	1273	0.97	967	1337	1.09	1082	1397	1.21	1200	1453	1.33	1320	**1507**	**1.45**	**1443**
1500	1309	1.09	1082	1371	1.21	1204	1430	1.33	1327	**1486**	**1.46**	**1453**	**1540**	**1.59**	**1581**

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM005 (4 TONS) — STANDARD MOTOR (DIRECT DRIVE)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)

Refer to page 70 for general Fan Performance Data notes.

48TM005 (4 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**666**	**0.26**	**257**	778	0.37	367	871	0.47	471	952	0.57	572	1025	0.67	670
1300	**701**	**0.31**	**306**	810	0.43	426	901	0.54	540	981	0.65	651	1053	0.76	760
1400	**737**	**0.36**	**361**	842	0.49	491	931	0.62	616	1010	0.74	738	1081	0.86	856
1500	773	0.42	422	875	0.57	564	963	0.70	699	1040	0.84	831	1110	0.96	960
1600	810	0.49	491	909	0.65	643	994	0.79	790	1070	0.94	932	1140	1.08	1070
1700	847	0.57	567	943	0.73	730	1027	0.89	888	1101	1.05	1040	1170	1.20	1189
1800	885	0.66	652	978	0.83	826	1060	1.00	994	1133	1.16	1157	—	—	—
1900	923	0.75	745	1014	0.94	930	1093	1.11	1109	—	—	—	—	—	—
2000	962	0.85	847	1049	1.05	1043	—	—	—	—	—	—	—	—	—

48TM005 (4 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1093	0.77	767	1155	0.87	861	**1213**	**0.96**	**955**	**1268**	**1.05**	**1047**	**1321**	**1.14**	**1137**
1300	1119	0.87	866	**1181**	**0.98**	**970**	**1239**	**1.08**	**1073**	**1294**	**1.18**	**1175**	—	—	—
1400	1147	0.98	972	**1208**	**1.09**	**1086**	—	—	—	—	—	—	—	—	—
1500	1175	1.09	1086	—	—	—	—	—	—	—	—	—	—	—	—
1600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 770 to 1175 rpm. All other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.20.

48TM005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**666**	**0.26**	**257**	**778**	**0.37**	**367**	**871**	**0.47**	**471**	**952**	**0.57**	**572**	**1025**	**0.67**	**670**
1300	**701**	**0.31**	**306**	**810**	**0.43**	**426**	**901**	**0.54**	**540**	**981**	**0.65**	**651**	**1053**	**0.76**	**760**
1400	**737**	**0.36**	**361**	**842**	**0.49**	**491**	**931**	**0.62**	**616**	**1010**	**0.74**	**738**	1081	0.86	856
1500	**773**	**0.42**	**422**	**875**	**0.57**	**564**	**963**	**0.70**	**699**	**1040**	**0.84**	**831**	1110	0.96	960
1600	**810**	**0.49**	**491**	**909**	**0.65**	**643**	**994**	**0.79**	**790**	**1070**	**0.94**	**932**	1140	1.08	1070
1700	**847**	**0.57**	**567**	**943**	**0.73**	**730**	**1027**	**0.89**	**888**	1101	1.05	1040	1170	1.20	1189
1800	**885**	**0.66**	**652**	**978**	**0.83**	**826**	**1060**	**1.00**	**994**	1133	1.16	1157	1200	1.32	1316
1900	**923**	**0.75**	**745**	**1014**	**0.94**	**930**	1093	1.11	1109	1165	1.29	1283	1231	1.46	1453
2000	**962**	**0.85**	**847**	**1049**	**1.05**	**1043**	1127	1.24	1233	1198	1.42	1417	1263	1.61	1598

48TM005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1093	0.77	767	1155	0.87	861	1213	0.96	955	1268	1.05	1047	1321	1.14	1137
1300	1119	0.87	866	1181	0.98	970	1239	1.08	1073	1294	1.18	1175	1346	1.28	1275
1400	1147	0.98	972	1208	1.09	1086	1265	1.21	1199	1320	1.32	1310	1371	1.43	1419
1500	1175	1.09	1086	1235	1.22	1209	1292	1.34	1332	1346	1.46	1452	1397	1.58	1572
1600	1204	1.21	1207	1263	1.35	1340	1320	1.48	1472	1373	1.61	1603	1424	1.74	1732
1700	1233	1.34	1336	1292	1.49	1480	1348	1.63	1622	1401	1.77	1762	1451	1.91	1901
1800	1262	1.48	1473	1321	1.64	1627	1376	1.79	1779	1428	1.94	1930	**1479**	**2.09**	**2078**
1900	1293	1.63	1620	1350	1.79	1784	1405	1.96	1946	**1457**	**2.12**	**2106**	**1506**	**2.28**	**2265**
2000	1323	1.79	1776	1380	1.96	1950	1434	2.13	2123	**1486**	**2.31**	**2293**	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM006 (5 TONS) — STANDARD MOTOR (DIRECT DRIVE)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)

Refer to page 70 for general Fan Performance Data notes.

48TM006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* — SINGLE-PHASE UNITS

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**802**	**0.42**	**370**	912	0.55	489	1006	0.70	624	1088	0.87	773	1163	1.05	935
1600	**840**	**0.49**	**432**	947	0.63	557	1038	0.78	696	1119	0.95	848	**1193**	**1.14**	**1013**
1700	**878**	**0.57**	**502**	982	0.71	632	1071	0.87	776	1151	1.05	932	**1224**	**1.24**	**1100**
1800	917	0.65	581	1017	0.81	716	1105	0.97	864	1183	1.15	1024	—	—	—
1900	956	0.75	668	1053	0.91	808	1139	1.08	961	**1216**	**1.27**	**1126**	—	—	—
2000	995	0.86	764	1090	1.02	910	1173	1.20	1067	—	—	—	—	—	—
2100	1035	0.98	869	1127	1.15	1021	—	—	—	—	—	—	—	—	—
2200	1075	1.11	984	1164	1.29	1141	—	—	—	—	—	—	—	—	—
2300	1115	1.25	1110	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* — SINGLE-PHASE UNITS (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**1232**	**1.25**	**1109**	—	—	—	—	—	—	—	—	—	—	—	—
1600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.30.

48TM006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* — THREE-PHASE UNITS

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**802**	**0.42**	**370**	912	0.55	489	1006	0.70	624	1088	0.87	773	1163	1.05	935
1600	**840**	**0.49**	**432**	947	0.63	557	1038	0.78	696	1119	0.95	848	1193	1.14	1013
1700	**878**	**0.57**	**502**	982	0.71	632	1071	0.87	776	1151	1.05	932	1224	1.24	1100
1800	917	0.65	581	1017	0.81	716	1105	0.97	864	1183	1.15	1024	1255	1.35	1197
1900	956	0.75	668	1053	0.91	808	1139	1.08	961	1216	1.27	1126	1287	1.47	1302
2000	995	0.86	764	1090	1.02	910	1173	1.20	1067	1249	1.39	1236	**1319**	**1.59**	**1416**
2100	1035	0.98	869	1127	1.15	1021	1209	1.33	1183	1283	1.53	1357	**1351**	**1.74**	**1541**
2200	1075	1.11	984	1164	1.29	1141	1244	1.47	1309	**1317**	**1.68**	**1488**	**1385**	**1.89**	**1676**
2300	1115	1.25	1110	1202	1.43	1273	1280	1.63	1446	**1352**	**1.83**	**1629**	**1418**	**2.05**	**1822**
2400	1155	1.40	1246	1240	1.59	1415	**1316**	**1.79**	**1594**	**1387**	**2.01**	**1782**	**1452**	**2.23**	**1980**
2500	1196	1.57	1394	1278	1.77	1569	**1353**	**1.97**	**1753**	**1422**	**2.19**	**1946**	—	—	—

48TM006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* — THREE-PHASE UNITS (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1232	1.25	1109	1297	1.46	1295	**1357**	**1.68**	**1492**	**1415**	**1.91**	**1700**	**1469**	**2.16**	**1917**
1600	1262	1.34	1190	**1325**	**1.55**	**1379**	**1385**	**1.78**	**1579**	**1442**	**2.01**	**1788**	**1496**	**2.26**	**2009**
1700	1291	1.44	1281	**1354**	**1.66**	**1472**	**1414**	**1.89**	**1674**	**1470**	**2.12**	**1887**	**1524**	**2.37**	**2109**
1800	**1322**	**1.55**	**1380**	**1384**	**1.77**	**1575**	**1443**	**2.00**	**1779**	**1499**	**2.25**	**1994**	—	—	—
1900	**1352**	**1.68**	**1489**	**1414**	**1.90**	**1687**	**1472**	**2.13**	**1894**	**1528**	**2.38**	**2112**	—	—	—
2000	**1384**	**1.81**	**1607**	**1445**	**2.04**	**1808**	**1502**	**2.27**	**2019**	—	—	—	—	—	—
2100	**1415**	**1.95**	**1736**	**1476**	**2.18**	**1940**	—	—	—	—	—	—	—	—	—
2200	**1448**	**2.11**	**1875**	**1507**	**2.35**	**2083**	—	—	—	—	—	—	—	—	—
2300	**1480**	**2.28**	**2025**	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**802**	**0.42**	**370**	**912**	**0.55**	**489**	**1006**	**0.70**	**624**	**1088**	**0.87**	**773**	**1163**	**1.05**	**935**
1600	**840**	**0.49**	**432**	**947**	**0.63**	**557**	**1038**	**0.78**	**696**	**1119**	**0.95**	**848**	**1193**	**1.14**	**1013**
1700	**878**	**0.57**	**502**	**982**	**0.71**	**632**	**1071**	**0.87**	**776**	**1151**	**1.05**	**932**	**1224**	**1.24**	**1100**
1800	**917**	**0.65**	**581**	**1017**	**0.81**	**716**	**1105**	**0.97**	**864**	**1183**	**1.15**	**1024**	**1255**	**1.35**	**1197**
1900	**956**	**0.75**	**668**	**1053**	**0.91**	**808**	**1139**	**1.08**	**961**	**1216**	**1.27**	**1126**	**1287**	**1.47**	**1302**
2000	**995**	**0.86**	**764**	**1090**	**1.02**	**910**	**1173**	**1.20**	**1067**	**1249**	**1.39**	**1236**	1319	1.59	1416
2100	**1035**	**0.98**	**869**	**1127**	**1.15**	**1021**	**1209**	**1.33**	**1183**	**1283**	**1.53**	**1357**	1351	1.74	1541
2200	**1075**	**1.11**	**984**	**1164**	**1.29**	**1141**	**1244**	**1.47**	**1309**	1317	1.68	1488	1385	1.89	1676
2300	**1115**	**1.25**	**1110**	**1202**	**1.43**	**1273**	**1280**	**1.63**	**1446**	1352	1.83	1629	1418	2.05	1822
2400	**1155**	**1.40**	**1246**	**1240**	**1.59**	**1415**	1316	1.79	1594	1387	2.01	1782	1452	2.23	1980
2500	**1196**	**1.57**	**1394**	**1278**	**1.77**	**1569**	1353	1.97	1753	1422	2.19	1946	1486	2.42	2149

48TM006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**1232**	**1.25**	**1109**	**1297**	**1.46**	**1295**	1357	1.68	1492	1415	1.91	1700	1469	2.16	1917
1600	**1262**	**1.34**	**1190**	1325	1.55	1379	1385	1.78	1579	1442	2.01	1788	1496	2.26	2009
1700	**1291**	**1.44**	**1281**	1354	1.66	1472	1414	1.89	1674	1470	2.12	1887	1524	2.37	2109
1800	1322	1.55	1380	1384	1.77	1575	1443	2.00	1779	1499	2.25	1994	1552	2.50	2219
1900	1352	1.68	1489	1414	1.90	1687	1472	2.13	1894	1528	2.38	2112	1580	2.63	2339
2000	1384	1.81	1607	1445	2.04	1808	1502	2.27	2019	1557	2.52	2240	1609	2.78	2470
2100	1415	1.95	1736	1476	2.18	1940	1533	2.43	2155	1587	2.68	2378	—	—	—
2200	1448	2.11	1875	1507	2.35	2083	1563	2.59	2301	1617	2.85	2528	—	—	—
2300	1480	2.28	2025	1539	2.52	2237	1595	2.77	2459	—	—	—	—	—	—
2400	1513	2.46	2187	1571	2.71	2403	—	—	—	—	—	—	—	—	—
2500	1547	2.66	2360	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

48TM007 (6 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**967**	**0.65**	**579**	1077	0.81	718	1172	0.96	856	1257	1.12	993	1334	1.27	1130
1900	**1007**	**0.75**	**663**	1115	0.91	811	1208	1.08	957	1291	1.24	1101	1368	1.40	1246
2000	**1048**	**0.85**	**757**	1153	1.03	913	1244	1.20	1066	1326	1.37	1219	1401	1.54	1371
2100	1090	0.97	859	1191	1.15	1023	1281	1.33	1185	1361	1.51	1345	1435	1.69	1505
2200	1131	1.09	970	1230	1.29	1143	1318	1.48	1313	1397	1.67	1481	**1470**	**1.86**	**1649**
2300	1173	1.23	1091	1269	1.43	1273	1355	1.63	1451	1433	1.83	1627	**1505**	**2.03**	**1803**
2400	1215	1.38	1223	1309	1.59	1413	1393	1.80	1600	**1470**	**2.01**	**1784**	**1540**	**2.21**	**1967**
2500	1258	1.54	1365	1349	1.76	1564	1431	1.98	1759	**1506**	**2.20**	**1951**	—	—	—
2600	1300	1.71	1518	1389	1.94	1726	**1470**	**2.17**	**1929**	**1544**	**2.40**	**2130**	—	—	—
2700	1343	1.90	1683	1430	2.14	1899	**1509**	**2.38**	**2111**	—	—	—	—	—	—
2800	1386	2.09	1860	**1471**	**2.35**	**2085**	—	—	—	—	—	—	—	—	—
2900	1429	2.31	2050	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM007 (6 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1406	1.43	1268	**1473**	**1.58**	**1407**	**1535**	**1.74**	**1548**	**1595**	**1.90**	**1690**	**1652**	**2.06**	**1833**
1900	1438	1.57	1391	**1504**	**1.73**	**1537**	**1567**	**1.90**	**1685**	**1626**	**2.06**	**1833**	**1682**	**2.23**	**1983**
2000	**1471**	**1.72**	**1523**	**1536**	**1.89**	**1677**	**1598**	**2.06**	**1831**	**1657**	**2.24**	**1986**	—	—	—
2100	**1504**	**1.87**	**1665**	**1569**	**2.06**	**1825**	**1630**	**2.24**	**1986**	—	—	—	—	—	—
2200	**1538**	**2.04**	**1816**	**1602**	**2.23**	**1984**	—	—	—	—	—	—	—	—	—
2300	**1572**	**2.23**	**1978**	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**967**	**0.65**	**579**	**1077**	**0.81**	**718**	**1172**	**0.96**	**856**	**1257**	**1.12**	**993**	1334	1.27	1130
1900	**1007**	**0.75**	**663**	**1115**	**0.91**	**811**	**1208**	**1.08**	**957**	**1291**	**1.24**	**1101**	1368	1.40	1246
2000	**1048**	**0.85**	**757**	**1153**	**1.03**	**913**	**1244**	**1.20**	**1066**	1326	1.37	1219	1401	1.54	1371
2100	**1090**	**0.97**	**859**	**1191**	**1.15**	**1023**	**1281**	**1.33**	**1185**	1361	1.51	1345	1435	1.69	1505
2200	**1131**	**1.09**	**970**	**1230**	**1.29**	**1143**	1318	1.48	1313	1397	1.67	1481	1470	1.86	1649
2300	**1173**	**1.23**	**1091**	**1269**	**1.43**	**1273**	1355	1.63	1451	1433	1.83	1627	1505	2.03	1803
2400	**1215**	**1.38**	**1223**	1309	1.59	1413	1393	1.80	1600	1470	2.01	1784	1540	2.21	1967
2500	**1258**	**1.54**	**1365**	1349	1.76	1564	1431	1.98	1759	1506	2.20	1951	1576	2.41	2142
2600	1300	1.71	1518	1389	1.94	1726	1470	2.17	1929	1544	2.40	2130	1613	2.62	2329
2700	1343	1.90	1683	1430	2.14	1899	1509	2.38	2111	1581	2.61	2320	1649	2.85	2527
2800	1386	2.09	1860	1471	2.35	2085	1548	2.60	2305	1619	2.84	2522	—	—	—
2900	1429	2.31	2050	1512	2.57	2283	1588	2.83	2512	—	—	—	—	—	—
3000	1473	2.54	2252	1553	2.81	2494	—	—	—	—	—	—	—	—	—

48TM007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1406	1.43	1268	1473	1.58	1407	1535	1.74	1548	1595	1.90	1690	1652	2.06	1833
1900	1438	1.57	1391	1504	1.73	1537	1567	1.90	1685	1626	2.06	1833	1682	2.23	1983
2000	1471	1.72	1523	1536	1.89	1677	1598	2.06	1831	1657	2.24	1986	**1713**	**2.41**	**2142**
2100	1504	1.87	1665	1569	2.06	1825	1630	2.24	1986	**1688**	**2.42**	**2149**	**1744**	**2.60**	**2312**
2200	1538	2.04	1816	1602	2.23	1984	1663	2.42	2152	**1720**	**2.61**	**2321**	**1775**	**2.81**	**2491**
2300	1572	2.23	1978	1635	2.42	2153	**1695**	**2.62**	**2328**	**1753**	**2.82**	**2504**	—	—	—
2400	1607	2.42	2150	1669	2.63	2332	**1729**	**2.83**	**2515**	—	—	—	—	—	—
2500	1642	2.63	2333	**1704**	**2.84**	**2523**	—	—	—	—	—	—	—	—	—
2600	1677	2.85	2527	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM008 (7 1/2 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**513**	**0.54**	**505**	595	0.76	713	665	1.01	940	728	1.27	1187	786	1.56	1453
2300	**521**	**0.57**	**531**	601	0.79	741	671	1.04	972	734	1.31	1222	791	1.60	1489
2400	**535**	**0.63**	**584**	615	0.86	802	684	1.11	1038	745	1.39	1293	802	1.68	1566
2500	**551**	**0.69**	**642**	628	0.93	866	696	1.19	1109	757	1.47	1369	813	1.77	1647
2550	**558**	**0.72**	**673**	635	0.97	900	702	1.23	1146	763	1.51	1409	818	1.81	1689
2600	**566**	**0.76**	**705**	642	1.00	935	709	1.27	1183	769	1.55	1450	824	1.86	1732
2700	**582**	**0.83**	**771**	656	1.08	1008	721	1.35	1263	781	1.65	1535	835	1.95	1823
2800	597	0.90	842	670	1.16	1086	734	1.44	1347	793	1.74	1625	**847**	**2.06**	**1917**
2900	613	0.98	918	684	1.25	1169	748	1.54	1436	805	1.84	1720	**859**	**2.16**	**2019**
3000	629	1.07	999	699	1.35	1256	761	1.64	1530	818	1.95	1820	**871**	**2.28**	**2125**
3100	645	1.16	1085	713	1.45	1349	775	1.75	1630	831	2.06	1925	**883**	**2.40**	**2235**
3200	662	1.26	1176	728	1.55	1448	788	1.86	1734	**844**	**2.18**	**2036**	—	—	—
3300	678	1.36	1272	743	1.66	1551	802	1.98	1845	**857**	**2.31**	**2152**	—	—	—
3400	694	1.47	1374	758	1.78	1660	816	2.10	1961	—	—	—	—	—	—
3500	711	1.59	1482	773	1.90	1775	831	2.23	2082	—	—	—	—	—	—
3600	727	1.71	1596	789	2.03	1896	**845**	**2.37**	**2210**	—	—	—	—	—	—
3700	744	1.84	1716	804	2.17	2023	—	—	—	—	—	—	—	—	—
3750	752	1.91	1778	812	2.24	2089	—	—	—	—	—	—	—	—	—

48TM008 (7 1/2 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	839	1.86	1735	**889**	**2.18**	**2032**	—	—	—	—	—	—	—	—	—
2300	**844**	**1.90**	**1773**	**893**	**2.22**	**2073**	—	—	—	—	—	—	—	—	—
2400	**854**	**1.99**	**1855**	**903**	**2.32**	**2159**	—	—	—	—	—	—	—	—	—
2500	**865**	**2.08**	**1940**	—	—	—	—	—	—	—	—	—	—	—	—
2550	**870**	**2.13**	**1985**	—	—	—	—	—	—	—	—	—	—	—	—
2600	**875**	**2.18**	**2031**	—	—	—	—	—	—	—	—	—	—	—	—
2700	**886**	**2.28**	**2126**	—	—	—	—	—	—	—	—	—	—	—	—
2800	**897**	**2.39**	**2227**	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 590 to 840 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM008 (7 1/2 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**513**	**0.54**	**505**	**595**	**0.76**	**713**	**665**	**1.01**	**940**	728	1.27	1187	786	1.56	1453
2300	**521**	**0.57**	**531**	**601**	**0.79**	**741**	**671**	**1.04**	**972**	734	1.31	1222	791	1.60	1489
2400	**535**	**0.63**	**584**	**615**	**0.86**	**802**	**684**	**1.11**	**1038**	745	1.39	1293	802	1.68	1566
2500	**551**	**0.69**	**642**	**628**	**0.93**	**866**	696	1.19	1109	757	1.47	1369	813	1.77	1647
2550	**558**	**0.72**	**673**	**635**	**0.97**	**900**	702	1.23	1146	763	1.51	1409	818	1.81	1689
2600	**566**	**0.76**	**705**	**642**	**1.00**	**935**	709	1.27	1183	769	1.55	1450	824	1.86	1732
2700	**582**	**0.83**	**771**	**656**	**1.08**	**1008**	721	1.35	1263	781	1.65	1535	835	1.95	1823
2800	**597**	**0.90**	**842**	**670**	**1.16**	**1086**	734	1.44	1347	793	1.74	1625	847	2.06	1917
2900	**613**	**0.98**	**918**	**684**	**1.25**	**1169**	748	1.54	1436	805	1.84	1720	859	2.16	2019
3000	**629**	**1.07**	**999**	699	1.35	1256	761	1.64	1530	818	1.95	1820	871	2.28	2125
3100	**645**	**1.16**	**1085**	713	1.45	1349	775	1.75	1630	831	2.06	1925	883	2.40	2235
3200	**662**	**1.26**	**1176**	728	1.55	1448	788	1.86	1734	844	2.18	2036	—	—	—
3300	**678**	**1.36**	**1272**	743	1.66	1551	802	1.98	1845	857	2.31	2152	—	—	—
3400	694	1.47	1374	758	1.78	1660	816	2.10	1961	—	—	—	—	—	—
3500	711	1.59	1482	773	1.90	1775	831	2.23	2082	—	—	—	—	—	—
3600	727	1.71	1596	789	2.03	1896	845	2.37	2210	—	—	—	—	—	—
3700	744	1.84	1716	804	2.17	2023	—	—	—	—	—	—	—	—	—
3750	752	1.91	1778	812	2.24	2089	—	—	—	—	—	—	—	—	—

48TM008 (7 1/2 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	839	1.86	1735	889	2.18	2032	—	—	—	—	—	—	—	—	—
2300	844	1.90	1773	893	2.22	2073	—	—	—	—	—	—	—	—	—
2400	854	1.99	1855	903	2.32	2159	—	—	—	—	—	—	—	—	—
2500	865	2.08	1940	—	—	—	—	—	—	—	—	—	—	—	—
2550	870	2.13	1985	—	—	—	—	—	—	—	—	—	—	—	—
2600	875	2.18	2031	—	—	—	—	—	—	—	—	—	—	—	—
2700	886	2.28	2126	—	—	—	—	—	—	—	—	—	—	—	—
2800	897	2.39	2227	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 685 to 935 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM008 (7 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**513**	**0.54**	**505**	**595**	**0.76**	**713**	**665**	**1.01**	**940**	**728**	**1.27**	**1187**	**786**	**1.56**	**1453**
2300	**521**	**0.57**	**531**	**601**	**0.79**	**741**	**671**	**1.04**	**972**	**734**	**1.31**	**1222**	**791**	**1.60**	**1489**
2400	**535**	**0.63**	**584**	**615**	**0.86**	**802**	**684**	**1.11**	**1038**	**745**	**1.39**	**1293**	**802**	**1.68**	**1566**
2500	**551**	**0.69**	**642**	**628**	**0.93**	**866**	**696**	**1.19**	**1109**	**757**	**1.47**	**1369**	**813**	**1.77**	**1647**
2550	**558**	**0.72**	**673**	**635**	**0.97**	**900**	**702**	**1.23**	**1146**	**763**	**1.51**	**1409**	**818**	**1.81**	**1689**
2600	**566**	**0.76**	**705**	**642**	**1.00**	**935**	**709**	**1.27**	**1183**	**769**	**1.55**	**1450**	**824**	**1.86**	**1732**
2700	**582**	**0.83**	**771**	**656**	**1.08**	**1008**	**721**	**1.35**	**1263**	**781**	**1.65**	**1535**	**835**	**1.95**	**1823**
2800	**597**	**0.90**	**842**	**670**	**1.16**	**1086**	**734**	**1.44**	**1347**	**793**	**1.74**	**1625**	**847**	**2.06**	**1917**
2900	**613**	**0.98**	**918**	**684**	**1.25**	**1169**	**748**	**1.54**	**1436**	**805**	**1.84**	**1720**	**859**	**2.16**	**2019**
3000	**629**	**1.07**	**999**	**699**	**1.35**	**1256**	**761**	**1.64**	**1530**	**818**	**1.95**	**1820**	871	2.28	2125
3100	**645**	**1.16**	**1085**	**713**	**1.45**	**1349**	**775**	**1.75**	**1630**	**831**	**2.06**	**1925**	883	2.40	2235
3200	**662**	**1.26**	**1176**	**728**	**1.55**	**1448**	**788**	**1.86**	**1734**	**844**	**2.18**	**2036**	895	2.52	2352
3300	**678**	**1.36**	**1272**	**743**	**1.66**	**1551**	**802**	**1.98**	**1845**	**857**	**2.31**	**2152**	908	2.65	2475
3400	**694**	**1.47**	**1374**	**758**	**1.78**	**1660**	**816**	**2.10**	**1961**	870	2.44	2275	920	2.79	2603
3500	**711**	**1.59**	**1482**	**773**	**1.90**	**1775**	**831**	**2.23**	**2082**	884	2.58	2402	933	2.93	2737
3600	**727**	**1.71**	**1596**	**789**	**2.03**	**1896**	**845**	**2.37**	**2210**	897	2.72	2537	946	3.09	2877
3700	**744**	**1.84**	**1716**	**804**	**2.17**	**2023**	860	2.51	2343	911	2.87	2677	959	3.24	3023
3750	**752**	**1.91**	**1778**	**812**	**2.24**	**2089**	867	2.59	2413	918	2.95	2750	966	3.32	3100

48TM008 (7 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**839**	**1.86**	**1735**	889	2.18	2032	935	2.52	2345	980	2.87	2673	1022	3.23	3015
2300	**844**	**1.90**	**1773**	893	2.22	2073	940	2.56	2389	984	2.91	2718	1027	3.28	3062
2400	**854**	**1.99**	**1855**	903	2.32	2159	950	2.66	2478	993	3.02	2812	1035	3.39	3159
2500	865	2.08	1940	913	2.41	2249	959	2.76	2573	1003	3.12	2911	1044	3.50	3261
2550	870	2.13	1985	918	2.46	2296	964	2.81	2622	1008	3.18	2962	1049	3.55	3315
2600	875	2.18	2031	923	2.51	2344	969	2.87	2673	1012	3.23	3014	1054	3.61	3370
2700	886	2.28	2126	934	2.62	2445	979	2.98	2777	1022	3.35	3123	—	—	—
2800	897	2.39	2227	944	2.73	2550	989	3.10	2888	1032	3.47	3238	—	—	—
2900	908	2.50	2333	955	2.85	2661	1000	3.22	3003	1042	3.60	3358	—	—	—
3000	920	2.62	2443	966	2.98	2777	1010	3.35	3123	—	—	—	—	—	—
3100	931	2.75	2560	977	3.11	2899	1021	3.49	3250	—	—	—	—	—	—
3200	943	2.88	2682	989	3.25	3026	1032	3.63	3383	—	—	—	—	—	—
3300	955	3.01	2810	1000	3.39	3159	—	—	—	—	—	—	—	—	—
3400	967	3.16	2945	1012	3.54	3299	—	—	—	—	—	—	—	—	—
3500	980	3.31	3084	1024	3.69	3445	—	—	—	—	—	—	—	—	—
3600	992	3.46	3230	—	—	—	—	—	—	—	—	—	—	—	—
3700	1005	3.63	3383	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 3.70.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM009 (8½ TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	**558**	**0.72**	**673**	**635**	**0.97**	**900**	702	1.23	1146	763	1.51	1409	818	1.81	1689
2600	**566**	**0.76**	**705**	**642**	**1.00**	**935**	709	1.27	1183	769	1.55	1450	824	1.86	1732
2700	**582**	**0.83**	**771**	**656**	**1.08**	**1008**	721	1.35	1263	781	1.65	1535	835	1.95	1823
2800	**597**	**0.90**	**842**	**670**	**1.16**	**1086**	734	1.44	1347	793	1.74	1625	847	2.06	1917
2900	**613**	**0.98**	**918**	**684**	**1.25**	**1169**	748	1.54	1436	805	1.84	1720	859	2.16	2019
3000	**629**	**1.07**	**999**	699	1.35	1256	761	1.64	1530	818	1.95	1820	871	2.28	2125
3100	**645**	**1.16**	**1085**	713	1.45	1349	775	1.75	1630	831	2.06	1925	883	2.40	2235
3200	**662**	**1.26**	**1176**	728	1.55	1448	788	1.86	1734	844	2.18	2036	—	—	—
3300	**678**	**1.36**	**1272**	743	1.66	1551	802	1.98	1845	857	2.31	2152	—	—	—
3400	694	1.47	1374	758	1.78	1660	816	2.10	1961	—	—	—	—	—	—
3500	711	1.59	1482	773	1.90	1775	831	2.23	2082	—	—	—	—	—	—
3600	727	1.71	1596	789	2.03	1896	845	2.37	2210	—	—	—	—	—	—
3700	744	1.84	1716	804	2.17	2023	—	—	—	—	—	—	—	—	—
3750	752	1.91	1778	812	2.24	2089	—	—	—	—	—	—	—	—	—
3800	761	1.98	1842	820	2.31	2156	—	—	—	—	—	—	—	—	—
3900	777	2.12	1974	—	—	—	—	—	—	—	—	—	—	—	—
4000	794	2.27	2113	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM009 (8½ 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	870	2.13	1985	—	—	—	—	—	—	—	—	—	—	—	—
2600	875	2.18	2031	—	—	—	—	—	—	—	—	—	—	—	—
2700	886	2.28	2126	—	—	—	—	—	—	—	—	—	—	—	—
2800	897	2.39	2227	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 685 to 935 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM009 (8 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	**558**	**0.72**	**673**	**635**	**0.97**	**900**	**702**	**1.23**	**1146**	**763**	**1.51**	**1409**	**818**	**1.81**	**1689**
2600	**566**	**0.76**	**705**	**642**	**1.00**	**935**	**709**	**1.27**	**1183**	**769**	**1.55**	**1450**	**824**	**1.86**	**1732**
2700	**582**	**0.83**	**771**	**656**	**1.08**	**1008**	**721**	**1.35**	**1263**	**781**	**1.65**	**1535**	**835**	**1.95**	**1823**
2800	**597**	**0.90**	**842**	**670**	**1.16**	**1086**	**734**	**1.44**	**1347**	**793**	**1.74**	**1625**	**847**	**2.06**	**1917**
2900	**613**	**0.98**	**918**	**684**	**1.25**	**1169**	**748**	**1.54**	**1436**	**805**	**1.84**	**1720**	**859**	**2.16**	**2019**
3000	**629**	**1.07**	**999**	**699**	**1.35**	**1256**	**761**	**1.64**	**1530**	**818**	**1.95**	**1820**	871	2.28	2125
3100	**645**	**1.16**	**1085**	**713**	**1.45**	**1349**	**775**	**1.75**	**1630**	**831**	**2.06**	**1925**	883	2.40	2235
3200	**662**	**1.26**	**1176**	**728**	**1.55**	**1448**	**788**	**1.86**	**1734**	**844**	**2.18**	**2036**	895	2.52	2352
3300	**678**	**1.36**	**1272**	**743**	**1.66**	**1551**	**802**	**1.98**	**1845**	**857**	**2.31**	**2152**	908	2.65	2475
3400	**694**	**1.47**	**1374**	**758**	**1.78**	**1660**	**816**	**2.10**	**1961**	870	2.44	2275	920	2.79	2603
3500	**711**	**1.59**	**1482**	**773**	**1.90**	**1775**	**831**	**2.23**	**2082**	884	2.58	2402	933	2.93	2737
3600	**727**	**1.71**	**1596**	**789**	**2.03**	**1896**	**845**	**2.37**	**2210**	897	2.72	2537	946	3.09	2877
3700	**744**	**1.84**	**1716**	**804**	**2.17**	**2023**	860	2.51	2343	911	2.87	2677	959	3.24	3023
3750	**752**	**1.91**	**1778**	**812**	**2.24**	**2089**	867	2.59	2413	918	2.95	2750	966	3.32	3100
3800	**761**	**1.98**	**1842**	**820**	**2.31**	**2156**	874	2.66	2484	925	3.03	2824	973	3.41	3177
3900	**777**	**2.12**	**1974**	**835**	**2.46**	**2296**	889	2.82	2630	939	3.19	2977	986	3.58	3336
4000	**794**	**2.27**	**2113**	**851**	**2.62**	**2442**	904	2.99	2784	953	3.36	3137	—	—	—
4100	**811**	**2.42**	**2259**	867	2.78	2595	919	3.16	2944	968	3.54	3304	—	—	—
4200	**828**	**2.59**	**2412**	883	2.95	2755	934	3.34	3110	—	—	—	—	—	—
4250	**837**	**2.67**	**2490**	891	3.04	2838	942	3.43	3197	—	—	—	—	—	—

48TM009 (8 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	870	2.13	1985	918	2.46	2296	964	2.81	2622	1008	3.18	2962	1049	3.55	3315
2600	875	2.18	2031	923	2.51	2344	969	2.87	2673	1012	3.23	3014	1054	3.61	3370
2700	886	2.28	2126	934	2.62	2445	979	2.98	2777	1022	3.35	3123	—	—	—
2800	897	2.39	2227	944	2.73	2550	989	3.10	2888	1032	3.47	3238	—	—	—
2900	908	2.50	2333	955	2.85	2661	1000	3.22	3003	1042	3.60	3358	—	—	—
3000	920	2.62	2443	966	2.98	2777	1010	3.35	3123	—	—	—	—	—	—
3100	931	2.75	2560	977	3.11	2899	1021	3.49	3250	—	—	—	—	—	—
3200	943	2.88	2682	989	3.25	3026	1032	3.63	3383	—	—	—	—	—	—
3300	955	3.01	2810	1000	3.39	3159	—	—	—	—	—	—	—	—	—
3400	967	3.16	2945	1012	3.54	3299	—	—	—	—	—	—	—	—	—
3500	980	3.31	3084	1024	3.69	3445	—	—	—	—	—	—	—	—	—
3600	992	3.46	3230	—	—	—	—	—	—	—	—	—	—	—	—
3700	1005	3.63	3383	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 3.70.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM012 (10 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**592**	**0.77**	**672**	**658**	**0.93**	**817**	719	1.10	961	775	1.26	1105	828	1.42	1249
3100	**607**	**0.83**	**731**	**672**	**1.00**	**881**	731	1.17	1030	787	1.34	1179	839	1.51	1328
3200	**623**	**0.90**	**794**	686	1.08	949	744	1.26	1103	798	1.43	1257	850	1.61	1410
3300	**638**	**0.98**	**860**	700	1.16	1020	757	1.34	1179	810	1.52	1338	861	1.71	1496
3400	**653**	**1.06**	**931**	714	1.25	1095	770	1.44	1260	822	1.62	1423	872	1.81	1586
3500	**669**	**1.15**	**1005**	728	1.34	1175	783	1.53	1344	835	1.72	1512	884	1.91	1680
3600	685	1.23	1084	742	1.43	1258	796	1.63	1432	847	1.83	1606	895	2.03	1778
3700	700	1.33	1167	757	1.53	1346	810	1.74	1524	860	1.94	1703	907	2.14	1881
3800	716	1.43	1254	771	1.64	1438	823	1.85	1621	873	2.06	1805	919	2.26	1987
3900	732	1.53	1345	786	1.75	1534	837	1.96	1722	886	2.18	1911	932	2.39	2099
4000	748	1.64	1441	801	1.86	1635	851	2.08	1828	899	2.30	2022	—	—	—
4100	764	1.76	1542	816	1.98	1741	865	2.21	1939	—	—	—	—	—	—
4200	780	1.88	1648	831	2.11	1851	879	2.34	2054	—	—	—	—	—	—
4300	796	2.00	1758	846	2.24	1966	—	—	—	—	—	—	—	—	—
4400	812	2.13	1874	861	2.38	2087	—	—	—	—	—	—	—	—	—
4500	828	2.27	1994	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM012 (10 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	878	1.59	1391	925	1.75	1534	**970**	**1.91**	**1676**	**1014**	**2.07**	**1817**	**1055**	**2.23**	**1958**
3100	888	1.68	1475	935	1.85	1623	**979**	**2.02**	**1769**	**1022**	**2.18**	**1916**	**1063**	**2.35**	**2062**
3200	898	1.78	1563	**944**	**1.95**	**1715**	**988**	**2.13**	**1867**	**1031**	**2.30**	**2018**	—	—	—
3300	909	1.88	1654	**954**	**2.06**	**1811**	**998**	**2.24**	**1968**	—	—	—	—	—	—
3400	919	1.99	1749	**964**	**2.18**	**1911**	**1007**	**2.36**	**2073**	—	—	—	—	—	—
3500	930	2.11	1848	**975**	**2.30**	**2015**	—	—	—	—	—	—	—	—	—
3600	**941**	**2.22**	**1951**	—	—	—	—	—	—	—	—	—	—	—	—
3700	**952**	**2.35**	**2058**	—	—	—	—	—	—	—	—	—	—	—	—
3800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 685 to 935 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM012 (10 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**592**	**0.77**	**672**	**658**	**0.93**	**817**	**719**	**1.10**	**961**	**775**	**1.26**	**1105**	**828**	**1.42**	**1249**
3100	**607**	**0.83**	**731**	**672**	**1.00**	**881**	**731**	**1.17**	**1030**	**787**	**1.34**	**1179**	839	1.51	1328
3200	**623**	**0.90**	**794**	**686**	**1.08**	**949**	**744**	**1.26**	**1103**	**798**	**1.43**	**1257**	850	1.61	1410
3300	**638**	**0.98**	**860**	**700**	**1.16**	**1020**	**757**	**1.34**	**1179**	**810**	**1.52**	**1338**	861	1.71	1496
3400	**653**	**1.06**	**931**	**714**	**1.25**	**1095**	**770**	**1.44**	**1260**	**822**	**1.62**	**1423**	872	1.81	1586
3500	**669**	**1.15**	**1005**	**728**	**1.34**	**1175**	**783**	**1.53**	**1344**	835	1.72	1512	884	1.91	1680
3600	**685**	**1.23**	**1084**	**742**	**1.43**	**1258**	**796**	**1.63**	**1432**	847	1.83	1606	895	2.03	1778
3700	**700**	**1.33**	**1167**	**757**	**1.53**	**1346**	**810**	**1.74**	**1524**	860	1.94	1703	907	2.14	1881
3800	**716**	**1.43**	**1254**	**771**	**1.64**	**1438**	**823**	**1.85**	**1621**	873	2.06	1805	919	2.26	1987
3900	**732**	**1.53**	**1345**	**786**	**1.75**	**1534**	837	1.96	1722	886	2.18	1911	932	2.39	2099
4000	**748**	**1.64**	**1441**	**801**	**1.86**	**1635**	851	2.08	1828	899	2.30	2022	944	2.52	2214
4100	**764**	**1.76**	**1542**	**816**	**1.98**	**1741**	865	2.21	1939	912	2.43	2137	957	2.66	2334
4200	**780**	**1.88**	**1648**	831	2.11	1851	879	2.34	2054	925	2.57	2257	969	2.80	2460
4300	**796**	**2.00**	**1758**	846	2.24	1966	894	2.48	2175	939	2.71	2382	—	—	—
4400	**812**	**2.13**	**1874**	861	2.38	2087	908	2.62	2299	952	2.86	2512	—	—	—
4500	**828**	**2.27**	**1994**	877	2.52	2212	922	2.77	2430	—	—	—	—	—	—
4600	845	2.42	2120	892	2.67	2343	—	—	—	—	—	—	—	—	—
4700	861	2.57	2251	907	2.82	2479	—	—	—	—	—	—	—	—	—
4800	877	2.72	2388	—	—	—	—	—	—	—	—	—	—	—	—
4900	894	2.88	2531	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM012 (10 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	878	1.59	1391	925	1.75	1534	970	1.91	1676	1014	2.07	1817	1055	2.23	1958
3100	888	1.68	1475	935	1.85	1623	979	2.02	1769	1022	2.18	1916	1063	2.35	2062
3200	898	1.78	1563	944	1.95	1715	988	2.13	1867	1031	2.30	2018	1072	2.47	2169
3300	909	1.88	1654	954	2.06	1811	998	2.24	1968	1040	2.42	2124	1080	2.60	2280
3400	919	1.99	1749	964	2.18	1911	1007	2.36	2073	1049	2.55	2234	1089	2.73	2395
3500	930	2.11	1848	975	2.30	2015	1017	2.49	2182	1058	2.68	2348	1098	2.86	2514
3600	941	2.22	1951	985	2.42	2123	1027	2.61	2295	1068	2.81	2466	—	—	—
3700	952	2.35	2058	996	2.55	2236	1038	2.75	2412	—	—	—	—	—	—
3800	964	2.47	2170	1007	2.68	2352	1048	2.89	2534	—	—	—	—	—	—
3900	976	2.60	2286	1018	2.82	2473	—	—	—	—	—	—	—	—	—
4000	987	2.74	2407	—	—	—	—	—	—	—	—	—	—	—	—
4100	999	2.88	2532	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 835 to 1085 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM012 (10 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**592**	**0.77**	**672**	**658**	**0.93**	**817**	**719**	**1.10**	**961**	**775**	**1.26**	**1105**	**828**	**1.42**	**1249**
3100	**607**	**0.83**	**731**	**672**	**1.00**	**881**	**731**	**1.17**	**1030**	**787**	**1.34**	**1179**	839	1.51	1328
3200	**623**	**0.90**	**794**	**686**	**1.08**	**949**	**744**	**1.26**	**1103**	**798**	**1.43**	**1257**	850	1.61	1410
3300	**638**	**0.98**	**860**	**700**	**1.16**	**1020**	**757**	**1.34**	**1179**	**810**	**1.52**	**1338**	861	1.71	1496
3400	**653**	**1.06**	**931**	**714**	**1.25**	**1095**	**770**	**1.44**	**1260**	**822**	**1.62**	**1423**	872	1.81	1586
3500	**669**	**1.15**	**1005**	**728**	**1.34**	**1175**	**783**	**1.53**	**1344**	835	1.72	1512	884	1.91	1680
3600	**685**	**1.23**	**1084**	**742**	**1.43**	**1258**	**796**	**1.63**	**1432**	847	1.83	1606	895	2.03	1778
3700	**700**	**1.33**	**1167**	**757**	**1.53**	**1346**	**810**	**1.74**	**1524**	860	1.94	1703	907	2.14	1881
3800	**716**	**1.43**	**1254**	**771**	**1.64**	**1438**	**823**	**1.85**	**1621**	873	2.06	1805	919	2.26	1987
3900	**732**	**1.53**	**1345**	**786**	**1.75**	**1534**	837	1.96	1722	886	2.18	1911	932	2.39	2099
4000	**748**	**1.64**	**1441**	**801**	**1.86**	**1635**	851	2.08	1828	899	2.30	2022	944	2.52	2214
4100	**764**	**1.76**	**1542**	**816**	**1.98**	**1741**	865	2.21	1939	912	2.43	2137	957	2.66	2334
4200	**780**	**1.88**	**1648**	831	2.11	1851	879	2.34	2054	925	2.57	2257	969	2.80	2460
4300	**796**	**2.00**	**1758**	846	2.24	1966	894	2.48	2175	939	2.71	2382	982	2.95	2589
4400	**812**	**2.13**	**1874**	861	2.38	2087	908	2.62	2299	952	2.86	2512	995	3.10	2725
4500	**828**	**2.27**	**1994**	877	2.52	2212	922	2.77	2430	966	3.02	2648	1008	3.26	2865
4600	845	2.42	2120	892	2.67	2343	937	2.92	2566	980	3.18	2788	1022	3.43	3010
4700	861	2.57	2251	907	2.82	2479	952	3.08	2706	994	3.34	2934	1035	3.60	3161
4800	877	2.72	2388	923	2.99	2621	966	3.25	2853	1008	3.52	3086	1049	3.78	3317
4900	894	2.88	2531	938	3.15	2768	981	3.42	3005	1022	3.69	3242	1062	3.96	3479
5000	910	3.05	2679	954	3.33	2921	996	3.60	3163	1037	3.88	3405	1076	4.15	3647

48TM012 (10 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	878	1.59	1391	925	1.75	1534	970	1.91	1676	1014	2.07	1817	1055	2.23	1958
3100	888	1.68	1475	935	1.85	1623	979	2.02	1769	1022	2.18	1916	1063	2.35	2062
3200	898	1.78	1563	944	1.95	1715	988	2.13	1867	1031	2.30	2018	1072	2.47	2169
3300	909	1.88	1654	954	2.06	1811	998	2.24	1968	1040	2.42	2124	1080	2.60	2280
3400	919	1.99	1749	964	2.18	1911	1007	2.36	2073	1049	2.55	2234	1089	2.73	2395
3500	930	2.11	1848	975	2.30	2015	1017	2.49	2182	1058	2.68	2348	1098	2.86	2514
3600	941	2.22	1951	985	2.42	2123	1027	2.61	2295	1068	2.81	2466	1107	3.00	2637
3700	952	2.35	2058	996	2.55	2236	1038	2.75	2412	1078	2.95	2588	1117	3.15	2764
3800	964	2.47	2170	1007	2.68	2352	1048	2.89	2534	1088	3.09	2715	1126	3.30	2895
3900	976	2.60	2286	1018	2.82	2473	1059	3.03	2660	1098	3.24	2846	**1136**	**3.45**	**3031**
4000	987	2.74	2407	1029	2.96	2598	1069	3.18	2790	1108	3.40	2981	**1146**	**3.61**	**3171**
4100	999	2.88	2532	1041	3.11	2729	1080	3.33	2925	1119	3.56	3121	**1156**	**3.78**	**3316**
4200	1012	3.03	2662	1052	3.26	2863	1092	3.49	3065	1130	3.72	3266	**1167**	**3.95**	**3466**
4300	1024	3.19	2796	1064	3.42	3003	1103	3.66	3210	**1141**	**3.89**	**3415**	**1177**	**4.13**	**3621**
4400	1036	3.35	2937	1076	3.59	3148	1114	3.83	3359	**1152**	**4.07**	**3570**	**1188**	**4.31**	**3781**
4500	1049	3.51	3082	1088	3.76	3298	1126	4.00	3514	**1163**	**4.25**	**3730**	**1199**	**4.50**	**3945**
4600	1062	3.68	3232	1100	3.94	3454	**1138**	**4.19**	**3675**	**1174**	**4.44**	**3895**	**1210**	**4.69**	**4116**
4700	1075	3.86	3387	1113	4.12	3614	**1150**	**4.38**	**3840**	**1186**	**4.63**	**4065**	**1221**	**4.89**	**4291**
4800	1088	4.04	3549	1125	4.31	3780	**1162**	**4.57**	**4011**	**1198**	**4.83**	**4241**	—	—	—
4900	1101	4.23	3716	**1138**	**4.50**	**3951**	**1174**	**4.77**	**4188**	—	—	—	—	—	—
5000	1114	4.43	3888	**1151**	**4.70**	**4129**	**1187**	**4.98**	**4370**	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 830 to 1130 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 5.25.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM014 (12 1/2 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	**728**	**1.36**	**1266**	**789**	**1.58**	**1473**	**848**	**1.81**	**1686**	904	2.04	1906	957	2.29	2132
3800	**744**	**1.46**	**1361**	**804**	**1.69**	**1572**	861	1.92	1790	916	2.16	2015	969	2.41	2246
3900	**760**	**1.57**	**1460**	**819**	**1.80**	**1676**	875	2.04	1899	929	2.28	2128	981	2.53	2364
4000	**777**	**1.68**	**1563**	**834**	**1.91**	**1785**	889	2.16	2012	942	2.41	2247	993	2.67	2487
4100	**793**	**1.79**	**1672**	**850**	**2.04**	**1899**	904	2.29	2132	956	2.54	2371	1006	2.80	2615
4200	**810**	**1.92**	**1786**	865	2.16	2018	918	2.42	2255	969	2.68	2499	1018	2.95	2748
4300	**826**	**2.04**	**1906**	880	2.30	2142	932	2.56	2385	983	2.82	2633	1031	3.10	2888
4400	**843**	**2.18**	**2031**	896	2.44	2272	947	2.70	2520	996	2.97	2773	1044	3.25	3032
4500	860	2.32	2161	912	2.58	2408	962	2.85	2660	1010	3.13	2918	1057	3.41	3182
4600	876	2.46	2297	927	2.73	2549	977	3.01	2807	1024	3.29	3070	1070	3.58	3338
4700	893	2.62	2439	943	2.89	2696	992	3.17	2958	1038	3.46	3226	—	—	—
4800	910	2.77	2587	959	3.06	2849	1007	3.34	3116	1053	3.63	3390	—	—	—
4900	927	2.94	2741	975	3.23	3008	1022	3.52	3280	—	—	—	—	—	—
5000	944	3.11	2901	991	3.40	3173	1037	3.70	3451	—	—	—	—	—	—
5100	961	3.29	3068	1007	3.59	3345	—	—	—	—	—	—	—	—	—
5200	978	3.48	3241	—	—	—	—	—	—	—	—	—	—	—	—
5300	995	3.67	3420	—	—	—	—	—	—	—	—	—	—	—	—
5400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM014 (12 1/2 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	1008	2.54	2364	1058	2.79	2602	**1106**	**3.05**	**2846**	**1152**	**3.32**	**3094**	**1198**	**3.59**	**3348**
3800	1019	2.66	2482	1068	2.92	2725	**1116**	**3.19**	**2972**	**1162**	**3.46**	**3226**	—	—	—
3900	1031	2.79	2605	1079	3.06	2852	**1126**	**3.33**	**3104**	**1171**	**3.61**	**3362**	—	—	—
4000	1042	2.93	2733	**1090**	**3.20**	**2984**	**1136**	**3.48**	**3241**	—	—	—	—	—	—
4100	1054	3.07	2866	**1101**	**3.35**	**3122**	**1146**	**3.63**	**3383**	—	—	—	—	—	—
4200	1066	3.22	3004	**1112**	**3.50**	**3264**	—	—	—	—	—	—	—	—	—
4300	1078	3.38	3148	**1123**	**3.66**	**3413**	—	—	—	—	—	—	—	—	—
4400	**1090**	**3.54**	**3297**	—	—	—	—	—	—	—	—	—	—	—	—
4500	**1103**	**3.70**	**3451**	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 3.70.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TM014 (12½ TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	**728**	**1.36**	**1266**	**789**	**1.58**	**1473**	848	1.81	1686	904	2.04	1906	957	2.29	2132
3800	**744**	**1.46**	**1361**	**804**	**1.69**	**1572**	861	1.92	1790	916	2.16	2015	969	2.41	2246
3900	**760**	**1.57**	**1460**	**819**	**1.80**	**1676**	875	2.04	1899	929	2.28	2128	981	2.53	2364
4000	**777**	**1.68**	**1563**	834	1.91	1785	889	2.16	2012	942	2.41	2247	993	2.67	2487
4100	**793**	**1.79**	**1672**	850	2.04	1899	904	2.29	2132	956	2.54	2371	1006	2.80	2615
4200	**810**	**1.92**	**1786**	865	2.16	2018	918	2.42	2255	969	2.68	2499	1018	2.95	2748
4300	**826**	**2.04**	**1906**	880	2.30	2142	932	2.56	2385	983	2.82	2633	1031	3.10	2888
4400	843	2.18	2031	896	2.44	2272	947	2.70	2520	996	2.97	2773	1044	3.25	3032
4500	860	2.32	2161	912	2.58	2408	962	2.85	2660	1010	3.13	2918	1057	3.41	3182
4600	876	2.46	2297	927	2.73	2549	977	3.01	2807	1024	3.29	3070	1070	3.58	3338
4700	893	2.62	2439	943	2.89	2696	992	3.17	2958	1038	3.46	3226	1084	3.75	3500
4800	910	2.77	2587	959	3.06	2849	1007	3.34	3116	1053	3.63	3390	1098	3.93	3668
4900	927	2.94	2741	975	3.23	3008	1022	3.52	3280	1067	3.82	3558	1111	4.12	3841
5000	944	3.11	2901	991	3.40	3173	1037	3.70	3451	1082	4.00	3733	1125	4.31	4021
5100	961	3.29	3068	1007	3.59	3345	1053	3.89	3627	1096	4.20	3915	**1139**	**4.51**	**4208**
5200	978	3.48	3241	1024	3.78	3523	1068	4.09	3811	1111	4.40	4103	**1153**	**4.72**	**4400**
5300	995	3.67	3420	1040	3.98	3707	1084	4.29	4000	1126	4.61	4298	**1168**	**4.93**	**4600**
5400	1012	3.87	3606	1056	4.18	3899	1099	4.50	4196	**1141**	**4.82**	**4499**	**1182**	**5.15**	**4806**
5500	1029	4.07	3799	1073	4.39	4097	1115	4.72	4400	**1156**	**5.05**	**4707**	—	—	—
5600	1046	4.29	3999	1089	4.61	4302	**1131**	**4.94**	**4610**	—	—	—	—	—	—
5700	1063	4.51	4207	1105	4.84	4515	**1146**	**5.18**	**4827**	—	—	—	—	—	—
5800	1080	4.74	4420	1122	5.08	4734	—	—	—	—	—	—	—	—	—
5900	1098	4.98	4642	—	—	—	—	—	—	—	—	—	—	—	—
6000	1115	5.22	4872	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM014 (12½ TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	1008	2.54	2364	1058	2.79	2602	1106	3.05	2846	**1152**	**3.32**	**3094**	**1198**	**3.59**	**3348**
3800	1019	2.66	2482	1068	2.92	2725	1116	3.19	2972	**1162**	**3.46**	**3226**	**1206**	**3.74**	**3484**
3900	1031	2.79	2605	1079	3.06	2852	1126	3.33	3104	**1171**	**3.61**	**3362**	**1215**	**3.89**	**3624**
4000	1042	2.93	2733	1090	3.20	2984	**1136**	**3.48**	**3241**	**1180**	**3.76**	**3503**	**1224**	**4.04**	**3770**
4100	1054	3.07	2866	1101	3.35	3122	**1146**	**3.63**	**3383**	**1190**	**3.91**	**3649**	**1233**	**4.20**	**3921**
4200	1066	3.22	3004	1112	3.50	3264	**1157**	**3.79**	**3530**	**1200**	**4.08**	**3801**	**1243**	**4.37**	**4077**
4300	1078	3.38	3148	1123	3.66	3413	**1167**	**3.95**	**3683**	**1210**	**4.24**	**3958**	**1252**	**4.54**	**4238**
4400	1090	3.54	3297	**1135**	**3.82**	**3566**	**1179**	**4.12**	**3841**	**1221**	**4.42**	**4121**	**1262**	**4.72**	**4405**
4500	1103	3.70	3451	**1147**	**4.00**	**3726**	**1190**	**4.29**	**4005**	**1232**	**4.60**	**4289**	**1273**	**4.91**	**4578**
4600	1115	3.87	3612	**1159**	**4.17**	**3891**	**1201**	**4.48**	**4175**	**1243**	**4.79**	**4464**	**1283**	**5.10**	**4757**
4700	1128	4.05	3778	**1171**	**4.36**	**4062**	**1213**	**4.67**	**4350**	**1254**	**4.98**	**4644**	—	—	—
4800	**1141**	**4.24**	**3951**	**1183**	**4.55**	**4239**	**1225**	**4.86**	**4532**	**1265**	**5.18**	**4830**	—	—	—
4900	**1154**	**4.43**	**4130**	**1196**	**4.74**	**4422**	**1237**	**5.06**	**4720**	—	—	—	—	—	—
5000	**1167**	**4.63**	**4314**	**1209**	**4.95**	**4611**	—	—	—	—	—	—	—	—	—
5100	**1181**	**4.83**	**4505**	**1221**	**5.16**	**4808**	—	—	—	—	—	—	—	—	—
5200	**1194**	**5.04**	**4703**	—	—	—	—	—	—	—	—	—	—	—	—
5300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 830 to 1130 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 5.25.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TMD016 (Low Heat Units)*

Cfm	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	753	1307	1.53	761	1330	1.56	840	1572	1.84	912	1822	2.14	980	2080	2.44
4800	747	1384	1.62	790	1515	1.78	866	1765	2.07	936	2023	2.37	1002	2289	2.68
5100	741	1465	1.72	820	1718	2.01	893	1977	2.32	961	2243	2.63	1025	2516	2.95
5700	810	1911	2.24	882	2182	2.56	950	2459	2.88	1014	2741	3.21	1075	3029	3.55
6000	844	2164	2.54	914	2444	2.87	980	2730	3.20	1042	3021	3.54	1100	3317	3.89
6300	879	2439	2.86	947	2729	3.20	1010	3023	3.55	1070	3322	3.90	1127	3626	4.25
6600	915	2737	3.21	980	3035	3.56	1041	3338	3.91	1099	3645	4.28	1155	3957	4.64
6900	950	3057	3.59	1013	3364	3.95	1072	3675	4.31	1129	3991	4.68	1183	4311	5.06
7200	986	3401	3.99	1047	3717	4.36	1104	4037	4.74	1159	4361	5.11	1211	4689	5.50
7500	1022	3770	4.42	1081	4095	4.80	1136	4423	5.19	1189	4755	5.58	1241	5091	5.97

48TMD016 (Low Heat Units)* (cont)

Cfm	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1044	2345	2.75	1105	2619	3.07	1163	2899	3.40	1218	3187	3.74	1271	3481	4.08
4800	1065	2561	3.00	1124	2841	3.33	1180	3127	3.67	1235	3420	4.01	1287	3720	4.36
5100	1086	2795	3.28	1144	3082	3.61	1199	3375	3.96	1252	3674	4.31	1304	3979	4.67
5700	1132	3324	3.90	1187	3624	4.25	1240	3929	4.61	1291	4241	4.97	1341	4558	5.35
6000	1157	3619	4.24	1210	3925	4.60	1262	4239	4.97	1312	4557	5.34	1361	4880	5.72
6300	1182	3935	4.62	1234	4249	4.98	1285	4569	5.36	1334	4894	5.74	—	—	—
6600	1208	4274	5.01	1259	4595	5.39	1309	4922	5.77	—	—	—	—	—	—
6900	1235	4636	5.44	1285	4964	5.82	—	—	—	—	—	—	—	—	—
7200	1262	5021	5.89	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TMD016 (Low Heat Units)* (cont)

Cfm	Available External Static Pressure (in. wg)														
	2.2			2.4			2.6			2.8			3.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1322	3781	4.43	1372	4088	4.79	1419	4400	5.16	1466	4719	5.53	1511	5042	5.91
4800	1337	4025	4.72	1386	4337	5.09	1433	4655	5.46	1479	4978	5.84	—	—	—
5100	1353	4290	5.03	1401	4607	5.40	1448	4930	5.78	—	—	—	—	—	—
5700	1388	4881	5.72	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 873 to 1021 rpm. Alternate high-static drive range is 1025 to 1200. Other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:

1. Maximum continuous bhp for the standard motor is 6.13. The maximum continuous watts is 5180. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Fan performance is identical for horizontal applications using Carrier horizontal adapter curb.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TMF016 (High Heat Units)*

Cfm	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	753	1307	1.53	786	1404	1.65	861	1644	1.93	932	1893	2.22	997	2150	2.52
4800	747	1384	1.62	818	1603	1.88	890	1852	2.17	958	2108	2.47	1022	2373	2.78
5100	775	1571	1.84	850	1822	2.14	920	2079	2.44	986	2344	2.75	1048	2616	3.07
5700	849	2054	2.41	918	2323	2.73	982	2598	3.05	1044	2879	3.38	1102	3166	3.71
6000	886	2329	2.73	952	2607	3.06	1015	2891	3.39	1074	3180	3.73	1130	3474	4.08
6300	924	2628	3.08	987	2915	3.42	1047	3207	3.76	1105	3504	4.11	1160	3807	4.46
6600	962	2951	3.46	1023	3246	3.81	1081	3547	4.16	1136	3853	4.52	1190	4163	4.88
6900	1000	3298	3.87	1059	3603	4.23	1115	3912	4.59	1168	4225	4.96	1220	4543	5.33
7200	1038	3672	4.31	1095	3986	4.67	1149	4303	5.05	1201	4625	5.42	1251	4950	5.81
7500	1077	4072	4.78	1131	4394	5.15	1184	4720	5.54	1234	5050	5.92	—	—	—

48TMF016 (High Heat Units)* (cont)

Cfm	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1060	2414	2.83	1119	2685	3.15	1175	2964	3.48	1230	3250	3.81	1282	3542	4.15
4800	1082	2644	3.10	1140	2922	3.43	1195	3207	3.76	1248	3498	4.10	1299	3795	4.45
5100	1106	2894	3.39	1163	3178	3.73	1216	3470	4.07	1268	3767	4.42	1319	4071	4.77
5700	1157	3459	4.06	1211	3757	4.41	1262	4061	4.76	1312	4371	5.13	1360	4686	5.50
6000	1184	3774	4.43	1236	4080	4.79	1287	4391	5.15	1335	4707	5.52	1382	5029	5.90
6300	1212	4114	4.83	1263	4427	5.19	1312	4745	5.57	1359	5067	5.94	—	—	—
6600	1241	4478	5.25	1290	4798	5.63	1338	5122	6.01	—	—	—	—	—	—
6900	1270	4866	5.71	—	—	—	—	—	—	—	—	—	—	—	—
7200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TMF016 (High Heat Units)* (cont)

Cfm	Available External Static Pressure (in. wg)														
	2.2			2.4			2.6			2.8			3.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1332	3841	4.50	1381	4145	4.86	1428	4456	5.23	1473	4772	5.60	1518	5095	5.98
4800	1349	4100	4.81	1397	4409	5.17	1443	4725	5.54	1488	5046	5.92	—	—	—
5100	1367	4380	5.14	1414	4695	5.51	1460	5016	5.88	—	—	—	—	—	—
5700	1407	5007	5.87	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 873 to 1021 rpm. Alternate high-static drive range is 1025 to 1200. Other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. Maximum continuous bhp for the standard motor is 6.13. The maximum continuous watts is 5180. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Fan performance is identical for horizontal applications using Carrier horizontal adapter curb.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TMD020 (18 TONS) LOW HEAT UNITS*

Airflow (Cfm)	Available External Static Pressure (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
5,500	755	2.27	1908	831	2.58	2171	901	2.91	2443	968	3.24	2723	1031	3.58	3009	1091	3.93	3302
6,000	810	2.72	2287	881	3.04	2556	947	3.37	2833	1010	3.71	3116	1070	4.05	3406	1127	4.40	3702
6,500	866	3.22	2710	932	3.55	2985	994	3.88	3266	1054	4.23	3554	1111	4.57	3847	1166	4.93	4146
7,000	923	3.78	3177	985	4.11	3458	1044	4.45	3744	1100	4.80	4036	1155	5.15	4333	1207	5.51	4635
7,500	980	4.39	3690	1038	4.73	3976	1094	5.07	4267	1148	5.43	4564	1200	5.78	4864	1250	6.15	5170
8,000	1038	5.06	4251	1093	5.40	4542	1146	5.75	4838	1197	6.11	5138	1246	6.47	5443	1294	6.84	5752
8,500	1096	5.78	4859	1148	6.13	5156	1198	6.49	5456	1247	6.85	5761	1294	7.22	6070	1340	7.59	6382
9,000	1154	6.56	5517	1204	6.92	5818	1251	7.28	6123	1298	7.65	6432	1343	8.02	6745	1388	8.40	7062
9,500	1213	7.40	6224	1260	7.77	6531	1306	8.13	6840	1350	8.51	7154	1394	8.88	7471	1436	9.26	7791
10,000	1272	8.30	6983	1317	8.67	7294	1360	9.05	7608	1403	9.43	7926	1445	9.81	8247	1486	10.19	8570

48TMD020 (18 TONS) LOW HEAT UNITS* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.4			1.6			1.8			1.9			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
5,500	1149	4.28	3602	1204	4.65	3907	1258	5.02	4217	1284	5.20	4375	1309	5.39	4533
6,000	1183	4.76	4003	1236	5.13	4310	1288	5.50	4622	1313	5.68	4780	1337	5.87	4939
6,500	1219	5.29	4450	1270	5.66	4759	1320	6.03	5073	1344	6.22	5232	1368	6.41	5391
7,000	1258	5.88	4942	1307	6.25	5253	1355	6.62	5569	1378	6.81	5729	1402	7.00	5890
7,500	1299	6.52	5480	1346	6.89	5794	1392	7.27	6113	1415	7.46	6273	1437	7.65	6435
8,000	1341	7.21	6065	1387	7.59	6383	1392	7.97	6704	1453	8.16	6866	1475	8.36	7028
8,500	1385	7.97	6699	1429	8.35	7019	1472	8.73	7343	1493	8.93	7506	1514	9.12	7670
9,000	1431	8.78	7382	1473	9.15	7705	1515	9.55	8032	1535	9.75	8196	—	—	—
9,500	1478	9.65	8114	1519	10.04	8441	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 910 to 1095 rpm. Alternate high-static drive range is 1069 to 1287. Other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. Maximum continuous bhp is 5.90. The maximum continuous watts is 5180. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data table for more information.
2. Fan performance is identical for horizontal applications using Carrier horizontal adapter curb.

48TMF020 (18 TONS) HIGH HEAT UNITS*

Airflow (Cfm)	Available External Static Pressure (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
5,500	795	2.43	2043	866	2.74	2306	934	3.07	2578	998	3.40	2856	1059	3.74	3142	1117	4.08	3434
6,000	854	2.92	2452	921	3.24	2722	984	3.57	3998	1044	3.90	3281	1102	4.25	3570	1158	4.60	3865
6,500	914	3.46	2909	977	3.79	3184	1036	4.12	3465	1093	4.46	3752	1148	4.81	4045	1201	5.16	4343
7,000	975	4.06	3414	1034	4.39	3695	1090	4.73	3981	1144	5.08	4272	1196	5.43	4569	1246	5.79	4870
7,500	1037	4.72	3969	1092	5.06	4255	1145	5.41	4546	1196	5.76	4842	1256	6.12	5142	1294	6.48	5447
8,000	1099	5.44	4575	1150	5.79	4866	1201	6.14	5162	1249	6.50	5462	1297	6.86	5766	1343	7.22	6075
8,500	1161	6.22	5232	1210	6.57	5529	1258	6.93	5829	1304	7.29	6134	1349	7.66	6443	1393	8.03	6755
9,000	1223	7.07	5943	1270	7.43	6245	1315	7.79	6550	1360	8.16	6869	1403	8.53	7171	1445	8.90	7487
9,500	1286	7.98	6708	1331	8.34	7014	1374	8.71	7324	1416	9.08	7638	1457	9.46	7954	1498	9.84	8274
10,000	1349	8.95	7528	1392	9.32	7839	1433	9.70	8154	1473	10.07	8471	—	—	—	—	—	—

48TMF020 (18 TONS) HIGH HEAT UNITS* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.4			1.6			1.8			1.9			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
5,500	1173	4.44	3732	1227	4.80	4036	1279	5.17	4345	1304	5.35	4502	1329	5.54	4629
6,000	1211	4.95	4165	1263	5.32	4471	1313	5.69	4782	1337	5.87	4939	1361	6.06	5097
6,500	1252	5.53	4646	1302	5.89	4954	1350	6.26	5267	1373	6.56	5425	1396	6.64	5584
7,000	1295	6.16	5176	1343	6.52	5487	1389	6.90	5802	1412	7.09	5961	1434	7.28	6121
7,500	1340	6.85	5756	1386	7.22	6070	1431	7.60	6387	1452	7.79	6547	1474	7.98	6709
8,000	1388	7.60	6388	1431	7.97	6704	1474	8.35	7024	1495	8.54	7186	1516	8.74	7348
8,500	1436	8.41	7071	1478	8.79	7390	1520	9.17	7713	1540	9.37	7876	—	—	—
9,000	1486	9.28	7807	1527	9.67	8130	—	—	—	—	—	—	—	—	—
9,500	1538	10.22	8597	—	—	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 910 to 1095 rpm. Alternate high-static drive range is 1069 to 1287. Other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. Maximum continuous bhp is 5.90. The maximum continuous watts is 5180. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data table for more information.
2. Fan performance is identical for horizontal applications using Carrier horizontal adapter curb.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TMD025 (Low Heat Units)*

Cfm	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,000	824	2607	3.09	894	2844	3.37	961	3085	3.66	1023	3330	3.95	1083	3578	4.24
6,500	881	3030	3.59	947	3266	3.88	1009	3507	4.16	1069	3751	4.45	1126	3998	4.74
7,000	939	3488	4.14	1001	3725	4.42	1060	3965	4.70	1116	4208	4.99	1170	4454	5.28
7,500	998	3982	4.72	1055	4218	5.00	1111	4458	5.29	1165	4701	5.58	1217	4946	5.87
8,000	1056	4512	5.35	1111	4748	5.63	1164	4988	5.92	1215	5230	6.20	1264	5474	6.49
8,500	1116	5077	6.02	1167	5314	6.30	1218	5553	6.59	1266	5795	6.87	1314	6039	7.16
9,000	1175	5678	6.74	1224	5915	7.02	1272	6154	7.30	1319	6395	7.59	1364	6639	7.88
9,500	1235	6315	7.49	1282	6552	7.77	1327	6791	8.06	1372	7033	8.34	1415	7276	8.63
10,000	1295	6988	8.29	1340	7225	8.57	1383	7465	8.86	1426	7706	9.14	1468	7949	9.43

48TMD025 (Low Heat Units)* (cont)

Cfm	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,000	1141	3829	4.54	1196	4082	4.84	1249	4337	5.15	1301	4596	5.45	1351	4856	5.76
6,500	1181	4247	5.04	1234	4499	5.34	1285	4753	5.64	1334	5009	5.94	1383	5267	6.25
7,000	1223	4702	5.58	1274	4953	5.88	1323	5205	6.18	1371	5460	6.48	1417	5716	6.78
7,500	1267	5194	6.16	1316	5443	6.46	1363	5694	6.76	1409	5947	7.06	1454	6202	7.36
8,000	1313	5721	6.79	1359	5970	7.08	1405	6220	7.38	1449	6472	7.68	1493	6726	7.98
8,500	1360	6285	7.46	1405	6533	7.75	1449	6783	8.05	1491	7034	8.34	1533	7286	8.64
9,000	1408	6885	8.17	1451	7132	8.46	1494	7381	8.76	1535	7631	9.05	—	—	—
9,500	1458	7521	8.92	1499	7768	9.22	1540	8016	9.51	—	—	—	—	—	—
10,000	1508	8193	9.72	1549	8440	10.01	—	—	—	—	—	—	—	—	—

48TMD025 (Low Heat Units)* (cont)

Cfm	Available External Static Pressure (in. wg)														
	2.2			2.4			2.6			2.8			3.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,000	1399	5118	6.07	1446	5381	6.38	1492	5647	6.70	1537	5914	7.02	—	—	—
6,500	1429	5527	6.56	1475	5789	6.87	1520	6052	7.18	—	—	—	—	—	—
7,000	1462	5974	7.09	1507	6234	7.40	1550	6495	7.71	—	—	—	—	—	—
7,500	1498	6459	7.66	1540	6717	7.97	—	—	—	—	—	—	—	—	—
8,000	1535	6981	8.28	—	—	—	—	—	—	—	—	—	—	—	—
8,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 1002 to 1151 rpm. Alternate high-static drive range is 1193 to 1369. Other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTE:

1. Maximum continuous bhp for the standard motor is 8.7 (for 208/230 and 575-v units) and 9.5 (for 460-v units). The maximum continuous watts is 7915 (for 208/230 and 575-v units) and 8640 (for 460-v units). Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data table for additional information.
2. Fan performance is identical for horizontal applications using Carrier horizontal adapter curb.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TMF025 (High Heat Units)*

Cfm	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,000	868	2752	3.26	934	2987	3.54	997	3227	3.83	1058	3470	4.12	1115	3716	4.41
6,500	929	3201	3.80	991	3436	4.08	1051	3675	4.36	1108	3917	4.65	1162	4163	4.94
7,000	991	3687	4.37	1049	3923	4.65	1105	4161	4.94	1159	4403	5.22	1211	4647	5.51
7,500	1054	4211	5.00	1109	4447	5.28	1161	4686	5.56	1213	4926	5.84	1262	5170	6.13
8,000	1117	4773	5.66	1168	5009	5.94	1218	5247	6.22	1267	5488	6.51	1314	5731	6.80
8,500	1180	5373	6.37	1229	5609	6.65	1277	5847	6.94	1323	6088	7.22	1368	6331	7.51
9,000	1244	6011	7.13	1290	6247	7.41	1335	6485	7.69	1380	6726	7.98	1423	6968	8.27
9,500	1308	6687	7.93	1352	6924	8.21	1395	7162	8.50	1437	7402	8.78	1479	7644	9.07
10,000	1372	7401	8.78	1414	7638	9.06	1455	7876	9.34	1496	8117	9.63	1535	8358	9.92

48TMF025 (High Heat Units)* (cont)

Cfm	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,000	1171	3965	4.70	1224	4216	5.00	1276	4469	5.30	1326	4726	5.61	1374	4983	5.91
6,500	1215	4410	5.23	1266	4659	5.53	1316	4911	5.83	1364	5165	6.13	1411	5421	6.43
7,000	1262	4894	5.81	1311	5142	6.10	1358	5392	6.40	1404	5645	6.70	1449	5899	7.00
7,500	1310	5415	6.42	1357	5663	6.72	1403	5912	7.01	1447	6164	7.31	1490	6416	7.61
8,000	1360	5976	7.09	1405	6222	7.38	1449	6471	7.68	1492	6721	7.97	1533	6973	8.27
8,500	1412	6575	7.80	1455	6821	8.09	1497	7068	8.39	1538	7318	8.68	—	—	—
9,000	1465	7212	8.56	1506	7457	8.85	1547	7705	9.14	—	—	—	—	—	—
9,500	1519	7888	9.36	—	—	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TMF025 (High Heat Units)* (cont)

Cfm	Available External Static Pressure (in. wg)														
	2.2			2.4			2.6			2.8			3.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,000	1422	5243	6.22	1468	5505	6.53	1513	5768	6.84	—	—	—	—	—	—
6,500	1456	5679	6.74	1501	5938	7.04	1544	6199	7.35	—	—	—	—	—	—
7,000	1493	6155	7.30	1536	6412	7.61	—	—	—	—	—	—	—	—	—
7,500	1533	6670	7.91	—	—	—	—	—	—	—	—	—	—	—	—
8,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 1002 to 1151 rpm. Alternate high-static drive range is 1193 to 1369. Other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:

1. Maximum continuous bhp for the standard motor is 8.7 (for 208/230 and 575-v units) and 9.5 (for 460-v units). The maximum continuous watts is 7915 (for 208/230 and 575-v units) and 8640 (for 460-v units). Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data table for additional information.
2. Fan performance is identical for horizontal applications using Carrier horizontal adapter curb.

Performance data — 48TM (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48TMD028 (25 TONS) LOW HEAT UNITS*

Airflow (Cfm)	Available External Static Pressure (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
7,000	941	3.35	2,769	1002	3.80	3,140	1061	4.27	3528	1117	4.76	3,934	1171	5.27	4,356	1224	5.80	4,794
7,500	999	4.05	3,348	1057	4.53	3,742	1112	5.02	4152	1166	5.54	4,579	1218	6.07	5,020	1268	6.63	5,478
8,000	1058	4.85	4,007	1113	5.35	4,424	1165	5.87	4856	1216	6.41	5,304	1266	6.97	5,766	1314	7.55	6,243
8,500	1117	5.74	4,750	1169	6.28	5,190	1219	6.83	5645	1268	7.40	6,114	1315	7.98	6,597	1361	8.58	7,094
9,000	1177	6.75	5,583	1226	7.31	6,047	1274	7.89	6524	1320	8.48	7,015	1365	9.09	7,520	1410	9.72	8,037
9,500	1237	7.98	6,511	1284	8.46	6,999	1329	9.07	7499	1374	9.69	8,012	1417	10.33	8,538	1459	10.98	9,076
10,000	1297	9.12	7,450	1342	9.74	8,051	1385	10.37	8574	1428	11.02	9,110	1469	11.68	9,657	1510	12.36	10,217
10,500	1358	10.49	8,674	1400	11.14	9,209	1442	11.80	9755	1483	12.47	10,314	1523	13.16	10,883	—	—	—
11,000	1418	12.00	9,919	1459	12.67	10,478	—	—	—	—	—	—	—	—	—	—	—	—
11,250	1449	12.80	10,585	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TMD028 (25 TONS) LOW HEAT UNITS* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)								
	1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
7,000	1274	6.35	5248	1323	6.92	5,718	1371	5.54	6204
7,500	1316	7.20	6960	1364	7.79	6,437	1410	6.41	6939
8,000	1360	8.14	6734	1406	8.76	7,239	1450	7.40	7759
8,500	1406	9.20	7605	1449	9.83	8,129	1492	8.48	8666
9,000	1453	10.36	8568	1495	11.02	9,111	1536	9.69	9667
9,500	1501	11.64	9627	1541	12.32	10,190	—	—	—
10,000	—	—	—	—	—	—	—	—	—
10,500	—	—	—	—	—	—	—	—	—
11,000	—	—	—	—	—	—	—	—	—
11,250	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 1066 to 1283 rpm. Alternate high-static drive range is 1332 to 1550. Other rpms require a field-supplied drive.

Refer to this page for general Fan Performance Data notes.

NOTE: Maximum continuous bhp is 10.20 (208/230, 575 v) or 11.80 (460 v) and the maximum continuous watts are 9510 (208/230, 575 v) or 11,000 (460 v). Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data table for more information.

48TMF028 (25 TONS) HIGH HEAT UNITS*

Airflow (Cfm)	Available External Static Pressure (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
7,000	992	4.05	3,348	1051	4.44	3,668	1106	4.83	3995	1160	5.24	4331	1212	5.65	4675	1262	6.08	5026
7,500	1055	4.77	3,947	1110	5.17	4,277	1162	5.58	4615	1214	6.00	4960	1263	6.43	5312	1311	6.86	5672
8,000	1118	5.58	4,610	1170	5.99	4,950	1220	6.41	5298	1268	6.84	5653	1315	7.27	6014	1361	7.72	6382
8,500	1182	6.46	5,339	1231	6.88	5,690	1278	7.31	6047	1324	7.75	6411	1369	8.20	6782	1413	8.66	7158
9,000	1246	7.42	6,136	1292	7.86	6,498	1337	8.30	6865	1381	8.75	7239	1424	9.21	7618	1466	9.68	8003
9,500	1310	8.47	7,005	1354	8.92	7,377	1397	9.38	7754	1439	9.84	8137	1480	10.31	8525	1520	10.79	8918
10,000	1374	9.61	7,947	1416	10.07	8,329	1457	10.54	8715	1497	11.02	9107	1537	11.50	9504	—	—	—
10,500	1439	10.84	8,964	1479	11.32	9,356	1518	11.79	9752	—	—	—	—	—	—	—	—	—
11,000	1503	12.17	10,059	1542	12.65	10,460	—	—	—	—	—	—	—	—	—	—	—	—
11,250	1536	12.86	10,636	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TMF028 (25 TONS) HIGH HEAT UNITS* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)								
	1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
7,000	1311	6.51	5385	1359	6.96	5751	1405	6.00	6124
7,500	1358	7.30	6039	1403	7.76	6412	1448	6.84	6792
8,000	1406	8.17	6767	1560	8.63	7137	1492	7.75	7524
8,500	1456	9.12	7541	1498	9.59	7929	1539	8.75	8323
9,000	1507	10.15	8393	1548	10.63	8790	—	—	—
9,500	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—
10,500	—	—	—	—	—	—	—	—	—
11,000	—	—	—	—	—	—	—	—	—
11,250	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 1066 to 1283 rpm. Alternate high-static drive range is 1332 to 1550. Other rpms require a field-supplied drive.

Refer to this page for general Fan Performance Data notes.

NOTE: Maximum continuous bhp is 10.20 (208/230, 575 v) or 11.80 (460 v) and the maximum continuous watts are 9510 (208/230, 575 v) or 11,000 (460 v). Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data table for more information.

GENERAL NOTES FOR FAN PERFORMANCE DATA TABLES

1. Static pressure losses (i.e., EconoMi$er+) must be added to external static pressure before entering Fan Performance table.
2. Interpolation is permissible. Do not extrapolate.
3. Fan performance is based on wet coils, clean filters, and casing losses. See Accessory/FIOP Static Pressure table on page 89.
4. Extensive motor and drive testing on these units ensures that the full horsepower and watts range of the motor can be utilized with confidence. Using your fan motors up to the watts or bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
5. Use of a field-supplied motor may affect wire size. Contact your Carrier representative for details.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS

48TM004 (3 TONS) — STANDARD MOTOR (DIRECT DRIVE)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)

Refer to page 70 for general Fan Performance Data notes.

48TM004 (3 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**607**	**0.14**	**142**	745	0.22	221	856	0.31	304	952	0.39	393	1037	0.49	485
1000	**640**	**0.18**	**174**	775	0.26	261	884	0.35	351	978	0.45	446	**1062**	**0.55**	**545**
1100	**674**	**0.21**	**212**	805	0.31	307	912	0.41	404	1005	0.51	506	**1089**	**0.61**	**611**
1200	708	0.26	256	836	0.36	359	941	0.47	464	1033	0.57	572	**1116**	**0.69**	**683**
1300	743	0.31	307	868	0.42	417	971	0.53	530	**1062**	**0.65**	**645**	**1143**	**0.77**	**764**
1400	780	0.37	364	900	0.49	483	1002	0.61	603	**1091**	**0.73**	**726**	**1172**	**0.86**	**851**
1500	816	0.43	428	934	0.56	556	1033	0.69	685	**1121**	**0.82**	**815**	**1201**	**0.95**	**947**

48TM004 (3 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**1114**	**0.59**	**582**	**1186**	**0.69**	**684**	**1253**	**0.79**	**789**	**1316**	**0.90**	**898**	**1375**	**1.02**	**1010**
1000	**1139**	**0.65**	**648**	**1210**	**0.76**	**754**	**1277**	**0.87**	**865**	**1340**	**0.98**	**979**	**1399**	**1.10**	**1097**
1100	**1165**	**0.72**	**720**	**1236**	**0.84**	**832**	**1302**	**0.95**	**948**	**1364**	**1.07**	**1068**	**1423**	**1.20**	**1191**
1200	**1191**	**0.80**	**799**	**1261**	**0.92**	**917**	**1327**	**1.04**	**1039**	**1389**	**1.17**	**1165**	—	—	—
1300	**1218**	**0.89**	**885**	**1288**	**1.02**	**1010**	**1353**	**1.14**	**1138**	—	—	—	—	—	—
1400	**1246**	**0.99**	**980**	**1315**	**1.12**	**1111**	—	—	—	—	—	—	—	—	—
1500	**1274**	**1.09**	**1083**	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 685 to 1045 rpm. All other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.20.

48TM004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**607**	**0.14**	**142**	**745**	**0.22**	**221**	**856**	**0.31**	**304**	**952**	**0.39**	**393**	**1037**	**0.49**	**485**
1000	**640**	**0.18**	**174**	**775**	**0.26**	**261**	**884**	**0.35**	**351**	**978**	**0.45**	**446**	**1062**	**0.55**	**545**
1100	**674**	**0.21**	**212**	**805**	**0.31**	**307**	**912**	**0.41**	**404**	**1005**	**0.51**	**506**	1089	0.61	611
1200	**708**	**0.26**	**256**	**836**	**0.36**	**359**	**941**	**0.47**	**464**	**1033**	**0.57**	**572**	1116	0.69	683
1300	**743**	**0.31**	**307**	**868**	**0.42**	**417**	**971**	**0.53**	**530**	**1062**	**0.65**	**645**	1143	0.77	764
1400	**780**	**0.37**	**364**	**900**	**0.49**	**483**	**1002**	**0.61**	**603**	1091	0.73	726	1172	0.86	851
1500	**816**	**0.43**	**428**	**934**	**0.56**	**556**	**1033**	**0.69**	**685**	1121	0.82	815	1201	0.95	947

48TM004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1114	0.59	582	1186	0.69	684	1253	0.79	789	1316	0.90	898	1375	1.02	1010
1000	1139	0.65	648	1210	0.76	754	1277	0.87	865	1340	0.98	979	1399	1.10	1097
1100	1165	0.72	720	1236	0.84	832	1302	0.95	948	1364	1.07	1068	1423	1.20	1191
1200	1191	0.80	799	1261	0.92	917	1327	1.04	1039	1389	1.17	1165	1448	1.30	1293
1300	1218	0.89	885	1288	1.02	1010	1353	1.14	1138	1414	1.28	1270	**1473**	**1.41**	**1404**
1400	1246	0.99	980	1315	1.12	1111	1379	1.25	1246	1440	1.39	1383	**1499**	**1.53**	**1523**
1500	1274	1.09	1083	1342	1.23	1221	1406	1.37	1362	**1467**	**1.51**	**1505**	**1525**	**1.66**	**1652**

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48TM (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM005 (4 TONS) — STANDARD MOTOR (DIRECT DRIVE)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)

Refer to page 70 for general Fan Performance Data notes.

48TM005 (4 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**643**	**0.23**	**234**	**762**	**0.34**	**343**	859	0.46	458	944	0.58	579	1020	0.71	705
1300	**675**	**0.28**	**277**	790	0.40	394	886	0.52	517	969	0.65	644	1044	0.78	777
1400	**707**	**0.33**	**326**	819	0.45	452	913	0.58	581	996	0.72	716	1070	0.86	855
1500	**740**	**0.38**	**382**	849	0.52	515	941	0.66	653	1023	0.80	795	1096	0.95	941
1600	773	0.45	444	879	0.59	586	970	0.73	731	1050	0.88	880	1123	1.04	1034
1700	807	0.52	513	910	0.67	663	999	0.82	817	1078	0.98	973	1150	1.14	1134
1800	841	0.59	589	942	0.75	749	1029	0.91	910	1106	1.08	1074	—	—	—
1900	875	0.68	674	974	0.85	842	1059	1.02	1012	1135	1.19	1184	—	—	—
2000	910	0.77	767	1006	0.95	944	1090	1.13	1122	—	—	—	—	—	—

48TM005 (4 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1089	0.84	837	1153	0.98	974	**1213**	**1.12**	**1115**	—	—	—	—	—	—
1300	1113	0.92	915	**1177**	**1.06**	**1058**	—	—	—	—	—	—	—	—	—
1400	1138	1.01	1000	**1201**	**1.15**	**1149**	—	—	—	—	—	—	—	—	—
1500	1163	1.10	1092	—	—	—	—	—	—	—	—	—	—	—	—
1600	**1189**	**1.20**	**1191**	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 770 to 1175 rpm. All other rpms require a field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.20.

48TM005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**643**	**0.23**	**234**	**762**	**0.34**	**343**	**859**	**0.46**	**458**	**944**	**0.58**	**579**	**1020**	**0.71**	**705**
1300	**675**	**0.28**	**277**	**790**	**0.40**	**394**	**886**	**0.52**	**517**	**969**	**0.65**	**644**	**1044**	**0.78**	**777**
1400	**707**	**0.33**	**326**	**819**	**0.45**	**452**	**913**	**0.58**	**581**	**996**	**0.72**	**716**	**1070**	**0.86**	**855**
1500	**740**	**0.38**	**382**	**849**	**0.52**	**515**	**941**	**0.66**	**653**	**1023**	**0.80**	**795**	1096	0.95	941
1600	**773**	**0.45**	**444**	**879**	**0.59**	**586**	**970**	**0.73**	**731**	**1050**	**0.88**	**880**	1123	1.04	1034
1700	**807**	**0.52**	**513**	**910**	**0.67**	**663**	**999**	**0.82**	**817**	1078	0.98	973	1150	1.14	1134
1800	**841**	**0.59**	**589**	**942**	**0.75**	**749**	**1029**	**0.91**	**910**	1106	1.08	1074	1177	1.25	1242
1900	**875**	**0.68**	**674**	**974**	**0.85**	**842**	**1059**	**1.02**	**1012**	1135	1.19	1184	1205	1.37	1360
2000	**910**	**0.77**	**767**	**1006**	**0.95**	**944**	1090	1.13	1122	1165	1.31	1302	1234	1.49	1485

48TM005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1089	0.84	837	1153	0.98	974	1213	1.12	1115	1270	1.27	1262	1324	1.42	1413
1300	1113	0.92	915	1177	1.06	1058	1237	1.21	1205	1293	1.36	1358	1347	1.52	1514
1400	1138	1.01	1000	1201	1.15	1149	1261	1.31	1303	1317	1.47	1461	1370	1.63	1623
1500	1163	1.10	1092	1226	1.25	1247	1285	1.41	1407	1341	1.58	1571	1394	1.75	1740
1600	1189	1.20	1191	1252	1.36	1353	1310	1.53	1520	1365	1.70	1690	1418	1.87	1865
1700	1216	1.31	1299	1277	1.48	1468	1335	1.65	1640	1390	1.83	1817	1442	2.01	1998
1800	1242	1.42	1414	1303	1.60	1590	1361	1.78	1770	1415	1.96	1953	**1467**	**2.15**	**2140**
1900	1270	1.55	1538	1330	1.73	1721	1387	1.92	1908	1441	2.11	2098	**1493**	**2.30**	**2292**
2000	1297	1.68	1672	1357	1.87	1862	1414	2.07	2055	**1467**	**2.26**	**2252**	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM006 (5 TONS) — STANDARD MOTOR (DIRECT DRIVE)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)

Refer to page 70 for general Fan Performance Data notes.

48TM006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* — SINGLE-PHASE UNITS

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**790**	**0.40**	**353**	896	0.53	470	990	0.67	599	1074	0.83	738	1151	1.00	886
1600	**828**	**0.46**	**413**	930	0.60	535	1021	0.75	669	1103	0.91	812	1179	1.09	965
1700	**866**	**0.54**	**479**	964	0.68	607	1053	0.84	746	1133	1.01	894	1207	1.18	1051
1800	905	0.62	553	1000	0.77	687	1085	0.94	831	1164	1.11	984	1236	1.29	1146
1900	944	0.71	635	1036	0.87	775	1119	1.04	924	1195	1.22	1082	—	—	—
2000	984	0.82	725	1072	0.98	871	1153	1.15	1025	—	—	—	—	—	—
2100	1024	0.93	824	1109	1.10	976	1188	1.28	1136	—	—	—	—	—	—
2200	1064	1.05	932	1147	1.23	1090	—	—	—	—	—	—	—	—	—
2300	1105	1.18	1050	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* — SINGLE-PHASE UNITS (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1223	1.18	1045	—	—	—	—	—	—	—	—	—	—	—	—
1600	1249	1.27	1127	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.30.

