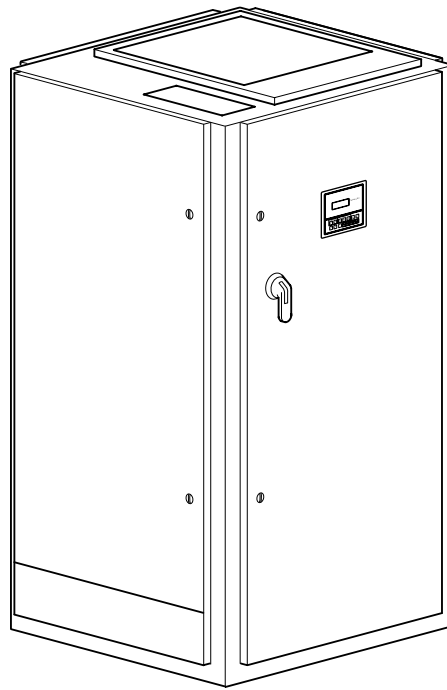




NetworkAIR™ TC Series

Precision Air-Conditioning Units—60 Hz



Technical Data

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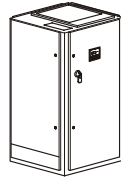
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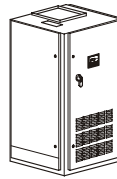
Available Models

Downflow



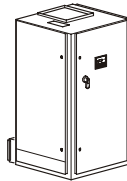
2-10 ton (4-12 ton CW)

Upflow front-return



2-10 ton (4-12 ton CW)

Upflow rear-return

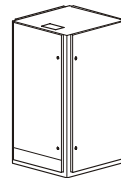


2-5 ton (4-8 CW)



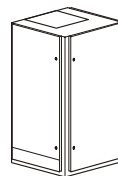
8-10 ton (10-12 CW)

Indoor rear-discharge centrifugal condenser



2-10 ton

Indoor top-discharge centrifugal condenser



2-10 ton

Overview

Introduction

The APC TC series precision air-conditioning system provides a quiet, efficient, and reliable system solution in an extremely compact footprint. The TC series is offered in a wide variety of capacities, configurations, and air patterns within an extremely compact cabinet size.

Precision environmental control requirements now reach far beyond the confines of the traditional data center or computer room to encompass a larger suite of applications, referred to as “Technology Rooms.”

Typical technology room applications included:

- Computer rooms
- Telecommunication facilities
- Clean rooms
- Power equipment
- Medical equipment rooms
- Archives
- LAN environments

A worldwide network of APC representatives is fully qualified to provide engineering, sales, installation and service for our products.

Our commitment to quality is demonstrated by the APC industry-leading two-year parts warranty.

Capacity

Available are 2 through 10 nominal tons (7 kW–35 kW) for direct expansion systems and 4 through 12 nominal tons (14 kW–42 kW) for chilled water systems.

Air pattern

Downflow units discharge air into the raised floor plenum eliminating the need for air distributing ductwork. This enables the owner to locate the unit where space is available or relocate the unit as the room changes or expands. These units are suitable for areas with raised floors greater than 12" (305 mm) high. Air is drawn in through the top of the unit.

Upflow units discharge air into either a plenum or ductwork. These units are suitable for areas with raised floors less than 12" (300 mm) high. Air is drawn in through the front on the standard design or optional from the rear of the unit.

Control

The microprocessor controller provides advanced integrated system operation and management ensuring simple, reliable and precise temperature and humidity control.

Configuration

Air-cooled. Unit used with an air-cooled condenser. Refrigerant lines must be run between the indoor unit and the condenser. Air cooled units require low maintenance and have low operating costs.

Configurations are:

- Air-cooled with remote outdoor condenser.
- Air-cooled with remote indoor floor mounted condenser.

Water-cooled. Unit used with a cooling tower or other source of water. Field refrigeration piping is eliminated by a factory sealed and tested system. Water piping to and from the unit is required.

Glycol-cooled. Unit used with a drycooler. The need for field refrigeration piping is eliminated by a factory sealed and tested system. The glycol piping is sealed, eliminating costly water treatment often encountered with open cooling towers.

Remote-condensing. Unit used with a remote air-cooled condensing unit which includes the compressor(s). This allows key maintenance procedures to be located outside the critical environment helping eliminate access by maintenance personnel in high security areas.

Pre-cool. Unit designed to reduce operating costs during mid to low ambient temperatures by integrating an economizer coil into the glycol-cooled system. The economizer coil, located up stream from the evaporator coil, provides partial cooling when ambient temperature falls below 60° F (16° C). At a return glycol temperature of 45° F (7° C) published capacity is accomplished by the economizer coil, therefore compressor operation is typically not required (2–5 ton only).

Chilled water. Unit utilizes a chilled water loop with a modulating control valve. Chilled water piping to and from the unit is required.

Front access

The TC series has full service front access for routine servicing of components. Front access also narrows the footprint of the unit making it possible for units to be placed side by side.

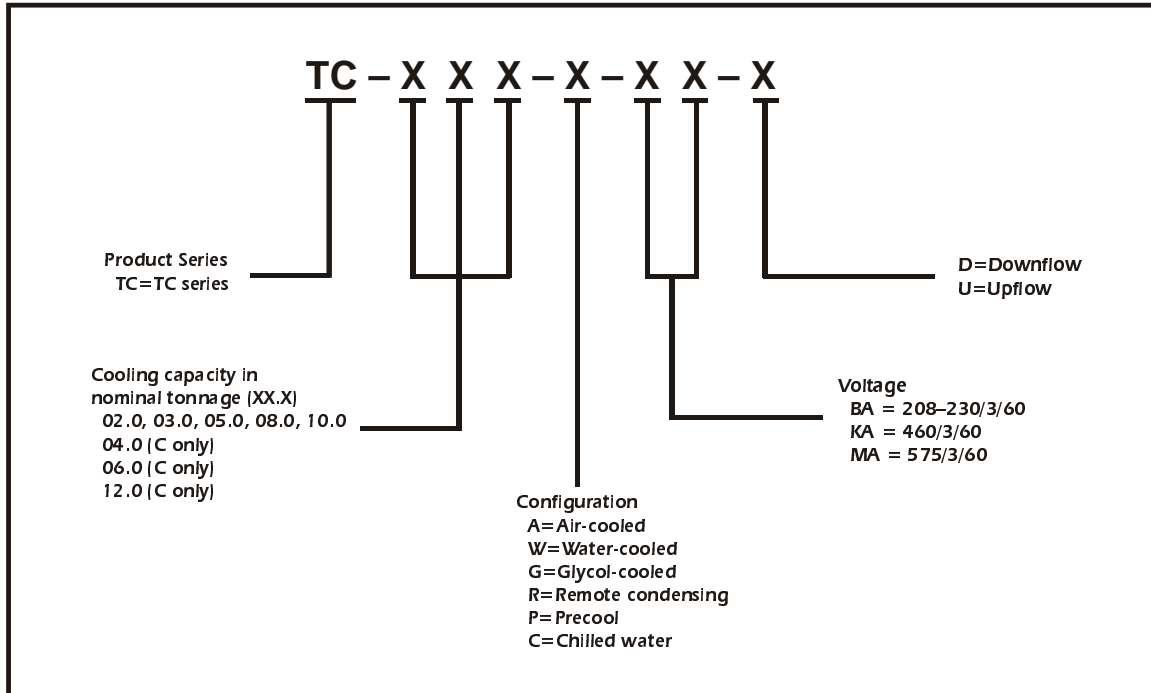
Humidity control

Humidity is managed through self-contained steam canister humidifier for maximum efficiency and ease of maintenance. The pure steam canister maintains consistent capacity output and requires very little or no scheduled maintenance. The humidity control cycle is controlled by the advanced microprocessor controller providing on demand dehumidification and humidification control.

Compliance

The TC series has received agency approvals by ETL and MEA#HENM-MY. Electrical systems comply with NEC and UL 1995 standards.

Model Selection



Standard Features

Microprocessor controller

The microprocessor controller provides state of the art control for a wide variety of environmental applications including the demanding requirements of data centers, control rooms, clean rooms, switch rooms, MRI facilities, CAT scan facilities and UPS rooms. Operator Interface is provided by the four-line, 80-character backlit LCD display. A user-friendly menu structure along with clearly defined prompts allow the operator to easily move about the program. Within the configuration menu the operator will find numerous selections allowing the TC to be tailored to meet specific requirements.

Status. Complete status monitoring is provided within the status menu of the microprocessor controller.

Available information includes:

- Current temperature
- Current humidity
- Temperature setpoint
- Humidity setpoint
- Cooling status
- Heating status
- Humidification status
- Dehumidification status

Alarms. Quick access to any alarm condition is facilitated through the menu structure. The alarm key acts as a hot key providing immediate access to the alarm display menu. Presence of a new alarm will sound the audible alarm. The red alarm LED on the display panel will remain illuminated until all alarms have been cleared. The temperature and humidity alarm setpoints are adjustable.

Alarm annunciations include:

- Loss of airflow
- Clogged filter
- High head pressure
- Low suction pressure
- High temperature
- Low temperature
- High humidity
- Low humidity

Setpoints. The microprocessor is provided with independent setpoint for:

- Heating
- Cooling
- Humidification
- Dehumidification

Automatic setpoint crossover protection will prevent the setting of the heat setpoint above the cool setpoint and the humidify setpoint above the dehumidify setpoint. Setpoint adjustment can be restricted to only operators with knowledge of the security codes set within the security menu structure.

Configuration. Flexibility is offered through the use of the configuration menu. Operating requirements are satisfied by changing the configuration settings. New configurations are stored in EEPROM and protected from unauthorized tampering by the four-digit security password, selected in the security menu.

Configuration options include:

- Fahrenheit or celsius display
- Compressor minimum on time
- Compressor minimum off time
- Power loss restart time delay
- Redundant unit grouping
- Alarm input polarity
- Alarm enable
- Temperature deadbands
- Humidity deadbands
- Small room delay

Common alarm contact. A common alarm relay is installed on every microprocessor. In the event of an alarm condition, the relay will change state. The user can select which alarms change the state of the relay. This feature allows for remote enunciation of alarm status.

Run times. The major components within the unit (motor, humidifier, and compressor) have independent run timers that monitor and store accumulated run hours on the components. The run timers are provided with operator adjustable run time alarms.

Security. Multiple security levels prevent unauthorized adjustment of important system parameters. The user may select a four-digit password for setpoint and configuration changes. Should the password be forgotten, APC can provide temporary access.

Monitoring. With the addition of a network communications card the microprocessor may interface with the locally installed APC remote monitoring and control system. Gateways are available for interfacing with building management systems. Please check with APC for compatibility with your building management system.

Cool inhibit. Prevents the unit from over-cooling during the dehumidification cycle. If the space temperature falls below a user adjustable setpoint, cooling will become inhibited until the space temperature returns to setpoint.

Cool override. A manual toggle switch will allow the compressor to operate in the event of a microprocessor failure. The cool override can be field wired to a snap acting thermostat for cooling control.

Remote shutdown. Events external to the unit, such as activation of a fire suppression system may require the unit to shut down remotely. Additionally this feature may be tied into a BMS that would allow remote control of the units on/off status.

Overall cabinet

The frame is constructed of heavy gauge steel for maximum strength. Steel access panels are insulated for quieter operation. The unit has been designed for full service access from the front. The flush mounted panels are removable using convenient quarter-turn fasteners. The access doors for the electronic controller and electrical panel can be opened without interrupting the operation of the unit.

Blower assembly	The TC series includes a centrifugal blower assembly that has been engineered for quiet, reliable operation. Lower blower speeds reduce noise and extend belt and bearing life to 100,000L ₁₀ hours. Permanently lubricated bearings, a single-belt variable pitch drive, and an adjustable motor base all ensure dependable operation. In addition, the return air is evenly distributed across the cooling coil.
Electrical panel	The electrical panel contains the contactors, starters, overload protection devices, and input power disconnects. Each wire (except jumpers) is numbered every 3" (80 mm), or color coded to facilitate circuit tracing when installing and servicing the unit. Each AC power circuit is individually branch circuit fused on all three phases. All compressor and motor devices are thermally and short circuit protected. The electrical panel is easily accessible from the front of the unit. An emergency cool override switch can be manually activated to initiate cooling and a field wired thermostat can be utilized to control cooling operation. All electrical components are UL-listed and-recognized and all wiring conforms to NFPA 70 (NEC) and UL 1995 requirements.
Humidifier	The humidifier utilizes a pure steam generator specifically designed for hi-tech area environmental control. The pure steam eliminates contaminating mineral deposits, potentially deadly bacteria, white dust and excessive humidity. The humidifier requires little or no scheduled maintenance. Automatic flushing combined with an indicator that signals when the canister is to be changed, ensure maintenance free operation.
Electric reheat	A three-phase electrical resistance heater sized to offset the sensible cooling capacity in the dehumidification mode is incorporated in each TC series unit. The reheat elements are low watt density sheathed components. The reheat is three phase to provide even phase loading. Reheat elements are electrically and thermally protected.
Refrigeration system and compressor	The refrigeration system operates under an automatic microprocessor controller for greater efficiency and accuracy. The heavy-duty compressor is designed for year-round operation with a 15-year life expectancy. The performance of the refrigeration system is enhanced by use of Scroll Compressor Technology. Vibration in the system is greatly reduced by elimination of the reciprocating masses found in the semi-hermetic compressor. Risk of refrigeration leaks at compressor gaskets are eliminated with the scroll compressors fully welded hermetic shell. The design of the scroll is more tolerant to liquid flood back than the traditional reciprocating compressor. Power consumption at full load is greatly reduced with higher EER's of the scroll. In addition reliability is enhanced due to the fewer moving parts required using scroll technology. The end result is a refrigeration system that offers the user optimized performance, efficiency and reliability.

Each refrigeration system includes:

- Thermal expansion valve with equalizer
- High and low pressure switches
- Sight glass with moisture indicator
- Filter drier
- Liquid line solenoid valve
- Liquid line isolation valve

Cooling coil

Designed for high sensible heat ratios, the coil is constructed with copper tubes, aluminum fins, galvanized steel end plates, and includes a stainless steel condensate pan. The return is drawn evenly through the entire face of the cooling coil.

Condenser

The water-and glycol-cooled systems employ a coaxial style condenser that uses efficient tube within a tube counterflow heat transfer to remove the heat of compression. Water flows through the inner tube while refrigerant flows in the annulus between the inner copper tube and outer steel tube. The convoluted tubes enhance thermal performance while inhibiting the accumulation of deposits.

Air filter

The filtration of conditioned air is extremely vital to maintaining the clean, particle-free environment required by electrical equipment. The TC series uses 30% efficient (ASHRAE 52.1-92), 4" (102 mm) deep filters, with full depth filter pleats. In addition to high filtration properties, these filters produce a lower pressure drop than standard filters so less energy is required during normal operation. Filters are easily replaced from the top on downflow units and from the front on upflow units.

Water-regulating valve

The water-and glycol-cooled systems maintain proper performance by sensing refrigerant discharge pressure and regulating the amount of water or glycol supplied to the condenser. A two-way and three-way valve is available. The standard valve pressure rating is 150 psi (1030 kPa).

Airflow sensor

The air proving switch is continuously monitored by the microprocessor. Upon detection of a loss of air flow the microprocessor will deactivate: cooling, heating, humidification and dehumidification. After the air flow has been restored for a predetermined period of time the microprocessor will reactivate the functions as needed.

Clogged filter alarm

An adjustable air pressure differential switch senses the pressure drop across the filters. Upon sensing an excessive pressure drop, the switch activates the alarm circuit of the microprocessor and displays a clogged filter message simultaneously with an audible signal.

Modulating valve

A fully modulating 2- or 3-way valve is microprocessor controlled to automatically direct the proper amount of chilled water into the cooling coil to maintain desired conditions. The pressure rating of the valve is 400 psi (2,700 kPa).

Optional Features

The following optional features are available on the TC Series unless otherwise noted. Certain combinations of options may not be available.

Emergency/ environmental

Smoke detector(s). The factory installed smoke detector(s) is designed to sense smoke concentration in the return air stream. Upon detecting smoke concentration an audible and visual alarm on the microprocessor will be activated and the unit will immediately shut-down.

Firestat. A Firestat is available for installation in the air stream. If the return air temperature reaches 125° F (52° C), the air conditioner will be turned off and both an audible and visual alarm will be activated on the microprocessor.

Water detector(s). The solid-state water detector(s) activates an audible and visual alarm on the microprocessor when moisture is detected. The water detector is provided with 15' (5 m) of wire.

Remote relay shutdown . Remote shutdown of the NetworkAIR system can be done remotely by a factory installed relay. The relay can be ordered with a 24V, 120V, or 240V coil. The relay must be powered by others to disable the NetworkAIR system.

Essential/non-essential lockout. When facilities have limited backup power capacity, this lockout prevents the operation of electrical loads that are not *essential* for continued site operation.

External components

Floorstand. The heavy gauge floorstand raises the unit above the subfloor to match the height of the raised floor. Heights are available from 6" to 36" (12" to 36" for downflow units) in 3" increments and are adjustable +/- 1.5". Adjustment is provided by threaded pedestals. Vibration absorbing pads are included. The floorstand, pedestal and pads ship loose. Floorstands are available for seismic applications.

Air deflector. An air deflector ships loose and attaches to the floorstand for changing air direction from vertical to horizontal.

Plenum. The discharge plenum mounts on top of the upflow unit to direct and distribute conditioned air. Manually adjustable, double deflecting grilles are provided on 3 or 4 sides.

