
NetworkAIR™ FM-DX
Computer Room Air-Conditioning—60 Hz
35–150 kW (10–45 tons)



Technical Data

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FM	Capacity (kW)	Module	Configuration	Voltage	Reheat	Humidifier	Air Pattern
FM	35	M= Main Module	A= Air Cooled	BA= 208-230/3/60	E= Electric	S= Replaceable Steam Canister	D= Downflow
	40	E= Expansion Module	E= Air Cooled with Multicool	KA= 480/3/60	W= Hot Water	C= Cleanable Steam Canister	U= Upflow (front return)
	50		W= Water Cooled	MA= 600/3/60	S= Steam	X= No Humidifier	R= Upflow (rear return)
			F= Water Cooled with Multicool		H= Hot Gas		
			D=Water Cooled with Economizer		B=Hot Gas & Electric		
			G=Glycol Cooled		X= No Reheat		
			B= Glycol Cooled with Multicool				
			P= Glycol Cooled with Economizer				
FM	XX	X	- X	XX -	X	X	X

Overview

The modular, Floor Mount computer room air-conditioning system offers efficient, effective and economical cooling for a variety of spaces.

Computer room environmental 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. Critical environment applications include:

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

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

APC warrants all parts for 12 months from shipment. Extended warranties are available.

Capacity

The NetworkAIR FM is available from 35kW (10 ton) to 150 kW (45 ton). The system configurations consist of one, two or three modules. Multiple module configurations consist of one main module and up to two expansion modules.

Room Air Distribution

Downflow systems discharge air into the raised floor plenum. These systems are suitable for areas with raised floors greater than 12" (305 mm) high. Return air is drawn in through the top of the system.

Downflow systems also include a static regain plenum for each blower. This evens out velocity profile and increases static performance while reducing noise level. It also allows access to some components while the system is operating, without interrupting airflow.

Upflow systems discharge air into either a plenum or ductwork. These systems can be used when a raised floor does not exist or is not suitable for cooling. Air is drawn in through the bottom and optionally from the rear of the system.

The NetworkAIR FM delivers high volumes of airflow (620 cfm per ton/180 cfm/kW) to eliminate hot spots in densely populated environments.

Configuration

- Glycol Cooled
- Glycol Cooled with Economizer
- Glycol Cooled with MultiCool (Chilled Water Coil)
- Water Cooled
- Water Cooled with Economizer
- Water Cooled with MultiCool (Chilled Water Coil)
- Air Cooled
- Air Cooled with MultiCool (Chilled Water Coil)

Compliance Approval

- UL Listed to UL 1995 and CSA C22.2 No. 236
- MEA (City of New York)



Standard Features

- Tandem Scroll Compressors
- Configurable Dehumidification
- Direct Drive Motor/Blower
- Frequency Controlled Motor
- Electrical Panel
- Water Regulating Valves
- Double Skin Panels
- Programmable Input/Output Interface Module
- Main Power Circuit Breaker(s)
- Brazed Plate Condenser (Water/Glycol)
- Microprocessor Controller
- 30% ASHRAE 52.1 Filters
- 94VO Thermal (anti-fungal) Condensate Pan
- Charge Isolation
- Predictive Failure Warnings
- Evaporator Freeze Protection
- High Return Air Temp Capability
- Network Management Card
- Redundant Group Control

Optional Features

- Plenums (with or without grilles)
- Floorstand
- Duct Flange
- Sub-Base
- Firestat
- Smoke Detector
- 85% High Efficiency Filters
- Water Flowswitch (Water, Glycol, Economizer, or MultiCool)
- Casters
- Spot Water Detector(s)
- Cable Leak Detector
- Replaceable/Cleanable Steam Humidifier
- SCR Controlled Electric Reheat
- Hot Water Reheat
- Hot Gas Reheat
- High Lift, Dual Float Condensate Pump
- MultiCool

Scalable Solution for Critical Environments

Temperature and Humidity Design Conditions

Maintenance of temperature and humidity design conditions is critical to the smooth operation of a technology room. Design conditions should be 72-75°F (22.2-24.8°C) and 45-50% relative humidity (R.H.). As damaging as the wrong maintained conditions can be, rapid temperature swings can also have a negative effect on hardware operation. This is one of the reasons hardware is left powered up, even when not processing data. Computer room air conditioning is designed to maintain temperature at $\pm 1^\circ\text{F}$ and humidity at $\pm 3\text{-}5\%$ R.H. 24 hours a day, 8760 hours a year. Vapor barriers and sealed rooms are required to maintain these tolerances.

In contrast, comfort systems are designed to maintain $\pm 5^\circ\text{F}$ from the temperature setpoint. There is usually no dedicated humidity control and the simple controllers cannot maintain the set point tolerance required for temperature, allowing potentially harmful temperature and humidity swings to occur. This is not acceptable for sensitive electronic equipment.