48TM006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* — THREE-PHASE UNITS

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**790**	**0.40**	**353**	896	0.53	470	990	0.67	599	1074	0.83	738	1151	1.00	886
1600	**828**	**0.46**	**413**	930	0.60	535	1021	0.75	669	1103	0.91	812	1179	1.09	965
1700	**866**	**0.54**	**479**	964	0.68	607	1053	0.84	746	1133	1.01	894	1207	1.18	1051
1800	905	0.62	553	1000	0.77	687	1085	0.94	831	1164	1.11	984	1236	1.29	1146
1900	944	0.71	635	1036	0.87	775	1119	1.04	924	1195	1.22	1082	1266	1.41	1248
2000	984	0.82	725	1072	0.98	871	1153	1.15	1025	1227	1.34	1189	1297	1.53	1360
2100	1024	0.93	824	1109	1.10	976	1188	1.28	1136	1260	1.47	1305	**1328**	**1.67**	**1481**
2200	1064	1.05	932	1147	1.23	1090	1223	1.41	1256	1294	1.61	1430	**1360**	**1.81**	**1612**
2300	1105	1.18	1050	1185	1.37	1215	1259	1.56	1386	**1328**	**1.76**	**1566**	**1393**	**1.97**	**1752**
2400	1146	1.33	1179	1223	1.52	1349	1295	1.72	1527	**1362**	**1.93**	**1711**	**1426**	**2.14**	**1903**
2500	1187	1.48	1317	1262	1.68	1494	**1332**	**1.89**	**1677**	**1398**	**2.10**	**1868**	**1460**	**2.33**	**2065**

48TM006 (5 TONS) — ALTERNATE MOTOR (BELT DRIVE)* — THREE-PHASE UNITS (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1223	1.18	1045	1291	1.36	1212	**1355**	**1.56**	**1388**	**1415**	**1.77**	**1573**	**1473**	**1.99**	**1765**
1600	1249	1.27	1127	**1316**	**1.46**	**1298**	**1379**	**1.66**	**1478**	**1439**	**1.87**	**1665**	**1496**	**2.09**	**1860**
1700	1277	1.37	1217	**1342**	**1.57**	**1392**	**1404**	**1.77**	**1575**	**1463**	**1.99**	**1766**	**1520**	**2.21**	**1965**
1800	**1305**	**1.48**	**1316**	**1369**	**1.68**	**1495**	**1430**	**1.89**	**1681**	**1489**	**2.11**	**1876**	**1545**	**2.34**	**2078**
1900	**1333**	**1.60**	**1423**	**1397**	**1.81**	**1606**	**1457**	**2.02**	**1797**	**1514**	**2.25**	**1995**	—	—	—
2000	**1363**	**1.73**	**1540**	**1425**	**1.94**	**1727**	**1484**	**2.16**	**1922**	**1541**	**2.39**	**2124**	—	—	—
2100	**1393**	**1.87**	**1665**	**1454**	**2.09**	**1857**	**1512**	**2.31**	**2056**	—	—	—	—	—	—
2200	**1424**	**2.03**	**1801**	**1484**	**2.25**	**1997**	—	—	—	—	—	—	—	—	—
2300	**1455**	**2.19**	**1946**	—	—	—	—	—	—	—	—	—	—	—	—
2400	**1487**	**2.37**	**2103**	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48TM (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**790**	**0.40**	**353**	**896**	**0.53**	**470**	**990**	**0.67**	**599**	**1074**	**0.83**	**738**	**1151**	**1.00**	**886**
1600	**828**	**0.46**	**413**	**930**	**0.60**	**535**	**1021**	**0.75**	**669**	**1103**	**0.91**	**812**	**1179**	**1.09**	**965**
1700	**866**	**0.54**	**479**	**964**	**0.68**	**607**	**1053**	**0.84**	**746**	**1133**	**1.01**	**894**	**1207**	**1.18**	**1051**
1800	**905**	**0.62**	**553**	**1000**	**0.77**	**687**	**1085**	**0.94**	**831**	**1164**	**1.11**	**984**	**1236**	**1.29**	**1146**
1900	**944**	**0.71**	**635**	**1036**	**0.87**	**775**	**1119**	**1.04**	**924**	**1195**	**1.22**	**1082**	**1266**	**1.41**	**1248**
2000	**984**	**0.82**	**725**	**1072**	**0.98**	**871**	**1153**	**1.15**	**1025**	**1227**	**1.34**	**1189**	**1297**	**1.53**	**1360**
2100	**1024**	**0.93**	**824**	**1109**	**1.10**	**976**	**1188**	**1.28**	**1136**	**1260**	**1.47**	**1305**	1328	1.67	1481
2200	**1064**	**1.05**	**932**	**1147**	**1.23**	**1090**	**1223**	**1.41**	**1256**	**1294**	**1.61**	**1430**	1360	1.81	1612
2300	**1105**	**1.18**	**1050**	**1185**	**1.37**	**1215**	**1259**	**1.56**	**1386**	1328	1.76	1566	1393	1.97	1752
2400	**1146**	**1.33**	**1179**	**1223**	**1.52**	**1349**	**1295**	**1.72**	**1527**	1362	1.93	1711	1426	2.14	1903
2500	**1187**	**1.48**	**1317**	**1262**	**1.68**	**1494**	1332	1.89	1677	1398	2.10	1868	1460	2.33	2065

48TM006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**1223**	**1.18**	**1045**	**1291**	**1.36**	**1212**	1355	1.56	1388	1415	1.77	1573	1473	1.99	1765
1600	**1249**	**1.27**	**1127**	1316	1.46	1298	1379	1.66	1478	1439	1.87	1665	1496	2.09	1860
1700	**1277**	**1.37**	**1217**	1342	1.57	1392	1404	1.77	1575	1463	1.99	1766	1520	2.21	1965
1800	1305	1.48	1316	1369	1.68	1495	1430	1.89	1681	1489	2.11	1876	1545	2.34	2078
1900	1333	1.60	1423	1397	1.81	1606	1457	2.02	1797	1514	2.25	1995	1570	2.48	2200
2000	1363	1.73	1540	1425	1.94	1727	1484	2.16	1922	1541	2.39	2124	1596	2.63	2333
2100	1393	1.87	1665	1454	2.09	1857	1512	2.31	2056	1568	2.55	2262	1622	2.79	2475
2200	1424	2.03	1801	1484	2.25	1997	1541	2.48	2200	1596	2.71	2411	—	—	—
2300	1455	2.19	1946	1514	2.42	2147	1571	2.65	2355	1625	2.89	2570	—	—	—
2400	1487	2.37	2103	1545	2.60	2308	1601	2.84	2521	—	—	—	—	—	—
2500	1520	2.56	2269	1577	2.79	2480	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

48TM007 (6 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**919**	**0.63**	**561**	**1010**	**0.75**	**663**	1095	0.87	771	1174	1.00	886	1250	1.14	1008
1900	**960**	**0.73**	**648**	**1047**	**0.85**	**754**	1129	0.98	867	1206	1.11	986	1279	1.25	1111
2000	**1001**	**0.84**	**744**	1085	0.96	855	1163	1.09	972	1238	1.23	1095	1309	1.38	1224
2100	**1043**	**0.96**	**850**	1123	1.09	965	1199	1.22	1086	1271	1.37	1213	1340	1.52	1346
2200	1085	1.09	966	1162	1.22	1086	1235	1.36	1211	1305	1.51	1342	1372	1.67	1479
2300	1127	1.23	1092	1201	1.37	1217	1272	1.52	1347	1340	1.67	1482	1405	1.83	1623
2400	1169	1.38	1229	1241	1.53	1359	1310	1.68	1493	1375	1.84	1633	1439	2.00	1778
2500	1212	1.55	1378	1281	1.70	1513	1348	1.86	1652	1412	2.02	1796	**1473**	**2.19**	**1945**
2600	1255	1.73	1539	1322	1.89	1678	1386	2.05	1822	1448	2.22	1970	**1508**	**2.39**	**2124**
2700	1298	1.93	1713	1363	2.09	1857	1425	2.26	2005	—	—	—	—	—	—
2800	1341	2.14	1899	1404	2.31	2048	—	—	—	—	—	—	—	—	—
2900	1384	2.36	2099	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM007 (6 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1321	1.28	1137	1390	1.43	1273	1455	1.59	1415	**1518**	**1.76**	**1563**	**1579**	**1.93**	**1718**
1900	1348	1.40	1243	1415	1.56	1381	**1479**	**1.72**	**1526**	**1541**	**1.89**	**1677**	**1601**	**2.06**	**1834**
2000	1377	1.53	1359	1442	1.69	1500	**1505**	**1.86**	**1648**	**1565**	**2.03**	**1801**	**1624**	**2.21**	**1961**
2100	1406	1.67	1485	**1470**	**1.83**	**1629**	**1531**	**2.00**	**1780**	**1591**	**2.18**	**1936**	**1648**	**2.36**	**2098**
2200	1437	1.83	1621	**1499**	**1.99**	**1769**	**1559**	**2.16**	**1923**	**1617**	**2.34**	**2082**	—	—	—
2300	**1468**	**1.99**	**1769**	**1529**	**2.16**	**1920**	**1587**	**2.34**	**2077**	—	—	—	—	—	—
2400	**1500**	**2.17**	**1928**	**1559**	**2.35**	**2083**	—	—	—	—	—	—	—	—	—
2500	**1533**	**2.36**	**2098**	—	—	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**919**	**0.63**	**561**	**1010**	**0.75**	**663**	**1095**	**0.87**	**771**	**1174**	**1.00**	**886**	**1250**	**1.14**	**1008**
1900	**960**	**0.73**	**648**	**1047**	**0.85**	**754**	**1129**	**0.98**	**867**	**1206**	**1.11**	**986**	**1279**	**1.25**	**1111**
2000	**1001**	**0.84**	**744**	**1085**	**0.96**	**855**	**1163**	**1.09**	**972**	**1238**	**1.23**	**1095**	1309	1.38	1224
2100	**1043**	**0.96**	**850**	**1123**	**1.09**	**965**	**1199**	**1.22**	**1086**	**1271**	**1.37**	**1213**	1340	1.52	1346
2200	**1085**	**1.09**	**966**	**1162**	**1.22**	**1086**	**1235**	**1.36**	**1211**	1305	1.51	1342	1372	1.67	1479
2300	**1127**	**1.23**	**1092**	**1201**	**1.37**	**1217**	**1272**	**1.52**	**1347**	1340	1.67	1482	1405	1.83	1623
2400	**1169**	**1.38**	**1229**	**1241**	**1.53**	**1359**	1310	1.68	1493	1375	1.84	1633	1439	2.00	1778
2500	**1212**	**1.55**	**1378**	**1281**	**1.70**	**1513**	1348	1.86	1652	1412	2.02	1796	1473	2.19	1945
2600	**1255**	**1.73**	**1539**	1322	1.89	1678	1386	2.05	1822	1448	2.22	1970	1508	2.39	2124
2700	**1298**	**1.93**	**1713**	1363	2.09	1857	1425	2.26	2005	1485	2.43	2158	1544	2.61	2315
2800	1341	2.14	1899	1404	2.31	2048	1464	2.48	2201	1523	2.66	2358	1580	2.84	2520
2900	1384	2.36	2099	1445	2.54	2253	1504	2.71	2410	1561	2.90	2572	—	—	—
3000	1428	2.60	2313	1487	2.78	2471	—	—	—	—	—	—	—	—	—

48TM007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1321	1.28	1137	1390	1.43	1273	1455	1.59	1415	1518	1.76	1563	1579	1.93	1718
1900	1348	1.40	1243	1415	1.56	1381	1479	1.72	1526	1541	1.89	1677	1601	2.06	1834
2000	1377	1.53	1359	1442	1.69	1500	1505	1.86	1648	1565	2.03	1801	1624	2.21	1961
2100	1406	1.67	1485	1470	1.83	1629	1531	2.00	1780	1591	2.18	1936	1648	2.36	2098
2200	1437	1.83	1621	1499	1.99	1769	1559	2.16	1923	1617	2.34	2082	1673	2.53	2246
2300	1468	1.99	1769	1529	2.16	1920	1587	2.34	2077	1644	2.52	2239	**1699**	**2.71**	**2406**
2400	1500	2.17	1928	1559	2.35	2083	1616	2.53	2243	1672	2.71	2408	**1726**	**2.90**	**2579**
2500	1533	2.36	2098	1591	2.54	2257	1647	2.73	2421	—	—	—	—	—	—
2600	1566	2.57	2281	1623	2.75	2444	—	—	—	—	—	—	—	—	—
2700	1600	2.79	2477	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

Performance data — 48TM (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM008 (7½ TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**505**	**0.52**	**484**	**586**	**0.73**	**681**	657	0.97	901	722	1.22	1142	782	1.50	1403
2300	**513**	**0.55**	**509**	592	0.76	708	663	1.00	931	727	1.26	1174	787	1.54	1437
2400	**527**	**0.60**	**561**	605	0.82	766	674	1.07	993	738	1.33	1241	796	1.62	1508
2500	**543**	**0.66**	**617**	618	0.89	828	686	1.14	1060	748	1.41	1312	806	1.70	1583
2550	**550**	**0.69**	**647**	625	0.92	860	692	1.17	1095	754	1.45	1349	811	1.74	1623
2600	**558**	**0.73**	**677**	632	0.96	894	698	1.21	1131	759	1.49	1388	816	1.78	1664
2700	**574**	**0.80**	**742**	645	1.03	964	710	1.29	1207	770	1.58	1469	826	1.88	1749
2800	**589**	**0.87**	**811**	659	1.11	1039	723	1.38	1287	782	1.67	1554	837	1.97	1839
2900	605	0.95	885	673	1.20	1119	736	1.47	1372	794	1.76	1644	**848**	**2.07**	**1933**
3000	621	1.03	963	688	1.29	1204	749	1.57	1463	806	1.87	1740	**859**	**2.18**	**2033**
3100	637	1.12	1046	702	1.39	1293	762	1.67	1558	818	1.97	1840	**871**	**2.29**	**2139**
3200	654	1.22	1135	717	1.49	1388	776	1.78	1658	831	2.09	1946	—	—	—
3300	670	1.32	1228	732	1.60	1488	789	1.89	1764	**843**	**2.21**	**2057**	—	—	—
3400	686	1.42	1328	747	1.71	1593	803	2.01	1876	**856**	**2.33**	**2174**	—	—	—
3500	703	1.54	1433	762	1.83	1705	817	2.14	1993	—	—	—	—	—	—
3600	720	1.66	1543	777	1.95	1822	832	2.27	2116	—	—	—	—	—	—
3700	736	1.78	1660	793	2.09	1944	—	—	—	—	—	—	—	—	—
3750	745	1.85	1721	801	2.15	2008	—	—	—	—	—	—	—	—	—

48TM008 (7½ 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	838	1.81	1683	**891**	**2.12**	**1981**	—	—	—	—	—	—	—	—	—
2300	**842**	**1.84**	**1719**	**895**	**2.17**	**2019**	—	—	—	—	—	—	—	—	—
2400	**851**	**1.92**	**1793**	**903**	**2.25**	**2097**	—	—	—	—	—	—	—	—	—
2500	**860**	**2.01**	**1873**	**911**	**2.34**	**2180**	—	—	—	—	—	—	—	—	—
2550	**865**	**2.05**	**1914**	**916**	**2.38**	**2223**	—	—	—	—	—	—	—	—	—
2600	**869**	**2.10**	**1957**	—	—	—	—	—	—	—	—	—	—	—	—
2700	**879**	**2.19**	**2046**	—	—	—	—	—	—	—	—	—	—	—	—
2800	**889**	**2.29**	**2140**	—	—	—	—	—	—	—	—	—	—	—	—
2900	**899**	**2.40**	**2239**	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 590 to 840 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM008 (7 1/2 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**505**	**0.52**	**484**	**586**	**0.73**	**681**	**657**	**0.97**	**901**	722	1.22	1142	782	1.50	1403
2300	**513**	**0.55**	**509**	**592**	**0.76**	**708**	**663**	**1.00**	**931**	727	1.26	1174	787	1.54	1437
2400	**527**	**0.60**	**561**	**605**	**0.82**	**766**	**674**	**1.07**	**993**	738	1.33	1241	796	1.62	1508
2500	**543**	**0.66**	**617**	**618**	**0.89**	**828**	686	1.14	1060	748	1.41	1312	806	1.70	1583
2550	**550**	**0.69**	**647**	**625**	**0.92**	**860**	692	1.17	1095	754	1.45	1349	811	1.74	1623
2600	**558**	**0.73**	**677**	**632**	**0.96**	**894**	698	1.21	1131	759	1.49	1388	816	1.78	1664
2700	**574**	**0.80**	**742**	**645**	**1.03**	**964**	710	1.29	1207	770	1.58	1469	826	1.88	1749
2800	**589**	**0.87**	**811**	**659**	**1.11**	**1039**	723	1.38	1287	782	1.67	1554	837	1.97	1839
2900	**605**	**0.95**	**885**	**673**	**1.20**	**1119**	736	1.47	1372	794	1.76	1644	848	2.07	1933
3000	**621**	**1.03**	**963**	688	1.29	1204	749	1.57	1463	806	1.87	1740	859	2.18	2033
3100	**637**	**1.12**	**1046**	702	1.39	1293	762	1.67	1558	818	1.97	1840	871	2.29	2139
3200	**654**	**1.22**	**1135**	717	1.49	1388	776	1.78	1658	831	2.09	1946	—	—	—
3300	**670**	**1.32**	**1228**	732	1.60	1488	789	1.89	1764	843	2.21	2057	—	—	—
3400	686	1.42	1328	747	1.71	1593	803	2.01	1876	856	2.33	2174	—	—	—
3500	703	1.54	1433	762	1.83	1705	817	2.14	1993	—	—	—	—	—	—
3600	720	1.66	1543	777	1.95	1822	832	2.27	2116	—	—	—	—	—	—
3700	736	1.78	1660	793	2.09	1944	—	—	—	—	—	—	—	—	—
3750	745	1.85	1721	801	2.15	2008	—	—	—	—	—	—	—	—	—

48TM008 (7 1/2 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	838	1.81	1683	891	2.12	1981	—	—	—	—	—	—	—	—	—
2300	842	1.84	1719	895	2.17	2019	—	—	—	—	—	—	—	—	—
2400	851	1.92	1793	903	2.25	2097	—	—	—	—	—	—	—	—	—
2500	860	2.01	1873	911	2.34	2180	—	—	—	—	—	—	—	—	—
2550	865	2.05	1914	916	2.38	2223	—	—	—	—	—	—	—	—	—
2600	869	2.10	1957	—	—	—	—	—	—	—	—	—	—	—	—
2700	879	2.19	2046	—	—	—	—	—	—	—	—	—	—	—	—
2800	889	2.29	2140	—	—	—	—	—	—	—	—	—	—	—	—
2900	899	2.40	2239	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 685 to 935 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48TM (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM008 (7½ TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**505**	**0.52**	**484**	**586**	**0.73**	**681**	**657**	**0.97**	**901**	**722**	**1.22**	**1142**	**782**	**1.50**	**1403**
2300	**513**	**0.55**	**509**	**592**	**0.76**	**708**	**663**	**1.00**	**931**	**727**	**1.26**	**1174**	**787**	**1.54**	**1437**
2400	**527**	**0.60**	**561**	**605**	**0.82**	**766**	**674**	**1.07**	**993**	**738**	**1.33**	**1241**	**796**	**1.62**	**1508**
2500	**543**	**0.66**	**617**	**618**	**0.89**	**828**	**686**	**1.14**	**1060**	**748**	**1.41**	**1312**	**806**	**1.70**	**1583**
2550	**550**	**0.69**	**647**	**625**	**0.92**	**860**	**692**	**1.17**	**1095**	**754**	**1.45**	**1349**	**811**	**1.74**	**1623**
2600	**558**	**0.73**	**677**	**632**	**0.96**	**894**	**698**	**1.21**	**1131**	**759**	**1.49**	**1388**	**816**	**1.78**	**1664**
2700	**574**	**0.80**	**742**	**645**	**1.03**	**964**	**710**	**1.29**	**1207**	**770**	**1.58**	**1469**	**826**	**1.88**	**1749**
2800	**589**	**0.87**	**811**	**659**	**1.11**	**1039**	**723**	**1.38**	**1287**	**782**	**1.67**	**1554**	**837**	**1.97**	**1839**
2900	**605**	**0.95**	**885**	**673**	**1.20**	**1119**	**736**	**1.47**	**1372**	**794**	**1.76**	**1644**	**848**	**2.07**	**1933**
3000	**621**	**1.03**	**963**	**688**	**1.29**	**1204**	**749**	**1.57**	**1463**	**806**	**1.87**	**1740**	**859**	**2.18**	**2033**
3100	**637**	**1.12**	**1046**	**702**	**1.39**	**1293**	**762**	**1.67**	**1558**	**818**	**1.97**	**1840**	871	2.29	2139
3200	**654**	**1.22**	**1135**	**717**	**1.49**	**1388**	**776**	**1.78**	**1658**	**831**	**2.09**	**1946**	882	2.41	2249
3300	**670**	**1.32**	**1228**	**732**	**1.60**	**1488**	**789**	**1.89**	**1764**	**843**	**2.21**	**2057**	894	2.54	2365
3400	**686**	**1.42**	**1328**	**747**	**1.71**	**1593**	**803**	**2.01**	**1876**	**856**	**2.33**	**2174**	907	2.67	2488
3500	**703**	**1.54**	**1433**	**762**	**1.83**	**1705**	**817**	**2.14**	**1993**	870	2.46	2297	919	2.81	2616
3600	**720**	**1.66**	**1543**	**777**	**1.95**	**1822**	**832**	**2.27**	**2116**	883	2.60	2425	932	2.95	2750
3700	**736**	**1.78**	**1660**	**793**	**2.09**	**1944**	**846**	**2.41**	**2245**	896	2.75	2560	944	3.10	2889
3750	**745**	**1.85**	**1721**	**801**	**2.15**	**2008**	**853**	**2.48**	**2312**	903	2.82	2630	951	3.18	2962

48TM008 (7½ TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**838**	**1.81**	**1683**	891	2.12	1981	941	2.46	2297	988	2.82	2629	1033	3.19	2976
2300	**842**	**1.84**	**1719**	895	2.17	2019	944	2.51	2336	992	2.86	2669	1037	3.24	3018
2400	**851**	**1.92**	**1793**	903	2.25	2097	952	2.59	2416	999	2.95	2752	1043	3.33	3104
2500	860	2.01	1873	911	2.34	2180	960	2.68	2502	1006	3.05	2842	1051	3.43	3196
2550	865	2.05	1914	916	2.38	2223	964	2.73	2547	1010	3.10	2888	1054	3.48	3243
2600	869	2.10	1957	920	2.43	2267	968	2.78	2593	1014	3.15	2935	1058	3.53	3292
2700	879	2.19	2046	929	2.53	2360	976	2.88	2689	1022	3.25	3035	1066	3.64	3395
2800	889	2.29	2140	938	2.64	2458	985	2.99	2791	1030	3.37	3140	—	—	—
2900	899	2.40	2239	948	2.75	2561	994	3.11	2898	1039	3.49	3250	—	—	—
3000	910	2.51	2343	958	2.86	2670	1004	3.23	3011	1048	3.61	3366	—	—	—
3100	921	2.63	2453	968	2.98	2783	1013	3.35	3128	—	—	—	—	—	—
3200	932	2.75	2569	978	3.11	2903	1023	3.49	3252	—	—	—	—	—	—
3300	943	2.88	2690	989	3.25	3029	1033	3.63	3382	—	—	—	—	—	—
3400	954	3.02	2816	1000	3.39	3159	—	—	—	—	—	—	—	—	—
3500	966	3.16	2950	1011	3.54	3297	—	—	—	—	—	—	—	—	—
3600	978	3.31	3088	1022	3.69	3442	—	—	—	—	—	—	—	—	—
3700	990	3.47	3233	—	—	—	—	—	—	—	—	—	—	—	—
3750	996	3.55	3308	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 3.70.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM009 (8 1/2 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	**550**	**0.69**	**647**	**625**	**0.92**	**860**	692	1.17	1095	754	1.45	1349	811	1.74	1623
2600	**558**	**0.73**	**677**	**632**	**0.96**	**894**	698	1.21	1131	759	1.49	1388	816	1.78	1664
2700	**574**	**0.80**	**742**	**645**	**1.03**	**964**	710	1.29	1207	770	1.58	1469	826	1.88	1749
2800	**589**	**0.87**	**811**	**659**	**1.11**	**1039**	723	1.38	1287	782	1.67	1554	837	1.97	1839
2900	**605**	**0.95**	**885**	**673**	**1.20**	**1119**	736	1.47	1372	794	1.76	1644	848	2.07	1933
3000	**621**	**1.03**	**963**	688	1.29	1204	749	1.57	1463	806	1.87	1740	859	2.18	2033
3100	**637**	**1.12**	**1046**	702	1.39	1293	762	1.67	1558	818	1.97	1840	871	2.29	2139
3200	**654**	**1.22**	**1135**	717	1.49	1388	776	1.78	1658	831	2.09	1946	—	—	—
3300	**670**	**1.32**	**1228**	732	1.60	1488	789	1.89	1764	843	2.21	2057	—	—	—
3400	686	1.42	1328	747	1.71	1593	803	2.01	1876	856	2.33	2174	—	—	—
3500	703	1.54	1433	762	1.83	1705	817	2.14	1993	—	—	—	—	—	—
3600	720	1.66	1543	777	1.95	1822	832	2.27	2116	—	—	—	—	—	—
3700	736	1.78	1660	793	2.09	1944	—	—	—	—	—	—	—	—	—
3750	745	1.85	1721	801	2.15	2008	—	—	—	—	—	—	—	—	—
3800	753	1.91	1783	808	2.22	2074	—	—	—	—	—	—	—	—	—
3900	770	2.05	1912	824	2.37	2209	—	—	—	—	—	—	—	—	—
4000	787	2.20	2047	—	—	—	—	—	—	—	—	—	—	—	—
4100	804	2.35	2189	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM009 (8 1/2 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	865	2.05	1914	916	2.38	2223	—	—	—	—	—	—	—	—	—
2600	869	2.10	1957	—	—	—	—	—	—	—	—	—	—	—	—
2700	879	2.19	2046	—	—	—	—	—	—	—	—	—	—	—	—
2800	889	2.29	2140	—	—	—	—	—	—	—	—	—	—	—	—
2900	899	2.40	2239	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 685 to 935 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48TM (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM009 (8½ TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	**550**	**0.69**	**647**	**625**	**0.92**	**860**	**692**	**1.17**	**1095**	**754**	**1.45**	**1349**	**811**	**1.74**	**1623**
2600	**558**	**0.73**	**677**	**632**	**0.96**	**894**	**698**	**1.21**	**1131**	**759**	**1.49**	**1388**	**816**	**1.78**	**1664**
2700	**574**	**0.80**	**742**	**645**	**1.03**	**964**	**710**	**1.29**	**1207**	**770**	**1.58**	**1469**	**826**	**1.88**	**1749**
2800	**589**	**0.87**	**811**	**659**	**1.11**	**1039**	**723**	**1.38**	**1287**	**782**	**1.67**	**1554**	**837**	**1.97**	**1839**
2900	**605**	**0.95**	**885**	**673**	**1.20**	**1119**	**736**	**1.47**	**1372**	**794**	**1.76**	**1644**	**848**	**2.07**	**1933**
3000	**621**	**1.03**	**963**	**688**	**1.29**	**1204**	**749**	**1.57**	**1463**	**806**	**1.87**	**1740**	**859**	**2.18**	**2033**
3100	**637**	**1.12**	**1046**	**702**	**1.39**	**1293**	**762**	**1.67**	**1558**	**818**	**1.97**	**1840**	871	2.29	2139
3200	**654**	**1.22**	**1135**	**717**	**1.49**	**1388**	**776**	**1.78**	**1658**	**831**	**2.09**	**1946**	882	2.41	2249
3300	**670**	**1.32**	**1228**	**732**	**1.60**	**1488**	**789**	**1.89**	**1764**	**843**	**2.21**	**2057**	894	2.54	2365
3400	**686**	**1.42**	**1328**	**747**	**1.71**	**1593**	**803**	**2.01**	**1876**	**856**	**2.33**	**2174**	907	2.67	2488
3500	**703**	**1.54**	**1433**	**762**	**1.83**	**1705**	**817**	**2.14**	**1993**	870	2.46	2297	919	2.81	2616
3600	**720**	**1.66**	**1543**	**777**	**1.95**	**1822**	**832**	**2.27**	**2116**	883	2.60	2425	932	2.95	2750
3700	**736**	**1.78**	**1660**	**793**	**2.09**	**1944**	**846**	**2.41**	**2245**	896	2.75	2560	944	3.10	2889
3750	**745**	**1.85**	**1721**	**801**	**2.15**	**2008**	**853**	**2.48**	**2312**	903	2.82	2630	951	3.18	2962
3800	**753**	**1.91**	**1783**	**808**	**2.22**	**2074**	861	2.55	2380	910	2.90	2701	957	3.26	3036
3900	**770**	**2.05**	**1912**	**824**	**2.37**	**2209**	875	2.70	2522	924	3.05	2848	970	3.42	3189
4000	**787**	**2.20**	**2047**	**840**	**2.52**	**2351**	890	2.86	2669	938	3.22	3002	984	3.59	3348
4100	**804**	**2.35**	**2189**	**856**	**2.68**	**2499**	905	3.03	2824	952	3.39	3162	—	—	—
4200	**821**	**2.51**	**2338**	872	2.85	2655	920	3.20	2986	967	3.57	3331	—	—	—
4250	**829**	**2.59**	**2415**	880	2.93	2735	928	3.29	3069	974	3.66	3417	—	—	—

48TM009 (8½ TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	865	2.05	1914	916	2.38	2223	964	2.73	2547	1010	3.10	2888	1054	3.48	3243
2600	869	2.10	1957	920	2.43	2267	968	2.78	2593	1014	3.15	2935	1058	3.53	3292
2700	879	2.19	2046	929	2.53	2360	976	2.88	2689	1022	3.25	3035	1066	3.64	3395
2800	889	2.29	2140	938	2.64	2458	985	2.99	2791	1030	3.37	3140	—	—	—
2900	899	2.40	2239	948	2.75	2561	994	3.11	2898	1039	3.49	3250	—	—	—
3000	910	2.51	2343	958	2.86	2670	1004	3.23	3011	1048	3.61	3366	—	—	—
3100	921	2.63	2453	968	2.98	2783	1013	3.35	3128	—	—	—	—	—	—
3200	932	2.75	2569	978	3.11	2903	1023	3.49	3252	—	—	—	—	—	—
3300	943	2.88	2690	989	3.25	3029	1033	3.63	3382	—	—	—	—	—	—
3400	954	3.02	2816	1000	3.39	3159	—	—	—	—	—	—	—	—	—
3500	966	3.16	2950	1011	3.54	3297	—	—	—	—	—	—	—	—	—
3600	978	3.31	3088	1022	3.69	3442	—	—	—	—	—	—	—	—	—
3700	990	3.47	3233	—	—	—	—	—	—	—	—	—	—	—	—
3750	996	3.55	3308	—	—	—	—	—	—	—	—	—	—	—	—
3800	1002	3.63	3385	—	—	—	—	—	—	—	—	—	—	—	—
3900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 3.70.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM012 (10 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**555**	**0.72**	**630**	**629**	**0.87**	**765**	696	1.03	904	757	1.19	1048	814	1.36	1198
3100	**568**	**0.78**	**686**	**641**	**0.94**	**825**	706	1.10	968	766	1.27	1115	823	1.45	1269
3200	**582**	**0.85**	**745**	**652**	**1.01**	**888**	717	1.18	1035	776	1.35	1186	832	1.53	1343
3300	**595**	**0.92**	**808**	**664**	**1.09**	**955**	728	1.26	1106	786	1.44	1261	841	1.62	1421
3400	**609**	**1.00**	**874**	**677**	**1.17**	**1026**	739	1.35	1181	797	1.53	1340	851	1.71	1503
3500	**623**	**1.08**	**945**	689	1.25	1100	750	1.43	1259	807	1.62	1422	860	1.81	1589
3600	**636**	**1.16**	**1019**	702	1.34	1179	762	1.53	1341	817	1.72	1508	870	1.91	1679
3700	**650**	**1.25**	**1097**	714	1.44	1261	773	1.63	1428	828	1.82	1598	880	2.02	1772
3800	**664**	**1.34**	**1179**	727	1.54	1347	785	1.73	1518	839	1.93	1693	890	2.13	1870
3900	**678**	**1.44**	**1266**	740	1.64	1438	797	1.84	1613	850	2.04	1791	901	2.25	1973
4000	693	1.55	1356	753	1.75	1533	809	1.95	1712	861	2.16	1894	911	2.37	2080
4100	707	1.65	1451	766	1.86	1632	821	2.07	1816	873	2.28	2002	—	—	—
4200	721	1.77	1551	779	1.98	1736	833	2.19	1924	—	—	—	—	—	—
4300	735	1.89	1656	792	2.10	1845	846	2.32	2037	—	—	—	—	—	—
4400	750	2.01	1764	806	2.23	1958	—	—	—	—	—	—	—	—	—
4500	764	2.14	1879	819	2.37	2077	—	—	—	—	—	—	—	—	—
4600	779	2.28	1998	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM012 (10 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	867	1.54	1353	918	1.72	1513	**966**	**1.91**	**1680**	**1012**	**2.11**	**1852**	**1056**	**2.31**	**2029**
3100	876	1.63	1427	926	1.81	1590	**973**	**2.00**	**1760**	**1019**	**2.20**	**1934**	—	—	—
3200	884	1.71	1504	934	1.90	1671	**981**	**2.10**	**1843**	**1026**	**2.30**	**2020**	—	—	—
3300	893	1.81	1586	**942**	**2.00**	**1755**	**988**	**2.20**	**1931**	**1033**	**2.40**	**2111**	—	—	—
3400	902	1.90	1671	**950**	**2.10**	**1844**	**996**	**2.30**	**2022**	—	—	—	—	—	—
3500	911	2.01	1760	**959**	**2.21**	**1937**	—	—	—	—	—	—	—	—	—
3600	920	2.11	1854	**967**	**2.32**	**2033**	—	—	—	—	—	—	—	—	—
3700	929	2.22	1951	—	—	—	—	—	—	—	—	—	—	—	—
3800	**939**	**2.34**	**2053**	—	—	—	—	—	—	—	—	—	—	—	—
3900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 685 to 935 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48TM (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM012 (10 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**555**	**0.72**	**630**	**629**	**0.87**	**765**	**696**	**1.03**	**904**	**757**	**1.19**	**1048**	**814**	**1.36**	**1198**
3100	**568**	**0.78**	**686**	**641**	**0.94**	**825**	**706**	**1.10**	**968**	**766**	**1.27**	**1115**	**823**	**1.45**	**1269**
3200	**582**	**0.85**	**745**	**652**	**1.01**	**888**	**717**	**1.18**	**1035**	**776**	**1.35**	**1186**	**832**	**1.53**	**1343**
3300	**595**	**0.92**	**808**	**664**	**1.09**	**955**	**728**	**1.26**	**1106**	**786**	**1.44**	**1261**	841	1.62	1421
3400	**609**	**1.00**	**874**	**677**	**1.17**	**1026**	**739**	**1.35**	**1181**	**797**	**1.53**	**1340**	851	1.71	1503
3500	**623**	**1.08**	**945**	**689**	**1.25**	**1100**	**750**	**1.43**	**1259**	**807**	**1.62**	**1422**	860	1.81	1589
3600	**636**	**1.16**	**1019**	**702**	**1.34**	**1179**	**762**	**1.53**	**1341**	**817**	**1.72**	**1508**	870	1.91	1679
3700	**650**	**1.25**	**1097**	**714**	**1.44**	**1261**	**773**	**1.63**	**1428**	**828**	**1.82**	**1598**	880	2.02	1772
3800	**664**	**1.34**	**1179**	**727**	**1.54**	**1347**	**785**	**1.73**	**1518**	839	1.93	1693	890	2.13	1870
3900	**678**	**1.44**	**1266**	**740**	**1.64**	**1438**	**797**	**1.84**	**1613**	850	2.04	1791	901	2.25	1973
4000	**693**	**1.55**	**1356**	**753**	**1.75**	**1533**	**809**	**1.95**	**1712**	861	2.16	1894	911	2.37	2080
4100	**707**	**1.65**	**1451**	**766**	**1.86**	**1632**	**821**	**2.07**	**1816**	873	2.28	2002	922	2.50	2191
4200	**721**	**1.77**	**1551**	**779**	**1.98**	**1736**	**833**	**2.19**	**1924**	884	2.41	2114	933	2.63	2307
4300	**735**	**1.89**	**1656**	**792**	**2.10**	**1845**	846	2.32	2037	896	2.54	2231	944	2.77	2428
4400	**750**	**2.01**	**1764**	**806**	**2.23**	**1958**	858	2.45	2154	908	2.68	2352	—	—	—
4500	**764**	**2.14**	**1879**	**819**	**2.37**	**2077**	871	2.59	2276	920	2.82	2479	—	—	—
4600	**779**	**2.28**	**1998**	**833**	**2.51**	**2200**	883	2.74	2404	—	—	—	—	—	—
4700	**793**	**2.42**	**2121**	846	2.65	2328	896	2.89	2537	—	—	—	—	—	—
4800	**808**	**2.56**	**2251**	860	2.81	2462	—	—	—	—	—	—	—	—	—
4900	**822**	**2.72**	**2385**	—	—	—	—	—	—	—	—	—	—	—	—
5000	837	2.88	2525	—	—	—	—	—	—	—	—	—	—	—	—

48TM012 (10 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	867	1.54	1353	918	1.72	1513	966	1.91	1680	1012	2.11	1852	1056	2.31	2029
3100	876	1.63	1427	926	1.81	1590	973	2.00	1760	1019	2.20	1934	1062	2.41	2114
3200	884	1.71	1504	934	1.90	1671	981	2.10	1843	1026	2.30	2020	1069	2.51	2203
3300	893	1.81	1586	942	2.00	1755	988	2.20	1931	1033	2.40	2111	1076	2.62	2295
3400	902	1.90	1671	950	2.10	1844	996	2.30	2022	1041	2.51	2205	1083	2.73	2393
3500	911	2.01	1760	959	2.21	1937	1004	2.41	2118	1048	2.62	2303	**1091**	**2.84**	**2494**
3600	920	2.11	1854	967	2.32	2033	1013	2.53	2217	1056	2.74	2406	—	—	—
3700	929	2.22	1951	976	2.43	2134	1021	2.65	2322	1064	2.86	2513	—	—	—
3800	939	2.34	2053	985	2.55	2239	1030	2.77	2430	—	—	—	—	—	—
3900	949	2.46	2159	995	2.68	2349	1039	2.90	2543	—	—	—	—	—	—
4000	959	2.59	2269	1004	2.81	2462	—	—	—	—	—	—	—	—	—
4100	969	2.72	2384	—	—	—	—	—	—	—	—	—	—	—	—
4200	979	2.85	2504	—	—	—	—	—	—	—	—	—	—	—	—
4300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 835 to 1085 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM012 (10 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**555**	**0.72**	**630**	**629**	**0.87**	**765**	**696**	**1.03**	**904**	**757**	**1.19**	**1048**	**814**	**1.36**	**1198**
3100	**568**	**0.78**	**686**	**641**	**0.94**	**825**	**706**	**1.10**	**968**	**766**	**1.27**	**1115**	**823**	**1.45**	**1269**
3200	**582**	**0.85**	**745**	**652**	**1.01**	**888**	**717**	**1.18**	**1035**	**776**	**1.35**	**1186**	832	1.53	1343
3300	**595**	**0.92**	**808**	**664**	**1.09**	**955**	**728**	**1.26**	**1106**	**786**	**1.44**	**1261**	841	1.62	1421
3400	**609**	**1.00**	**874**	**677**	**1.17**	**1026**	**739**	**1.35**	**1181**	**797**	**1.53**	**1340**	851	1.71	1503
3500	**623**	**1.08**	**945**	**689**	**1.25**	**1100**	**750**	**1.43**	**1259**	**807**	**1.62**	**1422**	860	1.81	1589
3600	**636**	**1.16**	**1019**	**702**	**1.34**	**1179**	**762**	**1.53**	**1341**	**817**	**1.72**	**1508**	870	1.91	1679
3700	**650**	**1.25**	**1097**	**714**	**1.44**	**1261**	**773**	**1.63**	**1428**	**828**	**1.82**	**1598**	880	2.02	1772
3800	**664**	**1.34**	**1179**	**727**	**1.54**	**1347**	**785**	**1.73**	**1518**	839	1.93	1693	890	2.13	1870
3900	**678**	**1.44**	**1266**	**740**	**1.64**	**1438**	**797**	**1.84**	**1613**	850	2.04	1791	901	2.25	1973
4000	**693**	**1.55**	**1356**	**753**	**1.75**	**1533**	**809**	**1.95**	**1712**	861	2.16	1894	911	2.37	2080
4100	**707**	**1.65**	**1451**	**766**	**1.86**	**1632**	**821**	**2.07**	**1816**	873	2.28	2002	922	2.50	2191
4200	**721**	**1.77**	**1551**	**779**	**1.98**	**1736**	833	2.19	1924	884	2.41	2114	933	2.63	2307
4300	**735**	**1.89**	**1656**	**792**	**2.10**	**1845**	846	2.32	2037	896	2.54	2231	944	2.77	2428
4400	**750**	**2.01**	**1764**	**806**	**2.23**	**1958**	858	2.45	2154	908	2.68	2352	955	2.91	2553
4500	**764**	**2.14**	**1879**	**819**	**2.37**	**2077**	871	2.59	2276	920	2.82	2479	966	3.06	2684
4600	**779**	**2.28**	**1998**	833	2.51	2200	883	2.74	2404	932	2.97	2611	978	3.21	2820
4700	**793**	**2.42**	**2121**	846	2.65	2328	896	2.89	2537	944	3.13	2747	989	3.37	2960
4800	**808**	**2.56**	**2251**	860	2.81	2462	909	3.05	2674	956	3.29	2889	1001	3.54	3106
4900	**822**	**2.72**	**2385**	873	2.96	2601	922	3.21	2818	968	3.46	3037	1013	3.71	3258
5000	837	2.88	2525	887	3.13	2745	935	3.38	2966	981	3.63	3189	1024	3.89	3414

48TM012 (10 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	867	1.54	1353	918	1.72	1513	966	1.91	1680	1012	2.11	1852	1056	2.31	2029
3100	876	1.63	1427	926	1.81	1590	973	2.00	1760	1019	2.20	1934	1062	2.41	2114
3200	884	1.71	1504	934	1.90	1671	981	2.10	1843	1026	2.30	2020	1069	2.51	2203
3300	893	1.81	1586	942	2.00	1755	988	2.20	1931	1033	2.40	2111	1076	2.62	2295
3400	902	1.90	1671	950	2.10	1844	996	2.30	2022	1041	2.51	2205	1083	2.73	2393
3500	911	2.01	1760	959	2.21	1937	1004	2.41	2118	1048	2.62	2303	1091	2.84	2494
3600	920	2.11	1854	967	2.32	2033	1013	2.53	2217	1056	2.74	2406	1098	2.96	2600
3700	929	2.22	1951	976	2.43	2134	1021	2.65	2322	1064	2.86	2513	1106	3.09	2710
3800	939	2.34	2053	985	2.55	2239	1030	2.77	2430	1073	2.99	2625	1114	3.22	2824
3900	949	2.46	2159	995	2.68	2349	1039	2.90	2543	1081	3.12	2741	1122	3.35	2943
4000	959	2.59	2269	1004	2.81	2462	1048	3.03	2660	1090	3.26	2861	1130	3.49	3067
4100	969	2.72	2384	1014	2.94	2581	1057	3.17	2782	1098	3.40	2987	**1139**	**3.64**	**3195**
4200	979	2.85	2504	1024	3.08	2705	1066	3.31	2909	1107	3.55	3117	**1147**	**3.79**	**3329**
4300	990	3.00	2629	1034	3.23	2833	1076	3.46	3040	1117	3.71	3252	**1156**	**3.95**	**3467**
4400	1000	3.14	2758	1044	3.38	2966	1085	3.62	3177	1126	3.87	3392	**1165**	**4.11**	**3611**
4500	1011	3.30	2892	1054	3.54	3104	1095	3.78	3319	**1135**	**4.03**	**3537**	**1174**	**4.28**	**3759**
4600	1022	3.45	3032	1064	3.70	3247	1105	3.95	3466	**1145**	**4.20**	**3688**	**1183**	**4.46**	**3913**
4700	1033	3.62	3176	1075	3.87	3395	1115	4.12	3618	**1155**	**4.38**	**3843**	**1193**	**4.64**	**4072**
4800	1044	3.79	3326	1085	4.04	3549	1126	4.30	3775	**1164**	**4.56**	**4004**	**1202**	**4.83**	**4237**
4900	1055	3.97	3482	1096	4.22	3708	**1136**	**4.49**	**3938**	**1174**	**4.75**	**4171**	**1212**	**5.02**	**4406**
5000	1066	4.15	3642	1107	4.41	3873	**1146**	**4.68**	**4106**	**1184**	**4.95**	**4342**	**1221**	**5.22**	**4582**

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 830 to 1130 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 5.25.

Performance data — 48TM (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM014 (12½ TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	**676**	**1.19**	**1106**	**747**	**1.42**	**1328**	**811**	**1.66**	**1552**	871	1.91	1779	927	2.15	2008
3800	**690**	**1.27**	**1185**	**760**	**1.52**	**1414**	**823**	**1.76**	**1644**	882	2.01	1876	938	2.26	2111
3900	**705**	**1.36**	**1269**	**773**	**1.61**	**1503**	**835**	**1.86**	**1739**	894	2.12	1977	948	2.38	2217
4000	**719**	**1.45**	**1357**	**786**	**1.71**	**1597**	**848**	**1.97**	**1838**	905	2.23	2082	959	2.50	2328
4100	**734**	**1.55**	**1449**	**799**	**1.82**	**1695**	860	2.08	1942	917	2.35	2192	970	2.62	2443
4200	**748**	**1.66**	**1545**	**813**	**1.93**	**1797**	872	2.20	2050	928	2.47	2305	981	2.75	2562
4300	**763**	**1.76**	**1646**	**826**	**2.04**	**1903**	885	2.32	2162	940	2.60	2423	992	2.88	2686
4400	**778**	**1.88**	**1751**	**840**	**2.16**	**2014**	898	2.44	2279	952	2.73	2546	1004	3.02	2814
4500	**792**	**1.99**	**1860**	**853**	**2.28**	**2130**	910	2.57	2401	964	2.87	2673	1015	3.16	2947
4600	**807**	**2.12**	**1975**	867	2.41	2250	923	2.71	2527	976	3.01	2805	1027	3.31	3085
4700	**822**	**2.25**	**2094**	881	2.55	2375	936	2.85	2658	989	3.15	2942	1038	3.46	3227
4800	**837**	**2.38**	**2218**	895	2.69	2505	949	3.00	2794	1001	3.31	3083	1050	3.62	3375
4900	**852**	**2.52**	**2347**	909	2.83	2640	963	3.15	2935	1014	3.46	3230	—	—	—
5000	867	2.66	2482	923	2.98	2781	976	3.30	3081	1026	3.63	3383	—	—	—
5100	882	2.81	2622	937	3.14	2926	989	3.47	3232	—	—	—	—	—	—
5200	897	2.97	2766	951	3.30	3077	1003	3.63	3389	—	—	—	—	—	—
5300	912	3.13	2917	966	3.47	3233	—	—	—	—	—	—	—	—	—
5400	927	3.30	3073	980	3.64	3395	—	—	—	—	—	—	—	—	—
5500	943	3.47	3234	—	—	—	—	—	—	—	—	—	—	—	—
5600	958	3.65	3402	—	—	—	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48TM014 (12½ 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	981	2.40	2240	1031	2.65	2473	1079	2.91	2709	**1125**	**3.16**	**2948**	**1169**	**3.42**	**3189**
3800	990	2.52	2348	1040	2.77	2587	**1088**	**3.03**	**2828**	**1133**	**3.30**	**3073**	**1177**	**3.56**	**3319**
3900	1000	2.64	2459	1050	2.90	2705	**1097**	**3.17**	**2951**	**1142**	**3.43**	**3201**	**1186**	**3.70**	**3452**
4000	1011	2.76	2576	1059	3.03	2826	**1106**	**3.30**	**3079**	**1151**	**3.58**	**3334**	—	—	—
4100	1021	2.89	2697	1069	3.17	2953	**1116**	**3.44**	**3210**	—	—	—	—	—	—
4200	1031	3.03	2822	1079	3.31	3083	**1125**	**3.59**	**3347**	—	—	—	—	—	—
4300	1042	3.16	2951	**1089**	**3.45**	**3218**	—	—	—	—	—	—	—	—	—
4400	1053	3.31	3085	**1100**	**3.60**	**3357**	—	—	—	—	—	—	—	—	—
4500	1064	3.46	3224	—	—	—	—	—	—	—	—	—	—	—	—
4600	1075	3.61	3367	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 3.70.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48TM014 (12 1/2 TONS) — ALTERNATE MOTOR (BELT DRIVE)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	**676**	**1.19**	**1106**	**747**	**1.42**	**1328**	**811**	**1.66**	**1552**	871	1.91	1779	927	2.15	2008
3800	**690**	**1.27**	**1185**	**760**	**1.52**	**1414**	**823**	**1.76**	**1644**	882	2.01	1876	938	2.26	2111
3900	**705**	**1.36**	**1269**	**773**	**1.61**	**1503**	835	1.86	1739	894	2.12	1977	948	2.38	2217
4000	**719**	**1.45**	**1357**	**786**	**1.71**	**1597**	848	1.97	1838	905	2.23	2082	959	2.50	2328
4100	**734**	**1.55**	**1449**	**799**	**1.82**	**1695**	860	2.08	1942	917	2.35	2192	970	2.62	2443
4200	**748**	**1.66**	**1545**	**813**	**1.93**	**1797**	872	2.20	2050	928	2.47	2305	981	2.75	2562
4300	**763**	**1.76**	**1646**	**826**	**2.04**	**1903**	885	2.32	2162	940	2.60	2423	992	2.88	2686
4400	**778**	**1.88**	**1751**	840	2.16	2014	898	2.44	2279	952	2.73	2546	1004	3.02	2814
4500	**792**	**1.99**	**1860**	853	2.28	2130	910	2.57	2401	964	2.87	2673	1015	3.16	2947
4600	**807**	**2.12**	**1975**	867	2.41	2250	923	2.71	2527	976	3.01	2805	1027	3.31	3085
4700	**822**	**2.25**	**2094**	881	2.55	2375	936	2.85	2658	989	3.15	2942	1038	3.46	3227
4800	837	2.38	2218	895	2.69	2505	949	3.00	2794	1001	3.31	3083	1050	3.62	3375
4900	852	2.52	2347	909	2.83	2640	963	3.15	2935	1014	3.46	3230	1062	3.78	3528
5000	867	2.66	2482	923	2.98	2781	976	3.30	3081	1026	3.63	3383	1074	3.95	3685
5100	882	2.81	2622	937	3.14	2926	989	3.47	3232	1039	3.80	3540	1086	4.13	3849
5200	897	2.97	2766	951	3.30	3077	1003	3.63	3389	1052	3.97	3702	1099	4.31	4017
5300	912	3.13	2917	966	3.47	3233	1016	3.81	3551	1065	4.15	3870	1111	4.49	4191
5400	927	3.30	3073	980	3.64	3395	1030	3.99	3719	1078	4.34	4044	1123	4.69	4370
5500	943	3.47	3234	994	3.82	3563	1044	4.17	3892	1091	4.53	4223	**1136**	**4.88**	**4555**
5600	958	3.65	3402	1009	4.01	3736	1057	4.37	4071	1104	4.73	4408	**1149**	**5.09**	**4746**
5700	973	3.83	3575	1023	4.20	3915	1071	4.56	4256	1117	4.93	4599	—	—	—
5800	988	4.03	3754	1038	4.40	4100	1085	4.77	4447	1130	5.14	4796	—	—	—
5900	1004	4.22	3939	1052	4.60	4292	1099	4.98	4645	—	—	—	—	—	—
6000	1019	4.43	4131	1067	4.81	4489	1113	5.20	4848	—	—	—	—	—	—
6100	1034	4.64	4329	1082	5.03	4693	—	—	—	—	—	—	—	—	—
6200	1050	4.86	4533	—	—	—	—	—	—	—	—	—	—	—	—
6300	1065	5.09	4744	—	—	—	—	—	—	—	—	—	—	—	—

48TM014 (12 1/2 TONS) — ALTERNATE MOTOR (BELT DRIVE)* (cont)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	981	2.40	2240	1031	2.65	2473	1079	2.91	2709	1125	3.16	2948	**1169**	**3.42**	**3189**
3800	990	2.52	2348	1040	2.77	2587	1088	3.03	2828	**1133**	**3.30**	**3073**	**1177**	**3.56**	**3319**
3900	1000	2.64	2459	1050	2.90	2705	1097	3.17	2951	**1142**	**3.43**	**3201**	**1186**	**3.70**	**3452**
4000	1011	2.76	2576	1059	3.03	2826	1106	3.30	3079	**1151**	**3.58**	**3334**	**1194**	**3.85**	**3591**
4100	1021	2.89	2697	1069	3.17	2953	1116	3.44	3210	**1160**	**3.72**	**3471**	**1203**	**4.00**	**3733**
4200	1031	3.03	2822	1079	3.31	3083	1125	3.59	3347	**1169**	**3.87**	**3612**	**1212**	**4.16**	**3880**
4300	1042	3.16	2951	1089	3.45	3218	**1135**	**3.74**	**3487**	**1179**	**4.03**	**3758**	**1221**	**4.32**	**4031**
4400	1053	3.31	3085	1100	3.60	3357	**1145**	**3.90**	**3632**	**1188**	**4.19**	**3909**	**1230**	**4.49**	**4187**
4500	1064	3.46	3224	1110	3.76	3502	**1155**	**4.06**	**3782**	**1198**	**4.36**	**4064**	**1239**	**4.66**	**4348**
4600	1075	3.61	3367	1121	3.91	3650	**1165**	**4.22**	**3937**	**1208**	**4.53**	**4224**	**1249**	**4.84**	**4514**
4700	1086	3.77	3515	**1131**	**4.08**	**3805**	**1175**	**4.39**	**4096**	**1217**	**4.71**	**4389**	**1258**	**5.02**	**4684**
4800	1097	3.93	3668	**1142**	**4.25**	**3963**	**1186**	**4.57**	**4260**	**1228**	**4.89**	**4559**	**1268**	**5.21**	**4860**
4900	1109	4.10	3826	**1153**	**4.43**	**4128**	**1196**	**4.75**	**4430**	**1238**	**5.08**	**4734**	—	—	—
5000	1120	4.28	3990	**1164**	**4.61**	**4296**	**1207**	**4.94**	**4604**	—	—	—	—	—	—
5100	**1132**	**4.46**	**4159**	**1175**	**4.79**	**4471**	**1218**	**5.13**	**4784**	—	—	—	—	—	—
5200	**1144**	**4.65**	**4333**	**1187**	**4.99**	**4651**	—	—	—	—	—	—	—	—	—
5300	**1155**	**4.84**	**4512**	**1198**	**5.19**	**4836**	—	—	—	—	—	—	—	—	—
5400	**1167**	**5.04**	**4697**	—	—	—	—	—	—	—	—	—	—	—	—
5500	**1179**	**5.24**	**4889**	—	—	—	—	—	—	—	—	—	—	—	—
5600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 830 to 1130 rpm. All other rpms require field-supplied drive.

Refer to page 70 for general Fan Performance Data notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 5.25.

REFER TO 48TM016-025 VERTICAL FAN PERFORMANCE TABLES ON PAGES 65-70 FOR FAN PERFORMANCE WITH HORIZONTAL ADAPTER CURB.

Performance data — 48TM (cont)

FAN RPM AT MOTOR PULLEY SETTINGS* — 48TM004-007

UNIT 48TM	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
004†	1045	1009	973	937	901	865	829	793	757	721	685	—	—
004**	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
005†	1175	1135	1094	1054	1013	973	932	892	851	811	770	—	—
005**	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
006†	1300	1266	1233	1200	1166	1133	1100	1066	1033	1000	966	933	900
006**	1685	1647	1608	1570	1531	1493	1454	1416	1377	1339	1300	—	—
007††	1460	1421	1382	1343	1304	1265	1226	1187	1148	1109	1070	—	—
007**	1685	1647	1608	1570	1531	1493	1454	1416	1377	1399	1300	—	—

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

FAN RPM AT MOTOR PULLEY SETTINGS* — 48TM008-014

UNIT 48TM	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
008†	840	815	790	765	740	715	690	665	635	615	590	—	—
008**	935	910	885	860	835	810	785	760	735	710	685	—	—
008††	1080	1025	1007	988	970	952	933	915	897	878	860	—	—
009†	935	910	885	860	835	810	785	760	735	710	685	—	—
009††	1080	1025	1007	988	970	952	933	915	897	878	860	—	—
012†	935	910	885	860	835	810	785	760	735	710	685	—	—
012***	1085	1060	1035	1010	985	960	935	910	885	860	835	—	—
012††	1130	1112	1087	1062	1037	1012	987	962	937	912	887	862	830
014†	1080	1060	1035	1015	990	970	950	925	905	880	860	—	—
014***	1130	1112	1087	1062	1037	1012	987	962	937	912	887	862	830

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

FAN RPM AT MOTOR PULLEY SETTINGS* — 48TM016-028

UNIT 48TM	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
016†	††	††	††	††	1021	1002	984	965	947	928	910	891	873
016**	††	††	††	††	1200	1178	1156	1134	1112	1091	1069	1047	1025
020†	††	††	1095	1077	1058	1040	1021	1002	984	965	947	928	910
020**	††	††	1287	1265	1243	1222	1200	1178	1156	1134	1112	1091	1069
025†	††	††	††	††	1151	1132	1114	1095	1077	1058	1040	1021	1002
025**	††	††	††	††	1369	1347	1325	1303	1281	1259	1237	1215	1193
028†	††	††	1283	1269	1247	1225	1203	1182	1160	1138	1116	1095	1066
028**	††	††	††	††	1551	1524	1497	1470	1443	1415	1388	1361	1332

*Approximate fan rpm shown.
†Indicates standard drive package.
**Indicates alternate drive package.
††Due to belt and pulley size, pulley cannot be set to this number of turns open.

EVAPORATOR-FAN MOTOR EFFICIENCY — 48TM004-014

UNIT 48TM	MOTOR EFFICIENCY (%)
004,005	75
006	74/84*
007	84
008-012	80
014	87

*Single phase/three-phase.

EVAPORATOR-FAN MOTOR EFFICIENCY — 48TM016-028

UNIT 48TM	MOTOR EFFICIENCY (%)
5 Hp	87.5
7.5 Hp	88.5
10 Hp	89.5

NOTE: The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT-compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements. Therefore, the indoor fan motors for Carrier 48TM004-014 units are exempt from these requirements.

EVAPORATOR-FAN MOTOR PERFORMANCE — 48TM004-014

UNIT 48TM	EVAPORATOR-FAN MOTOR	UNIT VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE OPERATING WATTS	MAXIMUM AMP DRAW
004	Standard	208/230	0.34	440	2.8
		460			1.3
		575			1.3
	Alternate	208/230	1.20	1000	4.9
		460			2.1
		575			2.1
	High Static	208/230	2.40	2120	6.0
		460			3.0
		575			3.0
005	Standard	208/230	0.75	850	3.5
		460			1.8
		575			1.8
	Alternate	208/230	1.20	1000	4.9
		460			2.1
		575			2.1
	High Static	208/230	2.40	2120	6.0
		460			3.0
		575			3.0
006	Standard	208/230	1.20	1340	5.9
		460			3.2
		575			3.2
	Alternate	208/230	1.30/2.40†	2120	6.6/5.2†
		460			2.6
		575			3.0
	High Static	208/230	2.90	2562	8.6
		460			3.9
		575			3.9
007	Standard	208/230	2.40	2120	5.2
		460			3.0
		575			3.0
	High Static	208/230	2.90	2562	8.6
		460			3.9
		575			3.9
008	Standard, Alternate	208/230	2.40	2120	6.7
		460			3.0
		575			3.0
	High Static	208/230	3.70	3313	12.2
		460			5.5
		575			5.5
009	Standard	208/230	2.40	2120	6.7
		460			3.0
		575			3.0
	High Static	208/230	3.70	3313	12.2
		460			5.5
		575			5.5
012	Standard	208/230	2.40	2120	6.7
		460			3.0
		575			3.0
	Alternate	208/230	2.90	2615	8.6
		460			3.9
		575			3.9
	High Static	208/230	5.25	4400	17.3
		460			8.5
		575			8.5
014	Standard	208/230	3.70	3313	12.2
		460			5.5
		575			5.5
	Alternate	208/230	5.25	4400	17.3
		460			8.5
		575			8.5

LEGEND

BHP — Brake Horsepower

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

†Single phase/three-phase.

NOTE: High-static motor not available on single-phase units.

Performance data — 48TM (cont)

EVAPORATOR-FAN MOTOR PERFORMANCE — 48TM016-028

UNIT 48TM	UNIT VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE CONTINUOUS BkW*	MAXIMUM ACCEPTABLE OPERATING WATTS	MAXIMUM AMP DRAW
016	208/230	6.13	4.57	5,180	15.8
	460				7.9
	575				6.0
020	208/230	5.90	4.40	5,180	15.8
	460				7.9
	575				6.0
025	208/230	8.70	6.49	7,915	22.0
	460	9.50	7.08	8,640	13.0
	575	8.70	6.49	7,915	10.0
028	208/230	10.20	7.61	9,510	28.0
	460	11.80	8.80	11,000	14.6
	575	10.20	7.61	9,510	13.0

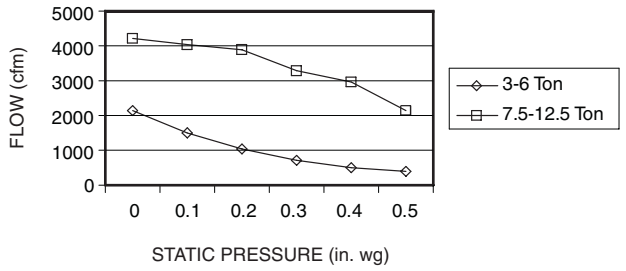
LEGEND

BHP — Brake Horsepower
BkW — Brake Kilowatts

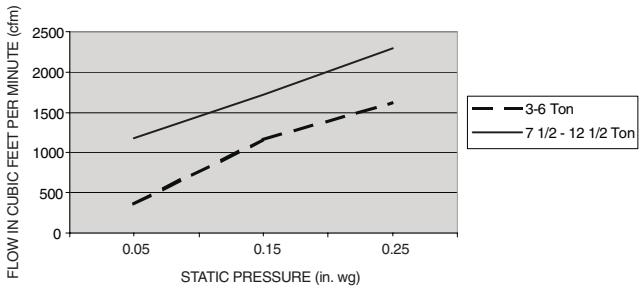
*Extensive motor and electrical testing on these units ensures that the full horsepower (brake kilowatt) range of the motors can be utilized with confidence. Using your fan motors up to the horsepower (brake kilowatt) ratings shown in this table will not result in nuisance tripping or premature motor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

NOTE: All indoor-fan motors 5 hp and larger meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT) effective October 24, 1997.

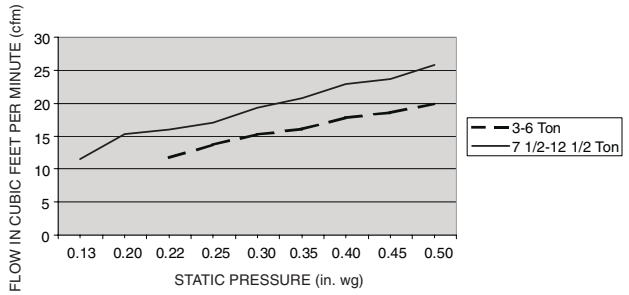
VERTICAL ECONOMI$ER+ AND ECONOMI$ER2 PERFORMANCE DATA (48TM004-014)



VERTICAL POWER EXHAUST PERFORMANCE

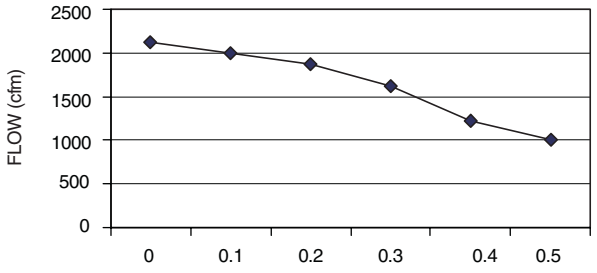


BAROMETRIC RELIEF FLOW CAPACITY

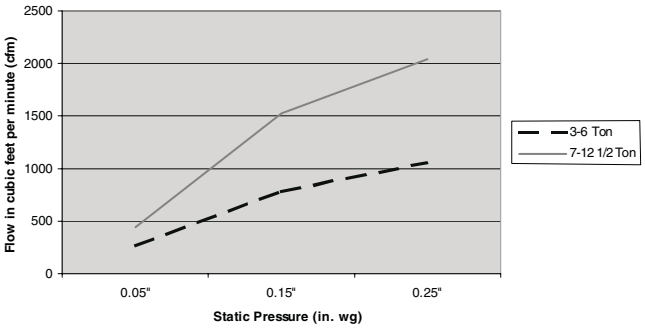


OUTDOOR AIR DAMPER LEAKAGE

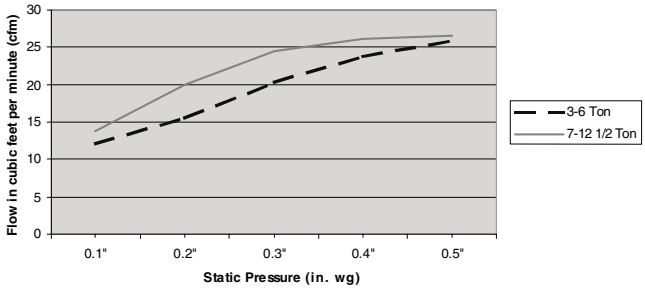
HORIZONTAL ECONOMI$ER+ AND ECONOMI$ER2 PERFORMANCE DATA (48TM004-014)



HORIZONTAL POWER EXHAUST PERFORMANCE

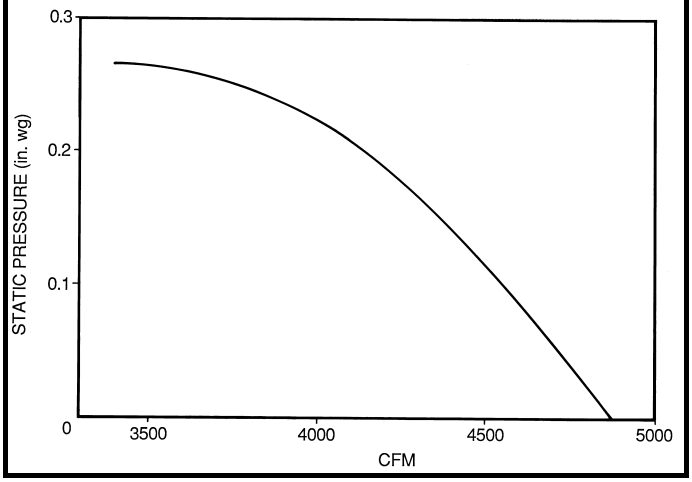


BAROMETRIC RELIEF CAPACITY



OUTDOOR AIR DAMPER LEAKAGE

FAN PERFORMANCE USING ACCESSORY POWER EXHAUST (48TM016-028)



ACCESSORY/FIOP STATIC PRESSURE* (in. wg) — 48TM004-007

COMPONENT	CFM							
	1250	1500	1750	2000	2250	2500	2750	3000
Vertical EconoMi$er+ and EconoMi$er2	0.045	0.065	0.08	0.12	0.145	0.175	0.22	0.255
Horizontal EconoMi$er+ and EconoMi$er2	—	—	0.1	0.125	0.15	0.18	0.225	0.275

LEGEND

FIOP — Factory-Installed Option

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

ACCESSORY/FIOP STATIC PRESSURE* (in. wg) — 48TM008-014

COMPONENT	CFM													
	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250	6250
Vertical EconoMi$er+ and EconoMi$er2	0.06	0.075	0.09	0.115	0.13	0.15	0.17	0.195	0.22	0.25	0.285	0.325	0.36	—
Horizontal EconoMi$er+ and EconoMi$er2	—	0.1	0.125	0.15	0.18	0.21	0.25	0.275	0.3	0.34	0.388	—	—	—

LEGEND

FIOP — Factory-Installed Option

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

ACCESSORY/FIOP STATIC PRESSURE (in. wg)* — 48TM016-028

COMPONENT	CFM								
	4500	5000	5400	6000	7200	7500	9000	10,000	11,250
EconoMi$er+ and EconoMi$er2	0.040	0.050	0.060	0.070	0.090	0.100	0.110	0.120	0.140

LEGEND

FIOP — Factory-Installed Option

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

OUTDOOR SOUND POWER (Total Unit) — 48TM004-014

UNIT 48TM	ARI RATING (decibels)	A-WEIGHTED (dB)	OCTAVE BANDS							
			63	125	250	500	1000	2000	4000	8000
004-006	81	80.5	56.8	75.8	72.4	72.9	74.8	75.4	71.3	69.1
007	80	80.0	59.1	68.9	68.7	71.9	74.0	68.9	65.7	59.0
008, 009	82	82.0	62.2	69.3	71.5	74.7	76.2	72.9	68.7	61.5
012	84	84.0	64.6	71.7	73.3	76.9	77.6	73.7	70.6	63.7
014	86	86.0	63.7	69.9	72.5	78.2	81.1	77.3	73.3	66.8

ARI — Air Conditioning and Refrigeration Institute

NOTE: Indoor sound power is available in Carrier's Electronic Catalog program (ECAT) for specific operating parameters.

Performance data — 48TM (cont)

OUTDOOR SOUND POWER — 48TM016-028

UNIT 48TM	SOUND RATING (60 Hz)	A-WEIGHTED (dB)	OCTAVE BANDS							
			63	125	250	500	1000	2000	4000	8000
016	88 decibels	87.6	90.8	88.7	86.4	84.3	83.5	78.4	75.6	66.8
020	88 decibels	87.8	90.8	88.7	86.4	84.3	83.5	78.4	75.6	66.8
025	94 decibels	94.4	99.7	93.0	93.7	91.8	89.7	85.9	80.7	74.4
028	94 decibels	94.1	98.7	92.3	93.8	90.9	89.6	85.9	80.3	74.3

NOTE: Indoor sound power is available in Carrier's Electronic Catalog program (ECAT) for specific operating parmeters.

ALTITUDE COMPENSATION* — 48TM004-007 STANDARD UNITS

ELEVATION (ft)	74,000 AND 115,000 BTUH NOMINAL INPUT		150,000 BTUH NOMINAL INPUT	
	Natural Gas Orifice Size†	Liquid Propane Orifice Size†	Natural Gas Orifice Size†	Liquid Propane Orifice Size†
0-2,000	33	43	30	37
2,000	36	44	31	39
3,000	36	45	31	40
4,000	37	45	32	41
5,000	38	46	32	42
6,000	40	47	34	43
7,000	41	48	35	43
8,000	42	49	36	44
9,000	43	50	37	45
10,000	44	50	39	46
11,000	45	51	41	47
12,000	46	52	42	48
13,000	47	52	43	49
14,000	48	53	44	50

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

ALTITUDE COMPENSATION* — 48TM004-006 LOW NOx UNITS

ELEVATION (ft)	60,000 AND 90,000 BTUH NOMINAL INPUT	120,000 BTUH NOMINAL INPUT
	Natural Gas Orifice Size†	Natural Gas Orifice Size
0-2,000	38	32
2,000	40	33
3,000	41	35
4,000	42	36
5,000	43	37
6,000	43	38
7,000	44	39
8,000	45	41
9,000	46	42
10,000	47	43
11,000	48	44
12,000	49	44
13,000	50	46
14,000	51	47

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

ALTITUDE COMPENSATION* — 48TM008-014

ELEVATION (ft)	125,000, 180,000, AND 224,000 BTUH NOMINAL INPUT		250,000 BTUH NOMINAL INPUT	
	Natural Gas Orifice Size†	Liquid Propane Orifice Size†	Natural Gas Orifice Size†	Liquid Propane Orifice Size†
0-2,000	31	41	30	38
2,000	32	42	30	39
3,000	32	42	31	40
4,000	32	42	32	41
5,000	33	43	33	42
6,000	34	43	34	43
7,000	35	44	35	43
8,000	36	44	36	44
9,000	37	45	37	44
10,000	38	46	38	45
11,000	39	47	39	45
12,000	40	47	40	46
13,000	41	48	41	47
14,000	42	48	42	47

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

ALTITUDE COMPENSATION* — 48TM016-028

ELEVATION (ft)	NATURAL GAS ORIFICE SIZE†	
	Low Heat	High Heat
0-3,000	30	29
3,000- 7,000	31	30
7,000- 9,000	32	31
9,000-10,000	33	31
above 10,000	35	32

*Includes a 4% input reduction per each 1,000 feet.
†Orifices available through your Carrier dealer.

ALTITUDE DERATING FACTOR*

ELEVATION	MAXIMUM HEATING VALUE AT SEA LEVEL (Btu/ft³)
0-2000	1100
2001-3000	1050
3001-4000	1000
4001-5000	950
5001-6000	900

*Derating of the gas heating equipment to compensate for the effects of altitude is always required. Orifice change is not required if the fuel heating value (at sea level) is below the limits listed in the table above. Derating conditions must be 4% per thousand ft above 2000 ft. For example, at 4000 ft, if the heating value of the gas exceeds 1000 Btu/ft³, the unit will require a 16% derating. For elevations above 6000 ft, the same formula applies. For example, at 7000 ft, the unit will require a 28% derating of the maximum heating value per the National Fuel Gas Code.

IMPORTANT: Local utility companies may be reducing heat content of gas at altitudes above 2000 ft. If this is being done, changing spuds may not be required.

ALTITUDE COMPENSATION — 48TM016-028 (LP Gas Units)

ELEVATION (ft)	LIQUID PROPANE ORIFICE SIZE
	Low Heat and High Heat
0-2,000	36
2,000	37
3,000	38
4,000	38
5,000	39
6,000	40
7,000	41
8,000	41
9,000	42
10,000	43

Electrical data — 48TM

ELECTRICAL DATA (48TM004-014 Units Without Convenience Outlet)

UNIT 48TM	NOMINAL VOLTAGE	IFM TYPE	VOLTAGE RANGE		COMPR (ea)			OFM (ea)			IFM	COMBUSTION FAN MOTOR FLA	POWER SUPPLY*		DISCONNECT SIZE†	
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA	FLA		MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-1-60	Std	187	254	1	16.2	96.0	1	1/4	1.4	3.5	.6	25.2/25.2	30/30	24/24	106/106
		Alt									4.9		26.6/26.6	35/35	26/26	111/111
	208/230-3-60	Std	187	254	1	10.2	75.0	1	1/4	1.4	3.5	.6	17.7/17.7	25/25	17/17	85/ 85
		Alt									4.9		19.1/19.1	25/25	19/19	90/ 90
		High									5.2		19.4/19.4	25/25	19/19	109/109
	460-3-60	Std	414	508	1	4.4	40.0	1	1/4	0.8	1.3	.3	7.6	15	7	44
		Alt									2.1		8.4	15	8	48
		High									2.6		8.9	15	9	57
	575-3-60	Std	518	632	1	3.7	31.0	1	1/4	0.8	1.3	.3	5.5	15	6	35
		Alt									2.1		6.0	15	7	37
		High									2.6		6.3	15	7	56
005 (4 Tons)	208/230-1-60	Std	187	254	1	23.3	118.0	1	1/4	1.4	3.5	.6	34.0/34.0	40/40	32/32	129/129
		Alt									4.9		35.4/35.4	45/45	34/34	133/133
	208/230-3-60	Std	187	254	1	15.4	90.0	1	1/4	1.4	3.5	.6	24.2/24.2	30/30	23/23	101/101
		Alt									4.9		25.6/25.6	30/30	25/25	105/105
		High									5.2		25.9/25.9	30/30	25/25	124/124
	460-3-60	Std	414	508	1	8.3	45.0	1	1/4	0.8	1.8	.3	13.0	20	13	51
		Alt									2.1		13.3	20	13	53
		High									2.6		13.8	20	13	62
	575-3-60	Std	518	632	1	6.4	36.0	1	1/4	0.8	1.8	.3	9.2	15	10	41
		Alt									2.1		9.3	15	10	42
		High									2.6		9.7	15	10	49
006 (5 Tons)	208/230-1-60	Std	187	254	1	28.8	147.0	1	1/4	1.4	5.9	.6	43.3/43.3	60/60	42/42	161/161
		Alt									6.6		44.0/44.0	60/60	42/42	184/184
	208/230-3-60	Std	187	254	1	16.0	114.0	1	1/4	1.4	5.9	.6	27.3/27.3	35/35	27/27	128/128
		Alt									5.2		26.6/26.6	35/35	26/26	148/148
		High									7.5		28.9/28.9	35/35	29/29	174/174
	460-3-60	Std	414	508	1	7.4	64.0	1	1/4	0.8	3.1	.3	13.2	20	13	71
		Alt									2.6		13.5	20	13	81
		High									3.4		13.5	20	13	93
	575-3-60	Std	518	632	1	6.2	52.0	1	1/4	0.8	3.1	.3	9.7	15	11	58
		Alt									2.6		9.9	15	11	65
		High									3.4		9.9	15	11	76
007 (6 Tons)	208/230-3-60	Std	187	254	1	20.6	146.0	1	1/4	1.4	5.2	.6	32.4/32.4	40/40	31/31	180/180
		High									7.5		34.7/34.7	40/40	34/34	205/205
	460-3-60	Std	414	508	1	9.5	73.0	1	1/4	0.9	2.6	.3	15.4	20	15	90
		High									3.4		16.2	20	16	103
	575-3-60	Std	518	632	1	7.6	58.4	1	1/4	0.6	2.6	.3	11.4	15	12	79
		High									3.4		11.9	15	13	86
008 (7 1/2 Tons)	208/230-3-60	Std	187	254	2	14.0	91.0	2	1/4	1.4	5.8	.6	40.1/40.1	45/45	42/42	229/229
		Alt									5.8		40.1/40.1	45/45	42/42	229/229
		High									10.6		44.9/44.9	50/50	48/48	273/273
	460-3-60	Std	414	508	2	6.4	42.0	2	1/4	0.7	2.6	.3	18.4	20	19	108
		Alt									2.6		18.4	20	19	108
		High									4.8		20.6	25	22	130
	575-3-60	Std	518	632	2	5.2	39.0	2	1/4	0.7	2.6	.3	14.9	20	16	97
		Alt									2.6		14.9	20	16	97
		High									4.8		16.7	20	18	114
009 (8 1/2 Tons)	208/230-3-60	Std	187	254	2	17.3††	120.0††	2	1/4	1.4	5.8	.6	44.3/44.3	50/50	46/46	272/272
		High									10.6		49.1/49.1	60/60	52/52	316/316
	460-3-60	Std	414	508	2	7.9††	70.0††	2	1/4	0.7	2.6	.3	21.0	25	22	149
		High									4.8		23.2	30	24	171
	575-3-60	Std	518	632	2	5.5††	50.0††	2	1/4	0.7	2.6	.3	16.7	20	17	109
		High									4.8		18.5	25	19	126

See Legend and Notes on page 92.

Electrical data — 48TM (cont)

ELECTRICAL DATA (48TM004-014 Without Convenience Outlet) (cont)

UNIT 48TM	NOMINAL VOLTAGE	IFM TYPE	VOLTAGE RANGE		COMPR (ea)			OFM (ea)			IFM	COMBUSTION FAN MOTOR FLA	POWER SUPPLY*		DISCONNECT SIZE†	
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA	FLA		MCA	MOCP**	FLA	LRA
012 (10 Tons)	208/230-3-60	Std	187	254	2	16.0	125.0	2	1/4	1.4	5.8	.6	44.6/44.6	50/50	47/47	297/297
		Alt									7.5		46.3/46.3	60/60	49/49	316/316
		High									15.0		53.8/53.8	60/60	57/57	364/364
	460-3-60	Std	414	508	2	8.0	62.5	2	1/4	0.7	2.6	.3	22.0	25	23	149
		Alt									3.4		22.8	25	24	188
		High									7.4		26.8	30	29	182
	575-3-60	Std	518	632	2	6.3	50.0	2	1/4	0.7	2.6	.3	17.4	20	18	119
		Alt									3.4		18.0	20	19	151
		High									7.4		21.2	25	23	146
014 (12 1/2 Tons)	208/230-3-60	Std	187	254	2	19.0	156.0	2	1/4	1.4	10.6	.6	56.2/56.2	70/70***	59/59	359/359
		Alt									15.0		60.6/60.6	70/70***	64/64	378/378
	460-3-60	Std	414	508	2	9.0	75.0	2	1/4	0.7	4.8	.3	26.5	30	28	174
		Alt									7.4		29.1	35	31	213
	575-3-60	Std	518	632	2	7.4	54.0	2	1/4	0.7	4.8	.3	21.6	25	23	127
		Alt									7.4		23.7	30	25	159

LEGEND

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

*The values listed in this table do not include power exhaust. See table below for power exhaust requirements.
†Used to determine minimum disconnect per NEC.
**Fuse or HACR circuit breaker.
††Compressor no. 1 data indicated in table.
208/230-3-60: Compressor no. 2 RLA is 14.1 amps and LRA is 105 amps.
460-3-60: Compressor no. 2 RLA is 7.1 amps and LRA is 55 amps.
575-3-60: Compressor no. 2 RLA is 6.4 amps and LRA is 40 amps.
***Fuse only.

POWER EXHAUST ELECTRICAL DATA

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH021A01	N/A	0.9	N/A	15
CRPWREXH022A01	3.3	N/A	1.32	15
CRPWREXH023A01	N/A	1.8	N/A	15
CRPWREXH028A01	1.7	N/A	0.68	15
CRPWREXH029A01	N/A	1.0	N/A	15
CRPWREXH030A01	1.6	N/A	0.64	15

N/A — Not available

NOTE: If a single power source is to be used, size wire to include power exhaust MCA and MOCP.

Check MCA and MOCP when power exhaust is powered through the unit. Determine the new MCA including the power exhaust using the following formula:

MCA New = MCA unit only + MCA of Power Exhaust

For example, using a 48TMD006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A01 power exhaust.

MCA New = 28.9 amps + 1.6 amps = 30.5 amps

If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps and the MCA New is below 35; therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

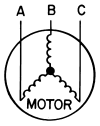
NOTES:

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.

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

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

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

   $$= 457$$

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

ELECTRICAL DATA (48TM004-014 With Convenience Outlet)

UNIT 48TM	NOMINAL VOLTAGE	IFM TYPE	VOLTAGE RANGE		COMPR (ea)			OFM (ea)			IFM	COMBUSTION FAN MOTOR FLA	POWER SUPPLY*		DISCONNECT SIZE†	
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA	FLA		MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-1-60	Std	187	254	1	16.2	96.0	1	1/4	1.4	3.5	.6	31.2/31.2	35/35	30/30	111/111
		Alt									4.9		32.6/32.6	40/40	31/31	116/116
	208/230-3-60	Std	187	254	1	10.2	75.0	1	1/4	1.4	3.5	.6	22.5/22.5	25/25	23/23	90/ 90
		Alt									4.9		23.9/23.9	30/30	25/25	95/ 95
		High									5.2		24.2/24.2	30/30	25/25	114/114
	460-3-60	Std	414	508	1	4.4	40.0	1	1/4	0.8	1.3	.3	9.8	15	10	47
		Alt									2.1		10.6	15	11	50
		High									2.6		11.1	15	11	59
	575-3-60	Std	518	632	1	3.7	31.0	1	1/4	0.8	1.3	.3	7.2	15	8	36
		Alt									2.1		7.7	15	9	39
		High									2.6		8.0	15	9	58
005 (4 Tons)	208/230-1-60	Std	187	254	1	23.3	118.0	1	1/4	1.4	3.5	.6	40.0/40.0	45/45	38/38	134/134
		Alt									4.9		41.4/41.4	50/50	40/40	138/138
	208/230-3-60	Std	187	254	1	15.4	90.0	1	1/4	1.4	3.5	.6	29.0/29.0	35/35	29/29	106/106
		Alt									4.9		30.4/30.4	35/35	30/30	110/110
		High									5.2		30.7/30.7	35/35	31/31	129/129
	460-3-60	Std	414	508	1	8.3	45.0	1	1/4	0.8	1.8	.3	15.2	20	15	53
		Alt									2.1		15.5	20	15	55
		High									2.6		16.0	20	16	64
	575-3-60	Std	518	632	1	6.4	36.0	1	1/4	0.8	1.8	.3	10.9	15	12	42
		Alt									2.1		11.1	15	12	44
		High									2.6		11.4	15	12	51
006 (5 Tons)	208/230-1-60	Std	187	254	1	28.8	147.0	1	1/4	1.4	5.9	.6	49.3/49.3	60/60	47/47	166/166
		Alt									6.6		50.0/50.0	60/60	48/48	188/188
	208/230-3-60	Std	187	254	1	16.0	114.0	1	1/4	1.4	5.9	.6	32.1/32.1	40/40	32/32	133/133
		Alt									5.2		31.4/31.4	40/40	32/32	153/153
		High									7.5		33.7/33.7	40/40	34/34	179/179
	460-3-60	Std	414	508	1	7.4	64.0	1	1/4	0.8	3.1	.3	15.3	20	15	74
		Alt									2.6		15.6	20	15	83
		High									3.4		15.6	20	16	96
	575-3-60	Std	518	632	1	6.2	52.0	1	1/4	0.8	3.1	.3	11.5	15	13	60
		Alt									2.6		11.7	15	12	67
		High									3.4		11.7	15	13	77
007 (6 Tons)	208/230-3-60	Std	187	254	1	20.6	146.0	1	1/4	1.4	5.2	.6	37.2/37.2	45/45	37/37	184/184
		High									7.5		39.5/39.5	45/45	39/39	210/210
	460-3-60	Std	414	508	1	9.5	73.0	1	1/4	0.6	2.6	.3	17.6	20	17	92
		High									3.4		18.4	25	18	105
	575-3-60	Std	518	632	1	7.6	58.4	1	1/4	0.6	2.6	.3	13.1	20	14	77
		High									3.4		13.7	20	15	90
008 (7 1/2 Tons)	208/230-3-60	Std	187	254	2	14.0	91.0	2	1/4	1.4	5.8	.6	44.9/44.9	50/50	48/48	234/234
		Alt									5.8		44.9/44.9	50/50	48/48	234/234
		High									10.6		49.7/49.7	60/60	53/53	277/277
	460-3-60	Std	414	508	2	6.4	42.0	2	1/4	0.7	2.6	.3	20.6	25	22	110
		Alt									2.6		20.6	25	22	110
		High									4.8		22.8	25	24	132
	575-3-60	Std	518	632	2	5.2	39.0	2	1/4	0.7	2.6	.3	16.6	20	18	99
		Alt									2.6		16.6	20	18	99
		High									4.8		18.4	20	20	116
009 (8 1/2 Tons)	208/230-3-60	Std	187	254	2	17.3††	120.0††	2	1/4	1.4	5.8	.6	49.1/49.1	60/60	52/52	277/277
		High									10.6		53.9/53.9	60/60	57/57	320/320
	460-3-60	Std	414	508	2	7.9††	70.0††	2	1/4	0.7	2.6	.3	23.2	30	24	151
		High									4.8		25.4	30	27	173
	575-3-60	Std	518	632	2	5.5††	50.0††	2	1/4	0.7	2.6	.3	18.4	25	19	111
		High									4.8		20.2	25	21	128

See Legend and Notes on page 94.

Electrical data — 48TM (cont)

ELECTRICAL DATA (48TM004-014 With Convenience Outlet) (cont)

UNIT 48TM	NOMINAL VOLTAGE	IFM TYPE	VOLTAGE RANGE		COMPR (ea)			OFM (ea)			IFM	COMBUSTION FAN MOTOR FLA	POWER SUPPLY*		DISCONNECT SIZE†	
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA	FLA		MCA	MOCP**	FLA	LRA
012 (10 Tons)	208/230-3-60	Std	187	254	2	16.0	125.0	2	1/4	1.4	5.8	.6	49.4/49.4	60/60	52/52	302/302
		Alt									7.5		51.1/51.1	60/60	54/54	321/321
		High									15.0		58.6/58.6	70/70	63/63	369/369
	460-3-60	Std	414	508	2	8.0	62.5	2	1/4	0.7	2.6	.3	24.2	30	26	151
		Alt									3.4		25.0	30	26	190
		High									7.4		29.0	35	31	184
	575-3-60	Std	518	632	2	6.3	50.0	2	1/4	0.7	2.6	.3	19.1	25	20	121
		Alt									3.4		19.7	25	21	152
		High									7.4		22.9	25	25	148
014 (12 1/2 Tons)	208/230-3-60	Std	187	254	2	19.0	156.0	2	1/4	1.4	10.6	.6	61.0/61.0	70/70***	65/65	364/364
		Alt									15.0		65.4/65.4	80/80***	70/70	383/383
	460-3-60	Std	414	508	2	9.0	75.0	2	1/4	0.7	4.8	.3	28.7	35	30	176
		Alt									7.4		31.3	35	33	215
	575-3-60	Std	518	632	2	8.3	58.4	2	1/4	0.7	4.8	.3	23.3	30	25	129
		Alt									7.4		25.4	30	27	160

LEGEND

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

*The values listed in this table do not include power exhaust. See table below for power exhaust requirements.
†Used to determine minimum disconnect per NEC.
**Fuse or HACR circuit breaker.
††Compressor no. 1 data indicated in table.
208/230-3-60: Compressor no. 2 RLA is 14.1 amps and LRA is 105 amps.
460-3-60: Compressor no. 2 RLA is 7.1 amps and LRA is 55 amps.
575-3-60: Compressor no. 2 RLA is 6.4 amps and LRA is 40 amps.
***Fuse only.

POWER EXHAUST ELECTRICAL DATA

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH021A01	N/A	0.9	N/A	15
CRPWREXH022A01	3.3	N/A	1.32	15
CRPWREXH023A01	N/A	1.8	N/A	15
CRPWREXH028A01	1.7	N/A	0.68	15
CRPWREXH029A01	N/A	1.0	N/A	15
CRPWREXH030A01	1.6	N/A	0.64	15

N/A — Not available

NOTE: If a single power source is to be used, size wire to include power exhaust MCA and MOCP.

Check MCA and MOCP when power exhaust is powered through the unit. Determine the new MCA including the power exhaust using the following formula:

MCA New = MCA unit only + MCA of Power Exhaust

For example, using a 48TMD006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A01 power exhaust.

MCA New = 28.9 amps + 1.6 amps = 30.5 amps

If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps and the MCA New is below 35; therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

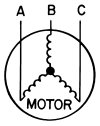
NOTES:

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.

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

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

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

   $$= 457$$

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

48TM016-028 UNITS

UNIT 48TM	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 1A		COMPRESSOR No. 2		OFM			IFM		POWER EXHAUST		COMBUSTION FAN MOTOR	POWER SUPPLY	
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	FLA	MCA	MOCP*
016	208/230	187	253	32.1	195	—	—	20.7	156	3	0.5	1.7	5.0	15.8/15.8	—	—	0.57	82/82	110/110
															4.6	18.8	0.57	86/86	110/110
	460	414	508	16.4	95	—	—	10	70	3	0.5	0.8	5.0	7.9	—	—	0.30	41	50
															2.3	6.0	0.30	43	50
	575	518	633	12	80	—	—	8.2	54	3	0.5	0.75	5.0	6.0	—	—	0.57	31	40
															2.1	4.8	0.57	34	40
020	208/230	187	253	30.1	225	—	—	28.8	195	3	0.5	1.7	5.0	15.8/15.8	—	—	0.57	87/87	110/110
															4.6	18.8	0.57	92/92	110/110
	460	414	508	15.5	114	—	—	14.7	95	3	0.5	0.8	5.0	7.9	—	—	0.30	44	50
															2.3	6.0	0.30	47	60
	575	518	632.5	12.1	80	—	—	10.7	80	3	0.5	0.75	5.0	6.0	—	—	0.57	34	40
															2.1	4.8	0.57	36	40
025	208/230	187	253	42	239	—	—	33.6	225	2	1	6.6	7.5	25.0/25.0	—	—	0.57	124/124	150/150
															4.6	18.8	0.57	129/129	150/150
	460	414	508	19.2	125	—	—	17.3	114	2	1	3.3	7.5	13.0	—	—	0.30	61	80
															2.3	6.0	0.30	63	80
	575	518	633	13.8	80.0	—	—	13.5	80.0	2	1.0	3.4	7.5	10.0	—	—	0.57	48	60
															2.1	4.8	0.57	50	60
028	208/230	187.2	253	20.7	156	20.7	156	47.1	245	6	0.5	1.7	10.0	28.0/28.0	—	—	0.57	138/138	175/175
															4.6	18.8	0.57	143/143	150/175
	460	414	508	10	75	10	75	19.6	125	6	0.5	0.8	10.0	14.6	—	—	0.30	64	80
															2.3	6	0.30	66	80
	575	517.5	632.5	8.2	54	8.2	54	15.8	100	6	0.5	0.8	10.0	13.0	—	—	0.57	54	60
															2.1	4.8	0.57	56	70

LEGEND

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

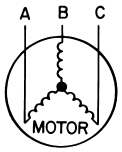
*Fuse or HACR circuit breaker.

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

% Voltage Imbalance

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

EXAMPLE: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

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

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

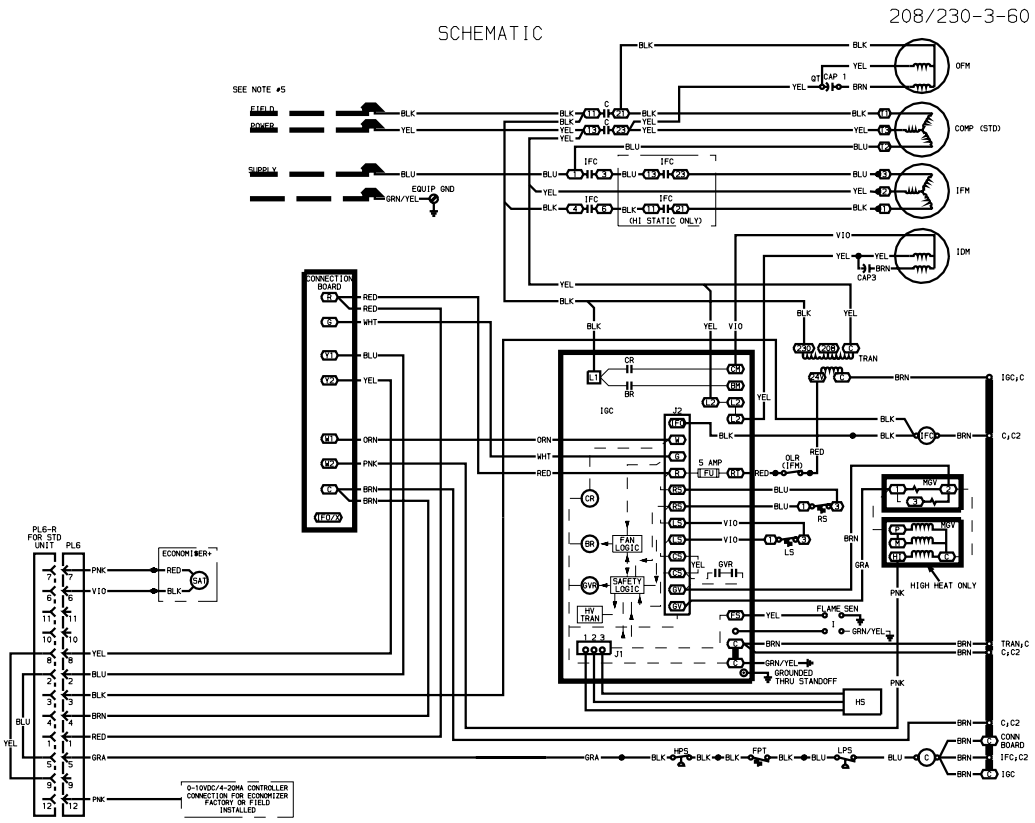
$$= 1.53\%$$

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

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

Typical wiring schematic — 48TM

TYPICAL WIRING SCHEMATIC — SIZES 004-014 (48TM007, 208/230-3-60 SHOWN)



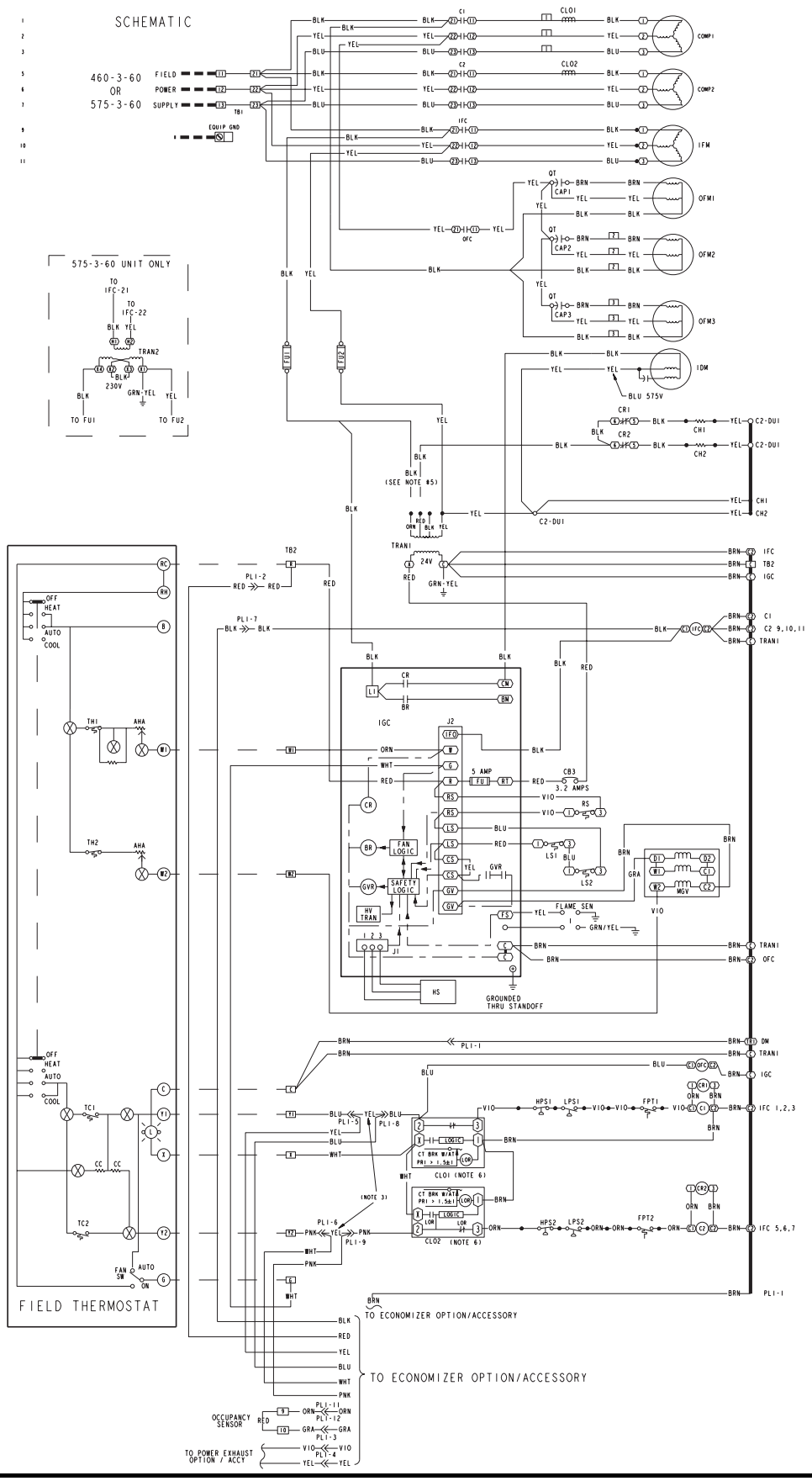
LEGEND

AHA — Adjustable Heat Anticipator
C — Contactor, Compressor
CAP — Capacitor
CB — Circuit Breaker
CC — Cooling Compensator
CH — Crankcase Heater
CLO — Compressor Lockout
COMP — Compressor Motor
CR — Control Relay
DM — Damper Motor
DU — Dummy Terminal
EQUIP — Equipment
FPT — Freeze Protection Thermostat
FU — Fuse
GND — Ground
HPS — High-Pressure Switch
HS — Hall Effect Sensor
HV — High Voltage
I — Ignitor
IAQ — Indoor Air Quality Sensor
IDM — Induced-Draft Motor
IFC — Indoor-Fan Contactor
IFCB — Indoor-Fan Circuit Breaker
IFM — Indoor-Fan Motor
IGC — Integrated Gas Unit Controller
IRH — Indoor/Return Relative Humidity
L — Light
LOR — Lockout Relay
LPS — Low-Pressure Switch
LS — Limit Switch
MGV — Main Gas Valve
OAT — Outdoor-Air Thermostat
OCCUP — Occupancy Sensor
OFC — Outdoor-Fan Contactor
OFM — Outdoor-Fan Motor
ORH — Outdoor Relative Humidity
PL — Plug Assembly
PRI — Primary
QT — Quadruple Terminal
R — Relay
RAT — Return Air Temperature Sensor
RS — Rollout Switch
SAT — Mixed Air Temperature Sensor
SN — Sensor
SR — Solenoid Relay
SW — Switch
TB — Terminal Block
TC — Thermostat, Cooling
TH — Thermostat, Heating
TRAN — Transformer

Terminal (Marked)
Terminal (Unmarked)
Terminal Block
Splice
Factory Wiring
Field Wiring
Option/Accessory Wiring
To indicate common potential only, not to represent wiring.

