TRANE®

Packaged Heat Pumps

Voyager™
12½ - 20 Tons — 60 Hz

May 2007

PKGP-PRC001-EN

Introduction

Packaged Rooftop Air Conditioners

Through the years, Trane has designed and developed the most complete line of Packaged Rooftop products available in the market today. Trane was the first to introduce the Micro—microelectronic unit controls—and has continued to improve and revolutionalize this design concept.

The ReliaTel control platform offers the same great features and functionality as the original Micro, with additional benefits for greater application flexibility.

Voyager continues to provide the highest standards in quality and reliability, comfort, ease of service, and the performance of Trane light commercial products.

Trane customers demand products that provide exceptional reliability, meet stringent performance requirements, and are competitively priced. Trane delivers all of this with Voyager.

Voyager features cutting edge technologies: reliable compressors, Trane engineered ReliaTel controls, computer-aided run testing, and Integrated Comfort™ Systems. So whether you're the contractor, the engineer or the owner, you can be certain Voyager Products are built to meet your needs.

It's Hard To Stop A Trane.®

Contents

Features and Benefits

Factory Installed Options

- Black Epoxy Pre-Coated Coils
- High Efficiency Motors
- High Pressure Cutout
- Hinged Access Doors
- Powered or Unpowered Convenience Outlet
- Supply and/or Return Air Smoke Detector
- Through the Base Electrical with Circuit Breaker
- Through the Base Electrical With Disconnect Switch
- Through the Base Utilities Access
- Two-Inch Pleated Filters

Factory or Field Installed Options

- Clogged Filter/Fan Failure Switch
- Differential Pressure Switches
- Discharge Air Sensing Kit
- Downflow – Economizer
- Electric Heaters
- Frostat
- LonTalk® Communications Interface
- Oversized Motors
- Reference or Comparative Enthalpy
- Tool-less Hail Guards
- Trane Communications Interface (TCI)

Field Installed Options

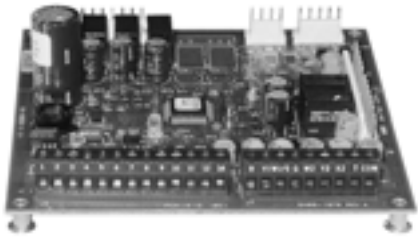
- CO_2 Sensing
- Digital Display Zone Sensor
- Dual Thermistor Remote Zone Sensor
- High Static Drive
- Manual Outside Air Damper
- Motorized Outside Air Dampers
- Powered Exhaust
- Downflow – Roof Curb
- Horizontal – Economizer
- Remote Potentiometer
- Ventilation Override Accessory
- Zone Sensors

Easy to Install, Service and Maintain

Because today's owners are very cost-conscious when it comes to service and maintenance, the Trane Voyager was designed with direct input from service contractors. This valuable information helped to design a product that would get the serviceman off the job quicker and save the owner money. Voyager does this by offering:

Quality and Reliability

ReliaTel™ Controls (LCI-R)



ReliaTel™ controls provide unit control for heating, cooling and ventilating by utilizing input from sensors that measure outdoor and indoor temperature.

Quality and Reliability are enhanced through ReliaTel™ control and logic:

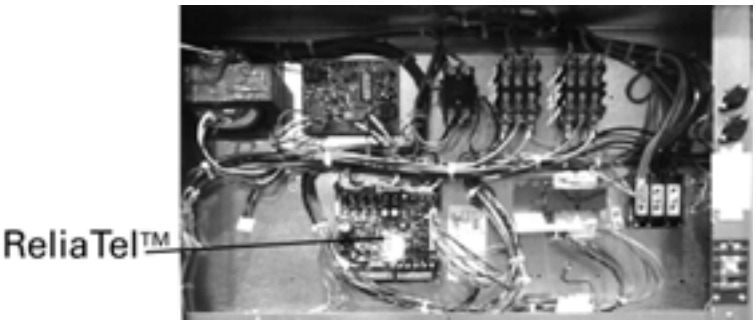
- prevents the unit from short cycling, considerably improving compressor life.
- ensures that the compressor will run for a specific amount of time whichallows oil to return for better lubrication, enhancing the reliability of the compressor.

Voyager with ReliaTel™ reduces the number of components required to operate the unit, thereby reducing possibilities for component failure.

ReliaTel™ Makes Installing and Servicing Easy

ReliaTel™ eliminates the need for field installed anti-shortcycle timer and time delay relays. ReliaTel™ controls provide these functions as an integral part of the unit. The contractor no longer has to pay for an optional control and its installation.

The wiring of the low voltage connections to the unit and the zone sensors is as easy as 1-1, 2-2, and 3-3. This simplified system makes wiring easier for the installer.



ReliaTel™ Makes Testing Easy

ReliaTel™ requires no special tools to run the Voyager unit through its paces. Simply place a jumper between Test 1 and Test 2 terminals on the Low Voltage Terminal Board and the unit will walk through its operational steps automatically.

- The unit automatically returns control to the zone sensor after stepping through the test mode a single time, even if the jumper is left on the unit.

As long as the unit has power and the "system on" LED is lit, ReliaTel™ is operational. The light indicates that the controls are functioning properly.

ReliaTel™ features expanded diagnostic capabilities when utilized with Trane Integrated Comfort™ Systems.

Some zone sensor options have central control panel lights which indicate the mode the unit is in and possible diagnostic information (dirty filters for example).

Other ReliaTel™ Benefits

The ReliaTel™ built-in anti-shortcycle timer, time delay relay and minimum "on" time control functions are factory tested to assure proper operation.

ReliaTel™ softens electrical "spikes" by staging on fans, compressors and heaters.

Intelligent Fallback is a benefit to the building occupant. If a component goes astray, the unit will continue to operate at the predetermined temperature setpoint.

Intelligent Anticipation is a standard ReliaTel™ feature. It functions continuously as ReliaTel™ and zone sensor(s) work together in harmony to provide much tighter comfort control than conventional electro-mechanical thermostats.

The same ReliaTel™ Board fits all Voyager Packaged Gas/Electrics, Cooling with Electric Heat and Heat Pump models. This provides standardization of parts for contractors. Less money is tied up in inventory with ReliaTel™.

Outstanding Standard and Optional Components

Black Epoxy Pre-Coated Coils

The pre-coated coils are an economical option for protection in mildly corrosive environments.

Cabinet Integrity

For added water integrity, Voyager has a raised 11 1/8" lip around the supply and return of the downflow units to prevent water from blowing into the ductwork.

Clogged Filter/Fan Failure Switch

A dedicated differential pressure switch is available to achieve active fan failure indication and/or clogged filter indication.

CO_2 Sensing

The CO_2 sensor has the ability to monitor space occupancy levels within the building by measuring the parts per million of CO_2 (Carbon Dioxide) in the air. As the CO_2 levels increase, the outside air damper modulates to meet the CO_2 space ventilation requirements. The CO_2 sensor kit is available as a field installed accessory.

Colored And Numbered Wiring

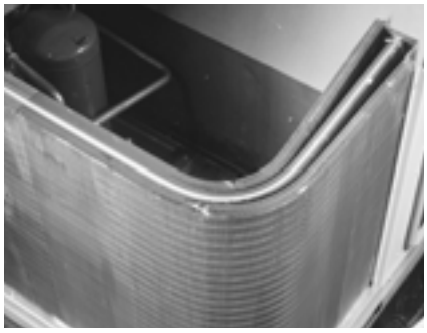
Save time and money tracing wires and diagnosing the unit.

Compressors

Voyager contains the best compressor technology available to achieve the highest possible performance. Dual compressors are outstanding for humidity control, light load cooling conditions and system back-up applications. Dual compressors are available on all models.

Condenser Coil

Voyager boasts a patent-pending 1+1+1 condenser coil, permanently gapped for easy cleaning.



Digital Display Zone Sensor

The Digital LCD (Liquid Crystal Display) zone sensor has the look and functionality of standard zone sensors. This sensor should be utilized with ReliaTel™ controls.

Discharge Air Sensing Kit

Provides true discharge air sensing in heating models. The kit is functional only with the ReliaTel™ Options Module.

Downflow And Horizontal Economizers

The economizers come with three control options — dry bulb is standard, enthalpy and differential enthalpy are optional.

Dual Thermistor Remote Zone Sensor

This sensor will reduce the total number of remote sensors to obtain space temperature averaging. This sensor should be utilized with ReliaTel™ controls.

Factory Built Roof Curbs

Available for downflow units. Only two roof curbs for the entire Voyager line simplifies curb selection.

Fresh Air

0 - 25% manual or 0 - 50% motorized outside air hoods are available.

High Static Drive Accessory

Available on many models, this high static drive accessory extends the capability of the standard motor. Avoid expensive motors and operating costs by installing this optimized sheave accessory.

Hinged Access Doors

These doors permit easy access to the filter, fan/heat, and compressor/control sections. They reduce the potential roof damage from screws or sharp access door corners.

LonTalk® Communications Interface

The LonTalk communications interface allows the unit to communicate as a Tracer™ LCI-V device or directly with generic LonTalk Network Building Automation System Controls.

Power Exhaust Option

This option is available on downflow units and provides exhaust of the return air, when using a downflow economizer, to maintain proper building pressurization. Great for relieving most building overpressurization problems.

Quick-Access Panels

Remove three or fewer screws for access to the standardized internal components and wiring.

Quick-Adjust Idler Arm

With the Quick-Adjust Idler Arm, the belt and sheaves can be quickly adjusted without moving the mounted fan motor. The result is a major savings in time and money.

Reference or Comparative Enthalpy

Measures and communicates humidity while maximizing comfort control.

Sloped Drain Pans

Standard on every unit.

Standardized Components

Components are placed in the same location on all Voyager units. Familiarize yourself with one Voyager and you are familiar with every Voyager.

Due to standardized components throughout the Voyager line, contractors/owners can stock fewer parts.

Supply and/or Return Air Smoke Detector

With this option installed, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. Return Air Smoke Detectors require minimum allowable airflow when used with certain models.

Tool-less Hail Guards

Tool-less coil guards are constructed of heavy gauge steel designed to protect coil from hail or vandal damage.

Hail guards are either factory- or field-installed for condenser coil protection.

Trane Communication Interface (TCI)

Available factory or field installed. This module when applied with the ReliaTel™ easily interfaces with Trane's Integrated Comfort™ System.

VariTrac

When Trane's changeover VAV System for light commercial applications is coupled with Voyager, it provides the latest in technological advances for comfort management systems and can allow thermostat control in every zone served by VariTrac.

Ventilation Override Accessory

With the Ventilation Override Accessory installed, the unit can be set to transition to up to 3 different pre-programmed sequences for Smoke Purge, Pressurization, and Exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard-wired relay output from a smoke detector or fire control panel. The ventilation override kit is available as a field installed accessory.

Zone Sensors

Available in programmable, automatic and manual styles.

Rigorous Testing

The fan and idler arm assembly designs have been tested to over 300,000 cycles each. Our combined cycle testing is now over 7 million cycles.

All of Voyager's designs were rigorously rain-tested at the factory to ensure water integrity.

Actual shipping tests were performed to determine packaging requirements. Units were test shipped around the country to determine the best packaging. Factory shake and drop tests were used as part of the package design process to help assure that the unit arrives at the job site in top condition.

Rigging tests include lifting a unit into the air and letting it drop one foot, assuring that the lifting lugs and rails hold up under stress.

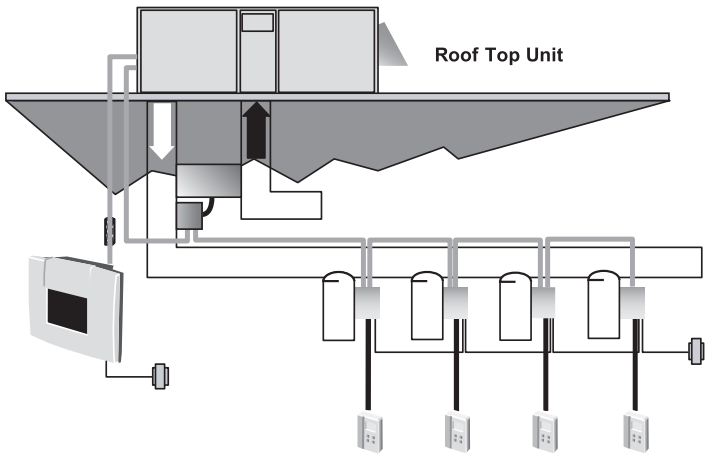
We perform a 100% coil leak test at the factory. The evaporator and condenser coils are leak tested at 200 psig and pressure tested to 450 psig.

All parts are inspected at the point of final assembly. Sub-standard parts are identified and rejected immediately.

Every unit receives a 100% unit run test before leaving the production line to make sure it lives up to rigorous Trane requirements.

Voyager units incorporate either a one piece top or the Trane-Tite-Top (T^3). Each part of the top (either two or three pieces) overlaps in such a way that water cannot leak into the unit. These overlapped edges are gasketed and sealed to ensure superior water integrity.

VariTrac ™



Easy to Install and Service

The dedicated design units (either downflow or horizontal) require no panel removal or alteration time to convert in the field — a major cost savings during installation.

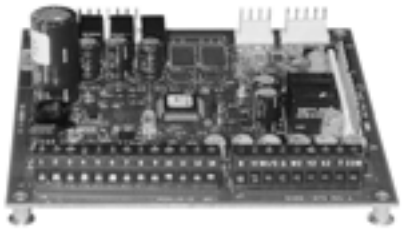
Horizontal units come complete with duct flanges so the contractor doesn't have to field-fabricate them. These duct flanges are a time and cost saver.

Easy Access Low Voltage Terminal Board

Voyager's Low Voltage Terminal Board is external to the electrical control cabinet. It is extremely easy to locate and operate the test mode. This is another installation feature that saves both cost and time.

Low Voltage Connections

The wiring of the low voltage connections to the unit and the zone sensors is as simple as 1-1, 2-2, and 3-3. This simplified system makes it easy for the installer to wire.



Electric Heaters

Electric heat modules are available within the basic unit. If ordering the Through the Base Electrical option with an Electrical Heater, the heater must be factory installed.

Powered or Unpowered Convenience Outlet

This option is a GFCI, 120v/15amp, 2 plug, convenience outlet, either powered or unpowered. This option can only be ordered when the Through the Base Electrical or Horizontal Side Access with either the Disconnect Switch, or Circuit Breaker, option is ordered. This option is available on all downflow models.

Single Point Power

A single electrical connection powers the unit.

Single Side Service

Single side service is standard on all units.

Through the Base Electrical/ Horizontal Side Access with Circuit Breaker

This option is a factory installed thermal-magnetic, molded case, HACR Circuit Breaker with provisions for through the base electrical connections.

Through the Base Electrical/ Horizontal Side Access with Disconnect Switch

Factory installed 3-pole, molded case, disconnect switch with provisions for through the base electrical connections are available.

Through the Base Utilities Access

An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through the base of the unit. This option will allow for field installation of liquid-tight conduit and an external, field-installed disconnect switch.

Factory Installed Options

A wide variety of Factory Installed Options (FIOPs) are available.

Added Efficiency

Airflow

Airflow performance is outstanding. The Voyager can replace an older machine with old ductwork and, in many cases, improve the comfort through better air distribution.

High Efficiency Motors

This option is available with efficiency ratings from 86.5 up to 91.0. It is not available for all models.

U-shaped Airflow

U-shaped airflow allows for improved static capabilities.

Low Ambient Cooling

Cooling capabilities down to 0°F as standard.

Oversized Motors

Factory or field installed oversized motors available for high static applications.

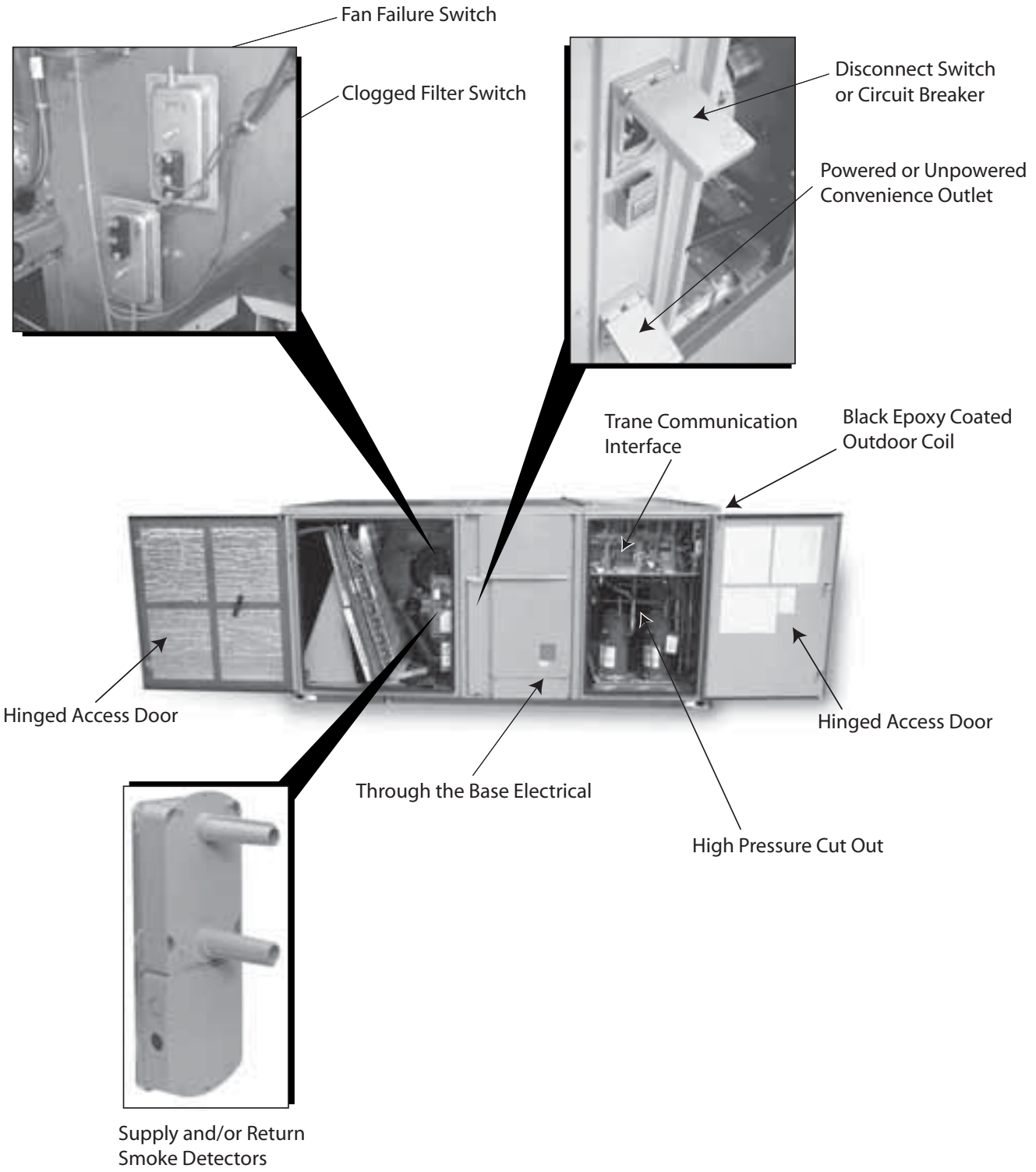
One of our Finest Assets:

Trane Sales Representatives are a support group that can assist you with:

- Product
- Application
- Service
- Training
- Special Applications
- Specifications
- Computer Programs and much more

Voyager has the features and benefits that make it first class in the light commercial rooftop market. Designed with input from field contractors and engineers, its U-shaped airflow performance is outstanding.

Factory Installed Options (FIOPS)



Application Considerations

Application of this product should be within the catalogued airflow and cooling considerations.

Low Ambient Cooling

This Voyager line features, as a standard, low ambient cooling down to 0°F. Contact your local Trane Representative for more assistance with low ambient cooling applications.