Air Quality

Computer room air conditioners provide a high CFM, around 600 CFM/ton (160 cfm/kW). This high CFM moves more air through the space improving air distribution and reducing the chance of localized hot spots. It also allows more air to move through filters, ensuring a cleaner environment. This requires a moderate- to high-efficiency filter bank to minimize airborne particles.

Problems Caused by the Wrong Environment

A poorly maintained technology room environment will have a negative impact on computer room operations. The results can range from data corruption to complete system shutdowns and failures.

High & Low Temperature

A high or low temperature swing or rapid temperature swings can corrupt data processing and shut down an entire system. Temperature variations can alter the electrical and physical characteristics of electronic chips and other board components, causing faulty operation or failure. These problems may be transient or may last for days. Transient problems can be very difficult to diagnose and repair.

High Humidity

High humidity can result in tape and surface deterioration, head crashes, condensation, corrosion, paper handling problems and (gold and silver) migration leading to component and board failure.

Low Humidity

Low humidity greatly increases the possibility of static electric discharges. Such static discharges can corrupt data and damage hardware.

APC NetworkAIR™ FM-The Right Solution

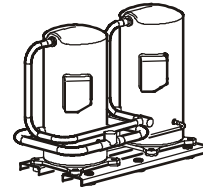
The APC NetworkAIR™ FM provides the maximum amount of computer room cooling in a compact footprint. Highly scalable, the system is capable of growing with your cooling needs as they increase. Each system comes standard with concise capacity controls for high efficiency operation.

Compact Footprint

The NetworkAIR FM delivers a high capacity of cooling in a small “overall” footprint. Since the system requires only front service access, modules can be placed or latched side by side and valuable floor space is not wasted.

Capacity Control

The NetworkAIR FM modules utilize tandem scroll compressors for two step modulation. One or both of the compressors can run depending on the load of the system. This allows up to six steps of “true” unloading in a three-module system without the power factor and friction penalty of an unloaded semi-hermetic compressor.



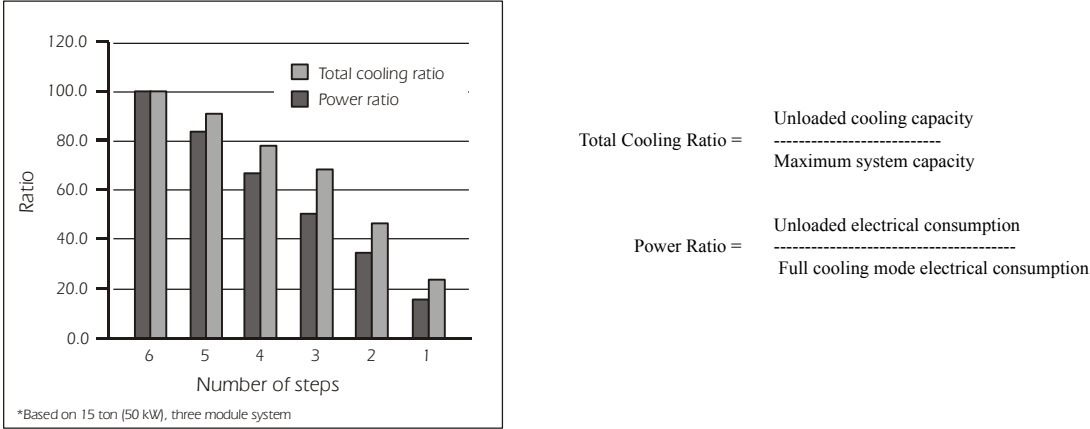
Efficiency and Reliability

The high EER (up to 20.0) and few moving parts of scroll compressors provide efficient and reliable operation. Scroll technology has unparalleled ability to withstand liquid refrigerant ‘slugging’ which is a major cause of compressor failure. It is designed as a single assembly with one suction line and one discharge line per set.

Energy Efficiency

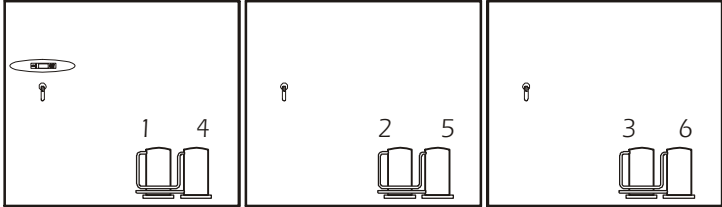
The NetworkAIR FM’s modular design and ability to connect up to three modules, working as a single system, provides up to six steps of capacity control. This allows for a precise response to changing room loads using multiple stages of capacity. The 35-50 kW (10-15 ton) modules control capacity using a tandem scroll compressor that can be unloaded in two stages. As seen in the graph, energy saving are directly impacted by the steps of unloading. At step 3, a 68% cooling capacity is achieved while consuming only 50% of the compressor power.