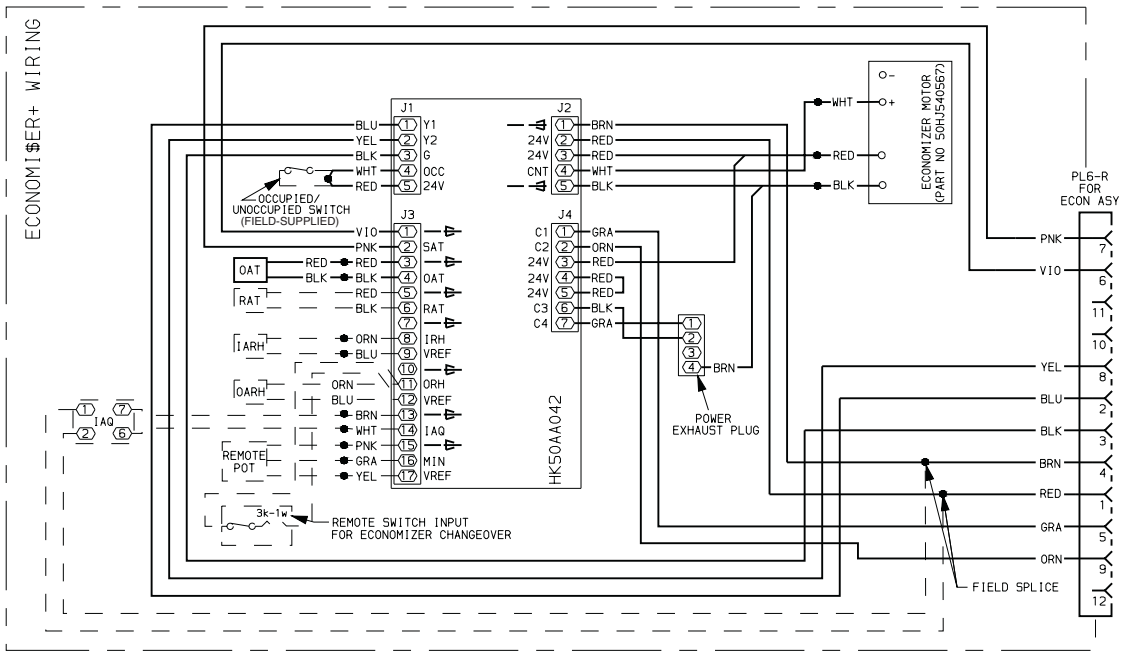
Typical wiring schematic — 48TM

TYPICAL WIRING SCHEMATIC — SIZES 016-028 (48TM016, 460-3-60 SHOWN)



Typical wiring schematics — 48TM (cont)

ECONOMI$ER+ WIRING — 48TM004-014 UNITS

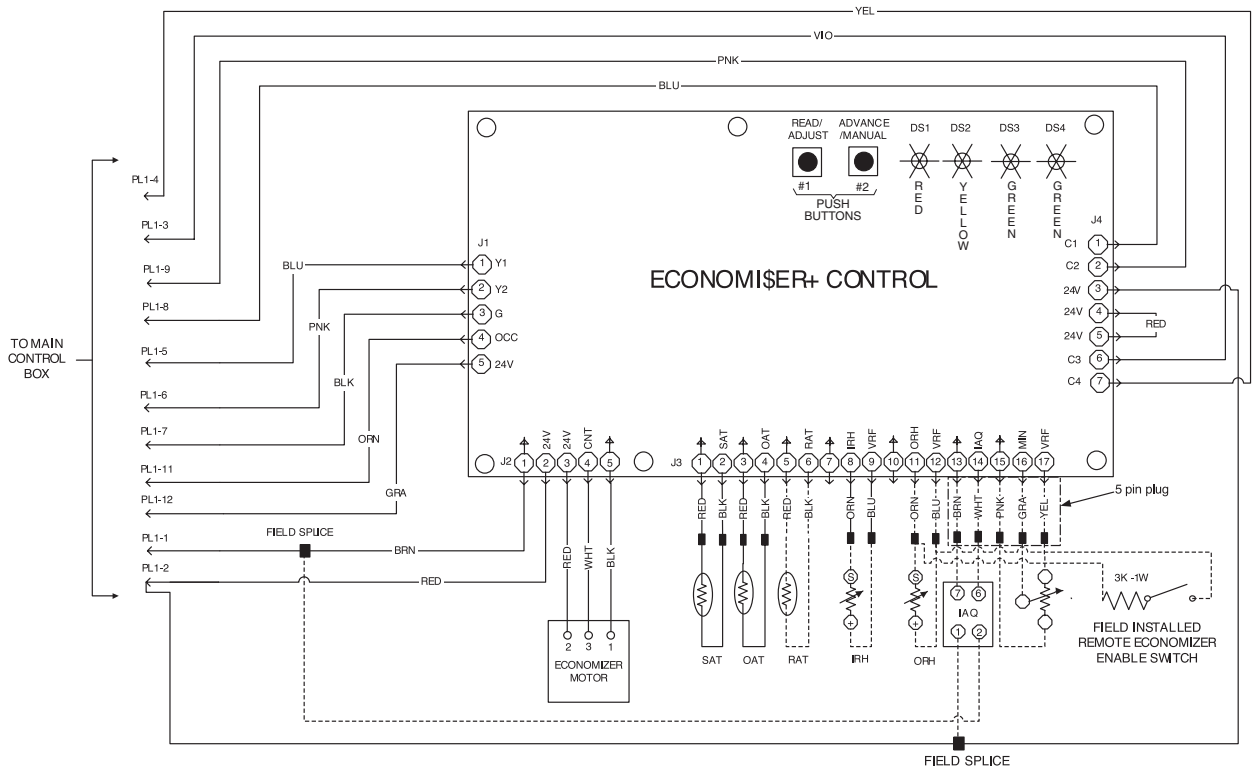


LEGEND

ECON — Economizer
IAQ — Indoor Air Quality (4 to 20 mA)
IARH — Indoor Air Relative Humidity (Signal)
IRH — Indoor Air Relative Humidity (Sensor)
OARH — Outdoor Air Relative Humidity (Signal)
OAT — Outdoor-Air Temperature
ORH — Outdoor Air Relative Humidity (Sensor)
POT — Potentiometer
RAT — Return-Air Temperature
SAT — Supply-Air Temperature

NOTES:
1. Terminals 13-17 are wired to 5-pin plug assembly (P/N CRE+PLUG001A00).
2. Pin numbers are not printed on the controller. They are provided in this book as a reference.

ECONOMI$ER+ WIRING — 48TM016-028 UNITS

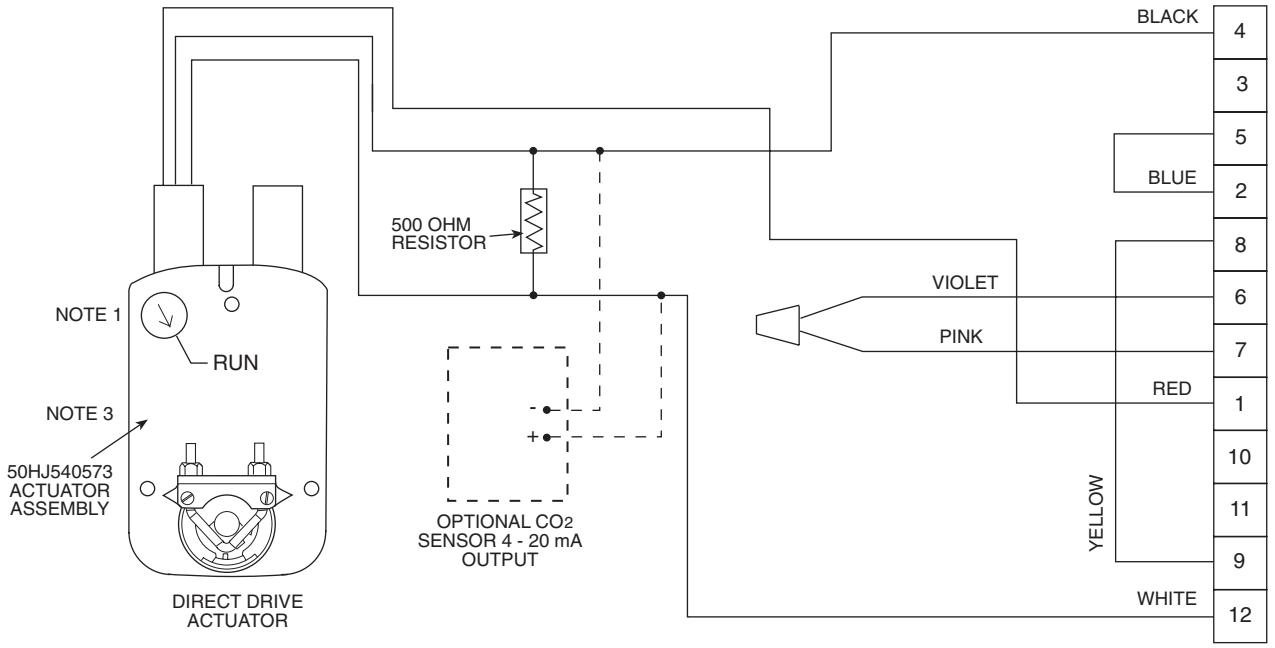


LEGEND

IAQ — Indoor Air Quality(4 to 20 mA)
IRH — Indoor Air Relative Humidity
OAT — Outdoor-Air Temperature
ORH — Outdoor Air Relative Humidity
RAT — Return-Air Temperature
SAT — Supply-Air Temperature

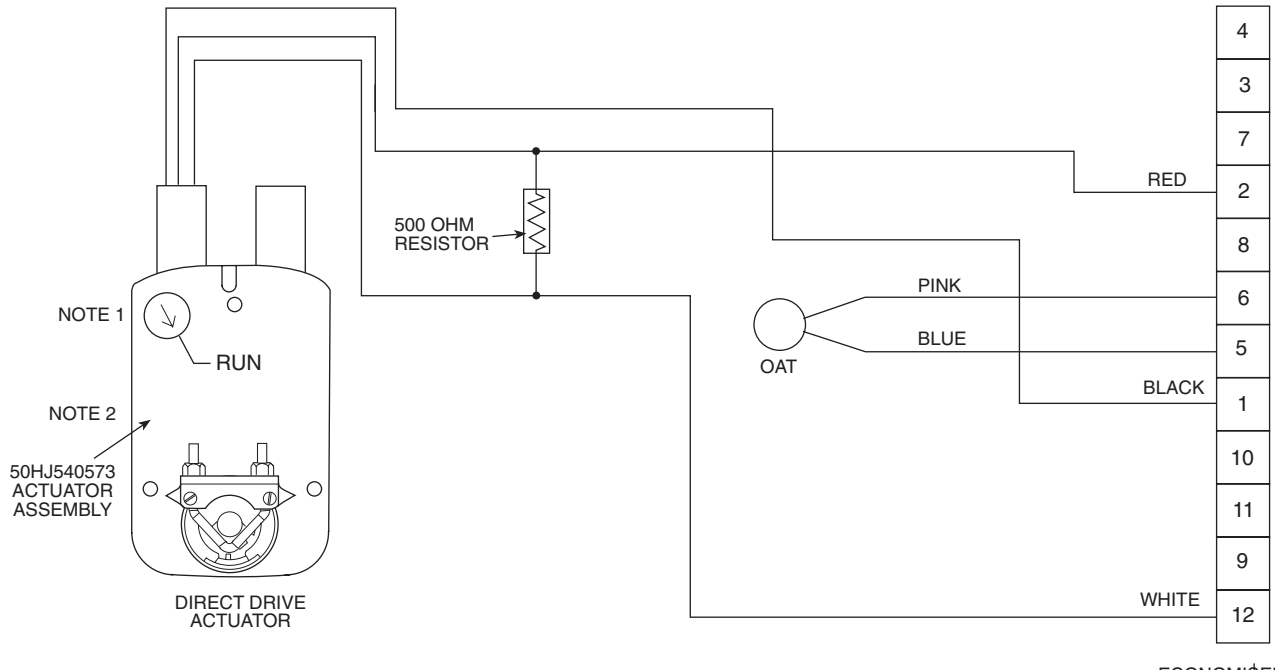
NOTE: Terminals 13-17 are wired to 5-pin plug assembly (P/N CRE+PLUG001A00).

ECONOMI$ER2 WIRING — 48TM004-014 UNITS



NOTES:
1. Switch on actuator must be in run position for economizer to operate.
2. PremierLink™ control requires that the standard 50HJ540569 outside-air sensor be replaced by either the CROASENR001A00 dry bulb sensor or HH57A077 enthalpy sensor.
3. 50HJ540573 actuator consists of the 50HJ540567 actuator and a harness with 500-ohm resistor.

ECONOMI$ER2 WIRING — 48TM016-028 UNITS



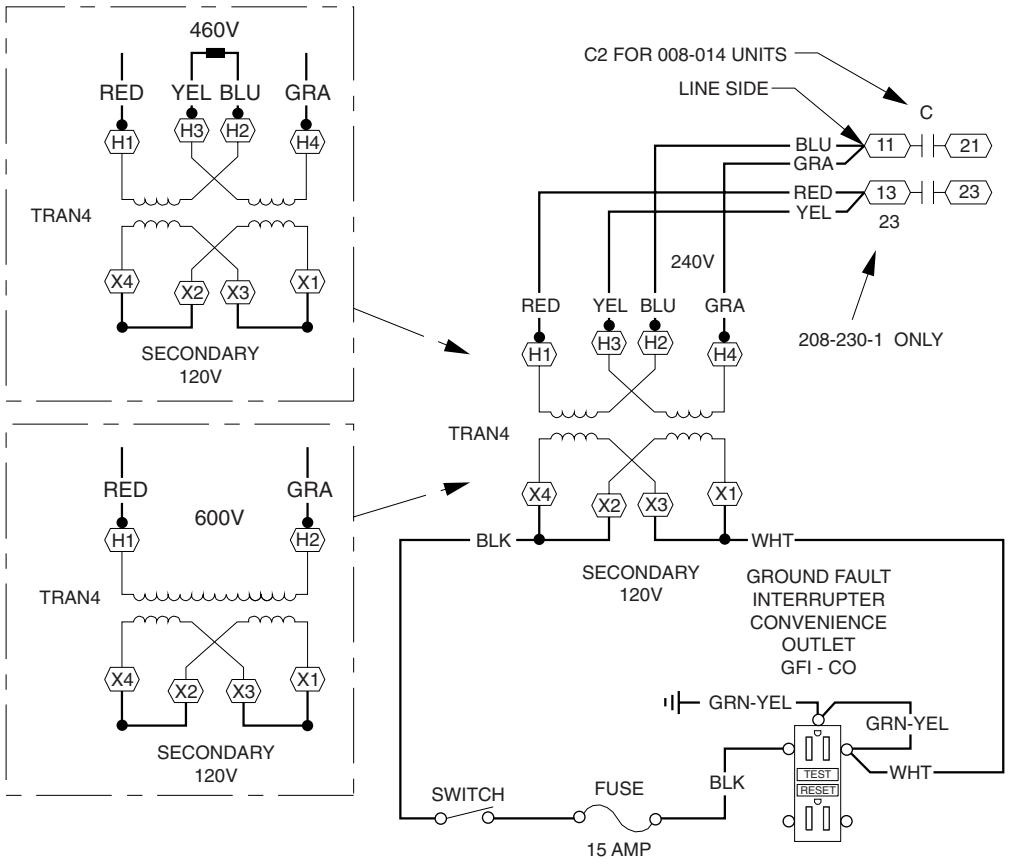
LEGEND

OAT — Outdoor Air Temperature Sensor

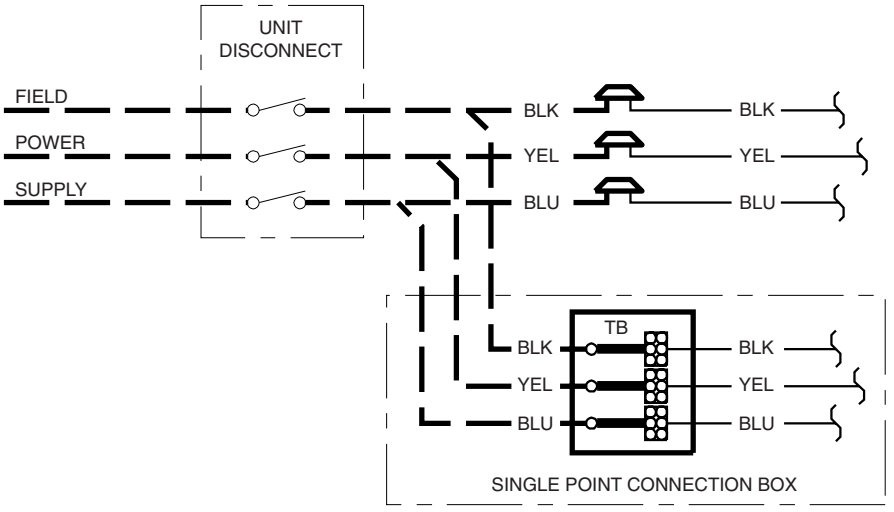
NOTES:
1. Switch on actuator must be in run position for economizer to operate.
2. 50HJ540573 actuator consists of the 50HJ540567 actuator and a harness with 500-ohm resistor.

Typical wiring schematics — 48TM (cont)

CONVENIENCE OUTLET (OPTIONAL) — SIZES 48TM004-014

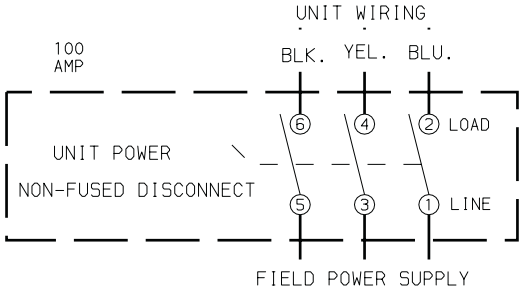


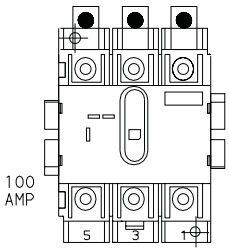
NON-FUSED DISCONNECT (OPTIONAL) — SIZES 48TM004-014

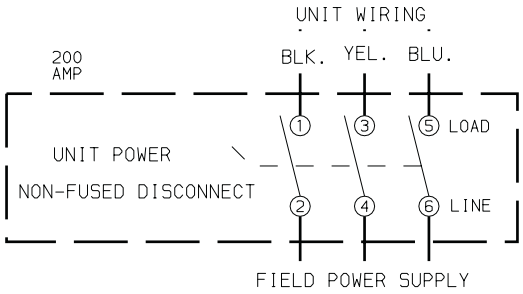


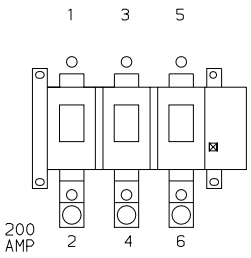
NOTE: Use copper conductors only.

NON-FUSED DISCONNECT (OPTIONAL) — 48TM016-028





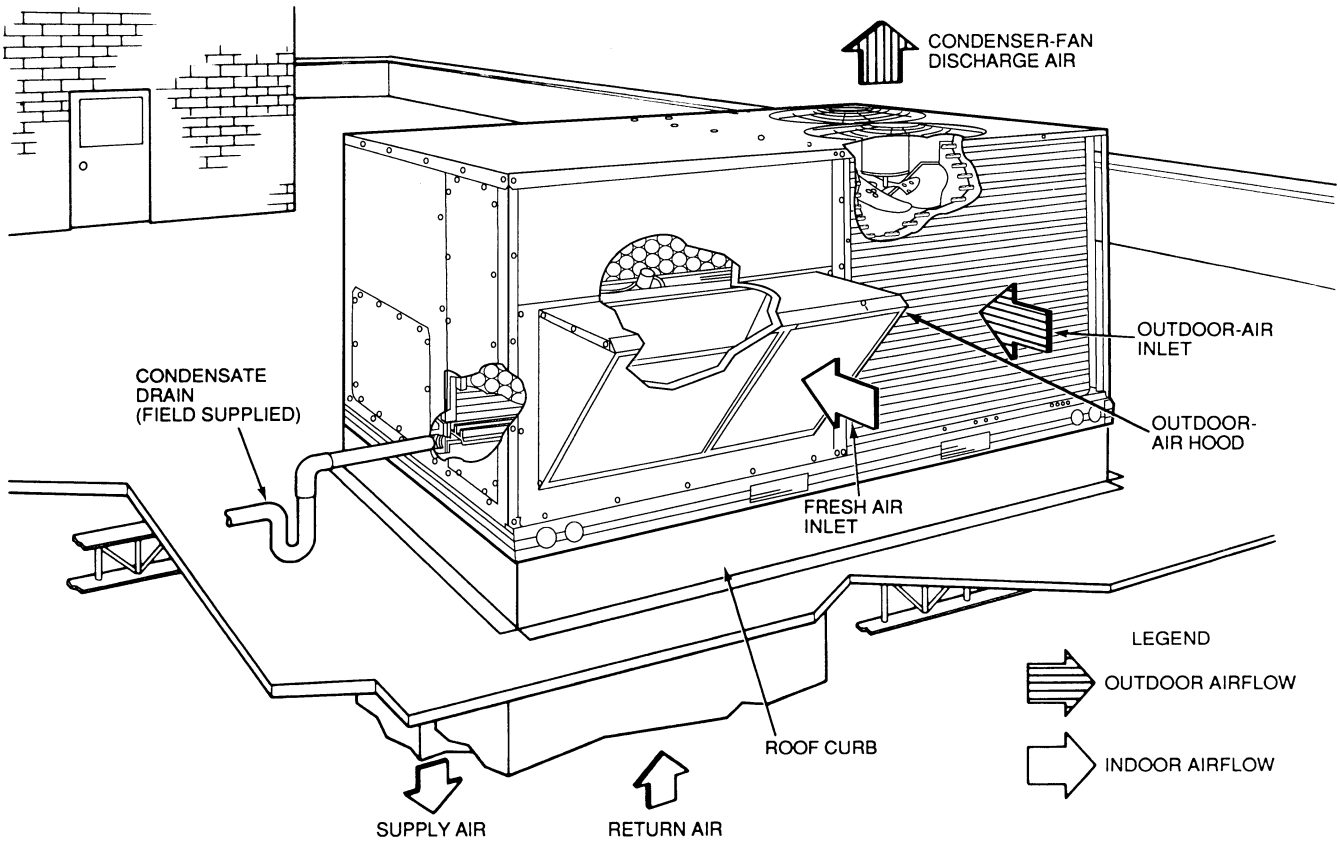




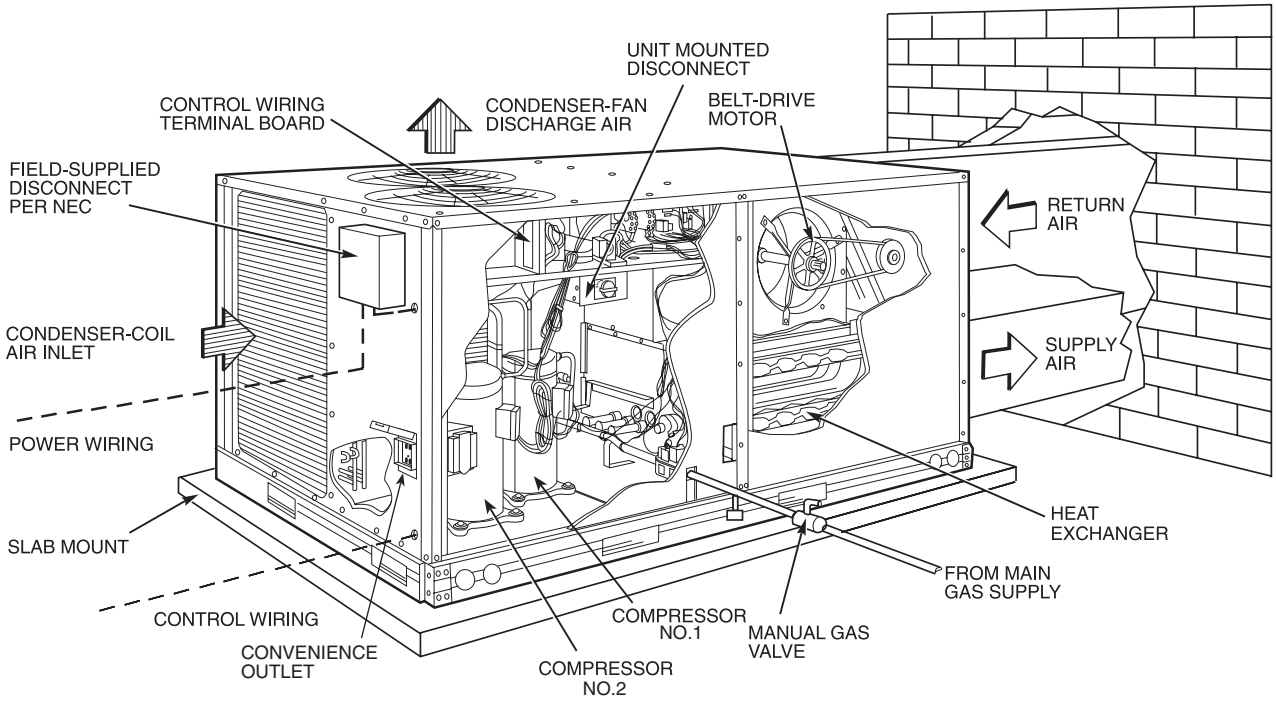
NOTES:
1. If the Non-Fused Disconnect Service Option is ordered for size 016-028 units, the Non-Fused Disconnect will be factory-installed.
2. The Disconnect takes the place of TB-1 as shown on the unit wiring diagram label and the component arrangement label.

Typical piping and wiring — 48TM004-014

VERTICAL DISCHARGE DUCTING

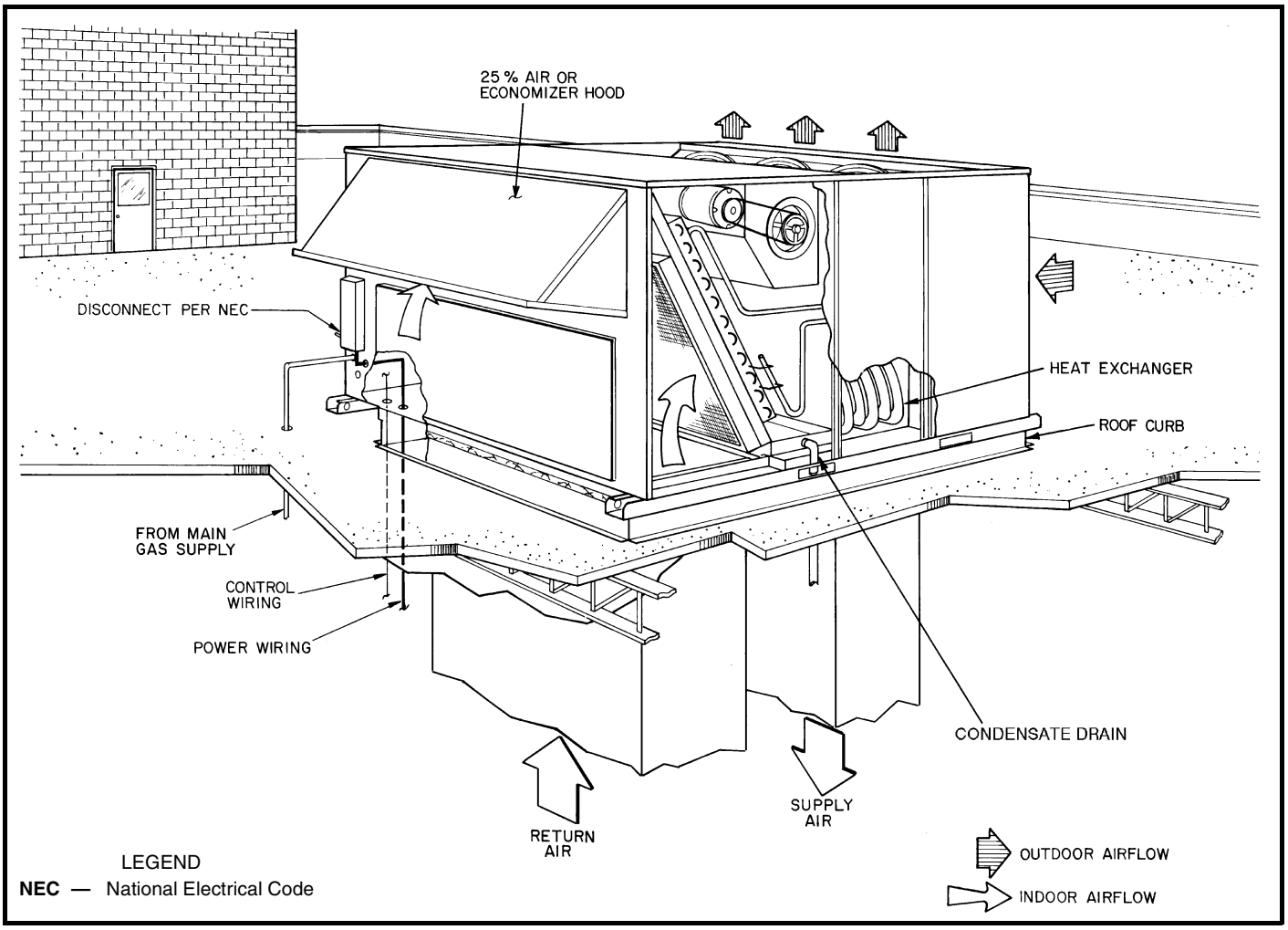


HORIZONTAL DISCHARGE DUCTING



NEC — National Electrical Code

Typical piping and wiring — 48TM016-028



LEGEND

NEC — National Electrical Code

Guide specifications — 48TM004-014

Packaged Rooftop Electric Cooling Unit with Gas Heat — Constant Volume Application

HVAC Guide Specifications

Size Range: **3 to 12 1/2 Tons, Nominal (Cooling)**
60,000 to 250,000 Btuh, Nominal (Input Heating)

Carrier Model Numbers:

48TMD/L
48TME/M
48TMF/N

ASHRAE 90.1 COMPLIANT

Part 1 — General

1.01 SYSTEM DESCRIPTION

Outdoor rooftop mounted, electrically controlled heating and cooling unit utilizing a hermetic compressor(s) for cooling duty and gas combustion for heating duty. Unit shall discharge supply air vertically or horizontally as shown on contract drawings.

1.02 QUALITY ASSURANCE

A. Unit shall comply with minimum requirements of ASHRAE 90.1-2001 Energy Efficiency Standards.

B. Unit shall be rated in accordance with ARI Standards 210/240 or 360 and 270. Designed in accordance with UL Standard 1995.

C. Unit shall be designed to conform to ASHRAE 15, latest revision.

D. Unit shall be UL-tested and certified in accordance with ANSI Z21.47 Standards and UL-listed and certified under Canadian standards as a total package for safety requirements.

E. Roof curb shall be designed to conform to NRCA Standards.

F. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

G. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).

H. Unit shall be designed in accordance with ISO 9001:2000, and shall be manufactured in a facility registered to ISO 9001:2000.

I. Each unit shall be subjected to a completely automated run testing on the assembly line. Units contain a factory-supplied printout indicating tested pressures, amperages, data, and inspectors, providing certification of the unit status at the time of manufacture.

1.03 DELIVERY, STORAGE, AND HANDLING

Unit 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, and shall be bonderized and coated with a prepainted baked enamel finish on all externally exposed surfaces.
2. Evaporator fan compartment interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density, flexible fiberglass insulation, neoprene 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 maneuvering and overhead rigging.
5. Unit shall have a factory-installed, sloped condensate drain pan made of a non-corrosive material, providing a minimum 3/4-in.-14 NPT. connection with both vertical and horizontal drains, and shall comply with ASHRAE Standard 62.
6. Unit shall have a factory-installed filter access panel to provide filter access with tool-less removal.
7. Unit shall have standard thru-the-bottom gas and power connection capability (accessory kit is required).

C. Fans:

1. Evaporator Fan:
   a. Fan shall be direct or belt driven as shown on the equipment drawings. Belt drive shall include an adjustable-pitch motor pulley.
   b. Fan wheel shall be double-inlet type with forward-curved blades.
   c. Bearings shall be sealed, permanently lubricated ball-bearing type for longer life and lower maintenance.
2. Evaporator fan shall be made from steel with a corrosion-resistant finish and shall be dynamically balanced.
3. Condenser fan shall be of the direct-driven (with totally enclosed motors) propeller type and shall discharge air vertically.

4. Condenser fan shall have aluminum blades riveted to corrosion-resistant steel spiders and shall be dynamically balanced.
5. Induced-draft blower shall be of the direct-driven, single inlet, forward-curved centrifugal type, made from steel with a corrosion-resistant finish and shall be dynamically balanced.

D. Compressor(s):
1. Fully hermetic type, internally protected reciprocating (48TM004,005,006 and 008) or scroll-type (48TM007,009,012 and 014).
2. Factory mounted on rubber grommets and internally spring mounted for vibration isolation.
3. On dual electrically and mechanically independent circuits (008-014).

E. Coils:
1. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Dual compressor models (size 008-014) shall have face-split type evaporator coil (circuit no. 1 on bottom).
3. Testing:
   a. Evaporator and condenser coils shall be qualified to UL 1995 burst test at 2,200 psi.
   b. Evaporator and condenser coils shall be leak tested to 150 psig and pressure tested to 400 psig.
4. Optional coils:
   a. Optional pre-coated aluminum-fin coils shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.
   b. Copper-fin coils shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan. All copper construction shall provide protection in moderate coastal environments.
   c. E-Coated aluminum-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.
   d. E-Coated copper-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be copper fins mechanically bonded to copper tubes with copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to maintain coating integrity and minimize corrosion potential between coil and pan.

F. Heating Section:
1. Induced-draft combustion type with energy saving direct-spark ignition system and redundant main gas valve.
2. Heat Exchanger:
   a. 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.
   b. The optional stainless steel heat exchanger shall be of the tubular section type, constructed of a minimum of 20-gage, type 409 stainless steel.
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 on side of unit (horizontal plane).
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. Fixed orifice metering system (Acutrol™ device).
2. Refrigerant filter drier.
3. Service gage connections on suction, discharge, and liquid lines.

H. Filter Section:

1. Standard filter section shall consist of factory-installed, low velocity, throwaway 2-in. thick fiberglass filters of commercially available sizes.
2. Filter face velocity shall not exceed 320 fpm at nominal airflows.
3. Filter section should 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 protected by a fuse on the 24-v transformer side (48TM008-014 units have a resettable circuit breaker).

2. Safeties:

   a. Unit shall incorporate a solid-state compressor protector which provides anti-cycle reset capability at the space thermostat, should any of the following standard safety devices trip and shut off compressor.
      1) Compressor overtemperature, overcurrent.
      2) Loss-of-charge/low-pressure switch.
      3) Freeze-protection thermostat, evaporator coil.
      4) High-pressure switch.
      5) Automatic reset motor thermal overload protector.

      The lockout protection shall be easily disconnected at the control board, if necessary.

   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 115 F ambient outdoor temperature, meeting maximum load criteria of ARI Standard 210/240 or 360 at ± 10% voltage. (The 48TM009 and 014 units are capable of operating at 125 F ambient outdoor air temperature.)
2. Compressor with standard controls shall be capable of operation down to 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 gas passing through motor windings and shall have line break thermal and current overload protection.
2. Evaporator-fan motor shall have permanently lubricated bearings and inherent automatic-reset thermal overload protection. Evaporator motors are designed specifically for Carrier and do *not* have conventional horsepower (hp) ratings listed on the motor nameplate. Motors are designed and qualified in the "air-over" location downstream of the cooling coil and carry a maximum continuous bhp rating that is the maximum application bhp rating for the motor; no "safety factors" above that rating may be applied.
3. Totally enclosed condenser-fan motor shall have permanently lubricated bearings, and inherent automatic-reset thermal overload protection.
4. Induced-draft motor shall have permanently lubricated sealed bearings and inherent automatic-reset thermal overload protection.

M. Special Features:

Certain features are not applicable when the features designated * are specified. For assistance in amending the specifications, contact your local Carrier Sales Office.

* 1. Carrier PremierLink™ Controls:

   a. Shall be available as a factory-installed or as a field-installed accessory.
   b. Shall work with CCN and ComfortVIEW™ software.
   c. Shall be compatible with *Comfort*Link™ controllers.
   d. Shall be ASHRAE 62-2001 compliant.
   e. Shall accept a CO_2 sensor in the conditioned space — Demand Control Ventilation (DCV) Ready.
   f. Shall have baud communication rate of 38.4K or faster.

g. Shall be Internet Ready.

h. Shall include an integrated economizer controller. If an economizer is specified, the "EconoMi$er2 with 4 to 20 mA actuator and no microprocessor control" is required.

2. Roof Curbs (Horizontal and Vertical):

a. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.

b. Permits installation and securing of ductwork to curb prior to mounting unit on the curb.

* 3. Integrated Economizers:

a. Integrated integral modulating type capable of simultaneous economizer and compressor operation. During economizer operation, up to two compressors on sizes 008-014 will operate.

b. Available as a factory-installed option in vertical supply/return configuration only. (Available as a field-installed accessory for horizontal and/or vertical supply return configurations.)

c. Includes all hardware and controls to provide cooling with outdoor air.

d. Equipped with low-leakage dampers, not to exceed 2% leakage at 1 in. wg pressure differential.

e. Capable of introducing up to 100% outdoor air.

f. EconoMi$er+ and EconoMi$er2 shall be equipped with a barometric relief damper capable of relieving up to 100% return air.

g. Designed to close damper(s) during loss-of-power situations with spring return built into motor.

h. Dry bulb outdoor-air temperature sensor shall be provided as standard. Outdoor air sensor set point is adjustable and shall range from 45 to 70 F. For the EconoMi$er+, the return air sensor, indoor humidity sensor, and outdoor humidity sensor shall be provided as field-installed accessories to provide enthalpy control, differential enthalpy control, and differential dry bulb temperature control. For the EconoMi$er2, the enthalpy, differential temperature (adjustable), and differential enthalpy control shall be provided as field-installed accessories.

i. The EconoMi$er+ and EconoMi$er2 shall have a gear-driven parallel blade design.

j. EconoMi$er+ microprocessor control shall provide control of internal building pressure through its accessory power exhaust function. Factory set at 100%, with a range of 0% to 100%.

k. EconoMi$er2 shall be capable of control from a 4 to 20 mA signal through optional 4 to 20 mA design without microprocessor control (required for PremierLink™ or third party control interface).

l. EconoMi$er+ Microprocessor Occupied Minimum Damper Position Setting maintains the minimum airflow into the building during occupied period providing design ventilation rate for full occupancy (damper position during heating). A remote potentiometer may be used to override the set point.

m. EconoMi$er+ Microprocessor Unoccupied Minimum Damper Position Setting maintains the minimum airflow into the building during unoccupied period providing base ventilation rate for demand control ventilation. The demand control ventilation position shall be set in the EconoMi$er+ software through configuration input. The EconoMi$er+ damper shall modulate between unoccupied and occupied minimum damper positions for demand control ventilation.

n. EconoMi$er+ Microprocessor Maximum Damper Position Setting — Setting the maximum position of the damper prevents the introduction of large amounts of hot or cold air into the space.

o. EconoMi$er+ Microprocessor IAQ control modulates the outdoor-air damper to provide ventilation based on the optional 2 to 10 vdc CO_2 sensor input.

p. Compressor lockout sensor (opens at 35 F, closes at 50 F).

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 15% 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.

* 7. Head Pressure Control Package:

Consists of solid-state control and condenser-coil temperature sensor to maintain condensing temperature between 90 F and 110 F at outdoor ambient temperatures down to –20 F by condenser-fan speed modulation or condenser-fan cycling and wind baffles.

8. LP (Liquid Propane) Conversion Kit:

Package shall contain all the necessary hardware (spuds only) and instructions to convert a standard natural gas unit for use with liquefied propane (valid up to 2000 ft elevation).

* 9. 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.

10. Light Commercial Thermidistat:

Field-installed wall-mounted thermostat is used to control temperature and activation of the Energy$Recycler device. The thermidistat can be set for humidity settings from 50% to 90% relative humidity. Automatic humidity control adjusts indoor humidity based on the outdoor temperature sensor.

* 11. Thermostat and Subbase:

Provides staged cooling and heating automatic (or manual) changeover, fan control, and indicator light.

* 12. Condenser Coil Hail Guard Assembly:

Hail guard shall protect against damage from hail and flying debris.

13. Unit-Mounted, Non-Fused Disconnect Switch:

Shall be factory-installed, internally mounted. NEC and UL approved non-fused switch shall provide unit power shutoff. Shall be accessible from outside the unit and shall provide power off lockout capability.

14. Convenience Outlet:

Shall be factory-installed and internally mounted with easily accessible 115-v female receptacle. Shall include 15 amp GFI receptacle with independent fuse protection. Voltage required to operate convenience outlet shall be provided by a factory-installed step-down transformer. Shall be accessible from outside the unit.

15. Alternate Motor(s) and/or Drive(s) (004-006, 008, 012, 014):

Alternate motor(s) and drive(s) shall be factory-installed to provide additional performance range.

16. High-Static Motor(s) and Drive(s) (004-012):

High-static motor(s) and drive(s) shall be factory-installed to provide additional performance range.

17. Flue Discharge Deflector:

Flue discharge deflector directs unit exhaust vertically instead of horizontally.

18. Condenser Coil Grille:

The grille protects the condenser coil from damage by large objects without increasing unit clearances.

19. Compressor Cycle Delay:

Unit shall be prevented from restarting for minimum of 5 minutes after shutdown.

20. Thru-the-Bottom Utility Connectors:

Kit shall provide connectors to permit gas and electrical connections to be brought to the unit through the basepan.

21. Fan/Filter Status Switch:

Provides status of indoor (evaporator) 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.

22. Energy$Recycler:

The package shall be an outdoor rooftop, surface mounted, electronically controlled, air-to-air heat pump unit utilizing a hermetic compressor for cooling and heating duty.

The Energy$Recycler shall recover energy from building exhaust air and pre-condition ventilation air to allow higher ventilation requirements and minimizing energy cost.

This accessory shall be available with the following:

a. A mounting kit for the Energy$Recycler for cantilever mounting off of the rooftop unit without the use of a slab or a roof curb.

b. A supplementary supply air fan kit to provide increased air movement into the 62AQ unit.

c. A field-installed 460-v to 208/230-v transformer to provide power when the 208-230/1/60 62AQ0060 or 100 size Energy$Recycler is used with a 460-v rooftop unit.

d. A field-installed 575-v to 208/230-v transformer to provide power when an Energy$Recycler is used with a 575-v unit.

23. Low-Ambient Kits:

When used, allows unit to operate at lower outdoor ambient temperatures down to 25 F.

24. Outdoor Air Humidity Sensor (EconoMi$er+):

    The outdoor air humidity sensor is used to sense outdoor air humidity for the EconoMi$er+ device. The outdoor air humidity sensor, in conjunction with the standard outdoor air temperature sensor, shall be used with the EconoMi$er+ device to provide outdoor enthalpy. Outdoor air enthalpy shall be calculated by the EconoMi$er+ device from the outdoor air temperature and humidity readings. When the outdoor air humidity sensor is installed, the EconoMi$er+ can perform Outdoor Air Enthalpy control. With the additional installation of an accessory return air temperature sensor and return air humidity sensor, differential enthalpy control can also be performed.

25. Return Air Humidity Sensor (EconoMi$er+):

    The return air humidity sensor is used to sense return air humidity for the EconoMi$er+ device. The return air humidity sensor, in conjunction with the accessory return air temperature sensor, shall be used with the EconoMi$er+ device to provide return air enthalpy. Return air enthalpy shall be calculated by the EconoMi$er+ device from the return air temperature and humidity readings. With the additional installation of an accessory return air temperature sensor and outdoor air humidity sensor, differential enthalpy control can also be performed.

26. Return Air Temperature Sensor (EconoMi$er+):

    The return air temperature sensor is used to sense return air temperature for the EconoMi$er+ device. When the return air temperature sensor is installed, the EconoMi$er+ can perform Differential Temperature control. The return air temperature sensor, in conjunction with the accessory return air humidity sensor, shall be used with the EconoMi$er+ device to provide return air enthalpy. Return air enthalpy shall be calculated by the EconoMi$er+ device from the return air temperature and humidity readings. With the additional installation of an accessory return air humidity sensor and outdoor air humidity sensor, differential enthalpy control can also be performed.

27. EconoMi$er+ 5-Pin Plug Assembly:

    The EconoMi$er+ 5-pin plug assembly shall provide a wiring connection to the EconoMi$er+ control board for a CO_2 sensor or a field-supplied remote potentiometer. The accessory plug is required when using a CO_2 sensor or a remote potentiometer.

28. Indoor Air Quality (CO_2) Room Sensor (EconoMi$er+):

    Sensor shall have the ability to provide demand ventilation control through the EconoMi$er+. The IAQ sensor shall be wall mounted with an LED display in parts per million. The set point shall have adjustment capability. The accessory 5-Pin Plug assembly is required to wire this device to the EconoMi$er+ control board.

29. Return Air CO_2 Sensor (EconoMi$er+):

    Sensor shall have the ability to provide demand ventilation control through the EconoMi$er+. The IAQ sensor shall be duct mounted. The set point shall have adjustment capability. The accessory 5-Pin Plug assembly is required to wire this device to the EconoMi$er+ control board.

30. Power Exhaust Accessory for EconoMi$er+ or EconoMi$er2:

    Power exhaust shall be used in conjunction with EconoMi$er+ or EconoMi$er2 to provide system exhaust of up to 100% of return air (vertical only). The power exhaust is a field-installed accessory (separate vertical and horizontal design).

    NOTE: Horizontal power exhaust is intended to mount in return ductwork.

    As the outdoor-air damper opens and closes, *both* propeller fans are energized and de-energized through the EconoMi$er+ controller. The set point is factory set at 100% of outdoor-air, and is adjustable 0 to 100% to meet specific job requirements. Available in 208/230-1-60 v or 460-3-60 v. An LED light on the controller indicates when the power exhaust is operating.

    For the EconoMi$er2, the power exhaust shall be controlled by the PremierLink or third party controls.

31. Outdoor Air Enthalpy Sensor (EconoMi$er2):

    The outdoor air enthalpy sensor shall be used with the EconoMi$er2 device to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the EconoMi$er2 device will provide differential enthalpy control. The sensor allows the EconoMi$er2 controller to determine if outside air is suitable for free cooling.

32. Return Air Enthalpy Sensor (EconoMi$er2):

    The return air enthalpy sensor shall be used with the EconoMi$er2 device. When used in conjunction with an outdoor air enthalpy sensor, the EconoMi$er2 device will provide differential enthalpy control.

33. Return Air Temperature Sensor (EconoMi$er2):

    The return air temperature sensor shall be used with the EconoMi$er2 device. When used in conjunction with the standard outdoor air temperature sensor, the EconoMi$er2 device will provide differential temperature control.

34. Indoor Air Quality (CO_2) Sensor (EconoMi$er2):
    a. Shall have the ability to provide demand ventilation indoor air quality (IAQ) control through the EconoMi$er2 with an IAQ sensor.
    b. The IAQ sensor shall be available in duct mount, wall mount, and wall mount with LED display. The set point shall have adjustment capability.
    c. Requires EconoMi$er2, PremierLink™, or Apollo control options.

35. Power Exhaust Auxiliary Transformer:

    Field-installed 575-v to 230-v transformer to provide power to the 230-v power exhaust when attached to a 575-v rooftop unit.

36. Gas Heat options (sizes 004-006):
    a. Single-stage gas heat shall be provided in lieu of two-stage heat (high heat only).
    b. NOx reduction shall be provided to reduce nitrous oxide emissions to meet the California Air Quality Management NOx requirement of 40 nanograms/joule or less.
    c. Primary tubes on low NOx units shall be 409 stainless steel. Other components shall be aluminized steel.

37. Ultra-Violet Germicidal Lamps:

    Ultra-violet germicidal lamps are designed to eliminate odor causing mold and fungus that may develop in the wet area of the evaporator section of the unit. The high output, low temperature germicidal lamps are field installed in the evaporator section of the unit, aimed at the evaporator coil and condensate pan. The short wavelength ultra-violet light inhibits and kills mold, fungus and microbial growth. The lamps have an output rating at 45 F in 400 fpm airflow of 120 microwatts/cm^2 at 1 meter.

38. Humidistat:

    Field-installed, wall-mounted humidistat is used to control activation of the Energy$Recycler device. The humidistat can be set for humidity levels between 20% and 80% relative humidity.

Guide specifications — 48TM016-028

Packaged Rooftop Electric Cooling Unit with Gas Heat — Constant Volume Application

HVAC Guide Specifications

Size Range: **15 to 25 Tons, Nominal (Cooling)**
172,000 to 360,000 Btuh, Nominal (Input Heating) (Gas Units)

Carrier Model Numbers:

48TMD, 48TMF
48TMM, 48TMN

Part 1 — General

1.01 SYSTEM DESCRIPTION

Unit is an outdoor rooftop mounted, electrically controlled heating and cooling unit utilizing scroll hermetic compressors for cooling duty and gas combustion for heating duty. Supply air shall be discharged downward or horizontally (with horizontal supply/return curb adapter assembly), as shown on contract drawings. Standard unit shall include a manual outdoor-air inlet.

1.02 QUALITY ASSURANCE

A. Units shall comply with the energy efficiency requirements of ASHRAE standard 90.1-2001.

B. Unit shall be rated in accordance with ARI Standards 270 and 360 and all units shall be designed in accordance with UL Standard 1995.

C. Unit shall be designed to conform to ASHRAE 15.

D. Unit shall be ETL and ETL, Canada tested and certified in accordance with ANSI Z21.47 Standards as a total package.

E. Roof curb shall be designed to conform to NRCA Standards.

F. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

G. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).

H. Unit shall be manufactured in a facility registered to ISO 9001:2000.

1.03 DELIVERY, STORAGE, AND HANDLING

Unit shall be stored and handled per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT (STANDARD)

A. General:

Each unit shall be a 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. Constructed of galvanized steel (G90 — 1.8 oz. of zinc per square foot [550 grams per square meter] of sheet metal), bonderized and primer-coated on both sides and coated with a baked polyester thermosetting powder coating finish on the outer surface.
2. Indoor blower compartment interior surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density fiberglass insulation. Fiberglass insulation shall be bonded with a thermosetting resin (8 to 12% by weight nominal, phenol formaldehyde typical), and coated with an acrylic or other material that meets the NFPA 90 flame retardance requirements and has an ''R'' Value of 3.70. Aluminum foil-faced fiberglass insulation shall be used in the gas heat compartment.
3. Cabinet panels shall be easily removable for servicing. Cabinet panels are minimum 20 gage. Panels shall have 1/2-in. thick, 1.5-lb. density insulation.
4. Filters shall be accessible through an access panel.
5. Holes shall be provided in the base rails (minimum 12 gage) for rigging shackles to facilitate overhead rigging.
6. Unit shall contain a sloped drain pan, to prevent standing water from accumulating. Pan shall be fabricated of hot dipped zinc coated minimum spangle steel. Zinc coating shall be G90 designation according to ASTM Standard A653. Unit shall contain a factory-installed nonferrous main condensate drain connection.

C. Fans:

1. Indoor blower (evaporator fan):
   a. Fan shall be belt driven. Belt drive shall include an adjustable pulley. The standard fan drive shall have a factory-installed low-medium static pressure fan drive. The alternate fan drive option shall have a factory-installed high static pressure fan drive.
   b. Fan wheel shall be made from steel with a corrosion resistant finish. It shall be a dynamically balanced, double-inlet type with forward-curved blades.
2. Condenser fans shall be of the direct-driven propeller type, with corrosion-resistant blades riveted to corrosion-resistant steel supports. They shall be dynamically balanced and discharge air upwards.
3. Induced-draft blower shall be of the direct-driven, single inlet, forward-curved, centrifugal type. It shall be made from steel with a corrosion-resistant finish and shall be dynamically balanced.

D. Compressor(s):

1. Fully hermetic, scroll type, internally protected.
2. Factory spring-shock mounted and internally spring mounted for vibration isolation.
3. On electrically and mechanically independent refrigerant circuits.

4. All compressors shall have 70 W crankcase heaters.

E. Coils:
1. Standard evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Coils shall be leak tested at 150 psig (1034 kPa) and pressure tested at 450 psig (3103 kPa).

F. Heating Section:
1. Induced-draft combustion type with energy saving direct-spark ignition system and redundant main gas valve.
2. a. 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.
b. The optional stainless steel heat exchangers shall be tubular-section design and shall be constructed of a minimum 20 gage, 409 stainless steel.
3. Burners shall be of the in-shot type constructed of aluminum-coated steel.
4. All gas piping shall enter the unit at a single location.
5. Gas piping shall be capable of being routed through the roof curb directly into unit.

G. Refrigerant Components:

Refrigerant circuit components shall include:
1. Thermostatic expansion valve (TXV).
2. Filter driers.
3. Gage port and connections on suction, discharge, and liquid lines.

H. Filter Section:

Standard filter section shall consist of 2 sizes of factory-installed 2-in. (51 mm) thick throwaway fiberglass filters of commercially available sizes. Filters shall be approximately 10% efficient with an airside pressure drop of approximately 0.07 in. wg (clean).

I. Controls and Safeties:
1. Unit Controls:
a. Economizer control (optional)
b. Capacity control (2-step)
c. Unit shall be complete with self-contained low-voltage control circuit.
2. Safeties:
a. Unit shall incorporate a solid-state compressor lockout which provides reset capability at the space thermostat, should any of the following safety devices trip and shut off compressor:
1) Compressor lockout protection provided for either internal or external overload.
2) Low-pressure switch.
3) Dual freezestats (evaporator coil).
4) High-pressure switch.
b. Supply-air thermostat shall be located in the unit.
c. Heating section shall be provided with the following minimum protections:
1) High-temperature limit switch.
2) Induced-draft motor speed sensor.
3) Flame rollout switch.
4) Flame proving controls.
5) Redundant gas valve.

J. Operating Characteristics:
1. Unit shall be capable of starting and running at 120 F (size 016-025) or 125 F (size 028) ambient outdoor temperature per maximum load criteria of ARI Standard 360.
2. Unit with standard controls will operate in cooling down to an outdoor ambient temperature of 40 F (4.4 C).
3. Unit shall be provided with fan time delay to prevent cold air delivery.

K. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location.

L. Motors:
1. Compressor motors shall be cooled by refrigerant gas passing through motor windings and shall have line break thermal and current overload protection.
2. All fan motors shall have permanently lubricated, sealed bearings and inherent automatic-reset thermal overload protection or manual reset calibrated circuit breakers. Evaporator motors are designed specifically for Carrier and do *not* have conventional horsepower (HP) ratings listed on the motor nameplate. Motors are designed and qualified in the "air-over" location downstream of the cooling coil and carry a maximum continuous bhp rating that is the maximum application bhp rating for the motor; no "safety factors" above that rating may be applied.
3. All indoor-fan motors 5 hp and larger shall meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT) effective October 24, 1997.

M. Special Features:

Certain features are not applicable when the features designated * are specified. For assistance in amending the specifications, contact your local Carrier Sales Office.

* 1. Carrier PremierLink™ Controls:
a. Shall be available as a factory-installed or as a field-installed accessory.
b. Shall work with CCN and ComfortVIEW™ software.

c. Shall be compatible with *Comfort*Link™ controllers.

d. Shall be ASHRAE 62-2001 compliant.

e. Shall accept a CO_2 sensor in the conditioned space — Demand Control Ventilation (DCV) Ready.

f. Shall have baud communication rate of 38.4K or faster.

g. Shall be Internet Ready.

h. Shall include an integrated economizer controller.

2. Optional Coils:

a. Optional pre-coated aluminum-fin coils shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.

b. Optional copper-fin coils shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan. All copper construction shall provide protection in moderate coastal environments.

c. Optional E-Coated aluminum-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.

d. Optional E-Coated copper-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be copper fins mechanically bonded to copper tubes with copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to maintain coating integrity and minimize corrosion potential between coil and pan.

3. Roof Curbs (Horizontal and Vertical):

a. Formed of 16-gage galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.

b. Permits installing and securing ductwork to curb prior to mounting unit on the curb.

4. Horizontal Adapter Roof Curb:

Includes factory-assembled adapter and internal duct.

NOTE: Power exhaust or barometric relief must be mounted in the return ductwork when used in conjunction with this accessory.

* 5. Integrated Economizers:

a. Integrated integral modulating type capable of simultaneous economizer and compressor operation.

b. Available as a factory-installed option in vertical supply/return configuration only. (Available as a field-installed accessory for horizontal and/or vertical supply return configurations.)

c. Includes all hardware and controls to provide cooling with outdoor air.

d. Equipped with low-leakage dampers, not to exceed 2% leakage at 1 in. wg pressure differential.

e. Capable of introducing up to 100% outdoor air.

f. EconoMi$er+ and EconoMi$er2 shall be equipped with a barometric relief damper capable of relieving up to 100% return air.

g. Designed to close damper(s) during loss-of-power situations with spring return built into motor.

h. Dry bulb outdoor-air temperature sensor shall be provided as standard. Outdoor air sensor set point is adjustable and shall range from 45 to 70 F. For the EconoMi$er+, the return air sensor, indoor humidity sensor, and outdoor humidity sensor shall be provided as field-installed accessories to provide enthalpy control, differential enthalpy control, and differential dry bulb temperature control. For the EconoMi$er2, the enthalpy, differential temperature (adjustable), and differential enthalpy control shall be provided as field-installed accessories.

i. The EconoMi$er+ and EconoMi$er2 shall have a gear-driven parallel blade design.

j. EconoMi$er+ microprocessor control shall provide control of internal building pressure through its accessory power exhaust function. Factory set at 100%, with a range of 0% to 100%.

k. EconoMi$er2 shall be capable of control from a 4 to 20 mA signal through optional 4 to 20 mA design without microprocessor control (required for PremierLink™ or third party control interface).

l. EconoMi$er+ Microprocessor Occupied Minimum Damper Position Setting maintains the minimum airflow into the building during occupied period providing design ventilation rate for full occupancy (damper position during heating). A remote potentiometer may be used to override the set point.

m. EconoMi$er+ Microprocessor Unoccupied Minimum Damper Position Setting maintains the minimum airflow into the building during unoccupied period providing base ventilation rate for demand control ventilation. The demand control ventilation position shall be set in the EconoMi$er+ software through configuration input. The EconoMi$er+ damper shall modulate between unoccupied and occupied minimum damper positions for demand control ventilation.

n. EconoMi$er2 Microprocessor Maximum Damper Position Setting — Setting the maximum position of the damper prevents the introduction of large amounts of hot or cold air into the space.

o. EconoMi$er+ Microprocessor IAQ control modulates the outdoor-air damper to provide ventilation based on the optional 2 to 10 vdc CO_2 sensor input.

p. Compressor lockout sensor (opens at 35 F, closes at 50 F).

6. Two-Position Damper:

   Two-position damper package shall include single blade damper and 24-v motor. Admits up to 25% outdoor air, and shall close upon unit shutoff. Damper shall cover 3.8-in. high by 17.75-in. wide (117.8 sq. in.) opening in return air upper panel.

7. Accessory Compressor Cycle Delay:

   Compressor shall be prevented from restarting for a minimum of 5 minutes after shutdown.

* 8. Thermostats and Subbases:

   To provide staged heating and cooling in addition to automatic (or manual) changeover and fan control.

* 9. Barometric Relief Damper Package:

   a. Package shall include damper, seals, hardware, and hoods to relieve excess internal pressure.

   b. Damper shall close due to gravity upon unit shutdown.

   c. Damper package must be field-installed in return-air ductwork when used with optional side return connections.

*10. Power Exhaust:

   Package shall include an exhaust (propeller style) fan, 1/2 Hp 208-230, 460 v (factory-wired for 460 v) direct drive motor, and damper for vertical flow units with economizer to control over-pressurization of building. Power Exhaust package must be field-installed in return-air ductwork when used with optional side return connections.

*11. Head Pressure Control Package:

   Consists of an accessory outdoor-air package and a solid-state control with condenser coil temperature sensor for controlling condenser-fan motor speed to maintain condensing temperature between 90 F (32.2 C) and 100 F (43.3 C) at outdoor ambient temperature down to –20 F (–29.8 C). (Size 016-025 only.)

12. Low-Ambient Kits:

   When used, allows units to operate at lower outdoor ambient temperatures. Sizes 016, 020, and 028 will operate down to 10 F. Size 025 will operate down to 25 F.

*13. Electronic Programmable Thermostat:

   Capable of using deluxe full-featured electronic thermostat.

14. Liquid Propane Conversion Kit:

   Kit shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane gas.

15. Service Option Package:
    a. Hinged access panels for the filter, compressors, evaporator fan, and control box areas. Filter hinged access panels permit tool-less entry for changing filters. Evaporator fan hinged access panel shall be field-convertible to a tool-less entry by removing and discarding screws. Each external hinged access panel shall be permanently attached to the rooftop unit.
    b. Convenience outlet: Shall be factory-installed and internally mounted with an externally accessible 115-v, 15 amp. GFI, female receptacle with hinged cover. Voltage and circuit protection required to operate convenience outlet shall be provided by a field-supplied and properly fused separate branch circuit.
    c. Non-fused disconnect switch: Shall be factory-installed, internally mounted, NEC and UL approved non-fuse switch; shall provide unit power shutoff. The control access door shall be interlocked with the non-fused disconnect. The disconnect switch must be in the OFF position to open the control box access door. Shall be accessible from outside the unit and shall provide power off lockout capability.
16. Alternate Drive:

    Shall provide higher static drive capability to enhance evaporator-fan performance rpm range.
17. Hail Guard (Size 016-025):

    Shall protect the condenser coil from hail, flying debris, and damage by large objects without increasing unit clearances.
18. Winter Start Time-Delay Relay:

    Used in conjunction with the accessory low-ambient kit or head pressure control device, permits operation in cooling at lower outdoor ambient temperatures. See price pages for more information.
19. Ultra-Violet Germicidal Lamps:

    Ultra-violet germicidal lamps are designed to eliminate odor causing mold and fungus that may develop in the wet area of the evaporator section of the unit. The high output, low temperature germicidal lamps are field installed in the evaporator section of the unit, aimed at the evaporator coil and condensate pan. The short wavelength ultra-violet light inhibits and kills mold, fungus and microbial growth. The lamps have an output rating at 45 F in 400 fpm airflow of 120 microwatts/cm^2 at 1 meter.
20. Stainless Steel Condensate Pan:

    Stainless steel condensate pans shall be available for condensate collection.
21. Outdoor Air Enthalpy Sensor (EconoMi$er2):

    The outdoor air enthalpy sensor shall be used with the PremierLink control to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the PremierLink control will provide differential enthalpy control. The sensor allows the PremierLink control to determine if outside air is suitable for free cooling.
22. Return Air Enthalpy Sensor (EconoMi$er2):

    The return air enthalpy sensor shall be used with the EconoMi$er2 device. When used in conjunction with an outdoor air enthalpy sensor, the PremierLink control will provide differential enthalpy control.
23. Return Air Temperature Sensor (EconoMi$er2):

    The return air temperature sensor shall be used with the EconoMi$er2 device. When used in conjunction with the standard outdoor air temperature sensor, the EconoMi$er2 device will provide differential temperature control.
24. Outdoor Air Humidity Sensor (EconoMi$er+):

    The outdoor air humidity sensor is used to sense outdoor air humidity for the EconoMi$er+ device. The outdoor air humidity sensor, in conjunction with the standard outdoor air temperature sensor, shall be used with the EconoMi$er+ device to provide outdoor enthalpy. Outdoor air enthalpy shall be calculated by the EconoMi$er+ device from the outdoor air temperature and humidity readings. When the outdoor air humidity sensor is installed, the EconoMi$er+ can perform Outdoor Air Enthalpy control. With the additional installation of an accessory return air temperature sensor and return air humidity sensor, differential enthalpy control can also be performed.
25. Return Air Humidity Sensor (EconoMi$er+):

    The return air humidity sensor is used to sense return air humidity for the EconoMi$er+ device. The return air humidity sensor, in conjunction with the accessory return air temperature sensor, shall be used with the EconoMi$er+ device to provide return air enthalpy. Return air enthalpy shall be calculated by the EconoMi$er+ device from the return air temperature and humidity readings. With the additional installation of an accessory return air temperature sensor and outdoor air humidity sensor, differential enthalpy control can also be performed.

26. Return Air Temperature Sensor (EconoMi$er+):

    The return air temperature sensor is used to sense return air temperature for the EconoMi$er+ device. When the return air temperature sensor is installed, the EconoMi$er+ can perform Differential Temperature control. The return air temperature sensor, in conjunction with the accessory return air humidity sensor, shall be used with the EconoMi$er+ device to provide return air enthalpy. Return air enthalpy shall be calculated by the EconoMi$er+ device from the return air temperature and humidity readings. With the additional installation of an accessory return air humidity sensor and outdoor air humidity sensor, differential enthalpy control can also be performed.

27. EconoMi$er+ 5-Pin Plug Assembly:

    The EconoMi$er+ 5-pin plug assembly shall provide a wiring connection to the EconoMi$er+ control board for a CO_2 sensor or a field-supplied remote potentiometer. The accessory plug is required when using a CO_2 sensor or a remote potentiometer.

28. Indoor Air Quality (CO_2) Room Sensor (EconoMi$er+):

    Sensor shall have the ability to provide demand ventilation control through the EconoMi$er+. The IAQ sensor shall be wall mounted with an LED display in parts per million. The set point shall have adjustment capability. The accessory 5-Pin Plug assembly is required to wire this device to the EconoMi$er+ control board.

29. Return Air CO_2 Sensor (EconoMi$er+):

    Sensor shall have the ability to provide demand ventilation control through the EconoMi$er+. The IAQ sensor shall be duct mounted. The set point shall have adjustment capability. The accessory 5-Pin Plug assembly is required to wire this device to the EconoMi$er+ control board.

30. MoistureMi$er™ Dehumidification Package:

    The dehumidification package is a factory-installed option that provides increased dehumidification by further subcooling the hot liquid refrigerant leaving the condenser coil. The package consists of a subcooling coil located on the leaving airside of the evaporator coil. The location of this coil in the indoor airstream greatly enhances the latent capacity of the units. The package shall be equipped with crankcase heater(s), low pressure switch(es) and thermostatic expansion valve(s) (TXV). Low pressure switch(es) prevents evaporator coil freeze-up and TXVs assure a positive superheat condition. If the operation of the subcooling coil is controlled by a field-installed, wall-mounted humidistat, the dehumidification circuit will then operate only when needed. Optional field connections for the humidistat are made in the low voltage compartment of the unit control box.

31. Humidistat:

    Field-installed, wall-mounted humidistat is used to control activation of the dehumidification package. The humidistat can be set for humidity levels between 20% and 80% relative humidity.

32. 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.

33. Fan/Filter Status Switch:

    Provides status of indoor (evaporator) 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.

34. Light Commercial Thermidistat:

    Field-installed wall-mounted thermostat is used to control temperature and activation of the Energy$Recycler device. The thermidistat can be set for humidity settings from 50% to 90% relative humidity. Automatic humidity control adjusts indoor humidity based on the outdoor temperature sensor.

Physical data — 48HJ

BASE UNIT 48HJ		E/F/H/K/M/N004	D/E/F/G/H/K/L/M/N005	D/E/F/G/H/K/L/M/N006	D/E/F007
NOMINAL CAPACITY (tons)		3	4	5	6
OPERATING WEIGHT (lb)					
Unit					
Al/Al (evap/cond)		530	540	560	635
Al/Cu (evap/cond)		577	592	612	708
Cu/Cu (evap/cond)		593	608	645	752
With MoistureMi$er™ Dehumidification Package		548	558	578	653
EconoMi$er+		50	50	50	50
EconoMi$er2		46	46	46	46
Roof Curb		115	115	115	115
COMPRESSOR		Scroll			
Quantity		1	1	1	1
Oil (oz)		42	53	50	60
REFRIGERANT TYPE		R-22			
Expansion Device		Acutrol™ Metering Device			
Operating Charge (lb-oz)					
Standard Unit		5- 8	10-2	10- 0	12-8
Unit With MoistureMi$er Dehumidification Package		8-13	13-2	12-13	15-6
CONDENSER FAN		Propeller			
Quantity...Diameter (in.)		1...22	1...22	1...22	1...22
Nominal Cfm		3500	3500	4100	4100
Motor Hp...Rpm		1/4...825	1/4...825	1/4...1100	1/4...1100
Watts Input (Total)		180	180	320	320
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Standard Unit					
Rows...Fins/in.		1...17	2...17	2...17	2...17
Total Face Area (sq ft)		14.6	16.5	16.5	21.3
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins			
Rows...Fins/in.		2...15	2...15	4...15	4...15
Total Face Area (sq ft)		5.5	5.5	5.5	7.3
Unit with MoistureMi$er Dehumidification Package					
Rows...Fins/in.		1...17	1...17	1...17	1...17
Total Face Area (sq ft)		3.9	3.9	3.9	3.9
EVAPORATOR FAN		Centrifugal Type, Belt Drive			
Quantity...Size (in.)		1...10 x 10	1...10 x 10	1...10 x 10	1...10 x 10
Nominal Cfm		1200	1600	2000	2400
Maximum Continuous Bhp	**Std**	1.20	1.20	1.30/2.40*	2.40
	Hi-Static	2.40	2.40	2.90	2.90
Motor Frame Size	**Std**	48	48	48/56*	56
	Hi-Static	56	56	56	56
Fan Rpm Range	**Std**	680-1044	770-1185	1035-1460	1119-1585
	Hi-Static	1075-1455	1075-1455	1300-1685	1300-1685
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Fan Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter A/B (in.)	**Std**	1.9/2.9	1.9/2.0	2.4/3.4	2.4/3.4
	Hi-Static	2.8/3.8	2.8/3.8	3.4/4.4	3.4/3.4
Nominal Motor Shaft Diameter (in.)	**Std**	1/2	1/2	5/8	5/8
	Hi-Static	5/8	5/8	5/8	7/8
Fan Pulley Pitch Diameter (in.)	**Std**	4.5	4.0	4.0	4.0
	Hi-Static	4.5	4.5	4.5	3.7
Belt — Type...Length (in.)	**Std**	1...A...36	1...A...36	1....4...40	1...A...38
	Hi-Static	1...A...39	1...A...39	1...A...40	1...A...40
Pulley Center Line Distance (in.)		10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
Speed Change per Full Turn of	**Std**	65	70	75	95
Movable Pulley Flange (rpm)	**Hi-Static**	65	65	60	60
Movable Pulley Maximum Full	**Std**	5	5	6	5
Turns from Closed Position	**Hi-Static**	6	6	5	5
Factory Setting — Full Turns Open	**Std**	3	3	3	3
	Hi-Static	3 1/2	3 1/2	3 1/2	3 1/2
Factory Speed Setting (rpm)	**Std**	826	936	1248	1305
	Hi-Static	1233	1233	1396	1396
Fan Shaft Diameter at Pulley (in.)		5/8	5/8	5/8	5/8

LEGEND

Bhp — Brake Horsepower

*Single phase/three phase.
†Indicates automatic reset.
**60,000 and 72,000 Btuh heat input units have 2 burners. 90,000 and 120,000 Btuh heat input units have 3 burners. 115,000 Btuh heat input units and 150,000 Btuh Heat input units have 3 burners.
††An LP kit is available as an accessory. Kit may be used at elevations as high as 2000 ft. LP kit is not used with Low NO_x units.
||Three-phase standard models have heating inputs as shown. Single-phase standard models have one-stage heating with heating input values as follows:
HJD005-006,HJE004 — 72,000 Btuh
HJE005-006,HJF004 — 115,000 Btuh
HJF005-006 — 150,000 Btuh
***California compliant three-phase models.
†††California SCAQMD compliant low NO_x models have combustion products that are controlled to 40 nanograms per joule or less.

Physical data — 48HJ (cont)

BASE UNIT 48HJ	E/F/H/K/M/N004	D/E/F/G/H/K/L/M/N005	D/E/F/G/H/K/L/M/N006	D/E/F007
FURNACE SECTION				
Rollout Switch Cutout Temp (F)†	195	195	195	195
Burner Orifice Diameter (in. ...drill size)**				
Natural Gas — Std	**HJE** .113...33	**HJD** .113...33	**HJD** .113...33	**HJD** .113...33
	HJF .113...33	**HJE** .113...33	**HJE** .113...33	**HJE** .113...33
	—	**HJF** .129...30	**HJF** .129...30	**HJF** .129...30
	HJH .113...33	**HJG** .113...33	**HJG** .113...33	—
	HJK .113...33	**HJH** .113...33	**HJH** .113...33	—
	—	**HJK** .129...30	**HJK** .129...30	—
	HJM .102...38	**HJL** .102...38	**HJL** .102...38	—
	HJN .102...38	**HJM** .102...38	**HJM** .102...38	—
	—	**HJN** .116...32	**HJN** .116...32	—
Liquid Propane — Alt††	**HJE** .089...43	**HJD** .089...43	**HJD** .089...43	**HJD** .089...43
	HJF .089...43	**HJE** .089...43	**HJE** .089...43	**HJE** .089...43
	—	**HJF** .104...37	**HJF** .104...37	**HJF** .104...37
	HJH .089...43	**HJG** .089...45	**HJG** .089...43	—
	HJK .089...43	**HJH** .089...45	**HJH** .089...43	—
	—	**HJK** .102...38	**HJK** .104...37	—
Thermostat Heat Anticipator Setting (amps)				
208/230/460/575 v				
First Stage	.14	.14	.14	.14
Second Stage	.14	.14	.14	.14
Gas Input (Btuh)				
First Stage/Second Stage	**HJE**‖ 50,000/ 72,000	**HJD**‖ 50,000/ 72,000	**HJD**‖ 50,000/ 72,000	**HJD**‖ 50,000/ 72,000
	HJF‖ 82,000/115,000	**HJE**‖ 82,000/115,000	**HJE**‖ 82,000/115,000	**HJE**‖ 82,000/115,000
	—	**HJF**‖ 120,000/150,000	**HJF**‖ 120,000/150,000	**HJF**‖ 120,000/150,000
	HJH*** —/ 72,000	**HJG***** —/ 72,000	**HJG***** —/ 72,000	—
	HJK***—/115,000	**HJH***** —/115,000	**HJH***** —/115,000	—
	—	**HJK***** —/150,000	**HJK***** —/150,000	—
	HJM††† —/ 60,000	**HJL**††† —/ 60,000	**HJL**††† —/ 60,000	—
	HJN††† —/ 90,000	**HJM**††† —/ 90,000	**HJM**†††—/ 90,000	—
	—	**HJN**††† —/120,000	**HJN**††† —/120,000	—
Efficiency (Steady State) (%)	**HJE** 82	**HJD** 82	**HJD** 82	**HJD** 82
	HJF 80	**HJE** 81	**HJE** 81	**HJE** 81
	—	**HJF** 80	**HJF** 80	**HJF** 80
	HJH 82	**HJG** 82	**HJG** 82	—
	HJK 81	**HJH** 81	**HJH** 81	—
	—	**HJK** 80	**HJK** 80	—
	HJM 81.2	**HJL** 81.2	**HJL** 81.2	—
	HJN 81.4	**HJM** 81.4	**HJM** 81.4	—
	—	**HJN** 82.4	**HJN** 82.4	—
Temperature Rise Range	**HJE** 25-55	**HJD** 25-55	**HJD** 25-55	**HJD** 25-55
	HJF 55-85	**HJE** 35-65	**HJE** 35-65	**HJE** 35-65
	—	**HJF** 50-80	**HJF** 50-80	**HJF** 50-80
	HJH 25-55	**HJG** 25-55	**HJG** 25-55	—
	HJK 55-85	**HJH** 35-65	**HJH** 35-65	—
	—	**HJK** 50-80	**HJK** 50-80	—
	HJM 20-50	**HJL** 20-50	**HJL** 20-50	—
	HJN 30-60	**HJM** 30-60	**HJM** 30-60	—
	—	**HJN** 40-70	**HJN** 40-70	—
Manifold Pressure (in. wg)				
Natural Gas — Std	3.5	3.5	3.5	3.5
Liquid Propane — Alt††	3.5	3.5	3.5	3.5
Maximum Static Pressure (in. wg)	1.0	1.0	1.0	1.0
Field Gas Connection Size (in.)	1/2	1/2	1/2	1/2
HIGH-PRESSURE SWITCH (psig)				
Standard Compressor Internal Relief	450 ± 50			
Cutout	428			
Reset (Auto.)	320			
LOSS-OF-CHARGE SWITCH/LOW-PRESSURE SWITCH (Liquid LIne) (psig)				
Cutout	7 ± 3			
Reset (Auto.)	22 ± 5			
FREEZE PROTECTION THERMOSTAT				
Opens (F)	30 ± 5			
Closes (F)	45 ± 5			
OUTDOOR-AIR INLET SCREENS	Cleanable			
Quantity...Size (in.)	Varies by Option Selected			
RETURN-AIR FILTERS	Throwaway			
Quantity...Size (in.)	2...16 x 25 x 2			4...16 x 16 x 2

LEGEND

Bhp — Brake Horsepower

*Single phase/three phase.
†Indicates automatic reset.
**60,000 and 72,000 Btuh heat input units have 2 burners. 90,000 and 120,000 Btuh heat input units have 3 burners. 115,000 Btuh heat input units and 150,000 Btuh Heat input units have 3 burners.
††An LP kit is available as an accessory. Kit may be used at elevations as high as 2000 ft. LP kit is not used with Low NOx units.
‖Three-phase standard models have heating inputs as shown. Single-phase standard models have one-stage heating with heating input values as follows:
HJD005-006,HJE004 — 72,000 Btuh
HJE005-006,HJF004 — 115,000 Btuh
HJF005-006 — 150,000 Btuh
***California compliant three-phase models.
†††California SCAQMD compliant low NO_x models have combustion products that are controlled to 40 nanograms per joule or less.

UNIT SIZE 48HJ		D/E/F008	D/E/F009	D/E/F012	D/E014
NOMINAL CAPACITY (tons)		7 1/2	8 1/2	10	12 1/2
OPERATING WEIGHT (lb)					
Unit					
Al/Al (evap/cond)		870	1015	1035	1050
Al/Cu (evap/cond)		935	1100	1120	1135
Cu/Cu (evap/cond)		988	1167	1187	1202
With MoistureMi$er™ Dehumidification Package		899	1068	1068	1083
EconoMi$er+		75	75	75	75
EconoMi$er2		71	71	71	71
Roof Curb		143	143	143	143
COMPRESSOR		Scroll			
Quantity		2	2	2	2
Oil (oz) (each compressor)		53	50	50	60
REFRIGERANT TYPE		R-22			
Expansion Device		Acutrol™ Metering Device			
Operating Charge (lb-oz)					
Standard Unit					
Circuit 1		7-10	9- 8	9-6	9-8
Circuit 2		8- 2	8-13	10-9	9-5
Unit With MoistureMi$er Dehumidification Package					
Circuit 1		10-10	12-10	13- 0	12-6
Circuit 2		12- 8	11-13	13- 5	12-2
CONDENSER FAN		Propeller			
Quantity...Diameter (in.)		2...22	2...22	2...22	2...22
Nominal Cfm		6500	6500	7000	7000
Motor Hp...Rpm		1/4...1100	1/4...1100	1/4...1100	1/4...1100
Watts Input (Total)		650	650	650	650
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Standard Unit					
Rows...Fins/in.		2...17	2...17	2...17	2...17
Total Face Area (sq ft)		20.5	25.0	25.0	25.0
EVAPORATOR FAN		Centrifugal			
Size (in.)		15 x 15	15 x 15	15 x 15	15 x 15
Type Drive		Belt	Belt	Belt	Belt
Nominal Cfm		3000	3400	4000	5000
Maximum Continuous Bhp	**Std**	2.90	2.90	3.70	5.25
	Hi-Static	4.20	4.20	5.25	—
Motor Frame		56	56	56	56
Fan Rpm Range	**Std**	840-1085	840-1085	860-1080	830-1130
	Hi-Static	860-1080	860-1080	830-1130	—
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Fan Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter	**Std**	3.4/4.4	3.4/4.4	4.0/5.0	2.8/3.8
A/B (in.)	**Hi-Static**	4.0/5.0	4.0/5.0	2.8/3.8	—
Nominal Motor Shaft Diameter (in.)		7/8	7/8	7/8	7/8
Fan Pulley Pitch Diameter (in.)	**Std**	7.0	7.0	8.0	5.8
	Hi-Static	8.0	8.0	5.8	—
Belt — Type...Length (in.)	**Std**	A...48	A...51	A...53	BX...48
	Hi-Static	A...53	A...53	BX...45	—
Pulley Center Line Distance (in.)		16.75-19.25	16.75-19.25	15.85-17.50	15.85-17.50
Speed Change per Full Turn of	**Std**	50	50	45	60
Movable Pulley Flange (rpm)	**Hi-Static**	60	60	60	—
Movable Pulley Maximum Full	**Std**	5	5	5	6
Turns from Closed Position	**Hi-Static**	5	5	6	—
Factory Setting — Full Turns Open	**Std**	5	5	5	5
	Hi-Static	5	5	5	—
Factory Speed Setting (rpm)	**Std**	840	840	860	887
	Hi-Static	860	860	890	—
Fan Shaft Diameter at Pulley (in.)		1	1	1	1
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Face-Split			
Rows...Fins/in.		3...15	4...15	4...15	4...15
Total Face Area (sq ft)		8.9	11.1	11.1	11.1
Unit with MoistureMi$er Dehumidification Package					
Rows...Fins/in.		1...17	1...17	1...17	1...17
Total Face Area (sq ft)		6.3	8.4	8.4	8.4

LEGEND

Bhp — Brake Horsepower

*Single phase/three phase.
†Indicates automatic reset.
**125,000 Btuh heat input units have 3 burners.
180,000 Btuh heat input units have 4 burners.
224,000 Btuh heat input units and 250,000 Btuh heat input units have 5 burners.
††An LP kit is available as an accessory. Kit may be used at elevations as high as 2000 ft.

Physical data — 48HJ (cont)

UNIT SIZE 48HJ	D/E/F008	D/E/F009	D/E/F012	D/E014
FURNACE SECTION				
Rollout Switch Cutout Temp (F)†	195	195	195	195
Burner Orifice Diameter (in. ...drill size)**				
Natural Gas — Std	**HJD** .120...31 **HJE** .120...31 **HJF** .120...31	**HJD** .120...31 **HJE** .120...31 **HJF** .120...31	**HJD** .120...31 **HJE** .120...31 **HJF** .129...30	**HJD** .120...31 **HJE** .129...30
Liquid Propane — Alt††	**HJD** .096...41 **HJE** .096...41 **HJF** .096...41	**HJD** .096...41 **HJE** .096...41 **HJF** .096...41	**HJD** .096...41 **HJE** .096...41 **HJF** .102...38	**HJD** .096...41 **HJE** .102...38
Thermostat Heat Anticipator Setting (amps)				
Stage 1	**HJD** .14 **HJE** .14 **HJF** .14	**HJD** .14 **HJE** .14 **HJF** .14	**HJD** .14 **HJE** .14 **HJF** .14	**HJD** .14 **HJE** .14
Stage 2	**HJD** .14 **HJE** .20 **HJF** .20	**HJD** .14 **HJE** .20 **HJF** .20	**HJD** .20 **HJE** .20 **HJF** .20	**HJD** .20 **HJE** .20
Gas Input (Btuh) Stage 1	**HJD** 90,000 **HJE** 120,000 **HJF** 180,000	**HJD** 90,000 **HJE** 120,000 **HJF** 180,000	**HJD** 120,000 **HJE** 180,000 **HJF** 200,000	**HJD** 180,000 **HJE** 200,000
Stage 2	**HJD** 125,000 **HJE** 180,000 **HJF** 224,000	**HJD** 125,000 **HJE** 180,000 **HJF** 224,000	**HJD** 180,000 **HJE** 224,000 **HJF** 250,000	**HJD** 224,000 **HJE** 250,000
Efficiency (Steady State) (%)	**HJD** 82 **HJE** 82 **HJF** 82	**HJD** 82 **HJE** 82 **HJF** 82	**HJD** 82 **HJE** 82 **HJF** 80	**HJD** 82 **HJE** 80
Temperature Rise Range	**HJD** 20-50 **HJE** 35-65 **HJF** 45-75	**HJD** 20-50 **HJE** 35-65 **HJF** 45-75	**HJD** 35-65 **HJE** 35-65 **HJF** 40-70	**HJD** 35-65 **HJE** 40-70
Manifold Pressure (in. wg)				
Natural Gas — Std	3.5	3.5	3.5	3.5
Liquid Propane — Alt††	3.5	3.5	3.5	3.5
Field Gas Connection Size (in.)	**HJD** .50 **HJE** .75 **HJF** .75	**HJD** .50 **HJE** .75 **HJF** .75	**HJD** .75 **HJE** .75 **HJF** .75	**HJD** .75 **HJE** .75
HIGH-PRESSURE SWITCH (psig)				
Standard Compressor Internal Relief	450 ± 50			
Cutout	428			
Reset (Auto.)	320			
LOSS-OF-CHARGE SWITCH/LOW-PRESSURE SWITCH (Liquid LIne) (psig)				
Cutout	7 ± 3			
Reset (Auto.)	22 ± 7			
FREEZE PROTECTION THERMOSTAT				
Opens (F)	30 ± 5			
Closes (F)	45 ± 5			
OUTDOOR-AIR INLET SCREENS	Cleanable			
Quantity...Size (in.)	1...20 x 25 x 1 1...16 x 25 x 1			
RETURN-AIR FILTERS	Throwaway			
Quantity...Size (in.)	4...16 x 20 x 2	4...20 x 20 x 2	4...20 x 20 x 2	4...20 x 20 x 2

LEGEND

Bhp — Brake Horsepower

*Single phase/three phase.
†Indicates automatic reset.
**125,000 Btuh heat input units have 3 burners.
180,000 Btuh heat input units have 4 burners.
224,000 Btuh heat input units and 250,000 Btuh heat input units have 5 burners.
††An LP kit is available as an accessory. Kit may be used at elevations as high as 2000 ft.

UNIT 48HJ		015D/F			017D/F		
		208/230	460	575	208/230	460	575
NOMINAL CAPACITY (tons)			12			15	
OPERATING WEIGHT (lb)							
Unit							
Al/Al*			1725			1800	
Al/Cu*			1875			1950	
Cu/Cu*			2005			2080	
EconoMi$er+			90			90	
EconoMi$er2			85			85	
Roof Curb†			200			200	
MoistureMi$er™ Dehumidification Package			40			40	
COMPRESSOR							
Quantity...Model (Ckt 1, Ckt 2)			2...ZR72KC			1...ZR94KC, 1...ZR72KC	
Number of Refrigerant Circuits			2			2	
Loading (% of full capacity)			0,53,100			0,60,100	
Crankcase Heater Watts			70			70	
Oil (oz) (Ckt 1, Ckt 2)			60,60			85,60	
REFRIGERANT TYPE			R-22				
Expansion Device			TXV				
Operating Charge (lb)							
Circuit 1**			20.7			19.5	
Circuit 2			13.4			13.45	
CONDENSER COIL			Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins				
Rows...Fins/in.			4...15			4...15	
Total Face Area (sq ft)			21.7			21.7	
CONDENSER FAN			Propeller Type				
Nominal Cfm			10,500			10,500	
Quantity...Diameter (in.)			3...22			3...22	
Motor Hp...Rpm			1/2...1050			1/2...1050	
Watts Input (Total)			1100			1100	
EVAPORATOR COIL			Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced or Copper Plate Fins, Face Split				
Rows...Fins/in.			4...15			4...15	
Total Face Area (sq ft)			17.5			17.5	
EVAPORATOR FAN			Centrifugal Type				
Quantity...Size (in.)			2...12 X 12			2...12 x 12	
Type Drive			Belt			Belt	
Nominal Cfm			5200			6000	
Std Motor Hp		2.9		3.0	5		
Opt Motor Hp		3.7		N/A	N/A		
Motor Nominal Rpm			1725			1745	
Std Maximum Continuous Bhp		3.13		3.38	6.13		
Opt Maximum Continuous Bhp		4.26		N/A	N/A		
Motor Frame Size			56H			184T	
Fan Rpm Range	Low-Medium Static	895-1147		895-1147	873-1021		
	High Static	1040-1315		N/A	1025-1200		
Motor Bearing Type			Ball			Ball	
Maximum Allowable Rpm			1550			1550	
Motor Pulley Pitch Dia.	Low-Medium Static	3.1/4.1		3.1/4.1	4.9/5.9		
	High Static	3.7/4.7		N/A	4.9/5.9		
Nominal Motor Shaft Diameter (in.)		7/8		7/8	1 1/8		
Fan Pulley Pitch Diameter (in.)	Low-Medium Static	6.0		6.0	9.4		
	High Static	6.0		6.0	8.0		
Nominal Fan Shaft Diameter (in.)		1 3/16		1 3/16	1 7/16		
Belt, Quantity...Type... Length (in.)	Low-Medium Static	1...BX...45		1...BX...45	1...BX...50		
	High Static	1...BX...45		1...BX...45	1...BX...48		
Pulley Center Line Distance (in.)		14.5-16.0		14.5-16.0	13.3-14.8		
Speed Change per Full Turn of Movable Pulley Flange (Rpm)	Low-Medium Static	45		45	37		
	High Static	45		N/A	44		
Movable Pulley Maximum Full Turns From Closed Position		6		6	4***		
Factory Speed		3.5		3.5	3.5		
Factory Speed Setting (Rpm)	Low-Medium Static	987		1240	965		
	High Static	1155		N/A	1134		
FURNACE SECTION							
Rollout Switch Cutout Temp (F)†††			190			190	
Burner Orifice Diameter (in...drill size)							
Natural Gas	Std		0.1285...30/ 0.136...29			0.1285...30/ 0.136...29	
Liquid Propane¶	Alt		0.1065...36/0.1065...36			0.1065...36/0.1065...36	
Thermostat Heat Anticipator Setting 208/230/460/575 v							
Stage 1 (amps)		0.98	0.8	0.98	0.98	0.8	0.98
Stage 2 (amps)		0.44	0.44	0.44	0.44	0.44	0.44
Gas Input (Btuh) Stage 1			172,000/230,000			206,000/270,000	
Stage 2			225,000/300,000			275,000/360,000	
Efficiency (Steady State) (%)			81			81	
Temperature Rise Range			15-45/30-60			15-45/20-50	
Manifold Pressure (in. wg)							
Natural Gas	Std		3.3			3.3	
Liquid Propane¶	Alt		3.3			3.3	
Gas Valve Quantity			1			1	
Gas Valve Pressure Range (Min-Max Allowable) (in. wg)			5.5-13.5			5.5-13.5	
(psig)			.235-.487			.235-.487	
Field Gas Connection Size (in.-FPT)			3/4			3/4	
HIGH-PRESSURE SWITCH (psig)							
Cutout			426				
Reset (Auto.)			320				
LOW-PRESSURE SWITCH (psig)							
Cutout			27				
Reset (Auto.)			44				
FREEZE PROTECTION THERMOSTAT (F)							
Opens			30 ± 5				
Closes			45 ± 5				
OUTDOOR-AIR INLET SCREENS			Cleanable				
Quantity...Size (in.)			2...20 x 25 x 1				
			1...20 x 20 x 1				
RETURN-AIR FILTERS			Throwaway				
Quantity...Size (in.)			4...20 x 20 x 2				
			4...16 x 20 x 2				

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper
TXV — Thermostatic Expansion Valve

*Evaporator coil fin material/condenser coil fin material.
†Weight of 14-in. roof curb.
**Circuit 1 uses the lower portion of condenser coil and lower portion of evaporator coils, and Circuit 2 uses the upper portion of both coils.
††Pulley has 6 turns. Due to belt and pulley style, moveable pulley cannot be set to 0 to 1 1/2 turns open.
***Due to belt and pulley style, moveable pulley cannot be set to 0 to 1/2 turns open.
†††Rollout switch is manual reset.
¶A Liquid Propane kit is available as an accessory. Kit may be used at elevations as high as 2000 ft.

Physical data — 48HJ (cont)

OPERATING AND RIGGING WEIGHTS — 48HJ015,017

UNIT	BASE UNIT OPERATING WEIGHTS*			
	015		017	
	lb	kg	lb	kg
48HJD/F	1725	782	1800	816

*Base unit weight does not include electric heaters, copper coils, economizer, power exhaust, barometric relief or crating. See Options and Accessories table below for more information.

NOTE: For 015 and 017 unit sizes add 75 lb (34 kg) for domestic crating. For export crating add 500 lb (227 kg).

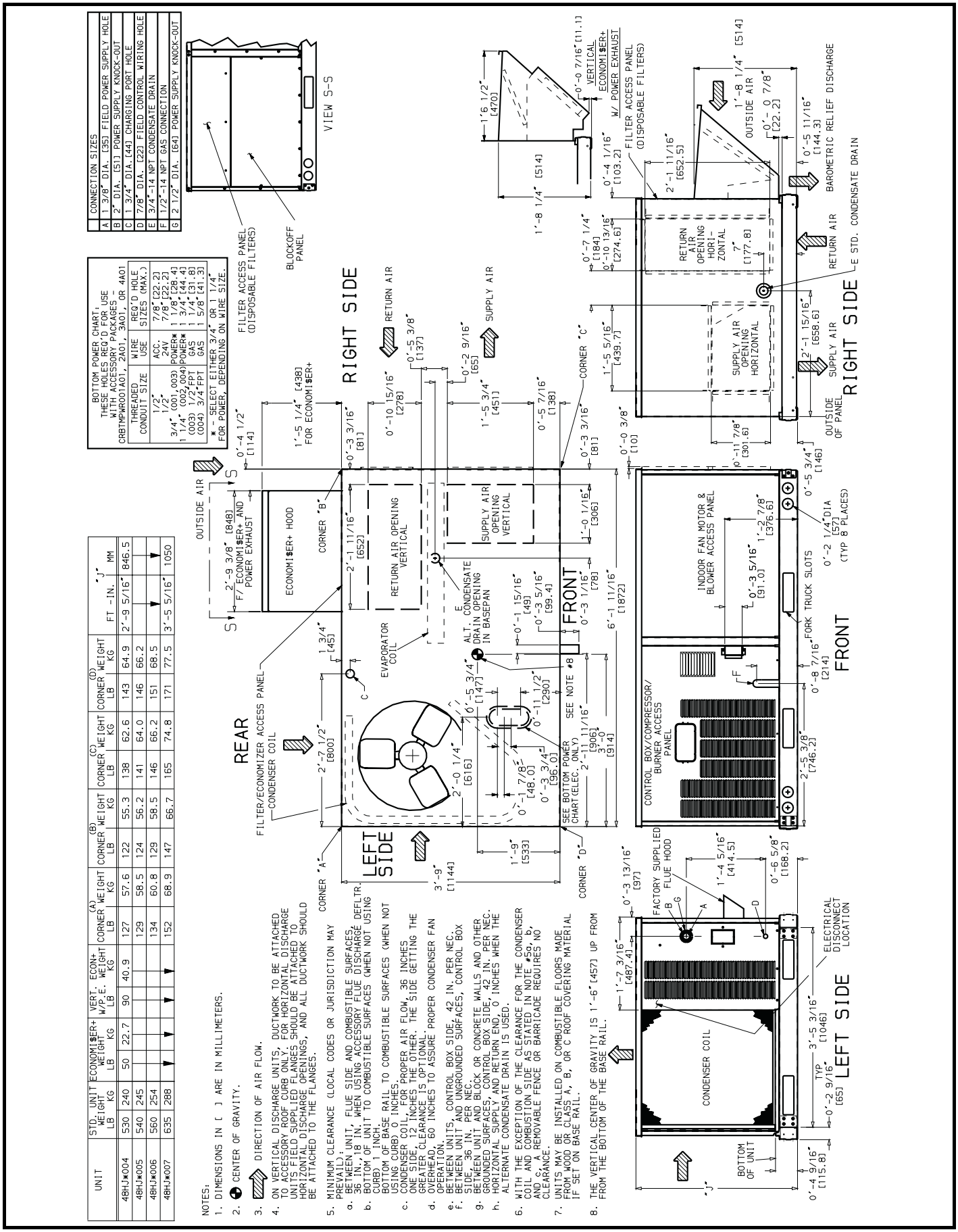
OPTIONS AND ACCESSORIES — 48HJ015,017
(Weight Adders)

OPTION/ ACCESSORY	OPTION/ACCESSORY WEIGHTS			
	48HJ015		48HJ017	
	lb	kg	lb	kg
Barometric Relief Damper	50	23	50	23
Power Exhaust	85	39	85	39
EconoMi$er+	90	41	90	41
EconoMi$er2	85	39	85	39
Cu Condenser Coil	150	68	150	68
Cu Condenser and Evaporator Coils	280	127	280	127
Roof Curb (14-in. curb)	200	91	200	91
Horizontal Adapter Roof Curb (Preassembled)	250	113	250	113
Horizontal Adapter Roof Curb (Field-assembled)	343	156	343	156
Hail Guard	60	27	60	27
MoistureMi$er™ Dehumidification Package	40	18	40	18

LEGEND

Cu — Copper

Base unit dimensions — 48HJ004-007



UNIT	STD. UNIT WEIGHT LB	STD. UNIT WEIGHT KG	ECONOMI$ER+ WEIGHT LB	ECONOMI$ER+ WEIGHT KG	VERT. ECON+ W/P.E. WEIGHT LB	VERT. ECON+ W/P.E. WEIGHT KG	(A) CORNER WEIGHT LB	(A) CORNER WEIGHT KG	(B) CORNER WEIGHT LB	(B) CORNER WEIGHT KG	(C) CORNER WEIGHT LB	(C) CORNER WEIGHT KG	(D) CORNER WEIGHT LB	(D) CORNER WEIGHT KG	"J" FT -IN.	"J" MM
48HJ*004	530	240	50	22.7	90	40.9	127	57.6	122	55.3	138	62.6	143	64.9	2'-9 5/16"	846.5
48HJ*005	540	245					129	58.5	124	56.2	141	64.0	146	66.2		
48HJ*006	560	254					134	60.8	129	58.5	146	66.2	151	68.5		
48HJ*007	635	288					152	68.9	147	66.7	165	74.8	171	77.5	3'-5 5/16"	1050

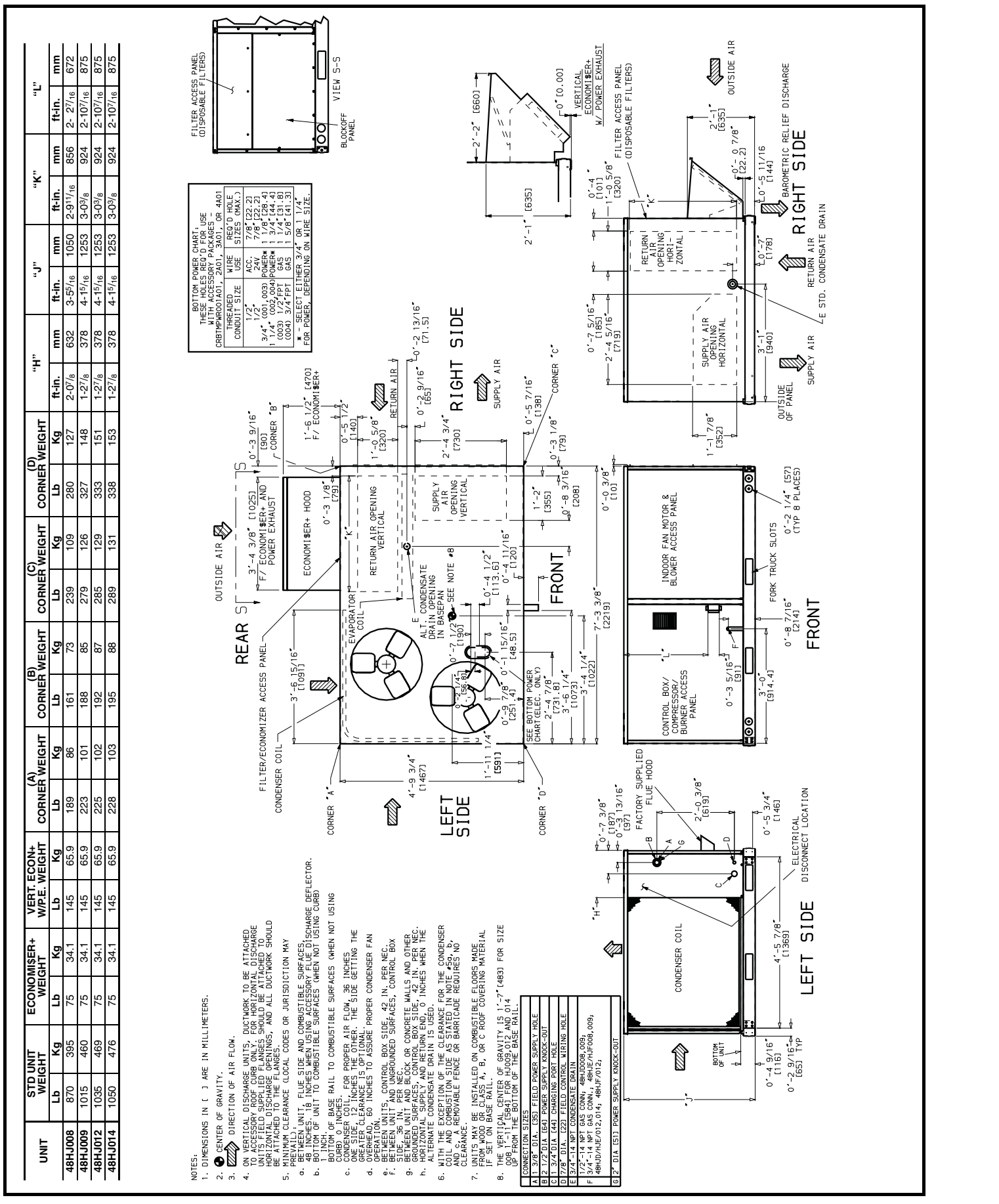
BOTTOM POWER CHART; THESE HOLES REQ'D FOR USE WITH ACCESSORY PACKAGES - CRBTMPWR001A01, 2A01, 3A01, OR 4A01			
THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)	
1/2"	ACC. 24V	7/8" [22.2]	
1/2"	(001,003) POWER*	1 1/8" [28.4]	
3/4", 1 1/4"	(002,004) POWER*	1 3/4" [44.4]	
(003) 1/2" FPT	GAS	1 1/4" [31.8]	
(004) 3/4" FPT	GAS	1 5/8" [41.3]	

* - SELECT EITHER 3/4" OR 1 1/4" FOR POWER, DEPENDING ON WIRE SIZE.