Duct flange. A 1" (25 mm) duct flange is installed on a unit to provide convenient connection to external ductwork. The duct flange can be installed at the air outlet on upflow units, at the air inlet on upflow rear return units, or at the air inlet on downflow units.

Control/monitoring

Custom alarm dry contact closures. Each unit can be equipped with any or all of the listed dry contact closures. Upon activation of the associated alarm, a discreet Normally Open or Normally Closed contact is available for remote monitoring of that discreet alarm.

- High Temperature Alarm
- Low Temperature Alarm
- High Humidity Alarm
- Low Humidity Alarm
- Compressor High Pressure Alarm
- Fan Status Alarm
- Change Filter Alarm
- Fire Alarm (with addition of optional firestat)
- Smoke Detector Alarm (with addition of optional smoke detector)
- Humidifier Change Canister Alarm
- Water Underfloor Alarm (with addition of water detector)
- Additional Common Alarm.

Redundant group control. Allows up to six NetworkAIR units the ability to communicate with each other to automatically switch upon alarm condition, or timed rotation. Can also allow standby units the ability to assist the running system.

Remote display panel. The microprocessor controller allows facility or building-maintenance personnel to evaluate and control the unit from up to 50 ft. away from the unit, without having to enter the secured space.

Remote sensor(s). Environmental sensor(s) can be strategically placed, up to 50 ft. from the unit to better meet the site's cooling needs. The sensor must be positioned to permit air movement across the sensors.

Environmental monitoring unit. A stand-alone unit performs continuous temperature and humidity sensing through two available probes (one included) and contact monitoring. The unit is controlled by available web, control console, or SNMP interface with network connection. In the event of an environmental anomaly, notification is sent to the customer via e-mail or SNMP. The unit is 18.25" × 9" × 2.75" (464 mm × 229 mm × 70 mm) and sits in or on top of a rack. The probes extend up to 12' (3.66 m) from the unit.

Reheat

Hot water or steam reheat. An on/off solenoid valve for steam reheat or a modulating valve for hot water reheat maintains the dry bulb temperature when the system is in dehumidification and heat mode. Completely factory pre-piped, the system includes a copper tube, aluminum-fin reheat coil, solenoid valve, float, and thermostatic and steam trap for steam reheat only.

Hot gas reheat. The copper tube, aluminum fin hot gas reheat coil maintains the leaving dry bulb temperature when the system is in the dehumidification mode. The coil is controlled by the microprocessor through a factory-piped-and-wired three-way heat reclaim regulator and check valve (water/glycol only).

System Components

Premium efficiency motor(s). High efficiency motor(s) conserve energy over periods of continuous fan operation.

High efficiency filter(s). Pleated final filter(s) with an efficiency of 40% and 60% (ASHRAE 52.2), 4" (102 mm) deep, allow the removal of a greater percentage of airborne particulate contaminants.

Prefilter(s). Intended to capture large airborne particulate contaminants, thereby extending the life of the high-efficiency filter. Prefilters are 1" (25 mm) deep and easily disposable.

Condensate pump. The factory installed and wired condensate pump will pump 36 gal/h (0.06 L/s) at 15 ft. (4.6 m) head.

High pressure water regulating valve(s). Water and glycol systems may utilize an optional regulating valve, which operates with a maximum pressure of 350 psi (2400 kPa), to automatically control condensing temperature.

Flared filter-drier connection. Flared threaded connections can be provided on either side of the filter drier to expedite replacement.

Hot gas bypass. An auxiliary side-port hot gas bypass circuit. The activation of the hot gas bypass circuit will maintain the evaporator coil temperature during low load conditions. This optional feature will offer longer compressor run times and minimize compressor cycling and temperature fluctuations.

External chilled water supply systems. Contains a primary chilled water coil and secondary TC coil within the same cabinet. These systems can provide cooling using either building chilled water or the standard TC refrigeration system. The chilled water mode is configured as primary and will switch to the TC upon chilled water temperature rise or loss of flow. The TC systems are available in water-cooled, glycol-cooled, and air-cooled configurations.

Performance Specifications—standard cfm

Net cooling capacity—air/remote condensing—standard cfm

CAPACITY IN BTU/H		MODEL				
		2T	3T	5T	8T	10T
80° F DB, 67° F WB	Total (BTUH)	27,800	39,900	63,100	94,100	98,800
(26.7°C DB, 19.4°C WB)	(kW)	(8.1)	(11.7)	(18.5)	(27.6)	(29.0)
50% RH	Sensible (BTUH)	23,100	32,900	54,500	78,800	82,500
	(kW)	(6.8)	(9.6)	(16.0)	(23.1)	(24.2)
75° F DB, 62.5° F WB	Total (BTUH)	26,200	37,400	59,000	86,800	91,500
(23.9°C DB, 16.9°C WB)	(kW)	(7.7)	(11.0)	(17.3)	(25.4)	(26.8)
50% RH	Sensible (BTUH)	23,200	33,300	53,500	77,600	81,500
	(kW)	(6.8)	(9.8)	(15.7)	(22.7)	(23.9)
75° F DB, 62.5° F WB	Total (BTUH)	25,800	36,900	58,600	86,000	90,800
(23.9°C DB, 16.1°C WB)	(kW)	(7.6)	(10.8)	(17.2)	(25.2)	(26.6)
45% RH	Sensible (BTUH)	24,700	35,300	57,500	83,600	88,200
	(kW)	(7.2)	(10.3)	(16.9)	(24.5)	(25.8)
72° F DB, 60° F WB	Total (BTUH)	25,100	35,900	56,600	82,900	87,300
(22.2°C DB, 15.5°C WB)	(kW)	(7.4)	(10.5)	(16.6)	(24.3)	(25.6)
50% RH	Sensible (BTUH)	22,600	32,500	52,500	75,500	79,200
	(kW)	(6.6)	(9.5)	(15.4)	(22.1)	(23.2)
72° F DB, 58.6° F WB	Total (BTUH)	24,800	35,400	56,300	82,400	86,800
(22.2°C DB, 14.8°C WB)	(kW)	(7.3)	(10.4)	(16.5)	(24.2)	(25.4)
45% RH	Sensible (BTUH)	24,000	34,300	55,800	80,800	85,100
	(kW)	(7.0)	(10.1)	(16.4)	(23.7)	(24.9)
70° F DB, 58.5° F WB	Total (BTUH)	24,400	35,000	54,900	80,500	84,600
(22.0°C DB, 14.8°C WB)	(kW)	(7.2)	(10.3)	(16.1)	(23.6)	(24.8)
50% RH	Sensible (BTUH)	22,100	31,800	50,700	73,500	76,700
	(kW)	(6.5)	(9.3)	(14.9)	(21.5)	(22.5)
70° F DB, 57.2° F WB	Total (BTUH)	24,100	34,500	54,800	80,100	84,400
(22.2°C DB, 14.8°C WB)	(kW)	(7.1)	(10.1)	(16.1)	(23.5)	(24.7)
45% RH	Sensible (BTUH)	23,400	33,400	54,300	78,400	82,800
	(kW)	(6.9)	(9.8)	(15.9)	(23.0)	(24.3)

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Net cooling capacity—water—standard cfm

CAPACITY IN BTU/H		MODEL				
		2T	3T	5T	8T	10T
80° F DB, 67° F WB (26.7°C DB, 19.4°C WB)	Total (BTUH)	29,600	43,000	68,700	100,400	105,800
	(kW)	(8.7)	(12.6)	(20.1)	(29.4)	(31.0)
50% RH	Sensible (BTUH)	23,900	34,300	56,700	81,600	85,700
	(kW)	(7.0)	(10.1)	(16.6)	(23.9)	(25.1)
75° F DB, 62.5° F WB (23.9°C DB, 16.9°C WB)	Total (BTUH)	27,800	39,900	63,900	92,200	97,500
	(kW)	(8.1)	(11.7)	(18.7)	(27.0)	(28.6)
50% RH	Sensible (BTUH)	24,100	34,000	56,100	80,200	84,400
	(kW)	(7.1)	(10.0)	(16.4)	(23.5)	(24.7)
75° F DB, 62.5° F WB (23.9°C DB, 16.1°C WB)	Total (BTUH)	27,400	39,700	63,300	91,300	96,600
	(kW)	(8.0)	(11.6)	(18.6)	(26.8)	(28.3)
45% RH	Sensible (BTUH)	25,600	37,000	60,400	86,400	91,300
	(kW)	(7.5)	(10.8)	(17.7)	(25.3)	(26.8)
72° F DB, 60° F WB (22.2°C DB, 15.5°C WB)	Total (BTUH)	26,600	38,200	61,700	88,600	93,600
	(kW)	(7.8)	(11.2)	(18.1)	(26.0)	(27.4)
50% RH	Sensible (BTUH)	23,500	33,300	55,000	78,700	82,900
	(kW)	(6.9)	(9.8)	(16.1)	(23.1)	(24.3)
72° F DB, 58.6° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	24,800	38,100	60,900	87,500	92,400
	(kW)	(7.3)	(11.2)	(17.8)	(25.6)	(27.1)
45% RH	Sensible (BTUH)	24,000	36,000	59,200	84,100	88,700
	(kW)	(7.0)	(10.6)	(17.4)	(24.6)	(26.0)
70° F DB, 58.5° F WB (22.0°C DB, 14.8°C WB)	Total (BTUH)	26,000	37,200	60,100	86,200	90,900
	(kW)	(7.6)	(10.9)	(17.6)	(25.3)	(26.6)
50% RH	Sensible (BTUH)	23,000	32,500	53,700	76,700	80,600
	(kW)	(6.7)	(9.5)	(15.7)	(22.5)	(23.6)
70° F DB, 57.2° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	25,600	37,200	59,400	85,100	89,800
	(kW)	(7.5)	(10.9)	(17.4)	(24.9)	(26.3)
45% RH	Sensible (BTUH)	24,300	35,100	57,200	81,600	86,000
	(kW)	(7.1)	(10.3)	(16.8)	(23.9)	(25.2)

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Net cooling capacity—glycol—standard cfm

CAPACITY IN BTU/H		MODEL				
		2T	3T	5T	8T	10T
80° F DB, 67° F WB (26.7°C DB, 19.4°C WB)	Total (BTUH)	26,500	38,100	61,300	89,300	93,800
	(kW)	(7.8)	(11.2)	(18.0)	(26.2)	(27.5)
50% RH	Sensible (BTUH)	22,900	32,200	53,400	76,700	80,300
	(kW)	(6.7)	(9.4)	(15.7)	(22.5)	(23.5)
75° F DB, 62.5° F WB (23.9°C DB, 16.9°C WB)	Total (BTUH)	24,600	35,800	57,100	82,300	87,000
	(kW)	(7.2)	(10.5)	(16.7)	(24.1)	(25.5)
50% RH	Sensible (BTUH)	22,300	32,400	52,500	75,100	79,300
	(kW)	(6.5)	(9.5)	(15.4)	(22.0)	(23.2)
75° F DB, 62.5° F WB (23.9°C DB, 16.1°C WB)	Total (BTUH)	24,500	35,400	56,700	81,700	86,500
	(kW)	(7.2)	(10.4)	(16.6)	(23.9)	(25.4)
45% RH	Sensible (BTUH)	24,500	34,400	56,300	80,600	85,500
	(kW)	(7.2)	(10.1)	(16.5)	(23.6)	(25.1)
72° F DB, 60° F WB (22.2°C DB, 15.5°C WB)	Total (BTUH)	23,600	34,400	54,800	78,600	82,900
	(kW)	(6.9)	(10.1)	(16.1)	(23.0)	(24.3)
50% RH	Sensible (BTUH)	21,800	31,700	51,200	73,000	76,900
	(kW)	(6.4)	(9.3)	(15.0)	(21.4)	(22.5)
72° F DB, 58.6° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	23,500	34,000	54,700	78,500	82,700
	(kW)	(6.9)	(10.0)	(16.0)	(23.0)	(24.2)
45% RH	Sensible (BTUH)	23,500	33,500	54,700	78,500	82,700
	(kW)	(6.9)	(9.8)	(16.0)	(23.0)	(24.2)
70° F DB, 58.5° F WB (22.0°C DB, 14.8°C WB)	Total (BTUH)	23,000	335,00	53,300	76,200	80,200
	(kW)	(6.7)	(9.8)	(15.6)	(22.3)	(23.5)
50% RH	Sensible (BTUH)	21,200	30,900	49,900	71,000	74,400
	(kW)	(6.2)	(9.1)	(14.6)	(20.8)	(21.8)
70° F DB, 57.2° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	22,800	33,100	53,100	76,100	80,100
	(kW)	(6.7)	(9.7)	(15.6)	(22.3)	(23.5)
45% RH	Sensible (BTUH)	22,800	32,600	53,100	76,100	80,100
	(kW)	(6.7)	(9.6)	(15.6)	(22.3)	(23.5)

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Gross cooling capacity—chilled water—standard cfm

CAPACITY IN BTU/H		MODEL				
		4T	6T	8T	10T	12T
80° F DB, 67° F WB (26.7°C DB, 19.4°C WB)	Total (BTUH)	51,700	70,000	111,600	131,000	140,200
	(kW)	(15.2)	(20.5)	(32.7)	(38.4)	(41.1)
50% RH	Sensible (BTUH)	35,400	49,700	78,600	100,800	109,700
	(kW)	(10.4)	(14.6)	(23.0)	(29.5)	(32.2)
75° F DB, 62.5° F WB (23.9°C DB, 16.9°C WB)	Total (BTUH)	36,700	50,900	83,000	98,100	105,600
	(kW)	(10.8)	(14.9)	(24.3)	(28.8)	(30.9)
50% RH	Sensible (BTUH)	30,300	43,300	69,300	89,100	97,100
	(kW)	(8.9)	(12.7)	(20.3)	(26.1)	(28.5)
75° F DB, 62.5° F WB (23.9°C DB, 16.1°C WB)	Total (BTUH)	34,400	48,300	79,100	95,800	101,700
	(kW)	(10.1)	(14.2)	(23.2)	(28.1)	(29.8)
45% RH	Sensible (BTUH)	32,000	45,100	72,700	93,200	100,400
	(kW)	(9.4)	(13.2)	(21.3)	(27.3)	(29.4)
72° F DB, 60° F WB (22.2°C DB, 15.5°C WB)	Total (BTUH)	30,300	42,400	70,300	83,400	88,300
	(kW)	(8.9)	(12.4)	(20.6)	(24.4)	(25.9)
50% RH	Sensible (BTUH)	27,400	39,200	63,600	80,400	86,500
	(kW)	(8.0)	(11.5)	(18.6)	(23.6)	(25.4)
72° F DB, 58.6° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	29,600	40,500	66,900	81,000	88,100
	(kW)	(8.7)	(11.9)	(19.6)	(23.7)	(25.8)
45% RH	Sensible (BTUH)	28,700	40,000	65,500	81,000	88,100
	(kW)	(8.4)	(11.7)	(19.2)	(23.7)	(25.8)
70° F DB, 58.5° F WB (22.0°C DB, 14.8°C WB)	Total (BTUH)	26,900	37,900	63,100	72,500	78,800
	(kW)	(7.9)	(11.1)	(18.5)	(21.2)	(23.1)
50% RH	Sensible (BTUH)	25,400	36,200	59,300	71,900	78,500
	(kW)	(7.4)	(10.6)	(17.4)	(21.1)	(23.0)
70° F DB, 57.2° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	25,700	36,000	59,200	71,800	78,400
	(kW)	(7.5)	(10.6)	(17.4)	(21.0)	(23.0)
45% RH	Sensible (BTUH)	25,600	36,000	59,200	71,800	78,400
	(kW)	(7.5)	(10.6)	(17.4)	(21.0)	(23.0)

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Gross cooling capacity—ECWS—standard cfm

CAPACITY IN BTU/H		MODEL				
		2T	3T	5T	8T	10T
80° F DB, 67° F WB (26.7°C DB, 19.4°C WB)	Total (BTUH)	57,800	80,900	111,600	N/A	N/A
	(kW)	(16.9)	(23.7)	(32.7)	N/A	N/A
50% RH	Sensible (BTUH)	38,100	54,500	78,600	N/A	N/A
	(kW)	(11.2)	(16.0)	(23.0)	N/A	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.9°C WB)	Total (BTUH)	41,300	58,500	83,000	N/A	N/A
	(kW)	(12.1)	(17.1)	(24.3)	N/A	N/A
50% RH	Sensible (BTUH)	32,500	47,100	69,300	N/A	N/A
	(kW)	(9.5)	(13.8)	(20.3)	N/A	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.1°C WB)	Total (BTUH)	38,300	54,800	79,100	N/A	N/A
	(kW)	(11.2)	(16.1)	(23.2)	N/A	N/A
45% RH	Sensible (BTUH)	33,700	49,000	72,700	N/A	N/A
	(kW)	(9.9)	(14.4)	(21.3)	N/A	N/A
72° F DB, 60° F WB (22.2°C DB, 15.5°C WB)	Total (BTUH)	34,100	48,600	70,300	N/A	N/A
	(kW)	(10.0)	(14.2)	(20.6)	N/A	N/A
50% RH	Sensible (BTUH)	29,500	42,900	63,600	N/A	N/A
	(kW)	(8.6)	(12.6)	(18.6)	N/A	N/A
72° F DB, 58.6° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	32,900	47,300	66,900	N/A	N/A
	(kW)	(9.6)	(13.9)	(19.6)	N/A	N/A
45% RH	Sensible (BTUH)	31,000	45,100	65,500	N/A	N/A
	(kW)	(9.1)	(13.2)	(19.2)	N/A	N/A
70° F DB, 58.5° F WB (22.0°C DB, 14.8°C WB)	Total (BTUH)	30,400	43,500	63,100	N/A	N/A
	(kW)	(8.9)	(12.7)	(18.5)	N/A	N/A
50% RH	Sensible (BTUH)	27,500	40,000	59,300	N/A	N/A
	(kW)	(8.1)	(11.7)	(17.4)	N/A	N/A
70° F DB, 57.2° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	28,800	41,500	59,100	N/A	N/A
	(kW)	(8.4)	(12.2)	(17.3)	N/A	N/A
45% RH	Sensible (BTUH)	28,100	40,900	59,100	N/A	N/A
	(kW)	(8.2)	(12.0)	(17.3)	N/A	N/A