Initial capacity control steps maximize evaporator surface to compressor displacement to provide high efficiencies. This is accomplished by operating one step in each module as capacity increases, before operation of a second step per module is utilized.



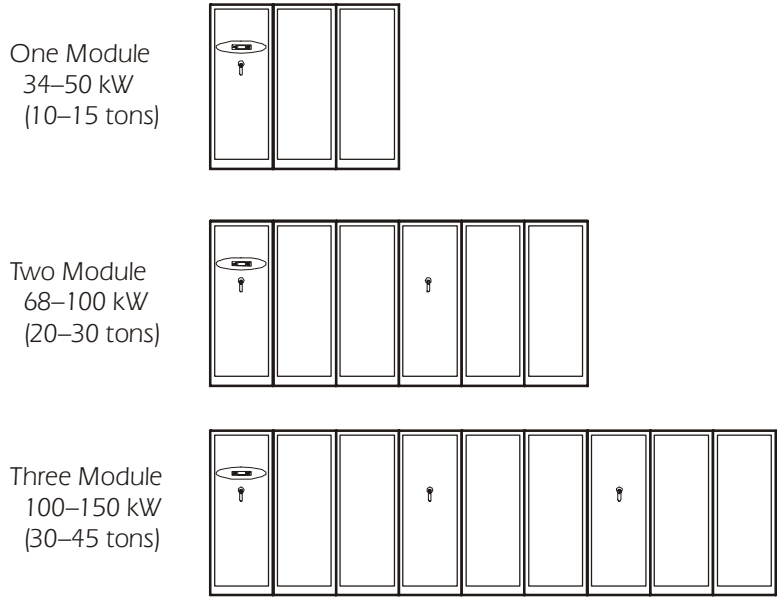
Multiple module capacity staging utilizes one compressor per module before any module starts a second compressor in response to load demand.

Load sequence can be rotated by hour intervals, time of day, or day of week. Proper rotation of the load sequence will ensure equal runtime on each compressor and tandem set. The first step in each module will rotate, avoiding over utilization of one compressor in the pair.



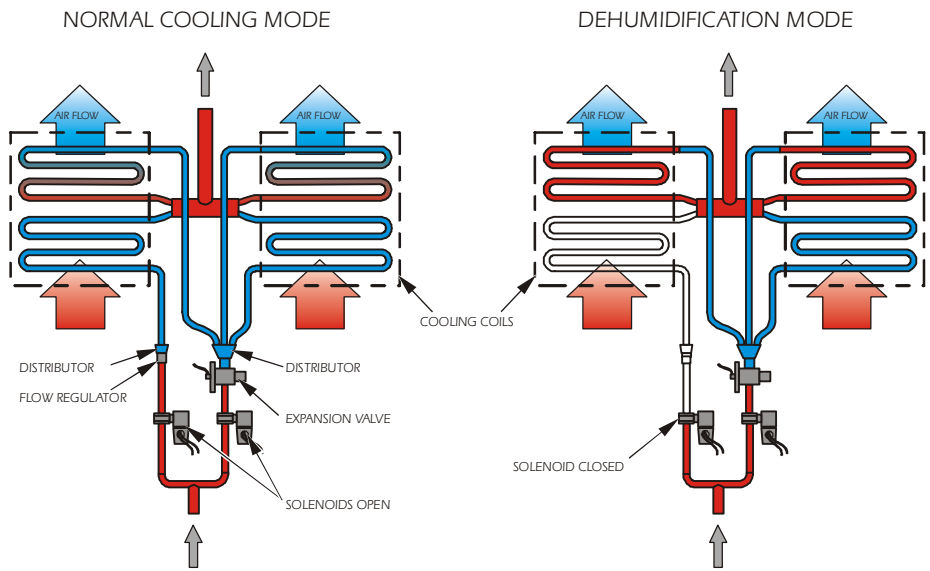
Scalable and Modular

Cooling requirements change with business requirements. The NetworkAIR FM provides the ability to scale your cooling needs with your changing heat loads. Available in three capacity choices, each module can be mated with one or two more modules to make a system of up to three modules. When controls are linked, up to four systems can communicate to avoid demand fighting. Without proper communications, cooling, reheating, humidification and dehumidification can occur on different systems at the same time, lowering efficiencies. The scalability of the NetworkAIR FM allows system configurations from 35kW -150kW (10-45 tons).