	CONNECTION SIZES
A	1 3/8" DIA. [35] FIELD POWER SUPPLY HOLE
B	2" DIA. [51] POWER SUPPLY KNOCK-OUT
C	1 3/4" DIA. [44] CHARGING PORT HOLE
D	7/8" DIA. [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	1/2"-14 NPT GAS CONNECTION
G	2 1/2" DIA. [64] POWER SUPPLY KNOCK-OUT

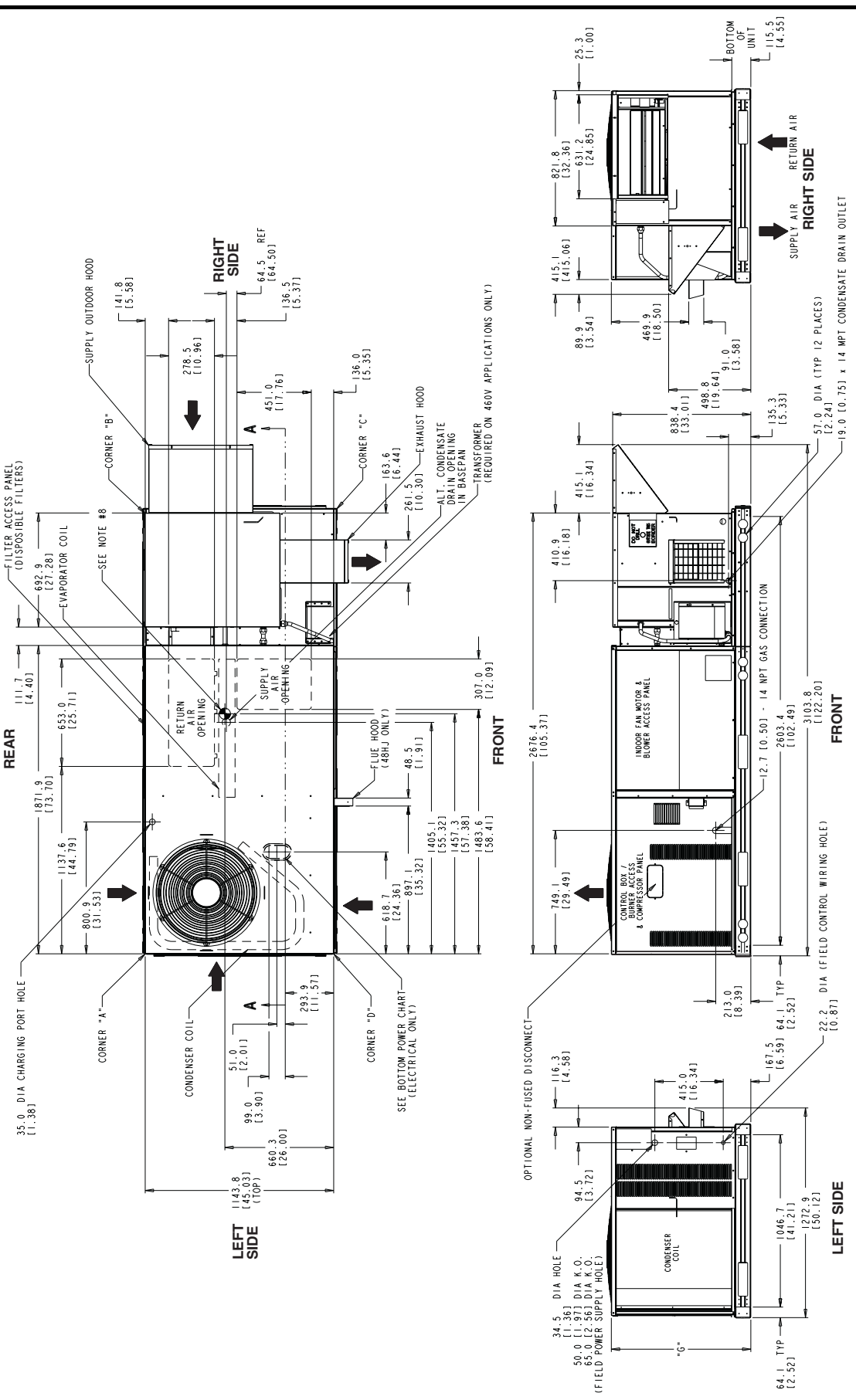
Base unit dimensions — 48HJ008-014

UNIT	STD UNIT WEIGHT		ECONOMISER+ WEIGHT		VERT. ECON+ W/P.E. WEIGHT		(A) CORNER WEIGHT		(B) CORNER WEIGHT		(C) CORNER WEIGHT		(D) CORNER WEIGHT		"H"		"J"		"K"		"L"	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm
48HJ008	870	395	75	34.1	145	65.9	189	86	161	73	239	109	280	127	2-0⅞	632	3-5⁹⁄₁₆	1050	2-9¹¹⁄₁₆	856	2- 2⁷⁄₁₆	672
48HJ009	1015	460	75	34.1	145	65.9	223	101	188	85	279	126	327	148	1-2⁷⁄₈	378	4-1⁵⁄₁₆	1253	3-0⅜	924	2-10⁷⁄₁₆	875
48HJ012	1035	469	75	34.1	145	65.9	225	102	192	87	285	129	333	151	1-2⁷⁄₈	378	4-1⁵⁄₁₆	1253	3-0⅜	924	2-10⁷⁄₁₆	875
48HJ014	1050	476	75	34.1	145	65.9	228	103	195	88	289	131	338	153	1-2⁷⁄₈	378	4-1⁵⁄₁₆	1253	3-0⅜	924	2-10⁷⁄₁₆	875



Base unit dimensions — COBRA™ units

COBRA ENERGY RECOVERY UNIT — 48HJ004-007 WITH 62AQ060,100



COBRA ENERGY RECOVERY UNIT — 48HJ004-007 WITH 62AQ060,100 (cont)

SINGLE ZONE ELECTRIC COOLING WITH GAS HEAT													
UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT "A"		CORNER WEIGHT "B"		CORNER WEIGHT "C"		CORNER WEIGHT "D"		UNIT HEIGHT "G"	
		LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	IN	MM
48HJ*004 w/62AQ060	208/230-1-60, 208/230-3-60, 460-3-60	890	404	234	106	280	127	205	93	171	78	33.33	846.5
48HJ*004 w/62AQ100	208/230-1-60, 208/230-3-60, 460-3-60	905	411	238	108	284	129	208	94	174	79	33.33	846.5
48HJ*005 w/62AQ060	208/230-1-60, 208/230-3-60, 460-3-60	900	409	237	107	283	128	207	94	173	79	33.33	846.5
48HJ*005 w/62AQ100	208/230-1-60, 208/230-3-60, 460-3-60	915	415	241	109	288	130	211	96	176	80	33.33	846.5
48HJ*006 w/62AQ060	208/230-1-60, 208/230-3-60, 460-3-60	920	418	242	110	289	131	212	96	177	80	33.33	846.5
48HJ*006 w/62AQ100	208/230-1-60, 208/230-3-60, 460-3-60	935	425	246	112	294	133	215	98	180	82	33.33	846.5
48HJ*007 w/62AQ060	208/230-3-60, 460-3-60	995	452	262	119	313	142	229	104	192	87	41.24	1047.4
48HJ*007 w/62AQ100	208/230-3-60, 460-3-60	1010	459	266	120	317	144	232	105	194	88	41.24	1047.4

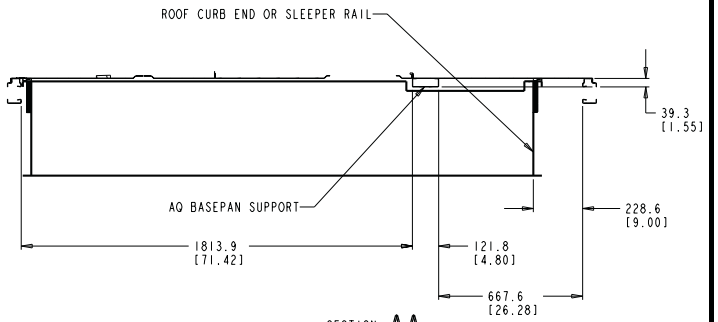
NOTES:
1. DIMENSIONS IN [ ] ARE IN INCHES.
2. ⊕ CENTER OF GRAVITY.
3. ➡ DIRECTION OF AIR FLOW.
4. DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY.
5. HJ - MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL).:
   a. BETWEEN UNIT, FLUE SIDE AND COMBUSTIBLE SURFACES, 48 INCHES. 18 INCHES WHEN USING ACCESSORY FLUE DISCHARGE DEFLECTOR.
   b. BOTTOM OF UNIT TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 1 INCH. BOTTOM OF BASE RAIL TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES.
   c. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   d. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   e. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   f. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   g. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   h. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.

   AQ - MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL.:)
   a. BETWEEN UNIT (CONTROL/EXHAUST SIDE) AND UNDGROUNDED SURFACES, 36 INCHES AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES.
   b. FILTER ACCESS SIDE, 30 INCHES. SUPPLY AIR INTAKE, 36 INCHES. UNIT TOP, 0 INCHES. EXHAUST AIR SIDE 36 INCHES.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL AND COMBUSTION SIDE AS STATED IN NOTE #5a, b AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL IF SET ON BASE RAIL.
8. THE VERTICAL CENTER OF GRAVITY IS 1'-6" [457] UP FROM THE BOTTOM OF THE BASE RAIL.
9. THIS DRAWING IS NOT APPLICABLE FOR ACCESSORY 62AQ UNITS-

BOTTOM POWER CHART:
THESE HOLES REQ'D FOR USE
WITH ACCESSORY PACKAGES -
CRBTMPWR001A00, 3A00 12.7 [0.50], 19.0 [0.75]
OR
CRBTMPWR002A00, 4A00 12.7 [0.50], 31.8 [1.25]

THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
12.7 [0.50]	24V	22.2 [0.88]
19.0 [0.75]	POWER *	28.4 [1.12]
31.7 [1.25]	POWER *	44.4 [1.75]
(003) 12.7 [0.50] FPT	GAS	31.8 [1.25]
(004) 19.0 [0.75] FPT	GAS	41.3 [1.62]

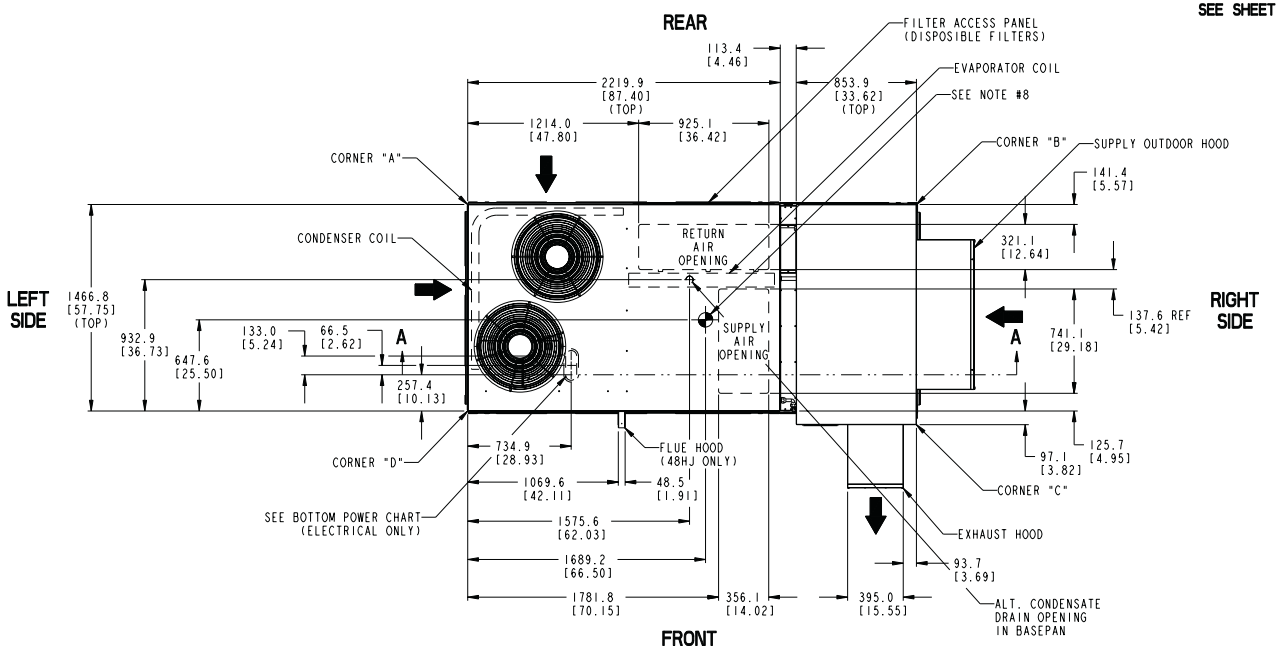
* - SELECT EITHER 19.0 [0.75] OR 31.8 [1.25] FOR POWER, DEPENDING ON WIRE SIZE.

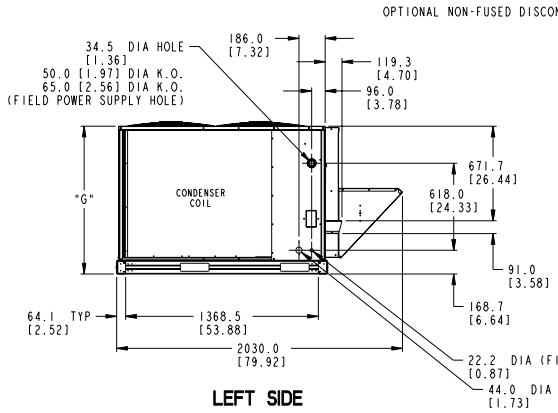


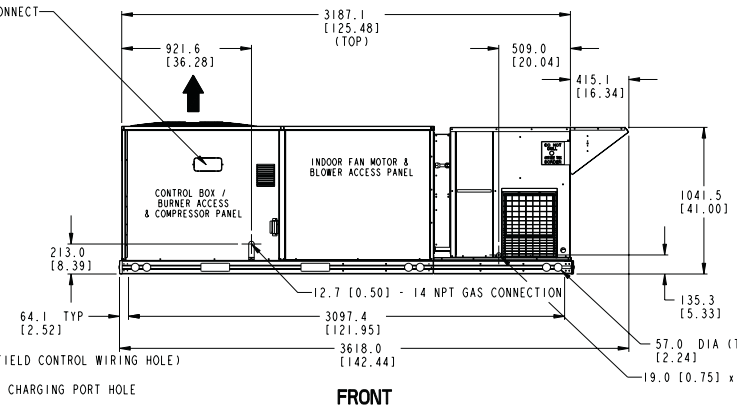
SECTION **A-A**
(VIEW FOR CURB/SLEEPER RAIL)

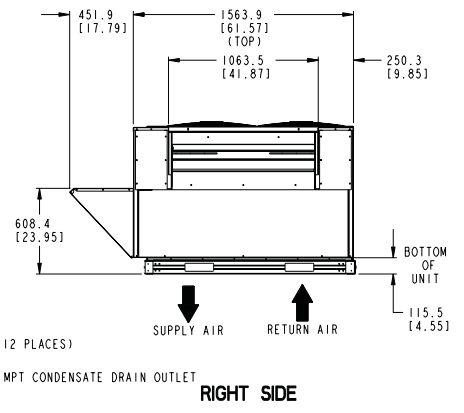
COBRA™ ENERGY RECOVERY UNIT — 48HJ008-014 WITH 62AQ200,300

SEE SHEET #2: FOR UNIT CHART
NOTES
BOTTOM POWER CHART
SECTION A-A









COBRA ENERGY RECOVERY UNIT — 48HJ008-014 WITH 62AQ200,300 (cont)

SINGLE ZONE ELECTRIC COOLING WITH GAS HEAT													
UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT "A"		CORNER WEIGHT "B"		CORNER WEIGHT "C"		CORNER WEIGHT "D"		UNIT HEIGHT "G"	
		LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	IN	MM
48HJ*008 w/62AQ200	208/230-3-60, 460-3-60	1310	595	272	123	307	139	388	176	344	156	42.12	1070
48HJ*008 w/62AQ300	208/230-3-60, 460-3-60	1355	616	281	128	317	144	401	182	356	161	42.12	1070
48HJ*009 w/62AQ200	208/230-3-60, 460-3-60	1315	597	273	124	308	140	389	177	345	157	42.12	1070
48HJ*009 w/62AQ300	208/230-3-60, 460-3-60	1360	618	282	128	318	144	403	183	357	162	42.12	1070
48HJ*012 w/62AQ200	208/230-3-60, 460-3-60	1400	636	291	132	328	149	414	188	367	167	50.12	1273
48HJ*012 w/62AQ300	208/230-3-60, 460-3-60	1445	657	300	136	338	153	428	194	379	172	50.12	1273
48HJ*014 w/62AQ200	208/230-3-60, 460-3-60	1440	655	299	136	337	153	426	193	378	171	50.12	1273
48HJ*014 w/62AQ300	208/230-3-60, 460-3-60	1485	675	308	140	347	158	440	199	390	177	50.12	1273

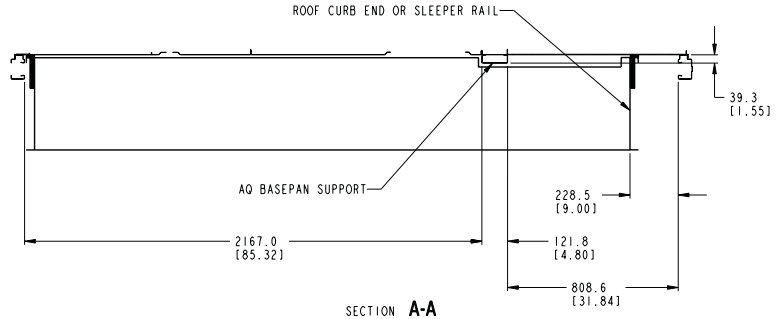
NOTES:
1. DIMENSIONS IN [ ] ARE IN INCHES.
2. ⊕ CENTER OF GRAVITY.
3. ➡ DIRECTION OF AIR FLOW.
4. DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY.
5. HJ - MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL).:
   a. BETWEEN UNIT, FLUE SIDE AND COMBUSTIBLE SURFACES, 48 INCHES. 18 INCHES WHEN USING ACCESSORY FLUE DISCHARGE DEFLECTOR.
   b. BOTTOM OF UNIT TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 1 INCH. BOTTOM OF BASE RAIL TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES.
   c. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   d. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   e. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   f. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   g. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   h. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.

   AQ - MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL.:)
   a. BETWEEN UNIT (CONTROL/EXHAUST SIDE) AND UNDGROUNDED SURFACES, 36 INCHES AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES.
   b. FILTER ACCESS SIDE, 30 INCHES. SUPPLY AIR INTAKE, 36 INCHES. UNIT TOP, 0 INCHES. EXHAUST AIR SIDE 36 INCHES.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL AND COMBUSTION SIDE AS STATED IN NOTE #5a, b AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL IF SET ON BASE RAIL.
8. THE VERTICAL CENTER OF GRAVITY IS 1'-6" [457] UP FROM THE BOTTOM OF THE BASE RAIL.
9. THIS DRAWING IS NOT APPLICABLE FOR ACCESSORY 62AQ UNITS.

BOTTOM POWER CHART:
THESE HOLES REQ'D FOR USE
WITH ACCESSORY PACKAGES -
CRBTMPWR001A00, 3A00 12.7 [0.50], 19.0 [0.75]
OR
CRBTMPWR002A00, 4A00 12.7 [0.50], 31.8 [1.25]

THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
12.7 [0.50]	24V	22.2 [0.88]
19.0 [0.75]	POWER *	28.4 [1.12]
31.7 [1.25]	POWER *	44.4 [1.75]
(003) 12.7 [0.50] FPT	GAS	31.8 [1.25]
(004) 19.0 [0.75] FPT	GAS	41.3 [1.62]

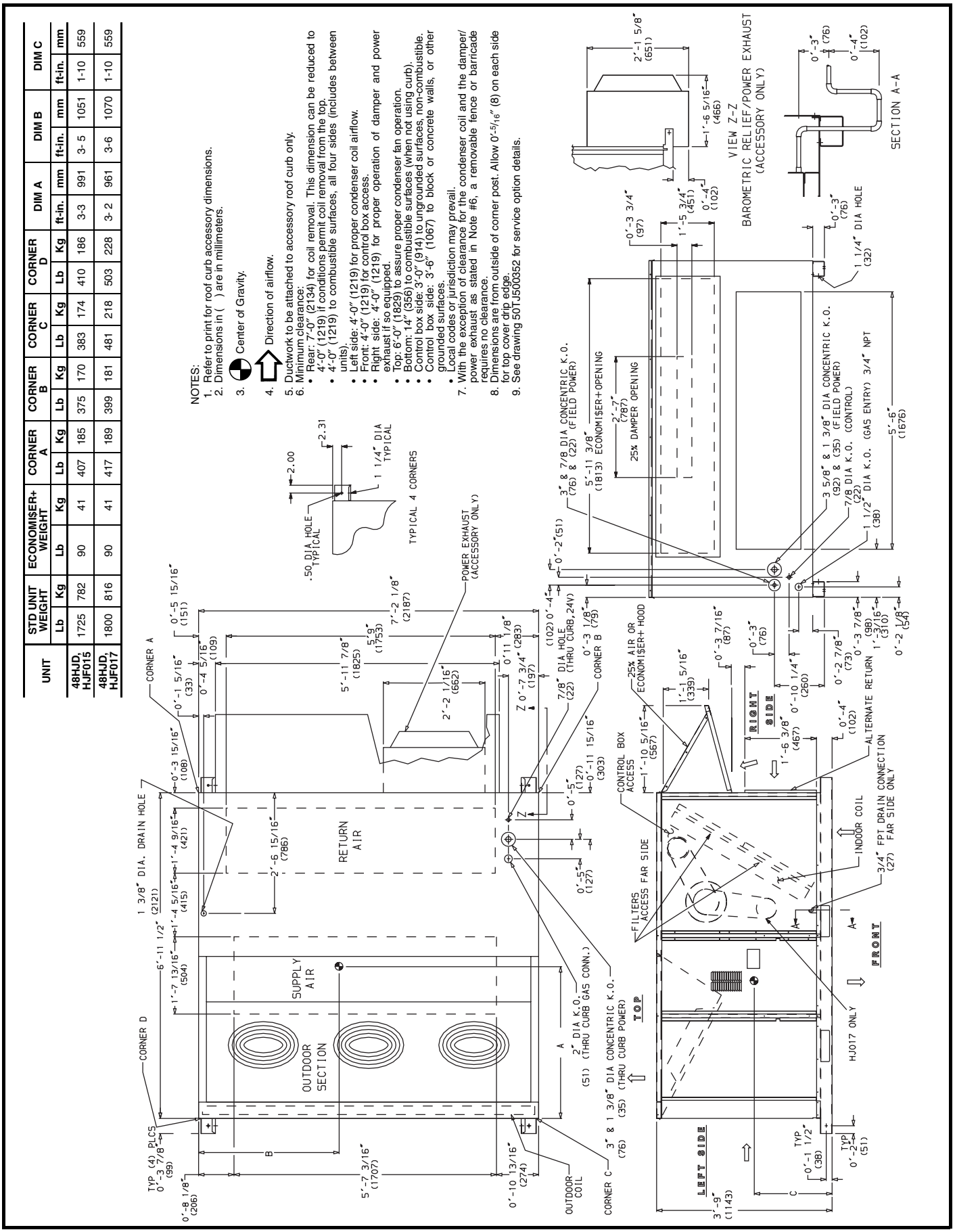
* - SELECT EITHER 19.0 [0.75] OR 31.8 [1.25] FOR POWER, DEPENDING ON WIRE SIZE.



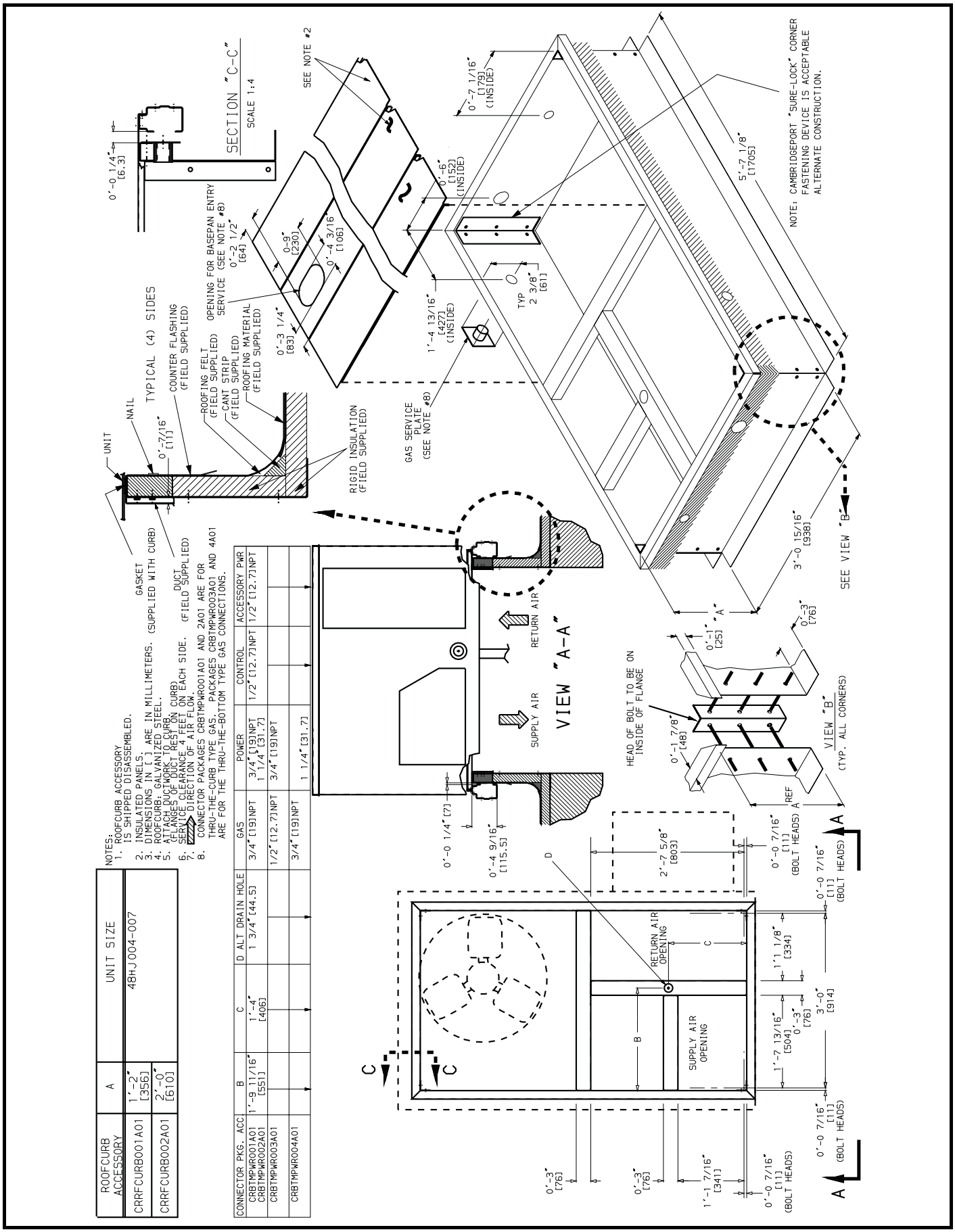
SECTION **A-A**
SCALE 3:32
(VIEW FOR CURB/SLEEPER RAIL)

Base unit dimensions — 48HJ015,017

UNIT	STD UNIT WEIGHT		ECONOMISER+ WEIGHT		CORNER A		CORNER B		CORNER C		CORNER D		DIM A		DIM B		DIM C	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	ft-in.	mm	ft-in.	mm	ft-in.	mm
48HJD, HJF015	1725	782	90	41	407	185	375	170	383	174	410	186	3-3	991	3- 5	1051	1-10	559
48HJD, HJF017	1800	816	90	41	417	189	399	181	481	218	503	228	3- 2	961	3-6	1070	1-10	559



Accessory dimensions — 48HJ004-007

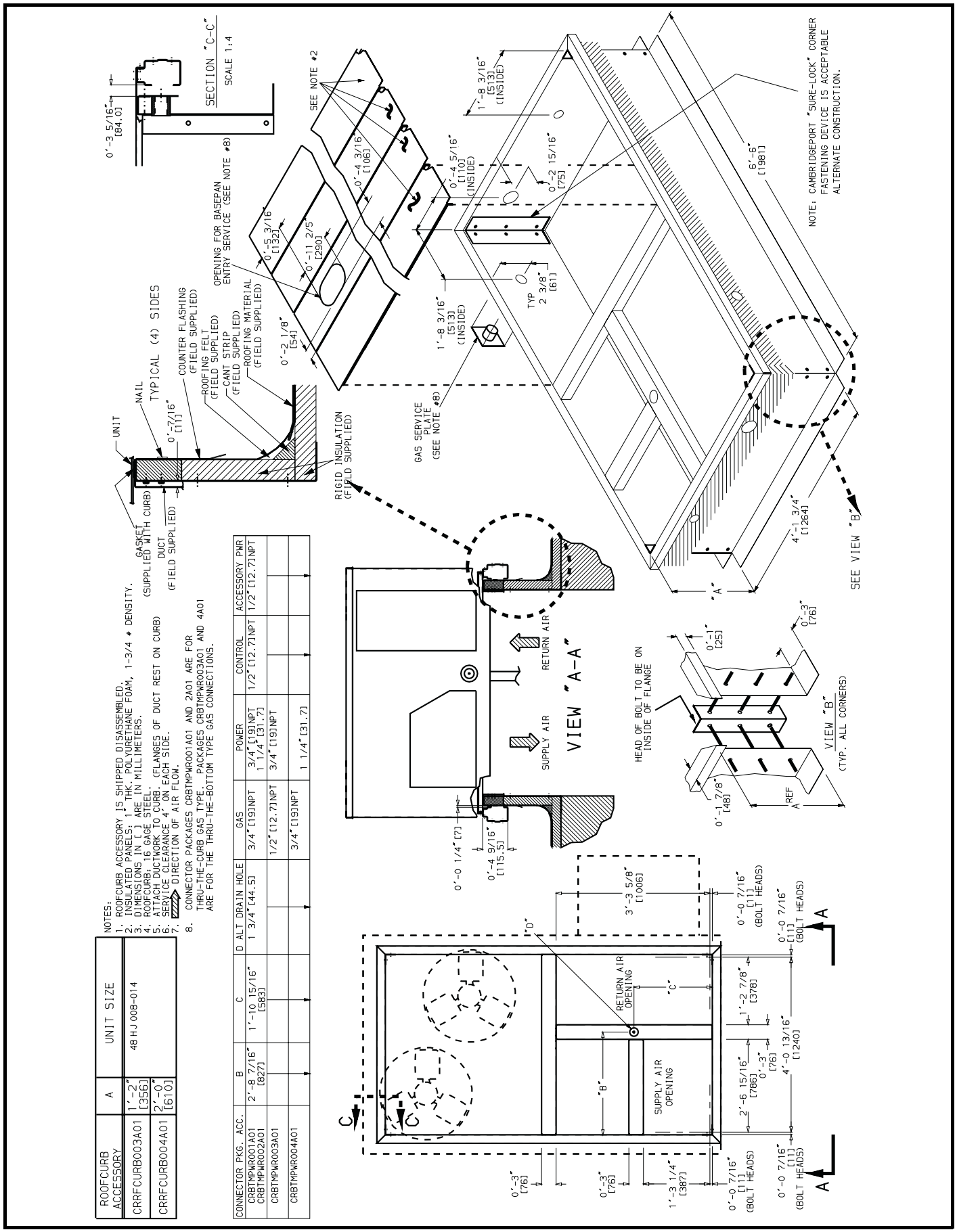


ROOFCURB ACCESSORY	A	UNIT SIZE
CRRFCURB001A01	1'-2" [356]	48HJ004-007
CRRFCURB002A01	2'-0" [610]	

NOTES:
1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. INSULATED PANELS.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB: GALVANIZED STEEL.
5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB)
6. SERVICE CLEARANCE 4 FEET ON EACH SIDE.
7. ARROW INDICATES DIRECTION OF AIR FLOW.
8. CONNECTOR PACKAGES CRBTMPWR001A01 AND 2A01 ARE FOR THRU-THE-CURB TYPE GAS. PACKAGES CRBTMPWR003A01 AND 4A01 ARE FOR THE THRU-THE-BOTTOM TYPE GAS CONNECTIONS.

CONNECTOR PKG. ACC.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY PWR
CRBTMPWR001A01 CRBTMPWR002A01	1'-9 11/16" [551]	1'-4" [406]	1 3/4" [44.5]	3/4" [19] NPT	3/4" [19] NPT 1 1/4" [31.7]	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR003A01				1/2" [12.7] NPT	3/4" [19] NPT		
CRBTMPWR004A01				3/4" [19] NPT	1 1/4" [31.7]		

Accessory dimensions — 48HJ008-014



ROOFCURB ACCESSORY	A	UNIT SIZE
CRRFCURB003A01	1'-2" [356]	48HJ008-014
CRRFCURB004A01	2'-0" [610]	

NOTES:
1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. INSULATED PANELS; 1" THK. POLYURETHANE FOAM, 1-3/4 # DENSITY.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB; 16 GAGE STEEL.
5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB)
6. SERVICE CLEARANCE 4" ON EACH SIDE.
7. ⇨ DIRECTION OF AIR FLOW.
8. CONNECTOR PACKAGES CRBTMPWR001A01 AND 2A01 ARE FOR THRU-THE-CURB GAS TYPE. PACKAGES CRBTMPWR003A01 AND 4A01 ARE FOR THE THRU-THE-BOTTOM TYPE GAS CONNECTIONS.

CONNECTOR PKG. ACC.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY PWR
CRBTMPWR001A01 CRBTMPWR002A01	2'-8 7/16" [827]	1'-10 15/16" [583]	1 3/4" [44.5]	3/4" [19] NPT	3/4" [19] NPT 1 1/4" [31.7]	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR003A01				1/2" [12.7] NPT	3/4" [19] NPT		
CRBTMPWR004A01				3/4" [19] NPT	1 1/4" [31.7]		

Accessory dimensions — 48HJ004-014 (cont)

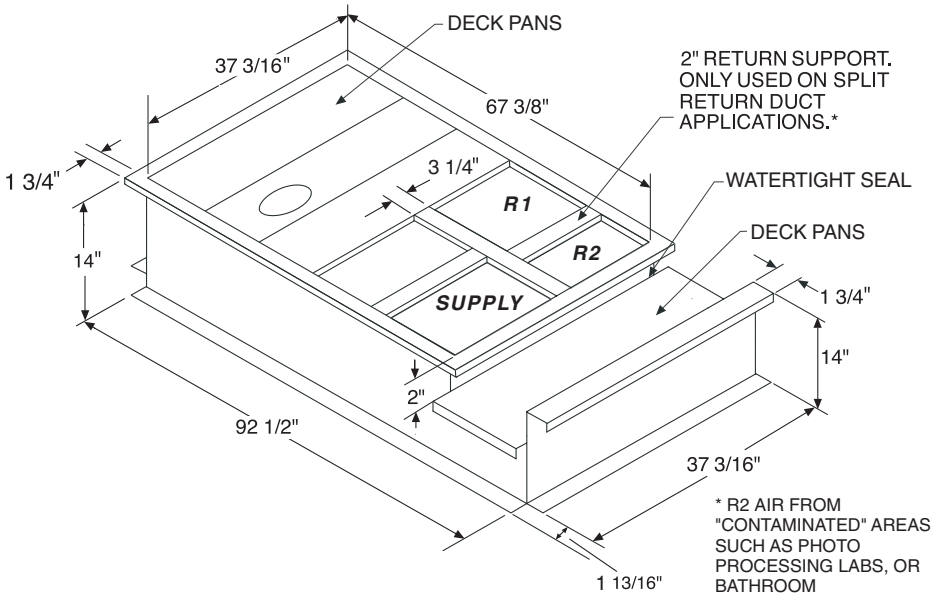
COBRA™ ENERGY RECOVERY UNIT FULL-PERIMETER ROOF CURB — 48HJ004-007 WITH 62AQ060,100

DUCT OPENING SIZES

Supply = 13 7/8" x 20 1/4"
R1 = 13 5/8" x 17 3/4"
R2 = 13 5/8" x 12 5/16"

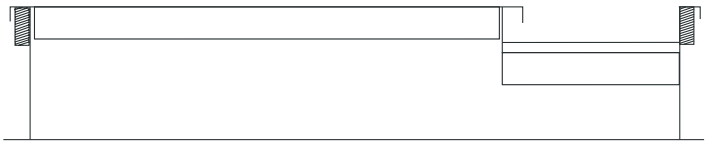
R1 = Return from building to HVAC

R2 = Return from building to 62AQ

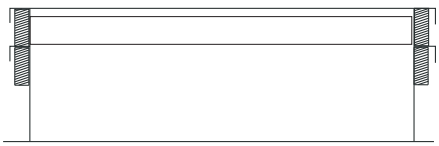


* R2 AIR FROM "CONTAMINATED" AREAS SUCH AS PHOTO PROCESSING LABS, OR BATHROOM

SIDE VIEW



END VIEW



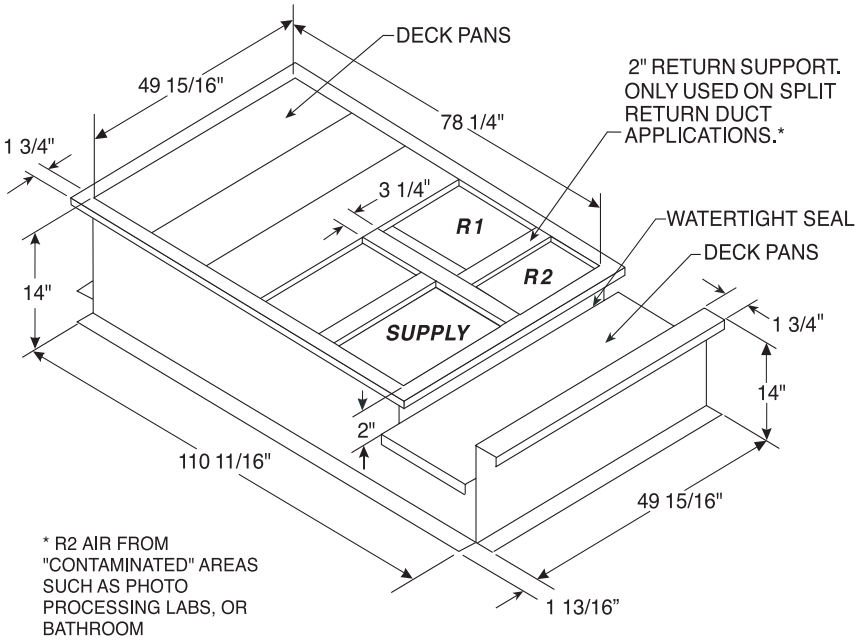
COBRA ENERGY RECOVERY UNIT FULL-PERIMETER ROOF CURB — 48HJ008-014 WITH 62AQ200,300

DUCT OPENING SIZES

Supply = 15 11/16" x 31 3/8"
R1 = 15 5/16" x 29 1/16"
R2 = 15 5/16" x 9"

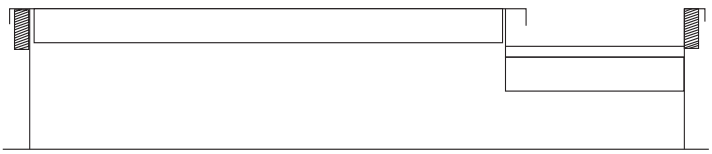
R1 = Return from building to HVAC

R2 = Return from building to 62AQ

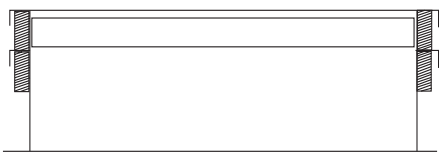


* R2 AIR FROM "CONTAMINATED" AREAS SUCH AS PHOTO PROCESSING LABS, OR BATHROOM

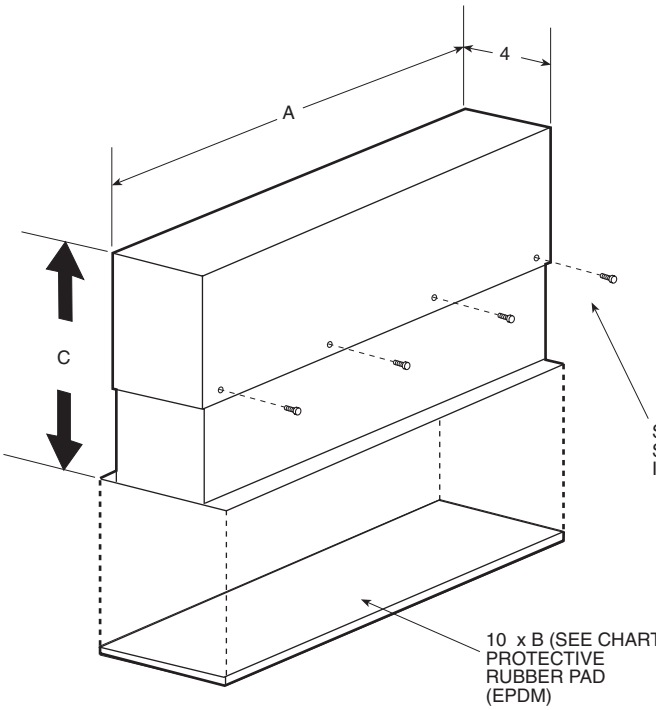
SIDE VIEW



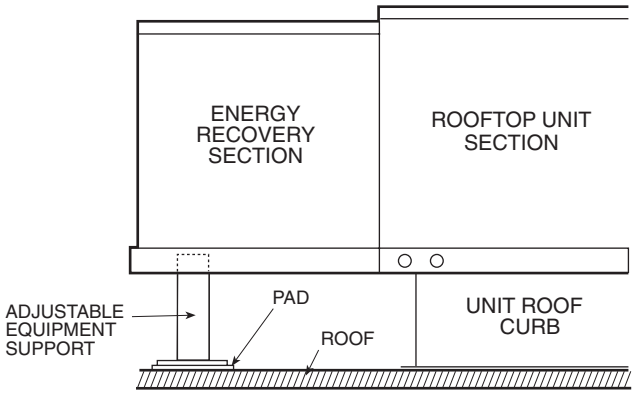
END VIEW



SUPPLEMENTAL ENERGY RECOVERY SECTION EQUIPMENT SUPPORT



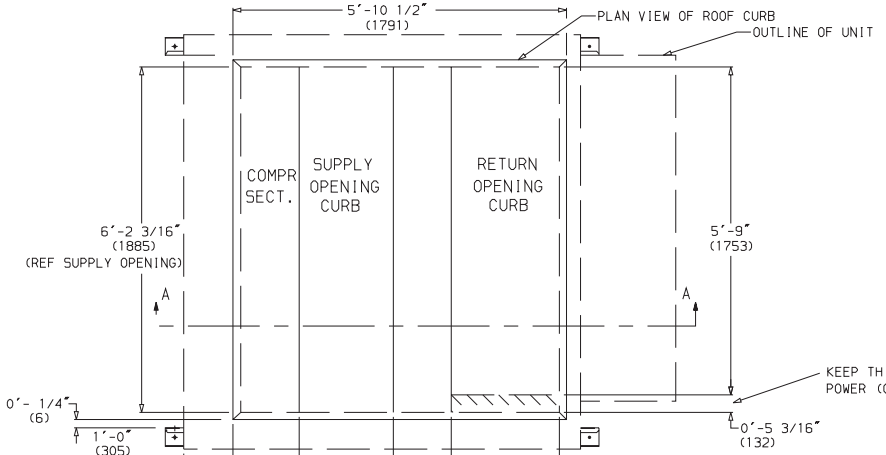
UNIT SIZE	EQUIPMENT SUPPORT PART NUMBER	DIMENSIONS (in.)		
		A	B	C
3-6 Ton	CRAQSUPT001A00	36.9	40	8 to 14
	CRAQSUPT002A00	36.9	40	14 to 24
$7^1/_2$-$12^1/_2$ Ton	CRAQSUPT003A00	49.7	54	8 to 14
	CRAQSUPT004A00	49.7	54	14 to 24



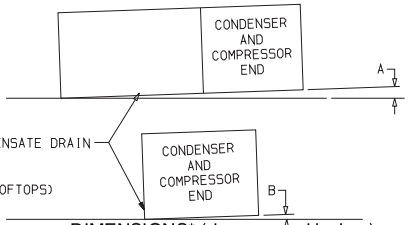
48HJ015,017

PKG. NO. REF.	CURB HEIGHT	DESCRIPTION
CRRFCURB010A00	1′-2″ (305)	Standard Curb 14″ High
CRRFCURB011A00	2′-0″ (610)	Standard Curb for Units Requiring High Installation
CRRFCURB012A00	2′-0″ (610)	Side Supply and Return Curb for High Installation

NOTES:
1. Roof curb accessory is shipped disassembled.
2. Insulated panels: 1″ thick neoprene coated 1 1/2 lb density.
3. Dimensions in ( ) are in millimeters.
4. ⇨ Direction of airflow.
5. Roof curb: 16 ga. (VA03-56) stl.
6. **A 90 degree elbow must be installed on the supply ductwork below the unit discharge for units equipped with electric heaters.**
7. To prevent the hazard of stagnant water build-up in the drain pan of the indoor section, unit can only be pitched as shown.

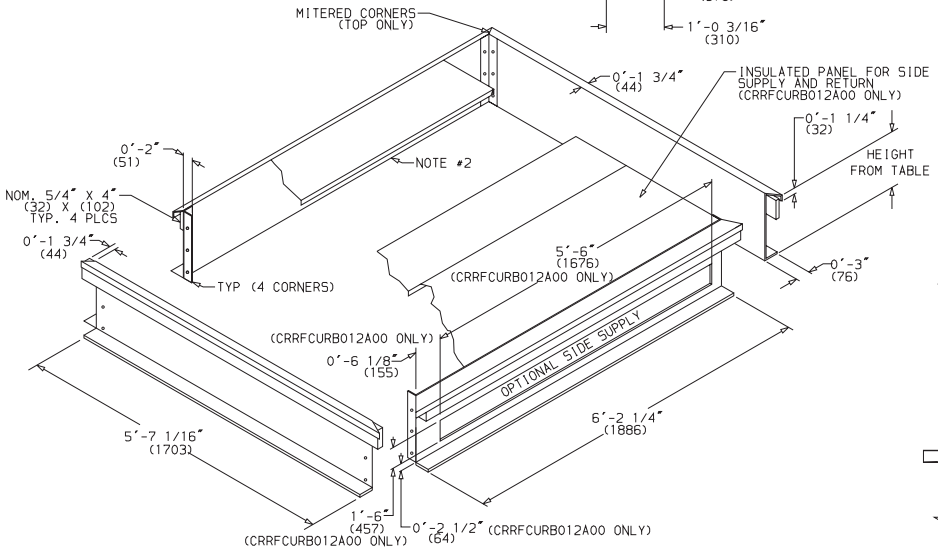


ATTACH DUCT TO ROOF CURB

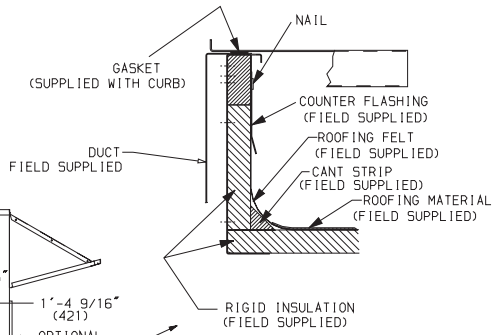


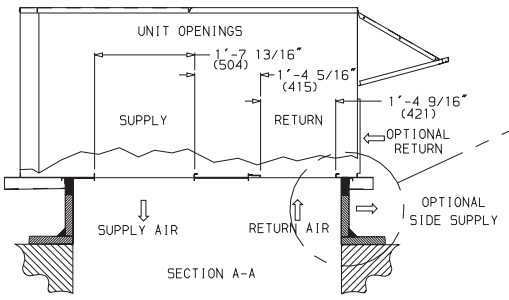
DIMENSIONS* (degrees and inches)

UNIT	A		B	
	Deg.	in.	Deg.	in.
ALL	.28	.45	.28	.43

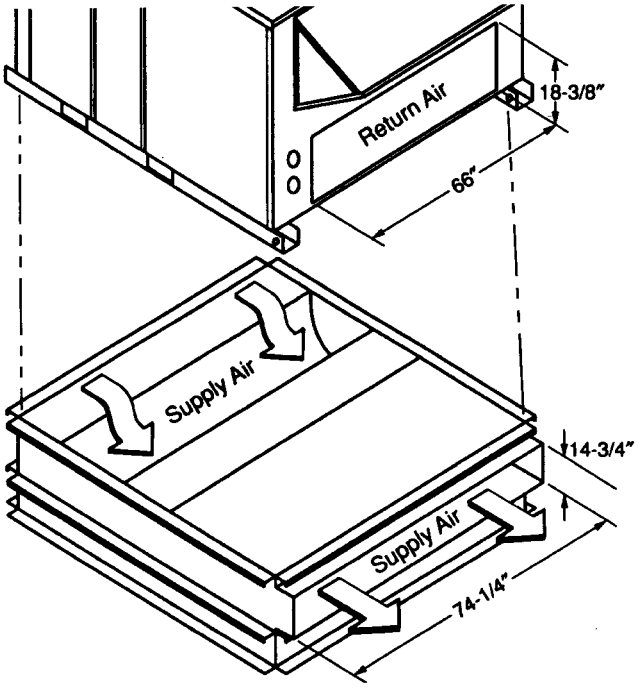


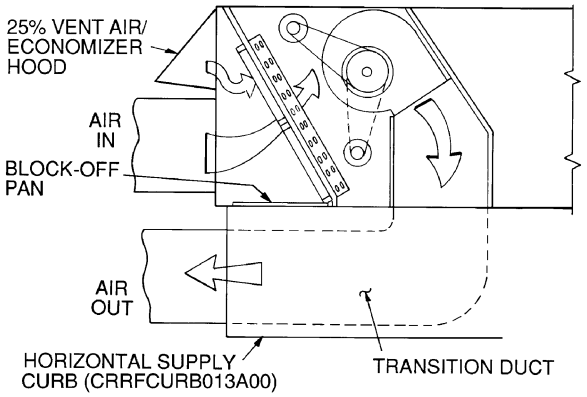
UNIT LEVELING TOLERANCES
*From edge of unit to horizontal.

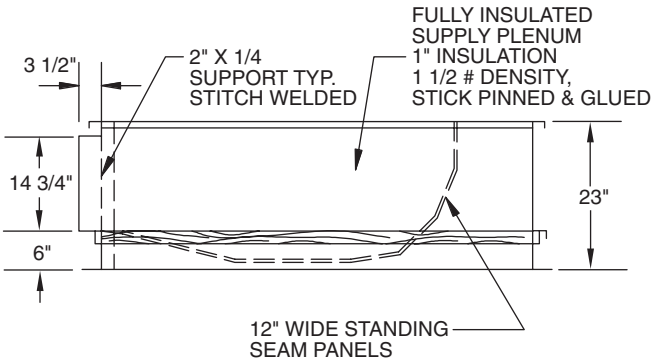




HORIZONTAL SUPPLY/RETURN ADAPTER INSTALLATION — 48HJ015,017





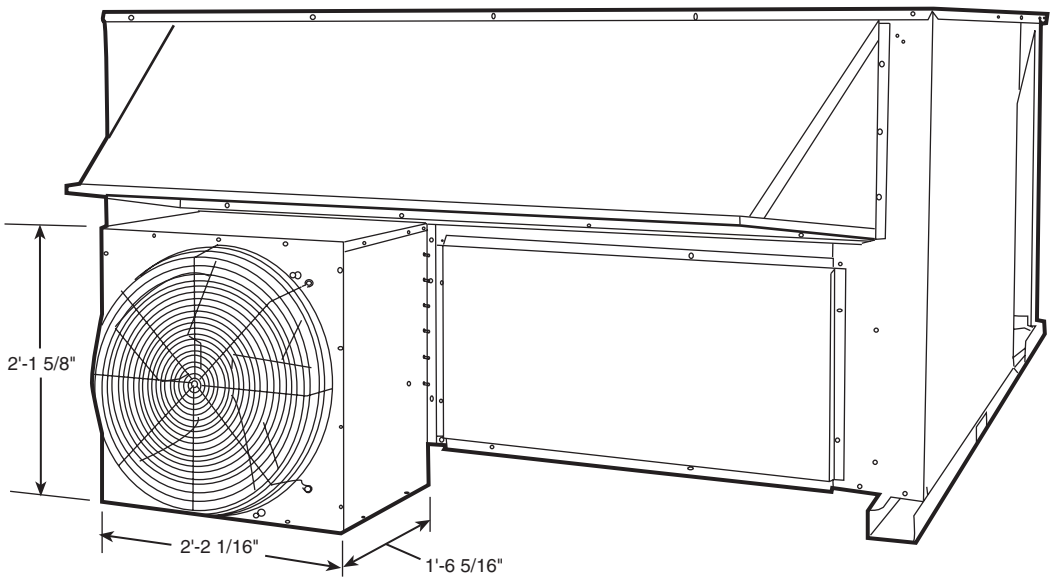


NOTE: CRRFCURB013A00 is a fully factory preassembled horizontal adapter and includes an insulated transition duct. The pressure drop through the adapter curb is negligible.

For horizontal return applications: The power exhaust and barometric relief dampers must be installed in the return air duct.

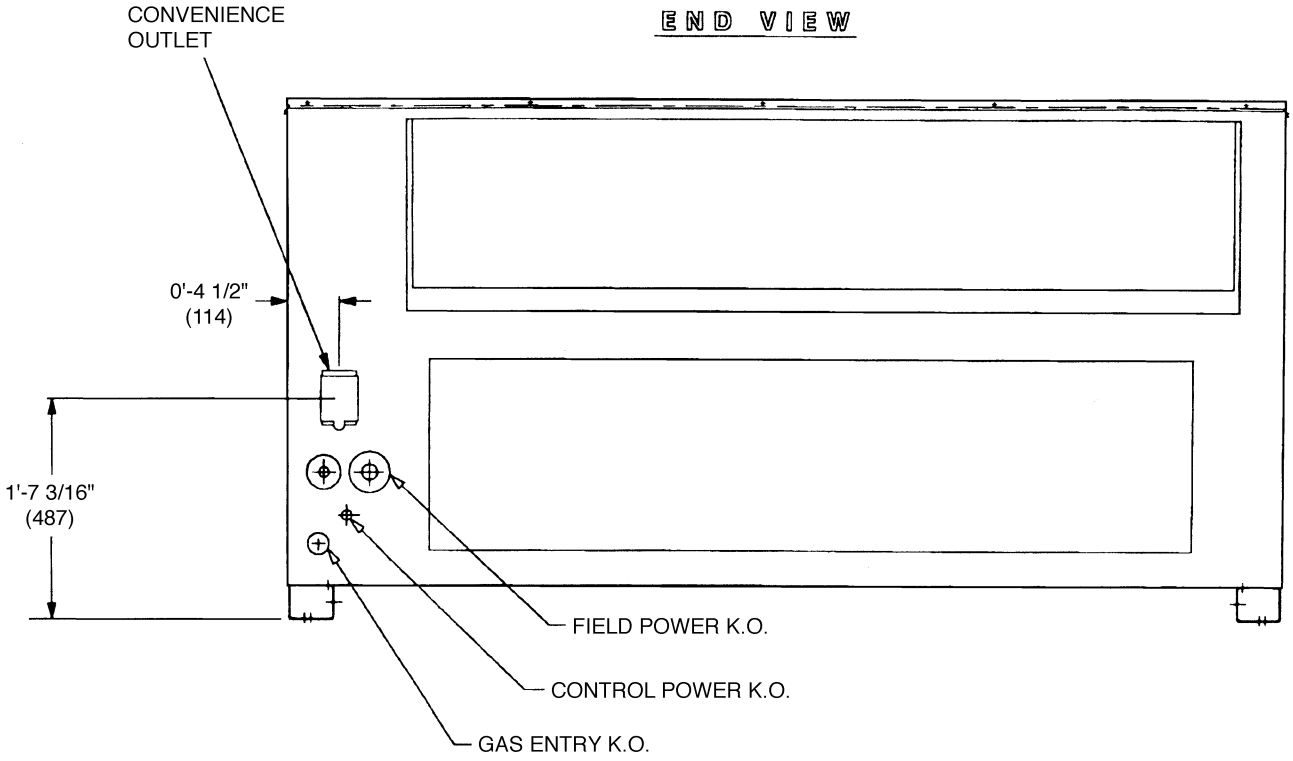
ACCESSORY PACKAGE NO.	CURB HEIGHT	DESCRIPTION
CRRFCURB013A00	1′-11″ (584)	Pre-Assembled, Horizontal Adapter Roof Curb

BAROMETRIC RELIEF/POWER EXHAUST — 48HJ015,017

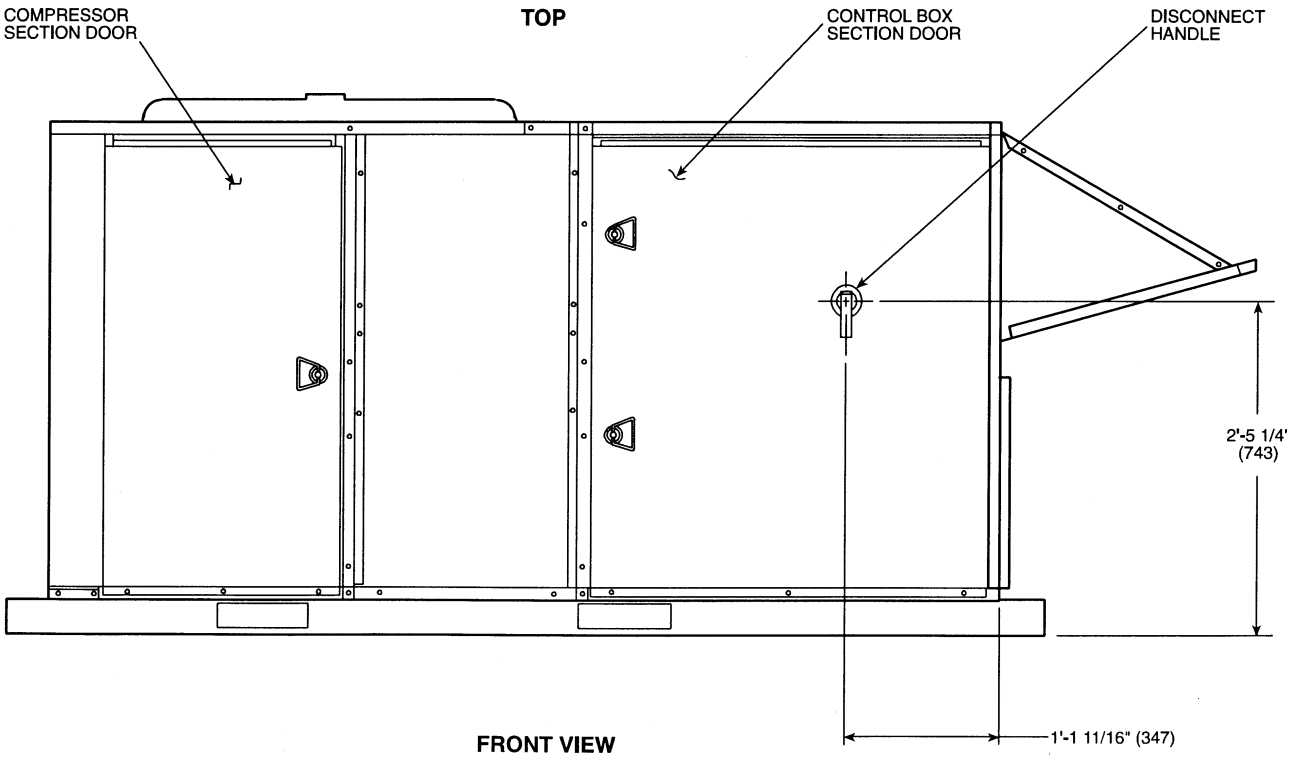


Accessory dimensions — 48HJ015,017 (cont)

FACTORY-INSTALLED CONVENIENCE OUTLET — 48HJ015,017



FACTORY-INSTALLED NON-FUSED DISCONNECT — 48HJ015,017



Selection procedure (with 48HJ006 example)

I Determine cooling and heating loads at design conditions.

Given:

Required Cooling Capacity (TC) . . . . . .67,000 Btuh
Sensible Heat Capacity (SHC). . . . . .46,000 Btuh
Required Heating Capacity. . . . . .85,000 Btuh
Outdoor Entering-Air Temperature db . . . . . .95 F
Outdoor Entering-Air Temperature wb. . . . . .75 F
Outdoor-Air Entering Airflow Cfm . . . . . 450 cfm
Outdoor-Air Winter Design Temperature . . . . . 0° F
Indoor-Air Winter Design Temperature . . . . . .70 F
Air to room including outdoor air . . . . . 2000 cfm
External Static Pressure . . . . . Supply — 0.60 in. wg
Return — 0.2 in. wg
Indoor-Air Temperature db (room air) . . . . . .78 F
Indoor-Air Temperature wb (room air) . . . . . .65 F
Indoor-Air Exhaust Cfm . . . . . 450 cfm
Electrical Characteristics (V-Ph-Hz) 230-3-60

Vertical discharge unit with Energy$Recycler required.

II Determine fan speed and power requirements at design conditions.

Before entering the Fan Performance tables, calculate the total static pressure required based on unit component. From the given find:

External static pressure supply	0.6 in. wg
External static pressure return	0.2 in. wg
Accessory static — None	0.0 in. wg
Total Static	0.8 in. wg

Enter the Fan Performance table for vertical discharge, standard motor, 48HJ006 at 0.80 in. wg and 2000 cfm. The rpm is 1326 and bhp is 1.37.

NOTE: Convert bhp to Fan Heat and Watts using the formula found in the note following the Evaporator-Fan Motor Efficiency table on page 178.

For this example:

Watts = (746 x Bhp)/(motor efficiency)

Watts = (746 x 1.37)/(0.74) = 1381 watts

Indoor Fan Heat = watts x 3.413 Btuh/watt
= 1381 x 3.413 = 4713 Btuh

III Select Energy$Recycler based on outdoor entering cfm.

Using Energy$Recycler cooling rating tables found in the Energy$Recycler Product Data choose 62AQ060 unit.

Using 450 cfm outdoor supply airflow, 95 F OD db, and 75 F OD wb find performance of the 62AQ060 at these conditions:

Energy$Recycler Gross Cooling Capacity is	13,000 Btuh
Energy$Recycler Gross Sensible Capacity is	10,100 Btuh
Compressor power is	1.06 kW
Energy$Recycler Leaving db is	73 F
Energy$Recycler Leaving wb is	66.9 F

IV Using the simplified* method below, calculate the approximate mixed air temperature for the Small Rooftop (SRT) evaporator coil.

Using the outdoor air entering cfm, the room cfm and the room exhaust airflow with their respective db and wb temperatures determine the db and wb entering the rooftop evaporator coil.

a) Estimate the mixed air db to the evaporator coil.

t mix db = ((cfm oa x t oa db) + ((cfm ra – cfm exh) x t rm db)) / ((cfm oa + (cfm ra – cfm exh)))

= ((450 cfm x 73.0 F) + ((2000 cfm – 450 cfm) x 78 F)) / ((450 cfm + (2000 cfm – 450 cfm)))

= 76.9 F mixed air into the rooftop evaporator coil

b) Estimate the mixed air wb to the evaporator coil.

t mix wb* = ((cfm oa x t oa wb) + ((cfm ra – cfm exh) x t rm wb)) / ((cfm oa + (cfm ra – cfm exh)))

= ((450 cfm x 66.9 F) + ((2000 cfm – 450 cfm) x 65 F)) / ((450 cfm + (2000 cfm – 450 cfm)))

= 65.4 F wb mixed air temperature into the rooftop evaporator

*Simplified method of determining wet bulb (wb) temperature of mixture. This approximation is used because the wb lines in the area of the psychrometric chart in the area used in the calculation is relatively linear, providing a close approximation. A more accurate solution can be found using the E-Cat program.

LEGEND

cfm — cubic feet per minute of air
db — dry bulb
exh — Energy$Recycler discharge
mix — mixture of outdoor + return air
oa — outside air leaving Energy$Recycler
ra — return air
sa — supply air at coil (sa = oa + ra – exh)
t — temperature
TC — total capacity gross
SHC — sensible capacity
wb — wet bulb

V Determine the cooling load requirement for the rooftop unit.

Required Cooling Capacity is	67,000 Btuh
Less Cooling Capacity supplied by the Energy$Recycler	–13,000 Btuh
Rooftop cooling load required is	54,000 Btuh

VI Select the rooftop unit based on mixed air entering conditions and cooling load.

Enter cooling capacity table at outdoor entering temperature 95 F, mixed air entering evaporator at 2000 cfm, 76.9 F db, and 65.4 F wb.

The 48HJ006 will provide a total gross cooling capacity of 59,420 Btuh and sensible cooling of 43,420 Btuh.

Because these values were not at 80 F entering db, they were calculated based on the notes following the Cooling Capacity tables.

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

Selection procedure (with 48HJ006 example) (cont)

VII Select net heating capacity of unit to meet design condition requirements.

Enter the 62AQ060 Heating Rating table found in the Energy$Recycler Product Data. At 450 cfm, 70 F and 0° F find the heating value for the Energy$Recycler to be 15.2 Btuh. Since the Energy$Recycler uses room air, the instantaneous heat is also the Integrated Heat Rating.

The customer heat requirement is 85,000 Btuh.

Fan heat from Step II	4,713 Btuh
Energy$Recycler Heat Capacity	15,200 Btuh
add Energy$Recycler optional supply fan heat if supplied	+ 0 Btuh
Total Unit heat with Energy$Recycler	19,913 Btuh

Determine additional electric heat capacity in kW.

The required heating capacity is 85,000 Btuh. Therefore, 65,087 Btuh (85,000 – 19,913) additional heat is required.

The output capacity for the 48HJE006 is 93,150 Btuh, which is sufficient.

Total unit net heating capacity is 113,063 Btuh (93,150 + 19,913).

VIII Determine net cooling capacity.

Cooling capacities are gross capacities and do not include indoor (evaporator) or optional Energy$Recycler supply fan heat.

Determine net cooling capacity using the following formula:

Net Capacity = (Gross Capacity Rooftop Unit + Gross Capacity Energy$Recycler) – (IFM Heat + Optional Energy$Recycler Supply Fan motor heat)

Gross Total Cooling	
Rooftop unit	59,420 Btuh
Energy$Recycler	13,000 Btuh
Total	72,420 Btuh
Less	
IFM heat (from Step II)	–4,713 Btuh
Optional Energy$Recycler Supply Fan Motor Heat	none
Net Total Capacity	67,707 Btuh
Gross Sensible Cooling	
Rooftop unit	43,420 Btuh
Energy$Recycler	10,090 Btuh
Total	53,510 Btuh
Less	
IFM heat (from Step II)	–4,713 Btuh
Optional Energy$Recycler Supply Fan Motor Heat	none
Net Sensible Capacity	48,797 Btuh

IX Determine the operating watts of the unit.

a) Cooling with Energy$Recycler in operation:

Rooftop unit:

Compressor watts from cooling capacity tables . . . . . 4,440 watts

Indoor fan motor from Step II† . . . . 1,381 watts

Outdoor fan motor from Physical Data table find 1/4 hp†.

Assume OD motor efficiency is 0.75.

Watts = (746 x hp)/(motor Eff)
= (746 x 1/4)/(0.75)
= 249 watts

†Dual circuit units will have two indoor and two outdoor fans, double values.

b) Energy$Recycler:

Compressor watts from Energy$Recycler Product Data	1,060 watts
Optional supply fan from Energy$Recycler Product Data fan curves	none
Exhaust fan, from Energy$Recycler Product Data fan curve at 450 cfm, 0.2 in. wg Static	110 watts
Total watts for the unit in operation at design conditions	7,240 watts

X Electrical data RLA, FLA, LRA, MCA and MOCP.

Separate Power Supply:

If the 62AQ is wired for separate power see the Electrical Data table.

Single Power Supply with Unit:

The unit is 230-3-60 Hz. Look up the 48JH006 without convenience outlet in the Electrical Data Table. Find unit electrical data. For the rooftop unit the data is MCA = 28.9 amps, MOCP = 35 amps, Min Unit Disconnect Size FLA = 28, and LRA = 168.

From the Table of "X" and "Y" values in the Energy$Recycler Product Data literature, find 230 v, for 62AQ060300, "X" = 8.1 amps and "Y" = 9.3 amps.

Add "X" amps to the MCA and MOCP and add "Y" amps to the minimum disconnect size.

	MCA	MOCP	FLA	LRA
SRT	28.9	35	28	168
62AQ	8.1	8.1	9.3	31.7
Total	37.0 amps	43.1** amps	37.3 amps	199.7 amps

**The calculated MOCP is 43.1 amps; it is rounded down to 40 amps. Compare it to MCA; it must be larger than the MCA of 37.0 amps, so it is acceptable as is.

The wiring of the unit must be suitable for the MCA calculated above, and the Maximum Overcurrent Protection (MOCP) device must be selected to meet the calculated MOCP.

If the overcurrent protective device for the combination load is equal to or less than 60 amps, a single disconnect may be used for BOTH the main unit and the 62AQ provided that the wire ampacity supplying the 62AQ is sized for a minimum of 33% larger than the overcurrent protection device value (i.e., 60 amps x 0.33 = 20 amps), no further subfusing would be required.

If the overcurrent protection device is greater than 60 amps and the old overcurrent protection device was less than 60 amps, a FUSED disconnect no greater than 60 amps must be provided for the main unit and a SEPARATE FUSED disconnect must be provided for the 62AQ unit.

If the old overcurrent protection device is greater than 60 amps, a disconnect is required for the MAIN UNIT as well as a FUSED DISCONNECT for the 62AQ unit.

Performance data — 48HJ

COOLING CAPACITIES — STANDARD UNITS

48HJ004 (3 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF								
		900/0.14			1200/0.17			1500/0.20		
		Air Entering Evaporator — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	41.9	38.7	35.7	43.5	40.8	37.7	44.8	41.8	39.0
	SHC	20.4	25.2	29.7	21.8	28.2	33.8	23.3	30.7	37.0
	kW	2.19	2.16	2.12	2.21	2.18	2.15	2.23	2.19	2.16
85	TC	40.7	37.5	34.5	42.1	39.3	36.4	43.5	40.4	37.6
	SHC	19.9	24.7	29.2	21.5	27.7	33.2	23.2	30.3	36.4
	kW	2.46	2.42	2.39	2.47	2.44	2.41	2.50	2.45	2.42
95	TC	39.3	36.1	33.1	40.8	37.8	34.9	42.0	38.9	36.1
	SHC	19.5	24.1	28.4	21.1	27.2	32.5	22.8	29.9	35.6
	kW	2.75	2.71	2.66	2.77	2.73	2.69	2.79	2.74	2.71
105	TC	37.7	34.6	31.7	39.3	36.2	33.4	40.1	37.2	34.7
	SHC	18.8	23.5	27.8	20.7	26.6	31.8	22.1	29.3	34.7
	kW	3.06	3.02	2.98	3.09	3.04	3.01	3.10	3.06	3.03
115	TC	36.0	33.0	29.7	37.4	34.5	31.5	38.1	35.5	33.2
	SHC	18.3	22.9	26.7	19.9	26.1	30.9	21.3	28.7	33.2
	kW	3.41	3.36	3.31	3.43	3.39	3.34	3.44	3.41	3.37
125	TC	34.2	31.3	27.8	35.6	32.7	29.4	36.3	33.6	31.9
	SHC	17.6	22.2	25.8	19.4	25.4	29.4	20.8	28.0	31.8
	kW	3.78	3.73	3.66	3.80	3.76	3.71	3.81	3.78	3.75

Standard Ratings

LEGEND

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

NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil.
   Below 80 F edb, subtract (corr factor x cfm) from SHC.
   Above 80 F edb, add (corr factor x cfm) to SHC.
   Correction Factor = 1.10 x (1 – BF) x (edb – 80).

48HJ005 (4 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		1200/0.17			1450/0.19			1600/0.21			2000/0.24		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	54.0	50.7	44.2	55.9	52.2	47.7	56.4	52.8	49.1	58.1	54.5	50.6
	SHC	26.1	32.7	37.5	27.6	35.1	41.8	28.2	36.2	43.8	30.2	39.5	47.5
	kW	2.81	2.80	2.76	2.83	2.81	2.78	2.83	2.80	2.79	2.84	2.82	2.79
85	TC	52.2	48.9	41.9	54.1	50.4	45.9	54.5	51.0	47.2	55.3	52.3	48.7
	SHC	25.4	32.0	36.4	26.9	34.5	40.8	27.5	35.7	42.8	28.6	38.5	46.6
	kW	3.20	3.19	3.15	3.22	3.20	3.17	3.22	3.20	3.18	3.22	3.20	3.18
95	TC	50.7	46.9	39.5	51.9	48.4	43.5	52.5	48.9	45.2	53.9	50.1	46.7
	SHC	24.9	31.1	35.0	26.1	33.6	39.6	26.8	34.7	41.8	28.8	37.5	45.6
	kW	3.64	3.61	3.57	3.65	3.62	3.60	3.65	3.62	3.60	3.67	3.63	3.61
105	TC	48.8	44.5	36.7	49.8	46.2	40.7	50.2	46.7	42.1	51.5	48.2	44.7
	SHC	24.3	30.2	33.6	25.3	32.8	38.2	26.0	33.9	40.3	27.9	37.4	44.4
	kW	4.12	4.09	4.03	4.12	4.09	4.06	4.12	4.09	4.07	4.14	4.11	4.08
115	TC	46.5	41.1	34.3	47.7	43.3	37.0	48.0	44.4	38.5	48.9	45.7	42.0
	SHC	23.4	28.9	32.4	24.9	31.8	36.3	25.4	33.4	38.3	27.1	36.9	42.0
	kW	4.64	4.59	4.53	4.65	4.62	4.55	4.64	4.63	4.56	4.65	4.63	4.60
125	TC	43.8	37.5	32.4	45.1	39.0	33.8	45.3	40.1	35.4	46.3	42.6	38.8
	SHC	22.5	27.4	31.5	24.1	30.2	33.7	24.7	31.9	35.4	26.5	35.9	38.8
	kW	5.19	5.13	5.05	5.20	5.15	5.09	5.19	5.17	5.11	5.20	5.19	5.15

48HJ006 (5 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		1500/0.08			1750/0.09			2000/0.11			2500/0.13		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	70.8	65.4	58.5	72.5	67.3	61.1	73.0	68.4	62.8	74.8	70.3	64.8
	SHC	34.1	42.7	49.9	35.7	45.5	54.2	36.8	48.0	57.8	39.6	53.0	63.4
	kW	3.53	3.49	3.44	3.55	3.50	3.46	3.55	3.51	3.47	3.57	3.54	3.48
85	TC	68.9	63.2	55.3	70.5	65.1	57.9	72.2	66.4	60.2	73.2	68.1	62.9
	SHC	33.5	41.8	48.4	35.0	44.8	52.8	37.0	47.6	56.8	39.3	52.5	62.4
	kW	3.98	3.94	3.87	4.00	3.96	3.90	4.03	3.97	3.92	4.04	3.99	3.94
95	TC	66.8	60.6	52.4	68.3	62.5	54.3	69.3	63.8	56.6	71.2	65.6	60.6
	SHC	32.8	40.7	47.0	34.5	43.8	51.1	36.0	46.7	55.0	39.1	51.8	60.5
	kW	4.48	4.43	4.35	4.50	4.45	4.37	4.51	4.46	4.40	4.55	4.48	4.44
105	TC	64.3	57.7	49.9	65.9	59.8	51.7	66.9	61.1	54.1	68.4	62.8	58.4
	SHC	32.0	39.6	45.8	33.7	42.8	49.7	35.3	45.7	53.5	38.4	51.0	58.4
	kW	5.03	4.96	4.87	5.05	4.99	4.90	5.06	5.00	4.93	5.08	5.02	4.98
115	TC	61.5	54.8	47.3	62.8	56.7	49.1	64.0	58.2	51.6	65.4	59.9	56.1
	SHC	31.0	38.4	44.5	32.5	41.6	48.2	34.4	44.6	51.6	37.4	50.0	56.1
	kW	5.61	5.55	5.46	5.62	5.58	5.49	5.65	5.60	5.52	5.67	5.61	5.57
125	TC	58.7	51.6	44.5	59.9	53.4	46.2	60.8	54.9	49.0	62.2	56.8	53.5
	SHC	30.0	37.2	43.1	31.7	40.4	46.2	33.3	43.4	48.9	36.4	48.9	53.4
	kW	6.27	6.19	6.09	6.28	6.21	6.13	6.29	6.24	6.17	6.31	6.27	6.22

COOLING CAPACITIES — STANDARD UNITS (cont)

48HJ007 (6 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		1800/0.05			2100/0.06			2400/0.06			3000/0.08		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	86.7	80.7	74.4	88.8	82.7	76.6	90.5	84.4	78.2	92.6	86.3	81.0
	SHC	43.0	53.7	63.8	45.0	57.4	68.9	47.2	61.2	73.6	51.2	67.4	80.7
	kW	4.58	4.46	4.33	4.63	4.50	4.38	4.67	4.55	4.41	4.72	4.58	4.47
85	TC	84.1	78.2	72.0	86.4	80.3	74.1	88.2	81.7	75.7	90.2	84.0	78.8
	SHC	42.0	52.6	62.7	44.5	56.6	68.0	46.8	60.2	72.5	50.6	67.4	78.7
	kW	5.10	4.97	4.85	5.16	5.03	4.90	5.21	5.06	4.93	5.26	5.12	4.99
95	TC	81.3	75.3	69.2	83.4	77.3	71.3	85.1	78.9	72.9	87.2	80.6	76.2
	SHC	41.0	51.4	61.4	43.4	55.3	66.6	45.8	59.2	71.2	50.2	65.8	76.2
	kW	5.65	5.52	5.39	5.71	5.57	5.44	5.77	5.62	5.48	5.83	5.66	5.55
105	TC	77.9	72.0	66.1	80.0	73.8	68.0	81.6	75.3	69.6	83.4	77.1	73.2
	SHC	39.7	50.2	60.0	42.2	54.0	65.2	44.6	57.8	69.3	49.0	64.5	73.2
	kW	6.22	6.08	5.94	6.29	6.13	6.00	6.34	6.17	6.04	6.40	6.22	6.12
115	TC	74.7	68.4	61.8	75.9	70.0	64.1	77.6	71.3	66.5	78.7	73.0	70.1
	SHC	38.7	48.8	58.1	40.8	52.6	63.2	43.3	56.4	66.4	46.9	63.2	70.0
	kW	6.84	6.68	6.49	6.87	6.71	6.56	6.93	6.75	6.63	6.96	6.80	6.72
125	TC	70.3	63.6	57.2	71.8	65.5	59.1	72.9	66.8	61.9	74.0	68.6	66.4
	SHC	37.2	47.0	55.8	39.5	51.0	59.1	41.7	55.0	61.9	45.4	61.8	66.3
	kW	7.43	7.25	7.03	7.48	7.30	7.13	7.51	7.35	7.22	7.54	7.41	7.33

48HJ008 (7 1/2 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF								
		2250/0.10			3000/0.11			3750/0.14		
		Air Entering Evaporator — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	105.5	96.9	87.6	107.3	99.6	90.7	110.3	101.9	93.8
	SHC	50.6	63.6	75.7	53.3	69.2	83.7	58.0	76.6	92.2
	kW	5.15	5.07	5.04	5.16	5.11	5.06	5.20	5.13	5.07
85	TC	102.5	93.6	83.6	105.1	96.5	87.5	107.7	99.0	90.6
	SHC	49.7	62.4	73.9	52.8	68.4	82.2	57.3	75.9	90.0
	kW	5.86	5.79	5.73	5.89	5.82	5.77	5.93	5.86	5.78
95	TC	98.9	90.1	79.3	101.6	92.9	83.5	103.8	95.3	87.4
	SHC	48.5	61.2	71.9	51.9	67.2	80.2	56.2	74.9	87.3
	kW	6.65	6.58	6.49	6.69	6.61	6.53	6.72	6.64	6.57
105	TC	95.3	86.2	75.7	97.6	88.8	79.6	100.0	91.0	84.1
	SHC	47.3	59.6	70.2	50.7	65.9	78.0	55.3	73.6	84.1
	kW	7.51	7.44	7.31	7.55	7.48	7.36	7.59	7.50	7.41
115	TC	91.0	82.0	71.6	93.2	84.5	75.4	95.6	86.6	80.7
	SHC	45.9	58.0	68.1	49.3	64.2	75.3	54.2	72.1	80.7
	kW	8.43	8.33	8.20	8.46	8.37	8.27	8.52	8.42	8.34
125	TC	86.2	77.8	68.1	88.3	80.0	71.9	90.0	81.9	77.2
	SHC	44.1	56.4	66.3	47.5	62.6	71.8	52.1	70.1	77.2
	kW	9.38	9.29	9.14	9.43	9.34	9.24	9.47	9.38	9.32

Standard Ratings

LEGEND

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

NOTES:
1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil.
Below 80 F edb, subtract (corr factor x cfm) from SHC.
Above 80 F edb, add (corr factor x cfm) to SHC.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

48HJ009 (8 1/2 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF															
		2550/0.11				3000/0.12				3400/0.13				4250/0.17			
		Air Entering Evaporator — Ewb (F)															
		57	62	67	72	57	62	67	57	62	67	72	57	62	67	72	57
75	TC	94.6	101.0	110.0	119.2	100.4	104.4	113.4	121.8	104.2	106.8	115.8	123.4	109.8	111.0	119.0	125.8
	SHC	94.6	84.4	69.4	54.4	100.4	92.4	75.0	57.2	104.2	99.0	80.0	59.8	109.8	110.4	89.4	64.2
	kW	5.72	5.76	5.76	5.82	5.74	5.76	5.80	5.86	5.74	5.76	5.82	5.88	5.76	5.78	5.84	5.90
85	TC	91.0	97.4	106.8	115.8	97.4	101.0	110.0	119.6	101.2	103.0	112.0	121.6	108.0	108.0	116.0	123.4
	SHC	91.0	83.0	68.8	53.2	97.4	91.2	74.2	57.0	101.2	97.6	78.8	59.6	108.0	108.0	89.4	64.2
	kW	6.46	6.5	6.52	6.58	6.50	6.52	6.54	6.60	6.50	6.52	6.54	6.64	6.54	6.54	6.60	6.64
95	TC	85.2	91.4	103.0	112.8	93.4	96.6	106.2	116.0	98.2	99.2	108.4	117.8	104.6	104.6	111.6	121.2
	SHC	85.2	80.4	67.2	52.6	93.4	89.4	73.0	55.8	98.2	96.2	78.2	58.8	104.6	104.6	88.0	64.6
	kW	7.24	7.28	7.36	7.42	7.30	7.32	7.38	7.44	7.34	7.36	7.4	7.46	7.36	7.36	7.42	7.50
105	TC	80.0	82.2	98.6	108.6	87.0	87.8	101.6	111.8	93.4	93.6	103.8	114.0	101.0	100.8	106.8	116.6
	SHC	80.0	76.6	65.6	51.2	87.0	85.6	71.6	54.8	93.4	93.2	76.6	57.8	101.0	100.8	86.8	63.6
	kW	8.08	8.12	8.26	8.32	8.16	8.16	8.28	8.36	8.20	8.20	8.3	8.38	8.28	8.28	8.30	8.40
115	TC	73.6	74.6	89.4	103.4	81.0	81.2	95.2	106.4	86.2	86.2	98.4	108.4	96.4	96.4	101.6	111.8
	SHC	73.6	73.0	62.2	49.6	81.0	81.2	69.4	53.0	86.2	86.2	75.0	56.4	96.4	96.4	85.4	62.8
	kW	9.00	9.00	9.16	9.28	9.08	9.08	9.22	9.30	9.14	9.14	9.26	9.34	9.22	9.22	9.30	9.38
125	TC	68.6	68.6	80.2	98.2	74.4	74.4	84.0	101.0	79.2	79.2	86.8	102.8	88.0	88.0	93.8	105.6
	SHC	68.6	68.6	59.0	48.0	74.4	74.4	65.4	51.6	79.2	79.2	71.0	54.6	88.0	88.0	82.8	61.0
	kW	9.98	9.98	10.14	10.32	10.06	10.06	10.18	10.36	10.14	10.14	10.22	10.38	10.24	10.24	10.28	10.42

Performance data — 48HJ (cont)

COOLING CAPACITIES — STANDARD UNITS (cont)

48HJ012 (10 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		3000/0.03			3200/0.03			4000/0.04			5000/0.04		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	140.3	129.4	115.0	141.2	130.4	118.1	145.2	134.0	122.1	147.5	136.6	125.3
	SHC	65.6	82.2	97.4	66.7	84.4	101.5	71.3	93.1	113.5	77.9	103.7	124.7
	kW	7.35	7.21	7.12	7.37	7.23	7.13	7.46	7.31	7.17	7.51	7.37	7.22
85	TC	137.7	125.3	110.0	138.9	126.6	113.6	142.6	130.6	117.7	144.6	133.3	122.3
	SHC	65.0	81.2	95.2	66.3	83.6	99.7	71.0	92.8	112.0	76.9	103.1	122.2
	kW	8.29	8.13	8.02	8.32	8.16	8.03	8.40	8.24	8.09	8.45	8.31	8.16
95	TC	133.8	120.7	103.0	135.1	121.9	107.2	138.8	125.8	112.8	141.7	128.5	118.5
	SHC	63.9	79.6	92.2	65.2	82.0	97.0	70.6	91.5	109.7	76.9	102.5	118.4
	kW	9.33	9.16	8.98	9.35	9.18	9.00	9.44	9.27	9.07	9.51	9.33	9.19
105	TC	128.7	115.4	96.5	129.8	116.6	99.7	133.7	120.3	107.1	136.7	122.8	114.5
	SHC	62.3	77.6	89.4	63.6	80.2	93.5	69.4	89.6	106.8	76.0	100.6	114.3
	kW	10.46	10.28	10.00	10.47	10.30	10.07	10.57	10.38	10.21	10.66	10.43	10.31
115	TC	123.2	109.1	90.8	124.3	110.3	92.2	127.9	114.4	100.8	130.9	116.8	110.1
	SHC	60.4	75.1	86.6	61.9	77.8	90.0	67.6	87.6	100.7	74.6	98.7	109.9
	kW	11.66	11.47	11.20	11.68	11.51	11.25	11.77	11.60	11.41	11.89	11.66	11.58
125	TC	117.5	101.8	86.2	118.5	103.0	87.4	121.6	107.1	96.0	124.1	110.3	104.8
	SHC	58.5	72.5	84.5	60.0	75.0	87.3	65.8	85.1	96.0	72.5	96.9	104.8
	kW	12.99	12.77	12.50	13.02	12.81	12.55	13.10	12.92	12.74	13.19	13.01	12.91

48HJ014 (12$^1/_2$ TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		3750/0.08			4300/0.09			5000/0.11			6250/0.13		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	167.1	154.3	142.0	169.8	157.7	144.8	173.5	160.6	148.4	176.5	164.5	153.3
	SHC	82.5	103.5	123.6	85.8	109.7	132.0	90.3	117.7	141.9	98.2	130.7	153.1
	kW	9.44	9.18	8.95	9.50	9.26	9.01	9.60	9.33	9.07	9.68	9.43	9.17
85	TC	162.3	149.3	135.6	165.1	152.5	139.5	168.8	155.3	143.5	172.1	159.2	149.3
	SHC	80.9	101.4	120.9	84.4	107.9	129.9	89.6	115.8	139.8	97.6	129.3	149.1
	kW	10.49	10.18	9.97	10.55	10.27	10.02	10.67	10.32	10.11	10.75	10.43	10.21
95	TC	156.5	143.7	126.3	159.6	146.8	131.3	162.3	149.8	136.5	166.5	153.2	144.5
	SHC	79.1	99.5	116.5	83.0	106.1	126.0	87.6	114.2	135.8	95.8	127.7	144.4
	kW	11.60	11.30	11.01	11.69	11.39	11.10	11.75	11.47	11.20	11.87	11.56	11.35
105	TC	150.0	136.2	115.7	153.0	139.3	120.9	155.6	142.5	138.5	158.8	145.9	138.8
	SHC	76.5	96.7	111.2	80.8	103.5	120.0	85.7	112.3	128.4	93.6	125.9	138.7
	kW	12.76	12.42	12.09	12.83	12.52	12.20	12.91	12.62	12.32	12.96	12.72	12.52
115	TC	141.8	122.2	104.4	144.3	126.1	110.8	147.7	129.4	118.9	150.7	135.2	130.1
	SHC	73.6	91.2	104.2	77.9	98.5	110.8	83.4	107.3	118.4	91.8	121.9	129.9
	kW	13.85	13.55	13.22	13.94	13.64	13.35	14.05	13.73	13.50	14.15	13.86	13.70
125	TC	132.5	108.6	93.9	134.8	111.4	100.7	137.6	114.4	106.6	140.3	122.9	120.1
	SHC	70.9	85.7	93.8	74.8	92.9	100.7	80.2	101.4	106.5	89.0	116.3	120.1
	kW	15.04	14.66	14.44	15.14	14.75	14.55	15.23	14.85	14.72	15.29	14.94	14.84

Standard Ratings

LEGEND

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

NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil.
Below 80 F edb, subtract (corr factor x cfm) from SHC.
Above 80 F edb, add (corr factor x cfm) to SHC.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

COOLING CAPACITIES — STANDARD UNITS (cont)

48HJ015 (12 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF														
		3600/0.01			4375/0.01			5000/0.01			5625/0.02			6250/0.02		
		Air Entering Evaporator — Ewb (F)														
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72
75	TC	154	166	180	159	171	185	164	175	189	168	178	191	173	180	193
	SHC	132	111	89.3	146	122	95.9	158	130	101	165	139	106	173	147	111
	kW	9.2	9.5	9.8	9.3	9.6	9.9	9.4	9.7	10.0	9.5	9.7	10.0	9.6	9.8	10.1
85	TC	149	161	174	154	165	179	159	169	182	163	172	184	167	174	186
	SHC	129	108	87.1	144	119	93.6	155	128	98.9	161	136	104	167	144	109
	kW	10.4	10.6	11.0	10.5	10.7	11.1	10.6	10.8	11.2	10.7	10.9	11.2	10.8	11.0	11.3
95	TC	144	155	168	149	160	172	154	163	176	158	166	178	162	168	180
	SHC	127	106	84.9	141	117	91.4	152	126	96.6	157	134	102	162	142	107
	kW	11.5	11.8	12.1	11.7	11.9	12.3	11.8	12.0	12.3	11.9	12.1	12.4	12.0	12.1	12.4
105	TC	138	150	162	144	154	166	148	157	169	152	159	170	157	161	172
	SHC	125	104	82.5	138	114	88.9	148	123	94.1	152	131	99.1	157	139	104
	kW	12.9	13.2	13.5	13.0	13.3	13.6	13.1	13.4	13.7	13.3	13.4	13.8	13.4	13.5	13.8
115	TC	133	143	155	138	147	159	143	150	161	147	152	163	151	154	165
	SHC	122	101	80	133	112	86.4	143	120	91.7	147	128	96.6	151	136	101
	kW	14.4	14.7	15.0	14.5	14.8	15.1	14.7	14.9	15.2	14.8	14.9	15.3	14.9	15.0	15.3
117	TC	132	142	154	137	146	157	142	149	160	145	151	161	149	153	163
	SHC	121	101	79.5	133	111	85.9	142	120	91.1	145	128	96	149	136	101
	kW	14.7	15.0	15.3	14.9	15.1	15.5	15.0	15.2	15.6	15.1	15.3	15.6	15.2	15.3	15.6
120	TC	130	140	152	135	144	155	140	147	158	144	149	159	147	151	161
	SHC	120	99.8	78.7	131	110	85.1	140	119	90.3	144	127	95.2	147	135	100
	kW	15.2	15.5	15.8	15.3	15.6	15.9	15.5	15.7	16.0	15.6	15.7	16.1	15.7	15.8	16.1
125	TC	127	137	148	132	140	151	137	143	154	141	145	155	144	147	157
	SHC	119	98.4	77.4	129	109	83.7	137	118	88.9	141	125	93.8	144	133	98.7
	kW	16.0	16.3	16.7	16.2	16.4	16.8	16.3	16.5	16.9	16.4	16.6	16.9	16.6	16.6	17.0

48HJ017 (15 TONS)

Temp (F) Air Entering Condenser (Edb)		Air Entering Evaporator — Cfm/BF														
		4500/0.02			5250/0.03			6000/0.04			6750/0.04			7500/0.05		
		Air Entering Evaporatorr — Ewb (F)														
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72
75	TC	181	196	213	186	201	217	189	204	219	194	206	220	198	208	223
	SHC	147	124	99	160	133	105	173	143	113	181	153	120	186	163	125
	kW	11.2	11.6	12.0	11.3	11.7	12.1	11.4	11.8	12.1	11.6	11.9	12.2	11.7	11.9	12.2
85	TC	175	190	205	180	194	209	183	198	212	188	200	213	192	202	214
	SHC	145	121	97	157	130	102	168	139	106	175	148	115	180	157	119
	kW	12.3	12.7	13.1	12.5	12.8	13.2	12.6	12.9	13.3	12.7	13.0	13.3	12.8	13.1	13.4
95	TC	168	182	197	172	187	201	176	190	203	181	192	205	185	194	206
	SHC	142	118	93	154	127	98	164	136	102	170	144	108	174	153	113
	kW	13.5	13.9	14.3	13.6	14.0	14.4	13.8	14.1	14.5	13.9	14.2	14.6	14.0	14.3	14.6
105	TC	161	174	188	165	178	191	169	181	193	173	182	194	177	184	194
	SHC	138	115	91	150	124	95	158	132	98	162	140	103	166	148	107
	kW	14.8	15.2	15.6	14.9	15.3	15.7	15.1	15.4	15.7	15.2	15.5	15.8	15.3	15.5	15.8
115	TC	152	165	179	157	168	180	161	171	181	166	172	183	169	174	183
	SHC	134	111	87	145	120	91	151	128	94	155	136	98	158	142	101
	kW	16.1	16.5	16.9	16.2	16.6	17.0	16.4	16.7	17.0	16.6	16.8	17.1	16.7	16.9	17.1
120	TC	148	161	—	153	—	—	157	—	—	—	—	—	—	—	—
	SHC	132	110	—	142	—	—	147	—	—	—	—	—	—	—	—
	kW	16.8	17.2	—	16.9	—	—	17.1	—	—	—	—	—	—	—	—

LEGEND

BF — Bypass Factor
Edb — Entering Dry-Bulb
Ewb — Entering Wet-Bulb
kW — Compressor Motor Power Input
ldb — Leaving Dry-Bulb
lwb — Leaving Wet-Bulb
SHC — Sensible Heat Capacity (1000 Btuh) Gross
TC — Total Capacity (1000 Btuh) Gross

NOTES:
1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil

3. The SHC is based on 80 F edb temperature of air entering evaporator coil. Below 80 F edb, subtract (corr factor x cfm) from SHC. *Above 80 F edb, add (corr factor x cfm) to SHC.*

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMP (F)					
	79	78	77	76	75	under 75
	81	*82*	*83*	*84*	*85*	*over 85*
	Correction Factor					
.05	1.04	2.07	3.11	4.14	5.18	Use formula shown below.
.10	.98	1.96	2.94	3.92	4.90	
.20	.87	1.74	2.62	3.49	4.36	
.30	.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

Performance data — 48HJ (cont)

COOLING CAPACITIES, UNITS WITH MOISTUREMI$ER™ OPTION

48HJ004 (3 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF								
		900/0.14			1200/0.17			1500/0.20		
		Air Entering Evaporator — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	41.3	37.3	34.3	43.5	39.2	35.9	45.5	41.6	38.2
	SHC	17.5	22.4	26.7	19.6	25.5	31.2	21.5	28.5	35.2
	kW	2.19	2.14	2.10	2.21	2.16	2.14	2.24	2.19	2.16
85	TC	38.6	34.4	31.6	41.3	37.5	33.3	43.5	38.6	35.5
	SHC	15.2	20.1	25.1	17.1	23.2	29.0	18.9	26.3	32.9
	kW	2.46	2.40	2.37	2.47	2.43	2.40	2.51	2.45	2.42
95	TC	35.9	31.4	28.8	39.2	35.9	30.6	41.3	35.7	32.9
	SHC	13.0	17.9	23.3	14.5	21.1	26.9	16.1	24.2	30.6
	kW	2.74	2.68	2.63	2.76	2.74	2.67	2.80	2.75	2.71
105	TC	33.8	29.7	27.4	36.3	32.2	28.7	38.1	32.8	30.4
	SHC	10.9	15.8	21.0	12.5	18.9	24.6	14.0	21.7	28.1
	kW	3.05	3.00	2.97	3.09	3.04	2.99	3.12	3.07	3.03
115	TC	31.8	28.0	25.5	33.2	28.7	26.5	34.9	30.0	27.9
	SHC	9.0	13.7	18.4	10.3	16.8	22.3	11.9	19.3	25.2
	kW	3.40	3.36	3.31	3.45	3.38	3.32	3.48	3.41	3.37
125	TC	28.7	26.3	23.4	29.7	25.5	22.9	31.3	27.1	25.5
	SHC	6.9	12.2	17.3	7.9	14.5	20.6	9.2	17.3	22.3
	kW	3.78	3.73	3.66	3.84	3.77	3.71	3.87	3.79	3.75

LEGEND

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

NOTES:
1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil.
Below 80 F edb, subtract (corr factor x cfm) from SHC.
Above 80 F edb, add (corr factor x cfm) to SHC.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

48HJ005 (4 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		1200/0.17			1450/0.19			1600/0.21			2000/0.24		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	52.9	47.5	41.5	55.7	50.9	47.5	57.0	51.7	48.1	60.5	55.6	52.1
	SHC	22.7	28.4	33.4	26.1	34.1	38.9	25.9	33.7	41.6	29.4	39.1	47.5
	kW	2.87	2.86	2.82	2.89	2.87	2.84	2.89	2.86	2.85	2.90	2.88	2.85
85	TC	49.2	43.8	37.1	52.1	47.2	43.6	52.9	47.9	43.7	55.4	51.4	47.0
	SHC	19.8	25.5	30.4	22.2	29.5	35.8	22.4	31.1	38.7	24.2	36.0	44.3
	kW	3.26	3.25	3.21	3.28	3.26	3.23	3.28	3.26	3.24	3.28	3.26	3.24
95	TC	45.8	40.1	32.8	48.2	43.6	39.4	48.8	44.0	39.3	51.7	47.4	43.0
	SHC	17.2	22.5	27.3	18.4	24.8	32.6	19.0	28.1	35.9	20.7	33.0	41.0
	kW	3.71	3.68	3.64	3.72	3.69	3.67	3.72	3.69	3.67	3.74	3.70	3.68
105	TC	41.6	37.0	29.7	43.2	38.9	35.4	43.9	39.7	34.7	46.5	41.4	37.5
	SHC	13.5	19.5	23.9	14.7	21.7	29.2	15.0	23.7	30.6	16.4	27.8	35.1
	kW	4.20	4.17	4.11	4.20	4.17	4.14	4.20	4.17	4.15	4.22	4.19	4.16
115	TC	37.2	33.2	27.1	38.4	34.0	30.8	39.4	35.5	30.0	41.3	35.2	31.9
	SHC	9.9	16.4	20.7	11.3	18.5	25.6	11.2	19.7	25.4	12.4	22.4	28.6
	kW	4.73	4.68	4.62	4.74	4.71	4.64	4.73	4.72	4.65	4.74	4.72	4.69
125	TC	32.4	28.1	24.9	33.8	28.1	27.4	35.3	30.5	26.6	36.1	32.0	28.7
	SHC	7.2	12.9	18.3	8.4	14.5	21.9	16.8	21.1	21.2	9.5	18.3	24.1
	kW	5.29	5.23	5.15	5.30	5.25	5.19	5.29	5.27	5.21	5.30	5.29	5.25

48HJ006 (5 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		1500/0.08			1750/0.09			2000/0.11			2500/0.13		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	69.9	62.7	56.2	74.7	67.3	61.0	78.5	71.2	64.8	81.7	75.5	69.3
	SHC	29.0	36.9	43.9	31.7	40.5	51.2	34.5	44.2	55.4	37.8	52.0	62.8
	kW	3.61	3.55	3.51	3.64	3.58	3.49	3.65	3.60	3.51	3.62	3.58	3.51
85	TC	65.9	59.1	51.7	70.6	63.2	56.3	75.5	66.8	60.7	78.1	70.8	65.1
	SHC	25.3	34.0	41.9	27.5	37.6	48.0	30.7	41.6	52.0	33.8	47.4	58.0
	kW	4.05	3.97	3.91	4.07	4.01	3.92	4.11	4.00	3.95	4.08	4.02	3.96
95	TC	61.9	55.2	47.7	66.5	58.8	51.3	70.4	61.9	55.7	74.2	65.9	60.6
	SHC	21.6	31.1	40.0	23.5	34.5	44.6	26.0	38.6	47.9	30.0	42.8	52.6
	kW	4.53	4.43	4.35	4.55	4.47	4.37	4.56	4.42	4.41	4.58	4.49	4.44
105	TC	57.7	51.1	44.9	61.8	54.5	47.7	65.1	57.2	50.8	68.4	60.3	56.1
	SHC	18.1	27.8	35.7	20.0	31.2	40.1	22.1	34.3	43.5	26.1	38.9	48.5
	kW	5.05	4.93	4.84	5.09	4.97	4.88	5.11	4.96	4.92	5.11	5.03	4.98
115	TC	53.4	47.2	42.0	56.6	50.0	44.2	59.6	52.5	46.2	62.6	54.9	51.6
	SHC	14.7	24.6	31.5	16.5	27.8	35.7	18.2	30.0	39.0	22.1	34.9	44.3
	kW	5.60	5.49	5.40	5.64	5.52	5.45	5.69	5.55	5.48	5.69	5.61	5.57
125	TC	48.7	42.0	36.9	51.3	45.0	39.0	54.1	46.8	40.9	56.9	49.2	45.9
	SHC	10.9	19.6	28.0	12.5	22.2	31.5	13.5	24.0	34.0	16.5	28.0	38.8
	kW	6.26	6.12	6.02	6.28	6.18	6.09	6.33	6.18	6.13	6.33	6.27	6.22

COOLING CAPACITIES, UNITS WITH MOISTUREMI$ER™ OPTION (cont)

48HJ007 (6 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		1800/0.05			2100/0.06			2400/0.06			3000/0.08		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	82.6	75.6	68.5	84.9	78.0	70.9	85.9	79.5	73.5	89.1	82.7	77.0
	SHC	36.0	44.8	55.4	37.5	49.1	59.7	38.8	51.1	64.0	41.8	58.1	70.2
	kW	4.60	4.52	4.36	4.67	4.57	4.46	4.70	4.57	4.45	4.77	4.61	4.51
85	TC	78.2	71.6	64.5	80.9	73.4	65.8	82.0	74.4	67.9	85.8	78.2	72.3
	SHC	31.4	41.2	51.7	33.0	44.7	55.8	34.7	47.4	60.1	37.6	54.3	66.7
	kW	5.16	5.03	4.89	5.22	5.11	4.96	5.26	5.09	4.97	5.32	5.17	5.04
95	TC	73.8	67.4	60.2	76.3	68.3	60.5	77.5	69.3	62.3	82.0	72.8	67.5
	SHC	27.0	37.6	47.9	28.2	40.0	51.6	30.2	43.7	56.2	33.6	49.2	62.9
	kW	5.75	5.60	5.44	5.80	5.66	5.48	5.84	5.68	5.53	5.90	5.73	5.60
105	TC	68.4	62.6	55.9	71.4	64.3	56.2	72.1	64.6	58.3	75.7	67.0	62.4
	SHC	22.3	33.5	43.5	23.4	36.5	48.0	25.4	38.4	50.2	29.1	45.2	56.2
	kW	6.37	6.22	6.06	6.45	6.27	6.10	6.46	6.29	6.16	6.53	6.36	6.24
115	TC	63.4	57.8	50.7	66.0	60.1	51.5	66.4	59.6	54.5	68.8	60.8	57.5
	SHC	18.1	29.5	38.9	18.8	32.9	44.1	20.7	33.3	43.8	24.3	41.4	49.7
	kW	7.04	6.89	6.68	7.10	6.91	6.74	7.12	6.95	6.83	7.16	7.01	6.92
125	TC	55.5	49.6	45.8	58.4	52.4	46.1	57.6	52.1	49.5	59.2	52.8	53.1
	SHC	15.3	24.0	35.2	15.7	27.5	39.0	17.5	27.5	38.4	20.9	34.6	44.4
	kW	7.80	7.61	7.38	7.83	7.67	7.49	7.89	7.72	7.58	7.92	7.78	7.70

48HJ008 (7 1/2 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF								
		2250/0.10			3000/0.11			3750/0.14		
		Air Entering Evaporator — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	98.4	91.1	81.1	103.7	97.9	91.8	105.8	101.3	94.1
	SHC	44.5	55.4	67.0	50.4	65.4	80.5	54.5	72.4	89.5
	kW	5.05	4.96	4.87	5.09	5.04	4.97	5.16	5.04	4.99
85	TC	94.2	85.8	76.9	100.3	92.4	85.2	103.5	96.8	89.0
	SHC	39.7	51.3	62.7	46.2	58.3	75.7	50.6	68.2	84.3
	kW	5.74	5.65	5.55	5.81	5.75	5.64	5.89	5.74	5.70
95	TC	89.9	80.5	72.6	96.9	86.8	78.6	101.1	92.2	83.8
	SHC	34.8	47.2	58.3	41.9	51.2	71.0	46.6	63.9	79.1
	kW	6.42	6.33	6.22	6.52	6.45	6.31	6.62	6.43	6.40
105	TC	84.6	75.3	68.0	91.6	81.3	73.4	94.5	86.3	78.4
	SHC	30.0	42.5	53.9	36.9	49.3	66.4	41.4	59.2	73.8
	kW	7.26	7.16	7.05	7.36	7.25	7.15	7.46	7.29	7.23
115	TC	79.2	70.1	63.3	86.2	75.8	68.1	87.9	80.3	72.9
	SHC	25.2	37.8	49.4	31.9	47.4	61.9	36.1	54.4	68.5
	kW	8.10	7.99	7.87	8.20	8.05	7.98	8.30	8.14	8.05
125	TC	72.8	64.5	57.2	78.0	69.8	62.3	81.6	73.2	69.2
	SHC	20.1	33.4	44.1	25.4	42.5	56.5	31.1	48.9	64.7
	kW	9.10	8.94	8.83	9.23	9.05	8.95	9.26	9.10	8.99

LEGEND

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

NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil.
   Below 80 F edb, subtract (corr factor x cfm) from SHC.
   Above 80 F edb, add (corr factor x cfm) to SHC.
   Correction Factor = 1.10 x (1 – BF) x (edb – 80).