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Gross cooling capacity—precool—standard cfm

CAPACITY IN BTU/H		MODEL				
		2T	3T	5T	8T	10T
80° F DB, 67° F WB (26.7°C DB, 19.4°C WB)	Total (BTUH)	36,500	62,200	90,500	N/A	N/A
	(kW)	(10.7)	(18.2)	(26.5)	N/A	N/A
50% RH	Sensible (BTUH)	28,200	46,700	69,800	N/A	N/A
	(kW)	(8.3)	(13.7)	(20.5)	N/A	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.9°C WB)	Total (BTUH)	25,600	43,700	65,000	N/A	N/A
	(kW)	(7.5)	(12.8)	(19.1)	N/A	N/A
50% RH	Sensible (BTUH)	24,000	40,200	60,500	N/A	N/A
	(kW)	(7.0)	(11.8)	(17.7)	N/A	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.1°C WB)	Total (BTUH)	25,000	42,300	63,100	N/A	N/A
	(kW)	(7.3)	(12.4)	(18.5)	N/A	N/A
45% RH	Sensible (BTUH)	24,800	41,800	62,900	N/A	N/A
	(kW)	(7.3)	(12.3)	(18.4)	N/A	N/A
72° F DB, 60° F WB (22.2°C DB, 15.5°C WB)	Total (BTUH)	21,800	36,400	52,900	N/A	N/A
	(kW)	(6.4)	(10.7)	(15.5)	N/A	N/A
50% RH	Sensible (BTUH)	21,400	35,800	52,800	N/A	N/A
	(kW)	(6.3)	(10.5)	(15.5)	N/A	N/A
72° F DB, 58.6° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	21,700	36,300	52,700	N/A	N/A
	(kW)	(6.4)	(10.6)	(15.4)	N/A	N/A
45% RH	Sensible (BTUH)	21,700	36,300	52,700	N/A	N/A
	(kW)	(6.4)	(10.6)	(15.4)	N/A	N/A
70° F DB, 58.5° F WB (22.0°C DB, 14.8°C WB)	Total (BTUH)	19,600	33,200	45,600	N/A	N/A
	(kW)	(5.7)	(9.7)	(13.4)	N/A	N/A
50% RH	Sensible (BTUH)	19,600	33,200	45,600	N/A	N/A
	(kW)	(5.7)	(9.7)	(13.4)	N/A	N/A
70° F DB, 57.2° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	19,500	33,100	45,400	N/A	N/A
	(kW)	(5.7)	(9.7)	(13.3)	N/A	N/A
45% RH	Sensible (BTUH)	19,500	33,100	45,400	N/A	N/A
	(kW)	(5.7)	(9.7)	(13.3)	N/A	N/A

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Performance Specifications—optional cfm

Net cooling capacity—air/remote condensing—optional cfm

CAPACITY IN BTU/H		MODEL				
		2T	3T	5T	8T	10T
80° F DB, 67° F WB	Total (BTUH)	28,900	41,400	64,300	95,400	N/A
(26.7°C DB, 19.4°C WB)	(kW)	(8.5)	(12.1)	(18.8)	(28.0)	N/A
50% RH	Sensible (BTUH)	26,300	37,800	58,400	84,800	N/A
	(kW)	(7.7)	(11.1)	(17.1)	(24.9)	N/A
75° F DB, 62.5° F WB	Total (BTUH)	26,900	38,600	60,300	88,300	N/A
(23.9°C DB, 16.9°C WB)	(kW)	(7.9)	(11.3)	(17.7)	(25.9)	N/A
50% RH	Sensible (BTUH)	25,700	36,800	57,700	82,700	N/A
	(kW)	(7.5)	(10.8)	(16.9)	(24.2)	N/A
75° F DB, 62.5° F WB	Total (BTUH)	26,800	38,400	60,200	88,100	N/A
(23.9°C DB, 16.1°C WB)	(kW)	(7.9)	(11.3)	(17.6)	(25.8)	N/A
45% RH	Sensible (BTUH)	26,800	38,400	60,200	88,100	N/A
	(kW)	(7.9)	(11.3)	(17.6)	(25.8)	N/A
72° F DB, 60° F WB	Total (BTUH)	25,800	37,000	57,900	84,400	N/A
(22.2°C DB, 15.5°C WB)	(kW)	(7.6)	(10.8)	(17.0)	(24.7)	N/A
50% RH	Sensible (BTUH)	25,000	35,800	56,000	80,400	N/A
	(kW)	(7.3)	(10.5)	(16.4)	(23.6)	N/A
72° F DB, 58.6° F WB	Total (BTUH)	25,700	36,900	57,400	84,200	N/A
(22.2°C DB, 14.8°C WB)	(kW)	(7.5)	(10.8)	(16.8)	(24.7)	N/A
45% RH	Sensible (BTUH)	25,700	36,900	57,400	84,200	N/A
	(kW)	(7.5)	(10.8)	(16.8)	(24.7)	N/A
70° F DB, 58.5° F WB	Total (BTUH)	25,100	36,000	56,400	82,000	N/A
(22.0°C DB, 14.8°C WB)	(kW)	(7.4)	(10.6)	(16.5)	(24.0)	N/A
50% RH	Sensible (BTUH)	24,300	34,900	54,500	78,200	N/A
	(kW)	(7.1)	(10.2)	(16.0)	(22.9)	N/A
70° F DB, 57.2° F WB	Total (BTUH)	25,000	35,900	56,300	81,900	N/A
(22.2°C DB, 14.8°C WB)	(kW)	(7.3)	(10.5)	(16.5)	(24.0)	N/A
45% RH	Sensible (BTUH)	25,000	35,900	56,300	81,900	N/A
	(kW)	(7.3)	(10.5)	(16.5)	(24.0)	N/A

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Net cooling capacity—water—optional cfm

CAPACITY IN BTU/H		MODEL				
		2T	3T	5T	8T	10T
80° F DB, 67° F WB (26.7°C DB, 19.4°C WB)	Total (BTUH)	30,700	44,600	70,100	100,500	N/A
	(kW)	(9.0)	(13.1)	(20.5)	(29.5)	N/A
50% RH	Sensible (BTUH)	27,200	39,500	61,300	84,100	N/A
	(kW)	(8.0)	(11.6)	(18.0)	(24.6)	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.9°C WB)	Total (BTUH)	28,600	41,600	65,400	93,500	N/A
	(kW)	(8.4)	(12.2)	(19.2)	(27.4)	N/A
50% RH	Sensible (BTUH)	26,600	38,600	60,200	83,300	N/A
	(kW)	(7.8)	(11.3)	(17.6)	(24.4)	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.1°C WB)	Total (BTUH)	28,500	41,500	65,000	92,700	N/A
	(kW)	(8.4)	(12.2)	(19.1)	(27.2)	N/A
45% RH	Sensible (BTUH)	28,500	41,500	64,500	89,700	N/A
	(kW)	(8.4)	(12.2)	(18.9)	(26.3)	N/A
72° F DB, 60° F WB (22.2°C DB, 15.5°C WB)	Total (BTUH)	27,500	39,900	62,500	89,500	N/A
	(kW)	(8.1)	(11.7)	(18.3)	(26.2)	N/A
50% RH	Sensible (BTUH)	26,000	37,600	58,600	81,000	N/A
	(kW)	(7.6)	(11.0)	(17.2)	(23.7)	N/A
72° F DB, 58.6° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	27,400	39,800	62,400	88,900	N/A
	(kW)	(8.0)	(11.7)	(18.3)	(26.1)	N/A
45% RH	Sensible (BTUH)	27,400	39,800	62,400	86,800	N/A
	(kW)	(8.0)	(11.7)	(18.3)	(25.4)	N/A
70° F DB, 58.5° F WB (22.0°C DB, 14.8°C WB)	Total (BTUH)	26,800	38,900	60,900	87,000	N/A
	(kW)	(7.9)	(11.4)	(17.8)	(25.5)	N/A
50% RH	Sensible (BTUH)	25,300	36,600	57,100	78,900	N/A
	(kW)	(7.4)	(10.7)	(16.7)	(23.1)	N/A
70° F DB, 57.2° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	26,700	38,700	60,700	86,500	N/A
	(kW)	(7.8)	(11.3)	(17.8)	(25.4)	N/A
45% RH	Sensible (BTUH)	26,700	38,700	60,700	84,300	N/A
	(kW)	(7.8)	(11.3)	(17.8)	(24.7)	N/A

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Net cooling capacity—glycol—optional cfm

CAPACITY IN BTU/H		MODEL				
		2T	3T	5T	8T	10T
80° F DB, 67° F WB (26.7°C DB, 19.4°C WB)	Total (BTUH)	27,200	39,700	62,200	89,800	N/A
	(kW)	(8.0)	(11.6)	(18.2)	(26.3)	N/A
50% RH	Sensible (BTUH)	25,400	36,800	57,400	79,300	N/A
	(kW)	(7.4)	(10.8)	(16.8)	(23.2)	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.9°C WB)	Total (BTUH)	25,400	36,900	58,300	83,000	N/A
	(kW)	(7.4)	(10.8)	(17.1)	(24.3)	N/A
50% RH	Sensible (BTUH)	24,800	35,800	56,400	77,400	N/A
	(kW)	(7.3)	(10.5)	(16.5)	(22.7)	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.1°C WB)	Total (BTUH)	25,200	36,700	58,000	82,900	N/A
	(kW)	(7.4)	(10.8)	(17.0)	(24.3)	N/A
45% RH	Sensible (BTUH)	25,200	36,700	58,000	82,900	N/A
	(kW)	(7.4)	(10.8)	(17.0)	(24.3)	N/A
72° F DB, 60° F WB (22.2°C DB, 15.5°C WB)	Total (BTUH)	24,800	35,400	56,000	79,200	N/A
	(kW)	(7.3)	(10.4)	(16.4)	(23.2)	N/A
50% RH	Sensible (BTUH)	24,800	34,800	54,700	75,200	N/A
	(kW)	(7.3)	(10.2)	(16.0)	(22.0)	N/A
72° F DB, 58.6° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	24,700	35,100	55,900	79,000	N/A
	(kW)	(7.2)	(10.3)	(16.4)	(23.2)	N/A
45% RH	Sensible (BTUH)	24,700	35,100	55,900	79,000	N/A
	(kW)	(7.2)	(10.3)	(16.4)	(23.2)	N/A
70° F DB, 58.5° F WB (22.0°C DB, 14.8°C WB)	Total (BTUH)	24,100	34,500	54,600	76,900	N/A
	(kW)	(7.1)	(10.1)	(16.0)	(22.5)	N/A
50% RH	Sensible (BTUH)	24,100	33,900	53,300	73,100	N/A
	(kW)	(7.1)	(9.9)	(15.6)	(21.4)	N/A
70° F DB, 57.2° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	24,100	34,400	54,400	76,700	N/A
	(kW)	(7.1)	(10.1)	(15.9)	(22.5)	N/A
45% RH	Sensible (BTUH)	24,100	34,400	54,400	76,700	N/A
	(kW)	(7.1)	(10.1)	(15.9)	(22.5)	N/A

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Gross cooling capacity—chilled water—optional cfm

CAPACITY IN BTU/H		MODEL				
		4T	6T	8T	10T	12T
80° F DB, 67° F WB (26.7°C DB, 19.4°C WB)	Total (BTUH)	61,500	82,700	12,2300	135,700	N/A
	(kW)	(18.0)	(24.2)	(35.8)	(39.8)	N/A
50% RH	Sensible (BTUH)	42,800	60,400	87,400	105,300	N/A
	(kW)	(12.5)	(17.7)	(25.6)	(30.9)	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.9°C WB)	Total (BTUH)	44,100	61,000	91,400	101,900	N/A
	(kW)	(12.9)	(17.9)	(26.8)	(29.9)	N/A
50% RH	Sensible (BTUH)	36,900	53,100	77,400	93,100	N/A
	(kW)	(10.8)	(15.6)	(22.7)	(27.3)	N/A
75° F DB, 62.5° F WB (23.9°C DB, 16.1°C WB)	Total (BTUH)	41,500	58,600	87,600	97,800	N/A
	(kW)	(12.2)	(17.2)	(25.7)	(28.7)	N/A
45% RH	Sensible (BTUH)	38,500	55,600	81,400	96,400	N/A
	(kW)	(11.3)	(16.3)	(23.9)	(28.3)	N/A
72° F DB, 60° F WB (22.2°C DB, 15.5°C WB)	Total (BTUH)	36,500	51,500	77,900	87,800	N/A
	(kW)	(10.7)	(15.1)	(22.8)	(25.7)	N/A
50% RH	Sensible (BTUH)	33,500	48,300	71,300	84,100	N/A
	(kW)	(9.8)	(14.2)	(20.9)	(24.6)	N/A
72° F DB, 58.6° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	34,700	49,500	74,700	84,600	N/A
	(kW)	(10.2)	(14.5)	(21.9)	(24.8)	N/A
45% RH	Sensible (BTUH)	342,00	49,200	73,500	84,600	N/A
	(kW)	(10.0)	(14.4)	(21.5)	(24.8)	N/A
70° F DB, 58.5° F WB (22.0°C DB, 14.8°C WB)	Total (BTUH)	32,600	46,000	70,200	75,700	N/A
	(kW)	(9.6)	(13.5)	(20.6)	(22.2)	N/A
50% RH	Sensible (BTUH)	30,900	44,500	66,400	75,300	N/A
	(kW)	(9.1)	(13.0)	(19.5)	(22.1)	N/A
70° F DB, 57.2° F WB (22.2°C DB, 14.8°C WB)	Total (BTUH)	30,800	44,400	66,200	75,200	N/A
	(kW)	(9.0)	(13.0)	(19.4)	(22.0)	N/A
45% RH	Sensible (BTUH)	30,800	44,400	66,200	75,200	N/A
	(kW)	(9.0)	(13.0)	(19.4)	(22.0)	N/A

*Performance Specifications @ 95° F Ambient (AIR/GLYCOL/RC) or @ 105° F Condensing (WATER)

Performance Data

Air system

AIR/WATER/GLYCOL/RC/PC	MODEL	2T	3T	5T	8T	10T
Air Volume (CFM)–Standard		1200	1800	2800	4200	4750
(L/s)–Standard		(571)	(857)	(1333)	(2000)	(2262)
Fan Motor HP–Standard		0.5	0.5	1.0	3.0	5.0
(kW)–Standard		(0.4)	(0.4)	(0.8)	(2.3)	(3.8)
Air Volume (CFM)–Optional		1500	2300	3200	4750	N/A
(L/s)–Optional		(714)	(1095)	(1524)	(2262)	N/A
Fan Motor HP–Optional		0.5	0.8	1.5	5.0	N/A
(kW)–Optional		(0.4)	(0.6)	(1.2)	(3.8)	N/A
External Static Pressure (inches)		0.3	0.3	0.3	0.5	0.5
(Pa)		(75)	(75)	(75)	(124)	(124)
Number of Fans		1	1	1	1	1
CHILLED WATER		4T	6T	8T	10T	12T
Air Volume (CFM)– Standard		1200	1800	2800	4200	4750
(L/s)–Standard		(571)	(857)	(1333)	(2000)	(2262)
Fan Motor HP–Standard		0.5	0.5	1.0	3.0	5.0
(kW)–Standard		(0.4)	(0.4)	(0.8)	(2.3)	(3.8)
Air Volume (CFM)–Optional		1500	2300	3200	4750	N/A
(L/s)–Optional		(714)	(1095)	(1524)	(2262)	N/A
Fan Motor HP–Optional		0.5	0.8	1.5	5.0	N/A
(kW)–Optional		(0.4)	(0.6)	(1.2)	(3.8)	N/A
External Static Pressure (inches)		0.3	0.3	0.3	0.3	0.3
(Pa)		(75)	(75)	(75)	(75)	(75)
Number of Fans		1	1	1	1	1