Barometric Relief

This product line offers an optional barometric relief damper included in the downflow economizer accessory. This accessory consists of gravity dampers which open with increased pressure. As the building air pressure increases, the pressure in the unit return air section also increases, opening the dampers and relieving the conditioned space.

Note: *THE EFFECTIVENESS OF BAROMETRIC RELIEF DAMPER DURING ECONOMIZING OPERATION IS SYSTEM RELATED.*

PRESSURE DROP OF THE RETURN AIR SYSTEM SHOULD BE CONSIDERED TO CONTROL BUILDING PRESSURIZATION.

Power Exhaust Accessory

The power exhaust accessory is available on all downflow units. This accessory can be field installed and will assist in relieving a building's pressurization.

Condensate Trap

The evaporator is a draw-thru configuration. A trap must be field provided prior to start-up on the cooling cycle.

Clearance Requirements

The recommended clearances identified with unit dimensions should be maintained to assure adequate serviceability, maximum capacity and peak operating efficiency. Actual clearances which appear inadequate should be reviewed with the local Trane sales personnel.

Unit Pitch

These units have sloped condensate drain pans. Units must be installed level, any unit slope must be toward access side of unit.

Selection Procedure

Cooling Capacity

Step 1

Calculate the building's total and sensible cooling loads at design conditions. Use the Trane calculation form or any other standard accepted method.

Step 2

Given the following building requirements:

A. Electrical Characteristics: 460/60/3

B. Summer Design Conditions:
Entering Evaporator Coil: 80 DB/ 67 WB
Outdoor Ambient: 95 DB

C. Total Cooling Load: 172 MBh

D. Sensible Cooling Load: 122 MBh

E. Airflow: 6000 cfm

F. External Static Pressure: .50 in. w.g.

G. Rooftop - downflow configuration.

H. Accessories, Economizer, Supplementary Electric Heat

I. Heating Capacity 88 MBh
460 volt/3 phase Electric Supplemental Heat - at 6000 cfm

Size the equipment using Table 5. As a starting point, a rough determination of the size of the unit must be made. This selection will then be confirmed after examining the performance at the given conditions. Divide the total cooling load by nominal BTUH per ton (12 MBh per ton); then round up to the nearest unit size. 172 MBh/12 MBh = 14.33 (approx. 15 tons.)

Step 3

Table 5 shows that a WCD180B4 has a gross cooling capacity of 180.0 MBh and 128.0 MBh sensible capacity at 95°F ambient and 6000 cfm with 80 DB/67 WB air entering the evaporator.

To Find Capacity at Intermediate Conditions

When the design conditions are between two numbers that are in the capacity table, interpolation is required to approximate the capacity.

Note: Extrapolation outside of the table conditions is not recommended.

Step 4

Verify that there will be enough capacity by determining net capacity. In order to select the correct unit which meets the building's requirements, the fan motor heat must be deducted from the gross cooling capacity. The amount of heat that the fan motor generates is dependent on the effort by the motor CFM and static pressure. To determine the total unit static pressure, add the following:

External Static: 0.50 in.

Standard Filter 1 in: 0.11 in. (from Table 15)

Economizer Return Air: 0.04 in. (from Table 15)

Electric Heater Size 18 kW: .06 in.

Total Static Pressure: .71 in.

Note: The Evaporator Fan Performance Table 10 has already accounted for the pressure drop for standard filters and wet coils.

Therefore, the actual Total Static Pressure is .71 - .11 = .60. With 6000 CFM and .60 inches, Table 10 shows 2.66 Bhp.

The note below Table 10 gives a formula to calculate Fan Motor Heat:

3.15 x bhp = MBh
3.15 x 2.66 = 8.38 MBh

Now subtracting the fan motor heat from the gross cooling capacity of the unit:

Net Total Cooling Capacity =

183-8.38=170.62

Net Sensible Cooling Capacity =

129-8.38=120.62

Step 5

If the performance will not meet the required load of the building, try a selection at the next higher size unit.

Heating Capacity

Step 1

Calculate the building heating load using the Trane calculation form or other standard accepted method.

Step 2

Size the equipment using Table 18 to match the heating loads at design conditions.

A. Total Heating Load: 88 MBh

B. Outdoor Ambient (Winter) 17 DB

C. Indoor Return Temperature: 70 DB

D . Airflow: 6000 CFM

Use the integrated portion of Table 18 for the WCD180B4 to determine capacity at winter design conditions. The mechanical heating portion of the heat pump will provide 45 MBh.

Step 3

Because 45 MBh is less than the building's required heating capacity at winter design conditions, a supplementary heater must be selected.

88 MBh - 45 MBh = 43 MBh

From Table 22, at 480 volts, the 18 kW Heater will be adequate to do the job.

18 kW 61 MBh

From Table 28 select heater AYDHTRK418A (18 kW 460/60/3).

Model Number Description

Packaged Heat Pump Unit Model Nomenclature

W	C	D	1	5	0	C	3	0	0	B	A
1	2	3	4	5	6	7	8	9	10	11	12

Digits 1,2 Product Type

WC= Heat Pump, Packaged

WF= With Factory Installed Options

Digit 3 - Airflow Configuration

D = Downflow

H = Horizontal

Digits 4, 5, 6 - Nominal Gross Cooling Capacity (MBh)

150 = 12½ tons

180 = 15 tons

240 = 20 tons

Digit 7- Major Development Sequence

Digit 8 - Electrical Characteristics

3 = 208-230/60/3

4 = 460/60/3

W = 575/60/3

Digits 9, 10 - Factory Installed Options

00 = Packed Stock, No Options

0A = Factory Installed Downflow Economizer

0B = Oversize Motor

0C = Downflow Economizer and Oversize Motor

0F = Trane Communications Interface (TCI)

0G = Downflow Economizer and TCI

Digit 11- Minor Design Sequence

Digit 12- Service Digit

General Data

Table 1. General Data

	12½ Tons Downflow and Horizontal Units	
	WCD150B3, B4, BW	**WCH150B3, B4, BW**
Cooling Performance[i]		
Gross Cooling Capacity	152,00	152,000
EER[ii]	9.5	9.5
Nominal CFM / ARI Rated CFM	4,400 / 4,400	4,400 / 4,400
ARI Net Cooling Capacity	144,000	144,000
Integrated Part Load Value[iii]	9.9	9.9
System Power KW	15.16	15.16
Heating Performance[i]		
High Temp. Btuh Rating	135,000	132,000
System Power KW/COP	12.76/3.10	12.48/3.10
Low Temp. Btuh Rating	78,000	72,000
System Power KW/COP	10.88/2.1	10.55/2.0
HSPF (Btu/Watts-hr)	-	-
Compressor		
No./Type	2/Scroll	2/Scroll
ARI Sound Rating (BELS)[iv]	9.2	9.2
Outdoor Coil — Type	Hi-Performance	Hi-Performance
Tube Size (in.) OD	.375	.375
Face Area (sq ft)	23.96	23.96
Rows/FPI	2/16	2/16
Refrigerant Control	Expansion Valve	Expansion Valve
Indoor Coil — Type	Hi-Performance	Hi-Performance
Tube Size (in.)	.375	.375
Face Area (sq ft)	15.83	17.50
Rows/FPI	2/15	2/15
Refrigerant Control	Capillary Tube	Capillary Tube
Drain Connection No./Size (in.)	1/1.00 NPT	1/1.00 NPT
Outdoor Fan — Type	Propeller	Propeller
No. Used/Diameter (in.)	2/26	2/26
Drive Type/No. Speeds	Direct/1	Direct/1
CFM	10,800	10,800
No. Motors/HP	2/.50	2/.50
Motor RPM	1,110	1,110
Indoor Fan - Type	FC Centrifugal	FC Centrifugal
No. Used	1	1
Diameter x Width (in.)	15 x 15	15 x 15
Drive Type/No. Speeds	Belt/1	Belt/1
No. Motors	1	1
Motor HP (Standard/Oversized)	3.0/5.0	3.0/5.0
Motor RPM (Standard/Oversized)	1,740/3,450	1,740/3,450
Motor Frame Size (Standard/Oversized)	145T/145T	145T/145T

Table 1. General Data (continued)

	12½ Tons Downflow and Horizontal Units	
	WCD150B3, B4, BW	**WCH150B3, B4, BW**
Filters - Type Furnished[v]	Throwaway	Throwaway
(No.) Size Recommended (in.)	(2) 20 x 20 x 2	(2) 20 x 20 x 2
	(4) 20 x 25 x 2	(4) 20 x 25 x 2
Refrigerant Charge (Lbs of R-22)[vi]	11.1/11.4 Circuit	11.5/11.8 Circuit

(i) Cooling Performance and Heating Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Certified in accordance with the Unitary Large Equipment certification program, which is based on ARI Standard 340/360-93.
(ii) EER is rated at ARI conditions and in accordance with ASHRAE test procedures.
(iii) EER is rated at ARI conditions and in accordance with ASHRAE test procedures.
(iv) Sound Rating shown is tested in accordance with ARI Standard 270 or 370.
(v) Optional 2 inch pleated filter also available.
(vi) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

Table 2. General Data

	15 Tons Downflow and Horizontal Units	20 Tons Downflow and Horizontal Units	
	WC*180B3, B4, BW	WCD240B3, B4, BW	WCH240B3, B4, BW
Cooling Performance[i]			
Gross Cooling Capacity	180,000	233,000	237,000
EER[ii]	9.6	9.8	10.5
Nominal CFM / ARI Rated CFM	6,000 / 5,300	8,000 / 8,000	8,000/7,000
ARI Net Cooling Capacity	168,000	222,000	224,000
Integrated Part Load Value[iii]	10.0	9.7	10.3
System Power KW	17.50	22.2	21.3
Heating Performance[iv]			
High Temp. Btuh Rating	166,000	208,000	204,000
System Power KW/COP	15.69/3.10	19.65/3.10	19.29/3.10
Low Temp. Btuh Rating	88,000	118,000	118,000
System Power KW/COP	13.12/2.1	18.75/2.0	17.29/2.00
Compressor			
No./Type	2/Scroll	2/Scroll	2/Scroll
Sound Rating (BELS)[v]	9.2	9.4	9.4
Outdoor Coil — Type	Hi-Performance	Hi-Performance	Hi-Performance
Tube Size (in.) OD	.375	.375	.375
Face Area (sq ft)	27.12	35.3	35.3
Rows/FPI	3/16	3/16	3/16
Refrigerant Control	Expansion Valve	Expansion Valve	Expansion Valve
Indoor Coil — Type	Hi-Performance	Hi-Performance	Hi-Performance
Tube Size (in.)	.375	.375	.375
Face Area (sq ft)	17.50	26.00	26.00
Rows/FPI	3/15	3/15	3/15
Refrigerant Control	Short Orifice	Capillary Tube	Capillary Tube
Drain Connection No./Size (in.)	1/1.00 NPT	1/1.00 NPT	1/1.00 NPT
Outdoor Fan — Type	Propeller	Propeller	Propeller
No. Used/Diameter (in.)	2/26	2/28	2/28
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
CFM	10,200	13,800	13,800
No. Motors/HP	2/.50	2/1.0	2/1.0
Motor RPM	1,100	1,125	1,125

Table 2. General Data (continued)

	15 Tons Downflow and Horizontal Units	20 Tons Downflow and Horizontal Units	
	WC*180B3, B4, BW	WCD240B3, B4, BW	WCH240B3, B4, BW
Indoor Fan — Type	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used	1		1
Diameter x Width (in.)	15 x 15	18 x 18	18 x 18
Drive Type/No. Speeds	Belt/1	Belt/1	Belt/1
No. Motors	1	1	1
Motor HP (Standard/Oversized)	3.0/5.0	5.0/7.5	5.0/7.5
Motor RPM (Standard/Oversized)	1,740/3,450	3,450/3,450	3,450/3,450
Motor Frame Size (Standard/Oversized)	145T/145T	184T/184T	184T/184T
Filters - Type Furnished(vi)	Throwaway	Throwaway	Throwaway
(No.) Size Recommended (in.)	(2) 20 x 20 x 2	(4) 20 x 20 x 2	(8) 20 x 25 x 2
	(4) 20 x 25 x 2	(4) 20 x 25 x 2	
Refrigerant Charge (Lbs of R-22)(vii)	19.9/9.9 Circuit	22.0/21.0 Circuit	22.0/21.0 Circuit

(i) Cooling Performance and Heating Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Certified in accordance with the Unitary Large Equipment certification program, which is based on ARI Standard 340/360-93.
(ii) EER is rated at ARI conditions and in accordance with ASHRAE test procedures.
(iii) Integrated Part Load Value is based in accordance with ARI Standard 210/240 or 340. Units are rated at 80°F entering dry bulb, and 67°F entering wet bulb at ARI rated cfm.
(iv) Cooling Performance and Heating Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Certified in accordance with the Unitary Large Equipment certification program, which is based on ARI Standard 340/360-93.
(v) Sound Rating shown is tested in accordance with ARI Standard 270 or 370.
(vi) Optional 2 inch pleated filter also available.
(vii) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

*Indicates both downflow and horizontal units.

Performance Data

Table 3. Gross Cooling Capacities (MBH) 12½ Tons Downflow Three Phase WCD150B

		Ambient Temperature																					
		85						95						105						115			
Air	Ent	Entering Wet Bulb																					
Flow	DB	61		67		73		61		67		73		61		67		73		61		67		73	
CFM	°F	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC
4500	75	140.0	113.0	153.0	90.8	158.0	57.9	128.0	106.0	149.0	83.3	160.0	56.3	116.0	99.8	137.0	83.3	157.0	53.5	104.0	93.3	124.0	77.1	148.0	48.9
	80	141.0	134.0	154.0	105.0	159.0	78.3	130.0	128.0	149.0	104.0	161.0	77.4	119.0	119.0	138.0	98.3	157.0	74.3	109.0	109.0	125.0	91.8	148.0	69.6
	85	146.0	146.0	155.0	124.0	160.0	94.3	139.0	139.0	150.0	125.0	162.0	95.8	129.0	129.0	138.0	119.0	158.0	94.9	119.0	119.0	125.0	113.0	148.0	90.2
	90	153.0	153.0	156.0	143.0	162.0	111.0	148.0	148.0	151.0	145.0	163.0	114.0	140.0	140.0	139.0	139.0	158.0	114.0	130.0	130.0	129.0	129.0	148.0	111.0
5000	75	143.0	119.0	154.0	93.5	159.0	59.0	132.0	113.0	152.0	87.2	161.0	57.4	119.0	106.0	141.0	88.6	159.0	54.8	107.0	99.5	127.0	82.3	151.0	50.9
	80	145.0	141.0	156.0	108.0	160.0	79.2	134.0	134.0	152.0	109.0	162.0	79.5	124.0	124.0	141.0	104.0	160.0	77.2	114.0	114.0	128.0	97.5	151.0	72.9
	85	150.0	150.0	157.0	128.0	162.0	97.0	145.0	145.0	153.0	131.0	164.0	98.4	135.0	135.0	142.0	127.0	160.0	98.9	125.0	125.0	129.0	120.0	152.0	95.3
	90	156.0	156.0	158.0	148.0	164.0	112.0	153.0	153.0	155.0	153.0	165.0	118.0	146.0	146.0	146.0	146.0	161.0	120.0	136.0	136.0	136.0	136.0	152.0	118.0
5500	75	145.0	124.0	155.0	96.1	160.0	60.0	135.0	119.0	153.0	90.7	162.0	58.5	122.0	112.0	144.0	93.8	160.0	55.7	110.0	105.0	130.0	87.4	154.0	52.4
	80	147.0	147.0	157.0	111.0	162.0	80.5	139.0	139.0	154.0	113.0	163.0	80.9	129.0	129.0	144.0	110.0	161.0	79.9	118.0	118.0	131.0	103.0	154.0	75.9
	85	153.0	153.0	158.0	132.0	164.0	97.4	149.0	149.0	155.0	137.0	165.0	101.0	140.0	140.0	145.0	134.0	162.0	102.0	130.0	130.0	132.0	128.0	154.0	100.0
	90	159.0	159.0	160.0	152.0	166.0	115.0	157.0	157.0	157.0	157.0	166.0	121.0	151.0	151.0	151.0	151.0	163.0	125.0	141.0	141.0	141.0	141.0	154.0	124.0
6000	75	147.0	128.0	156.0	98.4	160.0	60.0	138.0	125.0	155.0	92.7	163.0	59.5	125.0	118.0	147.0	88.6	161.0	57.2	112.0	111.0	132.0	92.4	155.0	52.5
	80	150.0	150.0	158.0	113.0	162.0	81.2	144.0	144.0	156.0	117.0	164.0	82.1	133.0	133.0	147.0	115.0	162.0	82.1	122.0	122.0	133.0	108.0	156.0	78.7
	85	156.0	156.0	159.0	135.0	164.0	98.4	153.0	153.0	157.0	142.0	166.0	103.0	145.0	145.0	148.0	141.0	163.0	106.0	134.0	134.0	134.0	134.0	156.0	104.0
	90	160.0	160.0	161.0	156.0	166.0	116.0	160.0	160.0	160.0	160.0	167.0	123.0	155.0	155.0	155.0	155.0	165.0	129.0	146.0	146.0	146.0	146.0	157.0	130.0

Notes:
1. Dry Coil Condition. Total Gross Cooling Capacity (MBH) shown to the left is not applicable. In this case the Sensible Heat Capacity (SHC) is the total capacity.
2. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat.
3. MBH = Total Gross Capacity
4. SHC = Sensible Heat Capacity

Table 4. Gross Cooling Capacities (MBH) 12½ Tons Horizontal Three Phase WCH150B

		Ambient Temperature																					
		85						95						105						115			
Air	Ent	Entering Wet Bulb																					
Flow	DB	61		67		73		61		67		73		61		67		73		61		67		73	
CFM	°F	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC
4500	75	140.0	113.0	153.0	91.1	159.0	58.0	128.0	106.0	149.0	83.3	160.0	56.2	116.0	100.0	137.0	82.9	157.0	53.5	104.0	93.5	124.0	76.7	147.0	48.9
	80	141.0	134.0	154.0	105.0	160.0	78.3	130.0	128.0	149.0	104.0	161.0	77.5	119.0	119.0	138.0	98.4	157.0	74.3	109.0	109.0	124.0	91.9	148.0	69.6
	85	146.0	146.0	155.0	124.0	161.0	94.3	139.0	139.0	149.0	125.0	162.0	96.0	129.0	129.0	138.0	119.0	158.0	95.0	119.0	119.0	125.0	113.0	148.0	90.2
	90	153.0	153.0	156.0	143.0	163.0	110.0	148.0	148.0	151.0	145.0	163.0	114.0	140.0	140.0	139.0	139.0	158.0	115.0	130.0	130.0	129.0	129.0	148.0	111.0
5000	75	143.0	119.0	154.0	93.3	160.0	59.0	132.0	113.0	151.0	86.8	161.0	57.4	119.0	106.0	141.0	88.2	159.0	54.7	107.0	99.8	127.0	81.8	151.0	50.8
	80	145.0	142.0	156.0	109.0	162.0	79.9	134.0	134.0	152.0	109.0	162.0	79.6	124.0	124.0	141.0	104.0	159.0	77.3	114.0	114.0	128.0	97.7	151.0	72.9
	85	150.0	150.0	157.0	129.0	164.0	96.6	145.0	145.0	152.0	131.0	164.0	98.7	135.0	135.0	142.0	127.0	160.0	99.1	125.0	125.0	129.0	121.0	151.0	95.5
	90	156.0	156.0	158.0	149.0	164.0	112.0	153.0	153.0	153.0	153.0	165.0	118.0	146.0	146.0	146.0	146.0	161.0	120.0	136.0	136.0	136.0	136.0	151.0	118.0
5500	75	145.0	124.0	156.0	95.9	160.0	60.1	135.0	119.0	153.0	90.8	162.0	58.5	122.0	112.0	144.0	93.2	160.0	55.8	110.0	106.0	130.0	86.9	153.0	52.3
	80	147.0	147.0	157.0	111.0	162.0	80.8	139.0	139.0	154.0	114.0	163.0	81.0	129.0	129.0	144.0	110.0	161.0	80.1	118.0	118.0	130.0	103.0	154.0	76.0
	85	154.0	154.0	158.0	133.0	164.0	97.9	149.0	149.0	155.0	137.0	165.0	101.0	140.0	140.0	145.0	135.0	162.0	103.0	130.0	130.0	132.0	128.0	154.0	100.0
	90	159.0	159.0	160.0	153.0	166.0	115.0	157.0	157.0	157.0	157.0	167.0	121.0	151.0	151.0	151.0	151.0	163.0	125.0	141.0	141.0	141.0	141.0	154.0	124.0
6000	75	147.0	129.0	157.0	98.2	161.0	60.6	138.0	125.0	155.0	92.9	163.0	59.5	125.0	118.0	146.0	88.7	161.0	57.1	111.0	111.0	132.0	91.8	155.0	52.5
	80	150.0	150.0	158.0	114.0	163.0	81.5	144.0	144.0	156.0	118.0	164.0	82.1	133.0	133.0	147.0	115.0	162.0	82.3	122.0	122.0	133.0	109.0	155.0	78.8
	85	156.0	156.0	160.0	136.0	165.0	99.1	153.0	153.0	157.0	143.0	166.0	103.0	145.0	145.0	148.0	142.0	163.0	106.0	134.0	134.0	134.0	134.0	156.0	105.0
	90	161.0	161.0	162.0	157.0	167.0	117.0	160.0	160.0	160.0	160.0	168.0	124.0	155.0	155.0	155.0	155.0	164.0	130.0	146.0	146.0	146.0	146.0	156.0	130.0