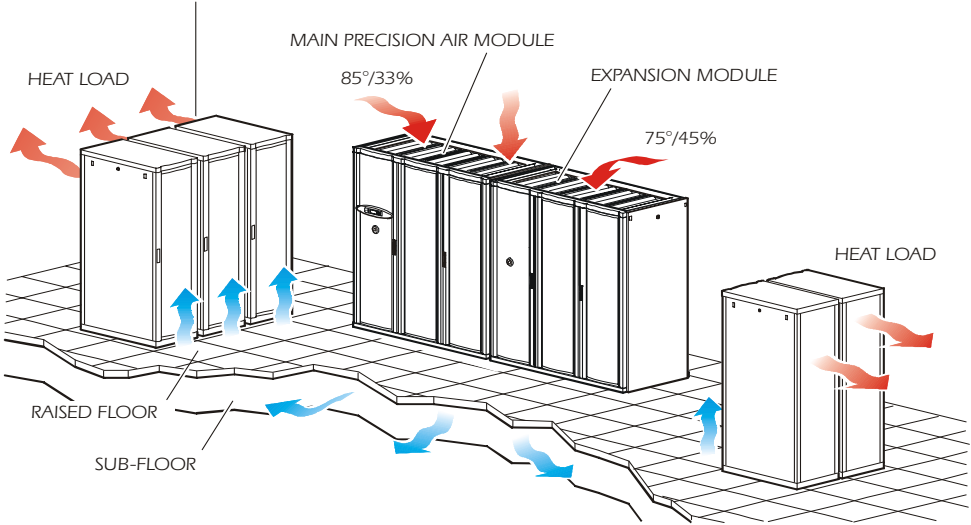
Dedicated Dehumidification Cycle

A dedicated dehumidification cycle allows the system to increase latent capacity without overcooling, lowering the requirement for reheat and humidification. This is accomplished by operating one compressor, isolating a portion of the coil from the refrigerant flow and lowering the evaporator temperature when dehumidification is required. Two compressor operation during dehumidification mode may be enabled through the microprocessor for humid environments where more latent capacity is required.

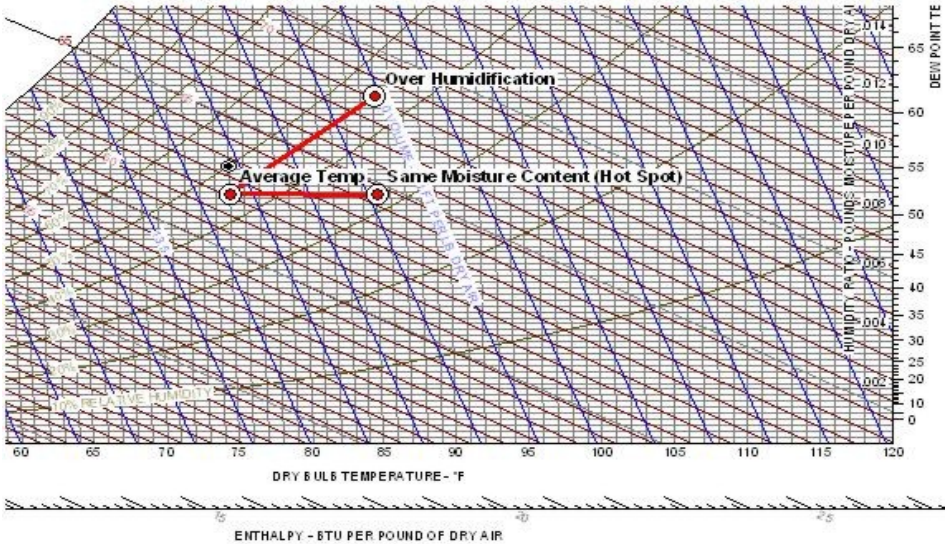


Temperature and Humidity Averaging

In multiple module systems, the return air temperature and humidity sensed by each module is communicated to the main module. The main module averages the reported values and communicates the averages to each module in the system. This allows connected modules to operate as one complete system. Each module within the system will report runtime to the controller, which assigns load to the module and cools according to the module with the fewest hours of operation. This ensures even cycling.