Coolant requirements

WATER	MODEL	2T	3T	5T	8T	10T
65° F Water In (GPM)		2.1	2.8	4.8	7.8	8.0
(18.3° C) (L/s)		(0.13)	(0.18)	(0.30)	(0.48)	(0.50)
Pressure Drop (psig)		1.4	1.1	2.6	3.4	1.5
(kPa)		(9.6)	(7.6)	(17.9)	(23.9)	(10.3)
THR (MBH)		33,800	50,600	73,500	136,300	164,200
(kW)		(9.9)	(14.8)	(21.5)	(39.9)	(48.1)
75° F Water In (GPM)		3.2	4.1	7.7	11.8	15.3
(23.9° C) (L/s)		(0.20)	(0.27)	(0.48)	(0.74)	(0.96)
Pressure Drop (psig)		1.8	2.0	3.3	8.5	3.4
(kPa)		(18.6)	(13.8)	(22.7)	(58.6)	(23.9)
THR (MBH)		33,800	50,600	73,500	136,300	164,200
(kW)		(9.9)	(14.8)	(21.5)	(39.9)	(48.1)
85° F Water In (GPM)		4.4	5.5	10.5	15.2	20.7
(29.4° C) (L/s)		(0.27)	(0.34)	(0.66)	(0.95)	(1.29)
Pressure Drop (psig)		2.7	3.0	4.0	3.5	6.0
(kPa)		(18.6)	(20.6)	(27.6)	(24.1)	(41.4)
THR (MBH)		33,800	50,600	73,500	136,300	164,200
(kW)		(9.9)	(14.8)	(21.5)	(39.9)	(48.1)
GLYCOL/PRECOOL						
105° F Glycol in (GPM)		7.1	9.6	18.3	25.5	32.0
(40.6° C) (L/s)		(0.44)	(0.60)	(1.14)	(1.59)	(2.00)
Pressure Drop (psig)		9.0	11.4	15.6	22.0	24.8
(kPa)		(62.0)	(78.6)	(107.6)	(151.7)	(171.0)
THR (MBH)		33,100	48,600	70,900	126,200	154,500
(kW)		(9.7)	(14.2)	(20.7)	(36.9)	(45.2)
CHILLED WATER		4T	6T	8T	10T	12T
45° F Water in (GPM)		7.3	9.9	15.6	18.9	23.0
(7.2° C) (L/s)		(0.46)	(0.62)	(0.98)	(1.18)	(1.44)
Pressure Drop (psig)		6.2	7.6	9.0	8.8	6.3
(kPa)		(42.7)	(52.4)	(62.0)	(60.7)	(43.4)

Pump system

GLYCOL/PRECOOL	MODEL	2T	3T	5T	8T	10T
Standard horsepower		1	1	1	1.5	2
Total Head (feet) (@design GPM)		76	78	78	92	98
(m)		(23.2)	(23.8)	(23.8)	(28.0)	(29.9)
Available Ext. Head (feet)		49	36	35	35	31
(m)		(14.9)	(2.3)	(10.7)	(10.7)	(1.9)

Water regulating valve

WATER-2 WAY, SINGLE SEAT	MODEL	2T	3T	5T	8T	10T
Size (inches-NPT)		1/2	3/4	3/4	1	1-1/4
GLYCOL-2 WAY, SINGLE SEAT						
Size (inches-NPT)		1/2	3/4	1	1-1/4	1-1/4
PRECOOL-3 WAY, CONDENSER						
Size (inches-NPT)		1/2	3/4	1	N/A	N/A
ECWS-3 WAY, CONDENSER						
Size (inches-NPT)		3/4	3/4	3/4	N/A	N/A

Humidification

AIR/WATER/GLYCOL/RC/PC	Model	2T	3T	5T	8T	10T
Flush Cycle		automatic	automatic	automatic	automatic	automatic
Lbs/h		5	5	5	10	10
(Kg/h)		(2.3)	(2.3)	(2.3)	(4.5)	(4.5)
kW		1.7	1.7	1.7	3.4	3.4
CHILLED WATER		4T	6T	8T	10T	12T
Flush Cycle		automatic	automatic	automatic	automatic	automatic
Lbs/h		5	5	5	10	10
(Kg/h)		(2.3)	(2.3)	(2.3)	(4.5)	(4.5)
kW		1.7	1.7	1.7	3.4	3.4

Filters

AIR/WATER/GLYCOL/RC/PC	Model	2T	3T	5T	8T	10T
Quantity		2	2	2	2	2
Size (inches)		16 × 28	16 × 28	16 × 28	16 × 28	16 × 28
(mm)		(406 × 711)	(406 × 711)	(406 × 711)	(406 × 711)	(406 × 711)
Depth (inches)		4	4	4	4	4
(mm)		102	102	102	102	102
CHILLED WATER		4T	6T	8T	10T	12T
Quantity		2	2	2	2	2
Size (inches)		16 × 28	16 × 28	16 × 28	16 × 28	16 × 28
(mm)		(406 × 711)	(406 × 711)	(406 × 711)	(406 × 711)	(406 × 711)
Depth (inches)		4	4	4	4	4
(mm)		102	102	102	102	102

Evaporator coil

AIR/WATER/GLYCOL/RC/PC	Model	2T	3T	5T	8T	10T
Face Area (ft ²)		6.8	6.8	6.8	9.7	9.7
(m ²)		(0.63)	(0.63)	(0.63)	(0.90)	(0.90)
Rows Deep		2	2	4	4	4
Face Velocity (FPM)		176	264	411	432	490
(m/s)		(0.89)	(1.34)	(2.09)	(2.19)	(2.49)
CHILLED WATER		4T	6T	8T	10T	12T
Face Area (ft ²)		6.8	6.8	6.8	9.7	9.7
(m ²)		(0.63)	(0.63)	(0.63)	(0.90)	(0.90)
Rows Deep		3	3	4	3	4
Face Velocity (FPM)		176	264	411	432	490
(m/s)		(0.89)	(1.34)	(2.09)	(2.19)	(2.49)
Circuits		6	6	8	10	15

Compressor—scroll

AIR/WATER/GLYCOL/RC/PC	MODEL	2T	3T	5T	8T	10T
EER—Air		13.5	13.8	14.0	13.6	13.5
EER—Water		17.7	17.9	18.4	17.2	16.7
EER—Glycol		11.2	11.4	11.5	11.5	11.5
EER—Precool		12.8	12.6	12.8	N/A	N/A
Quantity		1	1	1	1	1
Nominal Horsepower		2.0	3.0	5.0	7.5	10.0
(kW)		(1.49)	(2.24)	(3.73)	(5.62)	(7.46)

Electric reheat

AIR/WATER/GLYCOL/RC/PC	MODEL	2T	3T	5T	8T	10T
MBH total (includes motor heat)		27.2	27.2	28.8	35.3	41.5
(kW)		(7.5)	(7.5)	(7.5)	(7.5)	(7.5)
Stages		1	1	1	1	1
CHILLED WATER		4T	6T	8T	10T	12T
MBH total (includes motor heat)		27.2	27.2	28.8	35.3	41.5
(kW)		(7.5)	(7.5)	(7.5)	(7.5)	(7.5)
Stages		1	1	1	1	1

* With equal load on each phase, rated at 240V/3 ϕ and 480V/3 ϕ .

Hot gas reheat

AIR/WATER/GLYCOL/PC	MODEL	2T	3T	5T	8T	10T
MBH Total (includes motor heat)		15.9	22.3	36.3	53.2	62.3
(kW)		(4.66)	(6.53)	(10.64)	(15.60)	(18.27)

Hot water reheat

AIR/WATER/GLYCOL/RC/PC	MODEL	2T	3T	5T	8T	10T
MBH (includes motor heat)		24.9	37.1	69.5	104.2	119.8
(kW)		(7.30)	(10.88)	(20.38)	(30.56)	(35.13)
GPM		0.5	0.8	2.0	3.5	4.1
(L/s)		(0.03)	(0.05)	(0.13)	(0.22)	(0.26)
Pressure Drop (psig)		0.1	0.2	0.7	1.9	2.5
(kPa)		(1.0)	(1.3)	(4.7)	(12.7)	(16.7)
Control Valve		solenoid	solenoid	solenoid	solenoid	solenoid
CHILLED WATER		4T	6T	8T	10T	12T
MBH (includes motor heat)		24.9	37.1	69.5	104.2	119.8
(kW)		(7.30)	(10.88)	(20.38)	(30.56)	(35.13)
GPM		0.5	0.8	2.0	3.5	4.1
(L/s)		(0.03)	(0.05)	(0.13)	(0.22)	(0.26)
Pressure Drop (psig)		0.1	0.2	0.7	1.9	2.5
(kPa)		(1.0)	(1.3)	(4.7)	(12.7)	(16.7)
Control Valve		solenoid	solenoid	solenoid	solenoid	solenoid

* Entering water temperature—180° F (82.2° C)

Steam reheat

AIR/WATER/GLYCOL/RC/PC	MODEL	2T	3T	5T	8T	10T
MBH (includes motor heat)		63.0	75.0	97.0	128.0	136.0
(kW)		(18.48)	(21.99)	(28.45)	(37.54)	(39.88)
Control Valve		solenoid	solenoid	solenoid	solenoid	solenoid
CHILLED WATER		4T	6T	8T	10T	12T
MBH (includes motor heat)		63.0	75.0	97.0	128.0	136.0
(kW)		(18.48)	(21.99)	(28.45)	(37.54)	(39.88)
Control Valve		solenoid	solenoid	solenoid	solenoid	solenoid

Drycooler

GLYCOL/PRECOOL	MODEL	2T	3T	5T	8T	10T
GPM		7.1	9.6	18.3	25.5	32.0
(L/s)		(0.44)	(0.60)	(1.14)	(1.59)	(2.00)
Pressure Drop (psig)		2.5	5.7	2.1	2.7	4.2
(kPa)		(17.24)	(39.31)	(14.48)	(18.62)	(28.97)

Centrifugal indoor condenser

AIR	MODEL	2T	3T	5T	8T	10T
Air Quantity-CFM		2000	2500	4000	5000	5900
(L/s)		(943)	(1179)	(1887)	(2358)	(2783)
Fan Motor HP		0.5	1.5	1.5	2.0	3.0
(kW)		(0.36)	(1.10)	(1.10)	(1.47)	(2.20)
Blower and Motor Quantity		1	1	1	1	1
External Static Pressure (inches)		0.3	0.3	0.3	0.5	0.5
(Pa)		(75)	(75)	(75)	(125)	(125)

Physical data

AIR	MODEL	2T	3T	5T	8T	10T
Weight (Lbs)		820	820	840	950	980
(Approx. kg)		(373)	(373)	(382)	(432)	(445)

WATER/GLYCOL/PRECOOL

Weight (Lbs)		830	830	850	960	990
(Approx. kg)		(377)	(377)	(386)	(436)	(450)
Unit Volume (gallons)		0.75	0.75	1.3	2.2	2.4
(Liters)		(2.88)	(2.88)	(5.00)	(8.46)	(9.23)

REMOTE CONDENSING

Weight (Lbs)		710	710	720	830	860
(Approx. kg)		(323)	(323)	(327)	(377)	(391)

CHILLED WATER

	4T	6T	8T	10T	12T
Weight (Lbs)	715	715	715	770	770
(Approx. kg)	(325)	(325)	(325)	(350)	(350)

Connection sizes

AIR/REMOTE CONDENSING	MODEL	2T	3T	5T	8T	10T
Liquid Line	(ODS)	3/8	3/8	1/2	1/2	5/8
AIR						
Hot Gas Line	(ODS)	1/2	5/8	5/8	7/8	7/8
AIR/WATER/GLYCOL/RC/PC						
Condensate Drain	(IDS)	7/8	7/8	7/8	7/8	7/8
Humidifier Line	(ODF)	1/4	1/4	1/4	1/4	1/4
Hot Water In/Out	(ODS)	5/8	5/8	5/8	7/8	7/8
Steam Reheat In/Out	(ODS)	5/8	5/8	5/8	5/8	5/8
AIR/WATER/GLYCOL/RC						
ECWS In/Out	(ODS)	7/8	7/8	1-1/8	N/A	N/A
WATER/GLYCOL/PC						
Water/Glycol In/Out	(ODS)	7/8	1-1/8	1-1/8	1-3/8	1-3/8
REMOTE CONDENSING						
Suction Line	(ODS)	5/8	5/8	7/8	7/8	1-1/8
CHILLED WATER		4T	6T	8T	10T	12T
Water In/Out	(ODS)	7/8	1-1/8	1-1/8	1-3/8	1-3/8
Condensate Drain	(IDS)	7/8	7/8	7/8	7/8	7/8
Humidifier Line	(ODF)	1/4	1/4	1/4	1/4	1/4
Hot Water In/Out	(ODS)	5/8	5/8	5/8	5/8	7/8
Steam Reheat In/Out	(ODS)	5/8	5/8	5/8	5/8	5/8

Electrical Data

Electric Reheat—2-5 ton

HUMIDIFIER			Electric				Steam or None			
VOLTAGE			208	230	460	575	208	230	460	575
2T	FLA	Air	24.2	25.8	12.9	N/A	24.2	25.8	12.9	N/A
		Water	23.3	24.9	12.5	N/A	23.3	24.9	12.5	N/A
		Glycol	24.6	26.2	13.1	N/A	24.6	26.2	13.1	N/A
		PreCool	24.6	26.2	13.1	N/A	24.6	26.2	13.1	N/A
		Remote Condensing	17.6	19.2	9.6	N/A	17.6	19.2	9.6	N/A
	WSA	Air	23.3	34.3	17.1	N/A	23.3	34.3	17.1	N/A
		Water	23.3	34.3	17.1	N/A	23.3	34.3	17.1	N/A
		Glycol	23.3	34.3	17.1	N/A	23.3	34.3	17.1	N/A
		PreCool	23.3	34.3	17.1	N/A	23.3	34.3	17.1	N/A
		Remote Condensing	22.0	24.0	12.0	N/A	22.0	24.0	12.0	N/A
	MOP	Air	35.0	35.0	20.0	N/A	35.0	35.0	20.0	N/A
		Water	35.0	35.0	20.0	N/A	35.0	35.0	20.0	N/A
		Glycol	35.0	35.0	20.0	N/A	35.0	35.0	20.0	N/A
		PreCool	35.0	35.0	20.0	N/A	35.0	35.0	20.0	N/A
		Remote Condensing	35.0	35.0	20.0	N/A	25.0	25.0	15.0	N/A
3T	FLA	Air	27.2	28.8	14.4	12.1	27.2	28.8	14.4	12.1
		Water	26.4	28	14.0	11.8	26.4	28.0	14.0	11.8
		Glycol	27.8	29.4	14.7	12.4	27.8	29.4	14.7	12.4
		PreCool	27.8	29.4	14.7	12.4	27.8	29.4	14.7	12.4
		Remote Condensing	25.8	26.6	13.3	11.3	17.6	19.2	9.6	8.3
	WSA	Air	38.9	40.9	19.8	16.9	38.9	40.9	19.8	16.9
		Water	38.9	40.9	19.8	16.9	38.9	40.9	19.8	16.9
		Glycol	38.9	40.9	19.8	16.9	38.9	40.9	19.8	16.9
		PreCool	38.9	40.9	19.8	16.9	38.9	40.9	19.8	16.9
		Remote Condensing	32.3	33.3	16.6	14.1	22.0	24.0	12.0	10.4
	MOP	Air	45.0	50.0	20.0	20.0	45.0	50.0	20.0	20.0
		Water	45.0	50.0	20.0	20.0	45.0	50.0	20.0	20.0
		Glycol	45.0	50.0	20.0	20.0	45.0	50.0	20.0	20.0
		PreCool	45.0	50.0	20.0	20.0	45.0	50.0	20.0	20.0
		Remote Condensing	35.0	35.0	20.0	15.0	25.0	25.0	15.0	15.0
5T	FLA	Air	32.1	33.4	16.7	14	32.1	33.4	16.7	14.0
		Water	30.6	31.9	16.0	13.4	30.6	31.9	16.0	13.4
		Glycol	32.9	34.2	17.1	14.3	32.9	34.2	17.1	14.3
		PreCool	32.9	34.2	17.1	14.3	32.9	34.2	17.1	14.3
		Remote Condensing	27.5	28.0	14.0	11.9	19.3	20.6	10.3	8.9
	WSA	Air	47.3	49.0	25.0	20.7	47.3	49.0	25.0	20.7
		Water	47.3	49.0	25.0	20.7	47.3	49.0	25.0	20.7
		Glycol	47.3	49.0	25.0	20.7	47.3	49.0	25.0	20.7
		PreCool	47.3	49.0	25.0	20.7	47.3	49.0	25.0	20.7
		Remote Condensing	34.4	35.0	17.5	14.9	24.1	25.8	12.9	11.1
	MOP	Air	60.0	60.0	30.0	25.0	60.0	60.0	30.0	25.0
		Water	60.0	60.0	30.0	25.0	60.0	60.0	30.0	25.0
		Glycol	60.0	60.0	30.0	25.0	60.0	60.0	30.0	25.0
		PreCool	60.0	60.0	30.0	25.0	60.0	60.0	30.0	25.0
		Remote Condensing	35.0	35.0	20.0	15.0	25.0	30.0	15.0	15.0