Performance data — 48HJ (cont)

COOLING CAPACITIES, UNITS WITH MOISTUREMI$ER™ OPTION (cont)

48HJ009 (8 1/2 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		2550/0.08			3000/0.09			3400/0.11			4250/0.13		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	114.1	104.1	97.8	116.3	108.5	103.4	117.6	111.9	108.0	122.2	118.9	111.4
	SHC	49.8	64.2	81.2	52.6	70.8	89.0	55.4	76.9	95.4	62.0	87.0	107.2
	kW	5.57	5.46	5.44	5.59	5.50	5.44	5.60	5.51	5.44	5.62	5.62	5.69
85	TC	107.3	98.4	92.6	111.0	101.8	98.0	113.0	104.2	102.0	117.1	111.4	106.1
	SHC	42.2	58.3	76.0	47.1	64.5	83.5	51.2	70.2	89.2	57.3	81.2	101.2
	kW	6.32	6.30	6.15	6.32	6.27	6.18	6.34	6.22	6.20	6.30	6.31	6.45
95	TC	101.9	92.4	86.8	105.3	95.5	92.8	107.4	97.7	96.5	112.1	103.7	100.3
	SHC	35.4	51.9	70.3	40.1	58.5	77.9	44.9	64.9	83.7	52.1	74.0	94.8
	kW	7.06	7.13	6.93	7.06	7.06	6.95	7.06	6.99	6.98	7.01	7.04	7.17
105	TC	94.5	85.4	77.0	97.6	88.3	82.4	99.9	90.6	88.0	104.1	96.1	94.0
	SHC	29.7	45.7	63.2	33.9	52.2	70.1	38.0	58.3	75.7	44.4	67.6	88.5
	kW	7.99	8.00	7.81	8.01	7.97	7.85	8.02	7.94	7.89	7.96	7.96	8.08
115	TC	86.4	75.0	68.3	89.3	80.2	74.1	91.4	83.2	78.4	96.5	88.4	87.1
	SHC	24.0	38.7	56.4	27.4	45.6	62.9	31.1	51.9	67.0	37.0	60.8	81.8
	kW	8.91	8.83	8.66	8.93	8.86	8.76	8.97	8.86	8.84	8.91	8.93	8.90
125	TC	78.6	65.5	60.2	81.3	68.9	64.7	83.3	71.6	68.2	88.5	78.8	78.9
	SHC	18.3	32.0	48.8	21.2	38.0	53.5	24.1	44.1	57.5	29.4	53.3	73.8
	kW	9.81	9.65	9.53	9.86	9.68	9.64	9.89	9.71	9.75	9.90	9.72	9.88

48HJ012 (10 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		3000/0.03			3200/0.03			4000/0.04			5000/0.04		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	134.3	122.5	111.4	135.8	124.3	113.0	138.4	129.5	123.5	143.3	136.5	130.2
	SHC	60.0	76.1	93.7	61.3	79.1	97.4	68.0	89.5	109.4	75.2	100.9	123.3
	kW	7.03	6.84	6.72	7.01	6.89	6.77	7.10	6.92	6.77	7.15	7.03	6.88
85	TC	127.6	115.4	104.6	128.9	118.1	107.0	132.5	121.5	116.6	137.2	128.0	122.9
	SHC	51.5	68.8	87.2	53.9	72.0	91.2	61.0	82.7	102.4	68.6	93.6	115.9
	kW	7.96	7.86	7.59	7.94	7.78	7.51	8.02	7.84	7.69	8.02	7.94	7.79
95	TC	120.9	108.3	97.8	121.9	111.8	101.0	126.5	113.4	109.7	131.1	119.4	115.5
	SHC	43.0	61.5	80.6	46.5	64.8	84.9	53.9	75.9	95.4	62.0	86.2	108.4
	kW	8.88	8.87	8.46	8.86	8.66	8.26	8.94	8.76	8.60	8.89	8.85	8.69
105	TC	112.0	99.9	90.4	113.1	103.2	93.4	117.2	105.0	100.7	122.1	110.5	105.9
	SHC	36.1	54.1	73.8	38.8	57.8	78.9	45.6	68.2	86.8	53.0	78.3	99.7
	kW	10.0	10.0	9.6	10.0	9.8	9.5	10.1	9.9	9.8	10.1	10.0	9.9
115	TC	103.0	91.5	83.1	104.3	94.6	85.9	107.8	96.7	91.7	113.0	101.6	96.4
	SHC	29.2	46.7	66.9	31.2	50.7	72.9	37.3	60.6	78.3	44.0	70.3	90.9
	kW	11.2	11.1	10.8	11.2	11.0	10.7	11.3	11.1	11.0	11.3	11.2	11.1
125	TC	94.1	83.1	75.7	95.5	86.0	78.3	98.5	88.3	82.7	104.0	92.7	86.8
	SHC	22.3	39.3	60.1	23.5	43.7	66.8	29.0	52.9	69.7	35.0	62.4	82.2
	kW	12.35	12.15	11.94	12.38	12.13	11.92	12.48	12.27	12.25	12.53	12.30	12.28

48HJ014 (12 1/2 TONS)

Temp (F) Air Ent Condenser (Edb)		Air Entering Evaporator — Cfm/BF											
		3750/0.08			4300/0.09			5000/0.11			6250/0.13		
		Air Entering Evaporator — Ewb (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
75	TC	156.3	144.2	132.3	160.0	148.4	136.2	162.8	150.6	138.2	169.0	157.5	145.6
	SHC	66.6	87.6	112.1	72.5	94.8	121.3	76.9	99.6	127.5	87.0	115.5	142.7
	kW	9.28	8.98	8.59	9.35	9.08	8.80	9.40	9.18	8.9	9.43	9.18	8.93
85	TC	147.6	136.2	123.7	150.7	140.1	127.2	154.1	140.8	127.9	161.1	148.0	135.4
	SHC	58.7	80.0	103.8	63.5	86.5	112.2	68.7	91.0	118.1	77.7	107.8	133.2
	kW	10.29	9.93	9.58	10.36	10.08	9.77	10.40	10.34	10.03	10.45	10.18	9.88
95	TC	138.9	128.2	115.1	141.4	131.8	118.3	145.3	131.0	117.6	153.1	138.4	125.1
	SHC	50.8	72.3	95.5	54.4	78.1	103.2	60.5	82.3	108.7	68.5	100.0	123.7
	kW	11.29	10.87	10.57	11.37	11.08	10.74	11.40	11.50	11.1	11.46	11.17	10.83
105	TC	129.1	117.8	105.8	131.7	121.0	108.7	134.8	119.9	107.7	140.9	126.9	115.9
	SHC	42.1	63.5	86.5	45.4	69.0	93.9	51.2	74.2	101.3	57.7	90.2	113.6
	kW	12.59	12.14	11.82	12.67	12.34	11.96	12.70	12.67	12.28	12.79	12.46	12.08
115	TC	119.2	107.3	96.4	122.1	110.2	99.0	124.2	108.8	97.8	128.7	115.3	106.7
	SHC	33.5	54.8	77.5	36.4	59.8	84.7	41.9	66.1	93.8	46.8	80.5	103.5
	kW	13.90	13.40	13.08	13.98	13.59	13.18	14.00	13.83	13.41	14.11	13.75	13.33
125	TC	109.4	96.9	87.1	112.4	99.4	89.3	113.7	97.7	87.8	116.5	103.8	97.5
	SHC	24.8	46.0	68.5	27.4	50.7	75.5	32.6	58.0	86.4	36.0	70.7	93.5
	kW	15.20	14.67	14.33	15.28	14.85	14.40	15.30	15.00	14.54	15.44	15.04	14.58

LEGEND

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

NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil.

3. The SHC is based on 80 F edb temperature of air entering evaporator coil.
Below 80 F edb, subtract (corr factor x cfm) from SHC.
Above 80 F edb, add (corr factor x cfm) to SHC.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

COOLING CAPACITIES, UNITS WITH MOISTUREMI$ER™ OPTION (cont)

48HJ015 (12 TONS)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm/BF															
		3600/0.01			4375/0.01			5000/0.01			5625/0.02			6250/0.02			
		Evaporator Air — Ewb (F)															
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72	
75	TC	—	159	180	151	166	181	157	170	188	161	173	193	171	176	192	
	SHC	—	97	78	131	110	85	143	117	89	154	127	97	170	135	101	
	kW	—	9.3	9.8	9.2	9.7	9.8	9.2	9.5	10.0	9.4	9.7	10.0	9.7	9.8	10.1	
85	TC	—	153	168	145	159	175	151	162	178	155	166	182	160	169	184	
	SHC	—	90	72	126	103	79	138	112	84	149	121	90	158	129	96	
	kW	—	10.4	10.9	10.4	10.8	11.1	10.4	10.7	11.0	10.3	10.7	11.2	10.8	10.9	11.4	
95	TC	—	146	161	139	152	166	145	156	172	148	160	174	152	163	176	
	SHC	—	85	67	119	97	74	132	107	80	142	116	85	149	125	89	
	kW	—	11.6	12.0	11.3	11.7	12.2	11.6	11.8	12.3	11.7	12.0	12.3	11.6	12.0	12.3	
105	TC	121	138	154	129	145	161	133	149	164	137	151	165	144	154	168	
	SHC	96	80	62	111	91	68	123	101	56	133	109	80	141	118	85	
	kW	12.3	12.8	13.3	12.6	12.9	13.5	12.7	13.0	13.3	12.8	13.0	13.6	12.9	13.3	13.7	
115	TC	105	127	145	114	134	151	116	139	155	121	142	158	131	145	160	
	SHC	81	71	55	96	85	63	103	93	67	114	102	72	126	111	78	
	kW	13.7	14.2	14.6	13.8	14.4	14.9	14.0	14.7	15.1	14.2	14.8	15.2	14.4	14.8	15.2	
117	TC	105	123	145	110	132	150	114	137	154	120	141	156	129	143	158	
	SHC	79	67	53	94	84	60	105	123	67	115	101	70	125	111	77	
	kW	13.8	14.3	15.0	14.2	14.6	15.3	14.3	14.7	15.4	14.1	14.9	15.4	14.5	14.9	15.4	
120	TC	104	120	141	107	129	147	110	134	152	114	138	154	123	142	156	
	SHC	80	65	51	88	79	57	99	88	64	107	97	68	116	105	73	
	kW	14.5	14.9	15.3	14.5	15.1	15.5	14.6	15.2	15.6	14.6	15.2	15.9	15.0	15.4	15.9	
125	TC	97	113	137	101	118	142	105	127	146	109	131	148	113	136	150	
	SHC	74	59	48	83	69	54	94	82	60	101	92	64	105	100	71	
	kW	15.1	15.5	16.2	15.1	15.6	16.3	15.3	15.9	16.4	15.2	16.1	16.5	15.5	16.1	16.6	

48HJ017 (15 TONS)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm/BF															
		4500/0.02			5250/0.03			6000/0.04			6750/0.04			7500/0.05			
		Evaporator Air — Ewb (F)															
		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72	
75	TC	—	185	203	175	191	209	179	195	212	182	198	213	186	200	216	
	SHC	—	105	82	141	115	88	154	125	96	165	135	104	174	145	109	
	kW	—	11.3	11.7	11.0	11.4	11.8	11.1	11.5	11.9	11.2	11.6	11.9	11.3	11.7	12.0	
85	TC	—	176	193	166	183	199	170	186	202	173	189	204	177	190	205	
	SHC	—	98	74	134	108	81	145	116	85	156	126	93	162	134	97	
	kW	—	12.3	12.7	12.1	12.9	13.4	12.1	12.6	13.5	12.2	12.7	13.5	12.7	12.2	12.7	
95	TC	—	168	182	156	173	187	160	176	191	163	178	194	167	181	196	
	SHC	—	91	66	126	100	72	137	108	76	146	116	82	153	125	86	
	kW	—	13.7	13.5	13.1	13.6	13.9	13.2	13.6	14.1	13.3	13.4	14.3	13.5	13.9	14.6	
105	TC	—	156	173	145	160	175	148	162	177	151	166	178	154	167	180	
	SHC	—	83	59	117	90	62	127	98	66	136	106	70	141	112	74	
	kW	—	14.5	15.3	14.2	14.8	15.1	14.4	14.5	15.1	14.4	14.9	14.9	14.2	14.6	14.9	
115	TC	—	141	156	130	146	160	132	150	162	135	150	164	139	152	166	
	SHC	—	72	47	104	79	52	112	86	55	119	93	59	127	100	63	
	kW	—	15.6	15.9	15.2	15.8	16.2	15.3	16.1	16.3	15.4	16.0	16.4	15.8	16.1	16.4	
118	TC	—	138	151	126	141	153	129	144	—	134	145	—	135	148	—	
	SHC	—	68	43	100	74	46	108	83	—	120	88	—	124	96	—	
	kW	—	16.1	16.5	15.7	16.1	16.5	15.8	16.3	—	16.0	16.3	—	15.9	16.3	—	
120	TC	—	134	—	124	—	—	126	—	—	—	—	—	—	—	—	
	SHC	—	65	—	99	—	—	106	—	—	—	—	—	—	—	—	
	kW	—	16.2	—	15.9	—	—	16.0	—	—	—	—	—	—	—	—	

LEGEND

BF — Bypass Factor
Edb — Entering Dry-Bulb
Ewb — Entering Wet-Bulb
kW — Compressor Motor Power Input
ldb — Leaving Dry-Bulb
lwb — Leaving Wet-Bulb
SHC — Sensible Heat Capacity (1000 Btuh) Gross
TC — Total Capacity (1000 Btuh) Gross

NOTES:
1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering evaporator coil

3. The SHC is based on 80 F edb temperature of air entering evaporator coil. Below 80 F edb, subtract (corr factor x cfm) from SHC. *Above 80 F edb, add (corr factor x cfm) to SHC.*

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMP (F)					
	79	78	77	76	75	under 75
	81	*82*	*83*	*84*	*85*	*over 85*
	Correction Factor					
.05	1.04	2.07	3.11	4.14	5.18	Use formula shown below.
.10	.98	1.96	2.94	3.92	4.90	
.20	.87	1.74	2.62	3.49	4.36	
.30	.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.
Correction Factor = 1.10 x (1 – BF) x (edb – 80).

Performance data — 48HJ (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS

48HJ004 (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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**567**	**0.15**	**145**	688	0.22	222	786	0.30	296	871	0.37	368	947	0.44	437
1000	**599**	**0.18**	**177**	717	0.27	265	814	0.35	349	897	0.43	430	972	0.51	509
1100	**632**	**0.22**	**215**	747	0.31	313	842	0.41	407	925	0.50	498	999	0.59	587
1200	**666**	**0.26**	**257**	778	0.37	367	871	0.47	471	952	0.57	572	1025	0.67	670
1300	701	0.31	306	810	0.43	426	901	0.54	540	981	0.65	651	**1053**	**0.76**	**760**
1400	737	0.36	361	842	0.49	491	931	0.62	616	1010	0.74	738	**1081**	**0.86**	**856**
1500	773	0.42	422	875	0.57	564	963	0.70	699	1040	0.84	831	**1110**	**0.96**	**960**

48HJ004 (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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1016	0.51	505	**1080**	**0.57**	**572**	**1139**	**0.64**	**637**	**1195**	**0.71**	**702**	**1249**	**0.77**	**765**
1000	1041	0.59	587	**1104**	**0.67**	**662**	**1163**	**0.74**	**737**	**1219**	**0.81**	**811**	**1272**	**0.89**	**883**
1100	**1066**	**0.68**	**674**	**1129**	**0.76**	**759**	**1188**	**0.85**	**843**	**1243**	**0.93**	**925**	**1296**	**1.01**	**1007**
1200	**1093**	**0.77**	**767**	**1155**	**0.87**	**861**	**1213**	**0.96**	**955**	**1268**	**1.05**	**1047**	**1321**	**1.14**	**1137**
1300	**1119**	**0.87**	**866**	**1181**	**0.98**	**970**	**1239**	**1.08**	**1073**	**1294**	**1.18**	**1175**	—	—	—
1400	**1147**	**0.98**	**972**	**1208**	**1.09**	**1086**	—	—	—	—	—	—	—	—	—
1500	**1175**	**1.09**	**1086**	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 680 to 1044 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.20.
3. See page 163 for general fan performance notes.

48HJ004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**567**	**0.15**	**145**	**688**	**0.22**	**222**	**786**	**0.30**	**296**	**871**	**0.37**	**368**	**947**	**0.44**	**437**
1000	**599**	**0.18**	**177**	**717**	**0.27**	**265**	**814**	**0.35**	**349**	**897**	**0.43**	**430**	**972**	**0.51**	**509**
1100	**632**	**0.22**	**215**	**747**	**0.31**	**313**	**842**	**0.41**	**407**	**925**	**0.50**	**498**	**999**	**0.59**	**587**
1200	**666**	**0.26**	**257**	**778**	**0.37**	**367**	**871**	**0.47**	**471**	**952**	**0.57**	**572**	**1025**	**0.67**	**670**
1300	**701**	**0.31**	**306**	**810**	**0.43**	**426**	**901**	**0.54**	**540**	**981**	**0.65**	**651**	**1053**	**0.76**	**760**
1400	**737**	**0.36**	**361**	**842**	**0.49**	**491**	**931**	**0.62**	**616**	**1010**	**0.74**	**738**	1081	0.86	856
1500	**773**	**0.42**	**422**	**875**	**0.57**	**564**	**963**	**0.70**	**699**	**1040**	**0.84**	**831**	1110	0.96	960

48HJ004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**1016**	**0.51**	**505**	1080	0.57	572	1139	0.64	637	1195	0.71	702	1249	0.77	765
1000	**1041**	**0.59**	**587**	1104	0.67	662	1163	0.74	737	1219	0.81	811	1272	0.89	883
1100	**1066**	**0.68**	**674**	1129	0.76	759	1188	0.85	843	1243	0.93	925	1296	1.01	1007
1200	1093	0.77	767	1155	0.87	861	1213	0.96	955	1268	1.05	1047	1321	1.14	1137
1300	1119	0.87	866	1181	0.98	970	1239	1.08	1073	1294	1.18	1175	1346	1.28	1275
1400	1147	0.98	972	1208	1.09	1086	1265	1.21	1199	1320	1.32	1310	1371	1.43	1419
1500	1175	1.09	1086	1235	1.22	1209	1292	1.34	1332	1346	1.46	1452	1397	1.58	1572

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

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

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.
3. See page 163 for general fan performance notes.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ005 (4 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**666**	**0.26**	**257**	778	0.37	367	871	0.47	471	952	0.57	572	1025	0.67	670
1300	**701**	**0.31**	**306**	810	0.43	426	901	0.54	540	981	0.65	651	1053	0.76	760
1400	**737**	**0.36**	**361**	842	0.49	491	931	0.62	616	1010	0.74	738	1081	0.86	856
1500	773	0.42	422	875	0.57	564	963	0.70	699	1040	0.84	831	1110	0.96	960
1600	810	0.49	491	909	0.65	643	994	0.79	790	1070	0.94	932	1140	1.08	1070
1700	847	0.57	567	943	0.73	730	1027	0.89	888	1101	1.05	1040	1170	1.20	1189
1800	885	0.66	652	978	0.83	826	1060	1.00	994	1133	1.16	1157	—	—	—
1900	923	0.75	745	1014	0.94	930	1093	1.11	1109	—	—	—	—	—	—
2000	962	0.85	847	1049	1.05	1043	—	—	—	—	—	—	—	—	—

48HJ005 (4 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1093	0.77	767	1155	0.87	861	**1213**	**0.96**	**955**	**1268**	**1.05**	**1047**	**1321**	**1.14**	**1137**
1300	1119	0.87	866	1181	0.98	970	**1239**	**1.08**	**1073**	**1294**	**1.18**	**1175**	—	—	—
1400	1147	0.98	972	**1208**	**1.09**	**1086**	—	—	—	—	—	—	—	—	—
1500	1175	1.09	1086	—	—	—	—	—	—	—	—	—	—	—	—
1600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 770 to 1185 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.20.
3. See page 163 for general fan performance notes.

48HJ005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**666**	**0.26**	**257**	**778**	**0.37**	**367**	**871**	**0.47**	**471**	**952**	**0.57**	**572**	**1025**	**0.67**	**670**
1300	**701**	**0.31**	**306**	**810**	**0.43**	**426**	**901**	**0.54**	**540**	**981**	**0.65**	**651**	**1053**	**0.76**	**760**
1400	**737**	**0.36**	**361**	**842**	**0.49**	**491**	**931**	**0.62**	**616**	**1010**	**0.74**	**738**	1081	0.86	856
1500	**773**	**0.42**	**422**	**875**	**0.57**	**564**	**963**	**0.70**	**699**	**1040**	**0.84**	**831**	1110	0.96	960
1600	**810**	**0.49**	**491**	**909**	**0.65**	**643**	**994**	**0.79**	**790**	**1070**	**0.94**	**932**	1140	1.08	1070
1700	**847**	**0.57**	**567**	**943**	**0.73**	**730**	**1027**	**0.89**	**888**	1101	1.05	1040	1170	1.20	1189
1800	**885**	**0.66**	**652**	**978**	**0.83**	**826**	**1060**	**1.00**	**994**	1133	1.16	1157	1200	1.32	1316
1900	**923**	**0.75**	**745**	**1014**	**0.94**	**930**	1093	1.11	1109	1165	1.29	1283	1231	1.46	1453
2000	**962**	**0.85**	**847**	**1049**	**1.05**	**1043**	1127	1.24	1233	1198	1.42	1417	1263	1.61	1598

48HJ005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1093	0.77	767	1155	0.87	861	1213	0.96	955	1268	1.05	1047	1321	1.14	1137
1300	1119	0.87	866	1181	0.98	970	1239	1.08	1073	1294	1.18	1175	1346	1.28	1275
1400	1147	0.98	972	1208	1.09	1086	1265	1.21	1199	1320	1.32	1310	1371	1.43	1419
1500	1175	1.09	1086	1235	1.22	1209	1292	1.34	1332	1346	1.46	1452	1397	1.58	1572
1600	1204	1.21	1207	1263	1.35	1340	1320	1.48	1472	1373	1.61	1603	1424	1.74	1732
1700	1233	1.34	1336	1292	1.49	1480	1348	1.63	1622	1401	1.77	1762	1451	1.91	1901
1800	1262	1.48	1473	1321	1.64	1627	1376	1.79	1779	1428	1.94	1930	**1479**	**2.09**	**2078**
1900	1293	1.63	1620	1350	1.79	1784	1405	1.96	1946	**1457**	**2.12**	**2106**	**1506**	**2.28**	**2265**
2000	1323	1.79	1776	1380	1.96	1950	1434	2.13	2123	**1486**	**2.31**	**2293**	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

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

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.
3. See page 163 for general fan performance notes.

Performance data — 48HJ (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ006 (5 TONS) — STANDARD MOTOR (BELT DRIVE)* — SINGLE-PHASE UNITS

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**848**	**0.42**	**371**	**968**	**0.55**	**486**	1069	0.68	600	1158	0.80	715	1238	0.94	831
1600	**887**	**0.49**	**433**	**1004**	**0.63**	**556**	1103	0.76	678	1190	0.90	800	1269	1.04	922
1700	**927**	**0.57**	**502**	1040	0.71	633	1137	0.86	763	1223	1.00	892	1302	1.15	1022
1800	**967**	**0.65**	**579**	1077	0.81	718	1172	0.96	856	1257	1.12	993	1334	1.27	1130
1900	**1007**	**0.75**	**663**	1115	0.91	811	1208	1.08	957	1291	1.24	1101	—	—	—
2000	1048	0.85	757	1153	1.03	913	1244	1.20	1066	—	—	—	—	—	—
2100	1090	0.97	859	1191	1.15	1023	—	—	—	—	—	—	—	—	—
2200	1131	1.09	970	1230	1.29	1143	—	—	—	—	—	—	—	—	—
2300	1173	1.23	1091	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48HJ006 (5 TONS) — STANDARD MOTOR (BELT DRIVE)* — SINGLE-PHASE UNITS (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1312	1.07	948	1380	1.20	1067	—	—	—	—	—	—	—	—	—
1600	1342	1.18	1047	—	—	—	—	—	—	—	—	—	—	—	—
1700	1374	1.30	1153	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 1035 to 1460 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.30.
3. See page 163 for general fan performance notes.

48HJ006 (5 TONS) — STANDARD MOTOR (BELT DRIVE)* — THREE-PHASE UNITS

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**848**	**0.42**	**371**	**968**	**0.55**	**486**	1069	0.68	600	1158	0.80	715	1238	0.94	831
1600	**887**	**0.49**	**433**	**1004**	**0.63**	**556**	1103	0.76	678	1190	0.90	800	1269	1.04	922
1700	**927**	**0.57**	**502**	1040	0.71	633	1137	0.86	763	1223	1.00	892	1302	1.15	1022
1800	**967**	**0.65**	**579**	1077	0.81	718	1172	0.96	856	1257	1.12	993	1334	1.27	1130
1900	**1007**	**0.75**	**663**	1115	0.91	811	1208	1.08	957	1291	1.24	1101	1368	1.40	1246
2000	1048	0.85	757	1153	1.03	913	1244	1.20	1066	1326	1.37	1219	1401	1.54	1371
2100	1090	0.97	859	1191	1.15	1023	1281	1.33	1185	1361	1.51	1345	1435	1.69	1505
2200	1131	1.09	970	1230	1.29	1143	1318	1.48	1313	1397	1.67	1481	**1470**	**1.86**	**1649**
2300	1173	1.23	1091	1269	1.43	1273	1355	1.63	1451	1433	1.83	1627	**1505**	**2.03**	**1803**
2400	1215	1.38	1223	1309	1.59	1413	1393	1.80	1600	**1470**	**2.01**	**1784**	**1540**	**2.21**	**1967**
2500	1258	1.54	1365	1349	1.76	1564	1431	1.98	1759	**1506**	**2.20**	**1951**	—	—	—

48HJ006 (5 TONS) — STANDARD MOTOR (BELT DRIVE)* — THREE-PHASE UNITS (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1312	1.07	948	1380	1.20	1067	1445	1.34	1189	**1506**	**1.48**	**1312**	**1564**	**1.62**	**1437**
1600	1342	1.18	1047	1411	1.32	1173	**1474**	**1.46**	**1300**	**1535**	**1.61**	**1429**	**1593**	**1.76**	**1560**
1700	1374	1.30	1153	1441	1.45	1286	**1505**	**1.60**	**1420**	**1565**	**1.75**	**1555**	**1622**	**1.91**	**1692**
1800	1406	1.43	1268	**1473**	**1.58**	**1407**	**1535**	**1.74**	**1548**	**1595**	**1.90**	**1690**	**1652**	**2.06**	**1833**
1900	1438	1.57	1391	**1504**	**1.73**	**1537**	**1567**	**1.90**	**1685**	**1626**	**2.06**	**1833**	**1682**	**2.23**	**1983**
2000	**1471**	**1.72**	**1523**	**1536**	**1.89**	**1677**	**1598**	**2.06**	**1831**	**1657**	**2.24**	**1986**	—	—	—
2100	**1504**	**1.87**	**1665**	**1569**	**2.06**	**1825**	**1630**	**2.24**	**1986**	—	—	—	—	—	—
2200	**1538**	**2.04**	**1816**	**1602**	**2.23**	**1984**	—	—	—	—	—	—	—	—	—
2300	**1572**	**2.23**	**1978**	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 1035 to 1460 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.
3. See page 163 for general fan performance notes.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**848**	**0.42**	**371**	**968**	**0.55**	**486**	**1069**	**0.68**	**600**	**1158**	**0.80**	**715**	**1238**	**0.94**	**831**
1600	**887**	**0.49**	**433**	**1004**	**0.63**	**556**	**1103**	**0.76**	**678**	**1190**	**0.90**	**800**	**1269**	**1.04**	**922**
1700	**927**	**0.57**	**502**	**1040**	**0.71**	**633**	**1137**	**0.86**	**763**	**1223**	**1.00**	**892**	1302	1.15	1022
1800	**967**	**0.65**	**579**	**1077**	**0.81**	**718**	**1172**	**0.96**	**856**	**1257**	**1.12**	**993**	1334	1.27	1130
1900	**1007**	**0.75**	**663**	**1115**	**0.91**	**811**	**1208**	**1.08**	**957**	**1291**	**1.24**	**1101**	1368	1.40	1246
2000	**1048**	**0.85**	**757**	**1153**	**1.03**	**913**	**1244**	**1.20**	**1066**	1326	1.37	1219	1401	1.54	1371
2100	**1090**	**0.97**	**859**	**1191**	**1.15**	**1023**	**1281**	**1.33**	**1185**	1361	1.51	1345	1435	1.69	1505
2200	**1131**	**1.09**	**970**	**1230**	**1.29**	**1143**	1318	1.48	1313	1397	1.67	1481	1470	1.86	1649
2300	**1173**	**1.23**	**1091**	**1269**	**1.43**	**1273**	1355	1.63	1451	1433	1.83	1627	1505	2.03	1803
2400	**1215**	**1.38**	**1223**	1309	1.59	1413	1393	1.80	1600	1470	2.01	1784	1540	2.21	1967
2500	**1258**	**1.54**	**1365**	1349	1.76	1564	1431	1.98	1759	1506	2.20	1951	1576	2.41	2142

48HJ006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1312	1.07	948	1380	1.20	1067	1445	1.34	1189	1506	1.48	1312	1564	1.62	1437
1600	1342	1.18	1047	1411	1.32	1173	1474	1.46	1300	1535	1.61	1429	1593	1.76	1560
1700	1374	1.30	1153	1441	1.45	1286	1505	1.60	1420	1565	1.75	1555	1622	1.91	1692
1800	1406	1.43	1268	1473	1.58	1407	1535	1.74	1548	1595	1.90	1690	1652	2.06	1833
1900	1438	1.57	1391	1504	1.73	1537	1567	1.90	1685	1626	2.06	1833	1682	2.23	1983
2000	1471	1.72	1523	1536	1.89	1677	1598	2.06	1831	1657	2.24	1986	**1713**	**2.41**	**2142**
2100	1504	1.87	1665	1569	2.06	1825	1630	2.24	1986	**1688**	**2.42**	**2149**	**1744**	**2.60**	**2312**
2200	1538	2.04	1816	1602	2.23	1984	1663	2.42	2152	**1720**	**2.61**	**2321**	**1775**	**2.81**	**2491**
2300	1572	2.23	1978	1635	2.42	2153	**1695**	**2.62**	**2328**	**1753**	**2.82**	**2504**	—	—	—
2400	1607	2.42	2150	1669	2.63	2332	**1729**	**2.83**	**2515**	—	—	—	—	—	—
2500	1642	2.63	2333	**1704**	**2.84**	**2523**	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

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

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.
3. See page 163 for general fan performance notes.

48HJ007 (6 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**967**	**0.63**	**563**	**1075**	**0.80**	**715**	1170	0.97	861	1255	1.13	1002	1333	1.28	1139
1900	**1008**	**0.72**	**643**	**1112**	**0.91**	**805**	1205	1.08	960	1289	1.25	1111	1366	1.42	1258
2000	**1049**	**0.82**	**731**	1151	1.02	903	1241	1.20	1068	1323	1.38	1228	1399	1.56	1384
2100	**1091**	**0.93**	**827**	1189	1.14	1008	1278	1.33	1183	1358	1.52	1353	1433	1.71	1519
2200	1133	1.05	933	1229	1.26	1123	1315	1.47	1308	1393	1.67	1487	1467	1.87	1662
2300	1176	1.18	1047	1268	1.40	1247	1352	1.62	1441	1429	1.84	1630	1501	2.04	1815
2400	1218	1.32	1170	1308	1.55	1380	1390	1.78	1584	1466	2.01	1782	1537	2.23	1977
2500	1261	1.47	1304	1349	1.72	1523	1429	1.96	1736	1503	2.19	1945	—	—	—
2600	1305	1.63	1448	1390	1.89	1677	1468	2.14	1900	1540	2.38	2117	—	—	—
2700	1348	1.80	1602	1431	2.07	1841	1507	2.33	2073	—	—	—	—	—	—
2800	1392	1.99	1768	1472	2.27	2016	—	—	—	—	—	—	—	—	—
2900	1435	2.19	1945	—	—	—	—	—	—	—	—	—	—	—	—
3000	1479	2.40	2135	—	—	—	—	—	—	—	—	—	—	—	—

48HJ007 (6 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1406	1.43	1273	1475	1.58	1403	1540	1.72	1531	**1601**	**1.87**	**1657**	**1660**	**2.00**	**1780**
1900	1438	1.58	1401	1505	1.73	1541	1569	1.89	1678	**1630**	**2.04**	**1813**	**1689**	**2.19**	**1945**
2000	1470	1.73	1537	1537	1.90	1686	**1600**	**2.06**	**1833**	**1660**	**2.23**	**1977**	**1718**	**2.38**	**2118**
2100	1502	1.89	1681	1568	2.07	1840	**1631**	**2.25**	**1996**	—	—	—	—	—	—
2200	1535	2.06	1834	**1600**	**2.25**	**2002**	—	—	—	—	—	—	—	—	—
2300	1569	2.25	1996	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 1119 to 1585 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.
3. See page 163 for general fan performance notes.

Performance data — 48HJ (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**967**	**0.63**	**563**	**1075**	**0.80**	**715**	**1170**	**0.97**	**861**	**1255**	**1.13**	**1002**	1333	1.28	1139
1900	**1008**	**0.72**	**643**	**1112**	**0.91**	**805**	**1205**	**1.08**	**960**	**1289**	**1.25**	**1111**	1366	1.42	1258
2000	**1049**	**0.82**	**731**	**1151**	**1.02**	**903**	**1241**	**1.20**	**1068**	1323	1.38	1228	1399	1.56	1384
2100	**1091**	**0.93**	**827**	**1189**	**1.14**	**1008**	**1278**	**1.33**	**1183**	1358	1.52	1353	1433	1.71	1519
2200	**1133**	**1.05**	**933**	**1229**	**1.26**	**1123**	1315	1.47	1308	1393	1.67	1487	1467	1.87	1662
2300	**1176**	**1.18**	**1047**	**1268**	**1.40**	**1247**	1352	1.62	1441	1429	1.84	1630	1501	2.04	1815
2400	**1218**	**1.32**	**1170**	1308	1.55	1380	1390	1.78	1584	1466	2.01	1782	1537	2.23	1977
2500	**1261**	**1.47**	**1304**	1349	1.72	1523	1429	1.96	1736	1503	2.19	1945	1572	2.42	2149
2600	1305	1.63	1448	1390	1.89	1677	1468	2.14	1900	1540	2.38	2117	1608	2.62	2331
2700	1348	1.80	1602	1431	2.07	1841	1507	2.33	2073	1578	2.59	2301	1645	2.84	2524
2800	1392	1.99	1768	1472	2.27	2016	1547	2.54	2258	1616	2.81	2495	—	—	—
2900	1435	2.19	1945	1514	2.48	2203	1587	2.76	2455	—	—	—	—	—	—
3000	1479	2.40	2135	1556	2.70	2402	—	—	—	—	—	—	—	—	—

48HJ007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1406	1.43	1273	1475	1.58	1403	1540	1.72	1531	1601	1.87	1657	1660	2.00	1780
1900	1438	1.58	1401	1505	1.73	1541	1569	1.89	1678	1630	2.04	1813	**1689**	**2.19**	**1945**
2000	1470	1.73	1537	1537	1.90	1686	1600	2.06	1833	1660	2.23	1977	**1718**	**2.38**	**2118**
2100	1502	1.89	1681	1568	2.07	1840	1631	2.25	1996	**1690**	**2.42**	**2149**	**1747**	**2.59**	**2300**
2200	1535	2.06	1834	1600	2.25	2002	1662	2.44	2167	**1721**	**2.62**	**2330**	**1778**	**2.80**	**2490**
2300	1569	2.25	1996	1633	2.45	2174	**1694**	**2.64**	**2348**	**1752**	**2.84**	**2520**	—	—	—
2400	1603	2.44	2167	1666	2.65	2355	**1727**	**2.86**	**2539**	—	—	—	—	—	—
2500	1638	2.64	2349	**1700**	**2.87**	**2546**	—	—	—	—	—	—	—	—	—
2600	1673	2.86	2541	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

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

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.
3. See page 163 for general fan performance notes.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ008 (7 1/2 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**513**	**0.54**	**505**	**595**	**0.76**	**713**	**665**	**1.01**	**940**	**728**	**1.27**	**1187**	**786**	**1.56**	**1453**
2300	**521**	**0.57**	**531**	**601**	**0.79**	**741**	**671**	**1.04**	**972**	**734**	**1.31**	**1222**	**791**	**1.60**	**1489**
2400	**535**	**0.63**	**584**	**615**	**0.86**	**802**	**684**	**1.11**	**1038**	**745**	**1.39**	**1293**	**802**	**1.68**	**1566**
2500	**551**	**0.69**	**642**	**628**	**0.93**	**866**	**696**	**1.19**	**1109**	**757**	**1.47**	**1369**	**813**	**1.77**	**1647**
2550	**558**	**0.72**	**673**	**635**	**0.97**	**900**	**702**	**1.23**	**1146**	**763**	**1.51**	**1409**	**818**	**1.81**	**1689**
2600	**566**	**0.76**	**705**	**642**	**1.00**	**935**	**709**	**1.27**	**1183**	**769**	**1.55**	**1450**	**824**	**1.86**	**1732**
2700	**582**	**0.83**	**771**	**656**	**1.08**	**1008**	**721**	**1.35**	**1263**	**781**	**1.65**	**1535**	**835**	**1.95**	**1823**
2800	**597**	**0.90**	**842**	**670**	**1.16**	**1086**	**734**	**1.44**	**1347**	**793**	**1.74**	**1625**	847	2.06	1917
2900	**613**	**0.98**	**918**	**684**	**1.25**	**1169**	**748**	**1.54**	**1436**	**805**	**1.84**	**1720**	859	2.16	2019
3000	**629**	**1.07**	**999**	**699**	**1.35**	**1256**	**761**	**1.64**	**1530**	**818**	**1.95**	**1820**	871	2.28	2125
3100	**645**	**1.16**	**1085**	**713**	**1.45**	**1349**	**775**	**1.75**	**1630**	**831**	**2.06**	**1925**	883	2.40	2235
3200	**662**	**1.26**	**1176**	**728**	**1.55**	**1448**	**788**	**1.86**	**1734**	844	2.18	2036	895	2.52	2352
3300	**678**	**1.36**	**1272**	**743**	**1.66**	**1551**	**802**	**1.98**	**1845**	857	2.31	2152	908	2.65	2475
3400	**694**	**1.47**	**1374**	**758**	**1.78**	**1660**	**816**	**2.10**	**1961**	870	2.44	2275	920	2.79	2603
3500	**711**	**1.59**	**1482**	**773**	**1.90**	**1775**	**831**	**2.23**	**2082**	884	2.58	2402	—	—	—
3600	**727**	**1.71**	**1596**	**789**	**2.03**	**1896**	845	2.37	2210	897	2.72	2537	—	—	—
3700	**744**	**1.84**	**1716**	**804**	**2.17**	**2023**	860	2.51	2343	911	2.87	2677	—	—	—
3750	**752**	**1.91**	**1778**	**812**	**2.24**	**2089**	867	2.59	2413	—	—	—	—	—	—

48HJ008 (7 1/2 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**839**	**1.86**	**1735**	889	2.18	2032	935	2.52	2345	980	2.87	2673	—	—	—
2300	844	1.90	1773	893	2.22	2073	940	2.56	2389	—	—	—	—	—	—
2400	854	1.99	1855	903	2.32	2159	950	2.66	2478	—	—	—	—	—	—
2500	865	2.08	1940	913	2.41	2249	959	2.76	2573	—	—	—	—	—	—
2550	870	2.13	1985	918	2.46	2296	964	2.81	2622	—	—	—	—	—	—
2600	875	2.18	2031	923	2.51	2344	969	2.87	2673	—	—	—	—	—	—
2700	886	2.28	2126	934	2.62	2445	—	—	—	—	—	—	—	—	—
2800	897	2.39	2227	944	2.73	2550	—	—	—	—	—	—	—	—	—
2900	908	2.50	2333	955	2.85	2661	—	—	—	—	—	—	—	—	—
3000	920	2.62	2443	—	—	—	—	—	—	—	—	—	—	—	—
3100	931	2.75	2560	—	—	—	—	—	—	—	—	—	—	—	—
3200	943	2.88	2682	—	—	—	—	—	—	—	—	—	—	—	—
3300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 840 to 1085 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.
3. See page 163 for general fan performance notes.

Performance data — 48HJ (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ008 (7 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**513**	**0.54**	**505**	**595**	**0.76**	**713**	**665**	**1.01**	**940**	**728**	**1.27**	**1187**	**786**	**1.56**	**1453**
2300	**521**	**0.57**	**531**	**601**	**0.79**	**741**	**671**	**1.04**	**972**	**734**	**1.31**	**1222**	**791**	**1.60**	**1489**
2400	**535**	**0.63**	**584**	**615**	**0.86**	**802**	**684**	**1.11**	**1038**	**745**	**1.39**	**1293**	**802**	**1.68**	**1566**
2500	**551**	**0.69**	**642**	**628**	**0.93**	**866**	**696**	**1.19**	**1109**	**757**	**1.47**	**1369**	**813**	**1.77**	**1647**
2550	**558**	**0.72**	**673**	**635**	**0.97**	**900**	**702**	**1.23**	**1146**	**763**	**1.51**	**1409**	**818**	**1.81**	**1689**
2600	**566**	**0.76**	**705**	**642**	**1.00**	**935**	**709**	**1.27**	**1183**	**769**	**1.55**	**1450**	**824**	**1.86**	**1732**
2700	**582**	**0.83**	**771**	**656**	**1.08**	**1008**	**721**	**1.35**	**1263**	**781**	**1.65**	**1535**	**835**	**1.95**	**1823**
2800	**597**	**0.90**	**842**	**670**	**1.16**	**1086**	**734**	**1.44**	**1347**	**793**	**1.74**	**1625**	**847**	**2.06**	**1917**
2900	**613**	**0.98**	**918**	**684**	**1.25**	**1169**	**748**	**1.54**	**1436**	**805**	**1.84**	**1720**	**859**	**2.16**	**2019**
3000	**629**	**1.07**	**999**	**699**	**1.35**	**1256**	**761**	**1.64**	**1530**	**818**	**1.95**	**1820**	871	2.28	2125
3100	**645**	**1.16**	**1085**	**713**	**1.45**	**1349**	**775**	**1.75**	**1630**	**831**	**2.06**	**1925**	883	2.40	2235
3200	**662**	**1.26**	**1176**	**728**	**1.55**	**1448**	**788**	**1.86**	**1734**	**844**	**2.18**	**2036**	895	2.52	2352
3300	**678**	**1.36**	**1272**	**743**	**1.66**	**1551**	**802**	**1.98**	**1845**	**857**	**2.31**	**2152**	908	2.65	2475
3400	**694**	**1.47**	**1374**	**758**	**1.78**	**1660**	**816**	**2.10**	**1961**	870	2.44	2275	920	2.79	2603
3500	**711**	**1.59**	**1482**	**773**	**1.90**	**1775**	**831**	**2.23**	**2082**	884	2.58	2402	933	2.93	2737
3600	**727**	**1.71**	**1596**	**789**	**2.03**	**1896**	**845**	**2.37**	**2210**	897	2.72	2537	946	3.09	2877
3700	**744**	**1.84**	**1716**	**804**	**2.17**	**2023**	860	2.51	2343	911	2.87	2677	959	3.24	3023
3750	**752**	**1.91**	**1778**	**812**	**2.24**	**2089**	867	2.59	2413	918	2.95	2750	966	3.32	3100

48HJ008 (7 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**839**	**1.86**	**1735**	889	2.18	2032	935	2.52	2345	980	2.87	2673	1022	3.23	3015
2300	**844**	**1.90**	**1773**	893	2.22	2073	940	2.56	2389	984	2.91	2718	1027	3.28	3062
2400	**854**	**1.99**	**1855**	903	2.32	2159	950	2.66	2478	993	3.02	2812	1035	3.39	3159
2500	865	2.08	1940	913	2.41	2249	959	2.76	2573	1003	3.12	2911	1044	3.50	3261
2550	870	2.13	1985	918	2.46	2296	964	2.81	2622	1008	3.18	2962	1049	3.55	3315
2600	875	2.18	2031	923	2.51	2344	969	2.87	2673	1012	3.23	3014	1054	3.61	3370
2700	886	2.28	2126	934	2.62	2445	979	2.98	2777	1022	3.35	3123	1063	3.74	3483
2800	897	2.39	2227	944	2.73	2550	989	3.10	2888	1032	3.47	3238	1073	3.86	3601
2900	908	2.50	2333	955	2.85	2661	1000	3.22	3003	1042	3.60	3358	**1083**	**4.00**	**3725**
3000	920	2.62	2443	966	2.98	2777	1010	3.35	3123	1052	3.74	3484	**1093**	**4.14**	**3856**
3100	931	2.75	2560	977	3.11	2899	1021	3.49	3250	1063	3.88	3615	—	—	—
3200	943	2.88	2682	989	3.25	3026	1032	3.63	3383	1074	4.02	3752	—	—	—
3300	955	3.01	2810	1000	3.39	3159	1043	3.78	3521	**1084**	**4.18**	**3896**	—	—	—
3400	967	3.16	2945	1012	3.54	3299	1055	3.93	3667	—	—	—	—	—	—
3500	980	3.31	3084	1024	3.69	3445	1066	4.09	3817	—	—	—	—	—	—
3600	992	3.46	3230	1036	3.86	3596	—	—	—	—	—	—	—	—	—
3700	1005	3.63	3383	1048	4.03	3755	—	—	—	—	—	—	—	—	—
3750	1011	3.71	3462	1054	4.11	3836	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 4.20.
3. See page 163 for general fan performance notes.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ009 (8 1/2 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	**541**	**0.50**	**467**	**624**	**0.66**	**614**	**701**	**0.83**	**771**	**771**	**1.00**	**936**	**837**	**1.19**	**1109**
2600	**556**	**0.55**	**513**	**637**	**0.71**	**665**	**711**	**0.89**	**827**	**781**	**1.07**	**996**	845	1.26	1173
2700	**571**	**0.60**	**562**	**650**	**0.77**	**720**	**722**	**0.95**	**885**	**790**	**1.14**	**1059**	854	1.33	1241
2800	**586**	**0.66**	**615**	**663**	**0.83**	**777**	**734**	**1.02**	**948**	**800**	**1.21**	**1126**	863	1.41	1312
2900	**601**	**0.72**	**672**	**676**	**0.90**	**839**	**745**	**1.09**	**1014**	**811**	**1.28**	**1197**	872	1.49	1387
3000	**616**	**0.79**	**732**	**689**	**0.97**	**904**	**757**	**1.16**	**1083**	**821**	**1.36**	**1271**	882	1.57	1465
3100	**632**	**0.85**	**796**	**703**	**1.04**	**972**	**769**	**1.24**	**1157**	**832**	**1.45**	**1349**	892	1.66	1548
3200	**648**	**0.93**	**864**	**717**	**1.12**	**1045**	**782**	**1.32**	**1235**	843	1.53	1431	902	1.75	1635
3300	**663**	**1.00**	**936**	**731**	**1.20**	**1122**	**795**	**1.41**	**1316**	855	1.63	1517	912	1.85	1725
3400	**679**	**1.09**	**1012**	**745**	**1.29**	**1203**	**808**	**1.50**	**1402**	867	1.72	1608	923	1.95	1820
3500	**695**	**1.17**	**1092**	**760**	**1.38**	**1288**	**821**	**1.60**	**1492**	879	1.83	1703	934	2.06	1920
3600	**711**	**1.26**	**1177**	**774**	**1.48**	**1379**	**834**	**1.70**	**1587**	891	1.93	1802	945	2.17	2024
3700	**728**	**1.36**	**1266**	**789**	**1.58**	**1473**	848	1.81	1686	904	2.04	1906	957	2.29	2132
3800	**744**	**1.46**	**1361**	**804**	**1.69**	**1572**	861	1.92	1790	916	2.16	2015	969	2.41	2246
3900	**760**	**1.57**	**1460**	**819**	**1.80**	**1676**	875	2.04	1899	929	2.28	2128	981	2.53	2364
4000	**777**	**1.68**	**1563**	**834**	**1.91**	**1785**	889	2.16	2012	942	2.41	2247	993	2.67	2487
4100	**793**	**1.79**	**1672**	850	2.04	1899	904	2.29	2132	956	2.54	2371	1006	2.80	2615
4200	**810**	**1.92**	**1786**	865	2.16	2018	918	2.42	2255	969	2.68	2499	—	—	—
4300	**826**	**2.04**	**1906**	880	2.30	2142	932	2.56	2385	983	2.82	2633	—	—	—

48HJ009 (8 1/2 TONS) — STANDARD MOTOR (BELT DRIVE)* (cont)

Airlfow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	900	1.38	1289	959	1.58	1476	1015	1.79	1669	1069	2.00	1868	**1121**	**2.22**	**2073**
2600	907	1.46	1357	965	1.66	1548	1021	1.87	1745	1074	2.09	1948	**1125**	**2.31**	**2158**
2700	914	1.53	1429	972	1.74	1624	1027	1.96	1825	1079	2.18	2032	**1130**	**2.41**	**2245**
2800	922	1.61	1505	979	1.83	1704	1033	2.05	1909	1085	2.27	2120	**1135**	**2.51**	**2337**
2900	931	1.70	1584	986	1.92	1787	1040	2.14	1996	**1091**	**2.37**	**2211**	**1141**	**2.61**	**2432**
3000	939	1.79	1667	994	2.01	1874	1047	2.24	2087	**1098**	**2.47**	**2307**	**1147**	**2.71**	**2532**
3100	948	1.88	1753	1002	2.11	1965	1054	2.34	2183	**1105**	**2.58**	**2406**	**1153**	**2.83**	**2635**
3200	957	1.98	1844	1011	2.21	2060	1062	2.45	2283	**1112**	**2.69**	**2510**	—	—	—
3300	967	2.08	1939	1020	2.32	2160	1070	2.56	2386	**1119**	**2.81**	**2618**	—	—	—
3400	977	2.19	2039	1029	2.43	2264	1079	2.67	2494	—	—	—	—	—	—
3500	987	2.30	2143	1038	2.54	2372	**1088**	**2.80**	**2607**	—	—	—	—	—	—
3600	998	2.41	2251	1048	2.66	2485	—	—	—	—	—	—	—	—	—
3700	1008	2.54	2364	1058	2.79	2602	—	—	—	—	—	—	—	—	—
3800	1019	2.66	2482	—	—	—	—	—	—	—	—	—	—	—	—
3900	1031	2.79	2605	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 840 to 1085 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.
3. See page 163 for general fan performance notes.

Performance data — 48HJ (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ009 (8 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	**541**	**0.50**	**467**	**624**	**0.66**	**614**	**701**	**0.83**	**771**	**771**	**1.00**	**936**	**837**	**1.19**	**1109**
2600	**556**	**0.55**	**513**	**637**	**0.71**	**665**	**711**	**0.89**	**827**	**781**	**1.07**	**996**	**845**	**1.26**	**1173**
2700	**571**	**0.60**	**562**	**650**	**0.77**	**720**	**722**	**0.95**	**885**	**790**	**1.14**	**1059**	**854**	**1.33**	**1241**
2800	**586**	**0.66**	**615**	**663**	**0.83**	**777**	**734**	**1.02**	**948**	**800**	**1.21**	**1126**	863	1.41	1312
2900	**601**	**0.72**	**672**	**676**	**0.90**	**839**	**745**	**1.09**	**1014**	**811**	**1.28**	**1197**	872	1.49	1387
3000	**616**	**0.79**	**732**	**689**	**0.97**	**904**	**757**	**1.16**	**1083**	**821**	**1.36**	**1271**	882	1.57	1465
3100	**632**	**0.85**	**796**	**703**	**1.04**	**972**	**769**	**1.24**	**1157**	**832**	**1.45**	**1349**	892	1.66	1548
3200	**648**	**0.93**	**864**	**717**	**1.12**	**1045**	**782**	**1.32**	**1235**	**843**	**1.53**	**1431**	902	1.75	1635
3300	**663**	**1.00**	**936**	**731**	**1.20**	**1122**	**795**	**1.41**	**1316**	**855**	**1.63**	**1517**	912	1.85	1725
3400	**679**	**1.09**	**1012**	**745**	**1.29**	**1203**	**808**	**1.50**	**1402**	867	1.72	1608	923	1.95	1820
3500	**695**	**1.17**	**1092**	**760**	**1.38**	**1288**	**821**	**1.60**	**1492**	879	1.83	1703	934	2.06	1920
3600	**711**	**1.26**	**1177**	**774**	**1.48**	**1379**	**834**	**1.70**	**1587**	891	1.93	1802	945	2.17	2024
3700	**728**	**1.36**	**1266**	**789**	**1.58**	**1473**	**848**	**1.81**	**1686**	904	2.04	1906	957	2.29	2132
3800	**744**	**1.46**	**1361**	**804**	**1.69**	**1572**	861	1.92	1790	916	2.16	2015	969	2.41	2246
3900	**760**	**1.57**	**1460**	**819**	**1.80**	**1676**	875	2.04	1899	929	2.28	2128	981	2.53	2364
4000	**777**	**1.68**	**1563**	**834**	**1.91**	**1785**	889	2.16	2012	942	2.41	2247	993	2.67	2487
4100	**793**	**1.79**	**1672**	**850**	**2.04**	**1899**	904	2.29	2132	956	2.54	2371	1006	2.80	2615
4200	**810**	**1.92**	**1786**	865	2.16	2018	918	2.42	2255	969	2.68	2499	1018	2.95	2748
4300	**826**	**2.04**	**1906**	880	2.30	2142	932	2.56	2385	983	2.82	2633	1031	3.10	2888

48HJ009 (8 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	900	1.38	1289	959	1.58	1476	1015	1.79	1669	1069	2.00	1868	**1121**	**2.22**	**2073**
2600	907	1.46	1357	965	1.66	1548	1021	1.87	1745	1074	2.09	1948	**1125**	**2.31**	**2158**
2700	914	1.53	1429	972	1.74	1624	1027	1.96	1825	1079	2.18	2032	**1130**	**2.41**	**2245**
2800	922	1.61	1505	979	1.83	1704	1033	2.05	1909	**1085**	**2.27**	**2120**	**1135**	**2.51**	**2337**
2900	931	1.70	1584	986	1.92	1787	1040	2.14	1996	**1091**	**2.37**	**2211**	**1141**	**2.61**	**2432**
3000	939	1.79	1667	994	2.01	1874	1047	2.24	2087	**1098**	**2.47**	**2307**	**1147**	**2.71**	**2532**
3100	948	1.88	1753	1002	2.11	1965	1054	2.34	2183	**1105**	**2.58**	**2406**	**1153**	**2.83**	**2635**
3200	957	1.98	1844	1011	2.21	2060	1062	2.45	2283	**1112**	**2.69**	**2510**	**1160**	**2.94**	**2743**
3300	967	2.08	1939	1020	2.32	2160	1070	2.56	2386	**1119**	**2.81**	**2618**	**1167**	**3.06**	**2855**
3400	977	2.19	2039	1029	2.43	2264	1079	2.67	2494	**1127**	**2.93**	**2730**	**1174**	**3.19**	**2971**
3500	987	2.30	2143	1038	2.54	2372	**1088**	**2.80**	**2607**	**1135**	**3.05**	**2847**	**1181**	**3.32**	**3092**
3600	998	2.41	2251	1048	2.66	2485	**1097**	**2.92**	**2724**	**1144**	**3.18**	**2968**	**1189**	**3.45**	**3218**
3700	1008	2.54	2364	1058	2.79	2602	**1106**	**3.05**	**2846**	**1152**	**3.32**	**3094**	**1198**	**3.59**	**3348**
3800	1019	2.66	2482	1068	2.92	2725	**1116**	**3.19**	**2972**	**1162**	**3.46**	**3226**	**1206**	**3.74**	**3484**
3900	1031	2.79	2605	1079	3.06	2852	**1126**	**3.33**	**3104**	**1171**	**3.61**	**3362**	**1215**	**3.89**	**3624**
4000	1042	2.93	2733	**1090**	**3.20**	**2984**	**1136**	**3.48**	**3241**	**1180**	**3.76**	**3503**	**1224**	**4.04**	**3770**
4100	1054	3.07	2866	**1101**	**3.35**	**3122**	**1146**	**3.63**	**3383**	**1190**	**3.91**	**3649**	**1233**	**4.20**	**3921**
4200	1066	3.22	3004	**1112**	**3.50**	**3264**	**1157**	**3.79**	**3530**	**1200**	**4.08**	**3801**	—	—	—
4300	1078	3.38	3148	**1123**	**3.66**	**3413**	**1167**	**3.95**	**3683**	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 4.20.
3. See page 163 for general fan performance notes.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ012 (10 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**616**	**0.79**	**732**	**689**	**0.97**	**904**	**757**	**1.16**	**1083**	**821**	**1.36**	**1271**	882	1.57	1465
3100	**632**	**0.85**	**796**	**703**	**1.04**	**972**	**769**	**1.24**	**1157**	**832**	**1.45**	**1349**	892	1.66	1548
3200	**648**	**0.93**	**864**	**717**	**1.12**	**1045**	**782**	**1.32**	**1235**	**843**	**1.53**	**1431**	902	1.75	1635
3300	**663**	**1.00**	**936**	**731**	**1.20**	**1122**	**795**	**1.41**	**1316**	**855**	**1.63**	**1517**	912	1.85	1725
3400	**679**	**1.09**	**1012**	**745**	**1.29**	**1203**	**808**	**1.50**	**1402**	867	1.72	1608	923	1.95	1820
3500	**695**	**1.17**	**1092**	**760**	**1.38**	**1288**	**821**	**1.60**	**1492**	879	1.83	1703	934	2.06	1920
3600	**711**	**1.26**	**1177**	**774**	**1.48**	**1379**	**834**	**1.70**	**1587**	891	1.93	1802	945	2.17	2024
3700	**728**	**1.36**	**1266**	**789**	**1.58**	**1473**	**848**	**1.81**	**1686**	904	2.04	1906	957	2.29	2132
3800	**744**	**1.46**	**1361**	**804**	**1.69**	**1572**	861	1.92	1790	916	2.16	2015	969	2.41	2246
3900	**760**	**1.57**	**1460**	**819**	**1.80**	**1676**	875	2.04	1899	929	2.28	2128	981	2.53	2364
4000	**777**	**1.68**	**1563**	**834**	**1.91**	**1785**	889	2.16	2012	942	2.41	2247	993	2.67	2487
4100	**793**	**1.79**	**1672**	**850**	**2.04**	**1899**	904	2.29	2132	956	2.54	2371	1006	2.80	2615
4200	**810**	**1.92**	**1786**	865	2.16	2018	918	2.42	2255	969	2.68	2499	1018	2.95	2748
4300	**826**	**2.04**	**1906**	880	2.30	2142	932	2.56	2385	983	2.82	2633	1031	3.10	2888
4400	**843**	**2.18**	**2031**	896	2.44	2272	947	2.70	2520	996	2.97	2773	1044	3.25	3032
4500	860	2.32	2161	912	2.58	2408	962	2.85	2660	1010	3.13	2918	1057	3.41	3182
4600	876	2.46	2297	927	2.73	2549	977	3.01	2807	1024	3.29	3070	1070	3.58	3338
4700	893	2.62	2439	943	2.89	2696	992	3.17	2958	1038	3.46	3226	—	—	—
4800	910	2.77	2587	959	3.06	2849	1007	3.34	3116	1053	3.63	3390	—	—	—
4900	927	2.94	2741	975	3.23	3008	1022	3.52	3280	—	—	—	—	—	—
5000	944	3.11	2901	991	3.40	3173	1037	3.70	3451	—	—	—	—	—	—

48HJ012 (10 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	939	1.79	1667	994	2.01	1874	1047	2.24	2087	**1098**	**2.47**	**2307**	**1147**	**2.71**	**2532**
3100	948	1.88	1753	1002	2.11	1965	1054	2.34	2183	**1105**	**2.58**	**2406**	**1153**	**2.83**	**2635**
3200	957	1.98	1844	1011	2.21	2060	1062	2.45	2283	**1112**	**2.69**	**2510**	**1160**	**2.94**	**2743**
3300	967	2.08	1939	1020	2.32	2160	1070	2.56	2386	**1119**	**2.81**	**2618**	**1167**	**3.06**	**2855**
3400	977	2.19	2039	1029	2.43	2264	1079	2.67	2494	**1127**	**2.93**	**2730**	**1174**	**3.19**	**2971**
3500	987	2.30	2143	1038	2.54	2372	**1088**	**2.80**	**2607**	**1135**	**3.05**	**2847**	**1181**	**3.32**	**3092**
3600	998	2.41	2251	1048	2.66	2485	**1097**	**2.92**	**2724**	**1144**	**3.18**	**2968**	**1189**	**3.45**	**3218**
3700	1008	2.54	2364	1058	2.79	2602	**1106**	**3.05**	**2846**	**1152**	**3.32**	**3094**	**1198**	**3.59**	**3348**
3800	1019	2.66	2482	1068	2.92	2725	**1116**	**3.19**	**2972**	**1162**	**3.46**	**3226**	—	—	—
3900	1031	2.79	2605	1079	3.06	2852	**1126**	**3.33**	**3104**	**1171**	**3.61**	**3362**	—	—	—
4000	1042	2.93	2733	**1090**	**3.20**	**2984**	**1136**	**3.48**	**3241**	—	—	—	—	—	—
4100	1054	3.07	2866	**1101**	**3.35**	**3122**	**1146**	**3.63**	**3383**	—	—	—	—	—	—
4200	1066	3.22	3004	**1112**	**3.50**	**3264**	—	—	—	—	—	—	—	—	—
4300	1078	3.38	3148	**1123**	**3.66**	**3413**	—	—	—	—	—	—	—	—	—
4400	**1090**	**3.54**	**3297**	—	—	—	—	—	—	—	—	—	—	—	—
4500	**1103**	**3.70**	**3451**	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 3.70.
3. See page 163 for general fan performance notes.

Performance data — 48HJ (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ012 (10 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**616**	**0.79**	**732**	**689**	**0.97**	**904**	**757**	**1.16**	**1083**	**821**	**1.36**	**1271**	882	1.57	1465
3100	**632**	**0.85**	**796**	**703**	**1.04**	**972**	**769**	**1.24**	**1157**	832	1.45	1349	892	1.66	1548
3200	**648**	**0.93**	**864**	**717**	**1.12**	**1045**	**782**	**1.32**	**1235**	843	1.53	1431	902	1.75	1635
3300	**663**	**1.00**	**936**	**731**	**1.20**	**1122**	**795**	**1.41**	**1316**	855	1.63	1517	912	1.85	1725
3400	**679**	**1.09**	**1012**	**745**	**1.29**	**1203**	**808**	**1.50**	**1402**	867	1.72	1608	923	1.95	1820
3500	**695**	**1.17**	**1092**	**760**	**1.38**	**1288**	**821**	**1.60**	**1492**	879	1.83	1703	934	2.06	1920
3600	**711**	**1.26**	**1177**	**774**	**1.48**	**1379**	834	1.70	1587	891	1.93	1802	945	2.17	2024
3700	**728**	**1.36**	**1266**	**789**	**1.58**	**1473**	848	1.81	1686	904	2.04	1906	957	2.29	2132
3800	**744**	**1.46**	**1361**	**804**	**1.69**	**1572**	861	1.92	1790	916	2.16	2015	969	2.41	2246
3900	**760**	**1.57**	**1460**	**819**	**1.80**	**1676**	875	2.04	1899	929	2.28	2128	981	2.53	2364
4000	**777**	**1.68**	**1563**	834	1.91	1785	889	2.16	2012	942	2.41	2247	993	2.67	2487
4100	**793**	**1.79**	**1672**	850	2.04	1899	904	2.29	2132	956	2.54	2371	1006	2.80	2615
4200	**810**	**1.92**	**1786**	865	2.16	2018	918	2.42	2255	969	2.68	2499	1018	2.95	2748
4300	**826**	**2.04**	**1906**	880	2.30	2142	932	2.56	2385	983	2.82	2633	1031	3.10	2888
4400	843	2.18	2031	896	2.44	2272	947	2.70	2520	996	2.97	2773	1044	3.25	3032
4500	860	2.32	2161	912	2.58	2408	962	2.85	2660	1010	3.13	2918	1057	3.41	3182
4600	876	2.46	2297	927	2.73	2549	977	3.01	2807	1024	3.29	3070	1070	3.58	3338
4700	893	2.62	2439	943	2.89	2696	992	3.17	2958	1038	3.46	3226	1084	3.75	3500
4800	910	2.77	2587	959	3.06	2849	1007	3.34	3116	1053	3.63	3390	1098	3.93	3668
4900	927	2.94	2741	975	3.23	3008	1022	3.52	3280	1067	3.82	3558	1111	4.12	3841
5000	944	3.11	2901	991	3.40	3173	1037	3.70	3451	1082	4.00	3733	1125	4.31	4021

48HJ012 (10 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	939	1.79	1667	994	2.01	1874	1047	2.24	2087	1098	2.47	2307	**1147**	**2.71**	**2532**
3100	948	1.88	1753	1002	2.11	1965	1054	2.34	2183	1105	2.58	2406	**1153**	**2.83**	**2635**
3200	957	1.98	1844	1011	2.21	2060	1062	2.45	2283	1112	2.69	2510	**1160**	**2.94**	**2743**
3300	967	2.08	1939	1020	2.32	2160	1070	2.56	2386	1119	2.81	2618	**1167**	**3.06**	**2855**
3400	977	2.19	2039	1029	2.43	2264	1079	2.67	2494	1127	2.93	2730	**1174**	**3.19**	**2971**
3500	987	2.30	2143	1038	2.54	2372	1088	2.80	2607	**1135**	**3.05**	**2847**	**1181**	**3.32**	**3092**
3600	998	2.41	2251	1048	2.66	2485	1097	2.92	2724	**1144**	**3.18**	**2968**	**1189**	**3.45**	**3218**
3700	1008	2.54	2364	1058	2.79	2602	1106	3.05	2846	**1152**	**3.32**	**3094**	**1198**	**3.59**	**3348**
3800	1019	2.66	2482	1068	2.92	2725	1116	3.19	2972	**1162**	**3.46**	**3226**	**1206**	**3.74**	**3484**
3900	1031	2.79	2605	1079	3.06	2852	1126	3.33	3104	**1171**	**3.61**	**3362**	**1215**	**3.89**	**3624**
4000	1042	2.93	2733	1090	3.20	2984	**1136**	**3.48**	**3241**	**1180**	**3.76**	**3503**	**1224**	**4.04**	**3770**
4100	1054	3.07	2866	1101	3.35	3122	**1146**	**3.63**	**3383**	**1190**	**3.91**	**3649**	**1233**	**4.20**	**3921**
4200	1066	3.22	3004	1112	3.50	3264	**1157**	**3.79**	**3530**	**1200**	**4.08**	**3801**	**1243**	**4.37**	**4077**
4300	1078	3.38	3148	1123	3.66	3413	**1167**	**3.95**	**3683**	**1210**	**4.24**	**3958**	**1252**	**4.54**	**4238**
4400	1090	3.54	3297	**1135**	**3.82**	**3566**	**1179**	**4.12**	**3841**	**1221**	**4.42**	**4121**	**1262**	**4.72**	**4405**
4500	1103	3.70	3451	**1147**	**4.00**	**3726**	**1190**	**4.29**	**4005**	**1232**	**4.60**	**4289**	**1273**	**4.91**	**4578**
4600	1115	3.87	3612	**1159**	**4.17**	**3891**	**1201**	**4.48**	**4175**	**1243**	**4.79**	**4464**	**1283**	**5.10**	**4757**
4700	1128	4.05	3778	**1171**	**4.36**	**4062**	**1213**	**4.67**	**4350**	**1254**	**4.98**	**4644**	—	—	—
4800	**1141**	**4.24**	**3951**	**1183**	**4.55**	**4239**	**1225**	**4.86**	**4532**	**1265**	**5.18**	**4830**	—	—	—
4900	**1154**	**4.43**	**4130**	**1196**	**4.74**	**4422**	**1237**	**5.06**	**4720**	—	—	—	—	—	—
5000	**1167**	**4.63**	**4314**	**1209**	**4.95**	**4611**	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 830 to 1130 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 5.25.
3. See page 163 for general fan performance notes.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJ014 (12½ TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	**728**	**1.36**	**1266**	**789**	**1.58**	**1473**	848	1.81	1686	904	2.04	1906	957	2.29	2132
3800	**744**	**1.46**	**1361**	**804**	**1.69**	**1572**	861	1.92	1790	916	2.16	2015	969	2.41	2246
3900	**760**	**1.57**	**1460**	**819**	**1.80**	**1676**	875	2.04	1899	929	2.28	2128	981	2.53	2364
4000	**777**	**1.68**	**1563**	834	1.91	1785	889	2.16	2012	942	2.41	2247	993	2.67	2487
4100	**793**	**1.79**	**1672**	850	2.04	1899	904	2.29	2132	956	2.54	2371	1006	2.80	2615
4200	**810**	**1.92**	**1786**	865	2.16	2018	918	2.42	2255	969	2.68	2499	1018	2.95	2748
4300	**826**	**2.04**	**1906**	880	2.30	2142	932	2.56	2385	983	2.82	2633	1031	3.10	2888
4400	843	2.18	2031	896	2.44	2272	947	2.70	2520	996	2.97	2773	1044	3.25	3032
4500	860	2.32	2161	912	2.58	2408	962	2.85	2660	1010	3.13	2918	1057	3.41	3182
4600	876	2.46	2297	927	2.73	2549	977	3.01	2807	1024	3.29	3070	1070	3.58	3338
4700	893	2.62	2439	943	2.89	2696	992	3.17	2958	1038	3.46	3226	1084	3.75	3500
4800	910	2.77	2587	959	3.06	2849	1007	3.34	3116	1053	3.63	3390	1098	3.93	3668
4900	927	2.94	2741	975	3.23	3008	1022	3.52	3280	1067	3.82	3558	1111	4.12	3841
5000	944	3.11	2901	991	3.40	3173	1037	3.70	3451	1082	4.00	3733	1125	4.31	4021
5100	961	3.29	3068	1007	3.59	3345	1053	3.89	3627	1096	4.20	3915	**1139**	**4.51**	**4208**
5200	978	3.48	3241	1024	3.78	3523	1068	4.09	3811	1111	4.40	4103	**1153**	**4.72**	**4400**
5300	995	3.67	3420	1040	3.98	3707	1084	4.29	4000	1126	4.61	4298	**1168**	**4.93**	**4600**
5400	1012	3.87	3606	1056	4.18	3899	1099	4.50	4196	**1141**	**4.82**	**4499**	**1182**	**5.15**	**4806**
5500	1029	4.07	3799	1073	4.39	4097	1115	4.72	4400	**1156**	**5.05**	**4707**	—	—	—
5600	1046	4.29	3999	1089	4.61	4302	**1131**	**4.94**	**4610**	—	—	—	—	—	—
5700	1063	4.51	4207	1105	4.84	4515	**1146**	**5.18**	**4827**	—	—	—	—	—	—
5800	1080	4.74	4420	1122	5.08	4734	—	—	—	—	—	—	—	—	—
5900	1098	4.98	4642	—	—	—	—	—	—	—	—	—	—	—	—
6000	1115	5.22	4872	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48HJ014 (12½ 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	1008	2.54	2364	1058	2.79	2602	1106	3.05	2846	**1152**	**3.32**	**3094**	**1198**	**3.59**	**3348**
3800	1019	2.66	2482	1068	2.92	2725	1116	3.19	2972	**1162**	**3.46**	**3226**	**1206**	**3.74**	**3484**
3900	1031	2.79	2605	1079	3.06	2852	1126	3.33	3104	**1171**	**3.61**	**3362**	**1215**	**3.89**	**3624**
4000	1042	2.93	2733	1090	3.20	2984	**1136**	**3.48**	**3241**	**1180**	**3.76**	**3503**	**1224**	**4.04**	**3770**
4100	1054	3.07	2866	1101	3.35	3122	**1146**	**3.63**	**3383**	**1190**	**3.91**	**3649**	**1233**	**4.20**	**3921**
4200	1066	3.22	3004	1112	3.50	3264	**1157**	**3.79**	**3530**	**1200**	**4.08**	**3801**	**1243**	**4.37**	**4077**
4300	1078	3.38	3148	1123	3.66	3413	**1167**	**3.95**	**3683**	**1210**	**4.24**	**3958**	**1252**	**4.54**	**4238**
4400	1090	3.54	3297	**1135**	**3.82**	**3566**	**1179**	**4.12**	**3841**	**1221**	**4.42**	**4121**	**1262**	**4.72**	**4405**
4500	1103	3.70	3451	**1147**	**4.00**	**3726**	**1190**	**4.29**	**4005**	**1232**	**4.60**	**4289**	**1273**	**4.91**	**4578**
4600	1115	3.87	3612	**1159**	**4.17**	**3891**	**1201**	**4.48**	**4175**	**1243**	**4.79**	**4464**	**1283**	**5.10**	**4757**
4700	1128	4.05	3778	**1171**	**4.36**	**4062**	**1213**	**4.67**	**4350**	**1254**	**4.98**	**4644**	—	—	—
4800	**1141**	**4.24**	**3951**	**1183**	**4.55**	**4239**	**1225**	**4.86**	**4532**	**1265**	**5.18**	**4830**	—	—	—
4900	**1154**	**4.43**	**4130**	**1196**	**4.74**	**4422**	**1237**	**5.06**	**4720**	—	—	—	—	—	—
5000	**1167**	**4.63**	**4314**	**1209**	**4.95**	**4611**	—	—	—	—	—	—	—	—	—
5100	**1181**	**4.83**	**4505**	**1221**	**5.16**	**4808**	—	—	—	—	—	—	—	—	—
5200	**1194**	**5.04**	**4703**	—	—	—	—	—	—	—	—	—	—	—	—
5300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 830 to 1130 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 5.25.
3. See page 163 for general fan performance notes.

Performance data — 48HJ (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJD015 WITH STANDARD MOTOR (Low Heat Units)*

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	597	895	0.84	692	967	1.07	781	1150	1.33	858	1342	1.59	928	1527	1.85
4000	625	1014	0.98	714	1097	1.21	800	1292	1.48	876	1495	1.75	945	1689	2.03
4250	653	1141	1.13	737	1236	1.36	820	1442	1.64	895	1656	1.93	963	1859	2.22
4500	682	1274	1.29	761	1382	1.54	840	1599	1.82	914	1824	2.11	982	2037	2.42
4750	711	1415	1.48	786	1538	1.73	861	1765	2.01	934	2001	2.32	1001	2224	2.63
5000	740	1563	1.68	812	1702	1.94	884	1940	2.22	954	2188	2.53	1020	2419	2.86
5250	769	1719	1.89	839	1875	2.16	907	2125	2.45	974	2384	2.77	1039	2625	3.10
5500	799	1884	2.13	867	2060	2.41	931	2321	2.70	996	2592	3.02	1059	2841	3.36
5750	828	2058	2.38	894	2256	2.67	956	2528	2.97	1018	2810	3.29	1080	3069	3.64
6000	857	2243	2.64	923	2464	2.96	982	2748	3.26	1041	3042	3.59	1101	3308	3.94
6250	885	2438	2.93	951	2687	3.27	1008	2981	3.58	1065	3286	3.91	1122	3559	4.26

48HJD015 WITH STANDARD MOTOR (Low Heat Units)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	992	1756	2.12	1053	1988	2.40	1112	2236	2.68	1169	2497	2.97	1224	2769	3.27
4000	1009	1931	2.31	1069	2173	2.59	1126	2431	2.88	1181	2702	3.18	1234	2984	3.48
4250	1026	2114	2.51	1085	2366	2.80	1141	2634	3.10	1194	2914	3.40	1246	3206	3.72
4500	1044	2304	2.72	1102	2566	3.02	1157	2844	3.33	1209	3133	3.65	1260	3433	3.97
4750	1062	2504	2.95	1120	2775	3.26	1174	3062	3.58	1226	3360	3.91	1275	3666	4.23
5000	1081	2712	3.19	1138	2993	3.52	1191	3288	3.85	1242	3592	4.18	1291	3905	4.52
5250	1100	2931	3.44	1156	3220	3.79	1209	3523	4.13	1260	3832	4.47	1308	4148	4.82
5500	1119	3160	3.72	1175	3457	4.07	1228	3765	4.43	1278	4077	4.78	1326	4395	5.14
5750	1138	3399	4.00	1194	3702	4.37	1246	4014	4.74	1296	4328	5.11	1343	4644	5.48
6000	1158	3649	4.31	1213	3957	4.69	1265	4270	5.07	1315	4581	5.45	—	—	—
6250	1179	3910	4.64	1233	4219	5.02	1284	4531	5.41	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 895 to 1147 rpm. Other rpms require a field-supplied drive.

Refer to page 163 for general Fan Performance Data notes.

NOTES:

1. Field-supplied motor required.
2. Maximum continuous bhp for the standard motor is 3.13 (for 208/230 and 460-v units) or 3.38 (for 575-v units). The maximum continuous watts is 2700 (for 208/230 and 460-v units) or 3065 (for 575-v units). Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data tables for more information.
3. Fan performance is identical for horizontal discharge applications using Carrier horizontal adapter curb.

48HJD015 WITH OPTIONAL MOTOR (Low Heat Units)*

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	597	895	0.84	692	967	1.07	781	1150	1.33	858	1342	1.59	928	1527	1.85
4000	625	1014	0.98	714	1097	1.21	800	1292	1.48	876	1495	1.75	945	1689	2.03
4250	653	1141	1.13	737	1236	1.36	820	1442	1.64	895	1656	1.93	963	1859	2.22
4500	682	1274	1.29	761	1382	1.54	840	1599	1.82	914	1824	2.11	982	2037	2.42
4750	711	1415	1.48	786	1538	1.73	861	1765	2.01	934	2001	2.32	1001	2224	2.63
5000	740	1563	1.68	812	1702	1.94	884	1940	2.22	954	2188	2.53	1020	2419	2.86
5250	769	1719	1.89	839	1875	2.16	907	2125	2.45	974	2384	2.77	1039	2625	3.10
5500	799	1884	2.13	867	2060	2.41	931	2321	2.70	996	2592	3.02	1059	2841	3.36
5750	828	2058	2.38	894	2256	2.67	956	2528	2.97	1018	2810	3.29	1080	3069	3.64
6000	857	2243	2.64	923	2464	2.96	982	2748	3.26	1041	3042	3.59	1101	3308	3.94
6250	885	2438	2.93	951	2687	3.27	1008	2981	3.58	1065	3286	3.91	1122	3559	4.26

48HJD015 WITH OPTIONAL MOTOR (Low Heat Units)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	992	1756	2.12	1053	1988	2.40	1112	2236	2.68	1169	2497	2.97	1224	2769	3.27
4000	1009	1931	2.31	1069	2173	2.59	1126	2431	2.88	1181	2702	3.18	1234	2984	3.48
4250	1026	2114	2.51	1085	2366	2.80	1141	2634	3.10	1194	2914	3.40	1246	3206	3.72
4500	1044	2304	2.72	1102	2566	3.02	1157	2844	3.33	1209	3133	3.65	1260	3433	3.97
4750	1062	2504	2.95	1120	2775	3.26	1174	3062	3.58	1226	3360	3.91	1275	3666	4.23
5000	1081	2712	3.19	1138	2993	3.52	1191	3288	3.85	1242	3592	4.18	1291	3905	4.52
5250	1100	2931	3.44	1156	3220	3.79	1209	3523	4.13	1260	3832	4.47	1308	4148	4.82
5500	1119	3160	3.72	1175	3457	4.07	1228	3765	4.43	1278	4077	4.78	1326	4395	5.14
5750	1138	3399	4.00	1194	3702	4.37	1246	4014	4.74	1296	4328	5.11	1343	4644	5.48
6000	1158	3649	4.31	1213	3957	4.69	1265	4270	5.07	1315	4581	5.45	—	—	—
6250	1179	3910	4.64	1233	4219	5.02	1284	4531	5.41	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Alternate high-static drive range is 1040 to 1315 (for 208/230 and 460-v units). The alternate high-static drive is not available for 575-v units. Other rpms require a field-supplied drive.

Refer to page 163 for general Fan Performance Data notes.

NOTES:

1. Field-supplied motor required.
2. Maximum continuous bhp for the optional motor is 4.26. Maximum continous watts for the optional motor is 3610. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data tables for more information.
3. Fan performance is identical for horizontal discharge applications using Carrier horizontal adapter curb.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJF015 WITH STANDARD MOTOR (High Heat Units)*

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	622	888	0.89	713	1027	1.13	795	1234	1.37	869	1454	1.63	936	1584	1.89
4000	652	1015	1.04	738	1168	1.28	818	1388	1.54	890	1620	1.80	956	1756	2.07
4250	682	1151	1.20	763	1317	1.45	841	1550	1.72	911	1793	1.99	976	1937	2.27
4500	713	1295	1.38	790	1474	1.63	864	1719	1.91	934	1973	2.20	997	2126	2.49
4750	744	1448	1.58	817	1641	1.84	889	1896	2.12	956	2159	2.42	1019	2326	2.72
5000	776	1610	1.80	845	1817	2.06	914	2081	2.35	979	2353	2.66	1041	2536	2.97
5250	808	1783	2.04	874	2003	2.31	940	2277	2.60	1003	2556	2.91	1064	2757	3.24
5500	840	1967	2.29	903	2200	2.57	966	2482	2.87	1028	2768	3.19	1087	2991	3.52
5750	872	2163	2.57	933	2410	2.86	993	2699	3.16	1053	2990	3.49	1110	3237	3.83
6000	905	2373	2.87	963	2634	3.16	1021	2929	3.47	1078	3225	3.81	1134	3497	4.15
6250	937	2596	3.19	994	2872	3.49	1049	3172	3.81	1105	3473	4.15	1159	3769	4.50

48HJF015 WITH STANDARD MOTOR (High Heat Units)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	999	1829	2.15	1059	2091	2.42	1117	2343	2.70	1174	2521	2.99	1228	2801	3.29
4000	1017	2010	2.35	1076	2279	2.63	1132	2540	2.91	1186	2738	3.21	1239	3023	3.51
4250	1036	2198	2.56	1093	2474	2.85	1148	2743	3.14	1201	2962	3.44	1253	3251	3.75
4500	1056	2395	2.78	1112	2675	3.08	1166	2951	3.39	1217	3194	3.70	1267	3487	4.01
4750	1077	2601	3.03	1132	2885	3.34	1184	3168	3.65	1235	3435	3.97	1284	3731	4.29
5000	1098	2816	3.29	1152	3104	3.61	1204	3392	3.93	1253	3683	4.26	1301	3981	4.59
5250	1120	3042	3.56	1173	3332	3.90	1224	3626	4.23	1273	3940	4.57	1320	4239	4.91
5500	1142	3279	3.86	1195	3570	4.20	1245	3870	4.55	1293	4203	4.89	1339	4501	5.24
5750	1165	3528	4.18	1217	3819	4.53	1266	4125	4.88	1313	4471	5.24	—	—	—
6000	1188	3789	4.51	1239	4080	4.88	1288	4389	5.24	—	—	—	—	—	—
6250	1212	4062	4.87	1262	4351	5.24	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 895 to 1147 rpm. Other rpms require a field-supplied drive.

Refer to page 163 for general Fan Performance Data notes.

NOTES:

1. Field-supplied motor required.
2. Maximum continuous bhp for the standard motor is 3.13 (for 208/230 and 460-v units) or 3.38 (for 575-v units). The maximum continuous watts is 2700 (for 208/230 and 460-v units) or 3065 (for 575-v units). Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data tables for more information.
3. Fan performance is identical for horizontal discharge applications using Carrier horizontal adapter curb.

48HJF015 WITH OPTIONAL MOTOR (High Heat Units)*

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	622	888	0.89	713	1027	1.13	795	1234	1.37	869	1454	1.63	936	1584	1.89
4000	652	1015	1.04	738	1168	1.28	818	1388	1.54	890	1620	1.80	956	1756	2.07
4250	682	1151	1.20	763	1317	1.45	841	1550	1.72	911	1793	1.99	976	1937	2.27
4500	713	1295	1.38	790	1474	1.63	864	1719	1.91	934	1973	2.20	997	2126	2.49
4750	744	1448	1.58	817	1641	1.84	889	1896	2.12	956	2159	2.42	1019	2326	2.72
5000	776	1610	1.80	845	1817	2.06	914	2081	2.35	979	2353	2.66	1041	2536	2.97
5250	808	1783	2.04	874	2003	2.31	940	2277	2.60	1003	2556	2.91	1064	2757	3.24
5500	840	1967	2.29	903	2200	2.57	966	2482	2.87	1028	2768	3.19	1087	2991	3.52
5750	872	2163	2.57	933	2410	2.86	993	2699	3.16	1053	2990	3.49	1110	3237	3.83
6000	905	2373	2.87	963	2634	3.16	1021	2929	3.47	1078	3225	3.81	1134	3497	4.15
6250	937	2596	3.19	994	2872	3.49	1049	3172	3.81	1105	3473	4.15	1159	3769	4.50

48HJF015 WITH OPTIONAL MOTOR (High Heat Units)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	999	1829	2.15	1059	2091	2.42	1117	2343	2.70	1174	2521	2.99	1228	2801	3.29
4000	1017	2010	2.35	1076	2279	2.63	1132	2540	2.91	1186	2738	3.21	1239	3023	3.51
4250	1036	2198	2.56	1093	2474	2.85	1148	2743	3.14	1201	2962	3.44	1253	3251	3.75
4500	1056	2395	2.78	1112	2675	3.08	1166	2951	3.39	1217	3194	3.70	1267	3487	4.01
4750	1077	2601	3.03	1132	2885	3.34	1184	3168	3.65	1235	3435	3.97	1284	3731	4.29
5000	1098	2816	3.29	1152	3104	3.61	1204	3392	3.93	1253	3683	4.26	1301	3981	4.59
5250	1120	3042	3.56	1173	3332	3.90	1224	3626	4.23	1273	3940	4.57	1320	4239	4.91
5500	1142	3279	3.86	1195	3570	4.20	1245	3870	4.55	1293	4203	4.89	1339	4501	5.24
5750	1165	3528	4.18	1217	3819	4.53	1266	4125	4.88	1313	4471	5.24	—	—	—
6000	1188	3789	4.51	1239	4080	4.88	1288	4389	5.24	—	—	—	—	—	—
6250	1212	4062	4.87	1262	4351	5.24	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Alternate high-static drive range is 1040 to 1315. Other rpms require a field-supplied drive.

Refer to page 163 for general Fan Performance Data notes.

NOTES:

1. Field-supplied motor required.
2. Maximum continuous bhp for the optional motor is 4.26. The maximum continuous watts is 3610. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data tables for more information.
3. Fan performance is identical for horizontal discharge applications using Carrier horizontal adapter curb.