Notes:
1. Dry Coil Condition. Total Gross Cooling Capacity (MBH) shown to the left is not applicable. In this case the Sensible Heat Capacity (SHC) is the total capacity.
2. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat.
3. MBH = Total Gross Capacity
4. SHC = Sensible Heat Capacity

Table 5. Gross Cooling Capacities (MBH) 15 Tons Downflow and Horizontal Three Phase WC*180B

		Ambient Temperature																					
		85						95						105						115			
Air	Ent	Entering Wet Bulb																					
Flow	DB	61		67		73		61		67		73		61		67		73		61		67		73	
CFM	°F	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC
5400	75	162.3	130.3	184.5	103.3	194.1	71.1	150.5	124.1	176.5	99.0	190.3	68.4	137.5	117.3	163.6	93.0	185.5	65.5	124.8	110.8	149.4	94.8	176.1	61.2
	80	163.8	154.2	185.1	126.5	195.7	95.8	152.7	148.2	176.7	122.2	191.5	92.1	139.3	139.3	163.8	116.2	186.0	88.8	129.4	129.4	150.0	109.7	176.4	84.3
	85	170.5	170.5	185.5	148.7	197.4	115.8	161.6	161.6	177.1	145.3	192.1	113.7	151.3	151.3	164.3	139.4	186.7	111.8	141.5	141.5	151.0	133.1	176.7	107.3
	90	181.0	181.0	186.7	170.9	201.0	136.9	173.5	173.5	178.5	168.4	194.9	135.7	163.7	163.7	166.9	163.2	187.1	133.8	153.8	153.8	153.7	153.7	177.0	130.2
6000	75	167.0	137.5	187.0	106.7	195.3	71.7	154.8	131.2	179.7	102.8	191.7	69.1	141.4	124.3	167.8	97.3	187.5	66.4	128.5	117.7	153.8	90.9	178.8	62.4
	80	169.2	163.7	187.6	131.0	197.2	98.1	156.0	156.0	180.0	128.0	193.2	95.1	145.5	145.5	168.0	122.6	188.3	91.8	135.3	135.3	154.1	116.1	179.2	87.6
	85	177.5	177.5	188.5	154.8	199.6	118.6	168.9	168.9	180.6	152.9	194.1	116.7	158.3	158.3	168.8	147.9	188.7	116.2	148.1	148.1	155.5	141.6	179.6	112.5
	90	186.6	186.6	190.1	178.4	202.6	140.1	180.0	180.0	182.7	177.5	197.3	140.3	171.1	171.1	171.0	171.0	189.9	139.5	161.1	161.1	161.2	161.2	180.0	136.8
6600	75	170.8	144.2	188.9	110.1	196.2	72.6	158.6	137.9	182.2	106.4	192.7	70.2	144.9	131.0	171.3	101.3	188.8	67.3	131.8	124.4	157.2	95.0	180.7	63.4
	80	173.6	172.6	189.7	134.9	198.3	99.3	162.1	162.1	182.7	133.3	194.4	97.9	151.1	151.1	171.5	128.5	190.0	94.7	140.6	140.6	157.6	122.2	181.2	90.5
	85	182.5	182.5	191.0	160.1	200.5	120.2	175.0	175.0	183.6	159.7	195.9	119.6	164.6	164.6	172.7	155.9	190.8	119.7	154.0	154.0	159.6	149.9	181.6	117.1
	90	190.6	190.6	192.9	184.7	202.3	140.8	184.9	184.9	186.2	185.4	199.1	144.1	177.1	177.1	177.0	177.0	192.1	144.4	167.4	167.4	167.3	167.3	182.6	142.8
7200	75	174.0	150.5	190.0	112.2	196.9	73.6	162.1	144.4	184.2	109.7	193.5	71.2	148.1	137.4	174.0	105.0	189.9	68.2	134.8	130.7	160.2	98.8	182.1	64.2
	80	176.7	176.7	191.4	138.3	199.1	100.2	167.6	167.6	184.8	137.8	195.7	99.2	156.3	156.3	174.3	134.1	190.7	97.2	145.4	145.4	160.6	128.0	182.9	93.4
	85	186.4	186.4	192.9	164.7	201.5	121.7	179.6	179.6	186.0	165.5	197.7	122.4	170.1	170.1	175.9	163.3	192.4	122.8	159.4	159.4	163.2	157.7	183.5	121.0
	90	193.8	193.8	195.1	190.1	203.3	143.0	188.6	188.6	188.5	188.5	200.6	147.4	181.9	181.9	181.7	181.7	193.9	148.7	172.6	172.6	172.5	172.5	184.6	148.2

Notes:

1. Dry Coil Condition. Total Gross Cooling Capacity (MBH) shown to the left is not applicable. In this case the Sensible Heat Capacity (SHC) is the total capacity.
2. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat.
3. MBH = Total Gross Capacity
4. SHC = Sensible Heat Capacity

Table 6. Gross Cooling Capacities (MBH) 20 Tons DownflowThree Phase WCD240B

		Ambient Temperature																					
		85						95						105						115			
Air	Ent	Entering Wet Bulb																					
Flow	DB	61		67		73		61		67		73		61		67		73		61		67		73	
CFM	°F	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC
7200	75	212.0	177.0	233.0	137.0	243.0	89.7	198.0	173.0	228.0	133.0	244.0	87.3	179.0	164.0	211.0	130.0	239.0	83.1	160.0	154.0	189.0	115.0	225.0	76.8
	80	219.0	218.0	234.0	165.0	246.0	122.0	204.0	204.0	229.0	168.0	247.0	123.0	188.0	188.0	212.0	160.0	240.0	118.0	172.0	172.0	190.0	150.0	225.0	112.0
	85	229.0	229.0	236.0	197.0	249.0	148.0	220.0	220.0	231.0	202.0	249.0	153.0	205.0	205.0	215.0	196.0	242.0	153.0	189.0	189.0	194.0	186.0	226.0	146.0
	90	238.0	238.0	238.0	227.0	252.0	174.0	234.0	234.0	233.0	233.0	252.0	183.0	222.0	222.0	222.0	222.0	242.0	186.0	206.0	206.0	206.0	206.0	227.0	181.0
8000	75	218.0	193.0	237.0	144.0	244.0	91.2	204.0	185.0	232.0	139.0	246.0	89.1	184.0	175.0	216.0	131.0	242.0	85.0	162.0	162.0	193.0	128.0	229.0	78.8
	80	224.0	224.0	239.0	173.0	247.0	123.0	213.0	213.0	233.0	176.0	249.0	126.0	196.0	196.0	217.0	170.0	243.0	124.0	180.0	180.0	195.0	160.0	230.0	117.0
	85	234.0	234.0	241.0	207.0	250.0	150.0	228.0	228.0	235.0	213.0	252.0	158.0	215.0	215.0	221.0	210.0	244.0	159.0	197.0	197.0	197.0	197.0	230.0	155.0
	90	242.0	242.0	245.0	238.0	253.0	178.0	240.0	240.0	240.0	240.0	254.0	190.0	231.0	231.0	231.0	231.0	246.0	195.0	216.0	216.0	216.0	216.0	232.0	193.0
8800	75	223.0	201.0	238.0	148.0	245.0	93.4	209.0	196.0	235.0	145.0	248.0	90.6	189.0	186.0	220.0	138.0	244.0	86.8	168.0	168.0	196.0	136.0	232.0	80.6
	80	229.0	229.0	241.0	177.0	248.0	139.0	220.0	220.0	236.0	184.0	250.0	128.0	204.0	204.0	221.0	180.0	246.0	129.0	186.0	186.0	199.0	170.0	233.0	122.0
	85	238.0	238.0	244.0	212.0	252.0	152.0	234.0	234.0	239.0	223.0	253.0	161.0	222.0	222.0	226.0	223.0	247.0	165.0	205.0	205.0	205.0	205.0	233.0	164.0
	90	245.0	245.0	247.0	245.0	255.0	181.0	245.0	245.0	245.0	245.0	256.0	195.0	238.0	238.0	238.0	238.0	249.0	203.0	224.0	224.0	224.0	224.0	236.0	205.0
9600	75	226.0	208.0	241.0	151.0	246.0	94.2	214.0	206.0	236.0	148.0	249.0	91.4	191.0	191.0	223.0	144.0	245.0	88.6	174.0	174.0	199.0	143.0	235.0	82.4
	80	232.0	232.0	243.0	185.0	250.0	126.0	226.0	226.0	238.0	190.0	251.0	115.0	211.0	211.0	225.0	189.0	247.0	123.0	193.0	193.0	203.0	179.0	235.0	127.0
	85	241.0	241.0	245.0	222.0	253.0	155.0	239.0	239.0	242.0	231.0	255.0	165.0	229.0	229.0	229.0	229.0	249.0	170.0	212.0	212.0	212.0	212.0	236.0	171.0
	90	248.0	248.0	247.0	247.0	256.0	184.0	248.0	248.0	248.0	248.0	258.0	200.0	243.0	243.0	243.0	243.0	252.0	210.0	231.0	231.0	231.0	231.0	239.0	215.0

Notes:
1. Dry Coil Condition. Total Gross Cooling Capacity (MBH) shown to the left is not applicable. In this case the Sensible Heat Capacity (SHC) is the total capacity.
2. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat.
3. MBH = Total Gross Capacity
4. SHC = Sensible Heat Capacity

Table 7. Gross Cooling Capacities (MBH) 20 Tons Horizontal Three Phase WCD240B

		Ambient Temperature																					
		85						95						105						115			
Air	Ent	Entering Wet Bulb																					
Flow	DB	61		67		73		61		67		73		61		67		73		61		67		73	
CFM	°F	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC
7200	75	217.0	181.0	238.0	140.0	248.0	91.4	202.0	177.0	233.0	136.0	249.0	88.9	183.0	167.0	215.0	132.0	244.0	84.7	163.0	157.0	192.0	117.0	229.0	78.3
	80	224.0	223.0	239.0	168.0	250.0	124.0	208.0	208.0	233.0	171.0	251.0	126.0	192.0	192.0	216.0	163.0	245.0	121.0	175.0	175.0	194.0	153.0	229.0	114.0
	85	233.0	233.0	241.0	201.0	253.0	151.0	224.0	224.0	235.0	206.0	254.0	156.0	209.0	209.0	219.0	200.0	246.0	156.0	192.0	192.0	198.0	190.0	230.0	149.0
	90	242.0	242.0	242.0	230.0	256.0	177.0	238.0	238.0	238.0	238.0	257.0	186.0	226.0	226.0	226.0	226.0	247.0	189.0	210.0	210.0	210.0	210.0	231.0	185.0
8000	75	223.0	197.0	241.0	147.0	249.0	93.5	208.0	188.0	236.0	142.0	251.0	90.8	188.0	178.0	220.0	134.0	247.0	86.6	165.0	165.0	196.0	130.0	233.0	80.3
	80	228.0	228.0	244.0	176.0	252.0	126.0	217.0	217.0	237.0	180.0	254.0	128.0	200.0	200.0	221.0	174.0	248.0	126.0	183.0	183.0	199.0	163.0	234.0	119.0
	85	238.0	238.0	246.0	211.0	255.0	153.0	233.0	233.0	240.0	217.0	256.0	161.0	219.0	219.0	225.0	214.0	249.0	163.0	201.0	201.0	201.0	201.0	234.0	158.0
	90	246.0	246.0	250.0	243.0	258.0	181.0	245.0	245.0	245.0	245.0	259.0	194.0	235.0	235.0	235.0	235.0	251.0	199.0	220.0	220.0	220.0	220.0	236.0	197.0
8800	75	228.0	205.0	243.0	151.0	250.0	95.2	213.0	200.0	239.0	147.0	252.0	92.3	193.0	189.0	224.0	140.0	249.0	88.5	172.0	172.0	200.0	138.0	237.0	82.1
	80	233.0	233.0	245.0	181.0	253.0	142.0	224.0	224.0	240.0	187.0	255.0	131.0	208.0	208.0	225.0	183.0	250.0	131.0	190.0	190.0	203.0	173.0	237.0	124.0
	85	242.0	242.0	248.0	216.0	256.0	155.0	239.0	239.0	243.0	227.0	258.0	165.0	227.0	227.0	230.0	227.0	252.0	169.0	209.0	209.0	209.0	209.0	238.0	167.0
	90	249.0	249.0	252.0	250.0	260.0	184.0	249.0	249.0	249.0	249.0	261.0	199.0	242.0	242.0	242.0	242.0	254.0	207.0	228.0	228.0	228.0	228.0	240.0	208.0
9600	75	231.0	212.0	245.0	153.0	251.0	96.0	218.0	210.0	241.0	151.0	253.0	93.1	195.0	195.0	227.0	146.0	250.0	90.3	177.0	177.0	203.0	146.0	239.0	84.0
	80	237.0	237.0	247.0	188.0	254.0	128.0	230.0	230.0	243.0	194.0	256.0	117.0	215.0	215.0	229.0	193.0	251.0	125.0	196.0	196.0	207.0	183.0	240.0	130.0
	85	245.0	245.0	249.0	226.0	258.0	158.0	243.0	243.0	246.0	236.0	260.0	168.0	233.0	233.0	233.0	233.0	253.0	173.0	216.0	216.0	216.0	216.0	241.0	175.0
	90	253.0	253.0	252.0	252.0	261.0	187.0	253.0	253.0	253.0	253.0	263.0	204.0	247.0	247.0	247.0	247.0	256.0	214.0	235.0	235.0	235.0	235.0	244.0	219.0

Notes:
1. Dry Coil Condition. Total Gross Cooling Capacity (MBH) shown to the left is not applicable. In this case the Sensible Heat Capacity (SHC) is the total capacity.
2. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat.
3. MBH = Total Gross Capacity
4. SHC = Sensible Heat Capacity

Table 8. Evaporator Fan Performance — 12½ Tons — WC*150B

	External Static Pressure (Inches of Water)																			
	.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3 HP Standard Motor & Field Supplied Low Static Drive[i]												3 HP Standard Motor & Drive							
4000	—	—	506	0.69	537	0.80	568	0.92	599	1.03	631	1.15	662	1.26	694	1.37	726	1.48	756	1.59
4500	511	0.87	541	0.98	572	1.09	603	1.21	634	1.32	664	1.43	693	1.55	721	1.68	749	1.81	777	1.94
5000	551	1.16	580	1.31	612	1.39	640	1.51	672	1.67	700	1.78	727	1.90	754	2.03	779	2.18	805	2.32
5500	597	1.54	626	1.68	656	1.80	682	1.89	709	2.04	738	2.22	763	2.34	788	2.46	813	2.60	837	2.76
6000	644	1.99	674	2.10	699	2.28	727	2.37	749	2.48	774	2.66	801	2.85	825	3.00	848	3.13	871	3.27
													3HP Standard Motor & High Static Drive Accessory							

Continued

	External Static Pressure (Inches of Water)																			
	1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90		2.00	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3 HP Standard Motor & Drive						3 HP Standard Motor & High Static Drive Accessory													
4000	786	1.70	815	1.82	843	1.94	870	2.06	897	2.20	923	2.34	949	2.48	974	2.64	998	2.80	1022	2.96
4500	806	2.06	833	2.18	860	2.30	886	2.43	912	2.56	937	2.69	962	2.83	986	2.98	1010	3.13	1033	3.28
5000	830	2.47	855	2.61	880	2.74	905	2.88	930	3.01	954	3.15	978	3.29	1001	3.43	1024	3.58	1047	3.73
5500	860	2.92	883	3.08	906	3.24	929	3.39	952	3.54	975	3.69	997	3.84	1020	3.99	1042	4.14	1064	4.29
6000	893	3.43	915	3.59	936	3.77	957	3.94	978	4.12	999	4.29	1020	4.46	1041	4.62	1062	4.78	1083	4.94
			5 HP Oversized Motor & Drive																	

[i] Field supplied fan sheave BK115 required. Field supplied belt may be necessary.

Notes:

1. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabulated data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
2. Fan motor heat (MBH) = 3.15 x Fan BHP.
3. Data includes pressure drop due to wet coils and filters.
4. No accessories or options are included in pressure drop data.
5. Refer to Table PD-13 to determine add'l static pressure drop due to other options/accessories.

Table 9. Evaporator Fan Performance — 15 Tons — WCD*180B

	External Static Pressure (Inches of Water)																			
	.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3 HP Standard Motor Drive										3 HP Standard Motor & Field Supplied High Static Drive[i]									
4800	691	1.64	723	1.81	751	1.97	778	2.13	808	2.32	836	2.51	861	2.68	885	2.86	909	3.04	931	3.22
5400	769	2.29	799	2.48	826	2.66	850	2.83	874	3.02	900	3.23	926	3.45	950	3.65	972	3.86	993	4.05
6000	848	3.09	875	3.30	901	3.51	924	3.71	946	3.90	967	4.09	991	4.33	1014	4.57	1037	4.81	1058	5.04
6600	928	4.06	953	4.30	977	4.53	999	4.76	1020	4.97	1039	5.18	1059	5.39	1080	5.64	1101	5.90	1122	6.17
7200	1008	5.22	1031	5.48	1053	5.74	1075	5.99	1095	6.24	1113	6.46	1131	6.69	1149	6.93	1168	7.18	1188	7.46
	5 HP Oversized Motor & Drive						7.5 HP Oversized Motor & Drive[ii]								5 HP Oversized Motor & Field Supplied High Static Drive[iii]					

Continued

	External Static Pressure (Inches of Water)																			
	1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90		2.00	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3 HP Standard Motor & Field Supplied High Static Drive[i]						5 HP Oversized Motor & Drive							5 HP Oversized Motor & Field Supplied High Static Drive[iii]						
4800	954	3.41	976	3.60	998	3.78	1020	3.98	1041	4.17	1062	4.38	1082	4.57	1102	4.76	1120	4.95	1138	5.14
5400	1014	4.25	1035	4.46	1055	4.66	1074	4.87	1095	5.08	1114	5.30	1133	5.51	1153	5.73	1171	5.94	1190	6.16
6000	1077	5.26	1097	5.48	1116	5.71	1134	5.93	1153	6.16	1171	6.38	1189	6.61	1207	6.85	1224	7.08	1242	7.31
6600	1143	6.43	1161	6.67	1180	6.92	1197	7.17	1215	7.41	1232	7.66	1249	7.91	1266	8.15	1282	8.41	-	-
7200	1207	7.74	1227	8.04	1245	8.32	1262	8.59	—	-	-	-	-	-	-	-	-	-	-	-
	7.5 HP Oversized Motor & Drive						Field Supplied 7.5 HP Oversized Motor[ii][iv]													

(i) Field Supplied Fan Sheave BK77 (1" bore) required.
(ii) 7.5HP motor kit BAYHSMT041 (208/460V), BAYHSMT042 (575V).
(iii) Field Supplied Motor Sheave 1VP50 (7/8" bore) required.
(iv) Field Supplied fan sheave BK115 (1" bore) required.