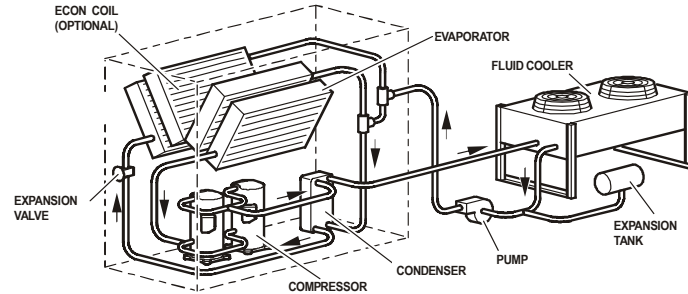
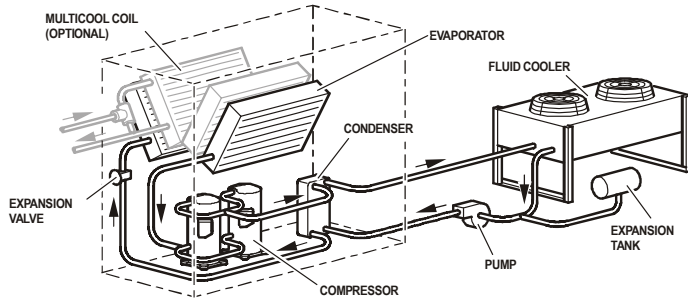
Increasing heat densities in data centers are leading to more hot spots and higher return temperatures to the precision air conditioners. When hot spots exist in close proximity to the air conditioner, temperature and humidity readings can be misleading to the overall room conditions. As temperature increases, the relative humidity (R.H.) level (the amount of moisture the air can hold at a given temperature, shown as a percentage) decreases. If the air conditioner is set to control on R.H., it will over humidify based on the higher return air temperature and lower R.H.. There are two methods of preventing this over-humidification. The most accurate way to achieve this is by changing the humidity set point on the controller to dew point control. You can see from the horizontal line in the psychrometric chart that the dew point does not change as the dry bulb temperature increases from 75°F (23.8°C) to 85°F (29.4°C). However, humidifying the room to maintain 45% R.H. would result in excess moisture content in the room. Another way to prevent over-humidification from hot spot fluctuations is through temperature and humidity averaging. This ensures that an outlying condition does not affect the overall room conditions. Individual hot spots should be addressed using heat removal architectures to address the problem at the rack level. See APC White Paper #55 for more information on air distribution architectures.



Glycol-Cooled Configuration

Glycol-cooled systems are completely charged and factory tested in a sealed system for reliability. In mid to low ambient climates, an economizer coil can be used to increase efficiency and extend compressor life. Economizer operation greatly reduces the energy consumption of the system. Water regulating valves control head pressure.

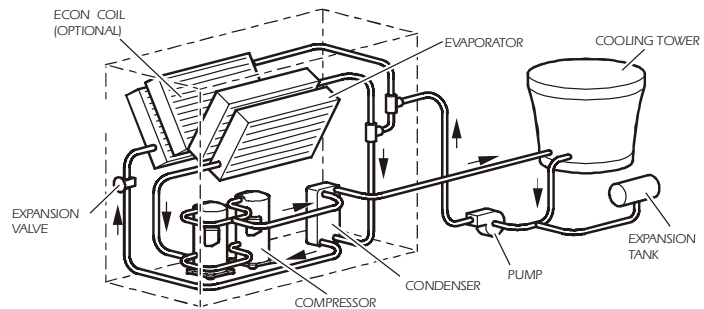
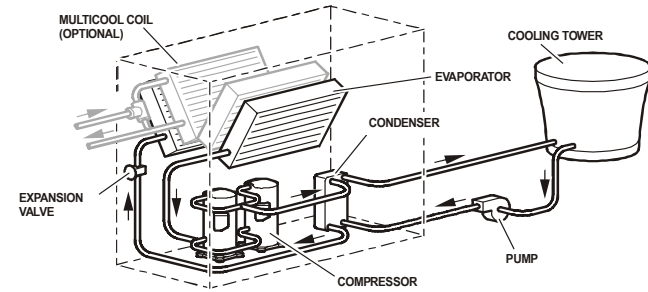
- System is used with a fluid cooler.
- Factory tested as a sealed system.
- Eliminates the need for field refrigerant piping.
- No requirement for water treatment.
- Economizer option for high efficiency.
- Low maintenance.



Water-Cooled Configuration

Water-cooled systems are completely charged and factory tested as a sealed system for reliability. Cooling towers are used as a source of heat rejection and can be used to serve multiple indoor units. Towers utilizing outdoor air require water treatment.

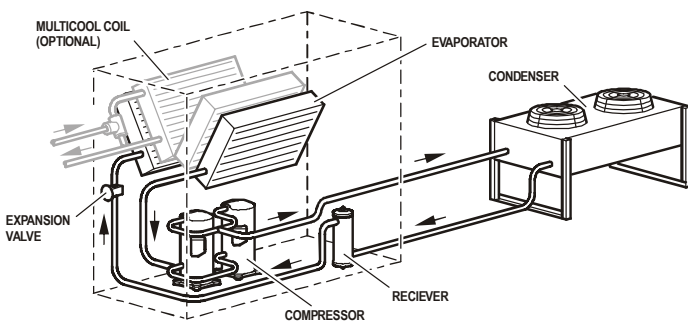
- System used with a cooling tower or other source of water.
- Factory sealed and tested system.
- Eliminates the need for field refrigerant piping
- Economizer option for high efficiency



Air-Cooled Configuration

Air-cooled systems are not pre-charged from the factory, requiring field refrigerant piping. Each installation requires an engineered piping solution. APC strongly recommends installation by a highly qualified refrigeration contractor, to avoid improper elevation and long piping runs.