Performance data — 48HJ (cont)

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJD017 (Low Heat Units)*

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	753	1307	1.53	761	1330	1.56	840	1572	1.84	912	1822	2.14	980	2080	2.44
4800	747	1384	1.62	790	1515	1.78	866	1765	2.07	936	2023	2.37	1002	2289	2.68
5100	741	1465	1.72	820	1718	2.01	893	1977	2.32	961	2243	2.63	1025	2516	2.95
5700	810	1911	2.24	882	2182	2.56	950	2459	2.88	1014	2741	3.21	1075	3029	3.55
6000	844	2164	2.54	914	2444	2.87	980	2730	3.20	1042	3021	3.54	1100	3317	3.89
6300	879	2439	2.86	947	2729	3.20	1010	3023	3.55	1070	3322	3.90	1127	3626	4.25
6600	915	2737	3.21	980	3035	3.56	1041	3338	3.91	1099	3645	4.28	1155	3957	4.64
6900	950	3057	3.59	1013	3364	3.95	1072	3675	4.31	1129	3991	4.68	1183	4311	5.06
7200	986	3401	3.99	1047	3717	4.36	1104	4037	4.74	1159	4361	5.11	1211	4689	5.50
7500	1022	3770	4.42	1081	4095	4.80	1136	4423	5.19	1189	4755	5.58	1241	5091	5.97

48HJD017 (Low Heat Units)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1044	2345	2.75	1105	2619	3.07	1163	2899	3.40	1218	3187	3.74	1271	3481	4.08
4800	1065	2561	3.00	1124	2841	3.33	1180	3127	3.67	1235	3420	4.01	1287	3720	4.36
5100	1086	2795	3.28	1144	3082	3.61	1199	3375	3.96	1252	3674	4.31	1304	3979	4.67
5700	1132	3324	3.90	1187	3624	4.25	1240	3929	4.61	1291	4241	4.97	1341	4558	5.35
6000	1157	3619	4.24	1210	3925	4.60	1262	4239	4.97	1312	4557	5.34	1361	4880	5.72
6300	1182	3935	4.62	1234	4249	4.98	1285	4569	5.36	1334	4894	5.74	—	—	—
6600	1208	4274	5.01	1259	4595	5.39	1309	4922	5.77	—	—	—	—	—	—
6900	1235	4636	5.44	1285	4964	5.82	—	—	—	—	—	—	—	—	—
7200	1262	5021	5.89	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48HJD017 (Low Heat Units)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	2.2			2.4			2.6			2.8			3.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1322	3781	4.43	1372	4088	4.79	1419	4400	5.16	1466	4719	5.53	1511	5042	5.91
4800	1337	4025	4.72	1386	4337	5.09	1433	4655	5.46	1479	4978	5.84	—	—	—
5100	1353	4290	5.03	1401	4607	5.40	1448	4930	5.78	—	—	—	—	—	—
5700	1388	4881	5.72	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Standard low-medium static drive range is 873 to 1021 rpm. Alternate high-static drive range is 1025 to 1200. Other rpms require a field-supplied drive.

Refer to page 163 for general Fan Performance Data notes.

NOTES:
1. Maximum continuous bhp for the standard motor is 6.13. The maximum continuous watts is 5180. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data tables for more information.
2. Fan performance is identical for horizontal discharge applications using Carrier horizontal adapter curb.

FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

48HJF017 (High Heat Units)*

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	753	1307	1.53	786	1404	1.65	861	1644	1.93	932	1893	2.22	997	2150	2.52
4800	747	1384	1.62	818	1603	1.88	890	1852	2.17	958	2108	2.47	1022	2373	2.78
5100	775	1571	1.84	850	1822	2.14	920	2079	2.44	986	2344	2.75	1048	2616	3.07
5700	849	2054	2.41	918	2323	2.73	982	2598	3.05	1044	2879	3.38	1102	3166	3.71
6000	886	2329	2.73	952	2607	3.06	1015	2891	3.39	1074	3180	3.73	1130	3474	4.08
6300	924	2628	3.08	987	2915	3.42	1047	3207	3.76	1105	3504	4.11	1160	3807	4.46
6600	962	2951	3.46	1023	3246	3.81	1081	3547	4.16	1136	3853	4.52	1190	4163	4.88
6900	1000	3298	3.87	1059	3603	4.23	1115	3912	4.59	1168	4225	4.96	1220	4543	5.33
7200	1038	3672	4.31	1095	3986	4.67	1149	4303	5.05	1201	4625	5.42	1251	4950	5.81
7500	1077	4072	4.78	1131	4394	5.15	1184	4720	5.54	1234	5050	5.92	—	—	—

48HJF017 (High Heat Units)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1060	2414	2.83	1119	2685	3.15	1175	2964	3.48	1230	3250	3.81	1282	3542	4.15
4800	1082	2644	3.10	1140	2922	3.43	1195	3207	3.76	1248	3498	4.10	1299	3795	4.45
5100	1106	2894	3.39	1163	3178	3.73	1216	3470	4.07	1268	3767	4.42	1319	4071	4.77
5700	1157	3459	4.06	1211	3757	4.41	1262	4061	4.76	1312	4371	5.13	1360	4686	5.50
6000	1184	3774	4.43	1236	4080	4.79	1287	4391	5.15	1335	4707	5.52	1382	5029	5.90
6300	1212	4114	4.83	1263	4427	5.19	1312	4745	5.57	1359	5067	5.94	—	—	—
6600	1241	4478	5.25	1290	4798	5.63	1338	5122	6.01	—	—	—	—	—	—
6900	1270	4866	5.71	—	—	—	—	—	—	—	—	—	—	—	—
7200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48HJF017 (High Heat Units)* (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)														
	2.2			2.4			2.6			2.8			3.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1332	3841	4.50	1381	4145	4.86	1428	4456	5.23	1473	4772	5.60	1518	5095	5.98
4800	1349	4100	4.81	1397	4409	5.17	1443	4725	5.54	1488	5046	5.92	—	—	—
5100	1367	4380	5.14	1414	4695	5.51	1460	5016	5.88	—	—	—	—	—	—
5700	1407	5007	5.87	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Standard low-medium static drive range is 873 to 1021 rpm. Alternate high-static drive range is 1025 to 1200. Other rpms require a field-supplied drive.

Refer to this page for general Fan Performance Data notes.

NOTES:
1. Maximum continuous bhp for the standard motor is 6.13. The maximum continuous watts is 5180. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm. See Evaporator Fan Motor Data tables for more information.
2. Fan performance is identical for horizontal discharge applications using Carrier horizontal adapter curb.

GENERAL NOTES FOR FAN PERFORMANCE DATA TABLES

1. Static pressure losses (i.e., EconoMi$er+) must be added to external static pressure before entering Fan Performance table.
2. Interpolation is permissible. Do not extrapolate.
3. Fan performance is based on wet coils, clean filters, and casing losses. See Accessory/FIOP Static Pressure table on page 179.
4. Extensive motor and drive testing on these units ensures that the full horsepower and watts range of the motor can be utilized with confidence. Using your fan motors up to the watts or bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
5. Use of a field-supplied motor may affect wire size. Contact your Carrier representative for details.

Performance data — 48HJ (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS

48HJ004 (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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**553**	**0.14**	**134**	681	0.22	221	782	0.32	316	870	0.42	417	948	0.53	526
1000	**582**	**0.16**	**163**	707	0.26	257	807	0.36	358	894	0.47	466	971	0.58	580
1100	**612**	**0.20**	**196**	734	0.30	297	833	0.41	405	919	0.52	519	995	0.64	639
1200	**643**	**0.23**	**234**	762	0.34	343	859	0.46	458	944	0.58	579	1020	0.71	705
1300	**675**	**0.28**	**277**	790	0.40	394	886	0.52	517	969	0.65	644	1044	0.78	777
1400	707	0.33	326	819	0.45	452	913	0.58	581	996	0.72	716	**1070**	**0.86**	**855**
1500	740	0.38	382	849	0.52	515	941	0.66	653	1023	0.80	795	**1096**	**0.95**	**941**

48HJ004 (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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1019	0.64	640	**1084**	**0.76**	**760**	**1146**	**0.89**	**885**	**1203**	**1.02**	**1016**	**1258**	**1.16**	**1152**
1000	1042	0.70	700	**1107**	**0.83**	**825**	**1168**	**0.96**	**956**	**1225**	**1.10**	**1091**	—	—	—
1100	**1065**	**0.77**	**765**	**1130**	**0.90**	**896**	**1190**	**1.04**	**1032**	**1247**	**1.18**	**1173**	—	—	—
1200	**1089**	**0.84**	**837**	**1153**	**0.98**	**974**	**1213**	**1.12**	**1115**	—	—	—	—	—	—
1300	**1113**	**0.92**	**915**	**1177**	**1.06**	**1058**	—	—	—	—	—	—	—	—	—
1400	**1138**	**1.01**	**1000**	**1201**	**1.15**	**1149**	—	—	—	—	—	—	—	—	—
1500	**1163**	**1.10**	**1092**	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 680 to 1044 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.20.

48HJ004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**553**	**0.14**	**134**	**681**	**0.22**	**221**	**782**	**0.32**	**316**	**870**	**0.42**	**417**	**948**	**0.53**	**526**
1000	**582**	**0.16**	**163**	**707**	**0.26**	**257**	**807**	**0.36**	**358**	**894**	**0.47**	**466**	**971**	**0.58**	**580**
1100	**612**	**0.20**	**196**	**734**	**0.30**	**297**	**833**	**0.41**	**405**	**919**	**0.52**	**519**	**995**	**0.64**	**639**
1200	**643**	**0.23**	**234**	**762**	**0.34**	**343**	**859**	**0.46**	**458**	**944**	**0.58**	**579**	**1020**	**0.71**	**705**
1300	**675**	**0.28**	**277**	**790**	**0.40**	**394**	**886**	**0.52**	**517**	**969**	**0.65**	**644**	**1044**	**0.78**	**777**
1400	**707**	**0.33**	**326**	**819**	**0.45**	**452**	**913**	**0.58**	**581**	**996**	**0.72**	**716**	**1070**	**0.86**	**855**
1500	**740**	**0.38**	**382**	**849**	**0.52**	**515**	**941**	**0.66**	**653**	**1023**	**0.80**	**795**	1096	0.95	941

48HJ004 (3 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**1019**	**0.64**	**640**	1084	0.76	760	1146	0.89	885	1203	1.02	1016	1258	1.16	1152
1000	**1042**	**0.70**	**700**	1107	0.83	825	1168	0.96	956	1225	1.10	1091	1279	1.24	1232
1100	**1065**	**0.77**	**765**	1130	0.90	896	1190	1.04	1032	1247	1.18	1173	1301	1.33	1319
1200	1089	0.84	837	1153	0.98	974	1213	1.12	1115	1270	1.27	1262	1324	1.42	1413
1300	1113	0.92	915	1177	1.06	1058	1237	1.21	1205	1293	1.36	1358	1347	1.52	1514
1400	1138	1.01	1000	1201	1.15	1149	1261	1.31	1303	1317	1.47	1461	1370	1.63	1623
1500	1163	1.10	1092	1226	1.25	1247	1285	1.41	1407	1341	1.58	1571	1394	1.75	1740

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

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

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ005 (4 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**643**	**0.23**	**234**	**762**	**0.34**	**343**	859	0.46	458	944	0.58	579	1020	0.71	705
1300	**675**	**0.28**	**277**	790	0.40	394	886	0.52	517	969	0.65	644	1044	0.78	777
1400	**707**	**0.33**	**326**	819	0.45	452	913	0.58	581	996	0.72	716	1070	0.86	855
1500	**740**	**0.38**	**382**	849	0.52	515	941	0.66	653	1023	0.80	795	1096	0.95	941
1600	773	0.45	444	879	0.59	586	970	0.73	731	1050	0.88	880	1123	1.04	1034
1700	807	0.52	513	910	0.67	663	999	0.82	817	1078	0.98	973	1150	1.14	1134
1800	841	0.59	589	942	0.75	749	1029	0.91	910	1106	1.08	1074	—	—	—
1900	875	0.68	674	974	0.85	842	1059	1.02	1012	1135	1.19	1184	—	—	—
2000	910	0.77	767	1006	0.95	944	1090	1.13	1122	—	—	—	—	—	—

48HJ005 (4 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1089	0.84	837	1153	0.98	974	**1213**	**1.12**	**1115**	—	—	—	—	—	—
1300	1113	0.92	915	1177	1.06	1058	—	—	—	—	—	—	—	—	—
1400	1138	1.01	1000	**1201**	**1.15**	**1149**	—	—	—	—	—	—	—	—	—
1500	1163	1.10	1092	—	—	—	—	—	—	—	—	—	—	—	—
1600	**1189**	**1.20**	**1191**	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 770 to 1185 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.20.

48HJ005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**643**	**0.23**	**234**	**762**	**0.34**	**343**	**859**	**0.46**	**458**	**944**	**0.58**	**579**	**1020**	**0.71**	**705**
1300	**675**	**0.28**	**277**	**790**	**0.40**	**394**	**886**	**0.52**	**517**	**969**	**0.65**	**644**	**1044**	**0.78**	**777**
1400	**707**	**0.33**	**326**	**819**	**0.45**	**452**	**913**	**0.58**	**581**	**996**	**0.72**	**716**	**1070**	**0.86**	**855**
1500	**740**	**0.38**	**382**	**849**	**0.52**	**515**	**941**	**0.66**	**653**	**1023**	**0.80**	**795**	1096	0.95	941
1600	**773**	**0.45**	**444**	**879**	**0.59**	**586**	**970**	**0.73**	**731**	**1050**	**0.88**	**880**	1123	1.04	1034
1700	**807**	**0.52**	**513**	**910**	**0.67**	**663**	**999**	**0.82**	**817**	1078	0.98	973	1150	1.14	1134
1800	**841**	**0.59**	**589**	**942**	**0.75**	**749**	**1029**	**0.91**	**910**	1106	1.08	1074	1177	1.25	1242
1900	**875**	**0.68**	**674**	**974**	**0.85**	**842**	**1059**	**1.02**	**1012**	1135	1.19	1184	1205	1.37	1360
2000	**910**	**0.77**	**767**	**1006**	**0.95**	**944**	1090	1.13	1122	1165	1.31	1302	1234	1.49	1485

48HJ005 (4 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1089	0.84	837	1153	0.98	974	1213	1.12	1115	1270	1.27	1262	1324	1.42	1413
1300	1113	0.92	915	1177	1.06	1058	1237	1.21	1205	1293	1.36	1358	1347	1.52	1514
1400	1138	1.01	1000	1201	1.15	1149	1261	1.31	1303	1317	1.47	1461	1370	1.63	1623
1500	1163	1.10	1092	1226	1.25	1247	1285	1.41	1407	1341	1.58	1571	1394	1.75	1740
1600	1189	1.20	1191	1252	1.36	1353	1310	1.53	1520	1365	1.70	1690	1418	1.87	1865
1700	1216	1.31	1299	1277	1.48	1468	1335	1.65	1640	1390	1.83	1817	1442	2.01	1998
1800	1242	1.42	1414	1303	1.60	1590	1361	1.78	1770	1415	1.96	1953	**1467**	**2.15**	**2140**
1900	1270	1.55	1538	1330	1.73	1721	1387	1.92	1908	1441	2.11	2098	**1493**	**2.30**	**2292**
2000	1297	1.68	1672	1357	1.87	1862	1414	2.07	2055	**1467**	**2.26**	**2252**	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

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

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48HJ (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ006 (5 TONS) — STANDARD MOTOR (BELT DRIVE)* — SINGLE-PHASE UNITS

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**800**	**0.39**	**350**	**904**	**0.49**	**438**	**999**	**0.60**	**535**	1087	0.72	640	1169	0.85	753
1600	**839**	**0.46**	**412**	**938**	**0.57**	**505**	**1030**	**0.68**	**605**	1115	0.80	714	1195	0.93	829
1700	**879**	**0.54**	**483**	**974**	**0.65**	**580**	1062	0.77	684	1144	0.90	796	1221	1.03	914
1800	**919**	**0.63**	**561**	**1010**	**0.75**	**663**	1095	0.87	771	1174	1.00	886	1250	1.14	1008
1900	**960**	**0.73**	**648**	1047	0.85	754	1129	0.98	867	1206	1.11	986	1279	1.25	1111
2000	**1001**	**0.84**	**744**	1085	0.96	855	1163	1.09	972	1238	1.23	1095	—	—	—
2100	1043	0.96	850	1123	1.09	965	1199	1.22	1086	—	—	—	—	—	—
2200	1085	1.09	966	1162	1.22	1086	—	—	—	—	—	—	—	—	—
2300	1127	1.23	1092	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48HJ006 (5 TONS) — STANDARD MOTOR (BELT DRIVE)* — SINGLE-PHASE UNITS (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1247	0.98	873	1320	1.13	1002	1390	1.28	1137	—	—	—	—	—	—
1600	1270	1.07	952	1342	1.22	1083	—	—	—	—	—	—	—	—	—
1700	1295	1.17	1040	—	—	—	—	—	—	—	—	—	—	—	—
1800	1321	1.28	1137	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 1035 to 1460 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 1.30.

48HJ006 (5 TONS) — STANDARD MOTOR (BELT DRIVE)* — THREE-PHASE UNITS

Airflow CFM	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**800**	**0.39**	**350**	**904**	**0.49**	**438**	**999**	**0.60**	**535**	1087	0.72	640	1169	0.85	753
1600	**839**	**0.46**	**412**	**938**	**0.57**	**505**	**1030**	**0.68**	**605**	1115	0.80	714	1195	0.93	829
1700	**879**	**0.54**	**483**	**974**	**0.65**	**580**	1062	0.77	684	1144	0.90	796	1221	1.03	914
1800	**919**	**0.63**	**561**	**1010**	**0.75**	**663**	1095	0.87	771	1174	1.00	886	1250	1.14	1008
1900	**960**	**0.73**	**648**	1047	0.85	754	1129	0.98	867	1206	1.11	986	1279	1.25	1111
2000	**1001**	**0.84**	**744**	1085	0.96	855	1163	1.09	972	1238	1.23	1095	1309	1.38	1224
2100	1043	0.96	850	1123	1.09	965	1199	1.22	1086	1271	1.37	1213	1340	1.52	1346
2200	1085	1.09	966	1162	1.22	1086	1235	1.36	1211	1305	1.51	1342	1372	1.67	1479
2300	1127	1.23	1092	1201	1.37	1217	1272	1.52	1347	1340	1.67	1482	1405	1.83	1623
2400	1169	1.38	1229	1241	1.53	1359	1310	1.68	1493	1375	1.84	1633	1439	2.00	1778
2500	1212	1.55	1378	1281	1.70	1513	1348	1.86	1652	1412	2.02	1796	**1473**	**2.19**	**1945**

48HJ006 (5 TONS) — STANDARD MOTOR (BELT DRIVE)* — THREE-PHASE UNITS (cont)

Airflow CFM	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1247	0.98	873	1320	1.13	1002	1390	1.28	1137	1457	1.44	1280	**1522**	**1.61**	**1430**
1600	1270	1.07	952	1342	1.22	1083	1411	1.37	1221	**1476**	**1.54**	**1365**	**1540**	**1.71**	**1517**
1700	1295	1.17	1040	1365	1.32	1173	1432	1.48	1313	**1497**	**1.64**	**1459**	**1559**	**1.82**	**1612**
1800	1321	1.28	1137	1390	1.43	1273	1455	1.59	1415	**1518**	**1.76**	**1563**	**1579**	**1.93**	**1718**
1900	1348	1.40	1243	1415	1.56	1381	**1479**	**1.72**	**1526**	**1541**	**1.89**	**1677**	**1601**	**2.06**	**1834**
2000	1377	1.53	1359	1442	1.69	1500	**1505**	**1.86**	**1648**	**1565**	**2.03**	**1801**	**1624**	**2.21**	**1961**
2100	1406	1.67	1485	**1470**	**1.83**	**1629**	**1531**	**2.00**	**1780**	**1591**	**2.18**	**1936**	**1648**	**2.36**	**2098**
2200	1437	1.83	1621	**1499**	**1.99**	**1769**	**1559**	**2.16**	**1923**	**1617**	**2.34**	**2082**	—	—	—
2300	**1468**	**1.99**	**1769**	**1529**	**2.16**	**1920**	**1587**	**2.34**	**2077**	—	—	—	—	—	—
2400	**1500**	**2.17**	**1928**	**1559**	**2.35**	**2083**	—	—	—	—	—	—	—	—	—
2500	**1533**	**2.36**	**2098**	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 1035 to 1460 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**800**	**0.39**	**350**	**904**	**0.49**	**438**	**999**	**0.60**	**535**	**1087**	**0.72**	**640**	**1169**	**0.85**	**753**
1600	**839**	**0.46**	**412**	**938**	**0.57**	**505**	**1030**	**0.68**	**605**	**1115**	**0.80**	**714**	**1195**	**0.93**	**829**
1700	**879**	**0.54**	**483**	**974**	**0.65**	**580**	**1062**	**0.77**	**684**	**1144**	**0.90**	**796**	**1221**	**1.03**	**914**
1800	**919**	**0.63**	**561**	**1010**	**0.75**	**663**	**1095**	**0.87**	**771**	**1174**	**1.00**	**886**	**1250**	**1.14**	**1008**
1900	**960**	**0.73**	**648**	**1047**	**0.85**	**754**	**1129**	**0.98**	**867**	**1206**	**1.11**	**986**	**1279**	**1.25**	**1111**
2000	**1001**	**0.84**	**744**	**1085**	**0.96**	**855**	**1163**	**1.09**	**972**	**1238**	**1.23**	**1095**	1309	1.38	1224
2100	**1043**	**0.96**	**850**	**1123**	**1.09**	**965**	**1199**	**1.22**	**1086**	**1271**	**1.37**	**1213**	1340	1.52	1346
2200	**1085**	**1.09**	**966**	**1162**	**1.22**	**1086**	**1235**	**1.36**	**1211**	1305	1.51	1342	1372	1.67	1479
2300	**1127**	**1.23**	**1092**	**1201**	**1.37**	**1217**	**1272**	**1.52**	**1347**	1340	1.67	1482	1405	1.83	1623
2400	**1169**	**1.38**	**1229**	**1241**	**1.53**	**1359**	1310	1.68	1493	1375	1.84	1633	1439	2.00	1778
2500	**1212**	**1.55**	**1378**	**1281**	**1.70**	**1513**	1348	1.86	1652	1412	2.02	1796	1473	2.19	1945

48HJ006 (5 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**1247**	**0.98**	**873**	1320	1.13	1002	1390	1.28	1137	1457	1.44	1280	1522	1.61	1430
1600	**1270**	**1.07**	**952**	1342	1.22	1083	1411	1.37	1221	1476	1.54	1365	1540	1.71	1517
1700	**1295**	**1.17**	**1040**	1365	1.32	1173	1432	1.48	1313	1497	1.64	1459	1559	1.82	1612
1800	1321	1.28	1137	1390	1.43	1273	1455	1.59	1415	1518	1.76	1563	1579	1.93	1718
1900	1348	1.40	1243	1415	1.56	1381	1479	1.72	1526	1541	1.89	1677	1601	2.06	1834
2000	1377	1.53	1359	1442	1.69	1500	1505	1.86	1648	1565	2.03	1801	1624	2.21	1961
2100	1406	1.67	1485	1470	1.83	1629	1531	2.00	1780	1591	2.18	1936	1648	2.36	2098
2200	1437	1.83	1621	1499	1.99	1769	1559	2.16	1923	1617	2.34	2082	1673	2.53	2246
2300	1468	1.99	1769	1529	2.16	1920	1587	2.34	2077	1644	2.52	2239	**1699**	**2.71**	**2406**
2400	1500	2.17	1928	1559	2.35	2083	1616	2.53	2243	1672	2.71	2408	**1726**	**2.90**	**2579**
2500	1533	2.36	2098	1591	2.54	2257	1647	2.73	2421	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

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

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

48HJ007 (6 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**913**	**0.64**	**569**	**1010**	**0.80**	**715**	**1098**	**0.98**	**869**	1178	1.16	1032	1252	1.35	1203
1900	**952**	**0.73**	**652**	**1046**	**0.91**	**805**	1131	1.09	965	1210	1.28	1134	1282	1.48	1311
2000	**992**	**0.84**	**744**	**1083**	**1.02**	**903**	1166	1.21	1070	1242	1.40	1245	1313	1.61	1427
2100	**1032**	**0.95**	**844**	1120	1.14	1010	1200	1.33	1184	1275	1.54	1365	1345	1.75	1553
2200	**1073**	**1.07**	**954**	1158	1.27	1127	1236	1.47	1307	1308	1.68	1495	1377	1.90	1689
2300	**1114**	**1.21**	**1074**	1196	1.41	1254	1272	1.62	1440	1343	1.84	1634	1409	2.07	1834
2400	1155	1.36	1204	1234	1.57	1391	1308	1.78	1584	1377	2.01	1784	1443	2.24	1990
2500	1196	1.51	1345	1273	1.73	1538	1345	1.96	1738	1412	2.19	1945	—	—	—
2600	1238	1.69	1497	1312	1.91	1697	1382	2.14	1904	1448	2.38	2117	—	—	—
2700	1280	1.87	1660	1352	2.10	1867	1420	2.34	2081	—	—	—	—	—	—
2800	1322	2.07	1835	1392	2.31	2050	—	—	—	—	—	—	—	—	—
2900	1364	2.28	2023	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

48HJ007 (6 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1322	1.56	1382	1388	1.77	1568	1451	1.98	1762	1510	2.21	1962	—	—	—
1900	1351	1.68	1495	1416	1.90	1686	1477	2.12	1885	1536	2.35	2090	—	—	—
2000	1380	1.82	1617	1444	2.04	1814	1505	2.27	2017	—	—	—	—	—	—
2100	1411	1.97	1748	1473	2.20	1950	—	—	—	—	—	—	—	—	—
2200	1441	2.13	1890	1503	2.36	2097	—	—	—	—	—	—	—	—	—
2300	1473	2.30	2041	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 1119 to 1585 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.40.

Performance data — 48HJ (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow CFM	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**913**	**0.64**	**569**	**1010**	**0.80**	**715**	**1098**	**0.98**	**869**	**1178**	**1.16**	**1032**	**1252**	**1.35**	**1203**
1900	**952**	**0.73**	**652**	**1046**	**0.91**	**805**	**1131**	**1.09**	**965**	**1210**	**1.28**	**1134**	**1282**	**1.48**	**1311**
2000	**992**	**0.84**	**744**	**1083**	**1.02**	**903**	**1166**	**1.21**	**1070**	**1242**	**1.40**	**1245**	1313	1.61	1427
2100	**1032**	**0.95**	**844**	**1120**	**1.14**	**1010**	**1200**	**1.33**	**1184**	**1275**	**1.54**	**1365**	1345	1.75	1553
2200	**1073**	**1.07**	**954**	**1158**	**1.27**	**1127**	**1236**	**1.47**	**1307**	1308	1.68	1495	1377	1.90	1689
2300	**1114**	**1.21**	**1074**	**1196**	**1.41**	**1254**	**1272**	**1.62**	**1440**	1343	1.84	1634	1409	2.07	1834
2400	**1155**	**1.36**	**1204**	**1234**	**1.57**	**1391**	1308	1.78	1584	1377	2.01	1784	1443	2.24	1990
2500	**1196**	**1.51**	**1345**	**1273**	**1.73**	**1538**	1345	1.96	1738	1412	2.19	1945	1477	2.43	2157
2600	**1238**	**1.69**	**1497**	1312	1.91	1697	1382	2.14	1904	1448	2.38	2117	1511	2.63	2335
2700	**1280**	**1.87**	**1660**	1352	2.10	1867	1420	2.34	2081	1484	2.59	2300	1546	2.84	2526
2800	1322	2.07	1835	1392	2.31	2050	1458	2.56	2270	1521	2.81	2496	—	—	—
2900	1364	2.28	2023	1432	2.53	2245	1496	2.78	2472	—	—	—	—	—	—
3000	1406	2.50	2224	1472	2.76	2452	—	—	—	—	—	—	—	—	—

48HJ007 (6 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow CFM	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1322	1.56	1382	1388	1.77	1568	1451	1.98	1762	1510	2.21	1962	1568	2.44	2169
1900	1351	1.68	1495	1416	1.90	1686	1477	2.12	1885	1536	2.35	2090	1593	2.59	2302
2000	1380	1.82	1617	1444	2.04	1814	1505	2.27	2017	1563	2.51	2227	1619	2.75	2443
2100	1411	1.97	1748	1473	2.20	1950	1533	2.43	2159	1590	2.67	2374	—	—	—
2200	1441	2.13	1890	1503	2.36	2097	1562	2.60	2311	1618	2.85	2532	—	—	—
2300	1473	2.30	2041	1533	2.54	2254	1591	2.79	2474	—	—	—	—	—	—
2400	1505	2.48	2203	1564	2.73	2422	—	—	—	—	—	—	—	—	—
2500	1537	2.68	2376	—	—	—	—	—	—	—	—	—	—	—	—
2600	1571	2.88	2560	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
Watts — Input Watts to Motor

*Motor drive range: 1300 to 1686 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ008 (7½ TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**505**	**0.52**	**484**	**586**	**0.73**	**681**	**657**	**0.97**	**901**	**722**	**1.22**	**1142**	**782**	**1.50**	**1403**
2300	**513**	**0.55**	**509**	**592**	**0.76**	**708**	**663**	**1.00**	**931**	**727**	**1.26**	**1174**	**787**	**1.54**	**1437**
2400	**527**	**0.60**	**561**	**605**	**0.82**	**766**	**674**	**1.07**	**993**	**738**	**1.33**	**1241**	**796**	**1.62**	**1508**
2500	**543**	**0.66**	**617**	**618**	**0.89**	**828**	**686**	**1.14**	**1060**	**748**	**1.41**	**1312**	**806**	**1.70**	**1583**
2550	**550**	**0.69**	**647**	**625**	**0.92**	**860**	**692**	**1.17**	**1095**	**754**	**1.45**	**1349**	**811**	**1.74**	**1623**
2600	**558**	**0.73**	**677**	**632**	**0.96**	**894**	**698**	**1.21**	**1131**	**759**	**1.49**	**1388**	**816**	**1.78**	**1664**
2700	**574**	**0.80**	**742**	**645**	**1.03**	**964**	**710**	**1.29**	**1207**	**770**	**1.58**	**1469**	**826**	**1.88**	**1749**
2800	**589**	**0.87**	**811**	**659**	**1.11**	**1039**	**723**	**1.38**	**1287**	**782**	**1.67**	**1554**	**837**	**1.97**	**1839**
2900	**605**	**0.95**	**885**	**673**	**1.20**	**1119**	**736**	**1.47**	**1372**	**794**	**1.76**	**1644**	848	2.07	1933
3000	**621**	**1.03**	**963**	**688**	**1.29**	**1204**	**749**	**1.57**	**1463**	**806**	**1.87**	**1740**	859	2.18	2033
3100	**637**	**1.12**	**1046**	**702**	**1.39**	**1293**	**762**	**1.67**	**1558**	**818**	**1.97**	**1840**	871	2.29	2139
3200	**654**	**1.22**	**1135**	**717**	**1.49**	**1388**	**776**	**1.78**	**1658**	**831**	**2.09**	**1946**	882	2.41	2249
3300	**670**	**1.32**	**1228**	**732**	**1.60**	**1488**	**789**	**1.89**	**1764**	843	2.21	2057	894	2.54	2365
3400	**686**	**1.42**	**1328**	**747**	**1.71**	**1593**	**803**	**2.01**	**1876**	856	2.33	2174	907	2.67	2488
3500	**703**	**1.54**	**1433**	**762**	**1.83**	**1705**	**817**	**2.14**	**1993**	870	2.46	2297	919	2.81	2616
3600	**720**	**1.66**	**1543**	**777**	**1.95**	**1822**	**832**	**2.27**	**2116**	883	2.60	2425	—	—	—
3700	**736**	**1.78**	**1660**	**793**	**2.09**	**1944**	846	2.41	2245	896	2.75	2560	—	—	—
3750	**745**	**1.85**	**1721**	**801**	**2.15**	**2008**	853	2.48	2312	903	2.82	2630	—	—	—

48HJ008 (7½ 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**838**	**1.81**	**1683**	891	2.12	1981	941	2.46	2297	988	2.82	2629	—	—	—
2300	842	1.84	1719	895	2.17	2019	944	2.51	2336	992	2.86	2669	—	—	—
2400	851	1.92	1793	903	2.25	2097	952	2.59	2416	—	—	—	—	—	—
2500	860	2.01	1873	911	2.34	2180	960	2.68	2502	—	—	—	—	—	—
2550	865	2.05	1914	916	2.38	2223	964	2.73	2547	—	—	—	—	—	—
2600	869	2.10	1957	920	2.43	2267	968	2.78	2593	—	—	—	—	—	—
2700	879	2.19	2046	929	2.53	2360	976	2.88	2689	—	—	—	—	—	—
2800	889	2.29	2140	938	2.64	2458	—	—	—	—	—	—	—	—	—
2900	899	2.40	2239	948	2.75	2561	—	—	—	—	—	—	—	—	—
3000	910	2.51	2343	958	2.86	2670	—	—	—	—	—	—	—	—	—
3100	921	2.63	2453	—	—	—	—	—	—	—	—	—	—	—	—
3200	932	2.75	2569	—	—	—	—	—	—	—	—	—	—	—	—
3300	943	2.88	2690	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 840 to 1085 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

Performance data — 48HJ (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ008 (7 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**505**	**0.52**	**484**	**586**	**0.73**	**681**	**657**	**0.97**	**901**	**722**	**1.22**	**1142**	**782**	**1.50**	**1403**
2300	**513**	**0.55**	**509**	**592**	**0.76**	**708**	**663**	**1.00**	**931**	**727**	**1.26**	**1174**	**787**	**1.54**	**1437**
2400	**527**	**0.60**	**561**	**605**	**0.82**	**766**	**674**	**1.07**	**993**	**738**	**1.33**	**1241**	**796**	**1.62**	**1508**
2500	**543**	**0.66**	**617**	**618**	**0.89**	**828**	**686**	**1.14**	**1060**	**748**	**1.41**	**1312**	**806**	**1.70**	**1583**
2550	**550**	**0.69**	**647**	**625**	**0.92**	**860**	**692**	**1.17**	**1095**	**754**	**1.45**	**1349**	**811**	**1.74**	**1623**
2600	**558**	**0.73**	**677**	**632**	**0.96**	**894**	**698**	**1.21**	**1131**	**759**	**1.49**	**1388**	**816**	**1.78**	**1664**
2700	**574**	**0.80**	**742**	**645**	**1.03**	**964**	**710**	**1.29**	**1207**	**770**	**1.58**	**1469**	**826**	**1.88**	**1749**
2800	**589**	**0.87**	**811**	**659**	**1.11**	**1039**	**723**	**1.38**	**1287**	**782**	**1.67**	**1554**	**837**	**1.97**	**1839**
2900	**605**	**0.95**	**885**	**673**	**1.20**	**1119**	**736**	**1.47**	**1372**	**794**	**1.76**	**1644**	**848**	**2.07**	**1933**
3000	**621**	**1.03**	**963**	**688**	**1.29**	**1204**	**749**	**1.57**	**1463**	**806**	**1.87**	**1740**	**859**	**2.18**	**2033**
3100	**637**	**1.12**	**1046**	**702**	**1.39**	**1293**	**762**	**1.67**	**1558**	**818**	**1.97**	**1840**	871	2.29	2139
3200	**654**	**1.22**	**1135**	**717**	**1.49**	**1388**	**776**	**1.78**	**1658**	**831**	**2.09**	**1946**	882	2.41	2249
3300	**670**	**1.32**	**1228**	**732**	**1.60**	**1488**	**789**	**1.89**	**1764**	**843**	**2.21**	**2057**	894	2.54	2365
3400	**686**	**1.42**	**1328**	**747**	**1.71**	**1593**	**803**	**2.01**	**1876**	**856**	**2.33**	**2174**	907	2.67	2488
3500	**703**	**1.54**	**1433**	**762**	**1.83**	**1705**	**817**	**2.14**	**1993**	870	2.46	2297	919	2.81	2616
3600	**720**	**1.66**	**1543**	**777**	**1.95**	**1822**	**832**	**2.27**	**2116**	883	2.60	2425	932	2.95	2750
3700	**736**	**1.78**	**1660**	**793**	**2.09**	**1944**	**846**	**2.41**	**2245**	896	2.75	2560	944	3.10	2889
3750	**745**	**1.85**	**1721**	**801**	**2.15**	**2008**	**853**	**2.48**	**2312**	903	2.82	2630	951	3.18	2962

48HJ008 (7 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**838**	**1.81**	**1683**	891	2.12	1981	941	2.46	2297	988	2.82	2629	1033	3.19	2976
2300	**842**	**1.84**	**1719**	895	2.17	2019	944	2.51	2336	992	2.86	2669	1037	3.24	3018
2400	**851**	**1.92**	**1793**	903	2.25	2097	952	2.59	2416	999	2.95	2752	1043	3.33	3104
2500	860	2.01	1873	911	2.34	2180	960	2.68	2502	1006	3.05	2842	1051	3.43	3196
2550	865	2.05	1914	916	2.38	2223	964	2.73	2547	1010	3.10	2888	1054	3.48	3243
2600	869	2.10	1957	920	2.43	2267	968	2.78	2593	1014	3.15	2935	1058	3.53	3292
2700	879	2.19	2046	929	2.53	2360	976	2.88	2689	1022	3.25	3035	1066	3.64	3395
2800	889	2.29	2140	938	2.64	2458	985	2.99	2791	1030	3.37	3140	1073	3.76	3503
2900	899	2.40	2239	948	2.75	2561	994	3.11	2898	1039	3.49	3250	**1082**	**3.88**	**3616**
3000	910	2.51	2343	958	2.86	2670	1004	3.23	3011	1048	3.61	3366	**1090**	**4.01**	**3736**
3100	921	2.63	2453	968	2.98	2783	1013	3.35	3128	1057	3.74	3488	**1099**	**4.14**	**3861**
3200	932	2.75	2569	978	3.11	2903	1023	3.49	3252	1066	3.88	3616	—	—	—
3300	943	2.88	2690	989	3.25	3029	1033	3.63	3382	1076	4.02	3749	—	—	—
3400	954	3.02	2816	1000	3.39	3159	1044	3.77	3518	**1086**	**4.17**	**3889**	—	—	—
3500	966	3.16	2950	1011	3.54	3297	1054	3.92	3660	—	—	—	—	—	—
3600	978	3.31	3088	1022	3.69	3442	1065	4.08	3808	—	—	—	—	—	—
3700	990	3.47	3233	1034	3.85	3591	—	—	—	—	—	—	—	—	—
3750	996	3.55	3308	1040	3.93	3669	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 4.20.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ009 (8 1/2 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	**513**	**0.45**	**423**	**603**	**0.62**	**576**	**682**	**0.78**	**732**	**753**	**0.96**	**892**	**817**	**1.13**	**1055**
2600	**526**	**0.50**	**463**	**614**	**0.67**	**621**	**692**	**0.84**	**783**	**761**	**1.02**	**948**	**825**	**1.20**	**1117**
2700	**539**	**0.54**	**505**	**625**	**0.72**	**670**	**702**	**0.90**	**837**	**770**	**1.08**	**1008**	**834**	**1.27**	**1182**
2800	**552**	**0.59**	**551**	**637**	**0.77**	**721**	**712**	**0.96**	**894**	**780**	**1.15**	**1070**	842	1.34	1250
2900	**565**	**0.64**	**599**	**648**	**0.83**	**775**	**722**	**1.02**	**954**	**789**	**1.22**	**1136**	851	1.42	1321
3000	**579**	**0.70**	**651**	**660**	**0.89**	**832**	**732**	**1.09**	**1017**	**799**	**1.29**	**1204**	860	1.50	1395
3100	**592**	**0.76**	**706**	**672**	**0.96**	**893**	**743**	**1.16**	**1083**	**808**	**1.37**	**1276**	869	1.58	1471
3200	**606**	**0.82**	**764**	**684**	**1.03**	**957**	**754**	**1.24**	**1153**	**818**	**1.45**	**1351**	878	1.66	1552
3300	**620**	**0.88**	**825**	**696**	**1.10**	**1024**	**765**	**1.31**	**1225**	**829**	**1.53**	**1429**	888	1.75	1636
3400	**634**	**0.95**	**890**	**709**	**1.17**	**1095**	**777**	**1.40**	**1302**	**839**	**1.62**	**1511**	897	1.85	1723
3500	**648**	**1.03**	**958**	**721**	**1.25**	**1169**	**788**	**1.48**	**1381**	850	1.71	1597	907	1.95	1815
3600	**662**	**1.10**	**1030**	**734**	**1.34**	**1246**	**800**	**1.57**	**1465**	860	1.81	1686	917	2.05	1909
3700	**676**	**1.19**	**1106**	**747**	**1.42**	**1328**	**811**	**1.66**	**1552**	871	1.91	1779	927	2.15	2008
3800	**690**	**1.27**	**1185**	**760**	**1.52**	**1414**	**823**	**1.76**	**1644**	882	2.01	1876	938	2.26	2111
3900	**705**	**1.36**	**1269**	**773**	**1.61**	**1503**	**835**	**1.86**	**1739**	894	2.12	1977	948	2.38	2217
4000	**719**	**1.45**	**1357**	**786**	**1.71**	**1597**	848	1.97	1838	905	2.23	2082	959	2.50	2328
4100	**734**	**1.55**	**1449**	**799**	**1.82**	**1695**	860	2.08	1942	917	2.35	2192	970	2.62	2443
4200	**748**	**1.66**	**1545**	**813**	**1.93**	**1797**	872	2.20	2050	928	2.47	2305	981	2.75	2562
4300	**763**	**1.76**	**1646**	**826**	**2.04**	**1903**	885	2.32	2162	940	2.60	2423	992	2.88	2686

48HJ009 (8 1/2 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	877	1.31	1222	933	1.49	1392	986	1.68	1565	1037	1.87	1742	1085	2.06	1921
2600	885	1.38	1289	940	1.57	1464	993	1.76	1643	1043	1.96	1824	**1091**	**2.15**	**2008**
2700	892	1.46	1359	948	1.65	1540	1000	1.85	1723	1049	2.05	1909	**1097**	**2.25**	**2099**
2800	900	1.54	1432	955	1.74	1618	1007	1.94	1807	1056	2.14	1998	**1103**	**2.35**	**2192**
2900	908	1.62	1508	963	1.82	1699	1014	2.03	1893	1063	2.24	2089	**1110**	**2.45**	**2289**
3000	917	1.70	1587	970	1.91	1784	1021	2.13	1983	1070	2.34	2185	**1117**	**2.56**	**2389**
3100	925	1.79	1670	979	2.01	1872	1029	2.23	2076	1077	2.45	2283	**1123**	**2.67**	**2492**
3200	934	1.88	1756	987	2.10	1963	1037	2.33	2172	1085	2.56	2384	**1131**	**2.79**	**2599**
3300	943	1.98	1845	995	2.21	2057	1045	2.44	2272	**1092**	**2.67**	**2490**	—	—	—
3400	952	2.08	1939	1004	2.31	2156	1053	2.55	2376	**1100**	**2.79**	**2599**	—	—	—
3500	961	2.18	2035	1013	2.42	2258	1062	2.66	2483	—	—	—	—	—	—
3600	971	2.29	2135	1022	2.53	2364	1070	2.78	2595	—	—	—	—	—	—
3700	981	2.40	2240	1031	2.65	2473	—	—	—	—	—	—	—	—	—
3800	990	2.52	2348	1040	2.77	2587	—	—	—	—	—	—	—	—	—
3900	1000	2.64	2459	1050	2.90	2705	—	—	—	—	—	—	—	—	—
4000	1011	2.76	2576	—	—	—	—	—	—	—	—	—	—	—	—
4100	1021	2.89	2697	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 840 to 1085 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 2.90.

Performance data — 48HJ (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ009 (8 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	**513**	**0.45**	**423**	**603**	**0.62**	**576**	**682**	**0.78**	**732**	**753**	**0.96**	**892**	**817**	**1.13**	**1055**
2600	**526**	**0.50**	**463**	**614**	**0.67**	**621**	**692**	**0.84**	**783**	**761**	**1.02**	**948**	**825**	**1.20**	**1117**
2700	**539**	**0.54**	**505**	**625**	**0.72**	**670**	**702**	**0.90**	**837**	**770**	**1.08**	**1008**	**834**	**1.27**	**1182**
2800	**552**	**0.59**	**551**	**637**	**0.77**	**721**	**712**	**0.96**	**894**	**780**	**1.15**	**1070**	**842**	**1.34**	**1250**
2900	**565**	**0.64**	**599**	**648**	**0.83**	**775**	**722**	**1.02**	**954**	**789**	**1.22**	**1136**	**851**	**1.42**	**1321**
3000	**579**	**0.70**	**651**	**660**	**0.89**	**832**	**732**	**1.09**	**1017**	**799**	**1.29**	**1204**	860	1.50	1395
3100	**592**	**0.76**	**706**	**672**	**0.96**	**893**	**743**	**1.16**	**1083**	**808**	**1.37**	**1276**	869	1.58	1471
3200	**606**	**0.82**	**764**	**684**	**1.03**	**957**	**754**	**1.24**	**1153**	**818**	**1.45**	**1351**	878	1.66	1552
3300	**620**	**0.88**	**825**	**696**	**1.10**	**1024**	**765**	**1.31**	**1225**	**829**	**1.53**	**1429**	888	1.75	1636
3400	**634**	**0.95**	**890**	**709**	**1.17**	**1095**	**777**	**1.40**	**1302**	**839**	**1.62**	**1511**	897	1.85	1723
3500	**648**	**1.03**	**958**	**721**	**1.25**	**1169**	**788**	**1.48**	**1381**	**850**	**1.71**	**1597**	907	1.95	1815
3600	**662**	**1.10**	**1030**	**734**	**1.34**	**1246**	**800**	**1.57**	**1465**	860	1.81	1686	917	2.05	1909
3700	**676**	**1.19**	**1106**	**747**	**1.42**	**1328**	**811**	**1.66**	**1552**	871	1.91	1779	927	2.15	2008
3800	**690**	**1.27**	**1185**	**760**	**1.52**	**1414**	**823**	**1.76**	**1644**	882	2.01	1876	938	2.26	2111
3900	**705**	**1.36**	**1269**	**773**	**1.61**	**1503**	**835**	**1.86**	**1739**	894	2.12	1977	948	2.38	2217
4000	**719**	**1.45**	**1357**	**786**	**1.71**	**1597**	**848**	**1.97**	**1838**	905	2.23	2082	959	2.50	2328
4100	**734**	**1.55**	**1449**	**799**	**1.82**	**1695**	860	2.08	1942	917	2.35	2192	970	2.62	2443
4200	**748**	**1.66**	**1545**	**813**	**1.93**	**1797**	872	2.20	2050	928	2.47	2305	981	2.75	2562
4300	**763**	**1.76**	**1646**	**826**	**2.04**	**1903**	885	2.32	2162	940	2.60	2423	992	2.88	2686

48HJ009 (8 1/2 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	877	1.31	1222	933	1.49	1392	986	1.68	1565	1037	1.87	1742	**1085**	**2.06**	**1921**
2600	885	1.38	1289	940	1.57	1464	993	1.76	1643	1043	1.96	1824	**1091**	**2.15**	**2008**
2700	892	1.46	1359	948	1.65	1540	1000	1.85	1723	1049	2.05	1909	**1097**	**2.25**	**2099**
2800	900	1.54	1432	955	1.74	1618	1007	1.94	1807	1056	2.14	1998	**1103**	**2.35**	**2192**
2900	908	1.62	1508	963	1.82	1699	1014	2.03	1893	1063	2.24	2089	**1110**	**2.45**	**2289**
3000	917	1.70	1587	970	1.91	1784	1021	2.13	1983	1070	2.34	2185	**1117**	**2.56**	**2389**
3100	925	1.79	1670	979	2.01	1872	1029	2.23	2076	1077	2.45	2283	**1123**	**2.67**	**2492**
3200	934	1.88	1756	987	2.10	1963	1037	2.33	2172	**1085**	**2.56**	**2384**	**1131**	**2.79**	**2599**
3300	943	1.98	1845	995	2.21	2057	1045	2.44	2272	**1092**	**2.67**	**2490**	**1138**	**2.91**	**2710**
3400	952	2.08	1939	1004	2.31	2156	1053	2.55	2376	**1100**	**2.79**	**2599**	**1145**	**3.03**	**2824**
3500	961	2.18	2035	1013	2.42	2258	1062	2.66	2483	**1108**	**2.91**	**2711**	**1153**	**3.15**	**2942**
3600	971	2.29	2135	1022	2.53	2364	1070	2.78	2595	**1116**	**3.03**	**2827**	**1161**	**3.29**	**3063**
3700	981	2.40	2240	1031	2.65	2473	1079	2.91	2709	**1125**	**3.16**	**2948**	**1169**	**3.42**	**3189**
3800	990	2.52	2348	1040	2.77	2587	**1088**	**3.03**	**2828**	**1133**	**3.30**	**3073**	**1177**	**3.56**	**3319**
3900	1000	2.64	2459	1050	2.90	2705	**1097**	**3.17**	**2951**	**1142**	**3.43**	**3201**	**1186**	**3.70**	**3452**
4000	1011	2.76	2576	1059	3.03	2826	**1106**	**3.30**	**3079**	**1151**	**3.58**	**3334**	**1194**	**3.85**	**3591**
4100	1021	2.89	2697	1069	3.17	2953	**1116**	**3.44**	**3210**	**1160**	**3.72**	**3471**	**1203**	**4.00**	**3733**
4200	1031	3.03	2822	1079	3.31	3083	**1125**	**3.59**	**3347**	**1169**	**3.87**	**3612**	**1212**	**4.16**	**3880**
4300	1042	3.16	2951	**1089**	**3.45**	**3218**	**1135**	**3.74**	**3487**	**1179**	**4.03**	**3758**	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 4.20.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ012 (10 TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**579**	**0.70**	**651**	**660**	**0.89**	**832**	**732**	**1.09**	**1017**	**799**	**1.29**	**1204**	860	1.50	1395
3100	**592**	**0.76**	**706**	**672**	**0.96**	**893**	**743**	**1.16**	**1083**	**808**	**1.37**	**1276**	869	1.58	1471
3200	**606**	**0.82**	**764**	**684**	**1.03**	**957**	**754**	**1.24**	**1153**	**818**	**1.45**	**1351**	878	1.66	1552
3300	**620**	**0.88**	**825**	**696**	**1.10**	**1024**	**765**	**1.31**	**1225**	**829**	**1.53**	**1429**	888	1.75	1636
3400	**634**	**0.95**	**890**	**709**	**1.17**	**1095**	**777**	**1.40**	**1302**	**839**	**1.62**	**1511**	897	1.85	1723
3500	**648**	**1.03**	**958**	**721**	**1.25**	**1169**	**788**	**1.48**	**1381**	**850**	**1.71**	**1597**	907	1.95	1815
3600	**662**	**1.10**	**1030**	**734**	**1.34**	**1246**	**800**	**1.57**	**1465**	860	1.81	1686	917	2.05	1909
3700	**676**	**1.19**	**1106**	**747**	**1.42**	**1328**	**811**	**1.66**	**1552**	871	1.91	1779	927	2.15	2008
3800	**690**	**1.27**	**1185**	**760**	**1.52**	**1414**	**823**	**1.76**	**1644**	882	2.01	1876	938	2.26	2111
3900	**705**	**1.36**	**1269**	**773**	**1.61**	**1503**	**835**	**1.86**	**1739**	894	2.12	1977	948	2.38	2217
4000	**719**	**1.45**	**1357**	**786**	**1.71**	**1597**	**848**	**1.97**	**1838**	905	2.23	2082	959	2.50	2328
4100	**734**	**1.55**	**1449**	**799**	**1.82**	**1695**	860	2.08	1942	917	2.35	2192	970	2.62	2443
4200	**748**	**1.66**	**1545**	**813**	**1.93**	**1797**	872	2.20	2050	928	2.47	2305	981	2.75	2562
4300	**763**	**1.76**	**1646**	**826**	**2.04**	**1903**	885	2.32	2162	940	2.60	2423	992	2.88	2686
4400	**778**	**1.88**	**1751**	**840**	**2.16**	**2014**	898	2.44	2279	952	2.73	2546	1004	3.02	2814
4500	**792**	**1.99**	**1860**	**853**	**2.28**	**2130**	910	2.57	2401	964	2.87	2673	1015	3.16	2947
4600	**807**	**2.12**	**1975**	867	2.41	2250	923	2.71	2527	976	3.01	2805	1027	3.31	3085
4700	**822**	**2.25**	**2094**	881	2.55	2375	936	2.85	2658	989	3.15	2942	1038	3.46	3227
4800	**837**	**2.38**	**2218**	895	2.69	2505	949	3.00	2794	1001	3.31	3083	1050	3.62	3375
4900	**852**	**2.52**	**2347**	909	2.83	2640	963	3.15	2935	1014	3.46	3230	—	—	—
5000	867	2.66	2482	923	2.98	2781	976	3.30	3081	1026	3.63	3383	—	—	—

48HJ012 (10 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	917	1.70	1587	970	1.91	1784	1021	2.13	1983	1070	2.34	2185	**1117**	**2.56**	**2389**
3100	925	1.79	1670	979	2.01	1872	1029	2.23	2076	1077	2.45	2283	**1123**	**2.67**	**2492**
3200	934	1.88	1756	987	2.10	1963	1037	2.33	2172	**1085**	**2.56**	**2384**	**1131**	**2.79**	**2599**
3300	943	1.98	1845	995	2.21	2057	1045	2.44	2272	**1092**	**2.67**	**2490**	**1138**	**2.91**	**2710**
3400	952	2.08	1939	1004	2.31	2156	1053	2.55	2376	**1100**	**2.79**	**2599**	**1145**	**3.03**	**2824**
3500	961	2.18	2035	1013	2.42	2258	1062	2.66	2483	**1108**	**2.91**	**2711**	**1153**	**3.15**	**2942**
3600	971	2.29	2135	1022	2.53	2364	1070	2.78	2595	**1116**	**3.03**	**2827**	**1161**	**3.29**	**3063**
3700	981	2.40	2240	1031	2.65	2473	1079	2.91	2709	**1125**	**3.16**	**2948**	**1169**	**3.42**	**3189**
3800	990	2.52	2348	1040	2.77	2587	**1088**	**3.03**	**2828**	**1133**	**3.30**	**3073**	**1177**	**3.56**	**3319**
3900	1000	2.64	2459	1050	2.90	2705	**1097**	**3.17**	**2951**	**1142**	**3.43**	**3201**	**1186**	**3.70**	**3452**
4000	1011	2.76	2576	1059	3.03	2826	**1106**	**3.30**	**3079**	**1151**	**3.58**	**3334**	—	—	—
4100	1021	2.89	2697	1069	3.17	2953	**1116**	**3.44**	**3210**	—	—	—	—	—	—
4200	1031	3.03	2822	1079	3.31	3083	**1125**	**3.59**	**3347**	—	—	—	—	—	—
4300	1042	3.16	2951	**1089**	**3.45**	**3218**	—	—	—	—	—	—	—	—	—
4400	1053	3.31	3085	**1100**	**3.60**	**3357**	—	—	—	—	—	—	—	—	—
4500	1064	3.46	3224	—	—	—	—	—	—	—	—	—	—	—	—
4600	1075	3.61	3367	—	—	—	—	—	—	—	—	—	—	—	—
4700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 3.70.

Performance data — 48HJ (cont)

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ012 (10 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	**579**	**0.70**	**651**	**660**	**0.89**	**832**	**732**	**1.09**	**1017**	**799**	**1.29**	**1204**	860	1.50	1395
3100	**592**	**0.76**	**706**	**672**	**0.96**	**893**	**743**	**1.16**	**1083**	**808**	**1.37**	**1276**	869	1.58	1471
3200	**606**	**0.82**	**764**	**684**	**1.03**	**957**	**754**	**1.24**	**1153**	**818**	**1.45**	**1351**	878	1.66	1552
3300	**620**	**0.88**	**825**	**696**	**1.10**	**1024**	**765**	**1.31**	**1225**	**829**	**1.53**	**1429**	888	1.75	1636
3400	**634**	**0.95**	**890**	**709**	**1.17**	**1095**	**777**	**1.40**	**1302**	839	1.62	1511	897	1.85	1723
3500	**648**	**1.03**	**958**	**721**	**1.25**	**1169**	**788**	**1.48**	**1381**	850	1.71	1597	907	1.95	1815
3600	**662**	**1.10**	**1030**	**734**	**1.34**	**1246**	**800**	**1.57**	**1465**	860	1.81	1686	917	2.05	1909
3700	**676**	**1.19**	**1106**	**747**	**1.42**	**1328**	**811**	**1.66**	**1552**	871	1.91	1779	927	2.15	2008
3800	**690**	**1.27**	**1185**	**760**	**1.52**	**1414**	**823**	**1.76**	**1644**	882	2.01	1876	938	2.26	2111
3900	**705**	**1.36**	**1269**	**773**	**1.61**	**1503**	835	1.86	1739	894	2.12	1977	948	2.38	2217
4000	**719**	**1.45**	**1357**	**786**	**1.71**	**1597**	848	1.97	1838	905	2.23	2082	959	2.50	2328
4100	**734**	**1.55**	**1449**	**799**	**1.82**	**1695**	860	2.08	1942	917	2.35	2192	970	2.62	2443
4200	**748**	**1.66**	**1545**	**813**	**1.93**	**1797**	872	2.20	2050	928	2.47	2305	981	2.75	2562
4300	**763**	**1.76**	**1646**	**826**	**2.04**	**1903**	885	2.32	2162	940	2.60	2423	992	2.88	2686
4400	**778**	**1.88**	**1751**	840	2.16	2014	898	2.44	2279	952	2.73	2546	1004	3.02	2814
4500	**792**	**1.99**	**1860**	853	2.28	2130	910	2.57	2401	964	2.87	2673	1015	3.16	2947
4600	**807**	**2.12**	**1975**	867	2.41	2250	923	2.71	2527	976	3.01	2805	1027	3.31	3085
4700	**822**	**2.25**	**2094**	881	2.55	2375	936	2.85	2658	989	3.15	2942	1038	3.46	3227
4800	837	2.38	2218	895	2.69	2505	949	3.00	2794	1001	3.31	3083	1050	3.62	3375
4900	852	2.52	2347	909	2.83	2640	963	3.15	2935	1014	3.46	3230	1062	3.78	3528
5000	867	2.66	2482	923	2.98	2781	976	3.30	3081	1026	3.63	3383	1074	3.95	3685

48HJ012 (10 TONS) — HIGH-STATIC MOTOR (BELT DRIVE)* (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	917	1.70	1587	970	1.91	1784	1021	2.13	1983	1070	2.34	2185	1117	2.56	2389
3100	925	1.79	1670	979	2.01	1872	1029	2.23	2076	1077	2.45	2283	1123	2.67	2492
3200	934	1.88	1756	987	2.10	1963	1037	2.33	2172	1085	2.56	2384	**1131**	**2.79**	**2599**
3300	943	1.98	1845	995	2.21	2057	1045	2.44	2272	1092	2.67	2490	**1138**	**2.91**	**2710**
3400	952	2.08	1939	1004	2.31	2156	1053	2.55	2376	1100	2.79	2599	**1145**	**3.03**	**2824**
3500	961	2.18	2035	1013	2.42	2258	1062	2.66	2483	1108	2.91	2711	**1153**	**3.15**	**2942**
3600	971	2.29	2135	1022	2.53	2364	1070	2.78	2595	1116	3.03	2827	**1161**	**3.29**	**3063**
3700	981	2.40	2240	1031	2.65	2473	1079	2.91	2709	1125	3.16	2948	**1169**	**3.42**	**3189**
3800	990	2.52	2348	1040	2.77	2587	1088	3.03	2828	**1133**	**3.30**	**3073**	**1177**	**3.56**	**3319**
3900	1000	2.64	2459	1050	2.90	2705	1097	3.17	2951	**1142**	**3.43**	**3201**	**1186**	**3.70**	**3452**
4000	1011	2.76	2576	1059	3.03	2826	1106	3.30	3079	**1151**	**3.58**	**3334**	**1194**	**3.85**	**3591**
4100	1021	2.89	2697	1069	3.17	2953	1116	3.44	3210	**1160**	**3.72**	**3471**	**1203**	**4.00**	**3733**
4200	1031	3.03	2822	1079	3.31	3083	1125	3.59	3347	**1169**	**3.87**	**3612**	**1212**	**4.16**	**3880**
4300	1042	3.16	2951	1089	3.45	3218	**1135**	**3.74**	**3487**	**1179**	**4.03**	**3758**	**1221**	**4.32**	**4031**
4400	1053	3.31	3085	1100	3.60	3357	**1145**	**3.90**	**3632**	**1188**	**4.19**	**3909**	**1230**	**4.49**	**4187**
4500	1064	3.46	3224	1110	3.76	3502	**1155**	**4.06**	**3782**	**1198**	**4.36**	**4064**	**1239**	**4.66**	**4348**
4600	1075	3.61	3367	1121	3.91	3650	**1165**	**4.22**	**3937**	**1208**	**4.53**	**4224**	**1249**	**4.84**	**4514**
4700	1086	3.77	3515	**1131**	**4.08**	**3805**	**1175**	**4.39**	**4096**	**1217**	**4.71**	**4389**	**1258**	**5.02**	**4684**
4800	1097	3.93	3668	**1142**	**4.25**	**3963**	**1186**	**4.57**	**4260**	**1228**	**4.89**	**4559**	**1268**	**5.21**	**4860**
4900	1109	4.10	3826	**1153**	**4.43**	**4128**	**1196**	**4.75**	**4430**	**1238**	**5.08**	**4734**	—	—	—
5000	1120	4.28	3990	**1164**	**4.61**	**4296**	**1207**	**4.94**	**4604**	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 830 to 1130 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 5.25.

FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48HJ014 (12½ TONS) — STANDARD MOTOR (BELT DRIVE)*

Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	**676**	**1.19**	**1106**	**747**	**1.42**	**1328**	**811**	**1.66**	**1552**	871	1.91	1779	927	2.15	2008
3800	**690**	**1.27**	**1185**	**760**	**1.52**	**1414**	**823**	**1.76**	**1644**	882	2.01	1876	938	2.26	2111
3900	**705**	**1.36**	**1269**	**773**	**1.61**	**1503**	835	1.86	1739	894	2.12	1977	948	2.38	2217
4000	**719**	**1.45**	**1357**	**786**	**1.71**	**1597**	848	1.97	1838	905	2.23	2082	959	2.50	2328
4100	**734**	**1.55**	**1449**	**799**	**1.82**	**1695**	860	2.08	1942	917	2.35	2192	970	2.62	2443
4200	**748**	**1.66**	**1545**	**813**	**1.93**	**1797**	872	2.20	2050	928	2.47	2305	981	2.75	2562
4300	**763**	**1.76**	**1646**	**826**	**2.04**	**1903**	885	2.32	2162	940	2.60	2423	992	2.88	2686
4400	**778**	**1.88**	**1751**	840	2.16	2014	898	2.44	2279	952	2.73	2546	1004	3.02	2814
4500	**792**	**1.99**	**1860**	853	2.28	2130	910	2.57	2401	964	2.87	2673	1015	3.16	2947
4600	**807**	**2.12**	**1975**	867	2.41	2250	923	2.71	2527	976	3.01	2805	1027	3.31	3085
4700	**822**	**2.25**	**2094**	881	2.55	2375	936	2.85	2658	989	3.15	2942	1038	3.46	3227
4800	837	2.38	2218	895	2.69	2505	949	3.00	2794	1001	3.31	3083	1050	3.62	3375
4900	852	2.52	2347	909	2.83	2640	963	3.15	2935	1014	3.46	3230	1062	3.78	3528
5000	867	2.66	2482	923	2.98	2781	976	3.30	3081	1026	3.63	3383	1074	3.95	3685
5100	882	2.81	2622	937	3.14	2926	989	3.47	3232	1039	3.80	3540	1086	4.13	3849
5200	897	2.97	2766	951	3.30	3077	1003	3.63	3389	1052	3.97	3702	1099	4.31	4017
5300	912	3.13	2917	966	3.47	3233	1016	3.81	3551	1065	4.15	3870	1111	4.49	4191
5400	927	3.30	3073	980	3.64	3395	1030	3.99	3719	1078	4.34	4044	1123	4.69	4370
5500	943	3.47	3234	994	3.82	3563	1044	4.17	3892	1091	4.53	4223	**1136**	**4.88**	**4555**
5600	958	3.65	3402	1009	4.01	3736	1057	4.37	4071	1104	4.73	4408	**1149**	**5.09**	**4746**
5700	973	3.83	3575	1023	4.20	3915	1071	4.56	4256	1117	4.93	4599	—	—	—
5800	988	4.03	3754	1038	4.40	4100	1085	4.77	4447	1130	5.14	4796	—	—	—
5900	1004	4.22	3939	1052	4.60	4292	1099	4.98	4645	—	—	—	—	—	—
6000	1019	4.43	4131	1067	4.81	4489	1113	5.20	4848	—	—	—	—	—	—
6100	1034	4.64	4329	1082	5.03	4693	—	—	—	—	—	—	—	—	—
6200	1050	4.86	4533	—	—	—	—	—	—	—	—	—	—	—	—
6300	1065	5.09	4744	—	—	—	—	—	—	—	—	—	—	—	—

48HJ014 (12½ 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	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	981	2.40	2240	1031	2.65	2473	1079	2.91	2709	1125	3.16	2948	**1169**	**3.42**	**3189**
3800	990	2.52	2348	1040	2.77	2587	1088	3.03	2828	**1133**	**3.30**	**3073**	**1177**	**3.56**	**3319**
3900	1000	2.64	2459	1050	2.90	2705	1097	3.17	2951	**1142**	**3.43**	**3201**	**1186**	**3.70**	**3452**
4000	1011	2.76	2576	1059	3.03	2826	1106	3.30	3079	**1151**	**3.58**	**3334**	**1194**	**3.85**	**3591**
4100	1021	2.89	2697	1069	3.17	2953	1116	3.44	3210	**1160**	**3.72**	**3471**	**1203**	**4.00**	**3733**
4200	1031	3.03	2822	1079	3.31	3083	1125	3.59	3347	**1169**	**3.87**	**3612**	**1212**	**4.16**	**3880**
4300	1042	3.16	2951	1089	3.45	3218	**1135**	**3.74**	**3487**	**1179**	**4.03**	**3758**	**1221**	**4.32**	**4031**
4400	1053	3.31	3085	1100	3.60	3357	**1145**	**3.90**	**3632**	**1188**	**4.19**	**3909**	**1230**	**4.49**	**4187**
4500	1064	3.46	3224	1110	3.76	3502	**1155**	**4.06**	**3782**	**1198**	**4.36**	**4064**	**1239**	**4.66**	**4348**
4600	1075	3.61	3367	1121	3.91	3650	**1165**	**4.22**	**3937**	**1208**	**4.53**	**4224**	**1249**	**4.84**	**4514**
4700	1086	3.77	3515	**1131**	**4.08**	**3805**	**1175**	**4.39**	**4096**	**1217**	**4.71**	**4389**	**1258**	**5.02**	**4684**
4800	1097	3.93	3668	**1142**	**4.25**	**3963**	**1186**	**4.57**	**4260**	**1228**	**4.89**	**4559**	**1268**	**5.21**	**4860**
4900	1109	4.10	3826	**1153**	**4.43**	**4128**	**1196**	**4.75**	**4430**	**1238**	**5.08**	**4734**	—	—	—
5000	1120	4.28	3990	**1164**	**4.61**	**4296**	**1207**	**4.94**	**4604**	—	—	—	—	—	—
5100	**1132**	**4.46**	**4159**	**1175**	**4.79**	**4471**	**1218**	**5.13**	**4784**	—	—	—	—	—	—
5200	**1144**	**4.65**	**4333**	**1187**	**4.99**	**4651**	—	—	—	—	—	—	—	—	—
5300	**1155**	**4.84**	**4512**	**1198**	**5.19**	**4836**	—	—	—	—	—	—	—	—	—
5400	**1167**	**5.04**	**4697**	—	—	—	—	—	—	—	—	—	—	—	—
5500	**1179**	**5.24**	**4889**	—	—	—	—	—	—	—	—	—	—	—	—
5600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

*Motor drive range: 830 to 1130 rpm. All other rpms require field-supplied drive.

See page 163 for general fan performance notes.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum continuous bhp is 5.25.

REFER TO 48HJ015,017 VERTICAL FAN PERFORMANCE TABLES ON PAGES 160-163 FOR FAN PERFORMANCE WITH HORIZONTAL ADAPTER CURB.

Performance data — 48HJ (cont)

FAN RPM AT MOTOR PULLEY SETTING WITH STANDARD MOTOR* — 48HJ004-014

UNIT 48HJ	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
004	1044	1008	971	935	898	862	826	789	753	716	680	—	—
005	1185	1144	1102	1061	1019	978	936	895	853	812	770	—	—
006	1460	1425	1389	1354	1318	1283	1248	1212	1177	1141	1106	1070	1035
007	1585	1538	1492	1445	1399	1352	1305	1259	1212	1166	1119	—	—
008,009	1085	1060	1035	1010	985	960	935	910	890	865	840	—	—
012	1080	1060	1035	1015	990	970	950	925	905	880	860	—	—
014	1130	1112	1087	1062	1037	1212	987	962	937	912	887	962	830

*Approximate fan rpm shown (standard motor/drive).

FAN RPM AT MOTOR PULLEY SETTING WITH HIGH-STATIC MOTOR* — 48HJ004-014

UNIT 48HJ	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
004	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
005	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
006	1685	1589	1557	1525	1493	1460	1428	1396	1364	1332	1300	—	—
007	1685	1589	1557	1525	1493	1460	1428	1396	1364	1332	1300	—	—
008	1080	1025	1007	988	970	952	933	915	897	878	860	—	—
009	1080	1025	1007	988	970	952	933	915	897	878	860	—	—
012	1130	1112	1087	1062	1037	1212	987	962	937	912	887	962	830

*Approximate fan rpm shown (high-static motor/drive).

FAN RPM AT MOTOR PULLEY SETTINGS* — 48HJ015,017

48HJ	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
015†	1147	1124	1101	1078	1055	1032	1010	987	964	941	918	895	††
015**	1315	1292	1269	1246	1223	1200	1178	1155	1132	1109	1086	1063	1040
017†	††	††	††	††	1021	1002	984	965	947	928	910	891	873
017**	††	††	††	††	1200	1178	1156	1134	1112	1091	1069	1047	1025

*Approximate fan rpm shown.
†Indicates standard drive package.
**Indicates alternate drive package.
††Due to belt and pulley style, pulley cannot be set to this number of turns open.

EVAPORATOR-FAN MOTOR PERFORMANCE — STANDARD MOTOR — 48HJ004-014

UNIT 48HJ	UNIT PHASE	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	UNIT VOLTAGE	MAXIMUM AMP DRAW
004	Single	1.20	1000	208/230	4.9
	Three	1.20	1000	208/230	4.9
				460	2.2
				575	2.2
005	Single	1.20	1000	208/230	4.9
	Three	1.20	1000	208/230	4.9
				460	2.2
				575	2.2
006	Single	1.30	1650	208/230	10.1
	Three	2.40	2120	208/230	6.7
				460	3.0
				575	3.0
007	Three	2.40	2120	208/230	6.7
				460	3.0
				575	3.0
008,009	Three	2.90	2615	208/230	8.6
				460	3.9
				575	3.9
012	Three	3.70	3775	208/230	12.2
				460	5.5
				575	5.5
014	Three	5.25	4400	208/230	17.3
				460	8.5
				575	8.5

LEGEND

Bhp — Brake Horsepower

*Extensive motor and electrical testing on these units ensures that the full horsepower and watts 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.

EVAPORATOR-FAN MOTOR PERFORMANCE — HIGH-STATIC MOTORS — 48HJ004-014

UNIT 48HJ	UNIT PHASE	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	UNIT VOLTAGE	MAXIMUM AMP DRAW
004	Three	2.40	2120	208/230	6.7
				460	3.0
				575	3.0
005	Three	2.40	2120	208/230	6.7
				460	3.0
				575	3.0
006	Three	2.90	2615	208/230	8.6
				460	3.9
				575	3.9
007	Three	2.90	2615	208/230	8.6
				460	3.9
				575	3.9
008,009	Three	4.20	3775	208/230	12.2
				460	5.5
				575	5.5
012	Three	5.25	4400	208/230	17.3
				460	8.5
				575	8.5

LEGEND

Bhp — Brake Horsepower

*Extensive motor and electrical testing on these units ensures that the full horsepower and watts 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.

Performance data — 48HJ (cont)

EVAPORATOR FAN MOTOR SPECIFICATIONS — 48HJ015,017

UNIT 48HJ	NOMINAL HP	VOLTAGE	MAX WATTS	EFF. %	MAX BHP	MAX BkW	MAX AMPS
015 (Standard Motor)	2.9	208	2700	85.8	3.13	2.34	9.46
	2.9	230	2700	85.8	3.13	2.34	8.6
	2.9	460	2700	85.8	3.13	2.34	4.3
	3	575	3065	81.7	3.38	2.53	3.9
015 (Optional Motor)	3.7	208	3610	85.8	4.38	3.27	10.5
	3.7	230	3610	85.8	4.38	3.27	10.5
	3.7	460	3610	85.8	4.38	3.27	4.8
017	5	208	5180	87.5	6.13	4.57	15.8
	5	230	5180	87.5	6.13	4.57	15.8
	5	460	5180	87.5	6.13	4.57	7.9
	5	575	5180	87.5	6.13	4.57	6.0

LEGEND

BHP — Brake Horsepower
BkW — Brake Kilowatts

EVAPORATOR-FAN MOTOR EFFICIENCY — 48HJ004-014

UNIT SIZE 48HJ	EFFICIENCY%
004,005	75
006	74/84*
007	84
008,009	80
012	85
014	87

*Single phase/3 phase.

NOTES:

1. Convert bhp to watts using the following formula:

$$\text{watts} = \frac{\text{bhp (746)}}{\text{motor efficiency}}$$

2. The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT-compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements. Therefore, the indoor fan motors for Carrier 48HJ004-014 units are exempt from these requirements.

EVAPORATOR-FAN MOTOR EFFICIENCY — 48HJ015,017

MOTOR HORSEPOWER	MOTOR EFFICIENCY (%)
3.0	81.7
2.9, 3.7	85.8
5.0	87.5

NOTE: All indoor-fan motors 5 hp and larger meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT) effective October 24, 1997.

ACCESSORY/FIOP STATIC PRESSURE* (in. wg) — 48HJ004-007

COMPONENT	CFM							
	1250	1500	1750	2000	2250	2500	2750	3000
Vertical EconoMi$er+ and EconoMi$er2	0.045	0.065	0.08	0.12	0.145	0.175	0.22	0.255
Horizontal EconoMi$er+ and EconoMi$er2	—	—	0.1	0.125	0.15	0.18	0.225	0.275

LEGEND

FIOP — Factory-Installed Option

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

ACCESSORY/FIOP STATIC PRESSURE* (in. wg) — 48HJ008-014

COMPONENT	CFM													
	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250	6250
Vertical EconoMi$er+ and EconoMi$er2	0.06	0.075	0.09	0.115	0.13	0.15	0.17	0.195	0.22	0.25	0.285	0.325	0.36	—
Horizontal EconoMi$er+ and EconoMi$er2	—	0.1	0.125	0.15	0.18	0.21	0.25	0.275	0.3	0.34	0.388	—	—	—

LEGEND

FIOP — Factory-Installed Option

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

ACCESSORY/FIOP STATIC PRESSURE (in. wg)* — 48HJ015,017

COMPONENT	CFM								
	4500	5000	5400	6000	7200	7500	9000	10,000	11,250
EconoMi$er+	0.040	0.050	0.060	0.070	0.090	0.100	0.110	0.120	0.140
MoistureMi$er™ Dehumidification Package	0.045	0.048	0.060	0.071	0.103	0.111	0.160	0.197	0.250

LEGEND

FIOP — Factory-Installed Option

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

FIOP MOISTUREMI$ER™ DEHUMIDIFICATION PACKAGE STATIC PRESSURE DROP (in. wg)

UNIT SIZE 48HJ	UNIT NOMINAL TONS	CFM PER TON		
		300	400	500
004	3	.04	.07	.09
005	4	.07	.12	.15
006	5	.09	.15	.21
007	6	.12	.20	.28
008	7 1/2	.08	.13	.18
009	8 1/2	.10	.15	.22
012	10	.08	.13	.18
014	12 1/2	.11	.18	.26

LEGEND

FIOP — Factory-Installed Option

Performance data — 48HJ (cont)

ALTITUDE COMPENSATION* — 48HJ004-007 STANDARD UNITS

ELEVATION (ft)	72,000 AND 115,000 BTUH NOMINAL INPUT		150,000 BTUH NOMINAL INPUT	
	Natural Gas Orifice Size†	Liquid Propane Orifice Size†	Natural Gas Orifice Size†	Liquid Propane Orifice Size†
0-2,000	33	43	30	37
2,000	36	44	31	39
3,000	36	45	31	40
4,000	37	45	32	41
5,000	38	46	32	42
6,000	40	47	34	43
7,000	41	48	35	43
8,000	42	49	36	44
9,000	43	50	37	45
10,000	44	50	39	46
11,000	45	51	41	47
12,000	46	52	42	48
13,000	47	52	43	49
14,000	48	53	44	50

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

ALTITUDE COMPENSATION* — 48HJ004-006 LOW NOx UNITS

ELEVATION (ft)	60,000 AND 90,000 BTUH NOMINAL INPUT	120,000 BTUH NOMINAL INPUT
	Natural Gas Orifice Size†	Natural Gas Orifice Size
0-2,000	38	32
2,000	40	33
3,000	41	35
4,000	42	36
5,000	43	37
6,000	43	38
7,000	44	39
8,000	45	41
9,000	46	42
10,000	47	43
11,000	48	44
12,000	49	44
13,000	50	46
14,000	51	47

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

ALTITUDE COMPENSATION* — 48HJ008-014

ELEVATION (ft)	125,000, 180,000, AND 224,000 BTUH NOMINAL INPUT		250,000 BTUH NOMINAL INPUT	
	Natural Gas Orifice Size†	Liquid Propane Orifice Size†	Natural Gas Orifice Size†	Liquid Propane Orifice Size†
0-2,000	31	41	30	38
2,000	32	42	30	39
3,000	32	42	31	40
4,000	32	42	32	41
5,000	33	43	33	42
6,000	34	43	34	43
7,000	35	44	35	43
8,000	36	44	36	44
9,000	37	45	37	44
10,000	38	46	38	45
11,000	39	47	39	45
12,000	40	47	40	46
13,000	41	48	41	47
14,000	42	48	42	47

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

ALTITUDE COMPENSATION — 48HJ015,017 (LP Gas Units)

ELEVATION (ft)	LIQUID PROPANE ORIFICE SIZE
	Low Heat and High Heat
0-2,000	36
2,000	37
3,000	38
4,000	38
5,000	39
6,000	40
7,000	41
8,000	41
9,000	42
10,000	43

ALTITUDE COMPENSATION* — 48HJ015,017

ELEVATION (ft)	NATURAL GAS ORIFICE SIZE†	
	Low Heat	High Heat
0-3,000	30	29
3,000- 7,000	31	30
7,000- 9,000	32	31
9,000-10,000	33	31
above 10,000	35	32

*Includes a 4% input reduction per each 1,000 feet.
†Orifices available through your Carrier dealer.

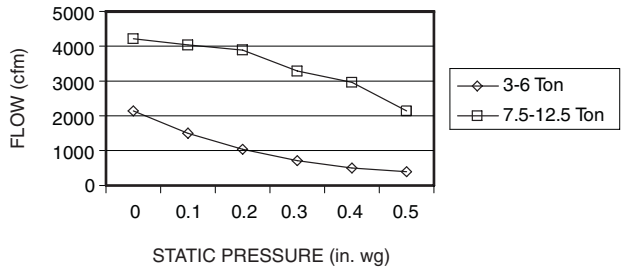
ALTITUDE DERATING FACTOR*

ELEVATION	MAXIMUM HEATING VALUE AT SEA LEVEL (Btu/ft³)
0-2000	1100
2001-3000	1050
3001-4000	1000
4001-5000	950
5001-6000	900

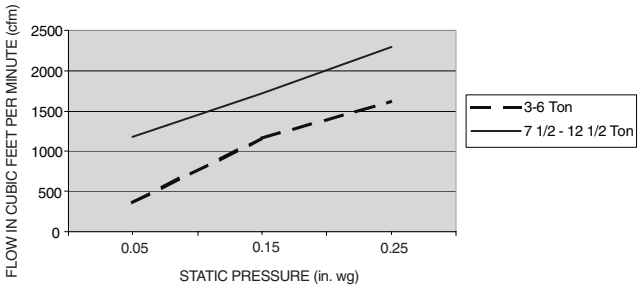
*Derating of the gas heating equipment to compensate for the effects of altitude is always required. Orifice change is not required if the fuel heating value (at sea level) is below the limits listed in the table at left. Derating conditions must be 4% per thousand ft above 2000 ft. For example, at 4000 ft, if the heating value of the gas exceeds 1000 Btu/ft³, the unit will require a 16% derating. For elevations above 6000 ft, the same formula applies. For example, at 7000 ft, the unit will require a 28% derating of the maximum heating value per the National Fuel Gas Code.

IMPORTANT: Local utility companies may be reducing heat content of gas at altitudes above 2000 ft. If this is being done, changing spuds may not be required.

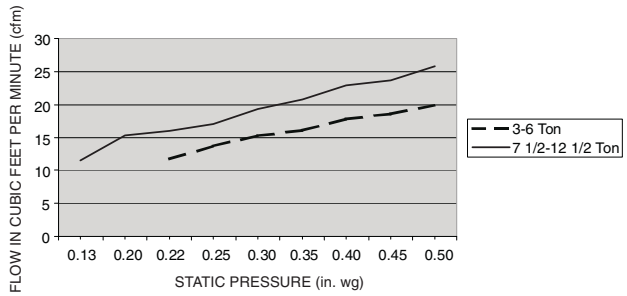
VERTICAL ECONOMI$ER+ AND ECONOMI$ER2 PERFORMANCE DATA (48HJ004-014)



VERTICAL POWER EXHAUST PERFORMANCE

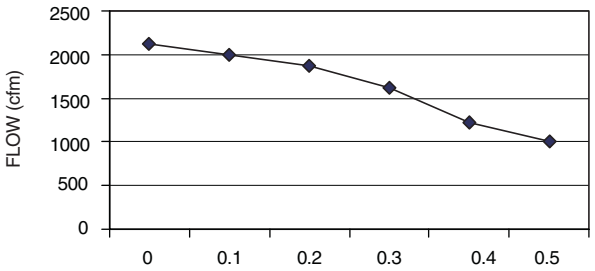


BAROMETRIC RELIEF FLOW CAPACITY

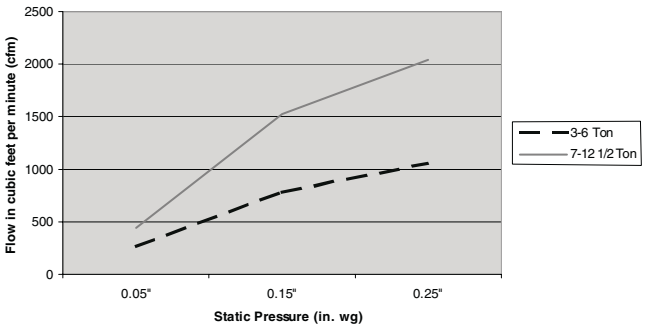


OUTDOOR AIR DAMPER LEAKAGE

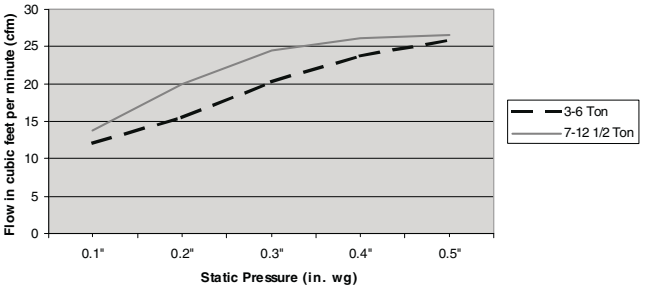
HORIZONTAL ECONOMI$ER+ AND ECONOMI$ER2 PERFORMANCE DATA (48HJ004-014)



HORIZONTAL POWER EXHAUST PERFORMANCE



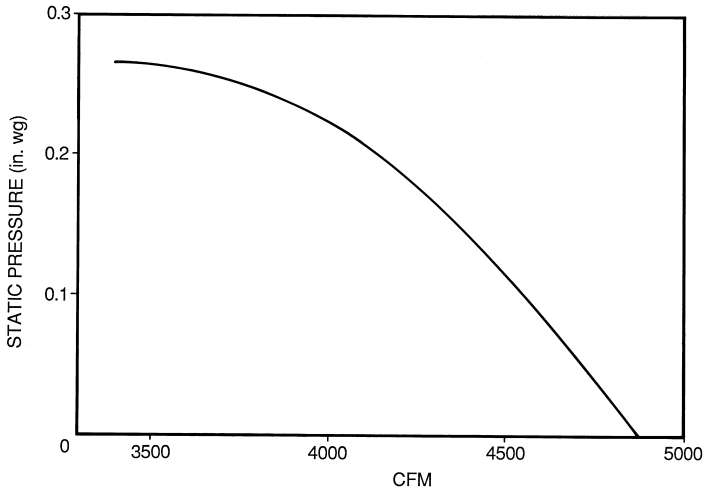
BAROMETRIC RELIEF CAPACITY



OUTDOOR AIR DAMPER LEAKAGE

Performance data — 48HJ (cont)

FAN PERFORMANCE USING ACCESSORY POWER EXHAUST (48HJ015,017)



OUTDOOR SOUND POWER (TOTAL UNIT)

UNIT 48HJ	ARI RATING (decibels)	A-WEIGHTED (db)	OCTAVE BANDS							
			63	125	250	500	1000	2000	4000	8000
004,005	76	76.0	55.9	66.0	64.0	66.2	68.4	64.5	61.7	57.3
006,007	80	80.0	59.1	68.9	68.7	71.9	74.0	68.9	65.7	59.0
008,009	82	82.0	62.2	69.3	71.5	74.7	76.2	72.9	68.7	61.5
012	84	84.0	64.6	71.1	73.3	76.9	77.6	73.7	70.6	63.7
014	86	86.0	63.7	69.9	72.5	78.2	81.1	77.3	73.3	66.8
015,017	88	87.6	90.8	88.7	86.4	84.3	83.5	78.4	75.6	66.8

LEGEND

ARI — Air Conditioning and Refrigeration Institute

NOTE: Indoor sound power is available in Carrier's Electronic Catalog Program (ECAT) for specific operating parameters.

Electrical data — 48HJ

48HJ004-014 STANDARD MOTOR UNITS (WITHOUT ELECTRICAL CONVENIENCE OUTLET)

UNIT 48HJ	NOMINAL VOLTAGE (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR (each)			OFM (each)	IFM	COMBUSTION FAN MOTOR	POWER SUPPLY*		MINIMUM UNIT DISCONNECT SIZE†	
		Min	Max	Qty	RLA	LRA	FLA	FLA	FLA	MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-1-60	187	254	1	16.0	88.0	0.7	4.9	.60	25.6/25.6	30/30	25/25	101/101
	208/230-3-60	187	254		10.3	77.0	0.7	4.9	.60	18.5/18.5	25/25	18/18	90/90
	460-3-60	414	508		5.1	39.0	0.4	2.2	.30	9.0	20	9	46
	575-3-60	518	632		4.2	31.0	0.4	2.2	.30	7.3	20	7	37
005 (4 Tons)	208/230-1-60	187	254	1	23.7	126.0	0.7	4.9	.60	35.2/35.2	45/45	34/34	139/139
	208/230-3-60	187	254		13.5	93.0	0.7	4.9	.60	22.5/22.5	30/30	22/22	106/106
	460-3-60	414	508		6.4	46.5	0.4	2.2	.30	10.6	20	10	54
	575-3-60	518	632		6.4	40.0	0.4	2.2	.30	10.1	20	10	46
006 (5 Tons)	208/230-1-60	187	254	1	28.8	169.0	1.5	8.8	.60	46.3/46.3	60/60	45/45	216/216
	208/230-3-60	187	254		17.3	123.0	1.5	5.8	.60	28.9/28.9	35/35	28/28	168/168
	460-3-60	414	508		9.0	62.0	0.8	2.6	.30	14.7	20	14	84
	575-3-60	518	632		7.1	50.0	0.8	2.6	.30	11.6	20	11	68
007 (6 Tons)	208/230-3-60	187	254	1	20.5	156.0	1.4	5.8	.60	32.8/32.8	40/40	32/32	200/200
	460-3-60	414	508		9.6	75.0	0.6	2.6	.30	15.2	20	15	97
	575-3-60	518	632		7.7	56.0	0.6	2.6	.30	12.2	20	12	74
008 (7½ Tons)	208/230-3-60	187	254	2	12.4	88.0	1.4	7.5	.60	38.2/38.2	45/45	40/40	242/242
	460-3-60	414	508		6.4	44.0	0.7	3.4	.30	19.2	25	20	121
	575-3-60	518	632		4.8	34.0	0.7	3.4	.30	14.6	20	15	95
009 (8½ Tons)	208/230-3-60	187	254	2	13.4	105.0	1.4	7.5	.60	40.2/40.2	45/45	42/42	276/276
	460-3-60	414	508		7.4	55.0	0.7	3.4	.30	21.5	25	23	143
	575-3-60	518	632		6.4	44.0	0.7	3.4	.30	18.2	20	19	115
012 (10 Tons)	208/230-3-60	187	254	2	17.6	125.0	1.4	10.6	.60	53/53	60/60	56/56	341/341
	460-3-60	414	508		8.3	62.5	0.7	4.8	.30	24.9	30	26	171
	575-3-60	518	632		6.3	50.0	0.7	4.8	.30	19.1	25	20	136
014 (12½ Tons)	208/230-3-60	187	254	2	19.0	156.0	1.4	15.0	.60	60.6/60.6	70/70††	64/64	426/426
	460-3-60	414	508		9.0	75.0	0.7	7.4	.30	29.1	35	31	207
	575-3-60	518	632		7.4	54.0	0.7	7.4	.30	23.7	30	25	154

48HJ004-014 STANDARD MOTOR UNITS (WITH ELECTRICAL CONVENIENCE OUTLET)

UNIT 48HJ	NOMINAL VOLTAGE (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR (each)			OFM (each)	IFM	COMBUSTION FAN MOTOR	POWER SUPPLY WITH OUTLET*		MINIMUM UNIT DISCONNECT SIZE†	
		Min	Max	Qty	RLA	LRA	FLA	FLA	FLA	MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-1-60	187	254	1	16.0	88.0	0.7	4.9	.60	31.6/31.6	35/35	30/30	106/106
	208/230-3-60	187	254		10.3	77.0	0.7	4.9	.60	24.5/24.5	30/30	24/24	95/95
	460-3-60	414	508		5.1	39.0	0.4	2.2	.30	11.7	20	11	48
	575-3-60	518	632		4.2	31.0	0.4	2.2	.30	9.5	20	9	38
005 (4 Tons)	208/230-1-60	187	254	1	23.7	126.0	0.7	4.9	.60	41.2/41.2	50/50	39/39	144/144
	208/230-3-60	187	254		13.5	93.0	0.7	4.9	.60	28.5/28.5	35/35	27/27	111/111
	460-3-60	414	508		6.4	46.0	0.4	2.2	.30	13.3	20	13	56
	575-3-60	518	632		6.4	40.0	0.4	2.2	.30	12.2	20	12	47
006 (5 Tons)	208/230-1-60	187	254	1	28.8	169.0	1.5	8.8	.60	52.3/52.3	60/60	50/50	221/221
	208/230-3-60	187	254		17.3	123.0	1.5	5.8	.60	34.9/34.9	40/40	34/34	173/173
	460-3-60	414	508		9.0	62.0	0.8	2.6	.30	17.4	20	17	87
	575-3-60	518	632		7.1	50.0	0.8	2.6	.30	13.8	20	13	70
007 (6 Tons)	208/230-3-60	187	254	1	20.5	156.0	1.4	5.8	.60	38.8/38.8	45/45	37/37	205/205
	460-3-60	414	508		9.6	75.0	0.6	2.6	.30	17.9	20	17	99
	575-3-60	518	632		7.7	56.0	0.6	2.6	.30	14.3	20	14	75
008 (7½ Tons)	208/230-3-60	187	254	2	12.4	88.0	1.4	7.5	.60	44.2/44.2	50/50	46/46	247/247
	460-3-60	414	508		6.4	44.0	0.7	3.4	.30	21.9	25	23	123
	575-3-60	518	632		4.8	34.0	0.7	3.4	.30	16.8	20	17	95
009 (8½ Tons)	208/230-3-60	187	254	2	13.4	105.0	1.4	7.5	.60	46.2/46.2	50/50	48/48	281/281
	460-3-60	414	508		7.4	55.0	0.7	3.4	.30	24.2	30	25	145
	575-3-60	518	632		6.4	44.0	0.7	3.4	.30	20.4	25	21	116
012 (10 Tons)	208/230-3-60	187	254	2	17.6	125.0	1.4	10.6	.60	59/59	70/70††	61/61	345/345
	460-3-60	414	508		8.3	62.5	0.7	4.8	.30	27.6	30	29	173
	575-3-60	518	632		6.3	50.0	0.7	4.8	.30	21.3	25	22	138
014 (12½ Tons)	208/230-3-60	187	254	2	19.0	156.0	1.4	15.0	.60	66.6/66.6	70/70††	70/70	431/431
	460-3-60	414	508		9.0	75.0	0.7	7.4	.30	31.8	35	33	209
	575-3-60	518	632		7.4	54.0	0.7	7.4	.30	25.9	30	27	156

LEGEND

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

*The values listed in this table do not include power exhaust. See table at right for power exhaust requirements.
†Used to determine minimum disconnect per NEC.
**Fuse or HACR circuit breaker.
††Fuse only.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. The UL, Canada units may be fuse or circuit breaker.
2. Electrical data based on 95 F ambient outdoor-air temperature ± 10% voltage.

POWER EXHAUST ELECTRICAL DATA

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH021A01	N/A	0.9	N/A	15
CRPWREXH022A01	3.3	N/A	1.32	15
CRPWREXH023A01	N/A	1.8	N/A	15
CRPWREXH028A01	1.7	N/A	0.68	15
CRPWREXH029A01	N/A	1.0	N/A	15
CRPWREXH030A01	1.6	N/A	0.64	15

N/A — Not available

NOTE: If a single power source is to be used, size wire to include power exhaust MCA and MOCP.

Check MCA and MOCP when power exhaust is powered through the unit. Determine the new MCA including the power exhaust using the following formula:
MCA New = MCA unit only + MCA of Power Exhaust

For example, using a 48HJD006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A01 power exhaust.

MCA New = 28.9 amps + 1.6 amps = 30.5 amps
If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps and the MCA New is below 35; therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

Electrical data — 48HJ (cont)

48HJ004-012 HIGH-STATIC MOTOR UNITS (WITHOUT ELECTRICAL CONVENIENCE OUTLET)

UNIT 48HJ	NOMINAL VOLTAGE (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR (each)			OFM (each)	IFM	COMBUSTION FAN MOTOR	POWER SUPPLY*		MINIMUM UNIT DISCONNECT SIZE†	
		Min	Max	Qty	RLA	LRA	FLA	FLA	RLA	MCA	MOCP**	FLA	LRA
004	208/230-3-60	187	254	1	10.3	77.0	0.7	5.8	0.6	19.4	25	19	120
	460-3-60	414	508		5.1	39.0	0.4	2.6	0.3	9.4	20	9	60
	575-3-60	518	632		4.2	31.0	0.4	2.6	0.3	7.7	20	8	48
005	208/230-3-60	187	254	1	13.5	93.0	0.7	5.8	0.6	23.4	30	23	136
	460-3-60	414	508		6.4	46.5	0.4	2.6	0.3	11.0	20	11	68
	575-3-60	518	632		6.4	40.0	0.4	2.6	0.3	10.4	20	10	57
006	208/230-3-60	187	254	1	17.3	123.0	1.5	7.5	0.6	30.6	35	30	187
	460-3-60	414	508		9.0	62.0	0.8	3.4	0.3	15.5	20	15	94
	575-3-60	518	632		7.1	50.0	0.8	3.4	0.3	12.2	20	12	76
007	208/230-3-60	187	254	1	20.5	156.0	1.4	7.5	0.6	34.5	40	34	219
	460-3-60	414	508		9.6	75.0	0.6	3.4	0.3	16	20	16	107
	575-3-60	518	632		7.7	56.0	0.6	3.4	0.3	12.8	20	13	81
008	208/230-3-60	187	254	2	12.4	88.0	1.4	10.6	0.6	41.3	45	44	267
	460-3-60	414	508		6.4	44.0	0.7	4.8	0.3	20.6	25	22	134
	575-3-60	632	518		4.8	34.0	0.7	4.8	0.3	15.8	20	17	104
009	208/230-3-60	187	254	2	13.4	105.0	1.4	10.6	0.6	43.3	50	46	301
	460-3-60	414	508		7.4	55.0	0.7	4.8	0.3	22.9	25	24	156
	575-3-60	518	632		6.4	44.0	0.7	4.8	0.3	18.2	20	19	115
012	208/230-3-60	187	254	2	17.6	125.0	1.4	15.0	0.6	57.4	70††	61	364
	460-3-60	414	508		8.3	62.5	0.7	7.4	0.3	27.5	30	29	182
	575-3-60	518	632		6.3	50.0	0.7	7.4	0.3	21.2	25	23	146

48HJ004-012 HIGH-STATIC MOTOR UNITS (WITH ELECTRICAL CONVENIENCE OUTLET)

UNIT 48HJ	NOMINAL VOLTAGE (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR (each)			OFM (each)	IFM	COMBUSTION FAN MOTOR	POWER SUPPLY*		MINIMUM UNIT DISCONNECT SIZE†	
		Min	Max	Qty	RLA	LRA	FLA	FLA	RLA	MCA	MOCP**	FLA	LRA
004	208/230-3-60	187	254	1	10.3	77.0	0.7	5.8	0.6	25.4	30	25	124
	460-3-60	414	508		5.1	39.0	0.4	2.6	0.3	12.1	20	12	63
	575-3-60	518	632		4.2	31.0	0.4	2.6	0.3	9.8	20	10	50
005	208/230-3-60	187	254	1	13.5	93.0	0.7	5.8	0.6	29.4	35	29	140
	460-3-60	414	508		6.4	46.5	0.4	2.6	0.3	13.7	20	13	70
	575-3-60	518	632		6.4	40.0	0.4	2.6	0.3	12.6	20	12	59
006	208/230-3-60	187	254	1	17.3	123.0	1.5	7.5	0.6	36.6	40	36	192
	460-3-60	414	508		9.0	62.0	0.8	3.4	0.3	18.2	20	18	96
	575-3-60	518	632		7.1	50.0	0.8	3.4	0.3	14.4	20	14	77
007	208/230-3-60	187	254	1	20.5	156.0	1.4	7.5	0.6	40.5	45	39	224
	460-3-60	414	508		9.6	75.0	0.6	3.4	0.3	18.7	25	18	109
	575-3-60	518	632		7.7	56.0	0.6	3.4	0.3	15.0	20	15	83
008	208/230-3-60	187	254	2	12.4	88.0	1.4	10.6	0.6	47.3	50	49	271
	460-3-60	414	508		6.4	44.0	0.7	4.8	0.3	23.3	25	24	136
	575-3-60	518	632		4.8	34.0	0.7	4.8	0.3	17.9	20	19	104
009	208/230-3-60	187	254	2	13.4	105.0	1.4	10.6	0.6	49.3	60	51	305
	460-3-60	414	508		7.4	55.0	0.7	4.8	0.3	25.6	30	27	158
	575-3-60	518	632		6.4	44.0	0.7	4.8	0.3	21.5	25	22	126
012	208/230-3-60	187	254	2	17.6	125.0	1.4	15.0	0.6	63.4	70††	66	369
	460-3-60	414	508		8.3	62.5	0.7	7.4	0.3	30.2	35	32	184
	575-3-60	518	632		6.3	50.0	0.7	7.4	0.3	23.4	25	25	148

LEGEND

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

*The values listed in this table do not include power exhaust. See table at right for power exhaust requirements.
†Used to determine minimum disconnect per NEC.
**Fuse or HACR circuit breaker.
††Fuse only.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. The UL, Canada units may be fuse or circuit breaker.
2. Electrical data based on 95 F ambient outdoor-air temperature ± 10% voltage.