Notes:

1. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabulated data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
2. Fan motor heat (MBH) = 3.15 x Fan BHP.
3. Data includes pressure drop due to wet coils and filters.
4. No accessories or options are included in pressure drop data.
5. Refer to Table PD-13 to determine add'l static pressure drop due to other options/accessories.

Table 10. Evaporator Fan Performance — 15 Tons — WCH*180B

	External Static Pressure (Inches of Water)																			
	.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3 HP Standard Motor & Field Supplied Low Static Drive(i)							3 HP Standard Motor & Drive							3 HP Standard Motor & Field Supplied High Static Drive(ii)					
4800	637	1.36	670	1.50	700	1.63	743	1.88	801	2.32	850	2.72	884	3.01	908	3.17	931	3.32	953	3.47
5400	709	1.90	738	2.06	766	2.20	793	2.34	833	2.65	884	3.12	931	3.62	969	4.02	998	4.31	1019	4.49
6000	781	2.56	808	2.74	834	2.91	858	3.06	882	3.22	918	3.55	962	4.05	1009	4.63	1049	5.15	1081	5.57
6600	854	3.37	879	3.56	903	3.75	925	3.93	947	4.10	970	4.28	1001	4.62	1039	5.11	1082	5.72	1122	6.34
7200	927	4.33	951	4.55	973	4.76	994	4.96	1014	5.15	1035	5.34	1055	5.54	1081	5.85	1115	6.33	1152	6.94
	5 HP Oversized Motor & Drive							7.5 HP Oversized Motor & Drive							5 HP Oversized Motor & Field Supplied High Static Drive(iii)					

Continued

	External Static Pressure (Inches of Water)																			
	1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90		2.00	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	5 HP Oversized Motor & Drive								5 HP Standard Motor & Field Supplied High Static Drive Accessory											
4800	975	3.62	997	3.79	1018	3.95	1040	4.12	1061	4.29	1078	4.39	1082	4.25	1086	4.10	1094	4.04	1116	4.21
5400	1040	4.66	1060	4.83	1079	5.00	1098	5.18	1118	5.36	1137	5.54	1156	5.73	1174	5.91	1194	6.11	1212	6.28
6000	1107	5.89	1126	6.08	1144	6.28	1162	6.47	1180	6.66	1197	6.85	1214	7.04	1232	7.24	1250	7.44	1267	7.65
6600	1157	6.90	1186	7.36	1212	7.75	1230	7.99	1246	8.20	1263	8.42	1279	8.62	—	—	—	—	—	—
7200	1191	7.62	1227	8.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	7.5 HP Oversized Motor & Drive(iv)								7.5 HP Oversized Motor with Field Supplied High Static Drive(iv)(v)											

(i) Field Supplied Fan Sheave BK95 (1" bore) required.
(ii) Field Supplied Fan Sheave BK77 (1" bore) required.
(iii) Field Supplied Motor Sheave 1VP50 (7/8" bore) required.
(iv) 7.5HP motor kit BAYHSMT041 (208/460V), BAYHSMT042 (575V).
(v) Field Supplied Fan Sheave BK115 (1" bore required).

Notes:

1. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabulated data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
2. Fan motor heat (MBH) = 3.15 x Fan BHP.
3. Data includes pressure drop due to wet coils and filters.
4. No accessories or options are included in pressure drop data.
5. Refer to Table PD-13 to determine add'l static pressure drop due to other options/accessories.

Table 11. Evaporator Fan Performance — 20 Tons — WC*240B

	External Static Pressure (Inches of Water)																			
	.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	5 HP Standard Motor & Field Supplied Low Static Drive[i]										5 HP Standard Motor & Drive									
6400	-	-	531	1.80	556	1.97	582	2.14	610	2.28	634	2.44	658	2.61	681	2.79	705	2.98	729	3.19
7200	552	2.23	576	2.16	605	2.60	631	2.81	655	3.00	678	3.18	701	3.36	722	3.55	743	3.74	763	3.94
8000	605	3.01	627	3.16	655	3.39	679	3.63	702	3.86	724	4.07	745	4.28	766	4.48	786	4.68	805	4.90
8800	648	3.83	678	4.10	705	4.34	729	4.61	751	4.87	771	5.12	791	5.36	811	5.59	830	5.81	848	6.03
9600	702	4.91	729	5.21	755	5.49	779	5.77	800	6.06	820	6.34	839	6.61	857	6.88	875	7.13	893	7.37
	7.5 HP Oversized Motor with Field Supplied Motor Sheave[ii]										7.5 HP Oversized Motor & Drive									

Continued

	External Static Pressure (Inches of Water)																			
	1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90		2.00	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	5 HP Standard Motor & Drive								5 HP Standard Motor & High Static Drive Accessory											
6400	753	3.39	776	3.59	799	3.80	822	4.02	844	4.24	865	4.47	886	4.69	906	4.92	925	5.16	944	5.40
7200	784	4.15	806	4.38	827	4.61	848	4.84	869	5.07	889	5.30	910	5.54	930	5.79	950	6.04	969	6.29
8000	824	5.11	842	5.32	860	5.55	880	5.80	899	6.06	918	6.31	937	6.56	956	6.81	974	7.07	993	7.33
8800	866	6.26	884	6.49	901	6.73	917	6.96	934	7.20	951	7.46	969	7.74	986	8.02	1004	8.30	-	-
9600	910	7.61	927	7.85	943	8.10	960	8.35	975	8.61	-	-	-	-	-	-	-	-	-	-
	7.5 HP Oversized Motor & Drive																			

[i] Field Supplied Fan Sheave BK190. Field supplied belt may be necessary.
[ii] 7.5HP oversize motor with field supplied motor sheave 1VP50 required. Field supplied belt may be necessary.

Notes:

1. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabulated data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
2. Fan motor heat (MBH) = 3.15 x Fan BHP.
3. Data includes pressure drop due to wet coils and filters.
4. No accessories or options are included in pressure drop data.
5. Refer to Table PD-13 to determine add'l static pressure drop due to other options/accessories.

Table 12. Standard Motor & Drive/Fan Speed (RPM)

Tons	Unit Model No.	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
12½	WC*150B	640	680	720	760	800	840	N/A
15	WC*180B	679	721	764	806	849	891	N/A
20	WC*240B	615	659	703	747	791	835	N/A

Notes: Factory set at 3 turns open.

Table 13. Standard Motor With High Static Drive Fan Speed (RPM)

Tons	Unit Model No.	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
12½	WC*150B	807	857	908	958	1009	1059	N/A
20	WC*240B	835	879	923	967	1011	1055	N/A

Table 14. Oversized Motor & Drive/Fan Speed (RPM)

Tons	Unit Model No.	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
12½	WC*150B	869	923	978	1032	1087	1141	N/A
15[i]	WC*180B	806	856	907	957	1008	1058	N/A
15[ii]	WC*180b	949	1008	1068	1127	1187	1246	N/A
20	WC*240B	816	853	890	928	965	1002	N/A

(i) 5 hp oversized motor/drive
(ii) 7.5 hp overized motor/drive

Table 15. Static Pressure Drops Through Accessories (Inches Water Column)

Tons	Unit Model No.	CFM	Standard Filters[iii]	2 inch Pleated Filters[iv]	Economizer with OA/RA Dampers[i] 100% OA	Economizer with OA/RA Dampers[i] 100% RA	Electric Heater Accessory (kW)[ii] 5-12	14-23	36	54	72
12½	WC*150B	4000	0.05	0.08	0.20	0.02	-	0.03	0.03	0.04	-
		5000	0.07	0.11	0.26	0.03	-	0.04	0.05	0.06	-
		6000	0.11	0.15	0.35	0.04	-	0.06	0.07	0.09	-
15	WC*180B	4800	0.07	0.10	0.24	0.03	-	0.04	0.04	0.05	-
		6000	0.11	0.15	0.35	0.04	-	0.06	0.07	0.08	-
		7200	0.15	0.19	0.42	0.05	-	0.09	0.10	0.12	-
20	WCD240B	6400	0.07	0.11	0.22	0.04	-	-	0.06	0.08	0.09
		8000	0.11	0.15	0.31	0.05	-	-	0.10	0.12	0.14
		9600	0.16	0.02	0.44	0.07	-	-	0.14	0.17	0.20
	WCH240B	6400	0.06	0.01	0.22	0.04	-	-	0.06	0.08	0.09
		8000	0.09	0.13	0.31	0.05	-	-	0.10	0.12	0.14
		9600	0.13	0.17	0.44	0.07	-	-	0.14	0.17	0.20

(i) OA = Outside Air and RA = Return Air
(ii) Nominal KW ratings at 240, 480, 600 volts
(iii) Tested with: 2" filters 12½ - 20 tons
(iv) Difference in pressure drop should be considered when utilizing optional 2" pleated filters

Table 16. 12½ Tons Downflow Three Phase Heating Capacities (Net) WCD150B3, B4, BW at 5000 CFM

Outdoor Temp.	Integrated Heating Capacity (MBh/1000) At Indicated Indoor Dry Bulb Temp.				Total Power in Kilowatts At Indicated Indoor Dry Bulb Temp.			
°F	60	70	75	80	60	70	75	80
-8	51.9	50.3	49.6	49	9.56	10.37	10.83	11.32
-3	56.8	55.3	54.6	54	9.61	10.45	10.92	11.42
2	62.1	60.7	60	59.4	9.74	10.55	11.03	11.53
7	67.9	66.4	65.7	65.1	9.85	10.72	11.2	11.71
12	74.1	72.6	71.9	71.1	9.98	10.87	11.36	11.88
17	80.7	79.1	78.3	77.6	10.13	11.03	11.53	12.06
22	87.8	86	85.1	84.3	10.3	11.22	11.72	12.26
27	95.3	93.3	92.3	91.4	10.48	11.41	11.92	12.48
32	103.2	101	99.9	98.9	10.68	11.62	12.14	12.7
37	111.1	108.6	107.4	106.3	10.89	11.84	12.37	12.94
42	119.2	116.4	115.1	113.9	11.11	12.07	12.61	13.18
47	138.6	135.3	133.8	132.3	11.93	12.96	13.53	14.14
52	148.1	144.5	142.9	141.2	12.2	13.25	13.83	14.43
57	155.6	151.4	149.4	147.4	12.46	13.49	14.06	14.67
62	168.8	164.2	161.9	159.7	12.8	13.86	14.43	15.04
67	179.3	174.3	171.8	169.4	13.17	14.24	14.82	15.44
72	189.9	184.5	181.8	179.1	13.55	14.64	15.23	15.85

Notes:
1. For other airflow conditions, see heating capacity correction factor (Table PD-19).
2. Net Heating Capacity and Power Input include indoor fan heat at nominal cfm and .35 inch ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
3. Heating capacities and powers are integrated to include the effects of defrost in the frost region.
4. All heating capacities and power (kW) are at 70% OD relative humidity.

Table 17. 12½ Ton Horizontal Three Phase Heating Capacities (Net) WCH150B3, B4, BW at 5000 CFM

Outdoor Temp.	Integrated Heating Capacity (MBh/1000) At Indicated Indoor Dry Bulb Temp.				Total Power in Kilowatts At Indicated Indoor Dry Bulb Temp.			
°F	60	70	75	80	60	70	75	80
-8	48.2	46.6	46	45.4	9.18	9.96	10.4	10.87
-3	52.7	51.3	50.6	50	9.23	10.03	10.48	10.96
2	57.7	56.3	55.7	55.1	9.35	10.13	10.58	11.07
7	63.1	61.7	61.1	60.4	9.46	10.29	10.75	11.24
12	68.9	67.5	66.8	66.1	9.58	10.43	10.9	11.4
17	75.2	73.6	72.9	72.1	9.73	10.59	11.07	11.58
22	81.8	80.1	79.3	78.4	9.88	10.77	11.25	11.77
27	88.9	87	86	85.1	10.06	10.96	11.45	11.98
32	96.3	94.2	93.1	92.1	10.25	11.16	11.66	12.2
37	103.7	101.4	100.2	99.1	10.45	11.37	11.88	12.42
42	111.3	108.7	107.5	106.3	10.67	11.6	12.11	12.66
47	137.3	133.9	132.4	130.9	11.53	12.52	13.07	13.66
52	146.8	143.1	141.4	139.8	11.8	12.8	13.36	13.96
57	154.4	150.1	148.1	146.1	12.04	13.04	13.6	14.19
62	167.7	162.9	160.7	158.4	12.37	13.39	13.95	14.55
67	178.1	173.1	170.6	168.2	12.72	13.76	14.33	14.93
72	188.8	183.4	180.7	178	13.1	14.15	14.73	15.33

Notes:
1. For other airflow conditions, see heating capacity correction factor (Table PD-19).
2. Net Heating Capacity and Power Input include indoor fan heat at nominal cfm and .40 inch ESP. To obtain net heating at
3. other conditions, subtract fan heat at this condition and add fan heat at new condition.
4. Heating capacities and powers are integrated to include the effects of defrost in the frost region.
5. All heating capacities and power (kW) are at 70% OD relative humidity.

Table 18. 15 Ton Three Phase Heating Capacities (Net) WC*180B3, B4, BW at 6000 CFM

Outdoor Temp.	Integrated Heating Capacity (MBh/1000) At Indicated Indoor Dry Bulb Temp.				Total Power in Kilowatts At Indicated Indoor Dry Bulb Temp.			
°F	60	70	75	80	60	70	75	80
-8	61.6	60.4	59.9	59.6	11.35	12.19	12.67	13.20
-3	67.6	66.4	65.9	65.5	11.55	12.39	12.88	13.41
2	74.0	72.8	72.3	71.9	11.74	12.62	13.12	13.65
7	80.8	79.6	79.1	78.6	11.94	12.84	13.34	13.88
12	88.0	86.8	86.2	85.7	12.15	13.06	13.57	14.12
17	95.8	94.3	93.7	93.2	12.36	13.29	13.81	14.37
22	104.1	102.5	101.8	101.1	12.59	13.54	14.07	14.63
27	113.0	111.2	110.3	109.6	12.84	13.80	14.33	14.91
32	122.3	120.3	119.3	118.4	13.10	14.07	14.61	15.20
37	131.6	129.8	128.3	127.3	13.36	14.35	14.90	15.50
42	141.3	138.8	137.6	136.5	13.63	14.64	15.20	15.81
47	172.0	168.8	167.3	165.8	14.97	16.07	16.68	17.34
52	183.8	180.3	178.6	177.1	15.31	16.42	17.05	17.71
57	196.1	192.2	190.4	188.6	15.66	16.80	17.43	18.10
62	208.6	204.3	202.3	200.3	16.04	17.19	17.83	18.51
67	217.8	212.8	210.4	208.0	16.35	17.50	18.13	18.80
72	230.9	225.6	222.9	220.4	16.79	17.95	18.59	19.27

Notes:
1. For other airflow conditions, see heating capacity correction factor (Table PD-19).
2. Net Heating Capacity and Power Input include indoor fan heat at nominal cfm and .35 inch ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
3. Heating capacities and powers are integrated to include the effects of defrost in the frost region.
4. All heating capacities and power (kW) are at 70% OD relative humidity.

Table 19. 20 Ton Downflow Three Phase Heating Capacities (Net) WCD240B3, B4, BW at 8000 CFM

Outdoor Temp.	Integrated Heating Capacity (MBh/1000) At Indicated Indoor Dry Bulb Temp.				Total Power in Kilowatts At Indicated Indoor Dry Bulb Temp.			
°F	60	70	75	80	60	70	75	80
-8	78.1	75.8	74.9	74.0	16.7	17.8	18.4	19.1
-3	86.8	84.4	83.4	82.5	16.8	17.9	18.6	19.3
2	96.0	93.6	92.4	91.4	16.9	18.1	18.7	19.5
7	106.4	103.8	102.0	100.9	17.1	18.3	18.9	19.7
12	119.9	117.1	115.8	114.6	17.3	18.6	19.2	20.0
17	131.0	128.0	126.6	125.3	17.5	18.8	19.5	20.2
22	142.5	139.4	137.9	136.4	17.7	19.0	19.8	20.5
27	154.5	151.2	149.6	148.0	18.0	19.3	20.0	20.8
32	167.2	163.6	161.7	160.0	18.3	19.6	20.3	21.1
37	180.8	176.9	174.8	172.9	18.5	19.8	20.5	21.3
42	194.0	189.8	187.5	185.5	18.7	20.0	20.7	21.5
47	213.9	209.0	206.6	204.3	18.9	20.2	20.9	21.7
52	228.5	223.1	220.4	217.8	19.0	20.4	21.1	21.9
57	243.4	237.4	234.5	231.7	19.4	20.8	21.5	22.3
62	262.1	255.5	252.3	249.1	19.9	21.2	21.9	22.7
67	278.3	271.2	267.7	264.1	20.3	21.7	22.4	23.2
72	295.6	288.1	284.3	280.5	20.8	22.2	23.0	23.8

Notes:
1. For other airflow conditions, see heating capacity correction factor (Table PD-19).
2. Net Heating Capacity and Power Input include indoor fan heat at nominal cfm and .40 inch ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
3. Heating capacities and powers are integrated to include the effects of defrost in the frost region.
4. All heating capacities and power (kW) are at 70% OD relative humidity.

Table 20. 20 Ton Horizontal Three Phase Heating Capacities (Net) WCH240B3, B4, BW at 8000 CFM

Outdoor Temp.	Integrated Heating Capacity (MBh/1000) At Indicated Indoor Dry Bulb Temp.				Total Power in Kilowatts At Indicated Indoor Dry Bulb Temp.			
°F	60	70	75	80	60	70	75	80
-8	77.7	75.4	74.5	73.6	15.4	16.4	17.0	17.6
-3	86.3	84.0	82.9	82.0	15.5	16.5	17.1	17.8
2	95.5	93.0	92.0	90.9	15.6	16.7	17.3	18.0
7	105.9	103.2	101.5	100.4	15.8	16.9	17.5	18.2
12	109.9	107.3	106.1	105.0	16.0	17.1	17.8	18.4
17	120.0	117.3	116.1	114.8	16.2	17.3	18.0	18.7
22	130.6	127.7	126.4	125.0	16.4	17.6	18.2	18.9
27	141.6	138.5	137.1	135.6	16.6	17.8	18.5	19.2
32	153.2	149.9	148.2	146.6	16.9	18.1	18.7	19.5
37	179.7	175.9	173.8	172.0	17.6	18.9	19.6	20.4
42	192.9	188.7	186.5	184.5	17.9	19.2	19.9	20.7
47	210.6	205.8	203.4	201.1	18.3	19.6	20.3	21.0
52	225.0	219.6	217.0	214.4	19.0	20.3	21.0	21.8
57	239.6	233.7	230.9	228.0	19.4	20.7	21.4	22.2
62	256.8	250.3	247.2	244.0	19.8	21.1	21.9	22.6
67	272.6	265.7	262.3	258.8	20.3	21.6	22.3	23.1
72	289.6	282.2	278.5	274.8	20.8	22.1	22.9	23.7

Notes:
1. For other airflow conditions, see heating capacity correction factor (Table PD-19).
2. Net Heating Capacity and Power Input include indoor fan heat at nominal cfm and .40 inch ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
3. Heating capacities and powers are integrated to include the effects of defrost in the frost region.
4. All heating capacities and power (kW) are at 70% OD relative humidity.