- System used with a remote air cooled condenser
- Requires field refrigerant piping
- Low maintenance



Standard Features

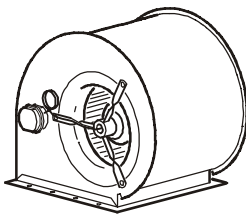


Double Skin Panels

The frame is bolt together 12 gauge formed steel for maximum strength. Cabinet is serviceable from the front. All exterior panels and corner posts on the frame are powder coated for durability and an attractive finish. Front exterior panel crowne is 16 gauge. All other panels are double skin, 24 gauge exterior, 24 gauge interior with 1 ½ lb. (.68 kg) per cubic foot insulated for quiet operation. Insulation is CFC-free and recyclable. Double skin panels isolate insulation from the air stream and further reduce sound levels. Left and right front panels are hinged and removable for easy access. Middle panel is removable.

Direct Drive Motor/Blower Assembly

Each cabinet includes a precision balanced centrifugal blower assembly(s) that is balanced to less than 1 mil displacement on all axis for quiet, reliable operation. The blowers are mounted based on mass and frequency to eliminate vibration and noise. A direct drive (L₁₀-500,000 hour bearing life) motor and frequency controller are used with each blower in the system to enhance user functionality. Modules are equipped with two blower assemblies.



Frequency Controlled Motor

A frequency controlled drive is installed for each direct drive blower motor. The frequency controller communicates with the microprocessor controller allowing user adjustable rpm settings via the main module display. This makes field air balancing quick and easy. Field air balancing is a common after thought that can be expensive and lead to back-charges. Each time the fans are started, the frequency controlled drives control the ramp-up of fan speed. This thirty second soft start lowers the in-rush current and reduces the locked rotor amps used when sizing generators.

Water Regulating Valves

Water and glycol cooled systems utilize two- or three-way valves to regulate the amount of water or glycol supplied to the condenser in response to refrigerant discharge pressure. The standard valve pressure rating is 400 psi (2758 kPa).

Tandem Scroll Compressors

The refrigeration system operates under a master controller for greater efficiency and accuracy. Suction and discharge pressures are monitored and electronically controlled. Tandem scroll compressors are designed for year-round operation with a 15-year life expectancy. The microprocessor controller provides real-time suction and discharge pressure readings reported by transducers installed on the refrigeration system.

Electrical Panel

The electrical panel contains the contactors, starters, overload protection devices, and input power disconnects. The panel is removable for easy access to blower motor assemblies.

Evaporator Coil/94V0 Thermal Condensate Pan

Evaporator coil is 1/2" rifled, copper tube, with raised aluminum fins. Condensate pan is 94V0 thermal formed, anti-fungal, non-ferrous material for higher indoor air quality. Evaporator is configured as a V coil.

Brazed Plate Condenser

Water- and Glycol-cooled systems employ a brazed plate heat exchanger. The condenser is equipped with clean out plugs. Rotalock valves make removal of the brazed plate condenser easy for maintenance and replacement.

30% ASHRAE 52.1 Filters

The filtration of conditioned air is extremely vital to maintaining the clean, particle-free environment required by electrical equipment. The system uses 30% efficient (100 microns) (ASHRAE 52.1-92), 4" (102 mm) deep filters, with full depth filter pleats. Deeper filters produce a lower pressure drop, requiring less energy during normal operation. Filters are replaceable through the front of the upflow unit, and through the top of the downflow unit.

Programmable Input/Output Interface Module

The main module provides field connections through a system programmable input/output module. Up to three additional input/output interfaces may be added to the main module. Each interface module is programmable with inputs that can be mapped to any system alarm or annunciated to outputs as a system alarm or custom (12 character) alarm.

Main Power Circuit Breaker(s)

A nonautomatic main power circuit breaker disconnects all high voltage power to the unit if necessary. The disconnect switch is accessible without removing the electric box cover.

Redundant Group Control

Allows up to 4 groups of FM units to communicate with each other for redundancy, demand fighting prevention, mode assist, and global sharing of certain settings. Requires standard network cable interconnection.

Network Management Card

Permits multi-level access to monitoring, control, and event notification features over the user's network.

Evaporator Freeze Protection

Suction pressure is actively monitored and controlled to eliminate risk of condensate freeze-up on the evaporator.

Predictive Failure Warnings

Several components within the unit will provide a warning that service is needed prior to failure occurring.

High Return Air Temperature Capability

All NetworkAIR FM units are equipped to handle the high return air temperatures associated with today's high density applications.

Charge Isolation

For compressor protection, the NetworkAIR FM utilizes charge isolation and crank case heaters during compressor off-cycles. This eliminates the threat of liquid refrigerant migration that could lead to compressor slugging and lubrication issues.