POWER EXHAUST ELECTRICAL DATA

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH021A01	N/A	0.9	N/A	15
CRPWREXH022A01	3.3	N/A	1.32	15
CRPWREXH023A01	N/A	1.8	N/A	15
CRPWREXH028A01	1.7	N/A	0.68	15
CRPWREXH029A01	N/A	1.0	N/A	15
CRPWREXH030A01	1.6	N/A	0.64	15

N/A — Not available

NOTE: If a single power source is to be used, size wire to include power exhaust MCA and MOCP.

Check MCA and MOCP when power exhaust is powered through the unit. Determine the new MCA including the power exhaust using the following formula:

MCA New = MCA unit only + MCA of Power Exhaust

For example, using a 48HJD006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A01 power exhaust.

MCA New = 28.9 amps + 1.6 amps = 30.5 amps

If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps and the MCA New is below 35; therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

COBRA™ ENERGY RECOVERY UNITS (48HJ004-007 UNITS WITH 62AQ060)

UNIT	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	POWER SUPPLY		DISCONNECT SIZE*	
					MCA	FUSE OR HACR BKR	FLA	LRA
48HJ004	208/230-1-60	STD	NO	9.2	34.8/34.8	40/40	35/35	135/135
		STD	YES	9.2	40.8/40.8	45/45	41/41	140/140
	208/230-3-60	STD	NO	9.2	27.7/27.7	35/35	29/29	124/124
		STD	YES	9.2	33.7/33.7	40/35	34/34	129/129
		HIGH STATIC	NO	9.2	28.6/28.6	35/35	30/30	154/154
		HIGH STATIC	YES	9.2	34.6/34.6	40/40	35/35	158/158
	460-3-60	STD	NO	9.2	13.6	20	14	63
		STD	YES	9.2	16.3	20	20	67
		HIGH STATIC	NO	9.2	14.0	20	15	77
		HIGH STATIC	YES	9.2	16.7	20	20	82
48HJ005	208/230-1-60	STD	NO	9.2	44.4/44.4	60/60	44/44	173/173
		STD	YES	9.2	50.4/50.4	60/60	50/50	178/178
	208/230-3-60	STD	NO	9.2	31.7/31.7	40/40	33/33	140/140
		STD	YES	9.2	37.7/37.7	40/40	38/38	145/145
		HIGH STATIC	NO	9.2	32.6/32.6	40/40	34/34	170/170
		HIGH STATIC	YES	9.2	38.6/38.6	45/45	39/39	174/174
	460-3-60	STD	NO	9.2	15.2	20	16	70
		STD	YES	9.2	17.9	20	21	75
		HIGH STATIC	NO	9.2	15.6	20	16	84
		HIGH STATIC	YES	9.2	18.3	20	22	89
48HJ006	208/230-1-60	STD	NO	9.2	55.5/55.5	70/70	56/56	250/250
		STD	YES	9.2	61.5/61.5	70/70	61/61	255/255
	208/230-3-60	STD	NO	9.2	38.1/38.1	45/45	39/39	202/202
		STD	YES	9.2	44.1/44.1	50/50	44/44	207/207
		HIGH STATIC	NO	9.2	39.8/39.8	45/45	41/41	221/221
		HIGH STATIC	YES	9.2	45.8/45.8	50/50	46/46	226/226
	460-3-60	STD	NO	9.2	19.3	25	20	101
		STD	YES	9.2	22.0	25	25	106
		HIGH STATIC	NO	9.2	20.1	25	20	110
		HIGH STATIC	YES	9.2	22.8	25	26	115
48HJ007	208/230-3-60	STD	NO	9.2	42.0/42.0	50/50	42/42	234/234
		STD	YES	9.2	48.0/48.0	60/60	48/48	239/239
	208/230-3-60	HIGH STATIC	NO	9.2	43.7/43.7	50/50	44/44	253/253
		HIGH STATIC	YES	9.2	49.7/49.7	60/60	50/50	258/258
	460-3-60	STD	NO	9.2	19.8	25	20	114
		STD	YES	9.2	22.5	25	26	118
		HIGH STATIC	NO	9.2	20.6	25	21	123
		HIGH STATIC	YES	9.2	23.3	30	26	128

LEGEND

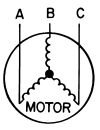
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
NEC — National Electrical Code
UL — Underwriters' Laboratories

*Used to determine minimum disconnect per NEC.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada 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.

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

Example: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

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

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

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

$$= 1.53\%$$

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

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

Electrical data — 48HJ (cont)

COBRA™ ENERGY RECOVERY UNITS (48HJ004-007 UNITS WITH 62AQ100)

UNIT	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	POWER SUPPLY		DISCONNECT SIZE*	
					MCA	FUSE OR HACR BKR	FLA	LRA
48HJ004	208/230-1-60	STD	NO	15.1	40.7/40.7	45/45	42/42	161/161
		STD	YES	15.1	46.7/46.7	50/50	48/48	166/166
	208/230-3-60	STD	NO	15.1	33.6/33.6	40/40	36/36	150/150
		STD	YES	15.1	39.6/39.6	45/45	41/41	155/155
		HIGH STATIC	NO	15.1	34.5/34.5	40/40	37/37	180/180
		HIGH STATIC	YES	15.1	40.5/40.5	45/45	42/42	184/184
	460-3-60	STD	NO	15.1	16.5	20	18	76
		STD	YES	15.1	19.2	20	23	80
		HIGH STATIC	NO	15.1	16.9	20	18	90
		HIGH STATIC	YES	15.1	19.6	25	24	95
48HJ005	208/230-1-60	STD	NO	15.1	50.3/50.3	60/60	51/51	199/199
		STD	YES	15.1	56.3/56.3	70/70	57/57	204/204
	208/230-3-60	STD	NO	15.1	37.6/37.6	45/45	39/39	166/166
		STD	YES	15.1	43.6/43.6	50/50	45/45	171/171
		HIGH STATIC	NO	15.1	38.5/38.5	45/45	40/40	196/196
		HIGH STATIC	YES	15.1	44.5/44.5	50/50	46/46	200/200
	460-3-60	STD	NO	15.1	18.2	20	19	83
		STD	YES	15.1	20.9	25	25	88
		HIGH STATIC	NO	15.1	18.6	25	19	97
		HIGH STATIC	YES	15.1	21.3	25	25	102
48HJ006	208/230-1-60	STD	NO	15.1	61.4/61.4	70/70	62/62	276/276
		STD	YES	15.1	67.4/67.4	80/80	68/68	281/281
	208/230-3-60	STD	NO	15.1	44.0/44.0	50/50	46/46	228/228
		STD	YES	15.1	50.0/50.0	60/60	51/51	233/233
		HIGH STATIC	NO	15.1	45.7/45.7	60/60	48/48	247/247
		HIGH STATIC	YES	15.1	51.7/51.7	60/60	53/53	252/252
	460-3-60	STD	NO	15.1	22.2	25	23	114
		STD	YES	15.1	24.9	30	28	119
		HIGH STATIC	NO	15.1	23.0	30	24	123
		HIGH STATIC	YES	15.1	25.7	30	29	128
48HJ007	208/230-3-60	STD	NO	15.1	47.9/47.9	60/60	49/49	260/260
		STD	YES	15.1	53.9/53.9	60/60	55/55	265/265
		HIGH STATIC	NO	15.1	49.6/49.6	60/60	51/51	279/279
		HIGH STATIC	YES	15.1	55.6/55.6	60/60	57/57	284/284
	460-3-60	STD	NO	15.1	22.8	30	23	127
		STD	YES	15.1	25.5	30	29	131
		HIGH STATIC	NO	15.1	23.6	30	24	136
		HIGH STATIC	YES	15.1	26.3	30	30	141

LEGEND

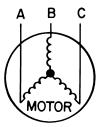
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
NEC — National Electrical Code
UL — Underwriters' Laboratories

*Used to determine minimum disconnect per NEC.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada 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.

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

Example: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

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

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

$$= 1.53\%$$

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

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

COBRA™ ENERGY RECOVERY UNITS (48HJ008-014 UNITS WITH 62AQ200)

UNIT	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	POWER SUPPLY		DISCONNECT SIZE*	
					MCA	FUSE OR HACR BKR	FLA	LRA
48HJ008	208/230-3-60	STD	NO	21.9	60.1	70	66	366
		STD	YES	21.9	66.1	70	71	371
		HIGH STATIC	NO	21.9	63.2	70	69	391
		HIGH STATIC	YES	21.9	69.2	80	75	395
	460-3-60	STD	NO	10.2	29.4	35	32	184
		STD	YES	10.2	32.1	35	34	186
		HIGH STATIC	NO	10.2	30.8	35	34	197
		HIGH STATIC	YES	10.2	33.5	35	36	199
48HJ009	208/230-3-60	STD	NO	21.9	62.1	70	68	400
		STD	YES	21.9	68.1	70	73	405
		HIGH STATIC	NO	21.9	65.2	70	71	425
		HIGH STATIC	YES	21.9	65.2	70	71	425
	460-3-60	STD	NO	10.2	31.7	35	34	206
		STD	YES	10.2	34.4	40	37	208
		HIGH STATIC	NO	10.2	33.1	35	36	219
		HIGH STATIC	YES	10.2	35.8	40	38	221
48HJ012	208/230-3-60†	STD	NO	21.9	74.9	80	81	465
		STD	YES	21.9	80.9	90	87	469
		HIGH STATIC	NO	21.9	79.3	90	86	488
		HIGH STATIC	YES	21.9	85.3	90	92	493
	460-3-60	STD	NO	10.2	35.1	40	38	234
		STD	YES	10.2	37.8	40	40	236
		HIGH STATIC	NO	10.2	37.7	40	41	245
		HIGH STATIC	YES	10.2	40.4	45	43	247
48HJ014	208/230-3-60†	STD	NO	21.9	82.5	90	89	550
		STD	YES	21.9	88.5	100	95	555
	460-3-60	STD	NO	10.2	39.3	45	43	270
		STD	YES	10.2	42.0	45	45	272

LEGEND

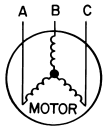
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
NEC — National Electrical Code
UL — Underwriters' Laboratories

*Used to determine minimum disconnect per NEC.
†Single point box with fuse is part of base unit.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada 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.

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

Example: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

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

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

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

$$= 1.53\%$$

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

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

Electrical data — 48HJ (cont)

COBRA™ ENERGY RECOVERY UNITS (48HJ008-014 UNITS WITH 62AQ300)

UNIT	NOMINAL V-PH-Hz	IFM TYPE	CONV OUTLET	62AQ FLA	POWER SUPPLY		DISCONNECT SIZE*	
					MCA	FUSE OR HACR BKR	FLA	LRA
48HJ008	208/230-3-60	STD	NO	29.8	68.0	80	75	420
		STD	YES	29.8	74.0	80	80	425
		HIGH STATIC	NO	29.8	71.1	80	78	445
		HIGH STATIC	YES	29.8	77.1	80	84	449
	460-3-60	STD	NO	15.8	35.0	40	38	211
		STD	YES	15.8	37.7	40	41	213
		HIGH STATIC	NO	15.8	36.4	40	40	224
		HIGH STATIC	YES	15.8	39.1	45	43	226
48HJ009	208/230-3-60	STD	NO	29.8	70.0	80	77	454
		STD	YES	29.8	76.0	80	82	459
		HIGH STATIC	NO	29.8	73.1	80	80	479
		HIGH STATIC	YES	29.8	79.1	80	86	483
	460-3-60	STD	NO	15.8	37.3	40	41	233
		STD	YES	15.8	40.0	45	43	235
		HIGH STATIC	NO	15.8	38.7	45	42	246
		HIGH STATIC	YES	15.8	41.4	45	45	248
48HJ012	208/230-3-60†	STD	NO	29.8	82.8	90	90	519
		STD	YES	29.8	88.8	100	96	523
		HIGH STATIC	NO	29.8	87.2	100	95	542
		HIGH STATIC	YES	29.8	93.2	100	101	547
	460-3-60	STD	NO	15.8	40.7	45	44	261
		STD	YES	15.8	43.4	45	47	263
		HIGH STATIC	NO	15.8	43.3	50	47	272
		HIGH STATIC	YES	15.8	46.0	50	50	274
48HJ014	208/230-3-60†	STD	NO	29.8	90.4	100	98	604
		STD	YES	29.8	96.4	100	104	609
	460-3-60	STD	NO	15.8	44.9	50	49	297
		STD	YES	15.8	47.6	50	51	299

LEGEND

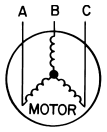
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
NEC — National Electrical Code
UL — Underwriters' Laboratories

*Used to determine minimum disconnect per NEC.
†Single point box with fuse is part of base unit.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. UL, Canada 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.

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

Example: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

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

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

$$= 1.53\%$$

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

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

ELECTRICAL DATA — 48HJ015,017

UNIT 48HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		COMBUSTION FAN MOTOR	POWER SUPPLY	
				No. 1		No. 2											
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	FLA	MCA	MOCP*
015 (Standard IFM)	208/230	187	253	20.7	156	20.7	156	3	0.5	1.70	2.9	8.8/ 8.4	—	—	0.57	60/60	80/80
													4.6	18.8	0.57	65/65	80/80
	460	414	506	10.0	75	10.0	75	3	0.5	0.80	2.9	4.2	—	—	0.30	29	35
													2.3	6.0	0.30	31	40
	575	518	633	8.2	54	8.2	54	3	0.5	0.75	3.0	3.9	—	—	0.57	25	30
													2.1	4.8	0.57	27	30
015 (Optional IFM)	208/230	187	253	20.7	156	20.7	156	3	0.5	1.70	3.7	10.5/11.0	—	—	0.57	62/63	80/80
													4.6	18.8	0.57	67/67	80/80
	460	414	506	10.0	75	10.0	75	3	0.5	0.80	3.7	4.8	—	—	0.30	30	35
													2.3	6.0	0.30	32	40
017	208/230	187	253	32.1	195	20.7	156	3	0.5	1.70	5.0	15.8/15.8	—	—	0.57	82/82	110/110
													4.6	18.8	0.57	86/86	110/110
	460	414	506	16.4	95	10.0	75	3	0.5	0.80	5.0	7.9	—	—	0.30	41	50
													2.3	6.0	0.30	43	50
	575	518	633	12.0	80	8.2	54	3	0.5	0.75	5.0	6.0	—	—	0.57	31	40
													2.1	4.8	0.57	34	45

LEGEND

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

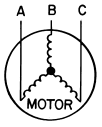
*Fuse or HACR circuit breaker.

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

   % Voltage Imbalance

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

Example: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

Determine maximum deviation from average voltage.

(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

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

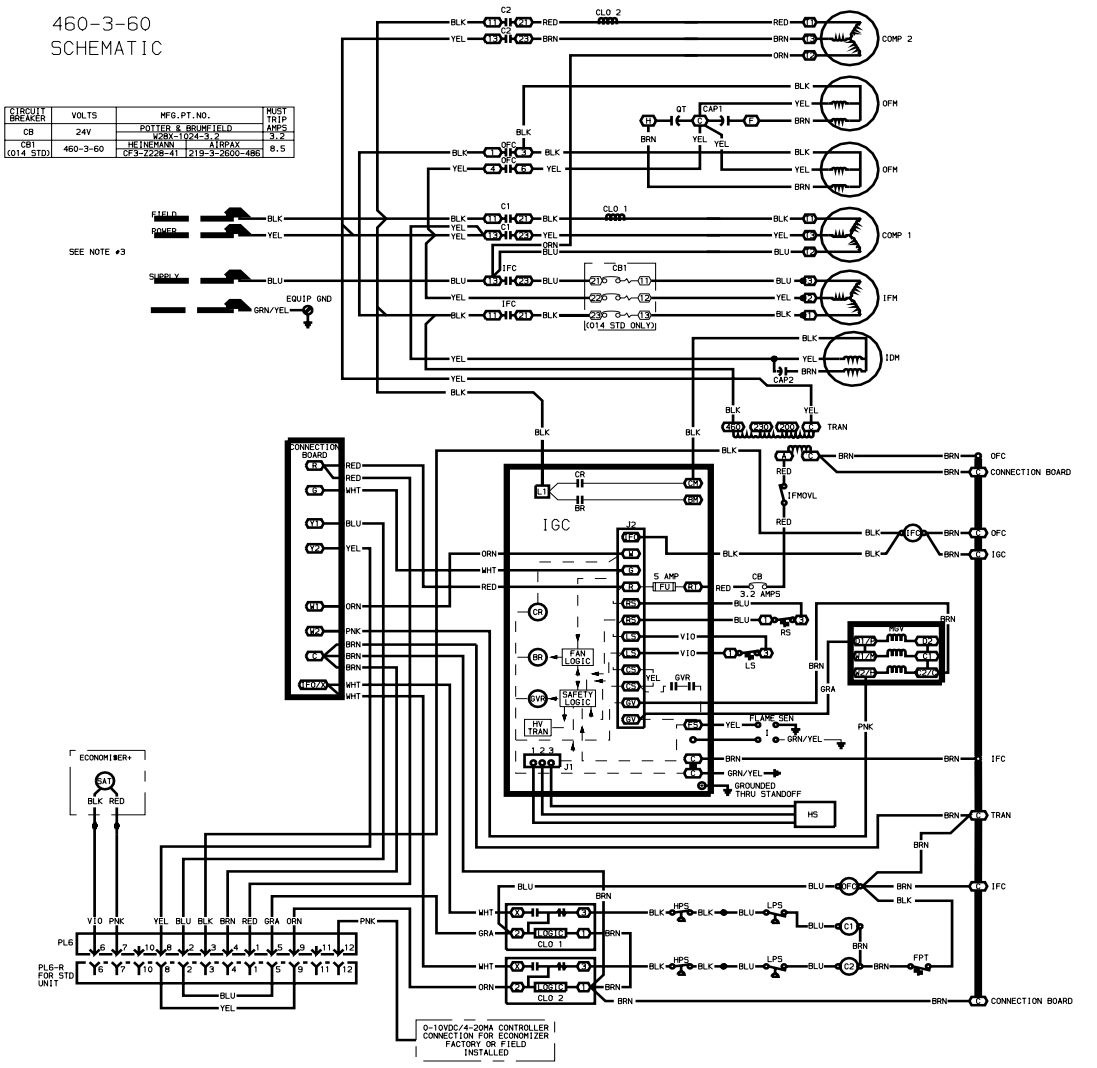
$$= 1.53\%$$

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

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

Typical wiring schematics — 48HJ

SIZES 004-014 (48HJ008, 460-3-60 SHOWN)



CIRCUIT BREAKER	VOLTS	MFG.PT.NO.		MUST TRIP AMPS
CB	24V	POTTER & BRUMFIELD W28X-1024-3.2		3.2
CB1 (014 STD)	460-3-60	HEINEMANN CF3-2228-41	AIRPAX 219-3-2600-486	8.5

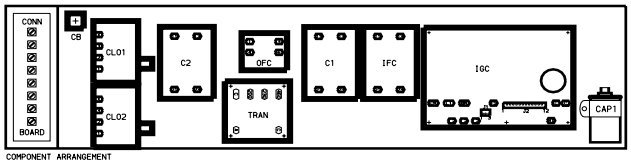
C CONTACTOR,COMPRESSOR
CB CIRCUIT BREAKER
CLO COMPRESSOR LOCKOUT
COMP COMPRESSOR MOTOR
EQUIP EQUIPMENT
FPT FREEZE UP PROTECTION THERMOSTAT
GND GROUND
HPS HIGH PRESSURE SWITCH
HS HALL EFFECT SEN.
I IGNITOR
IAQ INDOOR AIR QUALITY SEN.
IARH INDOOR AIR RELATIVE HUMIDITY SEN.
IDM INDUCED DRAFT MOTOR
IFC INDOOR FAN CONTACTOR
IFM INDOOR FAN MOTOR
IFMOVL INDOOR FAN MOTOR OVERLOAD SWITCH
IGC INTEGRATED GAS UNIT CONTROLLER
LPS LOW PRESSURE SWITCH
LS LIMIT SWITCH
MGV MAIN GAS VALVE
OARH OUTDOOR AIR RELATIVE HUMIDITY SEN.
OAT OUTDOOR AIR TEMP. SEN.
OFC OUTDOOR FAN CONTACTOR
OFM OUTDOOR FAN MOTOR
P PLUG
PL PLUG ASSEMBLY
POT POTENTIOMETER
QT QUADRUPLE TERMINAL
RAT RETURN AIR TEMP. SEN.
RS ROLLOUT SWITCH
SAT SUPPLY AIR TEMP. SEN.
SEN SENSOR
TRAN TRANSFORMER

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. USE COPPER CONDUCTORS ONLY.

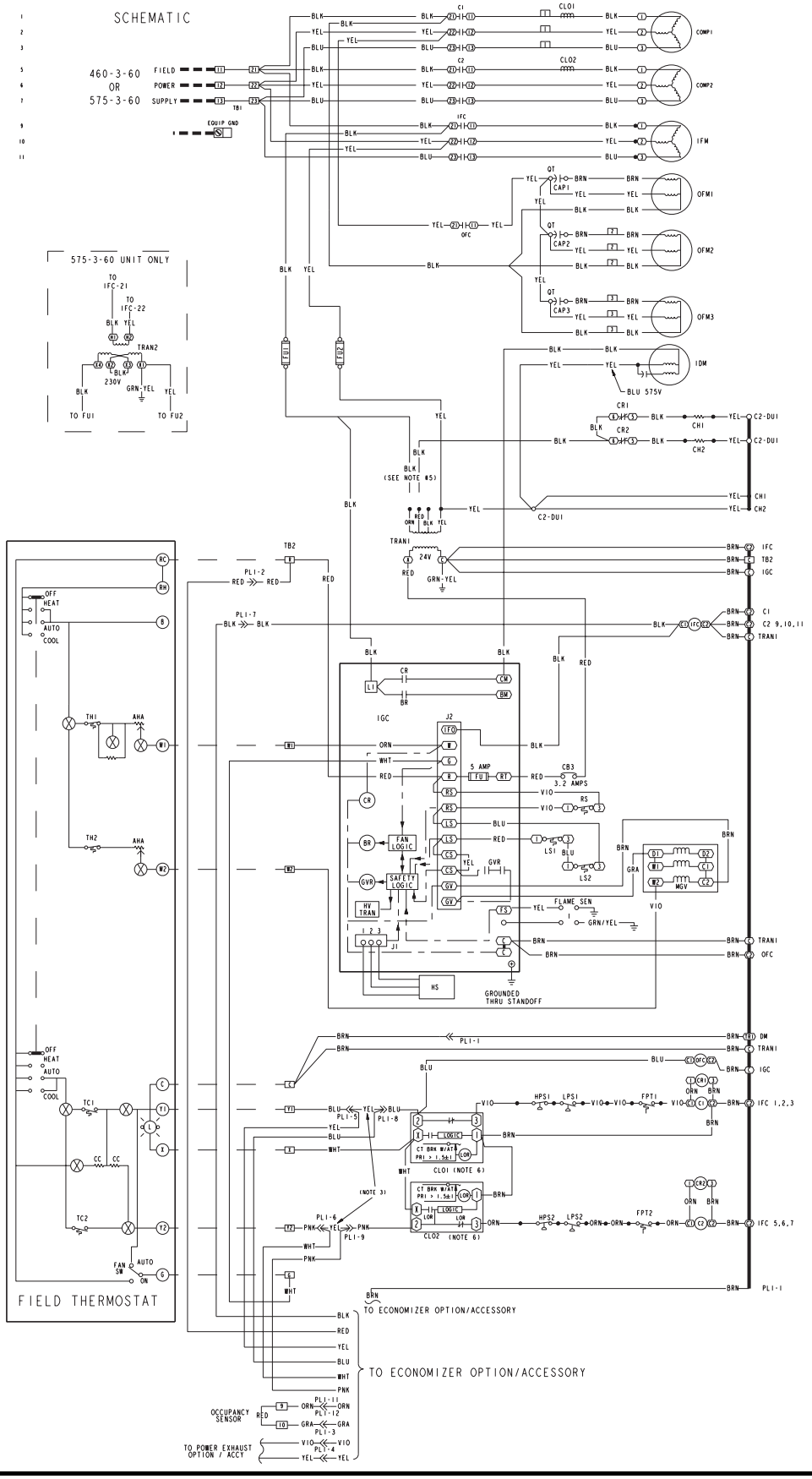
LEGEND

- 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



COMPONENT ARRANGEMENT

SIZES 015,017 (48HJ015, 460-3-60 SHOWN)



LEGEND

AHA	—	Adjustable Heat Anticipator
C	—	Contactor, Compressor
CAP	—	Capacitor
CB	—	Circuit Breaker
CC	—	Cooling Compensator
CH	—	Crankcase Heater
CLO	—	Compressor Lockout
COMP	—	Compressor Motor
CR	—	Control Relay
DM	—	Damper Motor
DU	—	Dummy Terminal
EQUIP	—	Equipment
FPT	—	Freeze Protection Thermostat
FU	—	Fuse
GND	—	Ground
HPS	—	High-Pressure Switch
HS	—	Hall Effect Sensor
HV	—	High Voltage
I	—	Ignitor
IAQ	—	Indoor Air Quality Sensor
IDM	—	Induced Draft Motor
IFC	—	Indoor Fan Contactor
IFCB	—	Indoor Fan Circuit Breaker
IFM	—	Indoor (Evaporator) Fan Motor
IGC	—	Integrated Gas Unit Controller
IRH	—	Indoor/Return Relative Humidity
L	—	Light
LOR	—	Lockout Relay
LPS	—	Low-Pressure Switch
LS	—	Limit Switch
MGV	—	Main Gas Valve
NEC	—	National Electrical Code
OAT	—	Outdoor-Air Temperature Sensor
OCCUP	—	Occupancy Sensor
OFC	—	Outdoor Fan Contactor
OFM	—	Outdoor Fan Motor
ORH	—	Outdoor Relative Humidity
PL	—	Plug Assembly
PRI	—	Primary
RAT	—	Return Air Temperature Sensor
RS	—	Rollout Switch
SAT	—	Mixed-Air Temperature Sensor
SN	—	Sensor
SW	—	Switch
TB	—	Terminal Block
TC	—	Thermostat-Cooling
TH	—	Thermostat-Heating
TRAN	—	Transformer

Terminal (Marked)

Terminal (Unmarked)

Terminal Block

Splice

Factory Wiring

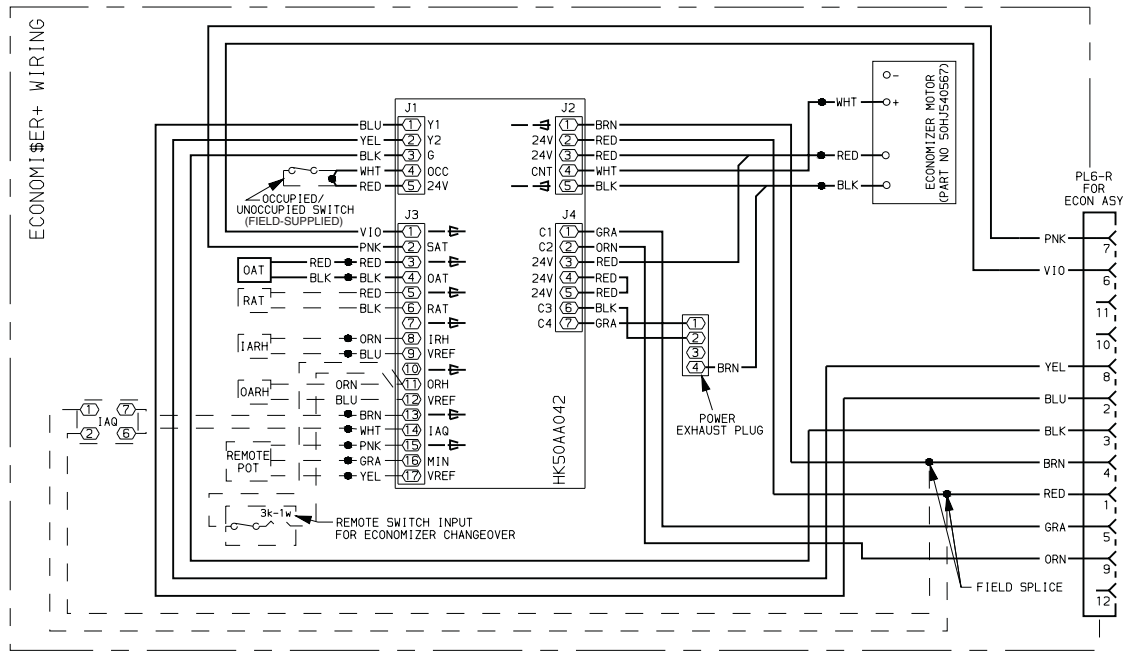
Field Wiring

Option/Accessory Wiring

To indicate common potential only. Not to represent wiring.

Typical wiring schematics — 48HJ (cont)

ECONOMI$ER+ WIRING — 48HJ004-014 UNITS

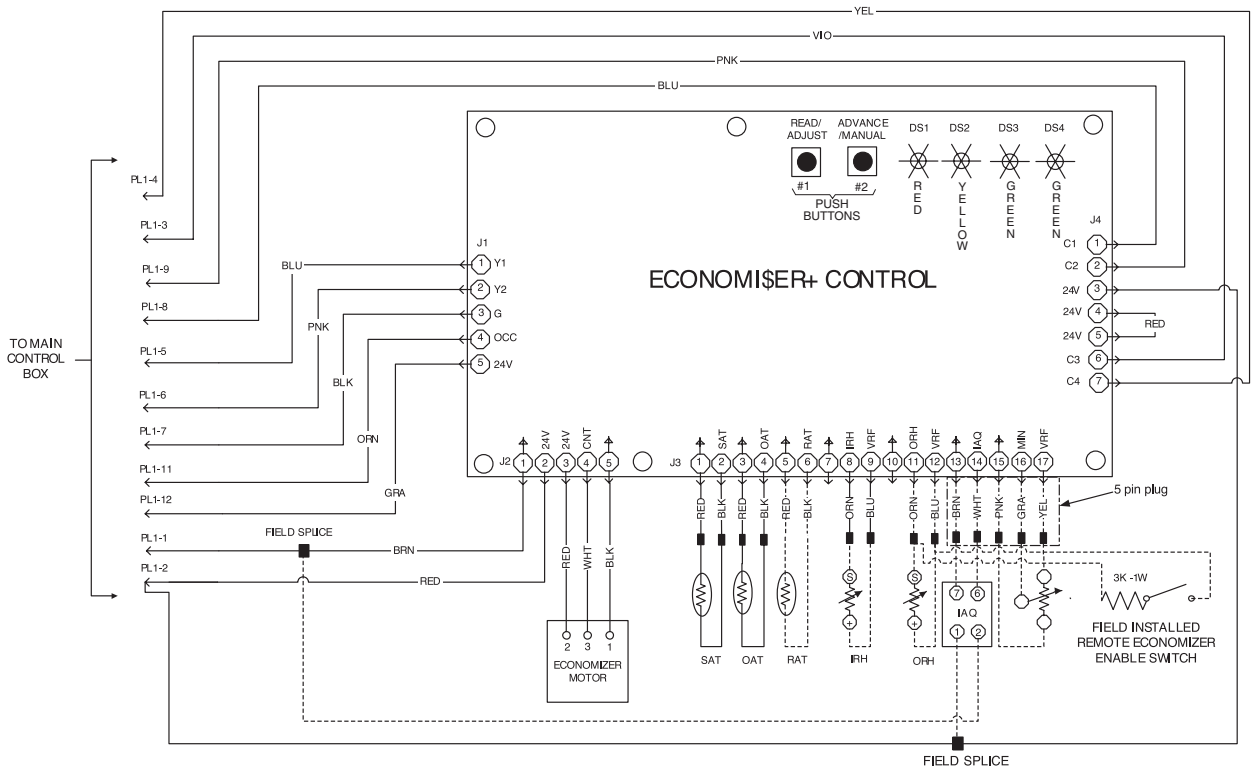


LEGEND

ECON — Economizer
IAQ — Indoor Air Quality (4 to 20 mA)
IARH — Indoor Air Relative Humidity (Signal)
IRH — Indoor Air Relative Humidity (Sensor)
OARH — Outdoor Air Relative Humidity (Signal)
OAT — Outdoor-Air Temperature
ORH — Outdoor Air Relative Humidity (Sensor)
POT — Potentiometer
RAT — Return-Air Temperature
SAT — Supply-Air Temperature

NOTES:
1. Terminals 13-17 are wired to 5-pin plug assembly (P/N CRE+PLUG001A00).
2. Pin numbers are not printed on the controller. They are provided in this book as a reference.

ECONOMI$ER+ WIRING — 48HJ015,017 UNITS

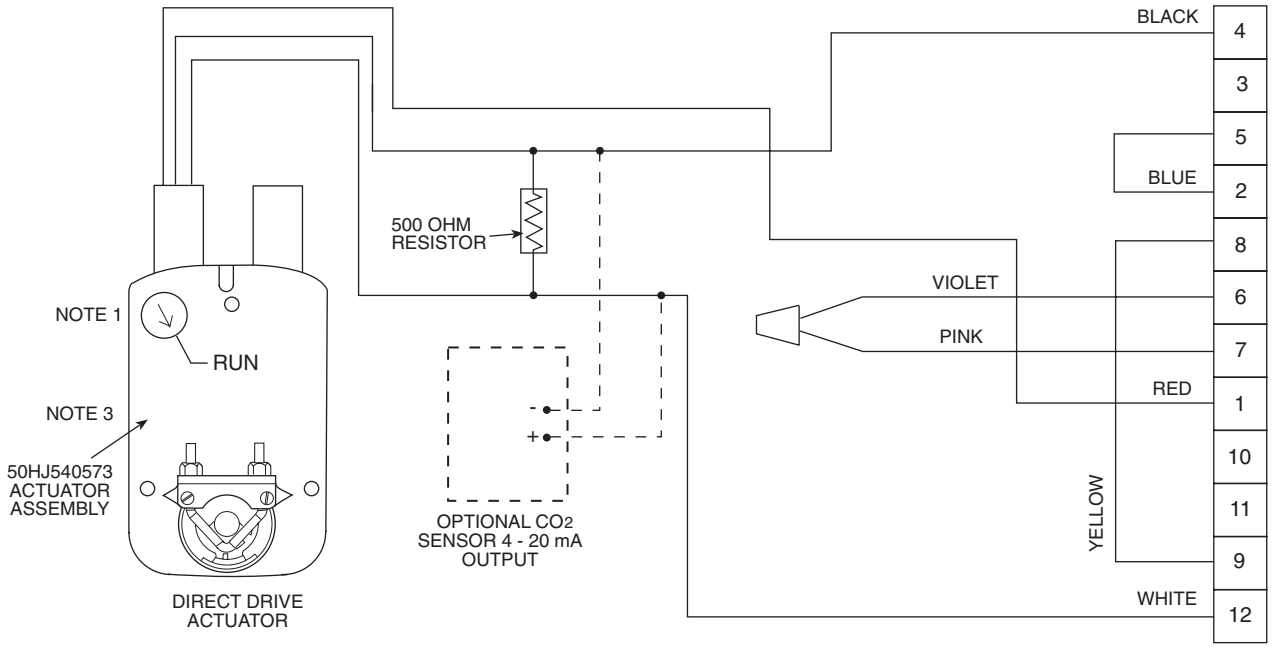


LEGEND

IAQ — Indoor Air Quality(4 to 20 mA)
IRH — Indoor Air Relative Humidity
OAT — Outdoor-Air Temperature
ORH — Outdoor Air Relative Humidity
RAT — Return-Air Temperature
SAT — Supply-Air Temperature

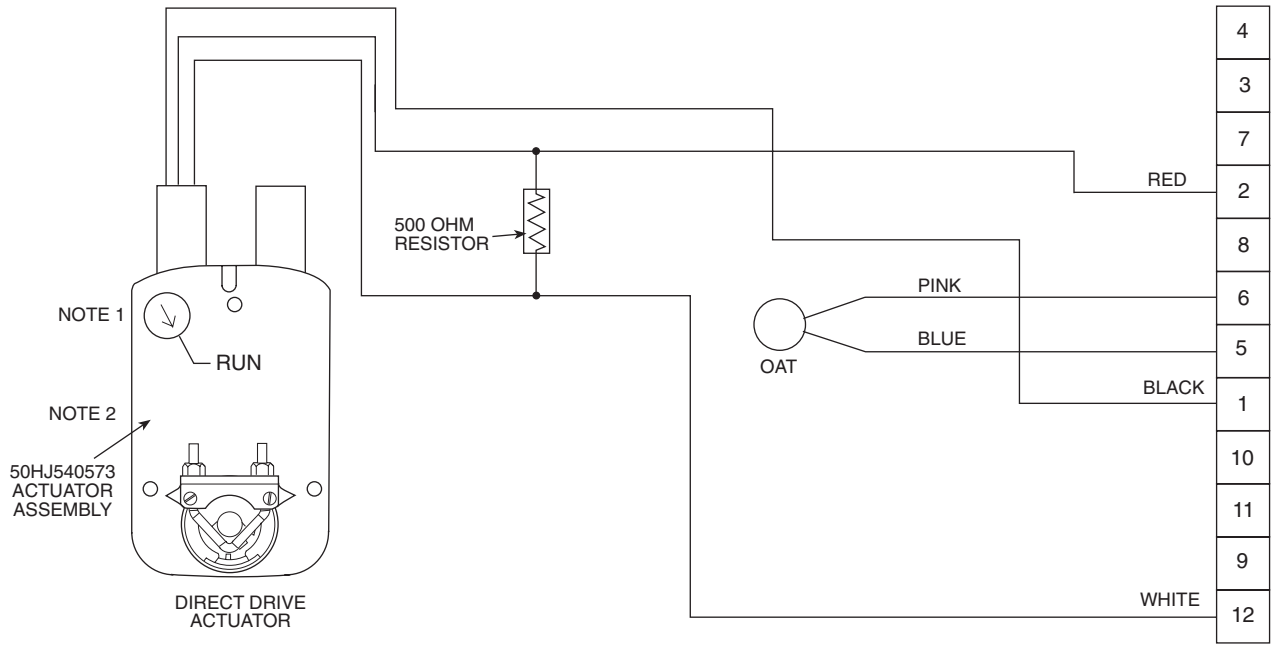
NOTE: Terminals 13-17 are wired to 5-pin plug assembly (P/N CRE+PLUG001A00).

ECONOMI$ER2 WIRING — 48HJ004-014 UNITS



NOTES:
1. Switch on actuator must be in run position for economizer to operate.
2. PremierLink™ control requires that the standard 50HJ540569 outside-air sensor be replaced by either the CROASENR001A00 dry bulb sensor or HH57A077 enthalpy sensor.
3. 50HJ540573 actuator consists of the 50HJ540567 actuator and a harness with 500-ohm resistor.

ECONOMI$ER2 WIRING — 48HJ015,017 UNITS



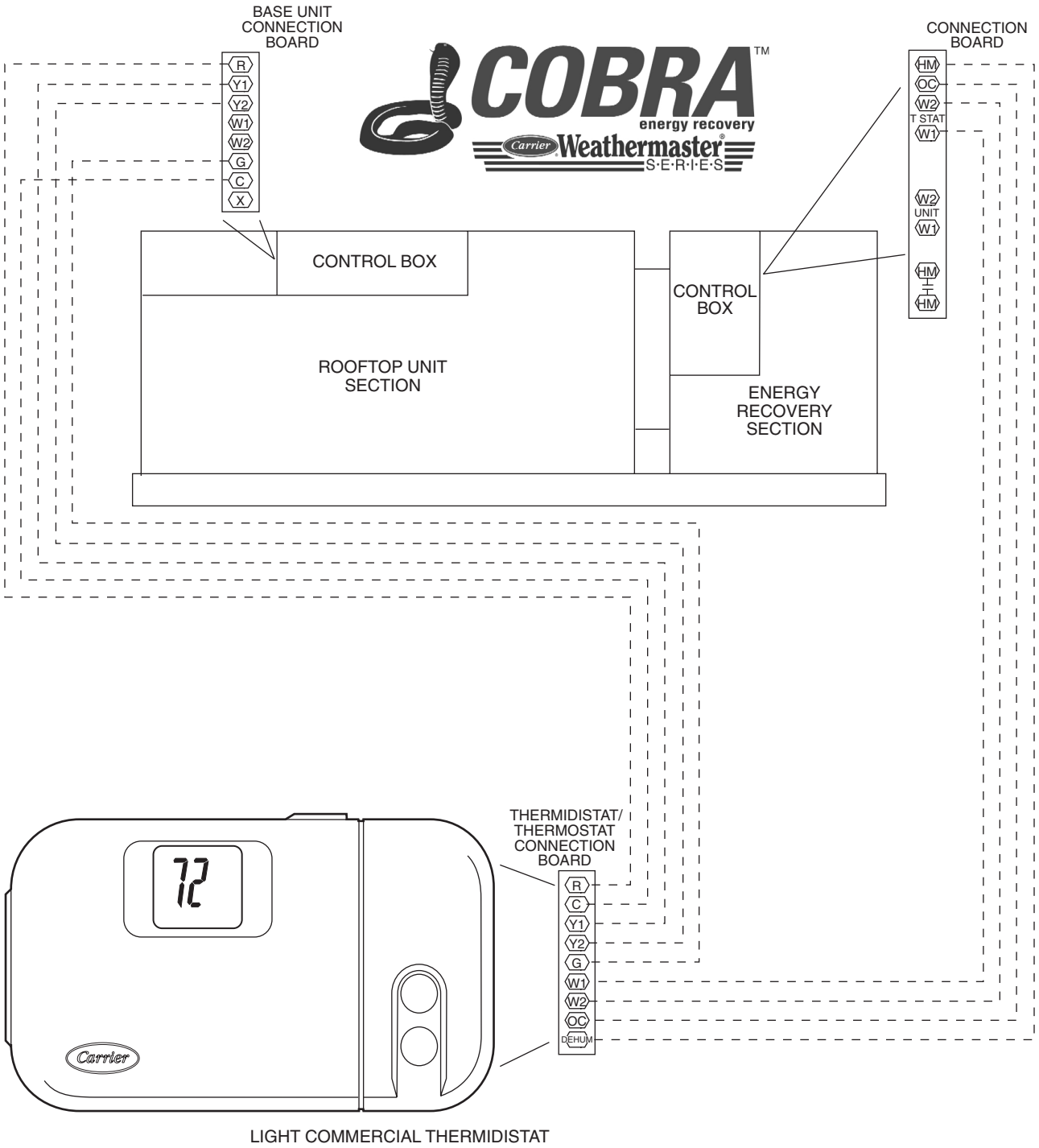
LEGEND

OAT — Outdoor Air Temperature Sensor

NOTES:
1. Switch on actuator must be in run position for economizer to operate.
2. 50HJ540573 actuator consists of the 50HJ540567 actuator and a harness with 500-ohm resistor.

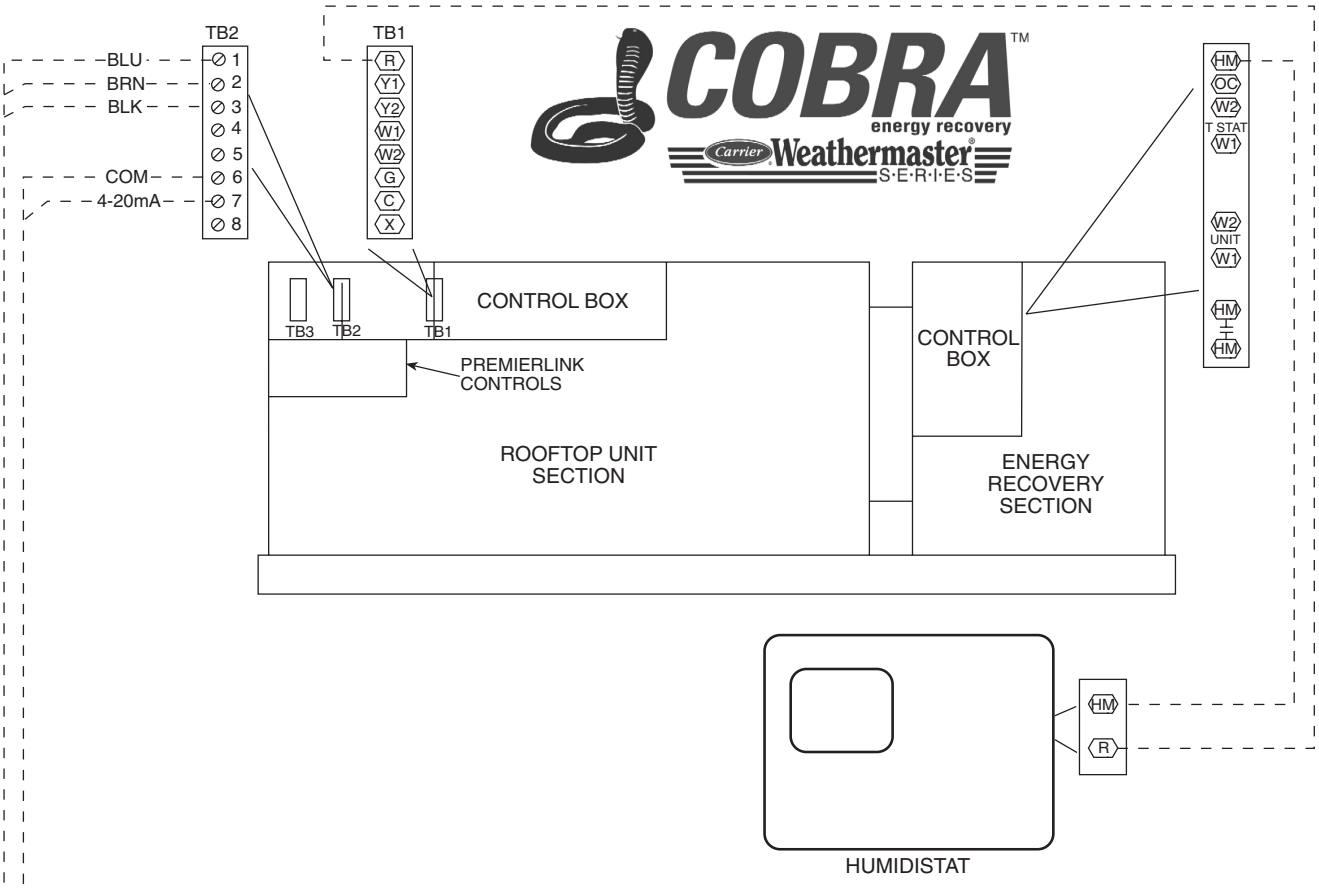
Typical wiring schematics — 48HJ (cont)

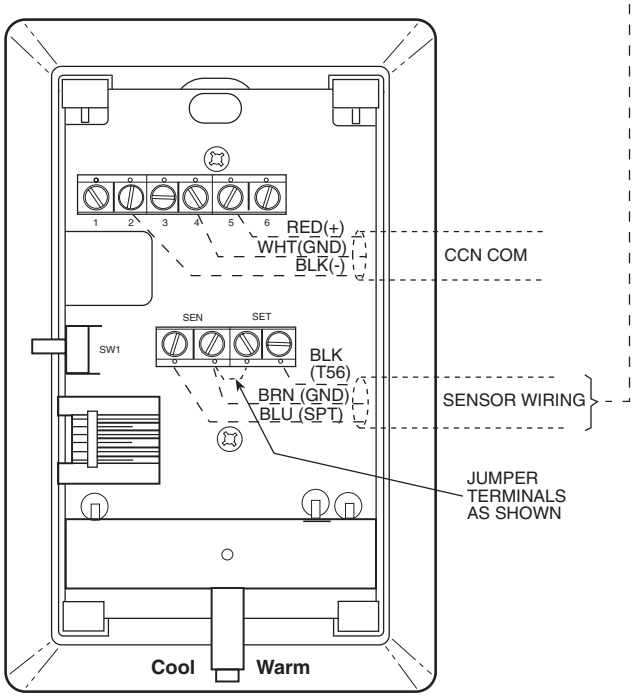
TYPICAL COBRA™ ENERGY RECOVERY UNIT CONTROL WIRING WITH THERMIDISTAT AND STANDARD CONTROLS



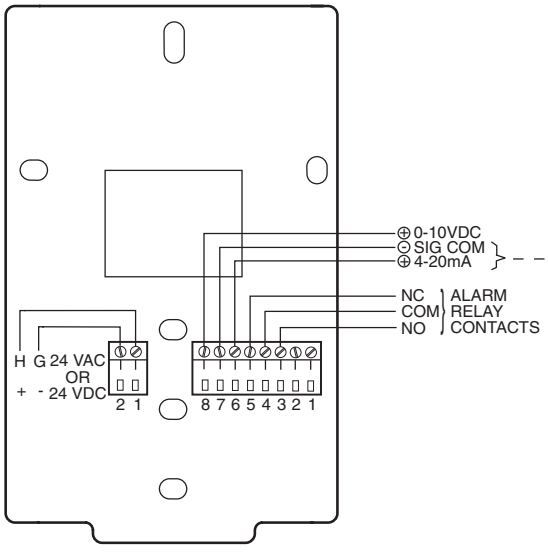
LIGHT COMMERCIAL THERMIDISTAT

TYPICAL COBRA™ ENERGY RECOVERY UNIT CONTROL WIRING WITH HUMIDISTAT, SPACE TEMPERATURE SENSOR, CO_2 SENSOR, AND PREMIERLINK™ CONTROLS





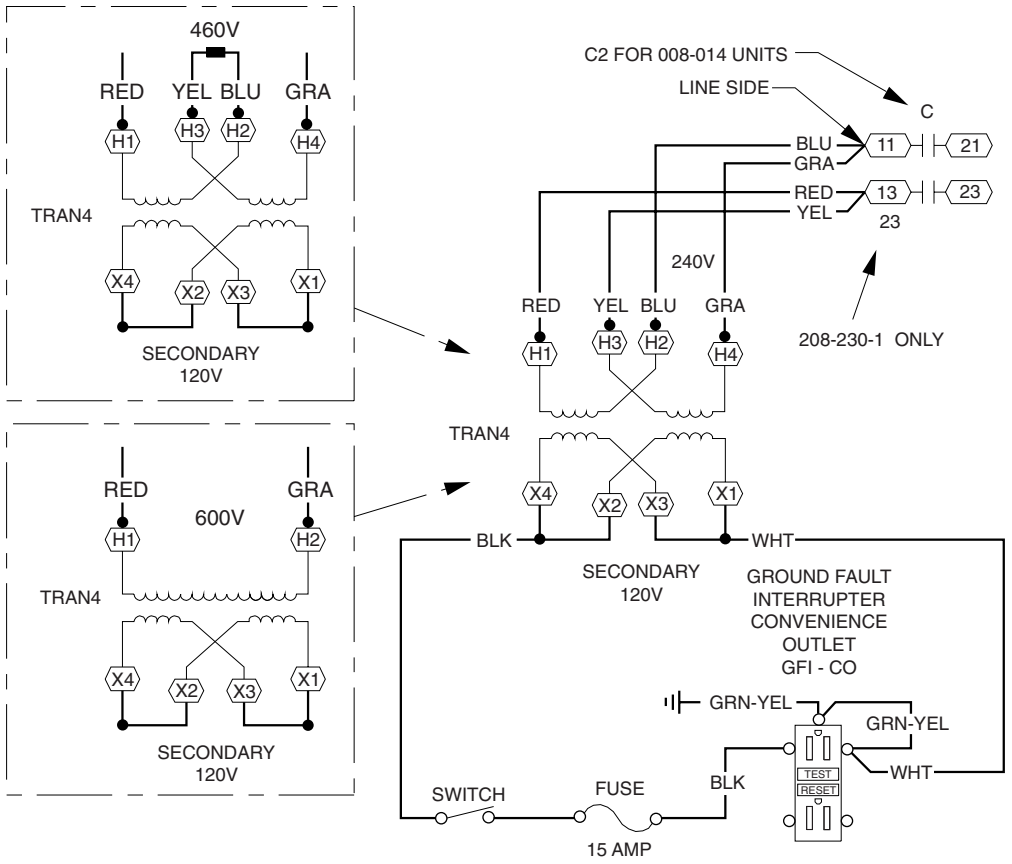
SPACE TEMPERATURE SENSOR
(33ZCT56SPT)



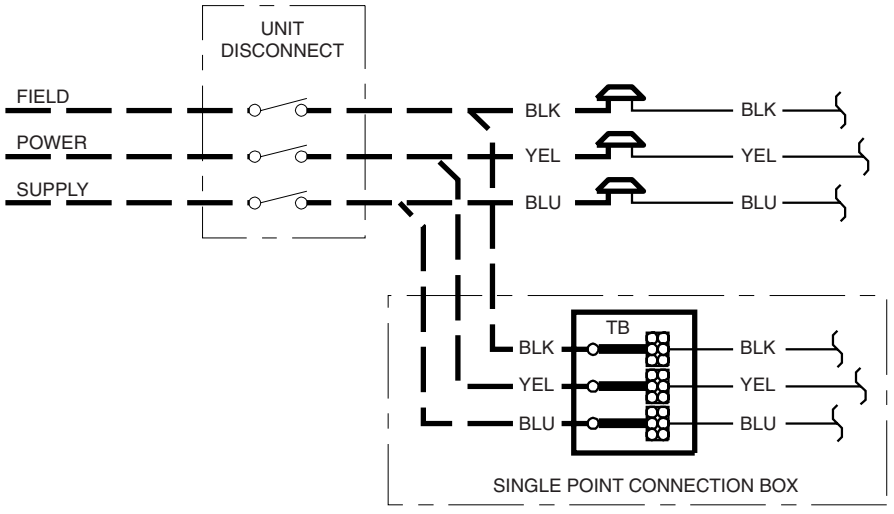
INDOOR AIR QUALITY (CO_2) SENSOR
(33ZCSENCO2)

Typical wiring schematics — 48HJ (cont)

CONVENIENCE OUTLET (OPTIONAL) — SIZES 48HJ004-014

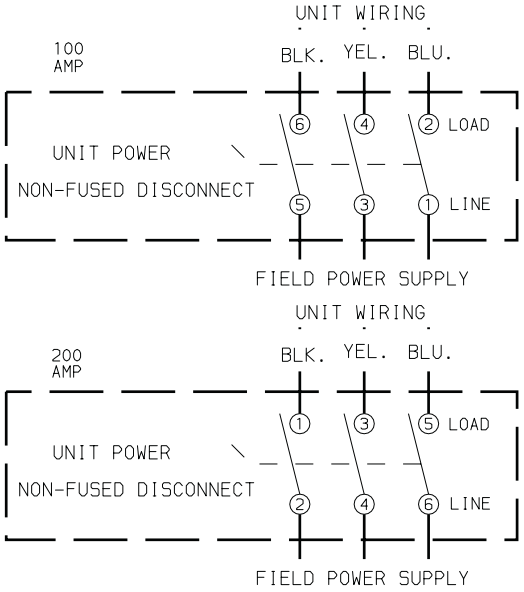


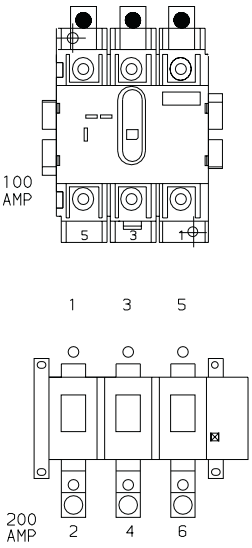
NON-FUSED DISCONNECT (OPTIONAL) — SIZES 48HJ004-014



NOTE: Use copper conductors only.

NON-FUSED DISCONNECT (OPTIONAL) — 48HJ015,017

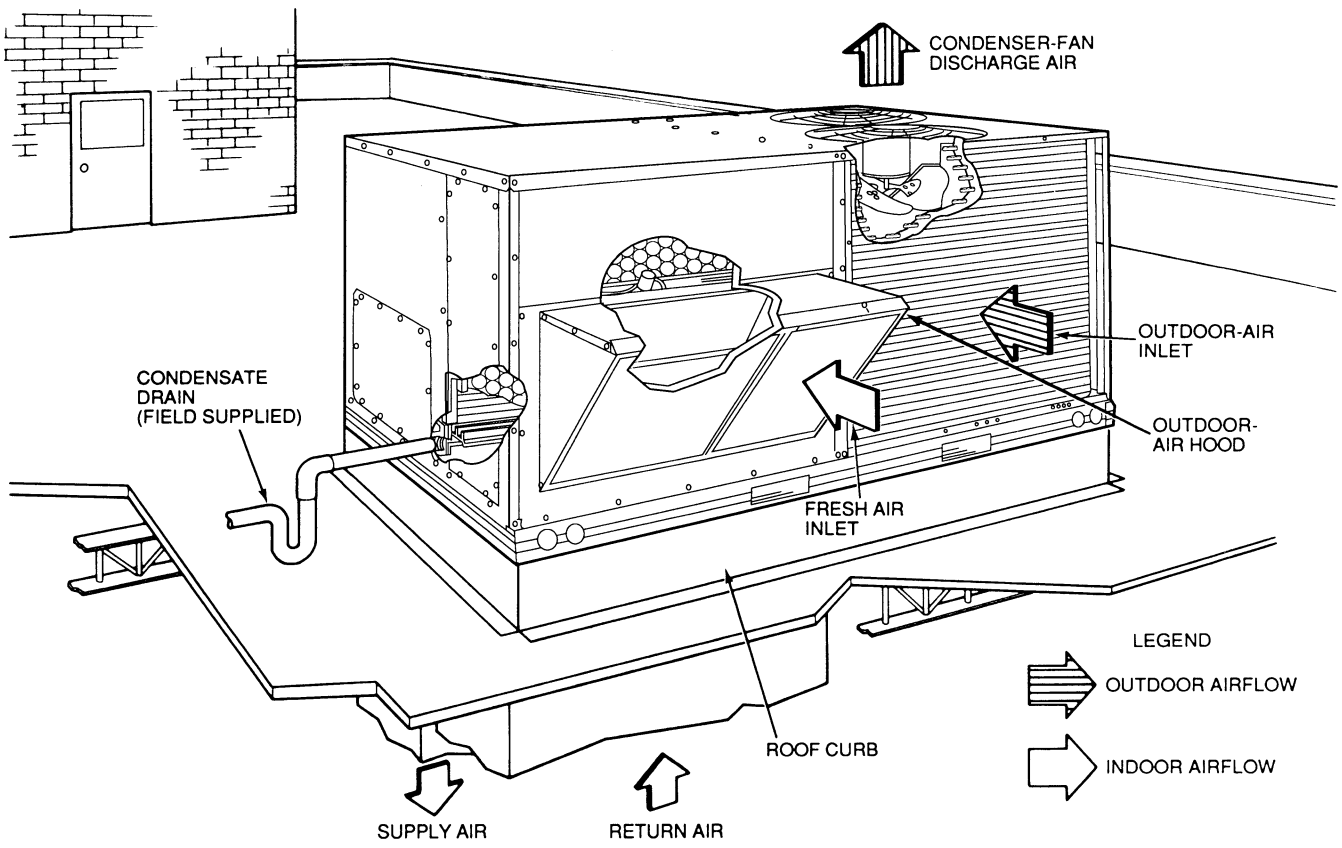




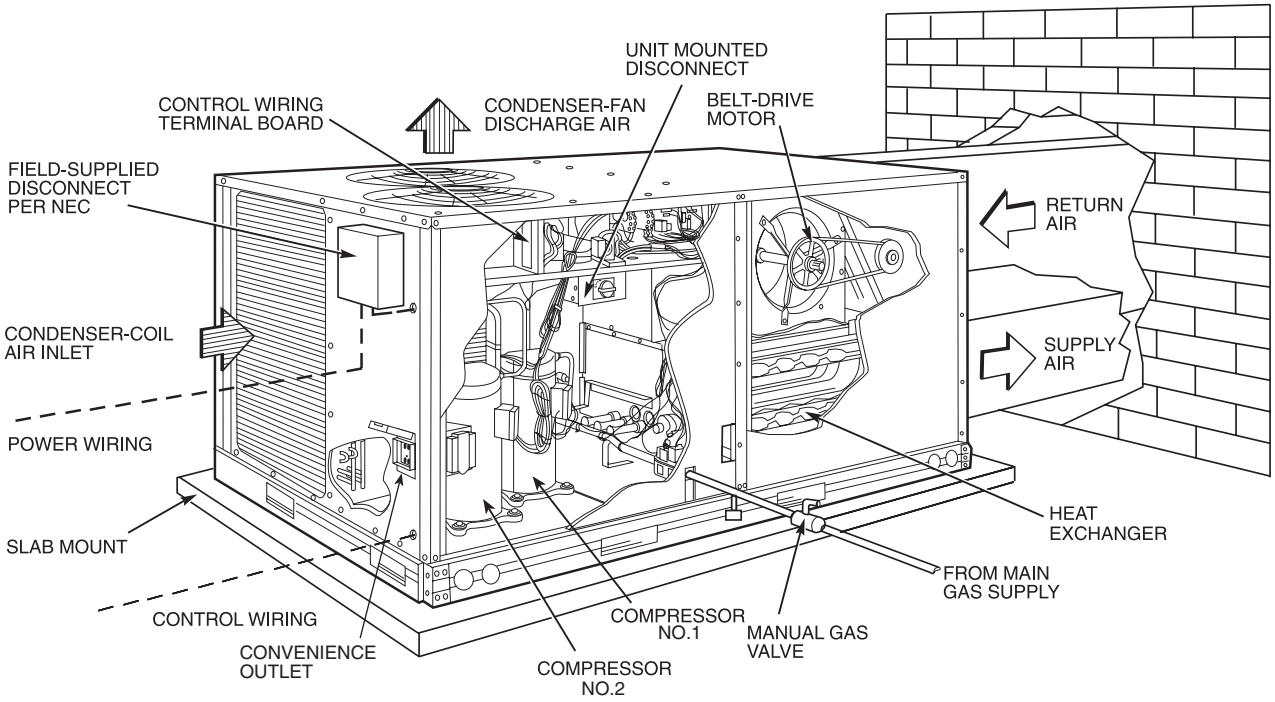
NOTES:
1. If the Non-Fused Disconnect Service Option is ordered for size 015,017 units, the Non-Fused Disconnect will be factory-installed.
2. The Disconnect takes the place of TB-1 as shown on the unit wiring diagram label and the component arrangement label.

Typical piping and wiring — 48HJ004-014

VERTICAL DISCHARGE DUCTING

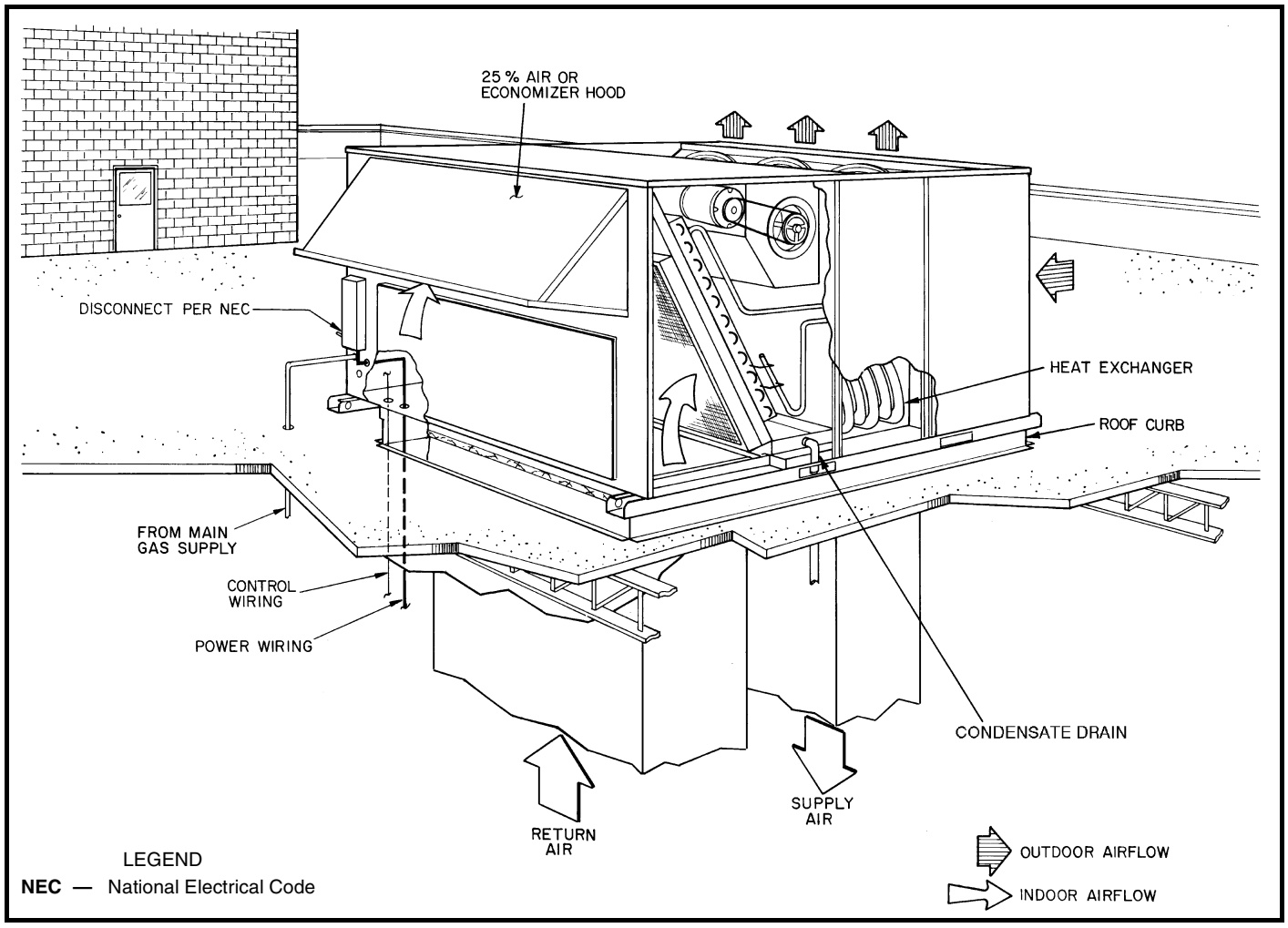


HORIZONTAL DISCHARGE DUCTING



NEC — National Electrical Code

Typical piping and wiring — 48HJ015 and 017



LEGEND

NEC — National Electrical Code

Guide specifications — 48HJ004-014

Packaged Rooftop Electric Cooling Unit with Gas Heat — Constant Volume Application

HVAC Guide Specifications

Size Range: **3 to 12 1/2 Tons, Nominal (Cooling)**
60,000 to 250,000 Btuh, Nominal (Input Heating)

Carrier Model Numbers:

48HJD/L/G/S
48HJE/M/H/R
48HJF/N/K/T

ENERGY STAR

SIZE 004-012 UNITS ARE ENERGY STAR QUALIFIED

ASHRAE 90.1 COMPLIANT

Part 1 — General

1.01 SYSTEM DESCRIPTION

Outdoor rooftop mounted, electrically controlled heating and cooling unit utilizing a hermetic compressor(s) for cooling duty and gas combustion for heating duty. Unit shall discharge supply air vertically or horizontally as shown on contract drawings.

1.02 QUALITY ASSURANCE

A. Unit well exceeds ASHRAE 90.1-2001 Energy Standards. Units 004-012 are Energy Star qualified.

B. Unit shall be rated in accordance with ARI Standards 210/240 or 360 and 270. Designed in accordance with UL Standard 1995.

C. Unit shall be designed to conform to ASHRAE 15, latest revision.

D. Unit shall be UL-tested and certified in accordance with ANSI Z21.47 Standards and UL-listed and certified under Canadian standards as a total package for safety requirements.

E. Roof curb shall be designed to conform to NRCA Standards.

F. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

G. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).

H. Unit shall be designed in accordance with ISO 9001:2000, and shall be manufactured in a facility registered to ISO 9001:2000.

I. Each unit shall be subjected to a completely automated run testing on the assembly line. Units contain a factory-supplied printout indicating tested pressures, amperages, data, and inspectors; providing certification of the unit status at the time of manufacture.

1.03 DELIVERY, STORAGE, AND HANDLING

Unit 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, and shall be bonderized and coated with a prepainted baked enamel finish on all externally exposed surfaces.
2. Evaporator fan compartment interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density, flexible fiberglass insulation, neoprene 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 maneuvering and overhead rigging.
5. Unit shall have a factory-installed, sloped condensate drain pan made of a non-corrosive material, providing a minimum 3/4-in.-14 NPT. connection with both vertical and horizontal drains, and shall comply with ASHRAE Standard 62.
6. Unit shall have a factory-installed filter access panel to provide filter access with tool-less removal.
7. Unit shall have standard thru-the-bottom gas and power connection capability (accessory kit is required).

C. Fans:

1. Evaporator Fan:
   a. Fan shall be direct or belt driven as shown on the equipment drawings. Belt drive shall include an adjustable-pitch motor pulley.
   b. Fan wheel shall be double-inlet type with forward-curved blades.
   c. Bearings shall be sealed, permanently lubricated ball-bearing type for longer life and lower maintenance.
2. Evaporator fan shall be made from steel with a corrosion-resistant finish and shall be dynamically balanced.
3. Condenser fan shall be of the direct-driven (with totally enclosed motors) propeller type and shall discharge air vertically.

4. Condenser fan shall have aluminum blades riveted to corrosion-resistant steel spiders and shall be dynamically balanced.
5. Induced-draft blower shall be of the direct-driven, single inlet, forward-curved centrifugal type, made from steel with a corrosion-resistant finish and shall be dynamically balanced.

D. Compressor(s):
1. Fully hermetic type, internally protected scroll-type.
2. Factory mounted on rubber grommets and internally spring mounted for vibration isolation.
3. On dual electrically and mechanically independent circuits (008-014).

E. Coils:
1. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Dual compressor models (size 008-014) shall have face-split type evaporator coil (circuit no. 1 on bottom).
3. Testing:
   a. Evaporator and condenser coils shall be qualified to UL 1995 burst test at 2,200 psi.
   b. Evaporator and condenser coils shall be leak tested to 150 psig and pressure tested to 400 psig.
4. Optional Coils:
   a. Optional pre-coated aluminum-fin coils shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.
   b. Copper-fin coils shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan. All copper construction shall provide protection in moderate coastal environments.
   c. E-Coated aluminum-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.
   d. E-Coated copper-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be copper fins mechanically bonded to copper tubes with copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to maintain coating integrity and minimize corrosion potential between coil and pan.

F. Heating Section:
1. Induced-draft combustion type with energy saving direct-spark ignition system and redundant main gas valve.
2. Heat Exchanger:
   a. The standard 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.
   b. The optional stainless steel heat exchanger shall be of the tubular-section type, constructed of a minimum of 20-gage type 409 stainless steel.
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 on side of unit (horizontal plane).

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. Fixed orifice metering system (Acutrol™ device).
2. Refrigerant filter drier.
3. Service gage connections on suction, discharge, and liquid lines.

H. Filter Section:

1. Standard filter section shall consist of factory-installed, low velocity, throwaway 2-in. thick fiberglass filters of commercially available sizes.
2. Filter face velocity shall not exceed 320 fpm at nominal airflows.
3. Filter section should 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 protected by a fuse on the 24-v transformer side (008-014 units have a resettable circuit breaker).

2. Safeties:

   a. Unit shall incorporate a solid-state compressor protector which provides anti-cycle reset capability at the space thermostat, should any of the following standard safety devices trip and shut off compressor.
      1) Compressor overtemperature, overcurrent.
      2) Loss-of-charge/low-pressure switch.
      3) Freeze-protection thermostat, evaporator coil.
      4) High-pressure switch.
      5) Automatic reset motor thermal overload protector.

      The lockout protection shall be easily disconnected at the control board, if necessary.

   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 125 F ambient outdoor temperature, meeting maximum load criteria of ARI Standard 210/240 or 360 at ± 10% voltage.
2. Compressor with standard controls shall be capable of operation down to 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 gas passing through motor windings and shall have line break thermal and current overload protection.
2. Evaporator-fan motor shall have permanently lubricated bearings and inherent automatic-reset thermal overload protection. Evaporator motors are designed specifically for Carrier and do *not* have conventional horsepower (HP) ratings listed on the motor nameplate. Motors are designed and qualified in the "air-over" location downstream of the cooling coil and carry a maximum continuous bhp rating that is the maximum application bhp rating for the motor; no "safety factors" above that rating may be applied.
3. Totally enclosed condenser-fan motor shall have permanently lubricated bearings, and inherent automatic-reset thermal overload protection.
4. Induced-draft motor shall have permanently lubricated sealed bearings and inherent automatic-reset thermal overload protection.

M. Special Features:

Certain features are not applicable when the features designated * are specified. For assistance in amending the specifications, contact your local Carrier Sales Office.

* 1. Carrier PremierLink™ Controls:

   a. Shall be available as a factory-installed or as a field-installed accessory.
   b. Shall work with CCN and ComfortVIEW™ software.
   c. Shall be compatible with *Comfort*Link™ controllers.
   d. Shall be ASHRAE 62-2001 compliant.
   e. Shall accept a CO_2 sensor in the conditioned space — Demand Control Ventilation (DCV) Ready.
   f. Shall have baud communication rate of 38.4K or faster.
   g. Shall be Internet Ready.
   h. Shall include an integrated economizer controller.

i. If an economizer is specified, the "EconoMi$er2 with 4 to 20 mA actuator and no microprocessor control" is required.

2. Roof Curbs (Horizontal and Vertical):
   a. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
   b. Permits installation and securing of ductwork to curb prior to mounting unit on the curb.

* 3. Integrated Economizers:
   a. Integrated integral modulating type capable of simultaneous economizer and compressor operation. During economizer operation, up to two compressors on sizes 008-014 will operate.
   b. Available as a factory-installed option in vertical supply/return configuration only. (Available as a field-installed accessory for horizontal and/or vertical supply return configurations.)
   c. Includes all hardware and controls to provide cooling with outdoor air.
   d. Equipped with low-leakage dampers, not to exceed 2% leakage at 1 in. wg pressure differential.
   e. Capable of introducing up to 100% outdoor air.
   f. EconoMi$er+ and EconoMi$er2 shall be equipped with a barometric relief damper capable of relieving up to 100% return air.
   g. Designed to close damper(s) during loss-of-power situations with spring return built into motor.
   h. Dry bulb outdoor-air temperature sensor shall be provided as standard. Outdoor air sensor set point is adjustable and shall range from 45 to 70 F. For the EconoMi$er+, the return air sensor, indoor humidity sensor, and outdoor humidity sensor shall be provided as field-installed accessories to provide enthalpy control, differential enthalpy control, and differential dry bulb temperature control. For the EconoMi$er2, the enthalpy, differential temperature (adjustable), and differential enthalpy control shall be provided as field-installed accessories.
   i. The EconoMi$er+ and EconoMi$er2 shall have a gear-driven parallel blade design.
   j. EconoMi$er+ microprocessor control shall provide control of internal building pressure through its accessory power exhaust function. Factory set at 100%, with a range of 0% to 100%.
   k. EconoMi$er2 shall be capable of control from a 4 to 20 mA signal through optional 4 to 20 mA design without microprocessor control (required for PremierLink™ or third party control interface).
   l. EconoMi$er+ Microprocessor Occupied Minimum Damper Position Setting maintains the minimum airflow into the building during occupied period providing design ventilation rate for full occupancy (damper position during heating). A remote potentiometer may be used to override the set point.
   m. EconoMi$er+ Microprocessor Unoccupied Minimum Damper Position Setting maintains the minimum airflow into the building during unoccupied period providing base ventilation rate for demand control ventilation. The demand control ventilation position shall be set in the EconoMi$er+ software through configuration input. The EconoMi$er+ damper shall modulate between unoccupied and occupied minimum damper positions for demand control ventilation.
   n. EconoMi$er+ Microprocessor Maximum Damper Position Setting — Setting the maximum position of the damper prevents the introduction of large amounts of hot or cold air into the space.
   o. EconoMi$er+ Microprocessor IAQ control modulates the outdoor-air damper to provide ventilation based on the optional 2 to 10 vdc CO_2 sensor input.
   p. Compressor lockout sensor (opens at 35 F, closes at 50 F).

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 15% 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.

Guide specifications — 48HJ004-014 (cont)

* 7. Head Pressure Control Package:

Consists of solid-state control and condenser-coil temperature sensor to maintain condensing temperature between 90 F and 110 F at outdoor ambient temperatures down to –20 F by condenser-fan speed modulation or condenser-fan cycling and wind baffles.

8. LP (Liquid Propane) Conversion Kit:

Package shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane (valid up to 2000 ft elevation).

* 9. 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.

10. Light Commercial Thermidistat:

Field-installed wall-mounted thermostat is used to control temperature and activation of the dehumidification package. The thermidistat can be set for humidity settings from 50% to 90% relative humidity. Automatic humidity control adjusts indoor humidity based on the outdoor temperature sensor.

* 11. Flue Shield:

Provides protection from the hot sides of the gas flue hood.

* 12. Thermostat and Subbase:

Provides staged cooling and heating automatic (or manual) changeover, fan control, and indicator light.

* 13. Condenser Coil Hail Guard Assembly:

Hail guard shall protect against damage from hail and flying debris.

14. Unit-Mounted, Non-Fused Disconnect Switch:

Shall be factory-installed, internally mounted. NEC and UL approved non-fused switch shall provide unit power shutoff. Shall be accessible from outside the unit and shall provide power off lockout capability.

15. Convenience Outlet:

Shall be factory-installed and internally mounted with easily accessible 115-v female receptacle. Shall include 15 amp GFI receptacle with independent fuse protection. Voltage required to operate convenience outlet shall be provided by a factory-installed step-down transformer. Shall be accessible from outside the unit.

16. High-Static Indoor Fan Motor(s) and Drive(s) (004-012):

High-static motor(s) and drive(s) shall be factory-installed to provide additional performance range.

17. Flue Discharge Deflector:

Flue discharge deflector directs unit exhaust vertically instead of horizontally.

18. Condenser Coil Grille:

The grille protects the condenser coil from damage by large objects without increasing unit clearances.

19. Compressor Cycle Delay:

Unit shall be prevented from restarting for minimum of 5 minutes after shutdown.

20. Thru-the-Bottom Utility Connectors:

Kit shall provide connectors to permit gas and electrical connections to be brought to the unit through the basepan.

21. Fan/Filter Status Switch:

Provides status of indoor (evaporator) 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.

22. Energy$Recycler:

The package shall be an outdoor rooftop, surface mounted, electronically controlled, air-to-air heat pump unit utilizing a hermetic compressor for cooling and heating duty.

The Energy$Recycler shall recover energy from building exhaust air and pre-condition ventilation air to allow higher ventilation requirements and minimizing energy cost.

This option shall be available with the following:

a. A mounting kit for the Energy$Recycler for cantilever mounting off of the rooftop unit with out the use of a slab or a roof curb.

b. An accessory sleeper rail is available for use with a standard unit roof curb.

c. A supplementary supply air fan kit to provide increased air movement into the 62AQ unit.

d. A field-installed 460-v to 208/230-v transformer to provide power when the 208-230/1/60 62AQ060 or 100 size Energy$Recycler is used with a 460-v rooftop unit.

e. A field-installed 575-v to 208/230-v transformer to provide power when an Energy$Recycler is used with a 575-v unit.

23. Power Exhaust Accessory for EconoMi$er+ or EconoMi$er2:

Power exhaust shall be used in conjunction with EconoMi$er+ or EconoMi$er2 to provide system exhaust of up to 100% of return air (vertical only). The power exhaust is a field-installed accessory (separate vertical and horizontal design).

NOTE: Horizontal power exhaust is intended to mount in return ductwork.

As the outdoor-air damper opens and closes, *both* propeller fans are energized and de-energized through the EconoMi$er+ controller. The set point is factory set at 100% of outdoor-air, and is adjustable 0 to 100% to meet specific job requirements. Available in 208/230-1-60 v or 460-3-60 v. An LED light on the controller indicates when the power exhaust is operating.

For the EconoMi$er2, the power exhaust shall be controlled by the PremierLink or third party controls.

24. Outdoor Air Enthalpy Sensor (EconoMi$er2):

    The outdoor air enthalpy sensor shall be used with the EconoMi$er2 device to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the EconoMi$er2 device will provide differential enthalpy control. The sensor allows the EconoMi$er2 controller to determine if outside air is suitable for free cooling.

25. Return Air Enthalpy Sensor (EconoMi$er2):

    The return air enthalpy sensor shall be used with the EconoMi$er2 device. When used in conjunction with an outdoor air enthalpy sensor, the EconoMi$er2 device will provide differential enthalpy control.

26. Return Air Temperature Sensor (EconoMi$er2):

    The return air temperature sensor shall be used with the EconoMi$er2 device. When used in conjunction with the standard outdoor air temperature sensor, the EconoMi$er2 device will provide differential temperature control.

27. Indoor Air Quality (CO_2) Sensor (EconoMi$er2):

    a. Shall have the ability to provide demand ventilation indoor air quality (IAQ) control through the EconoMi$er2 with an IAQ sensor.

    b. The IAQ sensor shall be available in duct mount, wall mount, and wall mount with LED display. The set point shall have adjustment capability.

    c. Requires EconoMi$er2, PremierLink™, or Apollo control options.

28. Outdoor Air Humidity Sensor (EconoMi$er+):

    The outdoor air humidity sensor is used to sense outdoor air humidity for the EconoMi$er+ device. The outdoor air humidity sensor, in conjunction with the standard outdoor air temperature sensor, shall be used with the EconoMi$er+ device to provide outdoor enthalpy. Outdoor air enthalpy shall be calculated by the EconoMi$er+ device from the outdoor air temperature and humidity readings. When the outdoor air humidity sensor is installed, the EconoMi$er+ can perform Outdoor Air Enthalpy control. With the additional installation of an accessory return air temperature sensor and return air humidity sensor, differential enthalpy control can also be performed.

29. Return Air Humidity Sensor (EconoMi$er+):

    The return air humidity sensor is used to sense return air humidity for the EconoMi$er+ device. The return air humidity sensor, in conjunction with the accessory return air temperature sensor, shall be used with the EconoMi$er+ device to provide return air enthalpy. Return air enthalpy shall be calculated by the EconoMi$er+ device from the return air temperature and humidity readings. With the additional installation of an accessory return air temperature sensor and outdoor air humidity sensor, differential enthalpy control can also be performed.

30. Return Air Temperature Sensor (EconoMi$er+):

    The return air temperature sensor is used to sense return air temperature for the EconoMi$er+ device. When the return air temperature sensor is installed, the EconoMi$er+ can perform Differential Temperature control. The return air temperature sensor, in conjunction with the accessory return air humidity sensor, shall be used with the EconoMi$er+ device to provide return air enthalpy. Return air enthalpy shall be calculated by the EconoMi$er+ device from the return air temperature and humidity readings. With the additional installation of an accessory return air humidity sensor and outdoor air humidity sensor, differential enthalpy control can also be performed.

31. EconoMi$er+ 5-Pin Plug Assembly:

    The EconoMi$er+ 5-pin plug assembly shall provide a wiring connection to the EconoMi$er+ control board for a CO_2 sensor or a field-supplied remote potentiometer. The accessory plug is required when using a CO_2 sensor or a remote potentiometer.

32. Indoor Air Quality (CO_2) Room Sensor (EconoMi$er+):

    Sensor shall have the ability to provide demand ventilation control through the EconoMi$er+. The IAQ sensor shall be wall mounted with an LED display in parts per million. The set point shall have adjustment capability. The accessory 5-Pin Plug assembly is required to wire this device to the EconoMi$er+ control board.

33. Return Air CO_2 Sensor (EconoMi$er+):

    Sensor shall have the ability to provide demand ventilation control through the EconoMi$er+. The IAQ sensor shall be duct mounted. The set point shall have adjustment capability. The accessory 5-Pin Plug assembly is required to wire this device to the EconoMi$er+ control board.

34. Power Exhaust Auxiliary Transformer:

    Field installed 575-v to 230-v transformer to provide power to the 230-v power exhaust when attached to a 575-v rooftop unit.

35. Gas Heat options (sizes 004-006):

    a. Single-stage gas heat shall be provided in lieu of two-stage heat.

    b. NOx reduction shall be provided to reduce nitrous oxide emissions to meet the California Air Quality Management NOx requirement of 40 nanograms/joule or less.

    c. Primary tubes on low NOx units shall be 409 stainless steel. Other components shall be aluminized steel.

36. Ultra-Violet Germicidal Lamps:

    Ultra-violet germicidal lamps are designed to eliminate odor causing mold and fungus that may develop in the wet area of the evaporator section of the unit. The high output, low temperature germicidal lamps are field installed in the evaporator section of the unit, aimed at the evaporator coil and condensate pan. The short wavelength ultra-violet light inhibits and kills mold, fungus and microbial growth. The lamps have an output rating at 45F in 400 fpm airflow of 120 microwatts/cm^2 at 1 meter.

37. MoistureMi$er™ Dehumidification Package:

    The dehumidification package is a factory-installed option that provides increased dehumidification by further subcooling the hot liquid refrigerant leaving the condenser coil. The package consists of a subcooling coil located on the leaving airside of the evaporator coil. The location of this coil in the indoor airstream greatly enhances the latent capacity of the units.

    The package shall be equipped with crankcase heater(s), low pressure switch(es) and thermostatic expansion valve(s) (TXV). Low pressure switch(es) prevents evaporator coil freeze-up and TXVs assure a positive superheat condition. If the operation of the subcooling coil is controlled by a field-installed, wall-mounted humidistat, the dehumidification circuit will then operate only when needed. Optional field connections for the humidistat are made in the low voltage compartment of the unit control box.

38. Humidistat:

    Field-installed, wall-mounted humidistat is used to control activation of the dehumidification package. The humidistat can be set for humidity levels between 20% and 80% relative humidity.

39. Hinged Panel Option:

    Hinged panel option provides hinged access panels for the filter, compressor, evaporator fan, and control box areas. Filter hinged panels permit tool-less entry for changing filters. Each hinged panel is permanently attached to the rooftop unit.

Guide specifications — 48HJ004-014 COBRA™ energy recovery units

Packaged Rooftop Electric Cooling Unit with Gas Heat and Energy Recovery Capability — Constant Volume Applications

HVAC Guide Specifications

Size Range: **3 to 12 1/2 Tons, Nominal (Cooling)**
60,000 to 250,000 Btuh, Nominal (Input Heating)
600 to 3000 cfm of outdoor air

Carrier Model Numbers:

48HJD/L/G/S
48HJE/M/H/R
48HJF/N/K/T

ENERGY STAR

ASHRAE 90.1 COMPLIANT

Part 1 — General

1.01 SYSTEM DESCRIPTION

Outdoor rooftop mounted, electrically controlled heating and cooling unit utilizing a hermetic compressor(s) for cooling duty and gas combustion for heating duty. Energy recovery section is electrically controlled using a rotary compressor for cooling and heating duty. Unit shall discharge supply air vertically.

1.02 QUALITY ASSURANCE

A. Unit well exceeds ASHRAE 90.1-2001 Energy Standards. Units are Energy Star qualified.

B. Unit shall be rated in accordance with ARI Standards 210/240. Designed in accordance with UL Standard 1812/1995.

C. Unit shall be designed to conform to ASHRAE 15, latest revision.

D. Unit shall be UL-tested and certified in accordance with ANSI Z21.47 Standards and UL-listed and certified under Canadian standards as a total package for safety requirements.

E. Roof curb shall be designed to conform to NRCA Standards.

F. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

G. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).

H. Unit casing shall be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 5000-hour salt spray.

I. Unit shall be designed in accordance with ISO 9001:2000, and shall be manufactured in a facility registered to ISO 9001:2000.

J. Each unit shall be subjected to a completely automated run testing on the assembly line. Units contain a factory-supplied printout indicating tested pressures, amperages, data, and inspectors; providing certification of the unit status at the time of manufacture.

1.03 DELIVERY, STORAGE, AND HANDLING

Unit 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 rooftop unit with energy recovery capability for vertical discharge applications. 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. General:

a. Unit cabinet shall be constructed of galvanized steel, and shall be bonderized and coated with a prepainted baked enamel finish on all externally exposed surfaces.

b. Cabinet panels shall be easily removable for servicing.

c. Holes shall be provided in the base rails for rigging shackles to facilitate maneuvering and overhead rigging.

d. Unit shall have 2 factory-installed, sloped condensate drain pans made of a non-corrosive material, providing a common connection with a minimum 3/4-in. drain, and shall comply with ASHRAE Standard 62. Condensate drain must be installed per manufacturer's recommendations.

e. Unit shall have one factory-installed filter access panel to provide filter access with tool-less removal.

2. Rooftop Section:

a. Evaporator fan compartment interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density, flexible fiberglass insulation, neoprene coated on the air side. Aluminum foil-faced fiberglass insulation shall be used in the gas heat compartment.

b. Unit shall have standard thru-the-bottom gas and power connection capability (accessory kit is required).

3. Energy Recovery Section:

a. All internal panels shall be primer coated.

b. Cabinet interior shall be insulated with a minimum 1/2-in. thick, rigid foam board insulation with foil facing on the air side.

C. Fans:

1. Evaporator Fan (rooftop section):

a. Fan shall be direct or belt driven as shown on the equipment drawings. Belt drive shall include an adjustable-pitch motor pulley.

b. Fan wheel shall be double-inlet type with forward-curved blades.

c. Bearings shall be sealed, permanently lubricated ball-bearing type for longer life and lower maintenance.

d. Evaporator fan shall be made from steel with a corrosion-resistant finish and shall be dynamically balanced.

2. Condenser Fan (Rooftop Section):

a. Fan shall be of the direct-driven (with totally enclosed motors) propeller type and shall discharge air vertically.

b. Fan shall have aluminum blades riveted to corrosion-resistant steel spiders and shall be dynamically balanced.

3. Supply Fan and Exhaust Air Fan (Energy Recovery Section):

a. Fans shall be of the double-inlet forward-curved centrifugal type.

b. Fan wheels shall be made from steel with a corrosion-resistant finish and shall be statically and dynamically balanced.

c. Bearings shall be sealed and permanently lubricated for longer life and lower maintenance.

4. Induced-draft blower shall be of the direct-driven, single inlet, forward-curved centrifugal type, made from steel with a corrosion-resistant finish and shall be dynamically balanced.

D. Compressor(s):

1. Rooftop Section:

a. Fully hermetic type, internally protected scroll-type.

b. Factory mounted on rubber grommets and internally spring mounted for vibration isolation.

c. On independent circuits (sizes 008-014).

2. Energy Recovery Section:

a. Fully hermetic type with electrical overload protection.

b. Factory rubber shock mounted vibration isolation.

E. Coils:

1. Rooftop Section:

a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.

b. Dual compressor models (size 008-014) shall have face-split type evaporator coil (circuit no. 1 on bottom).

2. Energy Recovery Section:

a. Supply and exhaust air coils shall have aluminum plate fins mechanically bonded to internally enhanced seamless copper tubes with all joints brazed.

b. Tube sheet openings shall be belled to prevent tube wear.

3. Optional Coils:

a. Copper-fin coils shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan. All copper construction shall provide protection in moderate coastal environments.

b. E-Coated aluminum-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.

F. Rooftop 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 on side of unit (horizontal plane).

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.
9. Optional Stainless Steel Heat Exchanger:
   a. Complete stainless steel heat exchanger allows for greater application flexibility.
   b. 409 stainless steel used in heat exchanger tubes and vestibule plate.

G. Refrigerant Components:
1. Rooftop section refrigerant circuit components shall include:
   a. Fixed orifice metering system (Acutrol™ device).
   b. Refrigerant filter drier.
   c. Service gage connections on suction, discharge, and liquid lines.
2. Energy recovery section refrigerant circuit components shall include:
   a. Fixed orifice metering device combined with maximum overcurrent protection (MOCP) type thermostatic expansion valve (TXV) to prevent compressor overloading.
   b. Service gage connections on suction and discharge lines to charge and evacuate the system.
   c. Ability to route gage hoses through the energy recovery section side panel to eliminate air bypass during diagnostic periods.
   d. Reversing valve.
   e. Accumulator located in compressor suction line.

H. Filter Section:
1. Rooftop Section:
   a. Standard filter section shall consist of factory-installed, low velocity, throwaway 2-in. thick fiberglass filters of commercially available sizes.
   b. Filter face velocity shall not exceed 320 fpm at nominal airflows.
   c. Filter section should use only one size filter.
   d. Filters shall be accessible through an access panel with "no-tool" removal.
2. Energy Recovery Section:
   a. Standard filter section shall consist of factory-installed low-velocity, throwaway fiberglass filters of commercially available sizes.
   b. Filter face velocity shall not exceed 300 fpm at nominal airflows.

I. Controls and Safeties:
1. Unit Controls:
   Unit shall be complete with self-contained low-voltage control circuit protected by a fuse on the 24-v transformer side (008-014 units have a resettable circuit breaker).
2. Safeties:
   a. Rooftop cooling section:
      1) Unit shall incorporate a solid-state compressor protector which provides anti-cycle reset capability at the space thermostat, should any of the following standard safety devices trip and shut off compressor.
      2) Compressor overtemperature, overcurrent.
      3) Loss-of-charge/low-pressure switch.
      4) Freeze-protection thermostat, evaporator coil.
      5) High-pressure switch.
      6) Automatic reset motor thermal overload protector.
      7) The lockout protection shall be easily disconnected at the control board, if necessary.
   b. Rooftop 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.
   c. Energy recovery section shall be provided with the following minimum protections:
      1) High-pressure switch.
      2) Unit shall incorporate an outdoor coil defrost system to prevent excessive frost accumulation during heating duty, Defrost system shall be initiated on the basis of time and coil temperature. A 30/50/90 minute timer shall activate defrost cycle only if coil temperature is low enough to indicate a heavy frost condition. Defrost cycle shall terminate when the defrost thermostat is satisfied and shall have a positive termination time of 10 minutes. A 5-minute time delay shall be built into the defrost control to prevent compressor short cycling.

J. Operating Characteristics:
1. Rooftop Section:
   a. Unit shall be capable of starting and running at 125 F ambient outdoor temperature, meeting maximum load criteria of ARI Standard 210/240 or 360 at ± 10% voltage.
   b. Compressor with standard controls shall be capable of operation down to 25 F ambient outdoor temperature.
2. Energy Recovery Section:
   a. Unit shall be capable of starting and running at 125 F ambient outdoor temperature, meeting maximum load criteria of ARI Standard 210/240 ± 10% voltage.

b. Compressor with standard controls shall be capable of operation down to 55 F ambient outdoor temperature in cooling mode and –20 F ambient outdoor temperature in heating mode.

K. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single factory-predrilled location.

L. Motors:

1. Rooftop Section:
   a. Compressor motors shall be cooled by refrigerant gas passing through motor windings and shall have line break thermal and current overload protection.
   b. Evaporator-fan motor shall have permanently lubricated bearings and inherent automatic-reset thermal overload protection. Evaporator motors are designed specifically for Carrier and do *not* have conventional horsepower (hp) ratings listed on the motor nameplate. Motors are designed and qualified in the "air-over" location downstream of the cooling coil and carry a maximum continuous bhp rating that is the maximum application bhp rating for the motor; no "safety factors" above that rating may be applied.
   c. Totally enclosed condenser-fan motor shall have permanently lubricated bearings, and inherent automatic-reset thermal overload protection.
   d. Induced-draft motor shall have permanently lubricated sealed bearings and inherent automatic-reset thermal overload protection.
2. Energy Recovery Section:
   a. Compressor motors shall be cooled by refrigerant gas passing through motor windings and shall include thermal overload protection.
   b. Supply and exhaust-air fan motor shall have permanently lubricated bearings and inherent automatic reset thermal overload protection.

M. Energy Recovery Section Supply and Exhaust Air Damper:

1. Modulating type supply air damper opens to preset position any time system fans are energized to provide specified ventilation airflow.
2. Motorized spring return supply air damper automatically closes on loss of power.
3. Capable of providing up to 100% outside air when matched to proper size rooftop unit.
4. Functions as economizer when outdoor air enthalpy sufficient to provide free cooling.
5. Barometric type exhaust air damper with adjustable stops to limit exhaust airflow to specified cfm. Gravity type damper closes automatically on loss of power or fan shut down.
6. Supply and exhaust rain hoods with cleanable aluminum mesh filters on supply air inlet and bird screens on exhaust air outlet standard.