Table 21. Heating Capacity Correction Factors

% Variation of Nominal CFM	- 20	- 10	0	+ 10	+ 20
Total Gross Capacity Multiplier	.96	.98	1.0	1.01	1.02

Table 22. Auxiliary Electric Heat Capacity

Tons	Unit Model No.	Total KW Input1	Total MBh Output1	No. of Stages	Stage 1 KW Input1	Stage 1 MBh Output1	Stage 2 KW Input1	Stage 2 MBh Output1
12½, 15	WC*150B3, B4, BW	18.00	61.00	1	18.00	61.00	-	-
		36.00	123.00	2	18.00	61.00	18.00	61.00
	WC*180B3, B4, BW	54.00	184.00	2	36.00	123.00	18.00	61.00
20	WC* 240B3, B4, BW	36.00	123.00	2	18.00	61.00	18.00	61.00
		54.00	184.00	2	36.00	123.00	18.00	61.00
		72.00	246.00	2	36.00	123.00	36.00	123.00

Notes:
1. Does not include indoor fan power or heat.
2. Heaters are rated at 240v 480v and 600v. For other than rated voltage, CAP = (Voltage/Rated Voltage)2 x rated cap.

Table 23. Electric Heater Voltage Correction Factors (Applicable to Auxiliary Heat Capacity)

Nominal Voltage	Distribution Voltage	Capacity Multiplier
240	208	0.75
	230	0.92
	240	1.00
480	440	0.84
	460	0.94
	480	1.00
600	540	0.81
	575	0.92
	600	1.00

Table 24. Air Temperature Rise Across Electric Heaters (Degree °F)

KW	Stages	12½ Ton 5000 CFM Three Phase WC*150B	15 Ton 6000 CFM Three Phase WC*180B	20 Ton 8000 CFM Three Phase WC*240B
9.00	1	-	-	-
17.30	1	-	-	-
18.00	1	11.4	9.5	-
27.00	2	-	-	-
36.00	2	23.0	19.0	14.2
54.00	2	34.1	28.4	21.3
72.00	2	-	-	28.5

Table 25. Electric Heater Temperature Rise Correction Factors

% Variation From Nominal CFM	- 20	- 15	- 10	- 5	0	+5	+10	+15	+20
Temperature Rise Multiplier	1.25	1.17	1.11	1.05	1.00	0.95	0.91	0.87	0.83

Controls

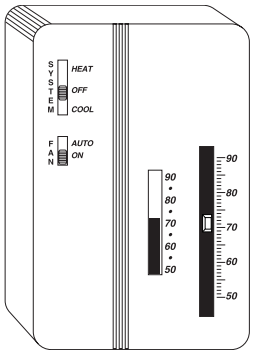
Field Installed Control Options

Zone Sensors

Zone sensors are the building occupant's comfort control devices. They replace the conventional electro-mechanical thermostats. The following zone sensor options are available for Voyager units with the ReliaTel™ control:

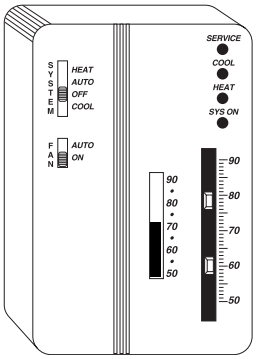
Manual Changeover

Heat, Cool or Off System Switch.
Fan Auto or Off Switch.
One temperature setpoint lever.



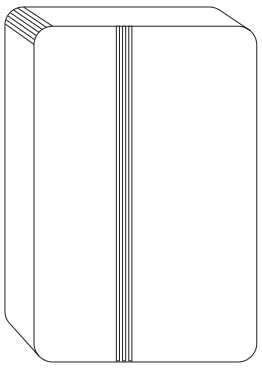
Manual/Automatic Changeover

Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers. Optional Status Indication LED lights, System On, Heat, Cool, or Service.



Remote Sensor

Sensor(s) available for all zone sensors to provide remote sensing capabilities.

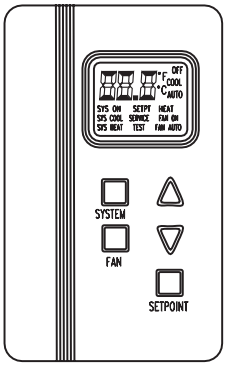


Dual Thermistor Remote Zone Sensor

This sensor will allow the customer to reduce the total number of remote sensors to obtain space temperature averaging. This sensor should be utilized with ReliaTel™ controls.

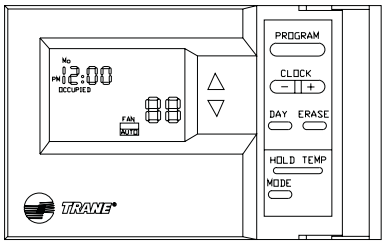
Digital Display Zone Sensor

The Digital LCD (Liquid Crystal Display) zone sensor has the look and functionality of standard zone sensors. This sensor includes a digital display of set point adjustment and space temperature in °F (Fahrenheit) or °C (Celsius). Includes FAN and SYSTEM buttons (supports the service functions of the standard sensor). E-squared memory stores last programmed set points. Requires 24 VAC (Volts AC). This sensor should be utilized with ReliaTel™ controls.



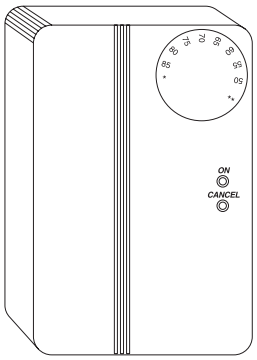
Programmable Night Setback

Auto or manual changeover with seven-day programming. Keyboard selection of Heat, Cool, Fan, Auto, or On. All programmable sensors have System On, Heat, Cool, Service LED/ indicators as standard. Night Setback Sensors have one (1) Occupied, one (1) Un-occupied, and two (2) Override programs per day.



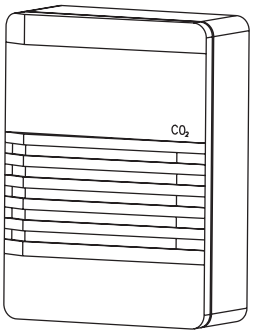
Integrated Comfort™ System

Sensor(s) available with optional temperature adjustment and override buttons to provide central control through a Trane Integrated Comfort™ system.



CO_2 Sensing

The CO_2 sensor has the ability to monitor space occupancy levels within the building by measuring the parts per million of CO_2 (Carbon Dioxide) in the air. As the CO_2 levels increase, the outside air damper modulates to meet the CO_2 space ventilation requirements. The CO_2 sensor kit is available as a field-installed accessory.



Economizer Controls

The standard equipment offering is a fixed dry bulb changeover control. In addition, there are two optional controls, Enthalpy and Differential Enthalpy Control.

Enthalpy Control

Replaces the dry bulb control with a wet bulb changeover controller which has a fully adjustable set point. Enthalpy control offers a higher level of comfort control, along with energy savings potential, than the standard dry bulb control. This is due to the additional wet bulb sensing capability.

Differential Enthalpy

Replaces the standard dry bulb control with two enthalpy sensors that compare total heat content of the indoor air and outdoor air to determine the most efficient air source. This control option offers the highest level of comfort control and energy efficiency.

Remote Potentiometer

Minimum position setting of economizer can be remotely adjusted with this accessory.

Differential Pressure Switches

This factory or field-installed option allows individual fan failure and dirty filter indication. The fan failure switch will disable all unit functions and "flash" the Service LED on the zone sensor. The dirty filter switch will light the Service LED on the zone sensor and will allow continued unit operation.

Trane Communication Interface (TCI)

This factory or field-installed micro-processor interface allows the unit to communicate to Trane's Integrated Comfort™ system.

Electrical Data

Table 26. Unit Wiring

Tons	Unit Model #	Unit Operating Voltage Range	Standard Indoor Motor		Oversize Indoor Fan Motor	
			Minimum Circuit Ampacity	Max Fuse Size or Max Circuit Breaker[(i)]	Minimum Circuit Ampacity	Max Fuse Size or Max Circuit Breaker[(i)]
12½	WC*150B3	187-253	66.0	80	72.0	80
	WC*150B4	414-506	31.0	40	34.0	40
	WC*150BW	517-633	25.0	30	28.0	35
15	WC*180B3	187-253	76.0	90	82.0	100
	WC*180B4	414-506	39.0	45	42.0	50
	WC*180BW	517-633	31.0	35	33.0	40
20	WC*240B3	187-253	96.0	125	103.0	125
	WC*240B4	414-506	49.0	60	53.0	60
	WC*240BW	517-633	38.0	45	41.0	50

(i) HACR type circuit breaker per NEC.

Table 27. Electrical Characteristics - Power Exhaust Accessory

Tons	Accessory Operating Voltage	Phase	HP	RPM	Amps FLA	LRA
12½, 15, 20	208-230	1	3/4	1040	6.6	13.5
	460	1	3/4	1040	3.2	8.4
	575	1	3/4	1040	2.1	5.2

Table 28. Unit Wiring With Electric Heat 208/230 Volts Three Phase (Single Point Connection)

Tons	To Use With	Heater Model No.	Heater KW Rating[i]	Control Stages	Standard Indoor Motor		Oversize Indoor Motor	
					MCA	Max Fuse Size or Max Circuit Breaker[ii]	MCA	Max Fuse Size or Max Circuit Breaker[ii]
208/230 Volts Three Phase								
12½	WCD150B3	AYDHTRK318A	13.5/18.0	1	113/120	125/125	119/127	125/150
		AYDHTRK336A	27.0/36.0	2	160/175	175/175	166/181	175/200
		AYDHTRK354A	40.5/54.0	2	207/229	225/250	213/235	225/250
	WCH150B3	AYHHTRN318A	13.5/18.0	1	113/120	125/125	119/127	125/150
		AYHHTRP336A	27.0/36.0	2	160/175	175/175	166/181	175/200
		AYHHTRP354A	40.5/54.0	2	207/229	225/250	213/235	225/250
15	WCD180B3	AYDHTRK318A	13.5/18.0	1	122/130	125/150	129/136	150/150
		AYDHTRK336A	27.0/36.0	2	169/184	175/200	175/190	175/200
		AYDHTRK354A	40.5/54.0	2	216/238	225/250	222/244	225/250
	WCH180B3	AYHHTRN318A	13.5/18.0	1	122/130	125/150	129/136	150/150
		AYHHTRP336A	27.0/36.0	2	169/184	175/200	175/190	175/200
		AYHHTRP354A	40.5/54.0	2	216/238	225/250	222/244	225/250
20	WCD240B3	AYDHTRL336A	27.0/36.0	2	190/204	200/225	197/212	200/225
		AYDHTRL354A	40.5/54.0	2	237/258	250/300	244/266	250/300
		AYDHTRK372A	54.0/72.0	2	284/312	300/350	291/320	300/350
	WCH240B3	AYHHTRN336A	27.0/36.0	2	190/204	200/225	197/212	200/225
		AYHHTRN354A	40.5/54.0	2	237/258	250/300	177/266	250/300
		AYHHTRN372A	54.0/72.0	2	284/312	300/350	224/320	300/350

[i] Heater kw ratings are at 208/240 for 208/230V unit 480V for 460 V unit
[ii] HACR type circuit breaker per NEC.

Table 29. Unit Wiring With Electric Heat 460 Volts Three Phase (Single Point Connection)

Tons	To Use With	Heater Model No.	Heater KW Rating[i]	Control Stages	Standard Indoor Motor		Oversize Indoor Motor	
					MCA	Max Fuse Size or Max Circuit Breaker[ii]	MCA	Max Fuse Size or Max Circuit Breaker[ii]
460 Volts Three Phase								
12½	WCD150B4	AYDHTRK418A	18.0	1	58	60	61	70
		AYDHTRK436A	36.0	2	85	90	88	90
		AYDHTRK454A	54.0	2	112	125	115	125
	WCH150B4	AYHHTRP418A	18.0	1	58	60	61	70
		AYHHTRP436A	36.0	2	85	90	88	90
		AYHHTRP454A	54.0	2	112	125	115	125
15	WCD180B4	AYDHTRK418A	18.0	1	66	70	69	70
		AYDHTRK436A	36.0	2	93	100	96	100
		AYDHTRK454A	54.0	2	120	125	123	125
	WCH180B4	AYHHTRP418A	18.0	1	66	70	69	70
		AYHHTRP436A	36.0	2	93	100	96	100
		AYHHTRP454A	54.0	2	120	125	123	125
20	WCD240B4	AYDHTRL436A	36.0	2	104	110	107	110
		AYDHTRL454A	54.0	2	131	150	134	150
		AYDHTRK472A	72.0	2	158	175	161	175
	WCH240B4	AYHHTRN436A	36.0	2	104	110	107	110
		AYHHTRN454A	54.0	2	131	150	134	150
		AYHHTRN472A	72.0	2	158	175	161	175

[i] Heater kw ratings are at 208/240 for 208/230V unit 480V for 460 V unit
[ii] HACR type circuit breaker per NEC.

Table 30. Unit Wiring With Electric Heat 575 Volts Three Phase (Single Point Connection)

Tons	To Use With	Heater Model No.	Heater KW Rating[i]	Control Stages	Standard Indoor Motor		Oversize Indoor Motor	
					MCA	Max Fuse Size or Max Circuit Breaker[ii]	MCA	Max Fuse Size or Max Circuit Breaker[ii]
575 Volts Three Phase								
12½	WCD150BW	AYDHTRKW18A	18.0	1	47	50	49	50
		AYDHTRKW36A	36.0	2	69	70	71	80
		AYDHTRKW54A	54.0	2	90	90	93	100
	WCH150BW	AYHHTRNW18A	18.0	1	47	50	49	50
		AYHHTRQW36A	36.0	2	69	70	71	80
		AYHHTRPW54A	54.0	2	90	90	93	100
15	WCD180BW	AYDHTRKW18A	18.0	1	52	60	54	60
		AYDHTRKW36A	36.0	2	74	80	76	80
		AYDHTRKW54A	54.0	2	96	100	98	100
	WCH180BW	AYHHTRNW18A	18.0	1	52	60	54	60
		AYHHTRQW36A	36.0	2	74	80	76	80
		AYHHTRPW54A	54.0	2	96	100	98	100
20	WCD240BW	AYDHTRLW36A	36.0	2	81	90	84	90
		AYDHTRLW54A	54.0	2	103	110	106	110
		AYDHTRKW72A	72.0	2	125	125	128	150
	WCH240BW	AYHHTRNW36A	36.0	2	81	90	84	90
		AYHHTRNW54A	54.0	2	103	110	106	110
		AYHHTRNW72A	72.0	2	125	125	128	150

[i] Heater kw ratings are at 208/240 for 208/230V unit 480V for 460 V unit
[ii] HACR type circuit breaker per NEC.

Table 31. Electrical Characteristics - Evaporator Fan Motors - 60 Cycle

Tons	Unit Model No.	Standard Evaporator Fan Motor						Oversized Evaporator Fan Motor					
						Amps						Amps	
		No.	Volts	Phase	HP	FLA	LRA	No.	Volts	Phase	HP	FLA	LRA
12½	WC*150B3	1	208-230	3	3.00	10.6	81.0	1	208-230	3	5.00	16.7	109.8
	WC*150B4	1	460	3	3.00	4.8	40.5	1	460	3	5.00	7.6	54.9
	WC*150BW	1	575	3	3.00	3.9	31.0	1	575	3	5.00	6.1	41.6
15	WC*180B3	1	208-230	3	3.00	10.6	81.0	1	208-230	3	5.00	16.7	109.8
	WC*180B4	1	460	3	3.00	4.8	40.5	1	460	3	5.00	7.6	54.9
	WC*180BW	1	575	3	3.00	3.9	31.0	1	575	3	5.00	6.1	41.6
20	WC*240B3	1	208-230	3	5.00	16.7	109.8	1	208-230	3	7.50	17.6	120.4
	WC*240B4	1	460	3	5.00	7.6	54.9	1	460	3	7.50	8.6	74.0
	WC*240BW	1	575	3	5.00	6.1	41.6	1	575	3	7.50	7.0	60.0

Table 32. Electrical Characteristics - Compressor Motor and Condenser Motor - 60 Cycle

Tons	Unit Model No.	Compressor Motors							Condensor Fan Motors				
							Amps[i]					Amps	
		No.	Volts	Phase	HP[ii]	RPM	RLA	LRA	No.	Phase	HP	FLA	LRA
12½	WC*150B3	2	208-230	3	6.00	3450	21.7	156	2	1	.50	3.2	8.8
	WC*150B4	2	460	3	6.00	3450	10.0	75	2	1	.50	1.6	4.0
	WC*150BW	2	575	3	6.00	3450	8.2	54	2	1	.50	1.3	3.2
15	WC*180B3	2	208-230	3	5.70/9.00	3450/3500	30.1/20.4	225/156	2	1	.50	3.2	8.8
	WC*180B4	2	460	3	5.70/9.00	3450/3500	15.6/10.8	114/75	2	1	.50	1.6	4.0
	WC*180BW	2	575	3	5.70/9.00	3450/3500	12.1/8.5	80/54	2	1	.50	1.3	3.2
20	WC*240B3	2	208-230	3	9.00	3500	30.1	225	2	1	1.00	5.5	18.3
	WC*240B4	2	460	3	9.00	3500	15.8	114	2	1	1.00	2.9	9.3
	WC*240BW	2	575	3	9.00	3500	12.2	80	2	1	1.00	2.0	5.7

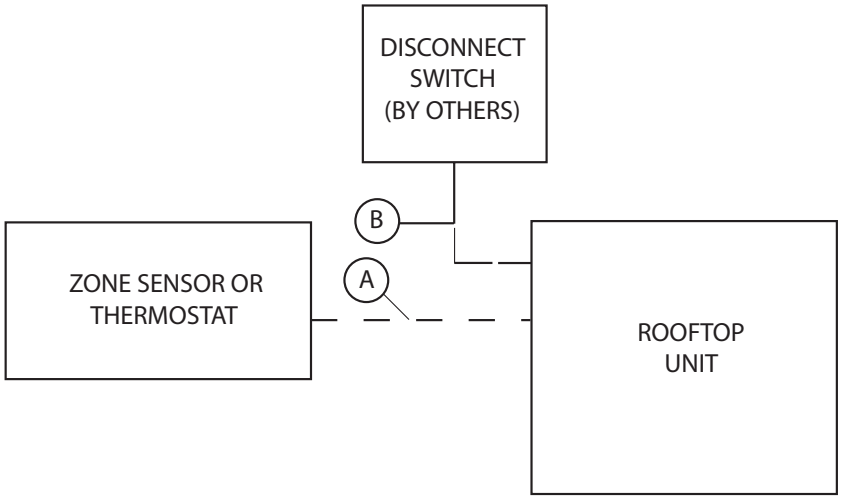
[i] Amp draw for each motor; multiply value by numbers of motors to determine total amps.
[ii] HP for each compressor.