Electric reheat—8-10 ton

HUMIDIFIER			ELECTRIC				STEAM OR NONE			
VOLTAGE			208	230	460	575	208	230	460	575
8T	FLA	Air	46.2	47.6	23.8	19.5	46.2	47.6	23.8	19.5
		Water	43.3	44.7	22.4	18.4	43.3	44.7	22.4	18.4
		Glycol	47.0	48.4	24.2	19.8	47.0	48.4	24.2	19.8
		PreCool	47.0	48.4	24.2	19.8	47.0	48.4	24.2	19.8
		Remote Condensing	40.6	40.4	20.2	16.7	24.2	25.6	12.8	10.7
	WSA	Air	68.2	70.0	35.5	27.6	68.2	70.0	35.5	27.6
		Water	68.2	70.0	35.5	27.6	68.2	70.0	35.5	27.6
		Glycol	68.2	70.0	35.5	27.6	68.2	70.0	35.5	27.6
		PreCool	68.2	70.0	35.5	27.6	68.2	70.0	35.5	27.6
		Remote Condensing	50.8	50.5	25.3	20.9	30.3	32.0	16.0	13.4
	MOP	Air	90.0	90.0	45.0	35.0	90.0	90.0	45.0	35.0
		Water	90.0	90.0	45.0	35.0	90.0	90.0	45.0	35.0
		Glycol	90.0	90.0	45.0	35.0	90.0	90.0	45.0	35.0
		PreCool	90.0	90.0	45.0	35.0	90.0	90.0	45.0	35.0
		Remote Condensing	60.0	60.0	30.0	25.0	35.0	35.0	20.0	15.0
10T	FLA	Air	57.4	58.2	29.1	23.9	57.4	58.2	29.1	23.9
		Water	53.8	54.6	27.3	22.5	53.8	54.6	27.3	22.5
		Glycol	58.4	59.2	29.6	24.3	58.4	59.2	29.6	24.3
		PreCool	58.4	59.2	29.6	24.3	58.4	59.2	29.6	24.3
		Remote Condensing	46.8	46.0	23.0	19.1	30.4	31.2	15.6	13.1
	WSA	Air	76.3	77.5	39.4	31.9	76.3	77.5	39.4	31.9
		Water	76.3	77.5	39.4	31.9	76.3	77.5	39.4	31.9
		Glycol	76.3	77.5	39.4	31.9	76.3	77.5	39.4	31.9
		PreCool	76.3	77.5	39.4	31.9	76.3	77.5	39.4	31.9
		Remote Condensing	58.5	57.5	28.8	23.9	38.0	39.0	19.5	16.4
	MOP	Air	100.0	100.0	50.0	40.0	100.0	100.0	50.0	40.0
		Water	100.0	100.0	50.0	40.0	100.0	100.0	50.0	40.0
		Glycol	100.0	100.0	50.0	40.0	100.0	100.0	50.0	40.0
		PreCool	100.0	100.0	50.0	40.0	100.0	100.0	50.0	40.0
		Remote Condensing	60.0	60.0	30.0	25.0	45.0	45.0	20.0	20.0

Steam/hot water/or no-reheat—2-5 ton

HUMIDIFIER			ELECTRIC				STEAM OR NONE			
VOLTAGE			208	230	460	575	208	230	460	575
2T	FLA	Air	16.8	16.0	8.0	N/A	8.6	8.6	4.3	N/A
		Water	15.9	15.1	7.6	N/A	7.7	7.7	3.9	N/A
		Glycol	17.2	16.4	8.2	N/A	9.0	9.0	4.5	N/A
		PreCool	17.2	16.4	8.2	N/A	9.0	9.0	4.5	N/A
		Remote Condensing	10.2	9.4	4.7	N/A	2.0	2.0	1.0	N/A
	WSA	Air	21.0	20.2	10.1	N/A	12.8	12.8	6.4	N/A
		Water	21.0	20.2	10.1	N/A	12.8	12.8	6.4	N/A
		Glycol	21.0	20.2	10.1	N/A	12.8	12.8	6.4	N/A
		PreCool	21.0	20.2	10.1	N/A	12.8	12.8	6.4	N/A
		Remote Condensing	10.7	9.9	5.0	N/A	2.5	2.5	1.3	N/A
	MOP	Air	25.0	25.0	15.0	N/A	20.0	20.0	15.0	N/A
		Water	25.0	25.0	15.0	N/A	20.0	20.0	15.0	N/A
		Glycol	25.0	25.0	15.0	N/A	20.0	20.0	15.0	N/A
		PreCool	25.0	25.0	15.0	N/A	20.0	20.0	15.0	N/A
		Remote Condensing	15.0	15.0	15.0	N/A	15.0	15.0	15.0	N/A
3T	FLA	Air	19.8	19	9.5	7.6	11.6	11.6	5.8	4.6
		Water	19	18.2	9.1	7.3	10.8	10.8	5.4	4.3
		Glycol	20.4	19.6	9.8	7.9	12.2	12.2	6.1	4.9
		PreCool	20.4	19.6	9.8	7.9	12.2	12.2	6.1	4.9
		Remote Condensing	10.2	9.4	4.7	3.8	2.0	2.0	1.0	0.8
	WSA	Air	27.6	26.8	12.7	10.6	19.4	19.4	9.0	7.6
		Water	27.6	26.8	12.7	10.6	19.4	19.4	9.0	7.6
		Glycol	27.6	26.8	12.7	10.6	19.4	19.4	9.0	7.6
		PreCool	27.6	26.8	12.7	10.6	19.4	19.4	9.0	7.6
		Remote Condensing	12.8	11.8	5.9	4.8	2.5	2.5	1.3	1.0
	MOP	Air	40.0	40.0	15.0	15.0	30.0	30.0	15.0	15.0
		Water	40.0	40.0	15.0	15.0	30.0	30.0	15.0	15.0
		Glycol	40.0	40.0	15.0	15.0	30.0	30.0	15.0	15.0
		PreCool	40.0	40.0	15.0	15.0	30.0	30.0	15.0	15.0
		Remote Condensing	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
5T	FLA	Air	24.7	23.6	11.8	9.5	16.5	16.2	8.1	6.5
		Water	23.2	22.1	11.1	8.9	15.0	14.7	7.4	5.9
		Glycol	25.5	24.4	12.2	9.8	17.3	17.0	8.5	6.8
		PreCool	25.5	24.4	12.2	9.8	17.3	17.0	8.5	6.8
		Remote Condensing	11.9	10.8	5.4	4.4	3.7	3.4	1.7	1.4
	WSA	Air	36.0	34.9	17.9	14.3	27.8	27.5	14.2	11.3
		Water	36.0	34.9	17.9	14.3	27.8	27.5	14.2	11.3
		Glycol	36.0	34.9	17.9	14.3	27.8	27.5	14.2	11.3
		PreCool	36.0	34.9	17.9	14.3	27.8	27.5	14.2	11.3
		Remote Condensing	14.9	13.5	6.8	5.5	4.6	4.3	2.1	1.8
	MOP	Air	50.0	50.0	25.0	20.0	45.0	45.0	20.0	15.0
		Water	50.0	50.0	25.0	20.0	45.0	45.0	20.0	15.0
		Glycol	50.0	50.0	25.0	20.0	45.0	45.0	20.0	15.0
		PreCool	50.0	50.0	25.0	20.0	45.0	45.0	20.0	15.0
		Remote Condensing	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0

Steam/hot water/or no-reheat—8–10 ton

HUMIDIFIER			ELECTRIC				STEAM OR NONE			
VOLTAGE			208	230	460	575	208	230	460	575
8T	FLA	Air	47.0	45.2	22.6	18.0	30.6	30.4	15.2	12.0
		Water	44.1	42.3	21.2	16.9	27.7	27.5	13.8	10.9
		Glycol	47.8	46.0	23.0	18.3	31.4	31.2	15.6	12.3
		PreCool	47.8	46.0	23.0	18.3	31.4	31.2	15.6	12.3
		Remote Condensing	25.0	23.2	11.6	9.2	8.6	8.4	4.2	3.2
	WSA	Air	65.1	63.3	32.1	24.2	48.7	48.5	24.7	18.2
		Water	65.1	63.3	32.1	24.2	48.7	48.5	24.7	18.2
		Glycol	65.1	63.3	32.1	24.2	48.7	48.5	24.7	18.2
		PreCool	65.1	63.3	32.1	24.2	48.7	48.5	24.7	18.2
		Remote Condensing	31.3	29.0	14.5	11.5	10.8	10.5	5.3	4.0
	MOP	Air	90.0	90.0	45.0	35.0	80.0	80.0	40.0	30.0
		Water	90.0	90.0	45.0	35.0	80.0	80.0	40.0	30.0
		Glycol	90.0	90.0	45.0	35.0	80.0	80.0	40.0	30.0
		PreCool	90.0	90.0	45.0	35.0	80.0	80.0	40.0	30.0
		Remote Condensing	35.0	30.0	15.0	15.0	15.0	15.0	15.0	15.0
10T	FLA	Air	58.2	55.8	27.9	22.4	41.8	41.0	20.5	16.4
		Water	54.6	52.2	26.1	21.0	38.2	37.4	18.7	15.0
		Glycol	59.2	56.8	28.4	22.8	42.8	42.0	21.0	16.8
		PreCool	59.2	56.8	28.4	22.8	42.8	42.0	21.0	16.8
		Remote Condensing	31.2	28.8	14.4	11.6	14.8	14.0	7.0	5.6
	WSA	Air	73.2	70.8	36.0	28.5	56.8	56.0	28.6	22.5
		Water	73.2	70.8	36.0	28.5	56.8	56.0	28.6	22.5
		Glycol	73.2	70.8	36.0	28.5	56.8	56.0	28.6	22.5
		PreCool	73.2	70.8	36.0	28.5	56.8	56.0	28.6	22.5
		Remote Condensing	39.0	36.0	18.0	14.5	18.5	17.5	8.8	7.0
	MOP	Air	100.0	100.0	50.0	40.0	90.0	80.0	45.0	35.0
		Water	100.0	100.0	50.0	40.0	90.0	80.0	45.0	35.0
		Glycol	100.0	100.0	50.0	40.0	90.0	80.0	45.0	35.0
		PreCool	100.0	100.0	50.0	40.0	90.0	80.0	45.0	35.0
		Remote Condensing	45.0	45.0	20.0	15.0	30.0	30.0	15.0	15.0

Electric reheat—4–12T—chilled water

HUMIDIFIER		ELECTRIC				STEAM OR NONE			
VOLTAGE		208	230	460	575	208	230	460	575
4T	FLA	25.8	26.6	13.3	11.3	17.6	19.2	9.6	8.3
	WSA	32.3	33.3	16.6	14.1	22.0	24.0	12.0	10.4
	MOP	35.0	35.0	20.0	15.0	25.0	25.0	15.0	15.0
6T	FLA	25.8	26.6	13.3	11.3	17.6	19.2	9.6	8.3
	WSA	32.3	33.3	16.6	14.1	22.0	24.0	12.0	10.4
	MOP	35.0	35.0	20.0	15.0	25.0	25.0	15.0	15.0
8T	FLA	27.5	28.0	14.0	11.9	19.3	20.6	10.3	8.9
	WSA	34.4	35.0	17.5	14.9	24.1	25.8	12.9	11.1
	MOP	35.0	35.0	20.0	15.0	25.0	30.0	15.0	15.0
10T	FLA	40.6	40.4	20.2	16.7	24.2	25.6	12.8	10.7
	WSA	50.8	50.5	25.3	20.9	30.3	32.0	16.0	13.4
	MOP	60.0	60.0	30.0	25.0	35.0	35.0	20.0	15.0
12T	FLA	46.8	46.0	23.0	19.1	30.4	31.2	15.6	13.1
	WSA	58.5	57.5	28.8	23.9	38.0	39.0	19.5	16.4
	MOP	60.0	60.0	30.0	25.0	45.0	45.0	20.0	20.0

Steam/hot water/or no-reheat—4–12T—chilled water

HUMIDIFIER		ELECTRIC				STEAM OR NONE			
VOLTAGE		208	230	460	575	208	230	460	575
4T	FLA	10.2	9.4	4.7	3.8	2.0	2.0	1.0	0.8
	WSA	12.8	11.8	5.9	4.8	2.5	2.5	1.3	1.0
	MOP	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
6T	FLA	10.2	9.4	4.7	3.8	2.0	2.0	1.0	0.8
	WSA	12.8	11.8	5.9	4.8	2.5	2.5	1.3	1.0
	MOP	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
8T	FLA	11.9	10.8	5.4	4.4	3.7	3.4	1.7	1.4
	WSA	14.9	13.5	6.8	5.5	4.6	4.3	2.1	1.8
	MOP	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
10T	FLA	25.0	23.2	11.6	9.2	8.6	8.4	4.2	3.2
	WSA	31.3	29.0	14.5	11.5	10.8	10.5	5.3	4.0
	MOP	35.0	30.0	15.0	15.0	15.0	15.0	15.0	15.0
12T	FLA	31.2	28.8	14.4	11.6	14.8	14.0	7.0	5.6
	WSA	39.0	36.0	18.0	14.5	18.5	17.5	8.8	7.0
	MOP	45.0	45.0	20.0	15.0	30.0	30.0	15.0	15.0

Indoor centrifugal condenser units

VOLTAGE		208	230	460	575
2T	FLA	5.0	4.8	2.4	N/A
	WSA	6.3	6.0	3.0	N/A
	MOP	15.0	15.0	15.0	N/A
3T	FLA	5.0	4.8	2.4	1.9
	WSA	6.3	6.0	3.0	2.4
	MOP	15.0	15.0	15.0	15.0
5T	FLA	5.0	4.8	2.4	1.9
	WSA	6.3	6.0	3.0	2.4
	MOP	15.0	15.0	15.0	15.0
8T	FLA	8.6	8.4	4.2	3.2
	WSA	10.8	10.5	5.3	4.0
	MOP	15.0	15.0	15.0	15.0
10T	FLA	8.6	8.4	4.2	3.2
	WSA	10.8	10.5	5.3	4.0
	MOP	15.0	15.0	15.0	15.0

Guide Specifications

General

Summary. The environmental control system shall be designed specifically for precision temperature and humidity control applications. It will automatically monitor and control heating, cooling, humidifying, dehumidifying, and filtering functions for the conditioned space. The system shall be built to the highest quality engineering and manufacturing standards, and shall be subject to a functional test prior to leaving the factory. The system shall be floor mounted and configured for up/down discharge of conditioned airflow, with draw-through air pattern, to provide uniform air distribution over the entire face of the coil.

Design requirements. The system shall be as described in the following specification as manufactured by APC.

Model TC _____.

Total cooling capacity: _____ MBH (kW).

Sensible cooling capacity: _____ MBH (kW).

Return air temperature: _____ ° F (° C).

Dry bulb: _____ ° F (° C).

Wet bulb: _____ % RH.

Air quantity: _____ CFM (L/s) at 0.5" (125 Pa) external static pressure, (1.5" (375 Pa)) chilled water.

Humidifier capacity: _____ kW.

Electrical supply: _____ V, _____ ph, 60 Hz.

Submittals. Submittals shall be provided with the proposal and shall include: capacity data, electrical data physical data, electrical connection drawing and piping connection drawing.

Quality assurance. The system shall be completely factory-tested prior to shipment. Testing shall include, but not be limited to: Completely charging the system with refrigerant to ensure pressurized integrity, "Hi-Pot" test, and controls calibration and settings. Each system shall ship with a completed test report to verify completion of factory testing procedure. The system shall be NTRL listed.

Product

Microprocessor. The microprocessor controller shall provide total environmental control. The system, based on the main controller, shall offer up to eight analog inputs, two analog outputs, twelve digital inputs and thirteen digital outputs. The operator interface shall provide a 4-line, 80-character backlit LCD display. User-friendly menu structure along with

clearly defined prompts shall allow the operator to easily move about the program and monitor the following functions and alarm conditions.

- **Status:** Complete status monitoring shall be provided within the status menu of the microprocessor controller, and shall include the following information: current temperature, current humidity, temperature setpoint, humidity setpoint, cooling status, heating status, humidification status, and dehumidification status.
- **Alarms:** Quick access to any alarm condition shall be facilitated through the menu structure. Presence of a new alarm shall sound an audible alarm. A red alarm LED on the display panel shall remain illuminated until such time that all alarms have been cleared. Alarm annunciation shall include: loss of air, clogged filter, high head pressure, low suction pressure, high temperature, low temperature, high humidity, low humidity. The temperature and humidity alarm setpoints are user adjustable.
- **Setpoint:** The microprocessor controller shall provide independent setpoints for heating, cooling, humidification, and dehumidification. Automatic setpoint cross-over protection shall prevent the setting of the heat setpoint above the cool setpoint, and the humidify setpoint above the dehumidify setpoint. Setpoint adjustment shall be capable of being protected via security code.
- **Configuration:** Flexibility shall be offered through the use of the configuration menu. It shall closely match the operating requirements by changing the configuration settings. The site configuration shall be stored in the EEPROM and be protected from unauthorized tampering by the user selectable 4-digit security password in the security menu. Configuration options shall include: Fahrenheit or Celsius display, compressor minimum off-time, power-loss restart time-delay, primary-secondary transfer functions, alarm input polarity, alarm enable, temperature deadbands, humidity deadbands, and small room delay.
- **Run time:** The major components within the unit (motor, humidifier and compressor) shall have independent run-timers that monitor and store the accumulated run-hours on the components. The run timers shall be provided with operator-adjustable run-time alarms for proper component maintenance.
- **Security:** The microprocessor shall have multiple security levels to prevent unauthorized adjustment of important system parameters. A user-selectable 4-digit password shall allow setpoint and configuration changes.

Cabinet and frame. The cabinet and frame shall be constructed from welded structural steel. Access panels shall be flush with the frame and insulated with fiberglass 1" (25 mm) in thickness, 1.5lb/ft³ (0.7kg/m³) in density.

The panels are powder coated and lift off for access to the unit. A piping and electrical access plate shall be provided in the bottom of the unit. All units require front access, 24" (610 mm) minimum.

Blower system. The unit shall be configured for draw-through air pattern, to provide uniform air-flow over the entire face of the coil. The blower shall be

double-inlet centrifugal type, with forward-curving blades, dynamically and statically balanced. Each blower shall be independently driven by a high-efficiency motor. The drive package shall be designed for 200% of the fan motor horsepower. The motor and blower shall be mounted on a common frame.