N. Special Features:

Certain features are not applicable when the features designated * are specified. For assistance in amending the specifications, contact your local Carrier Sales Office.

* 1. Carrier PremierLink™ Controls:
   a. Shall be available as a factory-installed or as a field-installed accessory.
   b. Shall work with CCN and ComfortVIEW™ software.
   c. Shall be compatible with *Comfort*Link™ controllers.
   d. Shall be ASHRAE 62-2001 compliant.
   e. Shall accept a CO_2 sensor in the conditioned space — Demand Control Ventilation (DCV) Ready.
   f. Shall have baud communication rate of 38.4K or faster.
   g. Shall be Internet Ready.
   h. Shall include an integrated economizer controller.
2. Electronic Programmable Light Commercial Thermidistat Accessory:

   The Light Commercial Thermidistat Accessory is a fully programmable thermostat with a built-in humidistat.
   a. Provides direct control of energy recycler control and rooftop unit fans in response to occupied/unoccupied output signals.
   b. Liquid crystal display (LCD) equipment function indicators display operating mode.
   c. Five-minute compressor delay with override functions.
   d. Keypad lock feature to prevent unauthorized changing of program control.
   e. Holiday Mode — With a single touch of a button mode adjusts all comfort levels for optimum efficiency while the home is unoccupied and restores the settings to normal upon return.
   f. Comfort and energy savings — Seven-day programming with 4 temperature changes and humidity set point changes provided per day, means proper ventilation during occupied periods and savings through reduced energy usage when the building is unoccupied.
   g. Easy to use — Simple instructions are located inside the thermostat's door.

h. Duplicate Programming — Copy the programmed schedule of one day to the next using the copy function.

i. Override Capability — Hold function allows the regular schedule to be bypassed with a temporary setting.

j. Battery-Free — Non-volatile RAM chip requires no battery backup. Retained in memory so reprogramming is not required after power loss.

3. Roof Curbs (Vertical):

a. Full perimeter roofcurb with exhaust capability providing separate air streams for energy recovery from the exhaust air without supply air contamination.

b. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.

c. Permits installation and securing of ductwork to curb prior to mounting unit on the curb.

* 4. Head Pressure Control Package:

Consists of solid-state control and condenser-coil temperature sensor to maintain condensing temperature between 90 F and 110 F at outdoor ambient temperatures down to –20 F by condenser-fan speed modulation or condenser-fan cycling and wind baffles.

5. LP (Liquid Propane) Conversion Kit:

Package shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane.

* 6. Flue Shield:

Provides protection from the hot sides of the gas flue hood.

* 7. Condenser Coil Hail Guard Assembly:

Hail guard shall protect against damage from hail and flying debris.

8. Unit-Mounted, Non-Fused Disconnect Switch:

Shall be factory-installed, internally mounted. NEC and UL approved non-fused switch shall provide unit power shutoff. Shall be accessible from outside the unit and shall provide power off lockout capability. (80 amp MAXIMUM)

9. Convenience Outlet:

Shall be factory-installed and internally mounted with easily accessible 115-v female receptacle. Shall include 15-amp GFI receptacle with independent fuse protection. Voltage required to operate convenience outlet shall be provided by a factory-installed step-down transformer. Shall be accessible from outside the unit.

10. High-Static Indoor Fan Motor(s) and Drive(s) (004-012):

High-static motor(s) and drive(s) shall be factory-installed to provide additional performance range.

11. Flue Discharge Deflector:

Flue discharge deflector directs unit exhaust vertically instead of horizontally.

12. Condenser Coil Grille:

The grille protects the condenser coil from damage by large objects without increasing unit clearances.

13. Compressor Cycle Delay:

Unit shall be prevented from restarting for minimum of 5 minutes after shutdown.

14. Thru-the-Bottom Utility Connectors:

Kit shall provide connectors to permit gas and electrical connections to be brought to the unit through the basepan.

15. Fan/Filter Status Switch:

Provides status of indoor (evaporator) 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.

16. Outdoor Air Enthalpy Sensor:

The outdoor air enthalpy sensor shall be used to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the unit will provide differential enthalpy control. The sensor allows the unit to determine if outside air is suitable for free cooling.

17. Return Air Enthalpy Sensor:

The return air enthalpy sensor shall be used in conjunction with an outdoor air enthalpy sensor to provide differential enthalpy control.

18. Indoor Air Quality (CO_2) Sensor:

a. Shall have the ability to provide demand ventilation indoor air quality (IAQ) control.

b. The IAQ sensor shall be available in duct mount, wall mount, and wall mount with LED display. The set point shall have adjustment capability.

19. Gas Heat options (sizes 004-006):

a. Single-stage gas heat shall be provided in lieu of two-stage heat.

b. NOx reduction shall be provided to reduce nitrous oxide emissions to meet the California Air Quality Management NOx requirement of 40 nanograms/joule or less.

c. Primary tubes on low NOx units shall be 409 stainless steel. Other components shall be aluminized steel.

20. MoistureMi$er™ Dehumidification Package:

The dehumidification package is a factory-installed option that provides increased dehumidification by further subcooling the hot liquid refrigerant leaving the condenser coil. The package consists of a subcooling coil located on the leaving airside of the evaporator coil. The

location of this coil in the indoor airstream greatly enhances the latent capacity of the units.

The package shall be equipped with crankcase heater(s), low pressure switch(es) and thermostatic expansion valve(s) (TXV). Low pressure switch(es) prevents evaporator coil freeze-up and TXVs assure a positive superheat condition. If the operation of the subcooling coil is controlled by a field-installed, wall-mounted humidistat, the dehumidification circuit will then operate only when needed. Optional field connections for the humidistat are made in the low voltage compartment of the unit control box.

21. Humidistat:

    Field-installed, wall-mounted humidistat is used to control activation of the dehumidification package. The humidistat can be set for humidity levels between 20% and 80% relative humidity.

22. Hinged Panel Option:

    Hinged panel option provides hinged access panels for the filter, compressor, evaporator fan, and control box areas. Filter hinged panels permit tool-less entry for changing filters. Each hinged panel is permanently attached to the rooftop unit.

Guide specifications — 48HJ015,017

Packaged Rooftop Electric Cooling Unit with Gas Heat — Constant Volume Application

HVAC Guide Specifications

Size Range: **12 and 15 Tons Nominal (Cooling)**
172,000 to 360,000 Btuh, Nominal (Input Heating)

Carrier Model Numbers:

48HJD, 48HJF
48HJM, 48HJN

ENERGY STAR

ASHRAE 90.1 COMPLIANT

Part 1 — General

1.01 SYSTEM DESCRIPTION

Unit is an outdoor rooftop mounted, electrically controlled heating and cooling unit utilizing scroll hermetic compressors for cooling duty and gas combustion for heating duty. Supply air shall be discharged downward or horizontally (with horizontal supply/return curb adapter assembly), as shown on contract drawings. Standard unit shall include a manual outdoor-air inlet.

1.02 QUALITY ASSURANCE

A. Units shall well exceed the energy efficiency requirements of ASHRAE standard 90.1-2001. Units are Energy Star qualified.

B. Unit shall be rated in accordance with ARI Standards 270 and 360 and all units shall be designed in accordance with UL Standard 1995.

C. Unit shall be designed to conform to ASHRAE 15.

D. Unit shall be ETL and ETL, Canada tested and certified in accordance with ANSI Z21.47 Standards as a total package.

E. Roof curb shall be designed to conform to NRCA Standards.

F. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

G. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).

H. Unit shall be manufactured in a facility registered to ISO 9001:2000.

1.03 DELIVERY, STORAGE, AND HANDLING

Unit shall be stored and handled per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT (STANDARD)

A. General:

Each unit shall be a 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. Constructed of galvanized steel (G90 — 1.8 oz. of zinc per square foot [550 grams per square meter] of sheet metal), bonderized and primer-coated on both sides and coated with a baked polyester thermosetting powdercoating finish on the outer surface.
2. Indoor blower compartment interior surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density fiberglass insulation. Fiberglass insulation shall be bonded with a thermosetting resin (8 to 12% by weight nominal, phenol formaldehyde typical), and coated with an acrylic or other material that meets the NFPA 90 flame retardance requirements and has an ''R'' Value of 3.70. Aluminum foil-faced fiberglass insulation shall be used in the gas heat compartment.
3. Cabinet panels shall be easily removable for servicing. Cabinet panels are minimum 20 gage. Panels shall have 1/2-in. thick, 1.5-lb. density insulation.
4. Filters shall be accessible through an access panel.
5. Holes shall be provided in the base rails (minimum 12 gage) for rigging shackles to facilitate overhead rigging.
6. Unit shall contain a sloped drain pan, to prevent standing water from accumulating. Pan shall be fabricated of hot dipped zinc coated minimum spangle steel. Zinc coating shall be G90 designation according to ASTM Standard A653. Unit shall contain a factory-installed nonferrous main condensate drain connection.

C. Fans:

1. Indoor blower (evaporator fan):
   a. Fan shall be belt driven. Belt drive shall include an adjustable pulley. The standard fan drive shall have a factory-installed low-medium static pressure fan drive. The alternate fan drive option shall have a factory-installed high static pressure fan drive.
   b. Fan wheel shall be made from steel with a corrosion resistant finish. It shall be a dynamically balanced, double-inlet type with forward-curved blades.
2. Condenser fans shall be of the direct-driven propeller type, with corrosion-resistant blades riveted to corrosion-resistant steel supports. They shall be dynamically balanced and discharge air upwards.
3. Induced-draft blower shall be of the direct-driven, single inlet, forward-curved, centrifugal type. It shall be made from steel with a corrosion-resistant finish and shall be dynamically balanced.

D. Compressor(s):

1. Fully hermetic, scroll type, internally protected.
2. Factory spring-shock mounted and internally spring mounted for vibration isolation.
3. On electrically and mechanically independent refrigerant circuits.

4. All compressors shall have 70 W crankcase heaters.

E. Coils:
1. Standard evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Coils shall be leak tested at 150 psig (1034 kPa) and pressure tested at 450 psig (3103 kPa).

F. Heating Section:
1. Induced-draft combustion type with energy saving direct-spark ignition system and redundant main gas valve.
2. a. 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.
b. The optional stainless steel heat exchangers shall be tubular-section design and shall be constructed of a minimum 20 gage, 409 stainless steel.
3. Burners shall be of the in-shot type constructed of aluminum-coated steel.
4. All gas piping shall enter the unit at a single location.
5. Gas piping shall be capable of being routed through the roof curb directly into unit.

G. Refrigerant Components:

Refrigerant circuit components shall include:
1. Thermostatic expansion valve (TXV).
2. Filter driers.
3. Gage port and connections on suction, discharge, and liquid lines.

H. Filter Section:

Standard filter section shall consist of 2 sizes of factory-installed 2-in. (51 mm) thick throwaway fiberglass filters of commercially available sizes. Filters shall be approximately 10% efficient with an air-side pressure drop of approximately 0.07 in. wg (clean).

I. Controls and Safeties:
1. Unit Controls:
a. Economizer control (optional)
b. Capacity control (2-step)
c. Unit shall be complete with self-contained low-voltage control circuit.
2. Safeties:
a. Unit shall incorporate a solid-state compressor lockout which provides reset capability at the space thermostat, should any of the following safety devices trip and shut off compressor:
1) Compressor lockout protection provided for either internal or external overload.
2) Low-pressure switch.
3) Dual freezestats (evaporator coil).
4) High-pressure switch.
b. Supply-air thermostat shall be located in the unit.
c. Heating section shall be provided with the following minimum protections:
1) High-temperature limit switch.
2) Induced-draft motor speed sensor.
3) Flame rollout switch.
4) Flame proving controls.
5) Redundant gas valve.

J. Operating Characteristics:
1. Unit shall be capable of starting and running at 120 F (size 017) or 125 F (size 015) ambient outdoor temperature per maximum load criteria of ARI Standard 360.
2. Unit with standard controls will operate in cooling down to an outdoor ambient temperature of 40 F (4.4 C).
3. Unit shall be provided with fan time delay to prevent cold air delivery.

K. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location.

L. Motors:
1. Compressor motors shall be cooled by refrigerant gas passing through motor windings and shall have line break thermal and current overload protection.
2. All fan motors shall have permanently lubricated, sealed bearings and inherent automatic-reset thermal overload protection or manual reset calibrated circuit breakers. Evaporator motors are designed specifically for Carrier and do *not* have conventional horsepower (HP) ratings listed on the motor nameplate. Motors are designed and qualified in the "air-over" location downstream of the cooling coil and carry a maximum continuous bhp rating that is the maximum application bhp rating for the motor; no "safety factors" above that rating may be applied.
3. All indoor-fan motors 5 hp and larger shall meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT) effective October 24, 1997.

M. Special Features:

Certain features are not applicable when the features designated * are specified. For assistance in amending the specifications, contact your local Carrier Sales Office.

* 1. Carrier PremierLink™ Controls:
a. Shall be available as a factory-installed or as a field-installed accessory.
b. Shall work with CCN and ComfortVIEW™ software.

c. Shall be compatible with *Comfort*Link™ controllers.

d. Shall be ASHRAE 62-2001 compliant.

e. Shall accept a CO_2 sensor in the conditioned space — Demand Control Ventilation (DCV) Ready.

f. Shall have baud communication rate of 38.4K or faster.

g. Shall be Internet Ready.

h. Shall include an integrated economizer controller.

2. Optional Coils:

a. Optional pre-coated aluminum-fin coils shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.

b. Optional copper-fin coils shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan. All copper construction shall provide protection in moderate coastal environments.

c. Optional E-Coated aluminum-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.

d. Optional E-Coated copper-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be copper fins mechanically bonded to copper tubes with copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to maintain coating integrity and minimize corrosion potential between coil and pan.

3. Roof Curbs (Horizontal and Vertical):

a. Formed of 16-gage galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.

b. Permits installing and securing ductwork to curb prior to mounting unit on the curb.

4. Horizontal Adapter Roof Curb:

Includes factory-assembled adapter and internal duct.

NOTE: Power exhaust or barometric relief must be mounted in the return ductwork when used in conjunction with this accessory.

* 5. Integrated Economizers:

a. Integrated integral modulating type capable of simultaneous economizer and compressor operation.

b. Available as a factory-installed option in vertical supply/return configuration only. (Available as a field-installed accessory for horizontal and/or vertical supply return configurations.)

c. Includes all hardware and controls to provide cooling with outdoor air.

d. Equipped with low-leakage dampers, not to exceed 2% leakage at 1 in. wg pressure differential.

e. Capable of introducing up to 100% outdoor air.

f. EconoMi$er+ and EconoMi$er2 shall be equipped with a barometric relief damper.

g. Designed to close damper(s) during loss-of-power situations with spring return built into motor.

h. Dry bulb outdoor-air temperature sensor shall be provided as standard. Outdoor air sensor set point is adjustable and shall range from 45 to 70 F. For the EconoMi$er+, the return air sensor, indoor humidity sensor, and outdoor humidity sensor shall be provided as field-installed accessories to provide enthalpy control, differential enthalpy control, and differential dry bulb temperature control. For the EconoMi$er2, the enthalpy, differential temperature (adjustable), and differential enthalpy control shall be provided as field-installed accessories.

i. The EconoMi$er+ and EconoMi$er2 shall have a gear-driven parallel blade design.

j. EconoMi$er+ microprocessor control shall provide control of internal building pressure through its accessory power exhaust function. Factory set at 100%, with a range of 0% to 100%.

k. EconoMi$er2 shall be capable of control from a 4 to 20 mA signal through optional 4 to 20 mA design without microprocessor control (required for PremierLink™ or third party control interface).

l. EconoMi$er+ Microprocessor Occupied Minimum Damper Position Setting maintains the minimum airflow into the building during occupied period providing design ventilation rate for full occupancy (damper position during heating). A remote potentiometer may be used to override the set point.

m. EconoMi$er+ Microprocessor Unoccupied Minimum Damper Position Setting maintains the minimum airflow into the building during unoccupied period providing base ventilation rate for demand control ventilation. The demand control ventilation position shall be set in the EconoMi$er+ software through configuration input. The EconoMi$er+ damper shall modulate between unoccupied and occupied minimum damper positions for demand control ventilation.

n. EconoMi$er2 Microprocessor Maximum Damper Position Setting — Setting the maximum position of the damper prevents the introduction of large amounts of hot or cold air into the space.

o. EconoMi$er+ Microprocessor IAQ control modulates the outdoor-air damper to provide ventilation based on the optional 2 to 10 vdc CO_2 sensor input.

p. Compressor lockout sensor (opens at 35 F, closes at 50 F).

6. Two-Position Damper:

   Two-position damper package shall include single blade damper and 24-v motor. Admits up to 25% outdoor air, and shall close upon unit shutoff. Damper shall cover 3.8-in. high by 17.75-in. wide (117.8 sq. in.) opening in return air upper panel.

7. Accessory Compressor Cycle Delay:

   Compressor shall be prevented from restarting for a minimum of 5 minutes after shutdown.

* 8. Thermostats and Subbases:

   To provide staged heating and cooling in addition to automatic (or manual) changeover and fan control.

* 9. Barometric Relief Damper Package:

   a. Package shall include damper, seals, hardware, and hoods to relieve excess internal pressure.

   b. Damper shall close due to gravity upon unit shutdown.

   c. Damper package must be field-installed in return-air ductwork when used with optional side return connections.

*10. Power Exhaust:

   Package shall include an exhaust (propeller style) fan, 1/2 Hp 208-230, 460 v (factory-wired for 460 v) direct drive motor, and damper for vertical flow units with economizer to control over-pressurization of building. Power Exhaust package must be field-installed in return-air ductwork when used with optional side return connections.

*11. Head Pressure Control Package:

   Consists of an accessory outdoor-air package and a solid-state control with condenser coil temperature sensor for controlling condenser-fan motor speed to maintain condensing temperature between 90 F (32.2 C) and 100 F (43.3 C) at outdoor ambient temperature down to –20 F (–29.8 C).

12. Low-Ambient Kits:

   When used, allows units to operate at lower outdoor ambient temperatures down to 20 F.

13. Electronic Programmable Thermostat:

   Capable of using deluxe full-featured electronic thermostat.

14. MoistureMi$er™ Dehumidification Package:

   The dehumidification package is a factory-installed option that provides increased dehumidification by further subcooling the hot liquid refrigerant leaving the condenser coil. The package consists of a subcooling coil located on the leaving airside of the evaporator coil. The location of this coil in the indoor air stream greatly enhances the latent capacity of the unit.

   The package shall be equipped with low pressure switch(es) and TXVs. Low pressure switch(es) prevents evaporator coil freeze-up and TXVs assure a positive superheat condition. If

the operation of the subcooling coil is controlled by a field-installed wall-mounted humidistat, the dehumidification circuit will then operate only when needed. Optional field connections for the humidistat are made in the low voltage compartment of the unit control box.

15. Winter Start Time-Delay Relay:

    Used in conjunction with the accessory low-ambient kit or head pressure control device, permits operation in cooling at lower outdoor ambient temperatures. See price pages for more information.

16. Liquid Propane Conversion Kit:

    Kit shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane gas.

17. Service Option Package:

    a. Hinged access panels for the filter, compressors, evaporator fan, and control box areas. Filter hinged access panels permit tool-less entry for changing filters. Evaporator fan hinged access panel shall be field-convertible to a tool-less entry by removing and discarding screws. Each external hinged access panel shall be permanently attached to the rooftop unit.

    b. Convenience outlet: Shall be factory-installed and internally mounted with an externally accessible 115-v, 15-amp GFI, female receptacle with hinged cover. Voltage and circuit protection required to operate convenience outlet shall be provided by a field-supplied and properly fused separate branch circuit.

    c. Non-fused disconnect switch: Shall be factory-installed, internally mounted, NEC and UL approved non-fused switch; shall provide unit power shutoff. The control access door shall be interlocked with the non-fused disconnect. The disconnect switch must be in the OFF position to open the control box access door. Shall be accessible from outside the unit and shall provide power off lockout capability.

18. Alternate Drive:

    Shall provide higher static drive capability to enhance evaporator-fan performance rpm range.

19. Hail Guard:

    Shall protect the condenser coil from hail, flying debris, and damage by large objects without increasing unit clearances.

20. Ultra-Violet Germicidal Lamps:

    Ultra-violet germicidal lamps are designed to eliminate odor causing mold and fungus that may develop in the wet area of the evaporator section of the unit. The high output, low temperature germicidal lamps are field installed in the evaporator section of the unit, aimed at the evaporator coil and condensate pan. The short wavelength ultra-violet light inhibits and kills mold, fungus and microbial growth. The lamps have an output rating at 45 F in 400 fpm airflow of 120 microwatts/cm^2 at 1 meter.

21. Stainless Steel Condensate Pan:

    Stainless steel condensate pans shall be available for condensate collection.

22. Outdoor Air Humidity Sensor (EconoMi$er+):

    The outdoor air humidity sensor is used to sense outdoor air humidity for the EconoMi$er+ device. The outdoor air humidity sensor, in conjunction with the standard outdoor air temperature sensor, shall be used with the EconoMi$er+ device to provide outdoor enthalpy. Outdoor air enthalpy shall be calculated by the EconoMi$er+ device from the outdoor air temperature and humidity readings. When the outdoor air humidity sensor is installed, the EconoMi$er+ can perform Outdoor Air Enthalpy control. With the additional installation of an accessory return air temperature sensor and return air humidity sensor, differential enthalpy control can also be performed.

23. Return Air Humidity Sensor (EconoMi$er+):

    The return air humidity sensor is used to sense return air humidity for the EconoMi$er+ device. The return air humidity sensor, in conjunction with the accessory return air temperature sensor, shall be used with the EconoMi$er+ device to provide return air enthalpy. Return air enthalpy shall be calculated by the EconoMi$er+ device from the return air temperature and humidity readings. With the additional installation of an accessory return air temperature sensor and outdoor air humidity sensor, differential enthalpy control can also be performed.

24. Return Air Temperature Sensor (EconoMi$er+):

    The return air temperature sensor is used to sense return air temperature for the EconoMi$er+ device. When the return air temperature sensor is installed, the EconoMi$er+ can perform Differential Temperature control. The return air temperature sensor, in conjunction with the accessory return air humidity sensor, shall be used with the EconoMi$er+ device to provide return air enthalpy. Return air enthalpy shall be calculated by the EconoMi$er+ device from the return air temperature and humidity readings. With the additional installation of an accessory return air humidity sensor and outdoor air humidity sensor, differential enthalpy control can also be performed.

25. EconoMi$er+ 5-Pin Plug Assembly:

    The EconoMi$er+ 5-pin plug assembly shall provide a wiring connection to the EconoMi$er+ control board for a CO_2 sensor or a field-supplied remote potentiometer. The accessory plug is required when using a CO_2 sensor or a remote potentiometer.

26. Indoor Air Quality (CO_2) Room Sensor (EconoMi$er+):

    Sensor shall have the ability to provide demand ventilation control through the EconoMi$er+. The IAQ sensor shall be wall mounted with an LED display in parts per million. The set point shall have adjustment capability. The accessory 5-Pin Plug assembly is required to wire this device to the EconoMi$er+ control board.

27. Return Air CO_2 Sensor (EconoMi$er+):

    Sensor shall have the ability to provide demand ventilation control through the EconoMi$er+. The IAQ sensor shall be duct mounted. The set point shall have adjustment capability. The accessory 5-Pin Plug assembly is required to wire this device to the EconoMi$er+ control board.

28. Outdoor Air Enthalpy Sensor (EconoMi$er2):

    The outdoor air enthalpy sensor shall be used to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the PremierLink control will provide differential enthalpy control. The sensor allows the PremierLink control to determine if outside air is suitable for free cooling.

29. Return Air Enthalpy Sensor (EconoMi$er2):

    The return air enthalpy sensor shall be used with the EconoMi$er2 device. When used in conjunction with an outdoor air enthalpy sensor, the PremierLink control will provide differential enthalpy control.

30. Return Air Temperature Sensor (EconoMi$er2):

    The return air temperature sensor shall be used with the EconoMi$er2 device and PremierLink control. When used in conjunction with the standard outdoor air temperature sensor, the EconoMi$er2 device will provide differential temperature control.

31. Humidistat:

    Field-installed, wall-mounted humidistat is used to control activation of the dehumidification package. The humidistat can be set for humidity levels between 20% and 80% relative humidity.

32. Light Commercial Thermidistat:

    Field-installed wall-mounted thermidistat is used to control temperature and activation of the dehumidification package. The thermidistat can be set for humidity settings from 50% to 90% relative humidity.

33. 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.

34. Fan/Filter Status Switch:

    Provides status of indoor (evaporator) 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.

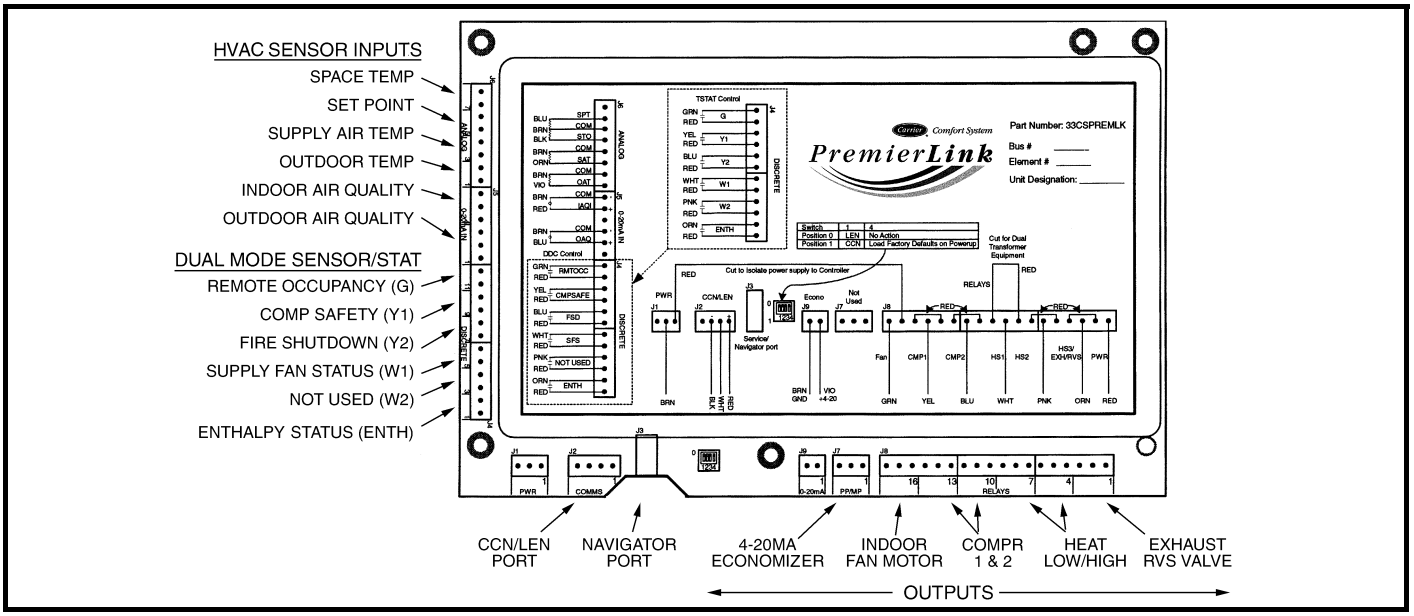
PremierLink™ Direct Digital Controls — The PremierLink Direct Digital Controls (DDC) require the use of a Carrier electronic thermostat or a CCN connection for time broadcast to initiate its internal timeclock. This is necessary for broadcast of time of day functions (occupied/unoccupied).

PremierLink Features:

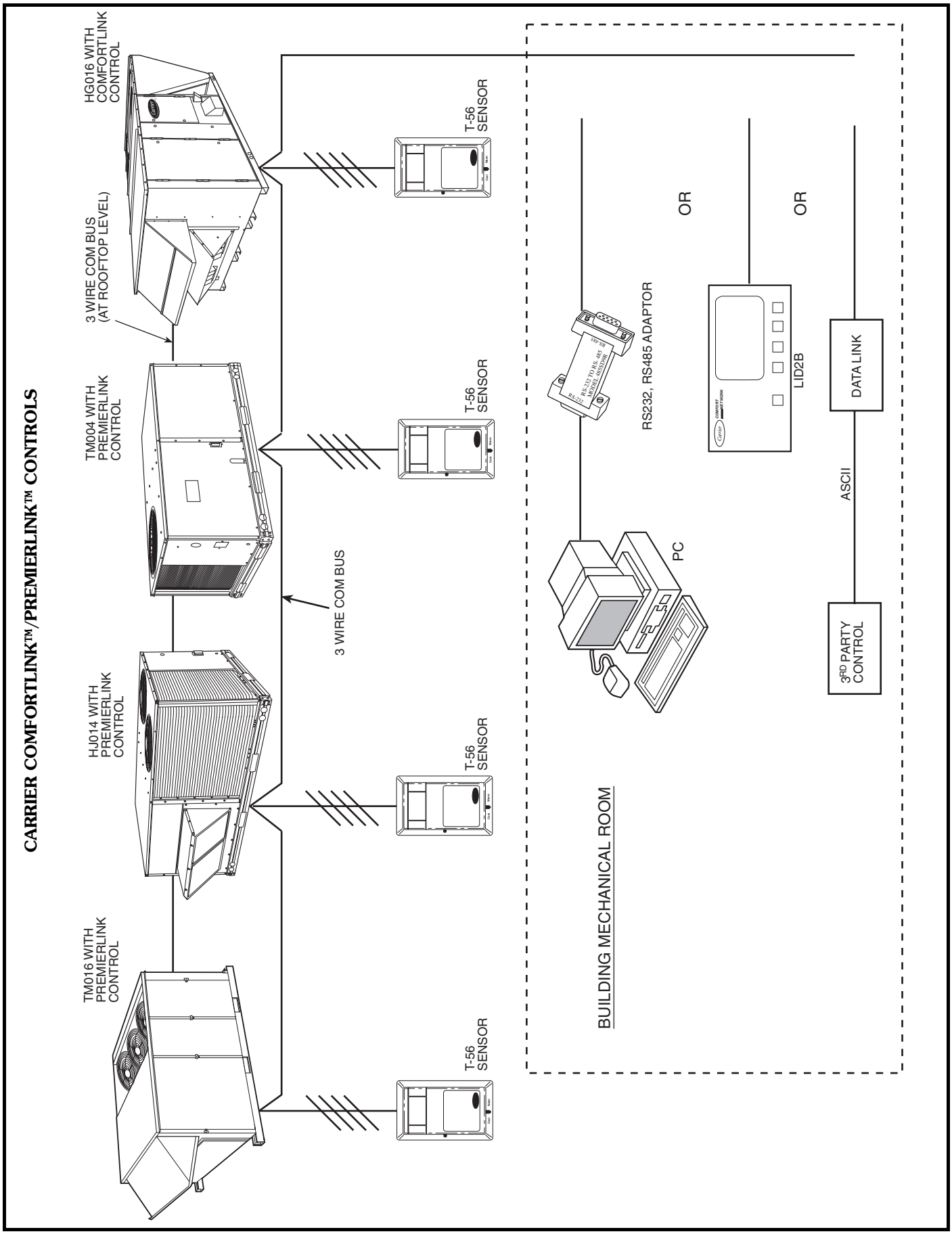
- Equipment Control Functions
  - Cooling Stages
  - Heating Stages
  - Indoor-Fan Motor
  - 4-Way Valve
- Economizer Control Functions
  - Dry Bulb Control
  - Enthalpy Control
  - Differential Enthalpy
  - Power Exhaust
- Advanced Control Functions
  - Smoke Detection
  - Optimal Start (90.1)
  - Unoccupied Free Cool
  - Smart Staging and Optimal Staging
- Network Protocol
  - CCN
  - Internet Ready 38.4 K baud rate
- Diagnostics/Advanced Service Features
  - Diagnostics
  - Onboard display
- Scheduling
  - Via Communicating Stat
- User Interface
  - Navigator (LEN protocol)
  - LID2B (CCN)
  - PC with Carrier software (CCN)

CCN POINTS FOR PREMIERLINK CONTROL

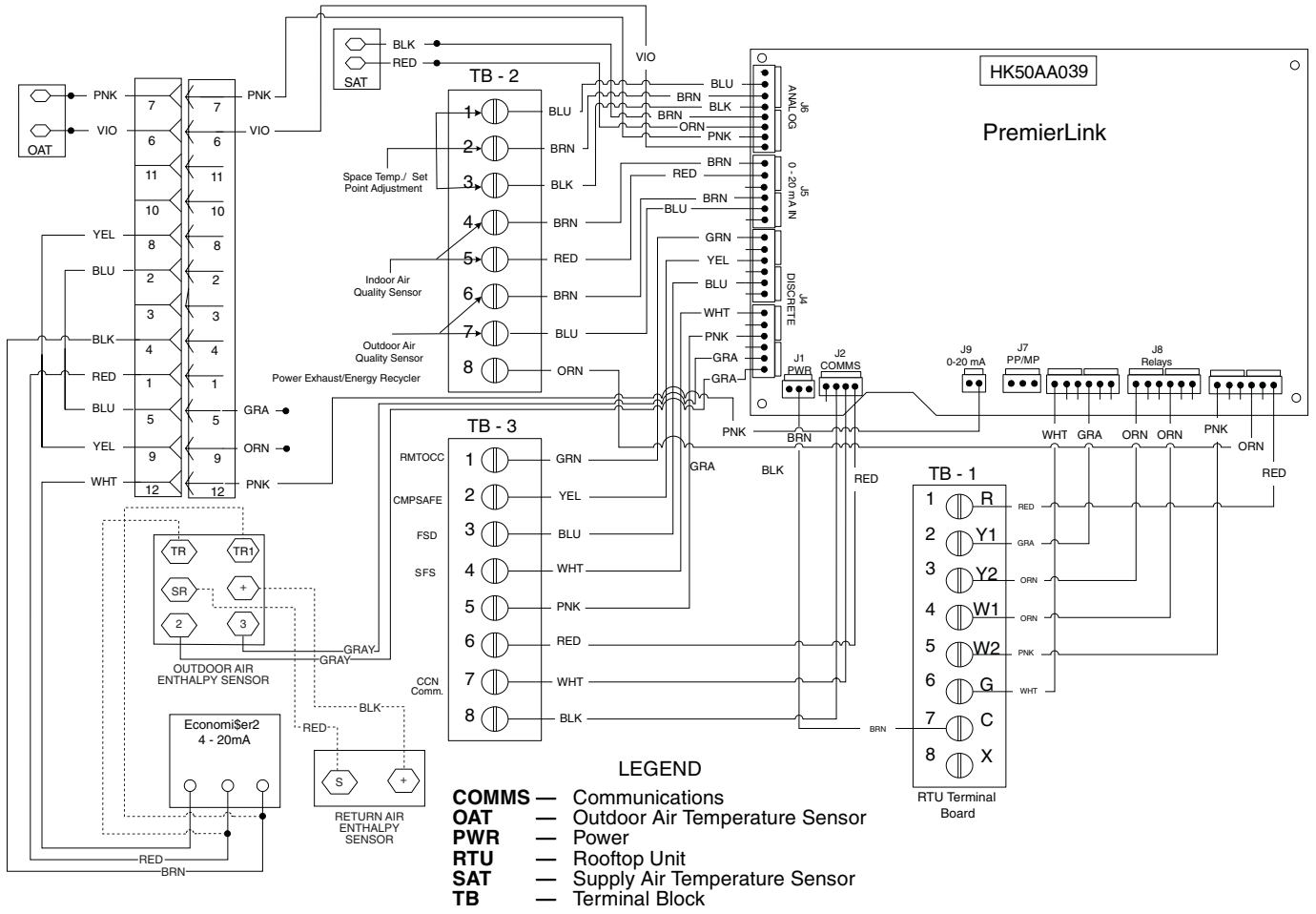
DESCRIPTION	STATUS	UNITS	POINT	LIMITS	ACCESS
Space Temperature	xxx.x	dF	SPT	–40.0 to 245.0 dF	R/W
Supply Air Temperature	xxx.x	dF	SAT	–40.0 to 245.0 dF	R/W
Outside Air Temperature	xxx.x	dF	OAT	–40.0 to 245.0 dF	R/W
Control Setpoint	xxx.x	dF	CLSP		R
Cooling % Total Capacity	xxx	%	CCAP	0 to 100 %	R
Heating % Total Capacity	xxx	%	HCAP	0 to 100 %	R
Economizer Active	No/Yes		ECOS	0 to 1	R
Supply Fan Relay	Off/On		SF	0 to 1	R/W
Supply Fan Status	Off/On		SFS	0 to 1	R
Economizer Position	xxx.x	%	ECONPOS	0.0 to 100.0 %	R/W
Current Min Damper Pos	xxx.x	%	IQMP	0.0 to 100.0 %	R
Filter Status	Clean/Dirty		FLTS	0 to 1	R/W
Remote Occupied Mode	Off/On		RMTOCC	0 to 1	R/W
Heat Stage 1	Off/On		HS1	0 to 1	R
Heat Stage 2	Off/On		HS2	0 to 1	R
Heat 3/Exhaust/Rev Valve	Off/On		H3_EX_RV	0 to 1	R
Enthalpy	Low/High		ENTH	0 to 1	R/W
Indoor Air Quality	xxxx.x		IAQI	0.0 to 5000.0	R/W
Indoor Air Quality Setpt	xxxx.x		IAQS	0.0 to 5000.0	R
Outdoor Air Quality	xxxx.x		OAQ	0.0 to 5000.0	R/W
Fire Shutdown	Normal/Alarm		FSD	0 to 1	R/W
SPT Offset	xx.x	^F	STO	–15.0 to 15.0 ^F	R/W
Compressor 1	Off/On		CMP1	0 to 1	R
Compressor 2	Off/On		CMP2	0 to 1	R
Compressor Safety	Off/On		CMPSAFE	0 to 1	R



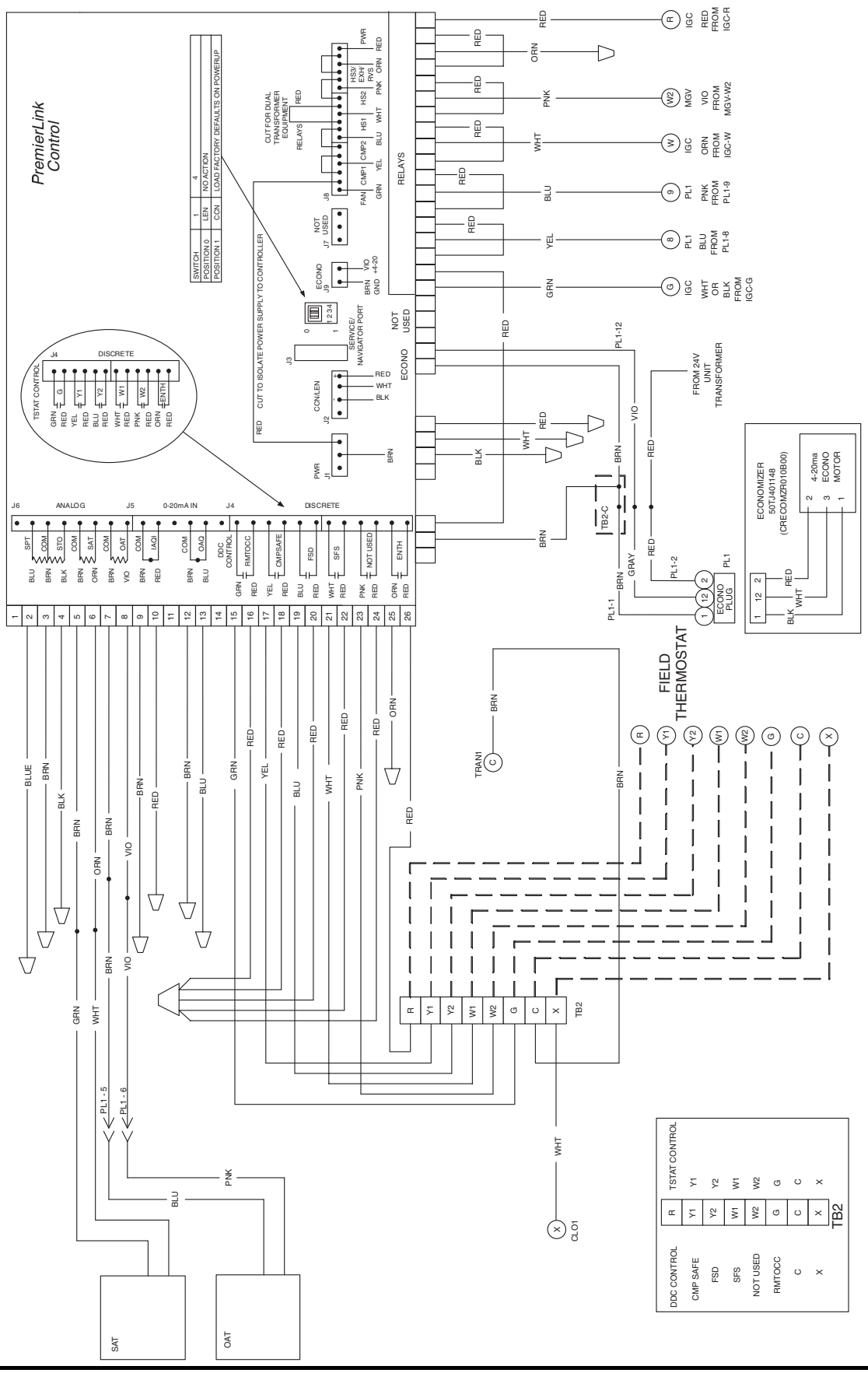
Controls (cont)



TYPICAL PREMIERLINK™ CONTROLS WIRING (SIZES 004-014)



TYPICAL PREMIERLINK™ CONTROLS WIRING (SIZES 015-028)



Operating sequence, size 004-014 units

Cooling, units without economizer — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor-fan contactor (IFC) and compressor contactor are energized and indoor-fan motor, compressor, and outdoor fan starts. The outdoor-fan motor runs continuously while unit is cooling.

For units with 2 stages of 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. To prevent thermostat short-cycling, the unit is locked into the Heating mode for at least 1 minute when W1 is energized. The induced-draft motor is energized and the burner ignition sequence begins. The indoor (evaporator) fan motor (IFM) is energized 45 seconds after a flame is ignited. On units equipped for two stages of heat, when additional heat is needed, W2 is energized and the high-fire solenoid on the main gas valve (MGV) is energized. When the thermostat is satisfied and W1 is deenergized, the IFM stops after a 45-second time-off delay.

**Cooling, units with EconoMi$er+ —** For EconoMi$er+ operation, there must be a thermostat call for the fan (G). This will move the damper to its minimum position.

When the EconoMi$er+ control is the occupied mode and a call for cooling exists (Y1 on the thermostat), the control will first check for indoor fan operation. If the fan is not on, then cooling will not be activated. If the fan is on, then the control will open the EconoMi$er+ damper to the minimum position.

On the initial power to the EconoMi$er+ board, it will take the damper up to $2^1/_2$ minutes before it begins to position itself. With subsequent fan signal (G) to the board, the change in damper position will take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take $2^1/_2$ minutes.

If the damper is in the process of a change (for example going to 100% open) and the signal (G) is turned off, the damper will continue to open to 100% before it closes (due to no fan signal (G).

If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to main the supply air temperature set point plus 2° F.

If there is a further demand for cooling (cooling second stage — Y2 is energized), then the control set point for the leaving air will be set at the supply air set point to increase the cooling capacity. If this cannot satisfy the load then the control will bring on compressor stages as needed to maintain the supply air temperature set point. The EconoMi$er+ damper will be locked open at 100% or the maximum damper position set point.

To ensure that there is oil return, the compressors will operate for at least 3 minutes. If, during this period, the leaving temperature drops below the set point by 5° F, then the EconoMi$er+ dampers will be closed to 60% until the compressor is turned off to avoid cold leaving-air temperatures.

If the conditions are not suitable for free cooling then the EconoMi$er+ dampers will be closed to the minimum ventilation position.

Compressor stages will be used to cool the air. If the control is configured for direct control by Y1 and Y2, then the stages will sequence based on the demand of Y1 and Y2. If the control is configured for leaving air temperature control, then Y1 will maintain the leaving air temperature at the supply air set point plus 2° F. If Y1 and Y2 are closed, then the leaving air will be controlled to the supply air set point. If Y2 is closed and Y1 is open, then control will shut down and indicate an error due to a thermostat failure or improper wiring of the thermostat.

If the unit is in the unoccupied mode, then the control of the temperature will depend on the unoccupied free cooling configuration: no unoccupied cooling, unoccupied free cooling with any mechanical cooling, or unoccupied free and mechanical cooling. If free cooling is enabled, then the control will check if free cooling can be used. The EconoMi$er+ will then control to the leaving air temperature set point plus 2° F for a Y1 command, or the leaving air temperature set point for a Y1 and Y2 command. If mechanical cooling is allowed to be used, then the control will then bring on additional stages of mechanical cooling if free cooling cannot satisfy the load.

If the EconoMi$er+ control:

- is in the occupied mode
- is configured to use demand ventilation
- cannot use free cooling
- has return air or space CO_2 levels below the DAQLO limit,

then the EconoMi$er+ damper position will be set to the IAQMIN_SP set point. If the CO_2 level rises above the DAQLO limit, then the dampers will modulate open in a linear relationship until the return air or space CO_2 levels are at or above the DAQ limit. The damper position will be at the ECONOMIN_SP set point.

When the EconoMi$er+ is being used for free cooling and the position exceeds the power exhaust set point, then the control will turn on the appropriate power exhaust fans.

Unoccupied and occupied minimum position control — There is an unoccupied minimum damper position and an occupied minimum damper position on the EconoMi$er+ controller. When the HVAC fan is off the outside air damper will always be closed. When the fan is on and in the unoccupied mode, the outside air damper will be at the unoccupied minimum position. When the fan is on (G call) and in the occupied mode, the outside air damper will be at the occupied minimum position.

A jumper wire is factory-installed to force the unit into occupied configuration whenever G or Y1 are closed. Without the jumper wire, the unit will always be in unoccupied mode.

The 2 minimum position settings are also used in the IAQ sequence of operation.

NOTE: The minimum position signal takes priority over the maximum position signal. If the maximum damper position is set below the minimum damper position, the EconoMi$er+ controller will maintain the actuator at minimum position.

Adjust the unoccupied minimum position to allow the minimum amount of outdoor air, as required by local codes, to enter the building. Make minimum position adjustments with at least 10° F (6° C) temperature difference between the outdoor and return air temperatures.

To determine the unoccupied minimum position setting, perform the following procedure:

Calculate the appropriate supply-air temperature using the following formula: (TO x OA) + (TR x RA) = TM

TO = Outdoor-Air Temperature
OA = Percent of Outdoor Air
TR = Return-Air Temperature
RA = Percent of Return Air
TM = Supply-Air Temperature

As an example, if local codes require 10% outdoor air during occupied conditions, outdoor-air temperature is 60 F, and return-air temperature is 75 F:

(60 x 0.10) + (75 x 0.90) = 73.5 F

Carefully adjust the unoccupied minimum position until the measured supply-air temperature matches the calculated value. Then, carefully adjust the occupied minimum position set point on the controller until the desired position is reached.

Heating, units with economizer — When the thermostat calls for heating, terminal W1 is energized. To prevent thermostat short-cycling, the unit is locked into the Heating mode for at least 1 minute when W1 is energized. The induced-draft motor is energized and the burner ignition sequence begins. The indoor (evaporator) fan motor (IFM) is energized 45 seconds after a flame is ignited and the damper moves to the minimum position. On units equipped for two stages of heat, when additional heat is needed, W2 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.

Cooling, units with EconoMi$er2, PremierLink™ control and a thermostat — When free cooling is not available, the compressors will be controlled by the PremierLink control in response to the Y1 and Y2 inputs from the thermostat.

The PremierLink control will use the following information to determine if free cooling is available:

- Indoor fan has been on for at least 30 seconds.
- The SPT, SAT, and OAT inputs must have valid readings.
- OAT must be less than 75 F.
- OAT must be less than SPT.
- Enthalpy must be LOW (may be jumpered if an enthalpy sensor not available).
- Economizer position is NOT forced.

Pre-cooling occurs when the is no call from the thermostat except G. Pre-cooling is defined as the economizer modulates to provide 70 F supply air.

When free cooling is available the PremierLink control will control the compressors and economizer to provide a supply-air temperature determined to meet the Y1 and Y2 calls from the thermostat.

If optional power exhaust is installed, as the outdoor-air damper opens and closes, the power exhaust fans will be energized and deenergized.

If field-installed accessory CO_2 sensors are connected to the PremierLink™ control, a PID-controlled demand ventilation strategy will begin to operate. As the CO_2 level in the zone increases above the CO_2 set point, the minimum position of the damper will be increased proportionally. As the CO_2 level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed.

Heating, units with EconoMi$er2, PremierLink control and a thermostat — When the thermostat calls for heating, terminal W1 is energized. The PremierLink control will move the economizer damper to the minimum position if there is a call for G and closed if there is a call for W1 without G. In order to prevent thermostat from short cycling, the unit is locked into the heating mode for at least 10 minutes when W1 is energized. The induced-draft motor is then energized and the burner ignition sequence begins.

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 unless G is still maintained.

Cooling, units with EconoMi$er2, PremierLink Control and a room sensor — When free cooling is not available, the compressors will be controlled by the PremierLink controller using a PID Error reduction calculation as indicated below.

The PremierLink controller will use the following information to determine if free cooling is available:

- Indoor fan has been on for at least 30 seconds.
- The SPT, SAT, and OAT inputs must have valid readings.
- OAT must be less than 75 F.
- OAT must be less than SPT.
- Enthalpy must be LOW (may be jumpered if an enthalpy sensor is not available).
- Economizer position is NOT forced.

When free cooling is available, the outdoor-air damper is positioned through the use of a Proportional Integral (PID) control process to provide a calculated supply-air temperature into the zone. The supply air will maintain the space temperature between the heating and cooling set points.

The PremierLink control will integrate the compressors stages with the economizer based on logic built into the controller.

If an optional power exhaust is installed, as the outdoor-air damper opens and closes, the power exhaust fans will be energized and deenergized.

If field-installed accessory CO_2 sensors are connected to the PremierLink™ control, a PID-controlled demand ventilation strategy will begin to operate. As the CO_2 level in the zone increases above the CO_2 set point, the minimum position of the damper will be increased proportionally. As the CO_2 level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed.

Heating, unit with EconoMi$er2, PremierLink control and a room sensor — Every 40 seconds the controller will calculate the required heat stages (maximum of 3) to maintain Supply Air Temperature (SAT) if the following qualifying conditions are met:

- Indoor fan has been on for at least 30 seconds.
- COOL mode is not active.
- OCCUPIED, TEMP.COMPENSATED START or HEAT mode is active.
- SAT reading is available.
- Fire shutdown mode is not active.

If all of the above conditions are met, the number of heat stages is calculated; otherwise the required number of heat stages will be set to 0.

If the PremierLink controller determines that heat stages are required, the economizer damper will be moved to minimum position if occupied and closed if unoccupied.

**Units with MoistureMi$er™ dehumidification package —** When thermostat calls for cooling, terminals G and Y1 and/or Y2 and the compressor contactor(s) C1 (and C2) is energized. The indoor (evaporator) fan motor (IFM), compressor, and outdoor (condenser) fan motor (OFM) start. The OFM runs continuously while the unit is in cooling. As shipped from the factory, MoistureMi$er dehumidification circuit is always energized. If MoistureMi$er circuit modulation is desired, a field-installed, wall-mounted humidistat is required.

If the MoistureMi$er humidistat is installed and calls for the MoistureMi$er subcooler coil to operate, the humidistat internal switch closes. This energizes and closes the liquid line solenoid valve coil (LLSV) of the MoistureMi$er circuit, forcing the hot liquid refrigerant of the liquid line to enter the subcooler coil. As the hot liquid passes through the subcooler coil, it is exposed to the cold supply airflow coming off from the evaporator coil and the liquid is further cooled to a temperature approaching the evaporator coil leaving-air temperature. The state of the refrigerant leaving the subcooler coil is a highly subcooled liquid refrigerant. The liquid then enters a thermostatic expansion valve (TXV) where the liquid is dropped to a lower pressure. The TXV does not have a pressure drop great enough to change the liquid to a 2-phase fluid. The TXV can throttle the pressure drop of the liquid refrigerant and maintain proper conditions at the compressor suction valve over a wide range of operating conditions. The liquid then enters a second fixed restrictor expansion device for a second pressure drop to a 2-phase fluid. The liquid proceeds to the evaporator coil at a temperature lower than normal cooling operation. This lower temperature is what increases the latent capacity of the rooftop. The 2-phase refrigerant passes through the evaporator and is changed into a vapor. The air passing over the evaporator coil will become colder than during normal operation as a result of the colder refrigerant temperatures. However, as it passes over the subcooler coil, the air will be warmed slightly.

As the refrigerant leaves the evaporator, the refrigerant passes a low-pressure switch in the suction line. This low-pressure switch will de-activate the MoistureMi$er package when the suction pressure reaches 60 psig. The low-pressure switch is an added safety device to protect against evaporator coil freeze-up. The low-pressure switch will only de-activate and open the liquid line solenoid valve in the MoistureMi$er circuit. The compressors will continue to run as long as there is a call for cooling, regardless of the position of the low-pressure switch. The solenoid valve and the MoistureMi$er package will be re-activated only when the call for cooling has been satisfied, the low-pressure switch has closed, and a new call for cooling exists. The crankcase heaters on the scroll compressor provide additional protection for the compressor due to the additional refrigerant charge in the subcooler.

When the humidistat is satisfied, the humidistat internal switch opens cutting power to and opening the LLSV. The refrigerant is routed back through the evaporator and the sub-cooler coil is removed from the refrigerant loop.

When the thermostat is satisfied, C1 (and C2) is deenergized and the compressor and OFM shut off. After a 30-second delay, the IFM shuts off. If the thermostat fan selector switch is in the ON position, the IFM will run continuously.

Operating sequence, COBRA™ energy recovery units (sizes 004-014)

Cooling, units with COBRA™ energy recovery — The cooling changeover thermostat located on COBRA energy recovery unit hood determines when the COBRA energy recovery unit goes into economizer mode. When the outdoor temperature is below the cooling set point the unit will be in economizer mode.

In the unoccupied mode, fans are normally set for AUTO operation, causing the fans to cycle on only as needed for heating or cooling. If the Light Commercial Thermidistat is set for "AUTO" fan, the rooftop unit fan will be off except when cooling or humidity control is required. The COBRA energy recovery unit fans will be off except when unit is running in the economizer mode. If the Light Commercial Thermidistat is set to "ON" for fan, the COBRA energy recovery unit and rooftop unit fans will run continuously. If outdoor air is below the outdoor air thermostat set point, the compressors are locked off and the unit operates in economizer mode when cooling is required. If outdoor air is unsuitable due to humidity or quality, the COBRA energy recovery unit is off and only the rooftop unit compressor runs when cooling is required. Note that the COBRA energy recovery unit does not run and dampers are closed when the outdoor air is unsuitable for cooling and the mode is unoccupied. If outdoor air is suitable, first stage cooling is COBRA energy recovery unit in economizer mode and all compressors are off. Second stage cooling adds the COBRA energy recovery unit compressor and rooftop unit compressor no. 1.

Controls (cont)

In occupied mode, when the COBRA™ energy recovery unit compressor runs in cooling mode, it is extracting heat from the incoming outdoor air and rejecting heat to the exhaust air. The COBRA energy recovery unit and rooftop unit fans run continuously. On a first stage call, all compressors will be off if the outdoor air is suitable for free cooling. Otherwise, the COBRA energy recovery unit compressor and rooftop unit compressor no. 1 will run whenever there is a first stage demand for cooling. On a second stage call, the COBRA energy recovery unit compressor and rooftop unit compressor no. 1 and 2 will run whenever there is a demand for cooling. If there is a demand for humidity control but not cooling, only the COBRA energy recovery unit compressor will run. If there is a field-installed CO_2 sensor and the levels are below that sensor set point, then the unit will operate in the unoccupied mode sequence (i.e., COBRA energy recovery unit dampers closed and rooftop unit operation only to maintain space conditions).

Heating, units with COBRA energy recovery — The heating changeover thermostat located on the COBRA energy recovery unit hood determines the stage 1 to stage 2 switchover point in heating mode.

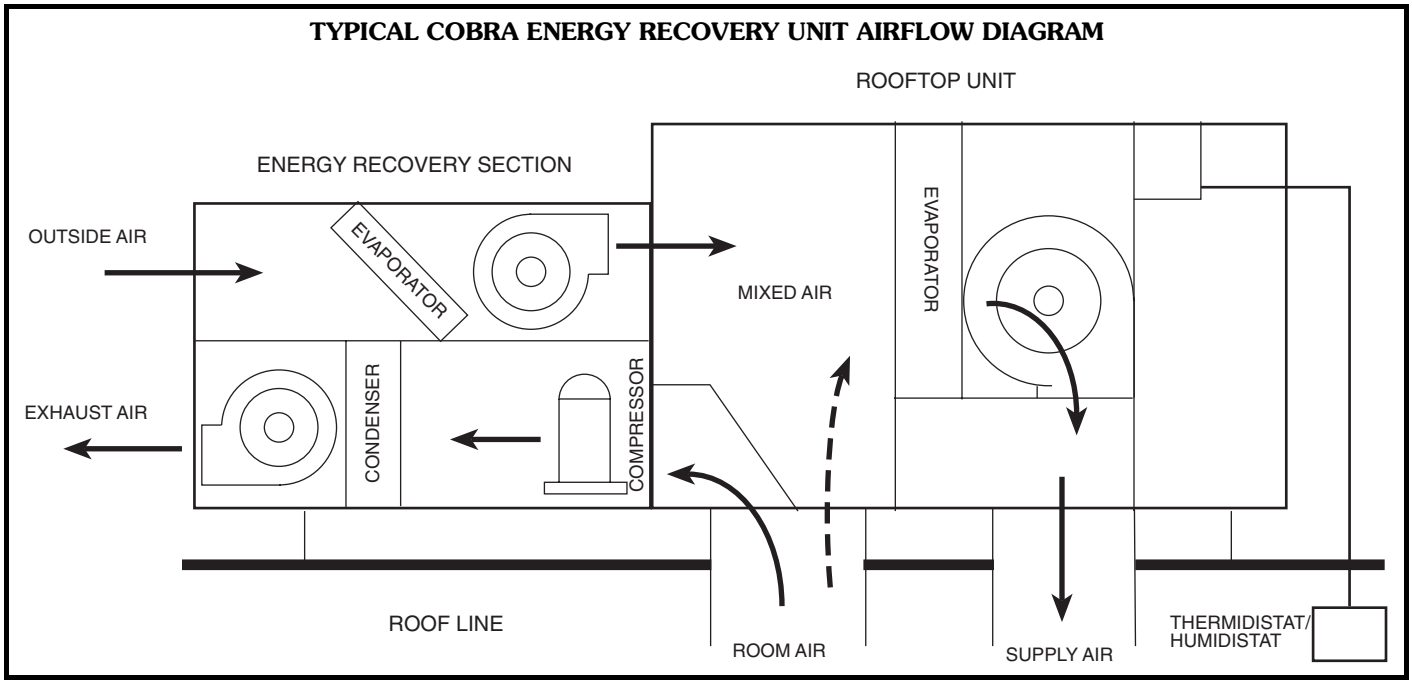
In unoccupied mode, the COBRA energy recovery unit is off and all compressors are locked off. First stage heat is rooftop unit heat at 50%. Second stage heat is rooftop unit heat at 100%.

In unoccupied mode, when the COBRA energy recovery unit compressor runs in heat mode, it is extracting heat from the exhaust air and rejecting heat to the incoming outdoor air. So it is returning energy to the building that otherwise would be "thrown away". The COBRA energy recovery unit and rooftop unit fans run continuously. The rooftop unit compressors are always off. On a first stage call, the COBRA energy recovery unit compressor is on in heat mode. Rooftop unit heat is off if the outdoor air is above the set point. Rooftop unit heat is on at 50% if the outdoor air is below the set point. On a second stage call, the COBRA energy recovery unit compressor is on in heat mode. Rooftop unit heat is on a 50% if the outdoor air is above the set point. Rooftop unit heat is on at 100% if the outdoor air is below the set point.

**MoistureMi$er™ dehumidification option —** When units are equipped with the MoistureMi$er dehumidification option there is up to a 40% increase in latent capacity in hot, humid climates. There is no need to oversize the HVAC equipment to satisfy high latent loads. The MoistureMi$er dehumidification option increases humidity control and comfort in the occupied space by automatically lowering the evaporator coil temperature down to optimum dehumidification levels while simultaneously reheating the leaving air to prevent overcooling.

Defrost — If the temperature of the 62AQ section condenser (exhaust air) coil drops below 28 F at the defrost thermostat (DFT) and the defrost timer is at the end of a timed period (adjustable to 30, 50 or 90 minutes), then the reversing valve solenoid (RVS) is energized and the condenser fan contactor(s) are deenergized. This switches the position of the reversing valve and shuts off the 62AQ section condenser (exhaust air) fan. The unit continues to defrost until the coil temperature measured at the DFT reaches 65 F or the defrost cycle completes a 10-minute cycle. At the end of the defrost cycle the RVS deenergizes and the exhaust fan motor energizes to put the unit in heating mode. If the space thermostat is satisfied during a defrost cycle, then the 62AQ section will continue in the Defrost mode until the defrost cycle is complete.

TYPICAL COBRA ENERGY RECOVERY UNIT AIRFLOW DIAGRAM



LIGHT COMMERCIAL THERMIDISTAT (LCT) OPERATING SEQUENCE AND SYSTEM RESPONSE

UNOCCUPIED

COOLING	ER Comp	ER Fans	RT Comp 1	RT Comp 2	RT Fans	RT Heat
Indoor Temperature Above 2nd Stage Set Point						
Humidity Low & OAT Low	On	On (cyc.)	On without MM	Off	On (cyc.)	Off
Humidity Low & OAT High	Off	Off	On without MM	without MM	On (cyc.)	Off
Humidity High & OAT Low	Off	Off	On with MM	On with MM	On (cyc.)	Off
Humidity High & OAT High	Off	Off	On with MM	On with MM	On (cyc.)	Off
Indoor Temperature Between 1st and 2nd Stage Set Points						
Humidity Low & OAT Low	Off	On (cyc.)	Off	Off	On (cyc.)	Off
Humidity Low & OAT High	Off	Off	On without MM	Off	On (cyc.)	Off
Humidity High & OAT Low	Off	Off	On with MM	Off	On (cyc.)	Off
Humidity High & OAT High	Off	Off	On with MM	Off	On (cyc.)	Off
Indoor Temperature Below 1st Stage Set Point	Off	Off	Off	Off	Off	Off

NOTE: OAT < 55 F all compression off*

HEATING	ER Comp.	ER Fans	RT Comp. 1	RT Comp. 2	RT Fans	RT Heat
Indoor Temperature Above 1st Set Point	Off	Off	Off	Off	Off	Off
Indoor Temperature Between 1st and 2nd Stage Set Points	Off	Off	Off	Off	On (cyc.)	On, 50%
Indoor Temperature Below 2nd Stage Set Point	Off	Off	Off	Off	On (cyc.)	On, 100%

OCCUPIED

COOLING	ER Comp	ER Fans	RT Comp 1	RT Comp 2	RT Fan	RT Heat
Indoor Temperature Above 2nd Stage Set Point						
Humidity Low & OAT Low	On	On	On without MM	On without MM	On	Off
Humidity Low & OAT High	On	On	On without MM	On without MM	On	Off
Humidity High & OAT Low	On	On	On with MM	On with MM	On	Off
Humidity High & OAT High	On	On	On with MM	On with MM	On	Off
Indoor Temperature Between 1st and 2nd Stage Set Points						
Humidity Low & OAT Low	Off	On	Off	Off	On	Off
Humidity Low & OAT High	On	On	On without MM	Off	On	Off
Humidity High & OAT Low	On	On	On with MM	Off	On	Off
Humidity High & OAT High	On	On	On with MM	Off	On	Off
Indoor Temperature Below 1st Stage Set Point						
Humidity Low	Off	On	Off	Off	On	Off
Humidity High	On	On	Off	Off	On	Off

NOTE: OAT < 55 F all compression off*

HEATING	ER Comp	ER Fans	RT Comp. 1	RT Comp. 2	RT Fans	RT Heat
Indoor Temperature Above 1st Stage Set Point	Off	On	Off	Off	On	Off
Indoor Temperature Between 1st and 2nd Stage Set Points						
OAT >Set Pt	On	On	Off	Off	On	Off
OAT <Set Pt	On	On	Off	Off	On	On, 50%
Indoor Temperature Below 2nd Stage Set Point						
OAT >Set Pt	On	On	Off	Off	On	On, 50%
OAT <Set Pt	On	On	Off	Off	On	On, 100%

LEGEND

Comp — Compressor
ER — Energy Recovery Section
MM — MoistureMi$er™ Dehumidification Device
OAT — Outdoor-Air Temperature
RT — Rooftop Section
Set Pt — Set Point

*Standard set point. Unit may be rewired to change set point.

Operating sequence, size 015-028 units

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 (IFM), compressor no. 1 and condenser fan(s) start. The condenser-fan motor(s) runs continuously while unit is cooling. When 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, power is sent to W on the IGC (integrated gas unit controller) board. An LED (light-emitting diode) on the IGC board will be on during normal operation. A check is made to ensure that the rollout switch and limit switch are closed. The induced-draft motor is then energized, and when speed is proven with the hall effect sensor on the motor, the ignition activation period begins. The burners will ignite within 5 seconds.

If the burners do not light, there is a 22-second delay before another 5-second attempt. If the burners still do not light, this sequence is repeated for 15 minutes. After the 15 minutes have elapsed, if the burners still have not lit, heating is locked out. To reset the control, break 24-v power to the thermostat.

When ignition occurs the IGC board will continue to monitor the condition of the rollout and limit switches, the hall effect sensor, as well as the flame sensor. If the unit is controlled through a room thermostat set for fan auto., 45 seconds after ignition occurs, the indoor-fan motor will be energized. If for some reason the overtemperature limit opens prior to the start of the indoor fan blower, on the next attempt, the 45-second delay will be shortened to 5 seconds less than the time from initiation of heat to when the limit tripped. Gas will not be interrupted to the burners and heating will continue. Once modified, the fan on delay will not change back to 45 seconds unless power is reset to the control.

When additional heat is required, W2 closes and initiates power to the second stage of the main gas valve. When the thermostat is satisfied, W1 and W2 open and the gas valve closes, interrupting the flow of gas to the main burners. If the call for W1 lasted less than 1 minute, the heating cycle will not terminate until 1 minute after W1 became active. If the unit is controlled through a room thermostat set for fan auto., the indoor-fan motor will continue to operate for an additional 45 seconds then stop. If the overtemperature limit opens after the indoor motor is stopped within 10 minutes of W1 becoming inactive, on the next cycle the time will be extended by 15 seconds. The maximum delay is 3 minutes. Once modified, the fan off delay will not change back to 45 seconds unless power is reset to the control.

An LED indicator is provided on the IGC to monitor operation. The IGC is located by removing the side panel and viewing the IGC through the view port located in the control box access panel. During normal operation, the LED is continuously on.

**Cooling, units with EconoMi$er+ —** For EconoMi$er+ operation, there must be a thermostat call for the fan (G). This will move the damper to its minimum position.

When the EconoMi$er+ control is the occupied mode and a call for cooling exists (Y1 on the thermostat), the control will first check for indoor fan operation. If the fan is not on, then cooling will not be activated. If the fan is on, then the control will open the EconoMi$er+ damper to the minimum position.

On the initial power to the EconoMi$er+ board, it will take the damper up to $2^1/_2$ minutes before it begins to position itself. With subsequent fan signal (G) to the board, the changed in damper position will take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take $2^1/_2$ minutes.

If the damper is in the process of a change (for example going to 100% open) and the signal (G) is turned off, the damper will continue to open to 100% before it closes (due to no fan signal (G).

If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to main the supply air temperature set point plus 2° F.

If there is a further demand for cooling (cooling second stage — Y2 is energized), then the control set point for the leaving air will be set at the supply air set point to increase the cooling capacity. If this cannot satisfy the load then the control will bring on compressor stages as needed to maintain the supply air temperature set point. The EconoMi$er+ damper will be locked open at 100% or the maximum damper position set point.

To ensure that there is oil return, the compressors will operate for at least 3 minutes. If, during this period, the leaving temperature drops below the set point by 5° F, then the EconoMi$er+ dampers will be closed to 60% until the compressor is turned off to avoid cold leaving air temperatures.

If the conditions are not suitable for free cooling then the EconoMi$er+ dampers will be closed to the minimum ventilation position.

Compressor stages will be used to cool the air. If the control is configured for direct control by Y1 and Y2, then the stages will sequence based on the demand of Y1 and Y2. If the control is configured for leaving air temperature control, then Y1 will maintain the leaving air temperature at the supply air set point plus 2° F. If Y1 and Y2 are closed, then the leaving air will be controlled to the supply air set point. If Y2 is closed and Y1 is open, then control will shut down and indicate an error due to a thermostat failure or improper wiring of the thermostat.

If the unit is in the unoccupied mode, then the control of the temperature will depend on the unoccupied free cooling configuration: no unoccupied cooling, unoccupied free cooling with any mechanical cooling, or unoccupied free and mechanical cooling. If free cooling is enabled, then the control will check if free cooling can be used. The EconoMi$er+ will then control to the leaving air temperature set point plus 2° F for a Y1 command, or the leaving air temperature set point for a Y1 and Y2 command. If mechanical cooling is allowed to be used, then the control will then bring on additional stages of mechanical cooling if free cooling cannot satisfy the load.

If the EconoMi$er+ control:

- is in the occupied mode
- is configured to use demand ventilation
- cannot use free cooling
- has return air or space CO_2 levels below the DAQLO limit,

then the EconoMi$er+ damper position will be set to the IAQMIN_SP set point. If the CO_2 level rises above the DAQLO limit, then the dampers will modulate open in a linear relationship until the return air or space CO_2 levels are at or above the DAQ limit. The damper position will be at the ECONOMIN_SP set point.

When the EconoMi$er+ is being used for free cooling and the position exceeds the power exhaust set point, then the control will turn on the appropriate power exhaust fans.

Unoccupied and occupied minimum position control — There is an unoccupied minimum damper position and an occupied minimum damper position on the EconoMi$er+ controller. When the HVAC fan is off the outside air damper will always be closed. When the fan is on and in the unoccupied mode, the outside air damper will be at the unoccupied minimum position. When the fan is on (G call) and in the occupied mode, the outside air damper will be at the occupied minimum position.

A jumper wire is factory-installed to force the unit into occupied configuration whenever G or Y1 are closed. Without the jumper wire, the unit will always be in unoccupied mode.

The 2 minimum position settings are also used in the IAQ sequence of operation.

NOTE: The minimum position signal takes priority over the maximum position signal. If the maximum damper position is set below the minimum damper position, the EconoMi$er+ controller will maintain the actuator at minimum position.

Adjust the unoccupied minimum position to allow the minimum amount of outdoor air, as required by local codes, to enter the building. Make minimum position adjustments with at least 10° F (6° C) temperature difference between the outdoor and return air temperatures.

To determine the unoccupied minimum position setting, perform the following procedure:

Calculate the appropriate supply-air temperature using the following formula: (TO x OA) + (TR x RA) = TM

TO = Outdoor-Air Temperature
OA = Percent of Outdoor Air
TR = Return-Air Temperature
RA = Percent of Return Air
TM = Supply-Air Temperature

As an example, if local codes require 10% outdoor air during occupied conditions, outdoor-air temperature is 60 F, and return-air temperature is 75 F:

(60 x 0.10) + (75 x 0.90) = 73.5 F

Carefully adjust the unoccupied minimum position until the measured supply-air temperature matches the calculated value. Then, carefully adjust the occupied minimum position set point on the controller until the desired position is reached.

Heating, units with economizer — When the thermostat calls for heating, terminal W1 is energized. To prevent thermostat short-cycling, the unit is locked into the Heating mode for at least 1 minute when W1 is energized. The induced-draft motor is energized and the burner ignition sequence begins. The indoor (evaporator) fan motor (IFM) is energized 45 seconds after a flame is ignited and the damper moves to the minimum position. On units equipped for two stages of heat, when additional heat is needed, W2 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.

Cooling, units with EconoMi$er2, PremierLink™ control and a thermostat — When free cooling is not available, the compressors will be controlled by the PremierLink control in response to the Y1 and Y2 inputs from the thermostat.

The PremierLink control will use the following information to determine if free cooling is available:

- Indoor fan has been on for at least 30 seconds.
- The SPT, SAT, and OAT inputs must have valid readings.
- OAT must be less than 75 F.
- OAT must be less than SPT.
- Enthalpy must be LOW (may be jumpered if an enthalpy sensor not available).
- Economizer position is NOT forced.

Pre-cooling occurs when the is no call from the thermostat except G. Pre-cooling is defined as the economizer modulates to provide 70 F supply air.

When free cooling is available the PremierLink control will control the compressors and economizer to provide a supply-air temperature determined to meet the Y1 and Y2 calls from the thermostat.

If optional power exhaust is installed, as the outdoor-air damper opens and closes, the power exhaust fans will be energized and deenergized.

If field-installed accessory CO_2 sensors are connected to the PremierLink™ control, a PID-controlled demand ventilation strategy will begin to operate. As the CO_2 level in the zone increases above the CO_2 set point, the minimum position of the damper will be increased proportionally. As the CO_2 level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed.

Heating, units with EconoMi$er2, PremierLink control and a thermostat — When the thermostat calls for heating, terminal W1 is energized. The PremierLink control will move the economizer damper to the minimum position if there is a call for G and closed if there is a call for W1 without G. In order to prevent thermostat from short cycling, the unit is locked into the heating mode for at least 10 minutes when W1 is energized. The induced-draft motor is then energized and the burner ignition sequence begins.

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 unless G is still maintained.

Cooling, units with EconoMi$er2, PremierLink™ control and a room sensor — When free cooling is not available, the compressors will be controlled by the PremierLink controller using a PID Error reduction calculation as indicated below.

The PremierLink controller will use the following information to determine if free cooling is available:

- Indoor fan has been on for at least 30 seconds.
- The SPT, SAT, and OAT inputs must have valid readings.
- OAT must be less than 75 F.
- OAT must be less than SPT.
- Enthalpy must be LOW (may be jumpered if an enthalpy sensor is not available).
- Economizer position is NOT forced.

When free cooling is available, the outdoor-air damper is positioned through the use of a Proportional Integral (PID) control process to provide a calculated supply-air temperature into the zone. The supply air will maintain the space temperature between the heating and cooling set points.

The PremierLink will integrate the compressors stages with the economizer based on logic built into the controller.

If an optional power exhaust is installed, as the outdoor-air damper opens and closes, the power exhaust fans will be energized and deenergized.

If field-installed accessory CO_2 sensors are connected to the PremierLink control, a PID-controlled demand ventilation strategy will begin to operate. As the CO_2 level in the zone increases above the CO_2 set point, the minimum position of the damper will be increased proportionally. As the CO_2 level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed.

Heating, unit with EconoMi$er2, PremierLink control and a room sensor — Every 40 seconds the controller will calculate the required heat stages (maximum of 3) to maintain Supply Air Temperature (SAT) if the following qualifying conditions are met:

- Indoor fan has been on for at least 30 seconds.
- COOL mode is not active.
- OCCUPIED, TEMP.COMPENSATED START or HEAT mode is active.
- SAT reading is available.
- Fire shutdown mode is not active.

If all of the above conditions are met, the number of heat stages is calculated; otherwise the required number of heat stages will be set to 0.

If the PremierLink controller determines that heat stages are required, the economizer damper will be moved to minimum position if occupied and closed if unoccupied.

**Units with MoistureMi$er™ dehumidification package —** When thermostat calls for cooling, terminals G and Y1 and Y2 and the compressor contactors C1 and C2 are energized. The indoor (evaporator) fan motor (IFM), compressor, and outdoor (condenser) fan motor (OFM) start. The OFM runs continuously while the unit is in cooling. As shipped from the factory, MoistureMi$er dehumidification circuit is always energized. If MoistureMi$er circuit modulation is desired, a field-installed, wall-mounted humidistat is required.

If the MoistureMi$er humidistat is installed and calls for the MoistureMi$er subcooler coil to operate, the humidistat internal switch closes. This energizes and closes the liquid line solenoid valve coil (LLSV) of the MoistureMi$er circuit, forcing the hot liquid refrigerant of the liquid line to enter the subcooler coil. As the hot liquid passes through the subcooler coil, it is exposed to the cold supply airflow coming off from the evaporator coil and the liquid is further cooled to a temperature approaching the evaporator coil leaving-air temperature. The state of the refrigerant leaving the subcooler coil is a highly subcooled liquid refrigerant. The liquid then enters a thermostatic expansion valve (TXV) where the liquid is dropped to a lower pressure. The TXV does not have a pressure drop great enough to change the liquid to a 2-phase fluid. The TXV can throttle the pressure drop of the liquid refrigerant and maintain proper conditions at the compressor suction valve over a wide range of operating conditions. The liquid then enters a second fixed restrictor expansion device for a second pressure drop to a 2-phase fluid. The liquid proceeds to the evaporator coil at a temperature lower than normal cooling operation. This lower temperature is what increases the latent capacity of the rooftop. The 2-phase refrigerant passes through the evaporator and is changed into a vapor. The air passing over the evaporator coil will become colder than during normal operation as a result of the colder refrigerant temperatures. However, as it passes over the subcooler coil, the air will be warmed slightly.

As the refrigerant leaves the evaporator, the refrigerant passes a low-pressure switch in the suction line. This low-pressure switch will de-activate the MoistureMi$er package when the suction pressure reaches 60 psig. The low-pressure switch is an added safety device to protect against evaporator coil freeze-up. The low-pressure switch will only de-activate and open the liquid line solenoid valve in the MoistureMi$er circuit. The compressors will continue to run as long as there is a call for cooling, regardless of the position of the low-pressure switch. The solenoid valve and the MoistureMi$er package will be re-activated only when the call for cooling has been satisfied, the low-pressure switch has closed, and a new call for cooling exists. The crankcase heaters on the scroll compressor provide additional protection for the compressor due to the additional refrigerant charge in the subcooler.

When the humidistat is satisfied, the humidistat internal switch opens cutting power to and opening the LLSV. The refrigerant is routed back through the evaporator and the sub-cooler coil is removed from the refrigerant loop.

When the thermostat is satisfied, C1 and C2 are deenergized and the compressor and OFM shut off. After a 30-second delay, the IFM shuts off. If the thermostat fan selector switch is in the ON position, the IFM will run continuously.

Application data

Condensate drain pan
A sloped condensate drain pan is supplied on all units. The condensate pan must be externally trapped. Condensate drains are located on both the bottom and end of the unit.

Ductwork
All ductwork must be attached to flanges. If no flanges are present, they must be field supplied. Secure vertical discharge ductwork to roof curb. For horizontal discharge applications, attach ductwork to flanges. Field-supplied flanges can be attached to horizontal discharge openings and all ductwork attached to flanges.

Thermostat
Use of 2-stage cooling thermostat is recommended for all units equipped with economizer. A 2-stage cooling thermostat is required for size 015-028 units with integrated economizer.

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 possibility of condensate blow-off from evaporator, airflow through units should not exceed 500 cfm/ton (sizes 004-025) and 11,250 cfm (size 028).

Minimum airflow
Minimum airflow for cooling is 300 cfm/ton (size 004-025) and 280 cfm/ton (028 units). Refer to Heating Capacities and Efficiencies table for minimum heating airflow.

Minimum ambient operating temperature
Minimum ambient operating temperature for size 004-014 standard units is 25 F. With accessory Motormaster® I, II, or IV units can operate at outdoor temperatures down to –20 F.

Unit sizes 015-028 are designed to operate at outdoor temperatures down to 40 F (4.4 C). With accessory Motormaster I or Motormaster V control, units can operate at outdoor temperatures down to –20 F.

NOTE: Under most application circumstances, if the rooftop unit is equipped with an economizer, low ambient controls are not required. Unless the outdoor air is unsatisfactory for free cooling due to high temperature, excessive humidity, or poor air quality, outdoor air should be used.

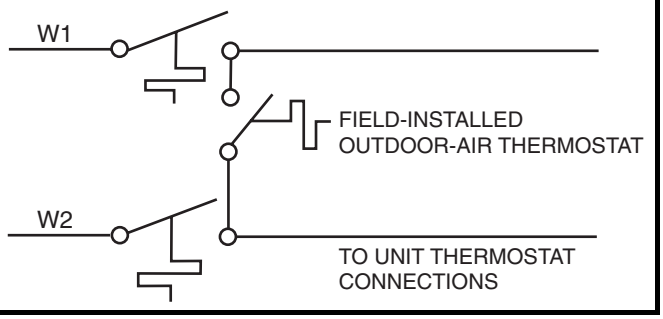
Maximum operating outdoor-air temperature
Maximum outdoor operating temperature for cooling is shown below (60 Hz):

48TM004-008,012	115 F
48TM009,014	125 F
48TM016-025	120 F
48TM028	125 F
48HJ004-015	125 F
48HJ017	120 F

High altitudes
These may require a change to the gas orifice. Refer to Altitude Compensation tables.

Minimum heating entering air temperature
The minimum temperature of air entering the dimpled heat exchanger is 50 F continuous and 45 F intermittent for aluminum heat exchangers and 40 F continuous and 35 F intermittent for stainless steel heat exchangers. To operate at lower mixed-air temperatures, a field-supplied outdoor-air thermostat must be used to initiate both stages of heat when the temperature is below the minimum required temperature to ensure full fire operation. Wire the outdoor-air thermostat (part no. HH22AG106) in series with the second stage gas valve as shown below. Set the outdoor-air thermostat at 35 F for stainless steel heat exchangers or 45 F for aluminum heat exchangers. This temperature setting will bring on the second stage of heat whenever the ambient temperature is below the thermostat set point. Indoor comfort may be compromised when heating is initiated using low entering air temperatures with insufficient heating temperature rise.

WIRING OF OUTDOOR-AIR THERMOSTAT



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

Using Carrier motors to the values listed in the Physical Data, Fan Performance, and Evaporator-Fan Motor Data tables *will not* result in nuisance tripping or premature motor failure. In addition, the unit warranty will not be affected.

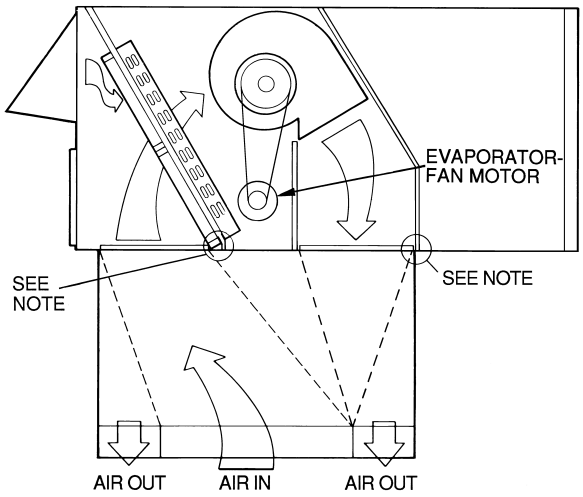
Carrier PremierLink™ controls
The Carrier PremierLink controls can be used with any thermostat.

Thru-the-bottom connections
The accessory thru-the-bottom connections are needed to ensure proper connections when routing wiring and piping through the basepan and roof curb. This accessory is used for electric and control power only or electric, control power, and gas piping depending on which accessory is selected.

Application data (cont)

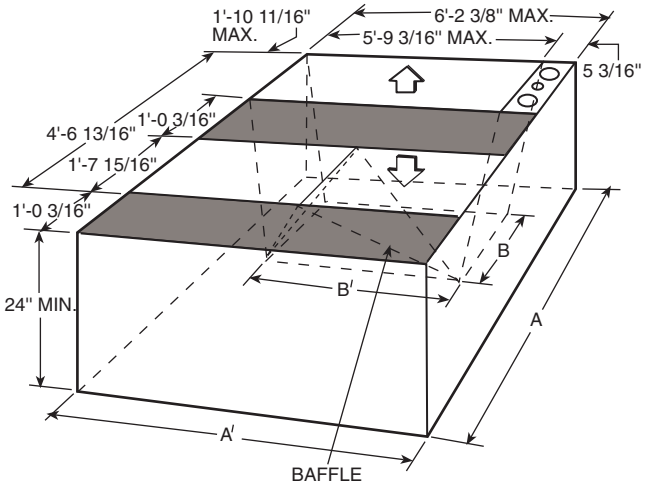
Concentric duct details

CONCENTRIC DUCT DISTRIBUTION



NOTE: Do not drill in this area, damage to basepan may result in water leak.

CONCENTRIC DUCT DETAILS



Shaded area indicates block-off panels.

NOTE: Dimensions A, A′ and B, B′ are obtained from field-supplied ceiling diffuser.

Field-supplied fan drives

If the factory drive sets must be changed to obtain other wheel speeds, consult the nearest Browning Manufacturing Co. sales office with the required new wheel speed and the data from Physical Data tables (center distances, motor and fan shaft diameters, motor horsepower) for a modified drive set selection. For minor speed changes, the fan sheave size should be changed. (Do not reduce the size of the motor sheave; this will result in reduced belt horsepower ratings and reduced belt life.)

Condenser coil protection

Pre-coated aluminum-fin coils have a durable epoxy-phenolic coating applied to the fin prior to the fin stamping process to provide protection in mildly corrosive coastal environments. Pre-coated coils have an inert barrier between the aluminum fin and copper tube. This barrier electrically disconnects the dissimilar metals to minimize the potential for galvanic corrosion. This economical option provides substantial corrosion protection beyond the standard uncoated coil construction.

Copper-fin coils provide increased corrosion resistance in moderate coastal environments where industrial air pollution is not present. All copper coils eliminate bi-metallic construction to eliminate the potential for galvanic corrosion. Application in industrial environments is not recommended due to potential attack from sulfur, sulfur oxide, nitrogen oxides, carbon and several other industrial airborne contaminants. In moderate seacoast environments, copper-fin coils have extended life compared to standard or pre-coated aluminum-fin coils.

E-Coated aluminum-fin coils undergo a precisely controlled scientific process that bonds an impermeable epoxy coating to the specially prepared fin coil surface. E-Coating produces a smooth, consistent coating that is less brittle, more resilient and more durable than previous postcoating processes. E-Coated aluminum-fin coils offer economical protection and improved coil life in many contaminated environments.

E-Coated copper-fin coils provide maximum protection in virtually all environments, this option combines the continuous, impenetrable barrier of the E-Coating process with the natural resistance of an all-copper construction. E-Coated copper-fin coil assemblies ensure long life, even in environments that combine harsh coastal conditions with industrial contamination.

CONDENSER COIL PROTECTION APPLICATIONS

DESCRIPTION (*Enviro-Shield*™ Option)	ENVIRONMENT					
	Standard, Non-Corrosive	Mild Coastal	Moderate Coastal	Severe Coastal	Industrial	Combined Coastal and Industrial
Standard, Al/Cu	X					
Pre-Coated Al/Cu		X				
Cu/Cu			X			
E-Coated Al/Cu					X	X
E-Coated Cu/Cu				X		

LEGEND

Al/Cu — Aluminum Fin with Copper Tube Coil
Cu/Cu — Copper Fin with Copper Tube Coil
Enviro-Shield — Family of Coil Protection Options
E-Coated — Extremely Flexible and Durable Epoxy Coating Uniformly Applied to the Coil Surfaces
Pre-Coated — Epoxy Coating Applied to Fin Stock Material

EconoMi$er+

The EconoMi$er+ factory-installed economizer package includes a gear-driven damper system that modulates the return air and outdoor air supply to the rooftop unit in order to take advantage of "free cooling" with outdoor air when conditions are suitable. The system utilizes the latest technology available for integrating the use of outdoor air for cooling with mechanical cooling for 3 through 25-ton rooftop units. The EconoMi$er+ microprocessor-based controller optimizes and enhances rooftop operation through reduced energy consumption, optimal zone comfort, and efficient equipment cycling. This is accomplished by operating the compressors when the outdoor air temperature is too warm, integrating the compressors with outdoor air when free cooling is available, and locking out the compressor when outdoor air temperature is too cold. The detailed sequence of operation is described in the Controls section with a brief description of selected application items here.

Thermostat interface — The EconoMi$er+ control was designed to work with conventional thermostats that have Y1 (cooling stage 1), Y2 (cooling stage 2), W1 (heat stage 1), W2 (heat stage 2), and G (fan). In addition, the EconoMi$er+ will support an occupied/unoccupied switch (typically integrated into the thermostat or Thermidistat). When the switch is closed, it provides a 24-vac signal to the unit for occupied mode, and provides no signal to indicate unoccupied mode. The EconoMi$er+ control can be configured to allow different minimum economizer damper positions and to allow the use of mechanical cooling in the occupied mode.

Control features — One of the major benefits of the EconoMi$er+ controller is the superior functionality that is provided for rooftop unit operation. EconoMi$er+ control features are included as follows:

Remote enable control — The EconoMi$er+ controller can be used with a field-supplied and field-installed control switch that will enable and disable the EconoMi$er+ in conjunction with an energy management system.

Demand control ventilation (DCV) — The EconoMi$er+ has DCV capability when using an IAQ sensor. This sensor is typically installed in the return duct or occupied space. When implementing a DCV control scheme with the EconoMi$er+, the control algorithm will modulate the position of the damper between two user-configured damper positions, Minimum IAQ Position and occupied minimum position. Design airflow rates for these two damper positions should be such that when the damper is at the IAQ minimum position, enough fresh ventilation air will be brought in to remove contaminants and CO_2 generated by sources other than people (i.e., since in unoccupied mode). The occupied minimum position design airflow rate should be sufficient to satisfy ventilation requirements for removing CO_2 from all sources including people at the maximum occupancy.

IAQ sensors — EconoMi$er+ can be utilized with any IAQ (CO_2) sensor that provides a 2 to 10 vdc output. The controller will modulate the outdoor air damper to provide ventilation based on the sensor output and the IAQ setting of the controller. When used, an IAQ sensor will modulate the damper from the minimum position (base ventilation rate based on CO_2 levels) to maximum position (full occupancy ventilation rate).

Damper operation — The EconoMi$er+ allows the damper to be configured for three adjustable damper positions including maximum position, and occupied/unoccupied minimum positions. The three (3) position damper capability is a unique feature of EconoMi$er+ and includes operation flexibility as follows:

1. Maximum Position: This adjustable position allows up to 100% outdoor air through the rooftop unit when conditions are appropriate.
2. Minimum Occupied Position: This adjustable position allows a minimum ventilation airflow rate through the unit during occupied periods.
3. Minimum Unoccupied Position: A minimum unoccupied position is provided for unoccupied periods or for a second minimum damper position (i.e., during occupied mode) when using an IAQ sensor for DCV. This is also referred to as the IAQ Minimum position (see DCV and Control sections for sequence).

Power exhaust — The EconoMi$er+ has the capability to control up to two (2) stages of power exhaust for maintaining air balance and pressurization.

Compressor staging — The EconoMi$er+ is an integrated economizer and has the ability to utilize simultaneous outdoor air and compressors. The EconoMi$er+ can be configured to support economizer and compressor operation for up to 4 compressors. Only one or two compressor operation is available with 3 to $12^1/_2$ ton units. Compressor staging applications that can be configured include unit operation for high sensible or high latent loads for units with more than 2 compressors. In addition, the control can be set up to control the leaving-air temperature using the Y1 and Y2 calls as a low cool and high cool demand based on the supply air set point and the rate of change of supply-air temperature, which can be configured in the EconoMi$er+ controller.

Changeover strategies — The EconoMi$er+ controller can be configured to accommodate all available economizer control strategies that place the rooftop unit in economizer mode including:

Switch — Used when a remote signal from an energy management system will enable and disable the EconoMi$er+ (remote enable control).

Outdoor dry bulb — EconoMi$er+ will be enabled based on the outdoor-air temperature. This is provided standard with the EconoMi$er+.

Differential dry bulb — EconoMi$er+ will be enabled whenever the outdoor-air temperature is lower than the return-air temperature.

Application data (cont)

Outside air enthalpy — EconoMi$er+ will be enabled based on the outside air enthalpy curves as shown in the EconoMi$er+ Changeover diagram below. The A, B, C, and D curves shown have been in use for many years and have been included as part of the latest ASHRAE 90.1 energy efficiency code. The curves are designed to take into consideration both outdoor temperature and humidity. These curves are used to set up the EconoMi$er+ controller to use the EconoMi$er+ for free cooling when the conditions to the left of the curve exist. When the conditions are to the right of the curve, then outdoor air cooling will not be used and the outdoor air damper position will be set at the minimum position.

Deciding which curve is used is a function of the outdoor climate and the type of economizer utilized. Since EconoMi$er+ is a fully integrated economizer, the range where outdoor air can be utilized for free cooling is expanded and the A and B curves may be used. The control point table in the EconoMi$er+ Changeover diagram below provides assistance for whether the A and B curves will be suitable. In general terms, a hot and humid climate may be a reason not to use the A curve, while a cooler climate might be more applicable for using the A or B curve.

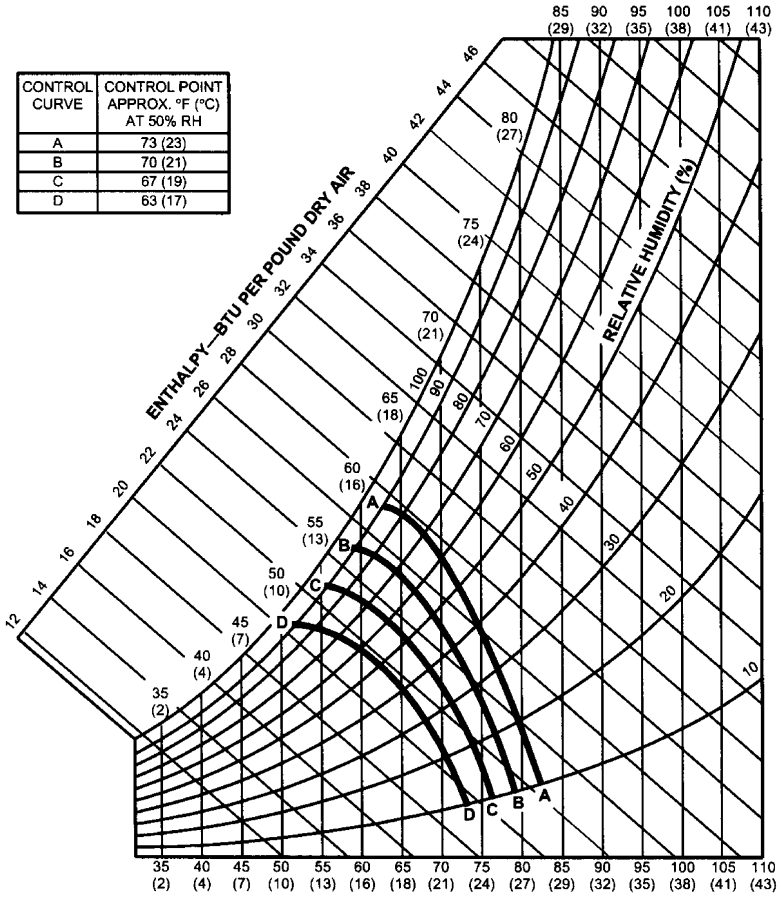
The EconoMi$er+ has expanded outdoor air capability. For a changeover economizer which cannot utilize simultaneous economizer and compression, both A and B curves would potentially be undesirable since the temperature and humidity levels are too high without compression assistance to provide effective cooling. Therefore, most changeover economizers utilize the D curve.

Differential enthalpy — The EconoMi$er+ will be enabled based on the comparison of the enthalpy of the return air and outside air. When the outside air enthalpy is lower than he return side, the unit will be in economizer mode.

Using the EconoMi$er+ controller for implementing different control changeover strategies requires the use of different combinations of dry bulb and humidity sensors as outlined in the EconoMi$er+ Sensor Usage table.

ECONOMIZER CHANGEOVER CURVES

CONTROL CURVE	CONTROL POINT APPROX. °F (°C) AT 50% RH
A	73 (23)
B	70 (21)
C	67 (19)
D	63 (17)



ECONOMIZER SENSOR USAGE CHART

REQUIRED CHANGEOVER		PROVIDED WITH ECONOMI$ER+	FIELD INSTALLED SENSOR(S) REQUIRED
Single Dry Bulb Control		(1) CRTEMPSN001A00	None Required
Differential Dry Bulb Control		(1) CRTEMPSN001A00	(1) CRTEMPSN001A00
Single Enthalpy Control		(1) CRTEMPSN001A00	(1) CRHUMDSN001B00
Differential Enthalpy Control		(1) CRTEMPSN001A00	(1) CRTEMPSN001A00 (2) CRHUMDSN001B00
To Add CO_2 DCV Control with Above	**Wall Mount**	Not Applicable	(1) 33ZCSENCO2 (1) CRE+PLUG001A00
	Duct Mount		(1) 33ZCSENCO2 (1) CRE+PLUG001A00 (1) 33ZCASPCO2 or (1) CRCBDIOX002A00 (1) CRE+PLUG001A00

NOTES:

1. EconoMi$er+ is provided with a standard outdoor air sensor and supply air sensor.
2. CRTEMPSN001A00 — Dry bulb temperature sensor used for single dry bulb changeover or in combination with a humidity sensor for enthalpy changeover.

   CRHUMDSN001B00 — Humidity sensor used in combination with dry bulb sensor, CRTEMPSN001A00, to implement enthalpy changeover.

CRE+PLUG001A00 — 5-Pin connector plug required when an Indoor Air Quality Sensor (CO_2 sensor) is used with EconoMi$er+.

33ZCSENCO2 — Adjustable CO_2 space sensor used for wall mount or duct mount applications.

33ZCASPCO2 — Aspirator box used with 33ZCSENCO2 CO_2 space sensor for duct mount applications.

CRCBDIOX002A00 — Adjustable CO_2 space sensor used for duct mount applications (aspirator box not required).

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