Jobsite Connections

Table 33. Zone Sensors - Typical Number of Wires

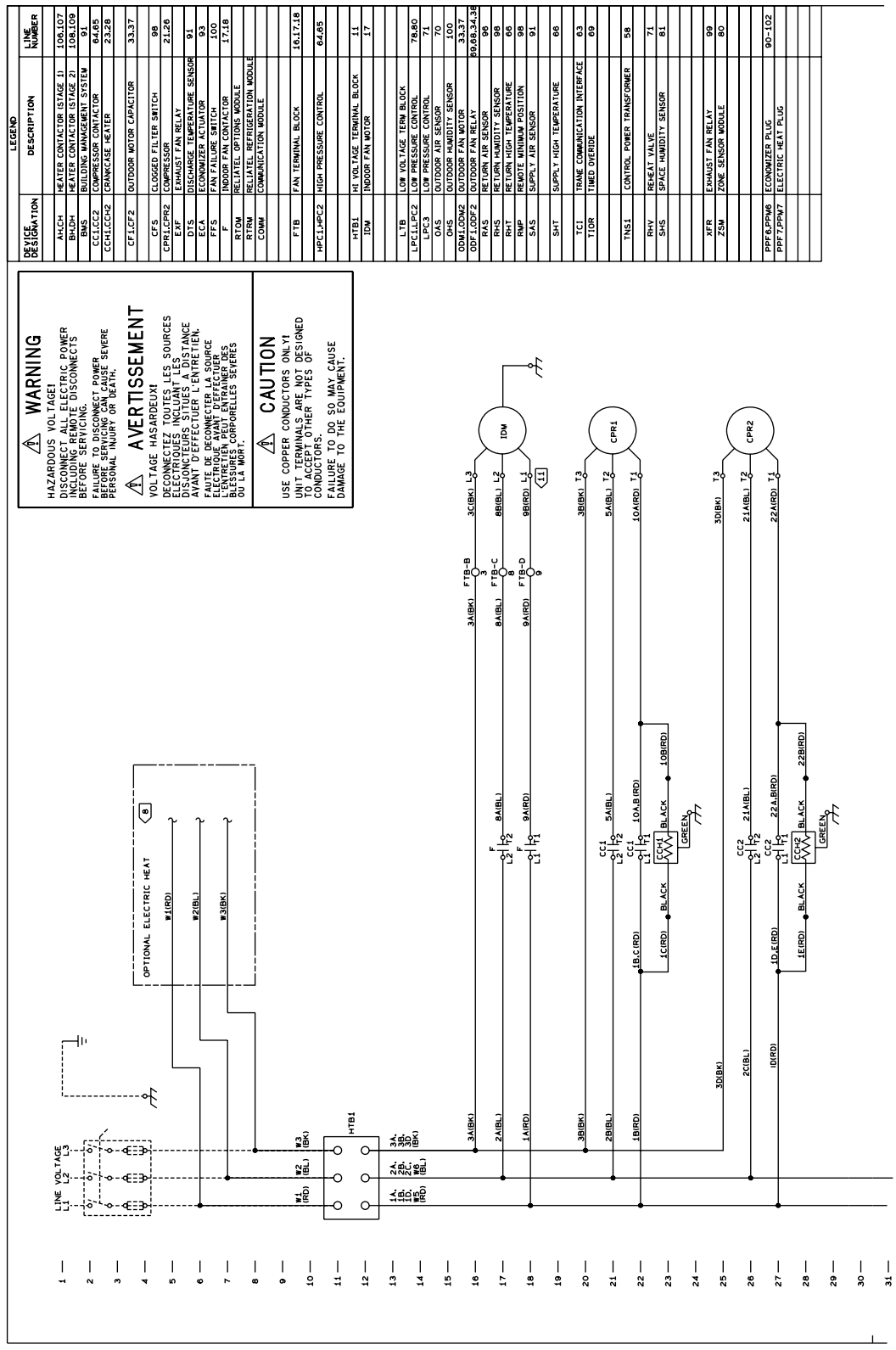
Zone Sensors	
A	Manual Changeover.....4
	Manual/Auto Changeover.....5
	Manual/Auto Changeover withStatus Indication LED's.....10
	Programmable Night Setback with Status Indication LED's.....7

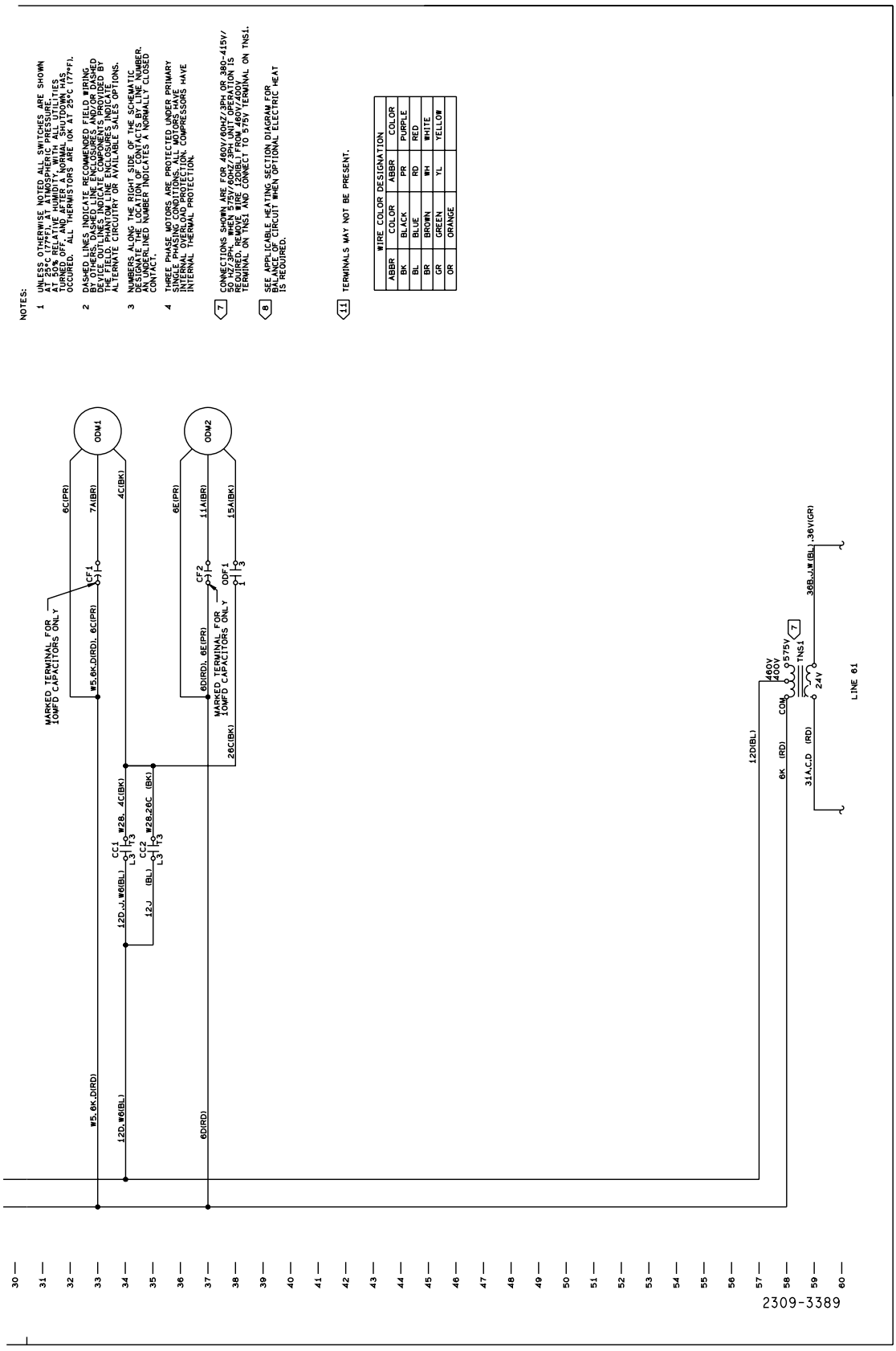
Thermostats	
B	3 Power Wires + 1 Ground Wire (three phase)
	2 Power Wires + 1 Ground Wire (single phase)

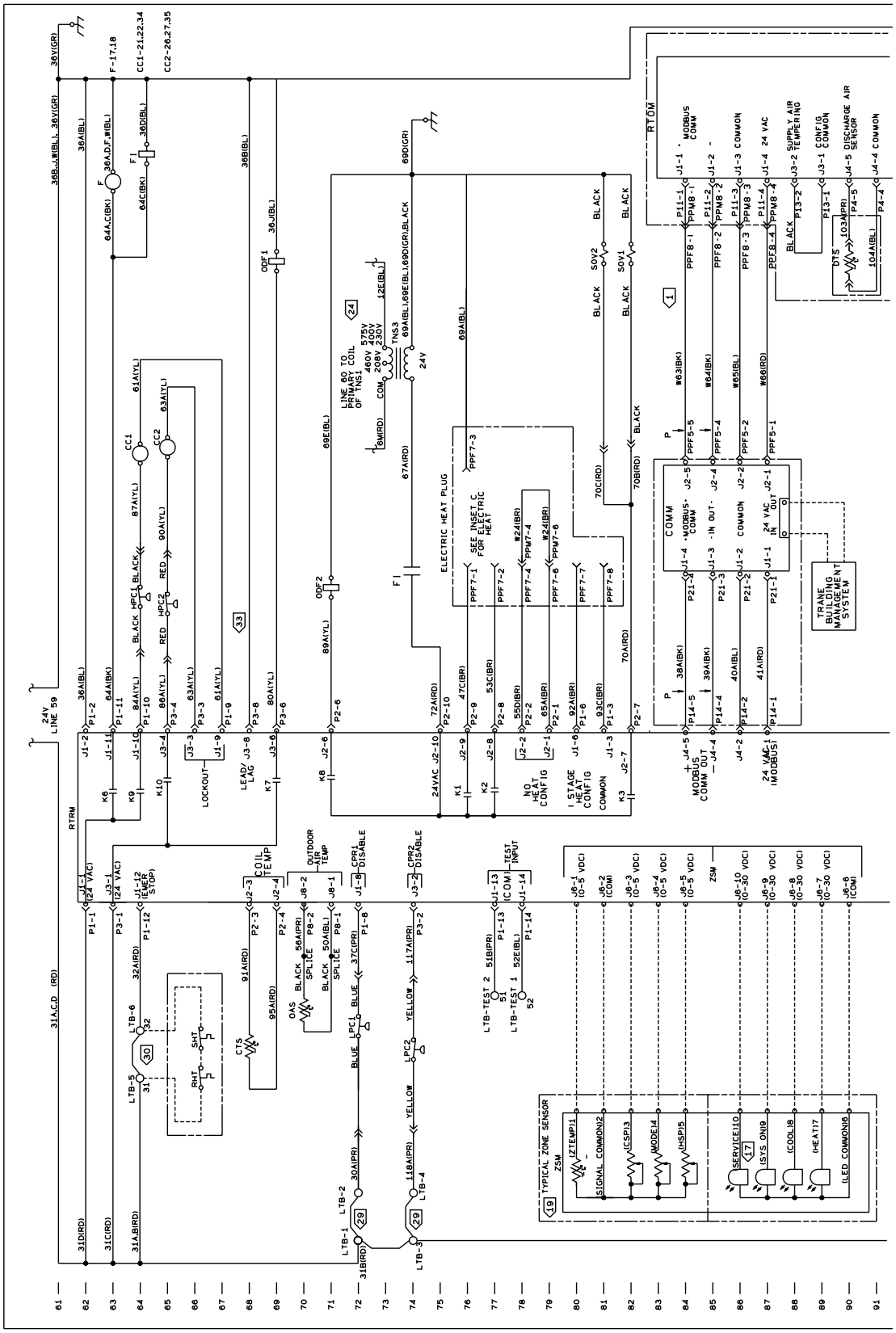


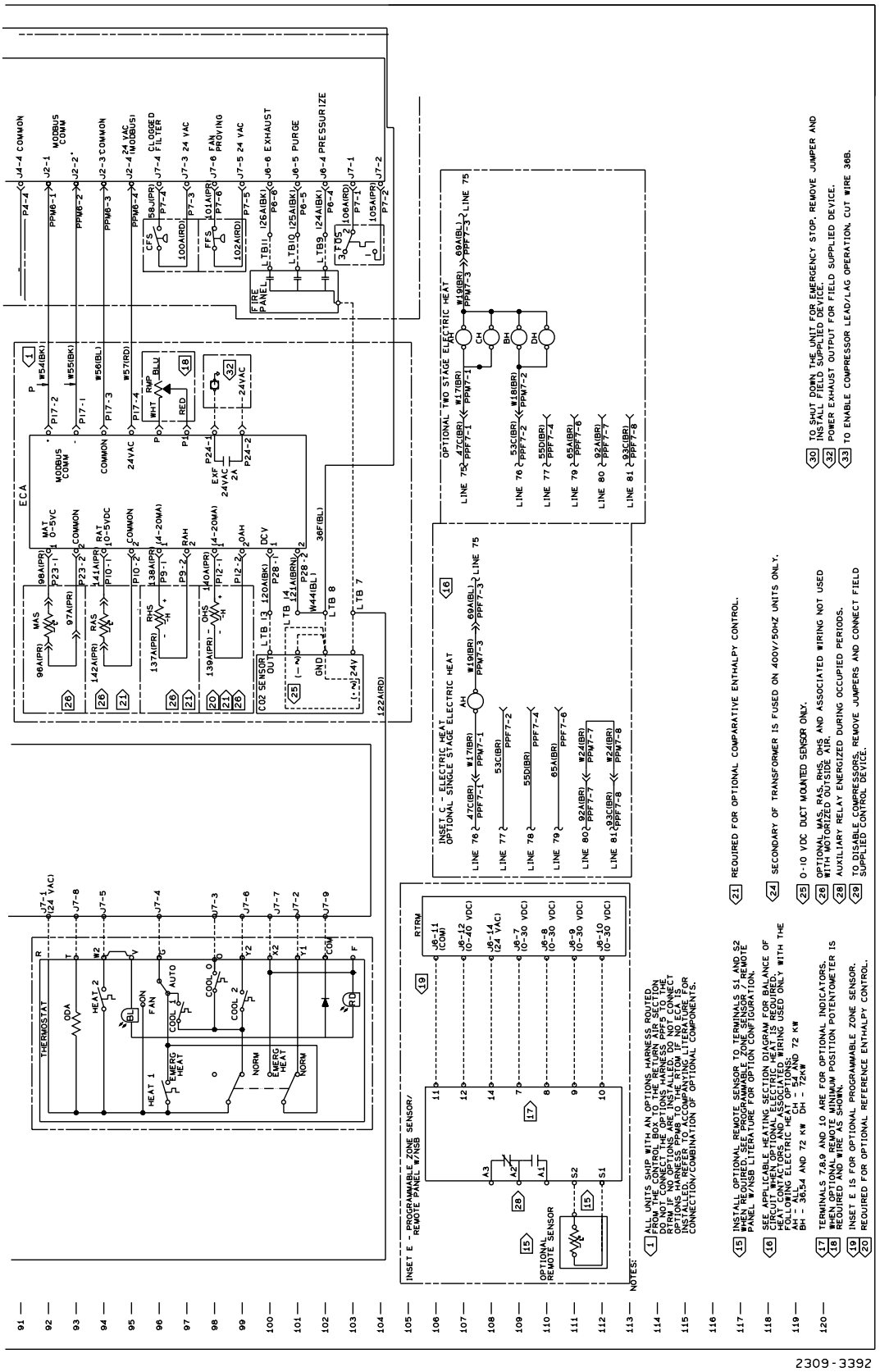
Note: *For specific wiring information, see the installation instructions. All wiring except power wires is low voltage. All customer-supplied wiring should be copper and must conform to NEC or CEC and local electrical codes. Wiring shown dotted is to be furnished and installed by the customer.*

Typical Wiring




NOTES:
1 UNLESS OTHERWISE NOTED ALL SWITCHES ARE SHOWN AT 25°C (77°F), AT ATMOSPHERIC PRESSURE, AT 0% OF LINE VOLTAGE, WITH NO FLUID PRESSURE APPLIED, AND WITH NO SHUTDOWN HAS OCCURED. ALL THERMISTORS ARE 10K AT 25°C (77°F).
2 DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED TIE FIELD OUTLINES INDICATE COMPONENTS PROVIDED BY ALTERNATE CIRCUITRY OR AVAILABLE SALES OPTIONS.
3 NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF CONTACTS BY LINE NUMBER. AN UNDERLINED NUMBER INDICATES A NORMALLY CLOSED CONTACT.
4 THREE PHASE MOTORS ARE PROTECTED UNDER PRIMARY SINGLE PHASING CONDITIONS. ALL MOTORS HAVE INTERNAL OVERLOAD PROTECTION. COMPRESSORS HAVE INTERNAL THERMAL PROTECTION.
7 CONNECTIONS SHOWN ARE FOR 460V/60HZ/3PH OR 380-415V/50 HZ/3PH. WHEN 575V/60HZ/3PH UNIT OPERATION IS REQUIRED, REMOVE WIRE 12D(BL) FROM 460V/400V TERMINAL ON TNS1 AND CONNECT TO 575V TERMINAL ON TNS1.
8 SEE APPLICABLE HEATING SECTION DIAGRAM FOR BALANCE OF CIRCUIT WHEN OPTIONAL ELECTRIC HEAT IS REQUIRED.
11 TERMINALS MAY NOT BE PRESENT.
WIRE COLOR DESIGNATION
ABBR COLOR ABBR COLOR
BK BLACK PR PURPLE
BL BLUE RD RED
BR BROWN WH WHITE
GR GREEN YL YELLOW
OR ORANGE
ODM1
ODM2
MARKED TERMINAL FOR 10MFD CAPACITORS ONLY
MARKED TERMINAL FOR 10MFD CAPACITORS ONLY
CF1
CF2
ODF1
CC1
CC2
W5, 6K, D(RD)
12D, W6(BL)
6D(RD)
12J (BL)
W28, 4C(BK)
W28, 26C (BK)
6C(PR)
7A(BR)
4C(BK)
6E(PR)
11A(BR)
15A(BK)
6D(RD), 6E(PR)
26C(BK)
12D(BL)
6K (RD)
COM
460V
400V
575V
TNS1
24V
7
31A,C,D (RD)
36B,J,W(BL), 36Y(GR)
LINE 61
30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
2309-3389




THERMOSTAT
ECA
INSET E - PROGRAMMABLE ZONE SENSOR/ REMOTE PANEL W/NSB
INSET C - ELECTRIC HEAT OPTIONAL SINGLE STAGE ELECTRIC HEAT
OPTIONAL TWO STAGE ELECTRIC HEAT
RTRM
NOTES:
1 ALL UNITS SHIP WITH AN OPTIONS HARNESS ROUTED FROM THE MAIN CONTROL BOX SECTION. DO NOT CONNECT THE OPTIONS HARNESS PPFS TO THE OPTIONS MODULES UNLESS THE OPTIONS ARE INSTALLED. DO NOT CONNECT OPTIONS HARNESS PPFS TO ANY OPTIONS THAT ARE NOT INSTALLED. REFER TO ACCOMPANYING LITERATURE FOR CONNECTION/COMBINATION OF OPTIONAL COMPONENTS.
15 INSTALL OPTIONAL REMOTE SENSOR TO TERMINALS S1 AND S2 WHEN REQUIRED. SEE PROGRAMMABLE ZONE SENSOR / REMOTE PANEL W/NSB LITERATURE FOR OPTION CONFIGURATION.
16 SEE APPLICABLE HEATING SECTION DIAGRAM FOR BALANCE OF HEAT CONNECTORS AND ASSOCIATED WIRING USED ONLY WITH THE FOLLOWING ELECTRIC HEAT OPTIONS:
BH - 36.54 AND 72 KW DH - 72KW
17 TERMINALS 7,8,9 AND 10 ARE FOR OPTIONAL INDICATORS.
18 WHEN OPTIONAL REMOTE MINIMUM POSITION POTENTIOMETER IS REQUIRED, USE 1K OHM, 1/4 WATT.
19 INSET E IS FOR OPTIONAL PROGRAMMABLE ZONE SENSOR.
20 REQUIRED FOR OPTIONAL REFERENCE ENTHALPY CONTROL.
21 REQUIRED FOR OPTIONAL COMPARATIVE ENTHALPY CONTROL.
24 SECONDARY OF TRANSFORMER IS FUSED ON 400V/50HZ UNITS ONLY.
25 0-10 VDC DUCT MOUNTED SENSOR ONLY.
26 OPTIONAL MAS, RAS, RHS, OHS AND ASSOCIATED WIRING NOT USED WITH ADAPTIVE FRESH AIR.
28 AUXILIARY RELAY ENERGIZED DURING OCCUPIED PERIODS.
29 TO DISABLE COMPRESSORS, REMOVE JUMPERS AND CONNECT FIELD SUPPLIED CONTROL DEVICE.
30 TO SHUT DOWN THE UNIT FOR EMERGENCY STOP, REMOVE JUMPER AND INSTALL FIELD SUPPLIED DEVICE.
32 POWER EXHAUST OUTPUT FOR FIELD SUPPLIED DEVICE.
33 TO ENABLE COMPRESSOR LEAD/LAG OPERATION, CUT WIRE 36B.