Optional Features

Steam Generating Humidifier

The humidifier utilizes a pure steam generator specifically designed for precision environmental control. The pure steam eliminates contaminating mineral deposits, potentially harmful bacteria, white dust and excessive humidity. The humidifier requires little scheduled maintenance. Automatic flushing combined with a communication link to the controller signals when the canister is to be changed. Humidifier is proportionally controlled to meet the humidification demands of the conditioned space. The communication link to the main controller provides diagnostic capability for the humidifier. Humidifier canisters can be cleaned or replaced. Cleanable canister has a maximum life up to three times longer than disposable cylinders.

High Lift, Dual Float Condensate Pump

The factory installed and wired condensate pump is capable of pumping 60 gal/hr (0.06 L/s) at 60 ft. (4.6 m) head.

SCR Controlled Electric Reheat

Electric reheat elements are low watt density, wired for 3-phase and loaded equally on all three phases, SCR controlled, and electrically and thermally protected by both automatic and manual reset thermal cut outs. Reheat coils are stainless steel, fin tubular construction.

Steam Reheat

An on/off solenoid valve maintains the dry bulb temperature when the system is in dehumidification and reheat mode. Completely factory pre-piped, the system includes a copper tube, aluminum fin reheat coil, float, and thermostatic steam trap. Not available with MultiCool.

Hot Gas Reheat

Hot gas reheat is optional on water- and glycol-cooled systems. The copper tube, aluminum fin hot gas reheat coil assists in maintaining the leaving dry bulb temperature when the system is in dehumidification mode. The coil is controlled by the processor through a factory piped and wired three-way heat reclaim regulator and check valve.

85% High Efficiency Filter(s)

A pleated final filter with an efficiency of 85%, 4" (102mm) deep, allows the removal of a greater percentage of airborne particulate contaminants.

Flowswitch

Single pole, double throw flowswitch detects when fluid flow drops below the set flow rate. Ships loose for field installation.

Firestat

A firestat is available for factory installation in the air stream of the unit. If the return air temperature reaches 125°F (52°C), an audible and visual alarm on the microprocessor will be activated and the unit will immediately shutdown.

Smoke Detector

The factory-installed smoke detector is designed to sense smoke in the return air stream. Upon detection of smoke, an audible and visual alarm on the microprocessor will be activated and the unit will be immediately shutdown.

Spot Water Detector(s)

The solid-state spot water detector activates an audible alarm on the controller when moisture is detected. A maximum of four detectors (spot or cable) may be installed.

Cable Leak Detector

A leak detection cable is placed on the floor or subfloor around all possible leak sources. If water or other conductive liquids contact the cable anywhere along its length, the master controller visually and audibly announces a leak. The 35 ft. cable may be cascaded to make custom lengths up to 1000 ft. A maximum of four detectors (spot or cable) may be installed.

MultiCool

The MultiCool systems contain a chilled water coil and direct expansion coil within the same cabinet. Either cooling coil can be used as a backup to the other. These systems provide cooling using either building chilled water and/or the direct expansion system.

Floorstand

The floorstand raises the unit above the subfloor to match the height of the raised floor. Floorstands are equipped with air deflectors and turning vanes for optimal air distribution. Heights are available (from 12" (305mm) to 24" (610mm)) in 3" (76.2mm) increments and are adjustable +/- 1.5" (38.1mm). Adjustment is provided by threaded pedestals. Vibration absorbing pads are included. The floorstand, pedestal, and pads ship loose.

Duct Flange

A 1" (25.4 mm) duct flange is shipped loose from the factory for field installation to provide connection to external ductwork for either supply or return as needed.

Plenums

Discharge plenums are available on upflow and downflow systems. On upflow configurations, heights are offered in 20" (508mm) and 24" (610mm) with front, 2-sided, or 3-sided grilles. On downflow configurations, the plenum raises the unit by 14" (356 mm) and discharges air horizontally from the front of the plenum. This application is recommended in rooms where racks are positioned in hot aisle/cold aisle configurations. Discharge air should be ducted down cold aisles.

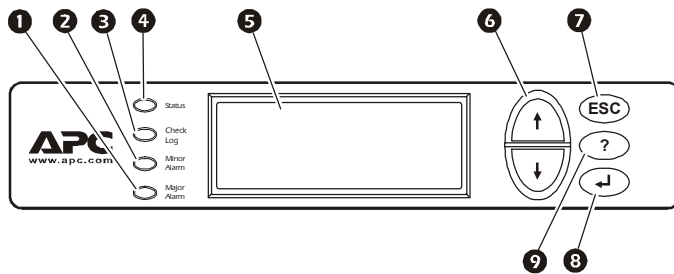
Sub-Base

The Sub-Base raises the height of the unit by 10" (254mm) on upflow units to provide access for electrical and piping connections. Front and rear access panels on the sub-base are removable.

Network Cable

Various lengths of network cable are available to ship with your cooling system. Network cable is used to interconnect multiple cooling units in a redundant group, as well as to connect the network management card to your LAN.