Electrical. The electrical system shall conform to National Electrical Code (NEC) requirements. The control voltage shall be 24 VAC, wired in accordance with NEC Class 1 requirements. The wire for the control circuit shall not be smaller than 18-gauge AWG. Each wire shall end with a service loop and be securely fastened by an approved method. Control wires more than 6" (150 mm) shall be color-coded or numbered every 3" (80 mm) for ease of service tracing. All electrically-actuated components shall be easily accessible from the front of the unit. Each high voltage unit shall be individually protected on all three phases. Main power shall be connected to a circuit breaker mounted on the electrical panel. The compressor and motor shall have overload and short circuit protection. The electrical box shall include all components and controls required for system operation. An emergency cool override manual switch shall be provided with provision for control using a field supplied thermostat.

- Incoming power is _____ V, _____ ph, 60 Hz.

Humidifier. The humidifier(s) shall be self-contained steam-generating type, factory piped and wired, with disposable cylinder and automatic solid-state control circuit.

- Capacity: _____ lb/h (g/s).

Reheat. The reheat elements shall be, sized to offset the sensible cooling capacity in the dehumidification mode and shall be electrically and thermally protected by safety agency approved safeties.

- Reheat capacity shall be _____ MBH, _____ kW, controlled in _____ (#) steps.

Refrigeration system. Each refrigeration system shall consist of a fully protected scroll compressor, evaporator coil mounted over an insulated stainless steel condensate pan, adjustable expansion valve, filter-drier, liquid line solenoid valve, sight glass, receiver, liquid line isolation valve, low pressure switch and manual reset high pressure switch.

Cooling coil. The evaporator coil shall use the latest heat-transfer technology, raised lanced-aluminum fins and rifle-bored copper tubes. Coil end-supports shall be galvanized steel. To enhance dehumidification, the coil shall be split into two circuits by a microprocessor-controlled solenoid valve. An insulated stainless steel drain pan for condensate shall be included.

Air filters. The air filters shall be 30% efficient per ASHRAE Standard 52.1-92, UL Class 2. The full 4" (102 mm) deep, pleated filters shall be replaceable from the top on downflow units and from the front on upflow units.

Individual systems

Air-cooled system. The air cooled system shall consist of an evaporator section including evaporator coil, blower package(s), controls and electrical section and compressor. The condenser section shall be as follows:

- **Outdoor propeller fan condenser:** The outdoor condenser casing shall be of aluminum, and all structural supports, coil frame, motor drive supports, and mounting legs shall be made of galvanized steel. The condenser shall have copper tubes expanded into aluminum fins. Headers and connections shall be copper. The coil shall be pressure tested and sealed for shipment. The condenser motors shall have permanently lubricated sealed ball bearings, with internal overload protection, and operate on _____-V, _____-ph, 60-Hz power. Motors shall be mounted inside the condenser casing for weather protection, and shall be wired to a terminal strip in a weather-proof panel on the unit. The direct drive, aluminum fan blade and painted steel hub assembly, shall be protected by a heavy-gauge, vinyl-coated, steel-wire fan guard. On multiple units, each fan section shall be separated by full-width baffles to prevent bypass air. The condenser shall be sized for _____ ° F (° C) ambient, and condensing temperature controls shall be fan speed for –20° F (–29° C) winter ambient. Flooded controls for –40° F (–40° C) optional.
- **Indoor floor-mounted centrifugal fan condenser:** The indoor floor mounted condenser shall be a draw-through design and include quiet belt-driven double-inlet centrifugal blower(s), and a condenser coil with copper tubes expanded into aluminum fins. Belt(s) shall be sized for 200% of the system horsepower. All components shall be housed in a corrosion-resistant, heavy-gauge, steel cabinet to match the evaporator section in finish and construction, equipment with 1" (25 mm) supply and return air-duct flanges. The condenser shall be sized for _____ ° F (° C) ambient with condensing temperature controls for –40°F (–40° C). The condenser section shall be remotely mounted suitable for _____ - V, _____ -ph, 60-Hz power.
- **Models with air cooled condensing units:** The air -cooled system shall consist of an evaporator section including evaporator coil, blower package, controls and electrical system. The remote air-cooled condensing unit, including compressor, shall be housed outdoors in a weather-resistant, cabinet that shall allow service access through a hinged panel. The condenser coil shall have rifled copper tubes and enhanced aluminum fins. The coil shall be pressure-tested, and sealed for shipment. The condensing unit shall be equipped with a scroll compressor and crankcase heater, service valves, high and low pressure controls, receiver with fusible plug, liquid shut-off valve and charging port, liquid line filter-drier, and sight glass. The direct drive, propeller fan, condensing unit motor(s) shall have permanently lubricated sealed ball bearing, with internal overload protection, shall operate on _____-V, _____-ph, 60-Hz power, and shall be mounted inside the unit casing for weather protection. The standard condensing unit shall be sized for 95° F (35° C) ambient, and controls shall be flooded suitable for –20° F (–29° C) winter ambient. Optional controls for –30° F (–34° C) shall included insulated and heated receiver. The condensing unit shall be field-wired and-piped to the evaporator section and shall be suitable for remote outdoor installation.

Water/glycol-cooled systems. The water/glycol-cooled systems shall consist of an evaporator section including evaporator coil, blower package(s), controls and electrical section, compressor(s), and a water/glycol-cooled condenser section. The condenser shall be stainless steel brazed plate design and shall be controlled by 2-way (3-way optional) head pressure-regulated valve(s). Maximum water pressure is 150 psi (1030 kPa).

• **Outside heat exchanger (drycooler) for glycol cooled systems only:**

The drycooler casing shall be of aluminum, and all structural supports, coil frame, motor-drive supports, and mounting legs shall be made of galvanized steel. The drycooler coil shall have copper tubes expanded into aluminum fins. Headers and connections shall be copper. The coil shall be pressure-tested and sealed for shipment. The drycooler motors shall have permanently lubricated, sealed, ball bearings, and internal overload protection. Motors shall be mounted inside the drycooler casing for weather protection and wired to a terminal strip in a weather-proof panel on the unit. The direct-drive, aluminum fan blade and painted steel hub assembly, shall be protected by a heavy -gauge, vinyl-coated, steel-wire fan guard. On multiple fan units, each fan section shall be separated by full-width baffles to prevent bypass air. The drycooler shall be sized for 95° F (35° C) ambient, and operate on _____ -V, _____ -ph, 60-Hz power.

• **Indoor floor mounted drycooler:** The indoor floor-mounted drycooler shall be a draw-through design and include a quiet belt-driven, double inlet centrifugal blower(s), and a condenser coil with copper tubes expanded into aluminum fins. Belt(s) shall be sized for 200% of the system horsepower. All components shall be housed in a corrosion-resistant, heavy-gauge, steel cabinet to match the evaporator section in finish and construction, equipped with 1" (25 mm) supply and return air duct flanges. The drycooler section shall be sized _____° F (° C) ambient. The drycooler section shall be remotely mounted suitable for _____ -V, _____ -ph, 60-Hz power.

• **Single pump package for glycol cooled systems only:** The pump package shall be comprised of a centrifugal pump in a vented enclosure with pump starter, separate drycooler fan and pump circuit breakers, Aquastat, and fan cycling contractor(s) to control the fluid temperature. The controls shall be mounted in a weather-tight box. An expansion tank and Airtrol fitting shall be supplied for field installation. The pump size shall be sized for _____ GPM (L/s) at _____ ft (m) external head, and operate on _____ -V, _____ -ph, 60-Hz power.

• **Dual pump package for glycol cooled system only:** The dual pump package shall consist of two centrifugal pumps in an enclosure. Pump starters, automatic pump switch-over controls, lead-lag pump selector switch, separate drycooler fan and pump circuit breakers, aquastat, and fan cycling contractor to control the fluid temperature shall be mounted in a separate weather-tight box. An expansion tank and airtrol fitting shall be supplied for field installation. Each pump shall be sized for _____ GPM(L/s) at _____ ft (m) external head, and operate on _____ -V, _____ -ph, 60-Hz power.

Pre-cool. Unit designed to reduce operating costs during mid to low ambient temperatures by integrating an economizer coil into the glycol cooled system. The economizer coil, located up stream from the evaporator coil, provides partial cooling when ambient temperature falls below 60° F (16° C). At a return glycol temperature of 45° F (7° C) total cooling is accomplished by the economizer coil, therefore compressor operation is not required.

Chilled water. Unit utilizes chilled water loop with modulation valves. Field refrigeration piping is eliminated by a factory sealed and tested system. Water piping to and from the unit is required.

Options

Smoke detector(s). A smoke detector(s) shall be factory-installed in the return air to sense concentrations of smoke and send a signal to the microprocessor to shut down the unit and activate a visual and audible alarm.

Firestat. A firestat shall be factory-installed in the return air to sense heat and send a signal to the microprocessor shutting down the unit and activating a visual and audible alarm.

Water detector(s). Water detector(s) shall be factory-wired and shipped in the bottom of the unit to sense water and send a signal to the microprocessor, giving the operator possible alarm indications options for shutdown. The water detector has a 15 ft (5 m) cable for mounting in the subfloor.

Remote sensor(s). The temperature and humidity sensors shall be shipped loose in a 2" × 4" × 1.5" (51 mm × 102 mm × 38 mm) box and 50 ft (15 m) of cable supplied for connection to the unit mounted controller.

Remote shutdown. A relay shall be factory installed in the unit with a two pin terminal block to be field wired to a _____ (24, 120, or 220 VAC) signal which will shut down the unit control circuit when the signal is received.

Essential/non-essential lockout. An essential/non-essential lockout relay shall be factory-installed and wired to a two-pin terminal block to prevent operation of reheat or humidifier operation when a _____ (24, 120, or 220 VAC) signal is received.

Floorstand. An adjustable floorstand fabricated from heavy gauge steel shall be provided. The height shall be adjustable from 6" to 36" (115 mm to 915 mm) on upflow units and 12" to 36" (230mm to 915mm) on downflow units. Pedestals and vibration pads shall be included. Each pedestal shall be a 3/4" (19 mm) threaded rod, capable of a 2000-lb. (910 kg) vertical load. Zone 4 seismic floorstands shall ship loose and shall be _____ in (mm) high, up to 36" (915 mm).

Air Deflector. A 90° air deflector shall ship loose and shall be _____ in. (mm) high.

Top-discharge plenum. A top-discharge plenum shall be supplied with a gasket material for mounting to an upflow unit. Manually adjustable, double-deflecting grilles shall be provided on 3 or 4 sides. A combination of sound lining and insulation material shall be used. Plenum height shall be 20" in (508 mm) or 24" (610 mm).

Duct flange. A 1" (25 mm) duct flange shall be factory-installed on the top of the upflow unit at the blower outlet.

Redundant group control. _____ (up to 6) units shall be capable of being connected together to form a redundant group. The master microprocessor controller shall monitor the status of the slave microprocessor controllers and determine—based on run time, alarm conditions and load requirements—which of the units in the redundant group shall run.

Remote display panel. A remote microprocessor control display with keypad shall be shipped loose in a 12" × 8" × 3" (300mm × 200mm × 80mm) box and 50 ft (15 m) of cable supplied for connection to the units' microprocessor logic board.

Environmental monitoring unit. An "EMU" shall ship loose complete with one 12' (305 mm) probe and network connection.

Hot water reheat. The unit shall be supplied with factory installed copper tube, aluminum fin, hot water reheat coil in place of electrical heater elements. Capacity shall be _____ MBH (kW) with _____ GPM (L/s) of _____ ° F (° C) entering hot water temperature. Hot water shall be controlled with a modulating control.

Steam reheat. The unit shall be supplied with a factory-installed copper tube, aluminum-fin-reheat steam-coil in place of electrical heater elements. Capacity shall be _____ MBH (kW) with 5 psi (35 kPa) of saturated steam. Steam shall be controlled with an on/off solenoid valve.

Hot gas reheat. The unit shall be supplied with a factory-installed copper tube and aluminum fin hot gas reheat coil, in place of electrical heater elements. Air-cooled systems using hot gas reheat shall also include flooded condenser pressure controls. This is not available with remote-condensing units.

Premium efficiency motor(s). Each motor shall have a premium efficiency of no less than _____% per NEMA MG1-12.55.

High efficiency filter(s). Filters shall be _____% efficient per ASHRAE Standard 52.1-92, UL Class2. The full 4" (102 mm) deep, pleated filters shall be replaceable from the top on downflow units and from the front on upflow units.

Prefilter(s). Replaceable 1" (25 mm) thick 25–30% efficient filter shall be installed upstream of the final filters to lengthen service life.

Condensate pump, factory installed . A factory installed and wired condensate pump shall pump 36 gal/h (0.06 L/s) at 15' (4.6 m) head.

Condensate pump, ship loose. A condensate pump shall ship loose for field installation and wiring. Wiring shall be 120 VAC plug-in type. A check valve is also shipped loose. It shall have a capacity of 60 gal/h (0.06 L/s) at 15 ft (4.6 m) head.

350 PSI water regulating valves. The condensing temperature shall be automatically controlled by 2-way (3-way) 350 psi (2400 kPa) water regulating valve(s).

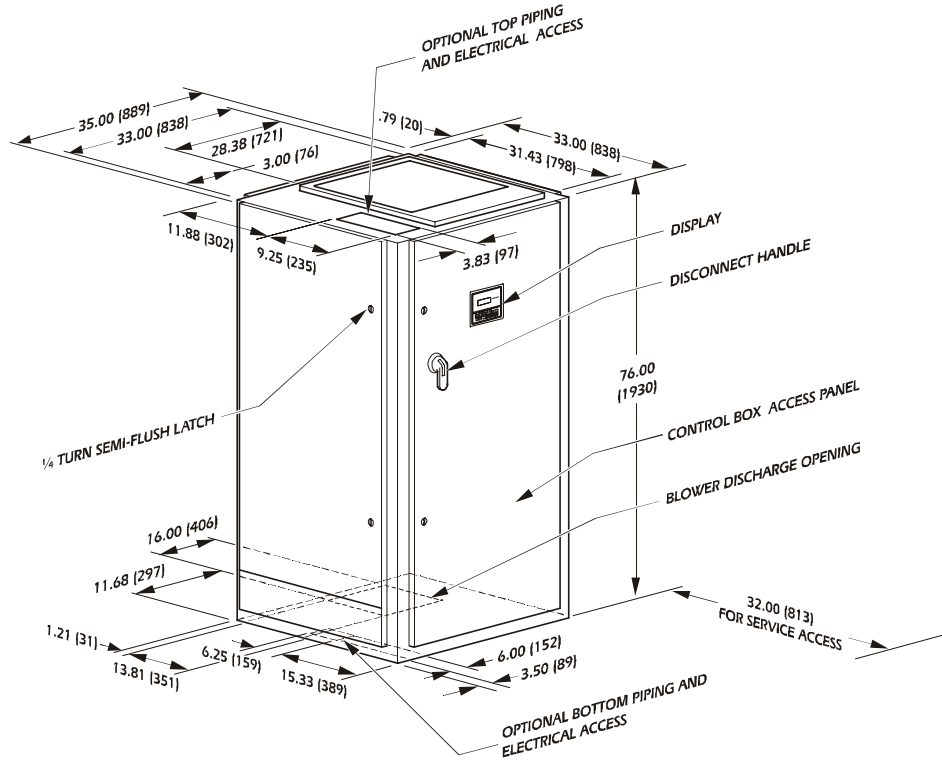
Flared connections for filter-drier. Flared connections shall be factory-installed on either side of the filter-drier to allow easy replacement.

Hot gas bypass. The unit shall be supplied with factory installed hot gas bypass system to maintain efficient compressor operation during periods of low load. The valve shall automatically control the amount of hot gas bypassed to maintain the proper system capacity.

External chilled water supply systems. Contains a primary chilled water coil and secondary TC coil within the same cabinet. These systems can provide cooling using either building chilled water or the standard TC refrigeration system. The chilled water mode is configured as the primary and will switch to the TC upon chilled water temperature rise or loss of flow. The TC systems are available in water cooled, glycol cooled, and air cooled configurations.