2309-3392

Dimensional Data

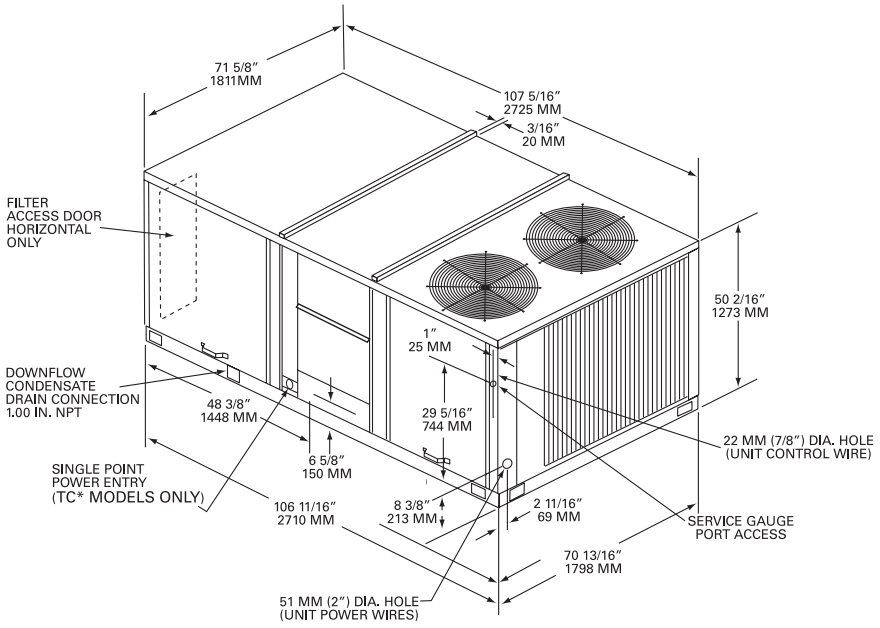


Figure 1. Heat Pump with Optional Electric Heat Models - 12½-15 Tons
*All dimensions are in inches/millimeters.
Single Point Power When Heat Installed

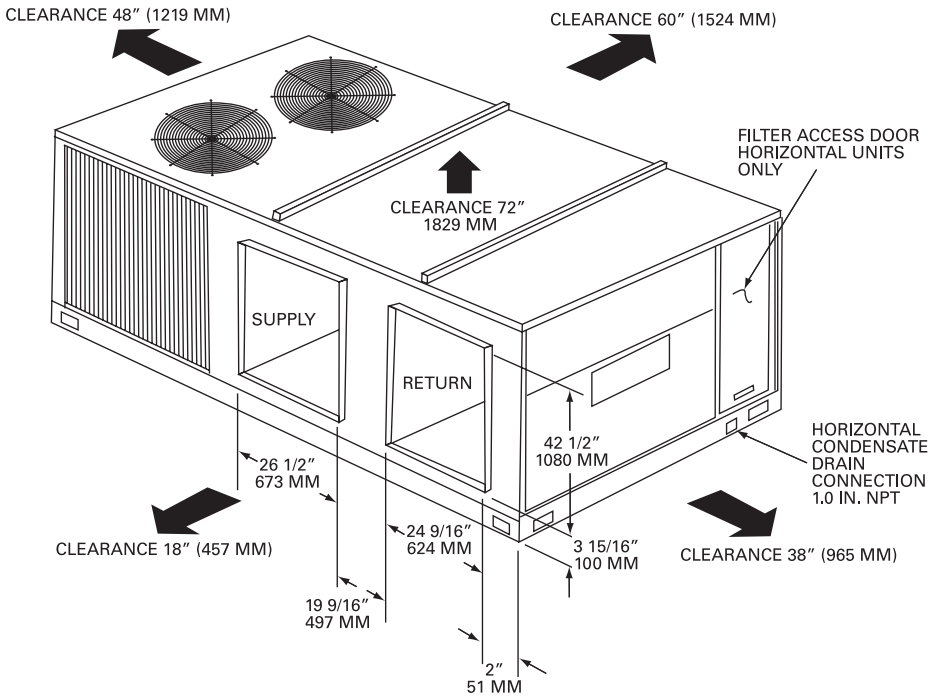


Figure 2. Heat Pump Models - 12½, 15 Tons
* All dimensions are in inches/millimeters.

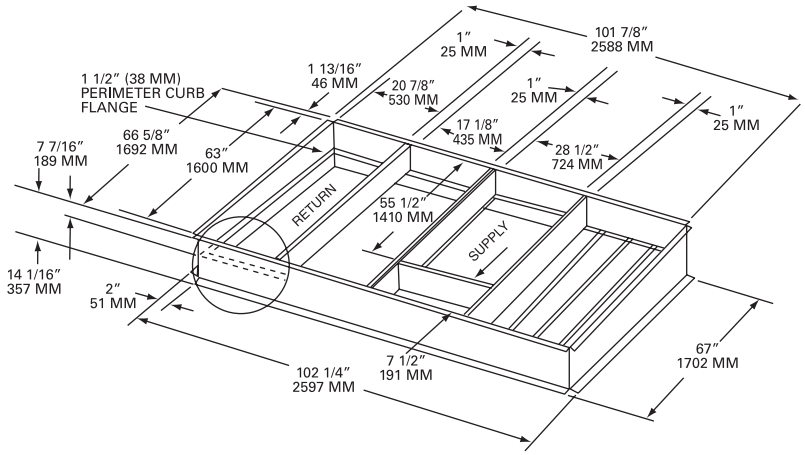


Figure 3. Heat Pump Models - 12½, 15 Tons
* All dimensions are in inches/millimeters.

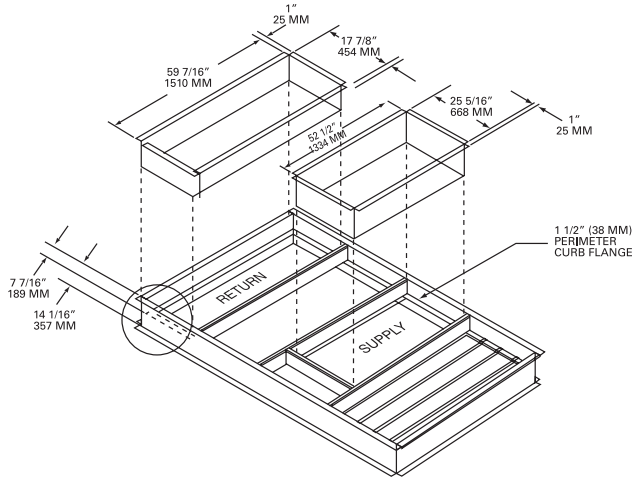


Figure 4. Heat Pump Models - 12½, 15 Tons
* Duct flanges mount 7-7/16" down inside the curb on the 1-1½ curb flanges. Roofcurb is intended for downflow use only.
* All dimensions are in inches/millimeters.

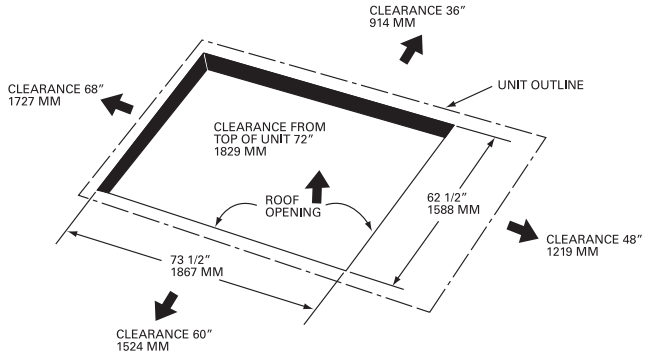


Figure 5. Heat Pump Models - 12½, 15 Tons
* All dimensions are in inches/millimeters.

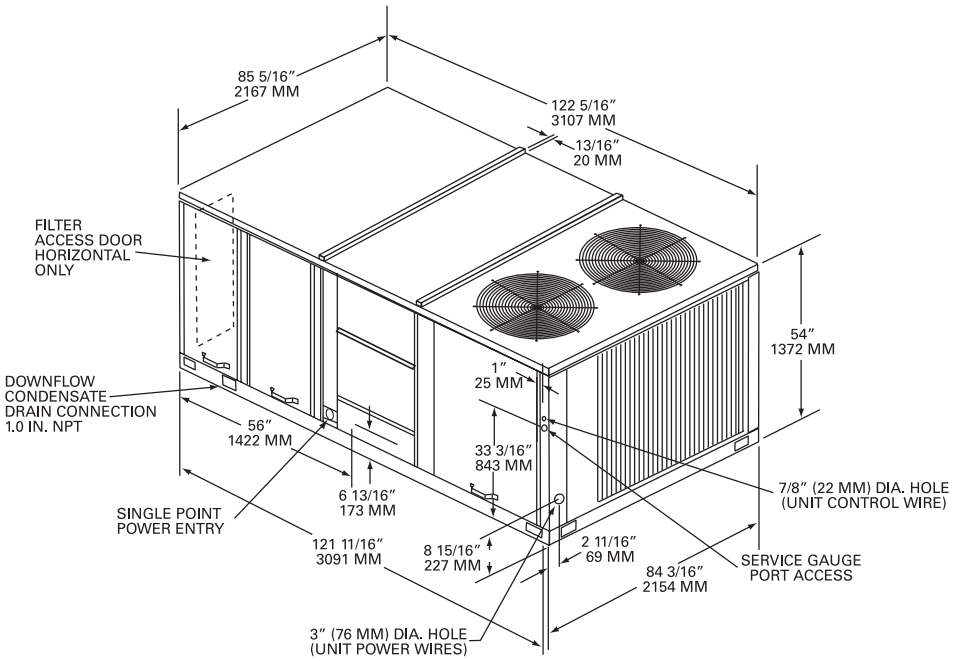


Figure 6. Heat Pump Models - 20 Tons
* All dimensions are in inches/millimeters.

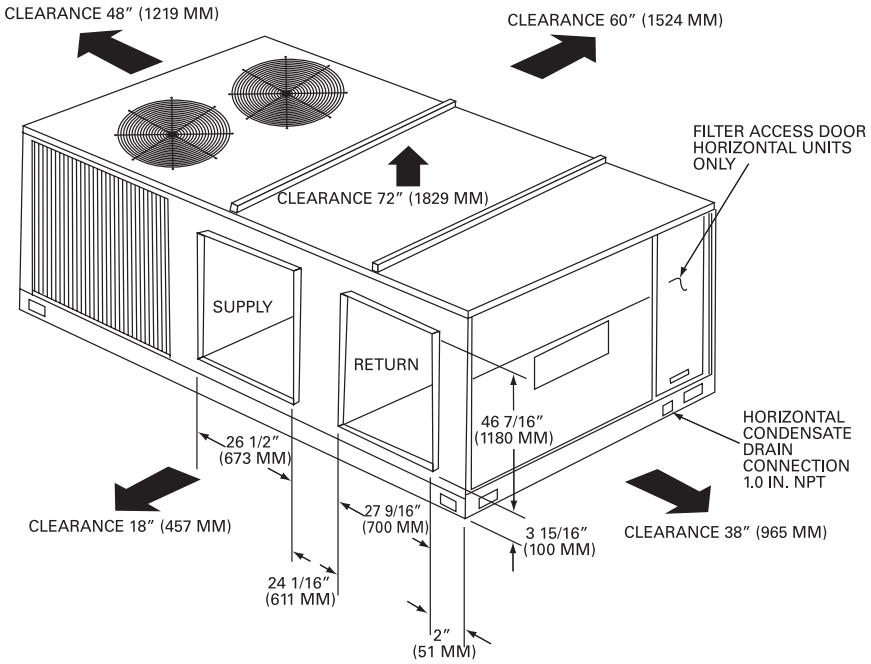


Figure 7. Heat Pump Models - 20 Tons
* All dimensions are in inches/millimeters.

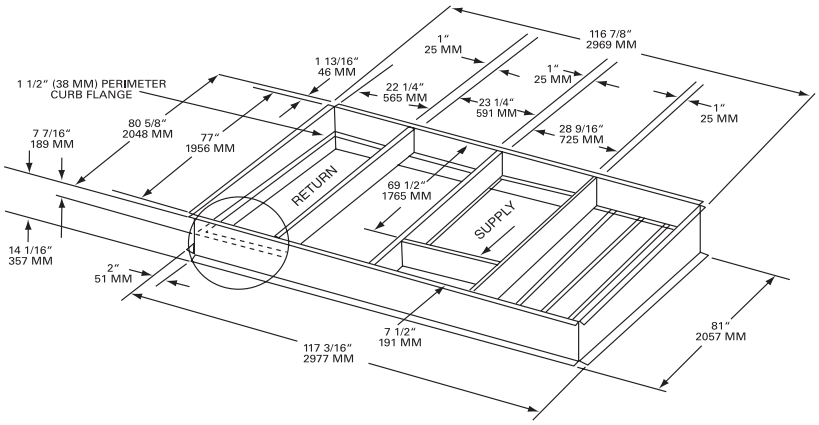


Figure 8. Heat Pump Models - 20 Tons
* All dimensions are in inches/millimeters.

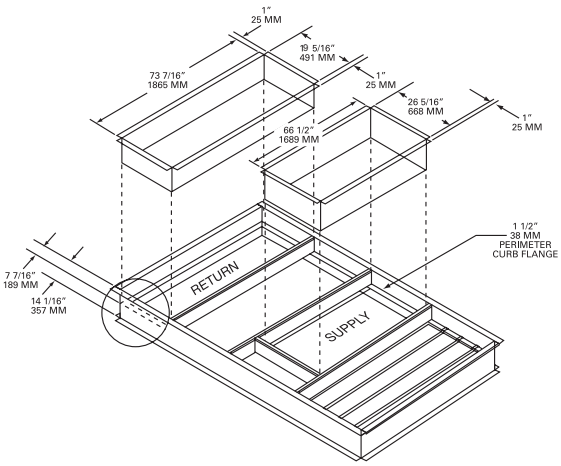


Figure 9. Heat Pump Models - 20 Tons
* Duct flanges mount 7-7/16" down inside the curb on the 1-1½ curb flanges. Roofcurb is intended for downflow use only.
* All dimensions are in inches/millimeters.

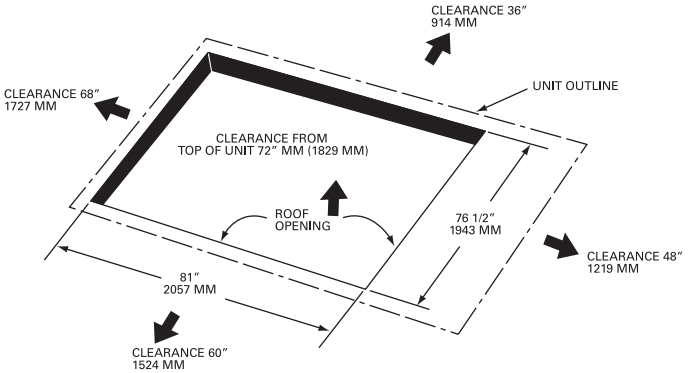


Figure 10. Heat Pump Models - 20 Tons
* All dimensions are in inches/millimeters.

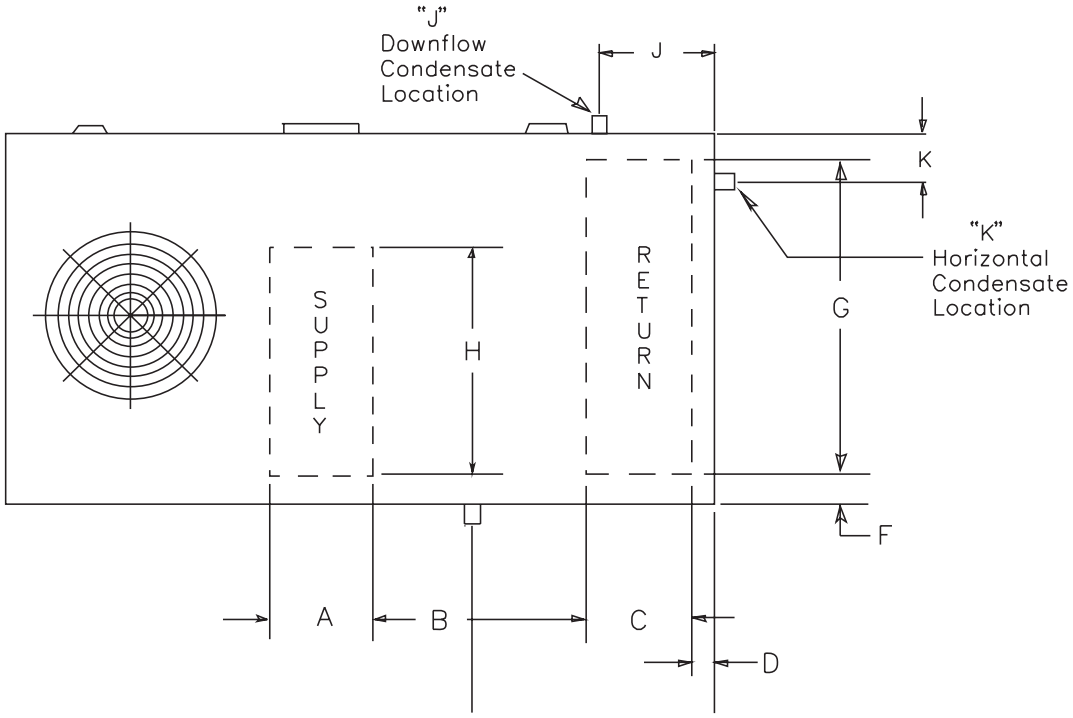


Table 34. Standard Efficiency Units (Cooling and Gas/Electric)

	Downflow Only							Condensate	Condensate Drain Location			
									Downflow		Horizontal	
Tons	A	B	C	D	F	G	H	Drain Size	E	J	E	K
12½, 15	26 7/16	22 1/2	18 11/16	4 1/4	4 1/4	62 7/16	54 11/16	1 NPT	-	25 5/8	-	5 3/8
20	26 7/16	28 3/4	19 15/16	4 1/4	4 1/4	76 5/16	68 11/16	1 NPT	-	26 3/4	-	5 3/8

Table 35.

Unit Model #	A	B	C	D	E
WCD 150-180	42 3/8	48 3/8	31	N/A	N/A
WCD 240	29 1/2	56	38 1/2	18 1/2	N/A

All dimensions are in inches.