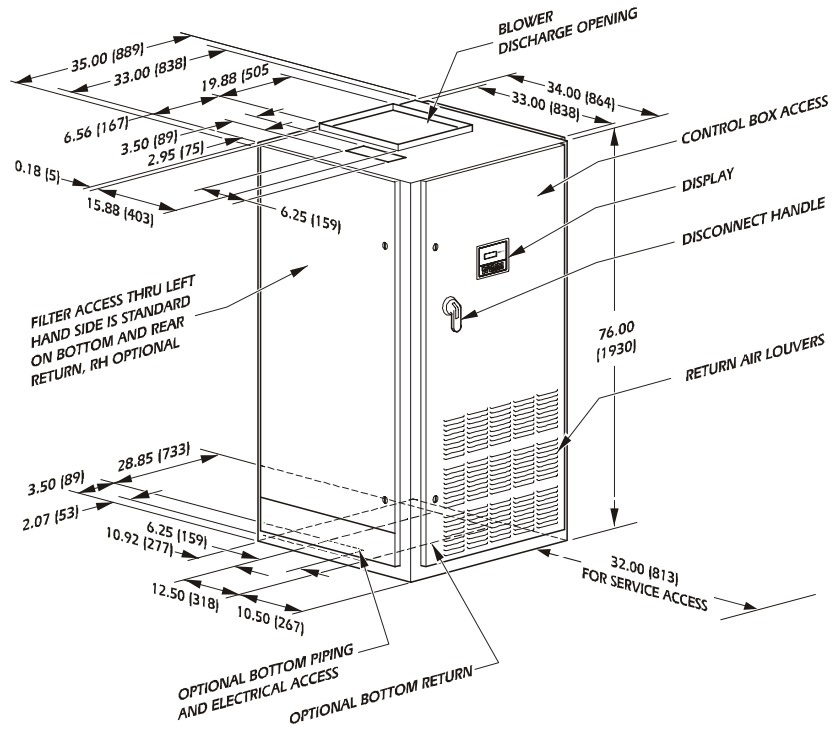
Dimensional Data

Downflow—2-10 ton



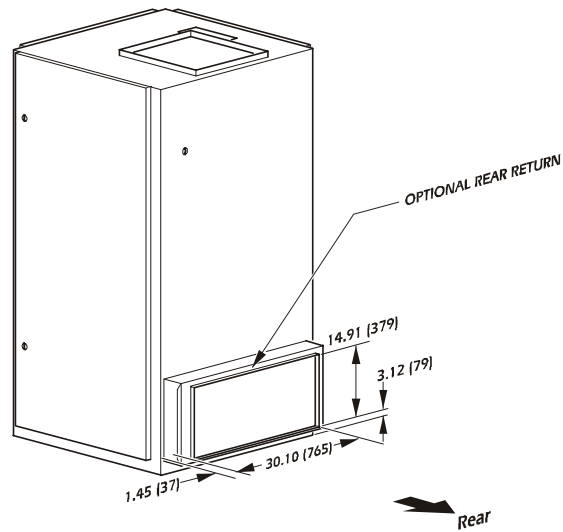
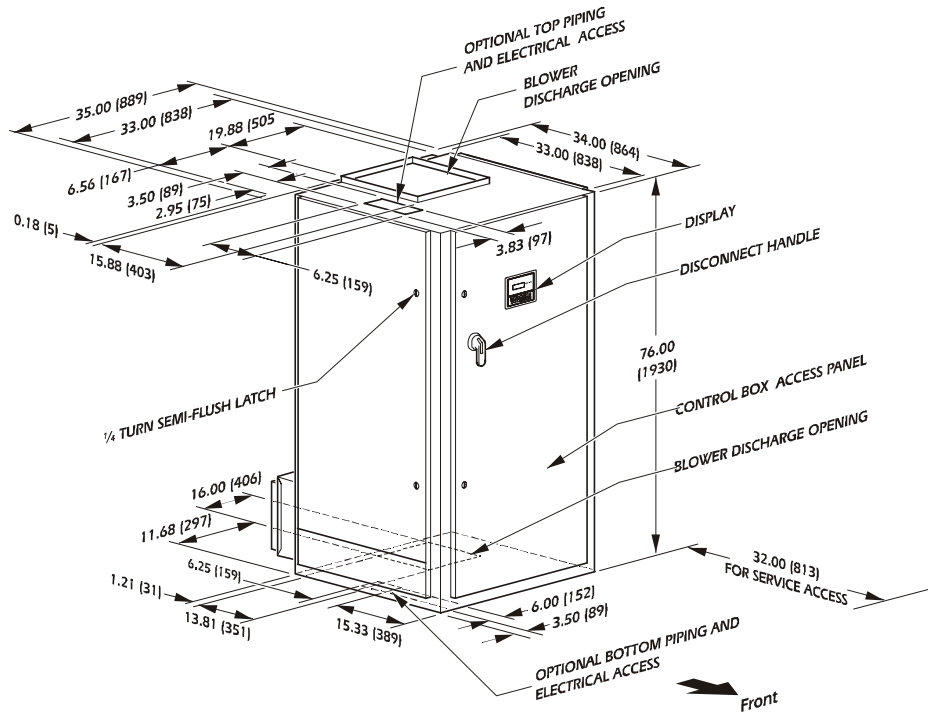
*All dimensions in inches (mm)

Upflow front-return—2-10 ton, (4-12 ton CW)



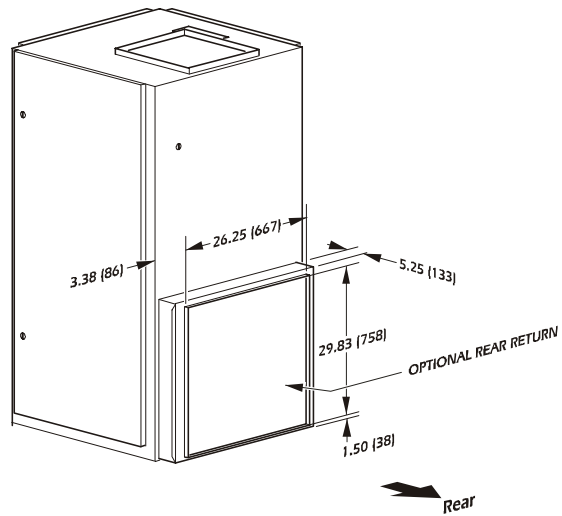
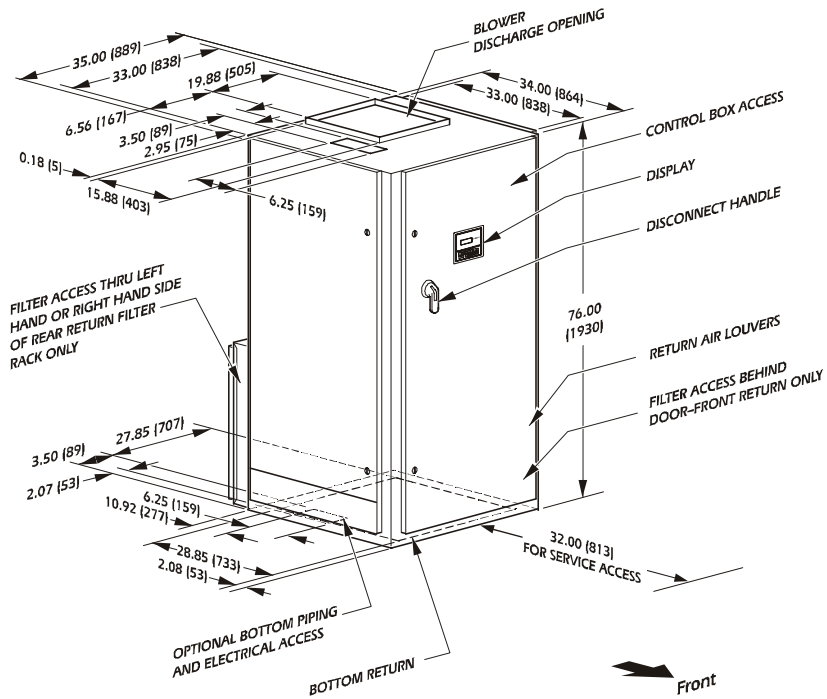
*All dimensions in inches (mm)

Upflow rear-return—2-5 ton, (4-8 ton CW)



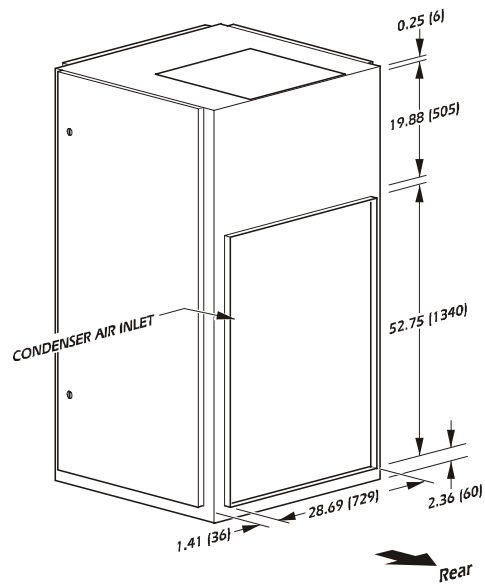
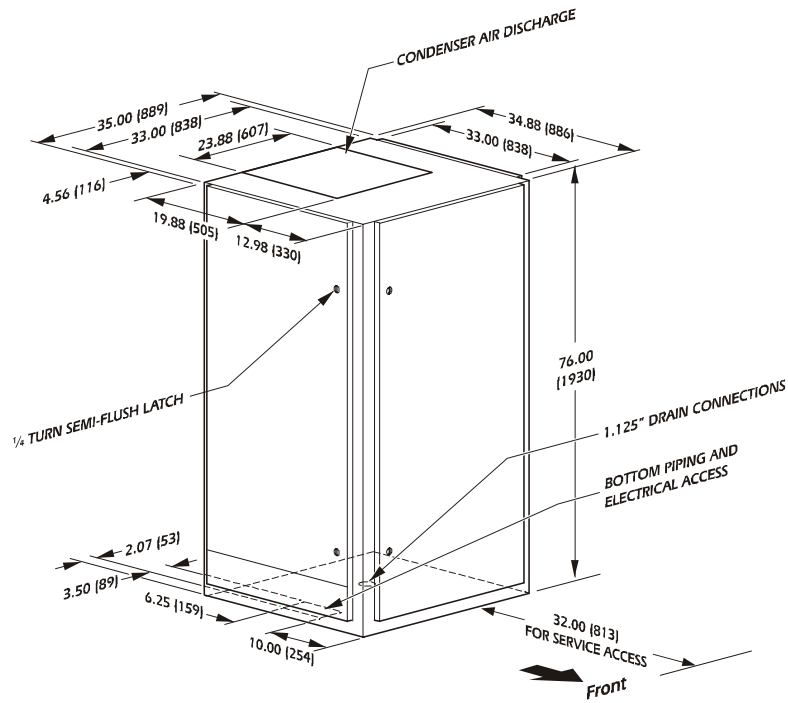
*All dimensions in inches (mm)

Upflow rear-return—8-10 ton, (10-12 ton CW)



*All dimensions in inches (mm)

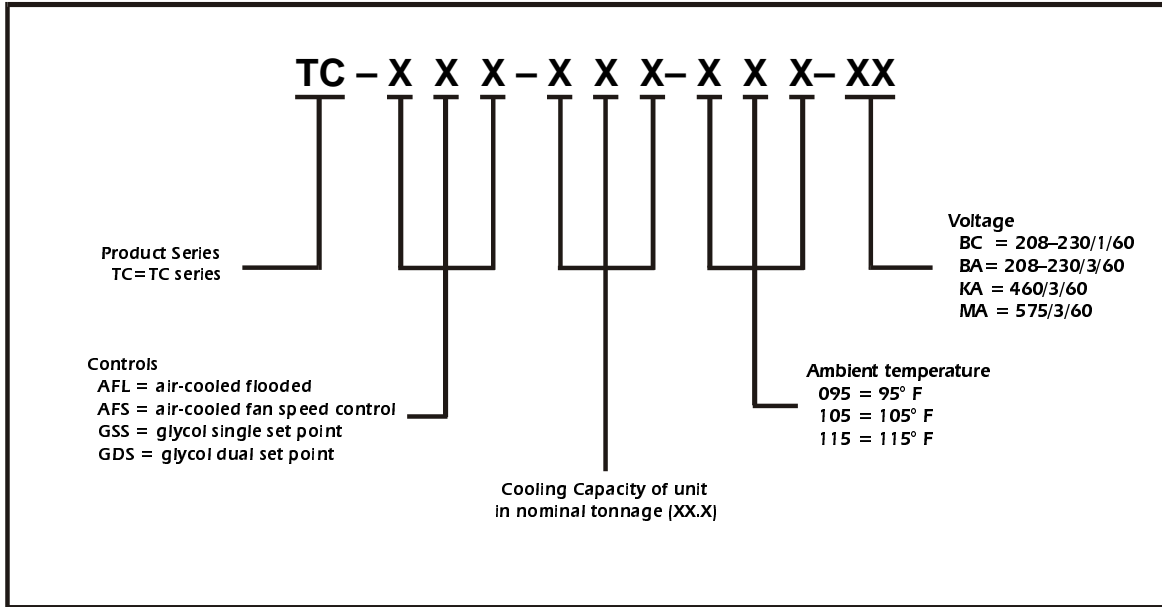
Indoor top-discharge indoor centrifugal condenser—2-10 ton



*All dimensions in inches (mm)

Air-Cooled Condensers and Drycoolers

Key to the model number



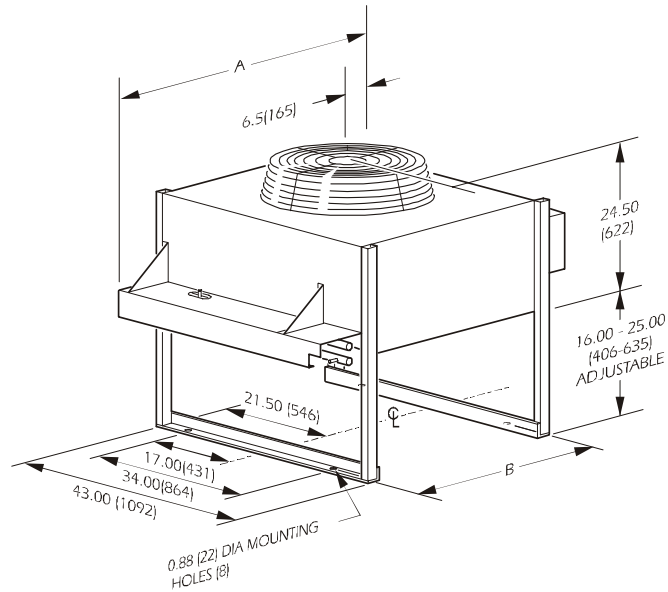
Air cooled condenser—physical data

MODEL	TEMP.	AIR QUANTITY		FAN	CONNECTION		WEIGHT	
		TONNAGE	AMBIENT		CFM	L/s	QUANTITY	HOT GAS
2 ton	95° F	2,100	991	1	7/8"	5/8"	114	51
	105° F	2,100	991	1	7/8"	5/8"	114	51
	115° F	2,100	991	1	7/8"	5/8"	114	51
3 ton	95° F	5,050	2,383	1	1-1/8"	7/8"	180	81
	105° F	5,050	2,383	1	1-1/8"	7/8"	180	81
	115° F	6,450	3,044	1	1-1/8"	7/8"	260	118
5 ton	95° F	6,450	3,044	1	1-1/8"	7/8"	260	118
	105° F	6,450	3,044	1	1-1/8"	7/8"	260	118
	115° F	10,100	4,766	2	1-1/8"	7/8"	450	204
8 ton	95° F	10,100	4,766	2	1-1/8"	7/8"	450	204
	105° F	10,100	4,766	2	1-1/8"	7/8"	450	204
	115° F	12,400	5,852	2	1-1/8"	7/8"	470	213
10 ton	95° F	12,400	5,852	2	1-1/8"	7/8"	470	213
	105° F	12,400	5,852	2	1-1/8"	7/8"	470	213
	115° F	13,700	6,465	2	1-1/8"	7/8"	510	231

Air cooled condenser—electrical data

MODEL	TEMP.	208-230/1/60			208-230/3/60			460/3/60			575/3/60			
		TONNAGE	AMBIENT	FLA	MCA	MOP	FLA	MCA	MOP	FLA	MCA	MOP	FLA	MCA
2 ton	95° F	2.0	2.5	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	105° F	2.0	2.5	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	115° F	2.0	2.5	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3 ton	95° F	3.4	4.3	15	2.6	3.3	15	1.3	1.6	15	1.0	1.2	15	
	105° F	3.4	4.3	15	2.6	3.3	15	1.3	1.6	15	1.0	1.2	15	
	115° F	4.8	10.8	20	N/A	N/A	N/A	2.4	5.4	15	2.0	4.5	15	
5 ton	95° F	4.8	10.8	20	N/A	N/A	N/A	2.4	5.4	15	2.0	4.5	15	
	105° F	4.8	10.8	20	N/A	N/A	N/A	2.4	5.4	15	2.0	4.5	15	
	115° F	8.2	14.2	20	7.4	13.4	20	3.7	6.7	15	3.0	5.5	15	
8 ton	95° F	8.2	14.2	20	7.4	13.4	20	3.7	6.7	15	3.0	5.5	15	
	105° F	8.2	14.2	20	7.4	13.4	20	3.7	6.7	15	3.0	5.5	15	
	115° F	8.7	14.7	20	7.4	13.4	20	3.7	6.7	15	3.0	5.5	15	
10 ton	95° F	8.7	14.7	20	7.4	13.4	20	3.7	6.7	15	3.0	5.5	15	
	105° F	8.7	14.7	20	7.4	13.4	20	3.7	6.7	15	3.0	5.5	15	
	115° F	8.7	14.7	20	7.4	13.4	20	3.7	6.7	15	3.0	5.5	15	

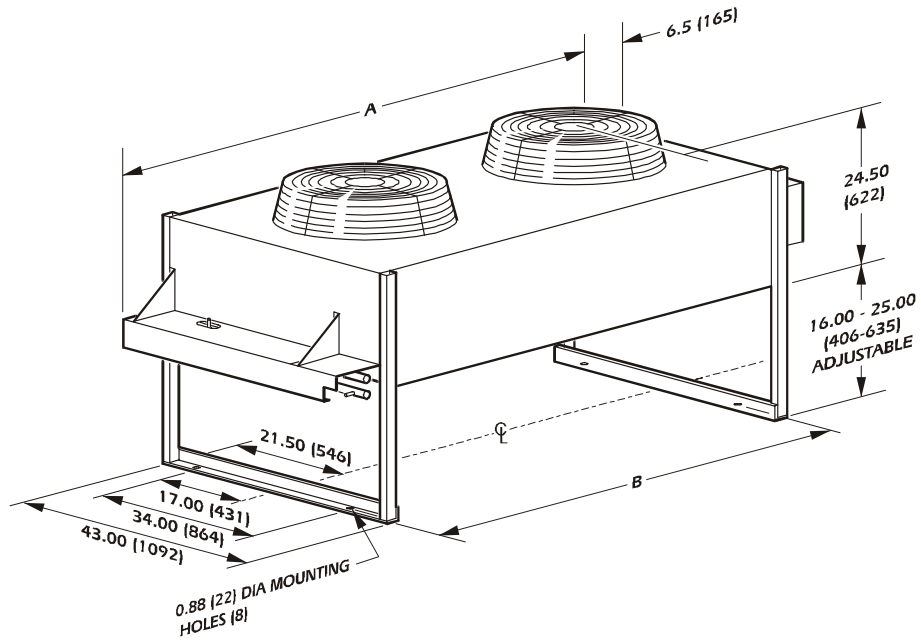
Single-fan air-cooled condenser—2-5 ton



APC UNIT	TEMP	FAN QTY	A	B
2 ton	95° F (35° C)	1	49.75 (1264)	40.00 (1016)
2 ton	105° F (41° C)	1	49.75 (1264)	40.00 (1016)
2 ton	115° F (46° C)	1	49.75 (1264)	40.00 (1016)
3 ton	95° F (35° C)	1	49.75 (1264)	40.00 (1016)
3 ton	105° F (41° C)	1	49.75 (1264)	40.00 (1016)
3 ton	115° F (46° C)	1	49.75 (1264)	40.00 (1016)
5 ton	95° F (35° C)	1	49.75 (1264)	40.00 (1016)
5 ton	105° F (41° C)	1	49.75 (1264)	40.00 (1016)