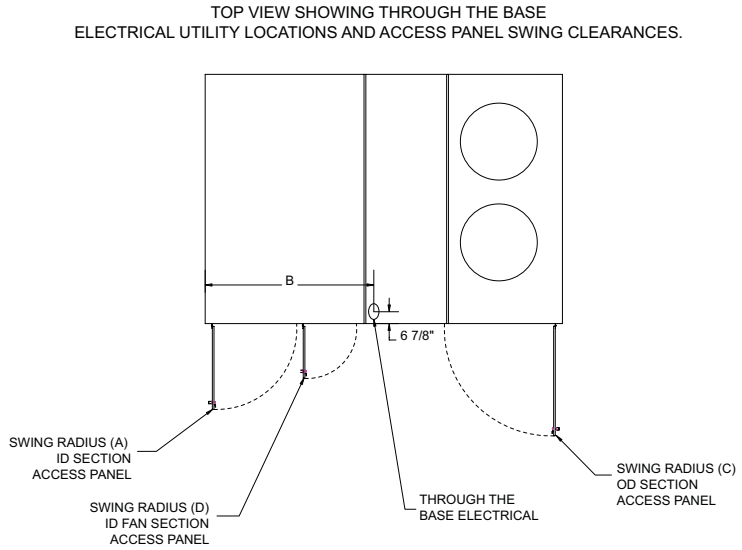


Figure 11. Heat Pump - Swing Diameter & Through the Base Electrical

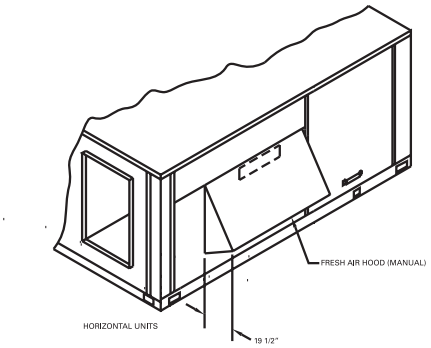


Figure 12. Fresh Air Hood (Horizontal Units)

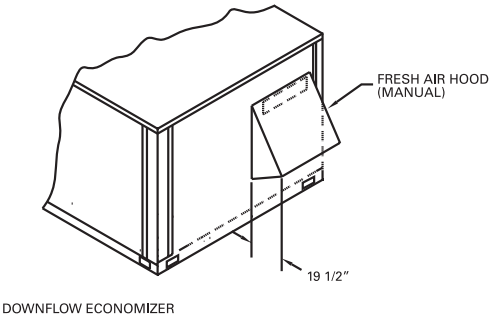


Figure 13. Fresh Air Hood (Downflow Units)

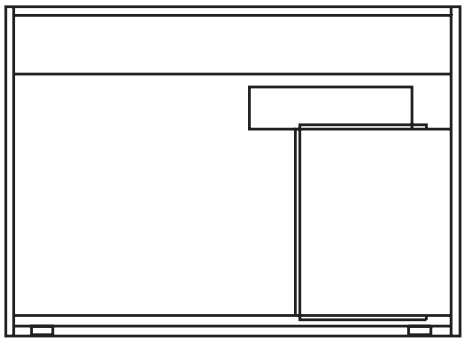


Figure 14. Power Exhaust - Downflow Economizers

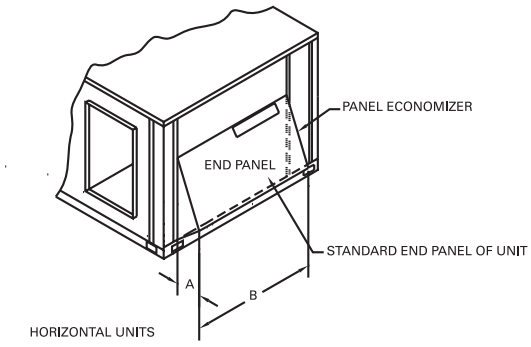


Figure 15. Economizer - Horizontal Units

Note: When applying economizer to horizontal units, connected ductwork must be run full size to allow proper operation of economizer damper.

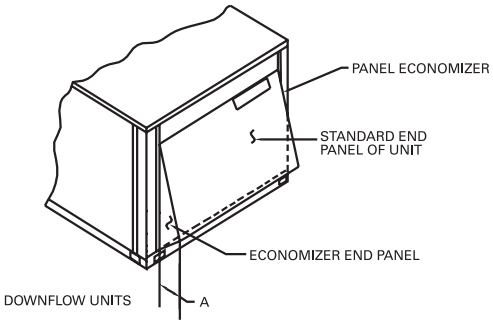


Figure 16. Economizer - Downflow Units

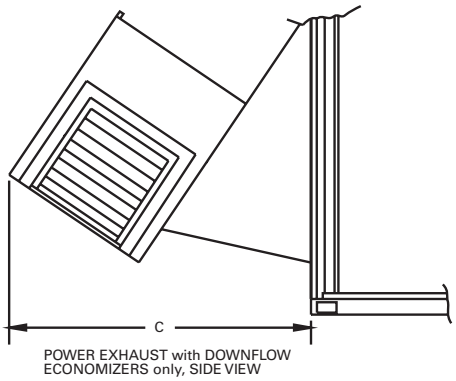


Figure 17. Power Exhaust - Downflow Economizers - Side View

Table 36. Power Exhaust Dimensions

Unit Model #	A	B(i)	C(ii)
WC*150-180	17½	53¾	36
WC*240	19½	64¾	39

(i) Horizontal dimension only. Downflow economizer is width of end panel.
(ii) Power exhaust is applied on downflow economizer only.

Weights

Table 37. Accessory Net Weights (Lbs)

Tons	Unit Model No.	Economizer[i]		Outside Air Damper		Power Exhaust[ii]	Roof Curb	Oversized Motor Adder	High Static Drive
		Net	Ship	Manual	Motorized				
12½,15	WCD150,180B	65	205	32	60	95	205	5	10/NA
20	WCD240B	80	265	32	75	95	235	5	10
12½,15	WCH150,180B	50	150	32	60	-	-	5	10/NA
20	WCH240B	65	210	32	75	-	-	5	15

(i) Net weight should be added to unit weight when ordering factory installed economizer or oversize motor.
(ii) Downflow only.

Table 38.

Tons	Unit Model No.	All Zone Sensors	Electric Heaters			
			5-18 kW 240/480V[i][ii]	23-36 kW 240/480V	54 kW 240/480V	72 kW 240/480V
12½,15	WCD150,180B	1	28/21	31/27	38/32	-
20	WCD240B	1	-	33/27	40/32	43/34
12½,15	WCH150,180B	1	28/21	31/27	38/32	-
20	WCH240B	1	-	33/27	40/32	43/34

(i) For 600V heaters net weights are same as 480V heaters.
(ii) To estimate shipping weight add 5 lbs to net weight.

Table 39.

Tons	Unit Model No.	Maximum Weights (Lbs)		Corner Weights (Lbs)				Center of Gravity (In.)	
		Shipping	Net	A	B	C	D	Length	Width
12½	WC*150	1719	1351	465	344	231	311	46	29
15	WC*180	1860	1492	678	227	383	204	44	28
20	WC*240	2467	2008	707	510	331	460	51	34

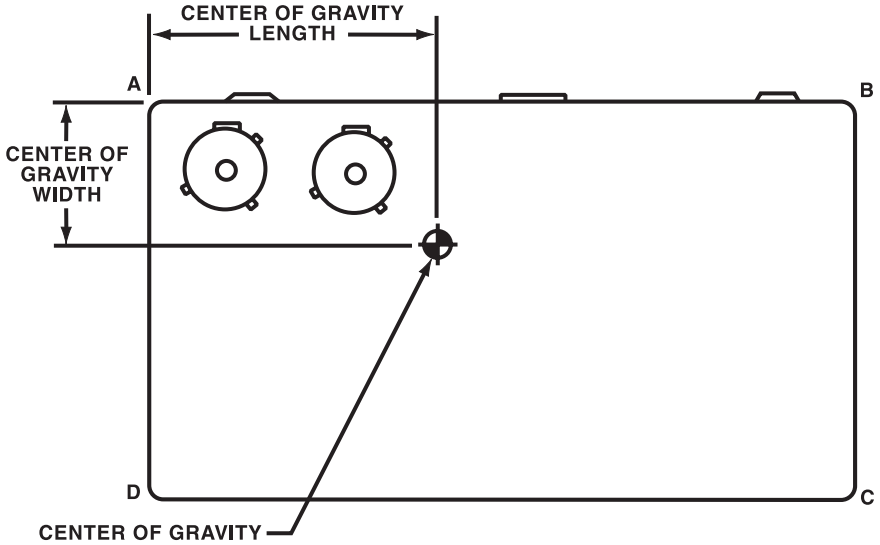


Figure 18.

Table 40. Factory Installed Options (FIOPS) Net Weights (Lbs)[i][ii][iii]

Accessory	Weight	Unit Model No.
High Efficiency Motors[iv]	49	WC*150-180 standard size motor
		WC*210-240 standard size motor
	36	WC*150-180 oversize motor
	0	WC*210-240 oversize motor
Hinged Doors	27	All WC* units
Powered Convenience Outlet	38	All WC* units
Through the Base Electrical	23	All WC* units
Unit Mounted Circuit Breaker	5	All WC* units except those with 54&72 kW heaters & 208/230V
	10	All WC* units with 54&72 kW heaters & 208/230V
Unit Mounted Disconnect	5	All WC* units except those with 54&72 kW heaters & 208/230V
	10	All WC* units with 54&72 kW heaters & 208/230V
Smoke Detectors Supply/Return	5	All WC* units
Tool-less Hail Guard	38	WC*150,180
	43	WC*240

(i) Weights for FIOP accessories not listed are >5 lbs.
(ii) Net weight should be added to unit weight when ordering factory installed accessories.
(iii) See Table W-1 for standard factory installed economizer and oversized motors.
(iv) Standard factory installed motors are already included in unit net and shipping weights. Values shown for high efficiency motors are in addition to the standard motor weight.

Notes: * Indicates both downflow and horizontal units.

Mechanical Specifications

General

The units shall be dedicated downflow or horizontal airflow. The operating range shall be between 115°F and 0°F in cooling as standard from the factory for all units. Cooling performance shall be rated in accordance with ARI testing procedures. All units shall be factory assembled, internally wired, fully charged with R-22, and 100% run tested to check cooling operation, fan and blower rotation and control sequence, before leaving the factory. Wiring internal to the unit shall be colored and numbered for simplified identification. Units shall be UL listed and labeled, classified in accordance to UL 1995/CAN/CSA No. 236-M90 for Heat Pumps. Canadian units shall be CSA Certified.

Casing

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. Unit's surface shall be tested 500 hours in a salt spray test in compliance with ASTM B117. Cabinet construction shall allow for all maintenance on one side of the unit. In order to ensure a water and air tight seal, service panels shall have lifting handles and no more than three screws to remove.

All exposed vertical panels and top covers in the indoor air section shall be insulated with a 1/2 inch, 1 pound density foil-faced, fire-resistant, permanent, odorless, glass fiber material. The base of the downflow unit shall be insulated with 1/2 inch, 1 pound density foil-faced, closed-cell material. The downflow unit's base pan shall have no penetrations within the perimeter of the curb other than the raised 11/8 inch high supply/return openings to provide an added water integrity precaution, if the condensate drain backs up. The base of the unit shall have provisions for forklift and crane lifting.

Unit Top

The top cover shall be one piece, or where seams exist, double hemmed and gasket sealed to prevent water leakage.

Filters

Two inch standard filters shall be factory supplied on all units. Optional two inch pleated media filters shall be available.

Compressors

External high pressure cutout shall be provided on all 15 and 20 models. Low pressure switches shall be standard. All units shall have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps. Motor shall be suction gas-cooled and shall have a voltage utilization range of plus or minus 10% of nameplate voltage. Internal overloads shall be provided with the scroll compressors. Crankcase heaters shall be utilized with all scroll compressors.

Refrigerant Circuits

Each refrigerant circuit shall have independent fixed orifice or thermostatic expansion devices, service pressure ports, and refrigerant line filter driers factory installed as standard. An area shall be provided for replacement suction line driers.

Evaporator and Condenser Coils

Internally finned, 3/8" copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 200 psig and pressure tested to 450 psig. All dual compressor units shall have intermingled evaporator coils. Sloped condensate drain pans are standard. Patent-pending 1+1+1 condenser coil, permanently gapped for easy cleaning is available.

Outdoor Fans

The outdoor fan shall be direct-drive, statically and dynamically balanced, draw-through in the vertical discharge position. The fan motor(s) shall be permanently lubricated and shall have built-in thermal overload protection.

Indoor Fan

Units above shall have belt driven, FC centrifugal fans with adjustable motor sheaves. Units with standard motors shall have an adjustable idler-arm assembly for quick-adjustment of fan belts and motor sheaves. All motors shall be thermally protected. Oversized motors shall be available for high static application. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

Controls

Unit shall be completely factory-wired with necessary controls and contactor pressure lugs or terminal block for power wiring. Unit shall provide an external location for mounting a fused disconnect device. ReliaTel controls shall be provided for all 24-volt control functions. The resident control algorithms shall make all heating, cooling, and/or ventilating decisions in response to electronic signals from sensors measuring indoor and outdoor temperatures. The control algorithm maintains accurate temperature control, minimizes drift from set point, and provides better building comfort. A centralized control shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.

Defrost Controls

Adaptive demand defrost shall be provided to permit defrost wherever coil icing conditions begin to significantly reduce unit capacity.

Factory Installed Options

Black Epoxy Pre-Coated Coils

The black epoxy coils have a thermoset vinyl coating that is bonded to the aluminum fin stock prior to the fin-stamping process. The pre-coated coils are an economical option for protection in mildly corrosive environments.

Hinged Access Doors

Sheet metal hinges are available on the Filter, Evaporator, ID Fan and Compressor/Control Access Doors. This option is available on all models.

High Efficiency Motors

This option is available with efficiency ratings from 86.5 up to 91.0. It is not available for all models.

High Pressure Cutout

This option is offered for units that do not have High Pressure cutout as standard. The Voyager units with High Pressure Cutout as standard are WC*180-240B.

Powered or Unpowered Convenience Outlet

This option is a GFCI, 120v/15amp, 2 plug, convenience outlet, either powered or unpowered. When the convenience outlet is powered, a service receptacle disconnect will be available. The convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker. This option can only be ordered when the Through the Base Electrical with either the Disconnect Switch, or Circuit Breaker, option is ordered. This option is available on all models.

Supply and/or Return Air Smoke Detector

With this option installed, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. Return Air Smoke Detectors require minimum allowable airflow when used with certain models. See the Installation, Operation, and Maintenance (IOM) manual for the models affected and the minimum allowable airflow required. This option is available on all models.

Through the Base Electrical with Circuit Breaker

This option is a thermal magnetic, molded case, HACR Circuit Breaker with provisions for through the base electrical connections. The circuit breaker will be installed in a water tight enclosure in the unit with access through a swinging door. Factory wiring will be provided from the switch to the unit high voltage terminal block. The circuit breaker will provide overcurrent protection, be sized per NEC and UL guidelines, and be agency recognized by UL/CSA. This option is available on all downflow models.

Through the Base Electrical With Disconnect Switch

Three-pole, molded case, disconnect switch with provisions for through the base electrical connections are available. The disconnect switch will be installed in the unit in a water-tight enclosure with access through a swinging door. Factory wiring will be provided from the switch to the unit high voltage terminal block. The switch will be UL/CSA agency recognized. This option is available on all downflow models.

Note: *Note: The disconnect switch will be sized per NEC and UL guidelines but will not be used in place of unit overcurrent protection. This option is available on all models.*

Through the Base Utilities Access

An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through the base of downflow units, and through the front of the horizontal units. Option will allow for field installation of liquid-tight conduit and an external field-installed disconnect switch.

Two-Inch Pleated Filters

Two inch pleated media filters shall be available on all models.

Factory or Field Installed Options

Clogged Filter/Fan Failure Switch

A dedicated differential pressure switch is available to achieve active fan failure indication and/or clogged filter indication. These indications will be registered with either a zone sensor with status indication lights or an Integrated Comfort™ System.

Differential Pressure Switches

These options allow for individual fan failure and dirty filter indication. The fan failure switch will disable all unit functions and “flash” the Service LED on the zone sensor. The dirty filter switch will light the Service LED on the zone sensor and will allow continued unit operation.

Discharge Air Sensing Kit

This kit provides true discharge air sensing in heating models. This sensor is a status indicator readable through Tracer™ or Tracker™. The kit is functional only with the ReliaTel Options Module.

Economizer - Downflow

The assembly includes fully modulating 0-100% motor and dampers, barometric relief, minimum position setting, preset linkage, wiring harness with plug, fixed dry bulb and spring return actuator. The barometric relief damper shall be standard with the downflow economizer and shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment “off” cycle. Solid state enthalpy and differential enthalpy control shall be field-installed.

Electric Heaters

Electric heat modules shall be available for installation within the basic unit. Electric heater elements shall be constructed of heavy-duty nickel chromium elements internally delta connected for 240 volt, wye connected for 480 and 600 volt. Staging shall be achieved through ReliaTel. Each heater package shall have automatically reset high limit control operating through heating element contactors. All heaters shall be individually fused from the factory, where required, and shall meet all NEC and CEC requirements when properly installed. Power assemblies shall provide single-point connection. Electric heat modules shall be UL listed or CSA certified. If ordering the Through the Base Electrical option with an Electric Heater, the heater must be factory installed.

Frostat

This option is to be utilized as a safety device. The Frostat opens when temperatures on the evaporator coil fall below 10°F. The temperature will need to rise to 50°F before closing. This option should be utilized in low airflow or high outside air applications.

LonTalk® Communications Interface

The LonTalk communications interface, when installed in a Voyager unit, allows the unit to communicate as a Tracer™ LCI-V device or directly with generic LonTalk Network Building Automation System Controls.

Oversized Motors

Oversized motors shall be available for high static applications.

Reference or Comparative Enthalpy

Reference Enthalpy is used to measure and communicate outdoor humidity. The unit receives and uses this information to provide improved comfort cooling while using the economizer. Comparative Enthalpy measures and communicates humidity for both outdoor and return air conditions and return air temperature. The unit receives and uses this information to maximize use of economizer cooling, and to provide maximum occupant comfort control. Reference or Comparative Enthalpy option shall be available when a factory or field installed Downflow Economizer is ordered. This option is available on all downflow models.

Tool-less Hail Guards

Tool-less, hail protection quality coil guards are available for condenser coil protection.

Trane Communication Interface

This factory or field-installed option shall be provided to interface ReliaTel™ controlled units with the Trane Integrated Comfort™ systems.

Field Installed Options

CO_2 Sensing

The CO_2 sensor has the ability to monitor space occupancy levels within the building by measuring the parts per million of CO_2 (Carbon Dioxide) in the air. As the CO_2 levels increase, the outside air damper modulates to meet the CO_2 space ventilation requirements.

Digital Display Zone Sensor

The Digital LCD (Liquid Crystal Display) zone sensor has the look and functionality of standard zone sensors. This sensor includes a digital display of set point adjustment and space temperature in °F (Fahrenheit) or °C (Celsius). Includes FAN and SYSTEM buttons (supports the service functions of the standard sensor). E-squared memory stores last programmed set points. Requires 24 VAC (Volts AC). This sensor should be utilized with ReliaTel™ controls.

Dual Thermistor Remote Zone Sensor

This sensor will allow the customer to reduce the total number of remote sensors to obtain space temperature averaging. This sensor should be utilized with ReliaTel™ controls.

High Static Drive

The high static drive option shall allow the standard motor on the 12½ and 20 ton units to operate with improved external static capabilities.

Manual Outside Air Damper

The rain hood and screen shall provide up to 25% outside air.

Motorized Outside Air Dampers

Manually set outdoor air dampers shall provide up to 50% outside air. Once set, outdoor air dampers shall open to set position when indoor fan starts. The damper shall close to the full closed position when indoor fan shuts down.

Powered Exhaust

The powered exhaust shall provide exhaust of return air, when using an economizer, to maintain better building pressurization.

Roof Curb - Downflow

The roof curb shall be designed to mate with the downflow unit and provide support and a water tight installation when installed properly. The roof curb design shall allow field-fabricated rectangular supply/ return ductwork to be connected directly to the curb. Curb design shall comply with NRCA requirements. Curb shall be shipped knocked down for field assembly and shall include wood nailer strips.

Economizer - Horizontal

The horizontal economizer shall contain the same features as the downflow economizer with the exception of barometric relief.

Remote Potentiometer

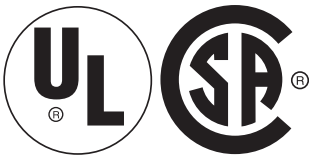
The minimum position setting of the economizer shall be adjusted with this accessory.

Ventilation Override Accessory

With the Ventilation Override Accessory installed, the unit can be set to transition up to three different pre-programmed sequences for Smoke Purge, Pressurization, and Exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard wired relay output from a smoke detector or fire control panel.

Zone Sensors

This option shall be provided to interface with the Micro equipped Voyagers and shall be available in either manual, automatic, programmable with night setback, with system malfunction lights or remote sensor options.



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