*All dimensions in inches (mm)

Dual-fan air-cooled condenser—5–10 ton



APC UNIT	TEMP	FAN QTY	A	B
5 ton	115° F (46° C)	2	69.75 (1772)	60.00 (1524)
8 ton	95° F (35° C)	2	69.75 (1772)	60.00 (1524)
8 ton	105° F (41° C)	2	69.75 (1772)	60.00 (1524)
8 ton	115° F (46° C)	2	69.75 (1772)	60.00 (1524)
10 ton	95° F (35° C)	2	69.75 (1772)	60.00 (1524)
10 ton	105° F (41° C)	2	69.75 (1772)	60.00 (1524)
10 ton	115° F (46° C)	2	89.75 (2280)	80.00 (2032)

*All dimensions in inches (mm)

Drycooler

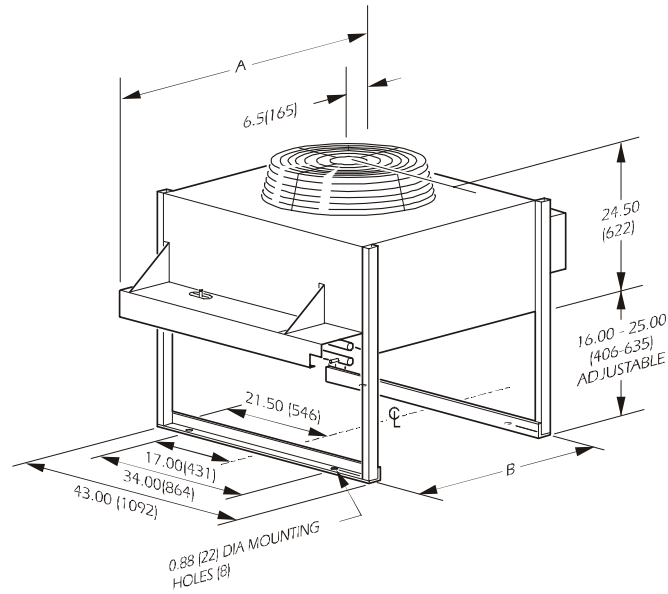
Glycol cooled drycooler—physical data

MODEL	TEMP.	AIR QUALITY		FAN	CONNECTION		WEIGHT		GLYCOL VOLUME		
		TONNAGE	AMBIENT		CFM	L/s	QUANTITY	HOT GAS	LIQUID	Lbs	Kg
2 ton	95° F		2,100	991	1	1-1/8"	1-1/8"	114	51	1.7	6.4
	105° F		5,050	2,383	1	1-3/8"	1-3/8"	180	81	2.6	9.8
3 ton	95° F		5,050	2,383	1	1-3/8"	1-3/8"	180	81	2.6	9.8
	105° F		6,450	3,044	1	1-3/8"	1-3/8"	260	118	4.0	15.1
5 ton	95° F		6,450	3,044	1	1-3/8"	1-3/8"	260	118	4.0	15.1
	105° F		10,100	4,766	2	1-3/8"	1-3/8"	450	204	4.9	18.1
8 ton	95° F		10,100	4,766	2	1-3/8"	1-3/8"	450	204	4.9	18.1
	105° F		12,400	5,852	2	1-3/8"	1-3/8"	470	214	6.5	24.6
10 ton	95° F		12,400	5,852	2	1-3/8"	1-3/8"	470	214	6.5	24.6
	105° F		13,700	6,465	2	1-3/8"	1-3/8"	510	232	7.8	29.5

Glycol cooled drycooler—electrical data

MODEL	TEMP.	208-230/1/60			208-230/3/60			460/3/60			575/3/60			
		TONNAGE	AMBIENT	FLA	MCA	MOP	FLA	MCA	MOP	FLA	MCA	MOP	FLA	MCA
2 ton	95° F		2.0	2.5	15	N/A	N/A	15	N/A	N/A	15	N/A	N/A	15
	105° F		3.4	4.3	15	2.6	3.3	15	1.3	1.6	15	1.0	1.2	15
3 ton	95° F		3.4	4.3	15	2.6	3.3	15	1.3	1.6	15	1.0	1.2	15
	105° F		3.9	4.9	15	2.6	3.3	15	1.3	1.6	15	1.0	1.2	15
5 ton	95° F		3.9	4.9	15	2.6	3.3	15	1.3	1.6	15	1.0	1.2	15
	105° F		6.8	11.1	15	5.2	8.5	15	2.6	4.2	15	1.9	3.1	15
8 ton	95° F		6.8	11.1	15	5.2	8.5	15	2.6	4.2	15	1.9	3.1	15
	105° F		6.8	11.1	15	5.2	8.5	15	2.6	4.2	15	1.9	3.1	15
10 ton	95° F		6.8	11.1	15	5.2	8.5	15	2.6	4.2	15	1.9	3.1	15
	105° F		6.8	11.1	15	5.2	8.5	15	2.6	4.2	15	1.9	3.1	15

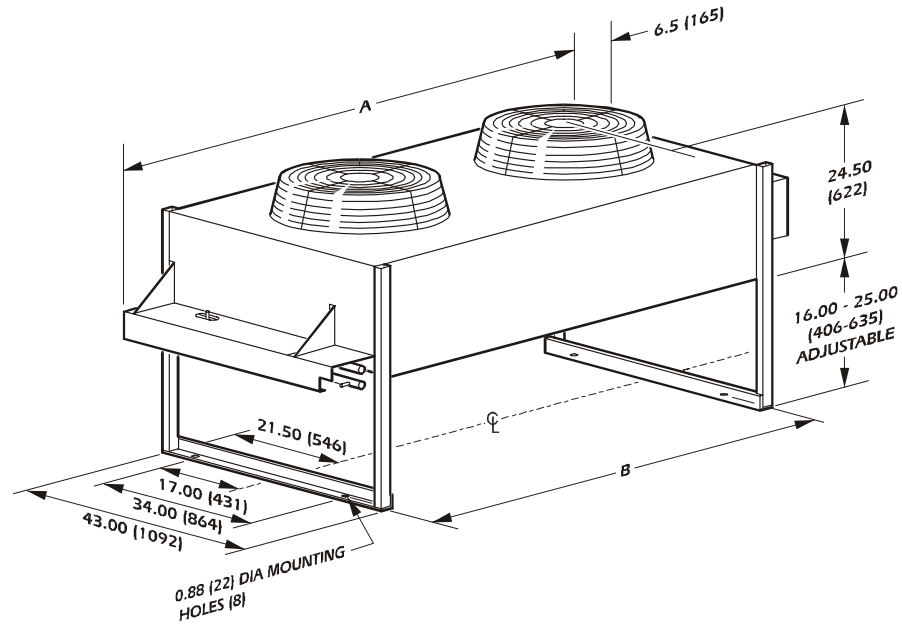
Single-fan fluid cooler—2-5 ton



APC UNIT	TEMP	FAN QTY	A	B
2 ton	95° F (35° C)	1	49.75 (1264)	40.00 (1016)
2 ton	105° F (41° C)	1	49.75 (1264)	40.00 (1016)
3 ton	95° F (35° C)	1	49.75 (1264)	40.00 (1016)
3 ton	105° F (41° C)	1	49.75 (1264)	40.00 (1016)
5 ton	95° F (35° C)	1	49.75 (1264)	40.00 (1016)

*All dimensions in inches (mm)

Dual-fan fluid cooler—5-10 ton

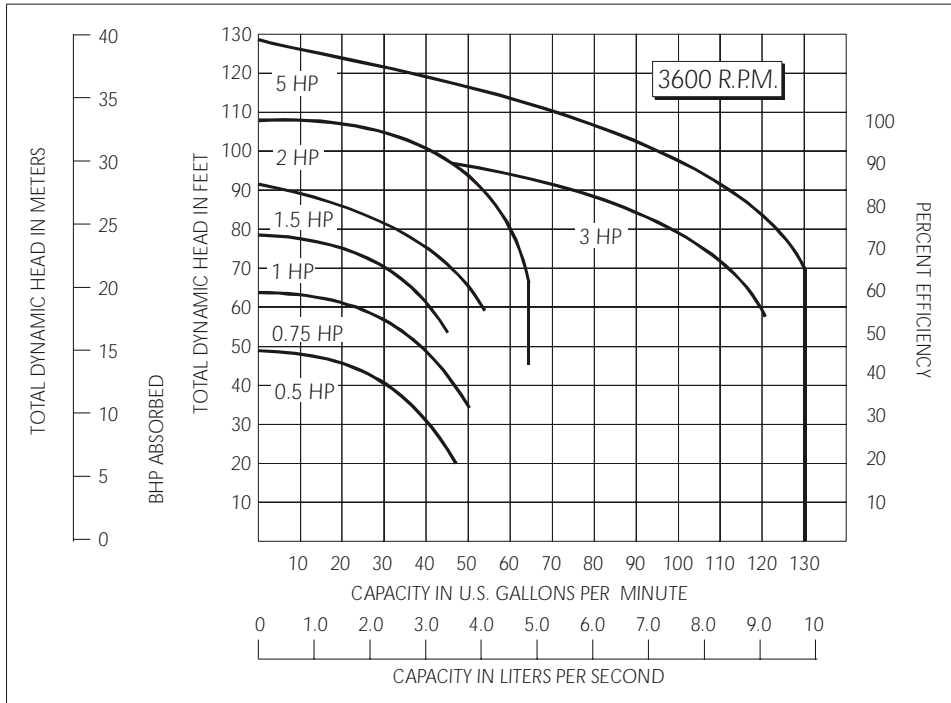


APC UNIT	TEMP	FAN QTY	A	B
5 ton	105° F (41° C)	2	69.50 (1765)	60.00 (1524)
8 ton	95° F (35° C)	2	69.50 (1765)	60.00 (1524)
8 ton	105° F 41° C)	2	89.5 (2238)	80.00 (2000)
10 ton	95° F (35° C)	2	89.5 (2238)	80.00 (2000)
10 ton	105° F 41° C)	2	89.5 (2238)	80.00 (2000)

*All dimensions in inches (mm)

Pump Specifications

Pump performance



Pump electrical data

HP (kW)	1/2" (0.37)		3/4" (0.56)		1" (0.75)		1.5" (1.1)		2" (1.5)	
	FLA	MCA	FLA	MCA	FLA	MCA	FLA	MCA	FLA	MCA
208/1/60	5.4	6.8	7.6	9.5	8.8	11.0	11.0	13.8	13.2	16.5
230/1/60	4.9	6.1	6.9	8.6	8.0	10.0	10.0	12.5	12.0	15.0
208/3/60	2.4	3.0	3.5	4.4	4.6	5.8	6.6	8.3	7.5	9.4
230/3/60	2.2	2.8	3.2	4.0	4.2	5.3	6.0	7.5	6.8	8.5
460/3/60	1.1	1.4	1.6	2.0	2.1	2.6	3.0	3.8	3.4	4.3
575/3/60	0.9	1.1	1.3	1.6	1.7	2.1	2.4	3.0	2.7	3.4

FLA= Full Load Amperes

MCA=Minimum Circuit Amperes

*Values are calculated based on 3-phase power.

Guidelines for Installation

The TC series provides reliable, accurate temperature and humidity control of computer rooms, laboratories, and other environments that require close tolerance control. The unit incorporates the latest system design innovations to provide you with optimum efficiency, reliability, and accuracy of control.

The TC system will provide years of trouble-free service, if it is installed and maintained by technically qualified personnel.

Room preparation

During the design of the room, consideration should be given to the following factors: ease of entry for the system, floor-loading factors, and accessibility of piping and wiring.

The room must be sealed with a vapor barrier to minimize migration of moisture. Polyethylene film (plastic sheeting) is a good vapor barrier for ceiling and wall applications. Rubber- or plastic-based paints should be applied to concrete floors and walls. The room should be thoroughly insulated to minimize thermal loads and make-up air (if required) should be preconditioned to reduce additional temperature, filtration, and moisture loads.

A room using a raised-floor plenum for air distribution should have at least 9" (300 mm) of clear space between the false floor and sub-floor for a finished floor height of 12" (380 mm). Pay special attention to the location of pipe chases, electrical conduits and other obstructions under the floor. These objects can block air circulation and cause loss of air pressure, thus reducing system efficiency and causing hot spots in your room.

APC should be notified before installation if the unit is incorrect for the application.

Unit location

The location of the unit is important for efficient and balanced environmental control in your room. The air conditioner should be located as close as possible to the largest heat load. In rooms having a high aspect ratio, mount the unit along the longest wall to ensure even air distribution. If improperly installed, erratic control or mechanical failure can and will result if the unit does not obtain proper air volume and distribution.

Service access

At least 24" (610 mm) of clear space must be left in front of the unit for routine service (belts, filters, humidifier). We strongly recommend approximately 34" (860 mm) clearance in front of the unit.

Receiving the unit

Your TC unit has been completely tested and inspected prior to shipment. To ensure that you have received the unit in excellent condition, perform a careful inspection of the crating and the unit immediately upon receipt. Verify that all parts ordered were received as specified and that the unit is the correct size and voltage necessary to fulfill your environmental control needs. Report any damage discovered to the freight carrier. If necessary,

contact the APC field service department for help in repairing or replacing damaged parts. While APC is not responsible for damage incurred in transit, we want to make sure that you have no undue delays in your system start-up.

Rigging

The unit is manufactured with a formed steel frame for maximum strength and unit integrity. However, as with all electrical and mechanical equipment, you must take care with proper rigging of your unit.

When using a forklift to move the unit, use the shipping skid to protect the bottom of the unit. When using chains, cables or rope to lift the unit, use spreader bars to prevent damage to the finished panel.

Floorstand

Install a threaded pedestal into each leg of the floorstand. Use the washer and nut on each panel are used to tighten against the floorstand leg.

Utility connections

All connections are made through the bottom left of the unit (the left side of upflow discharge units) for ease of service connections. Refer to the installation manual for pipe sizes and specific locations for your unit.

Power unit

The TC unit uses 3-phase power for operation. Bring the service cable through the bottom left of the unit and through the bulkhead hole into the electrical box to the circuit breaker provided on the left side of the electrical box. The ground lug is located near the 3-phase high-voltage connector. **THE UNIT MUST BE UTILITY GROUNDED OR THE WARRANTY IS VOID.**

Humidifier connections

The humidifier inlet connection is in the bottom of the mechanical section. A 1/4" compression connection is supplied with the unit.

Condensate drain

Condensate from the evaporator pan and discharge from the humidifier flushing system drain through a 7/8" ID drain trap in the bottom of the unit.

Water supply to humidifier

1. The humidifier fill valve orifice is sized for supply water pressure from 30 PSIG (210 kPa) to 85 PSIG (590 kPa).
2. For cases above 90 PSIG (630 kPa), install a pressure-reducing valve in the water feed line to the unit.
3. With extremely dirty or muddy water sources, proper filtration is required on the units incoming water line.
4. DO NOT use softened water with the humidifier. Softened water is too conductive.
5. DO NOT use completely demineralized water with the humidifier. The minerals allow the electrode principle to work.
6. DO NOT use a hot water source. Doing so will cause deposits that will eventually block the fill valve orifices.
7. Water supplies with high conductivity (above 700 $\mu\Omega$) must be pre-conditioned for proper operation and longevity of the humidifier.

Water supply

A 16- to 20-mesh strainer must be installed in the water supply to the water and glycol units to prevent clogging of brazed plate condenser. This is a field item.

NOTE: Because of an ongoing program dedicated to product improvement, specifications are subject to revisions without notice. APC assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions.



APC Worldwide Customer Support

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to find answers to frequently asked questions (FAQs), to access documents in the APC Knowledge Base, and to submit customer support requests.
 - www.apc.com (Corporate Headquarters)
Connect to localized APC Web sites for specific countries, each of which provides customer support information.
 - www.apc.com/support
Global support with FAQs, knowledge base, and e-support.
- Contact an APC Customer Support center by telephone or e-mail.
 - Regional centers:

APC Headquarters (U.S. and Canada)	(1) (800) 800-4272 (toll free)
Latin America	(1) (401) 789-5735 (United States)
Europe, Middle East, Africa	(353) (91) 702020 (Ireland)
Japan	(03) 5434-2021 Guidance 3

- Local, country-specific centers: go to www.apc.com/support/contact for contact information.
- Contact the APC representative or other distributor from whom you purchased your APC product for information on how to obtain local customer support.

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