Microprocessor Controller



1	Alarm LED
2	Warning LED
3	Check Log LED
4	System On LED
5	Liquid Crystal Display (LCD)
6	Menu Selection scroll keys
7	ESC key
8	Enter key
9	Help key

Microprocessor Controller

The microprocessor controller is standard on the main module of each system. The controller provides precision control for the demanding requirements of:

- Data centers
- Control rooms
- Clean rooms
- Switch rooms
- UPS rooms

The easy-to-use display allows the operator to select options from the device's menu-driven interface to control and monitor the connected air conditioning system.

Open Architecture

The NetworkAIR FM protocol is open for integration with all building management systems.

Communication interface on the system can be MODBUS RTU RS485.

Control Type

Controller utilizes proportional and integral derivative (PID), a time proven precision environmental control method. This allows for custom tuning of control variables to achieve desired system response.

Functions

- Status Report
- System Control
- Event Logging
- Redundant Unit Group
- Static Pressure Adjustment

Logging

The microprocessor displays the 64 most recent alarms. Each alarm log contains a time/date stamp as well as operating conditions at the time of occurrence. The controller also displays run time, in hours, for major components (compressors, heaters, humidifier, blower motors).

Control

The backlit, four-line x twenty-character display is password configurable.

- Temperature Setpoint 60-90° F (15-32° C)
- Humidity Setpoint 30-80% R.H.
- Blower Motor Setpoint 20-60Hz. (Factory preset for model size and options.)
- High Temperature Alarm 35-90° F (2-32° C)
- Low Temperature Alarm 35-90° F (2-32° C)
- High Humidity Alarm 15-85% RH
- Low Humidity Alarm 15-85% RH

Customer Interface Modules

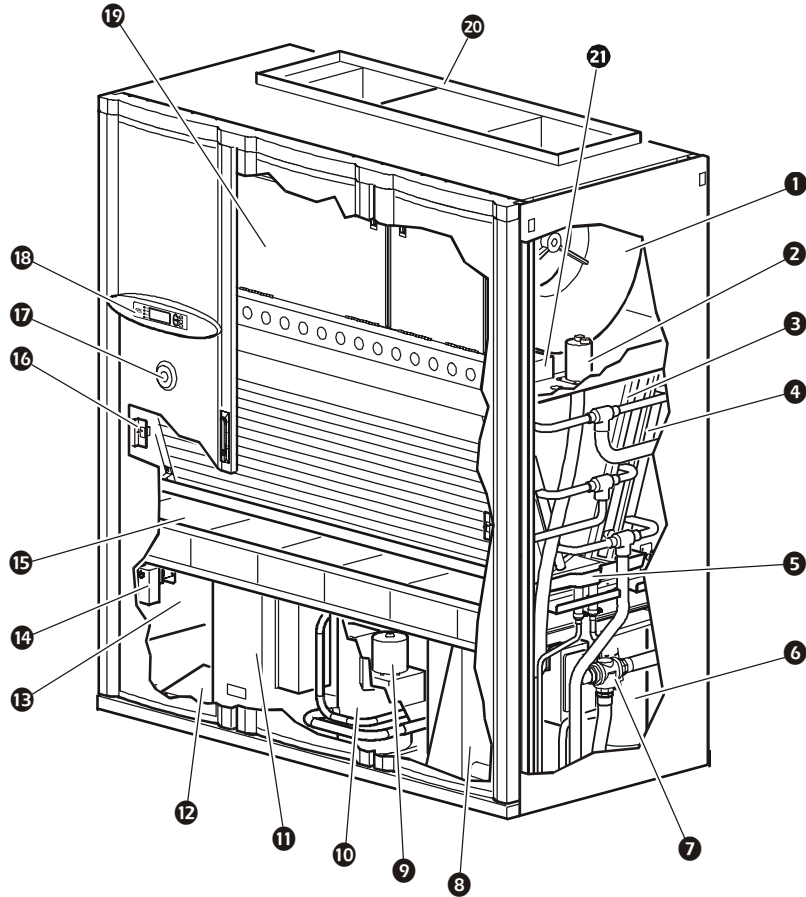
Each module CAN comes equipped with up to 3 additional discrete input/output modules for a system total of up to 16. Each interface module is programmable with outputs that can map from any system alarm through the microprocessor controller. Inputs are capable of mapping to outputs as a system alarm or custom alarm.

Alarms

- High control temperature
- Low control temperature
- High control humidity
- Low control humidity
- Clogged filter
- Return sensor failure
- High supply temperature
- Low supply temperature
- Loss or low airflow
- Loss of water flow
- Supply sensor failure
- Water regulator actuator failure
- Econ/MultiCool Actuator failure
- High head pressure
- Low suction pressure
- Humidifier failure
- Replace humidifier canister
- Frequency controller failure
- Air block interlock open
- Water detected
- Fire (thermal sensor trip)
- Smoke detected
- Condensate pump failure

Upflow models

FM 35-50 Upflow components

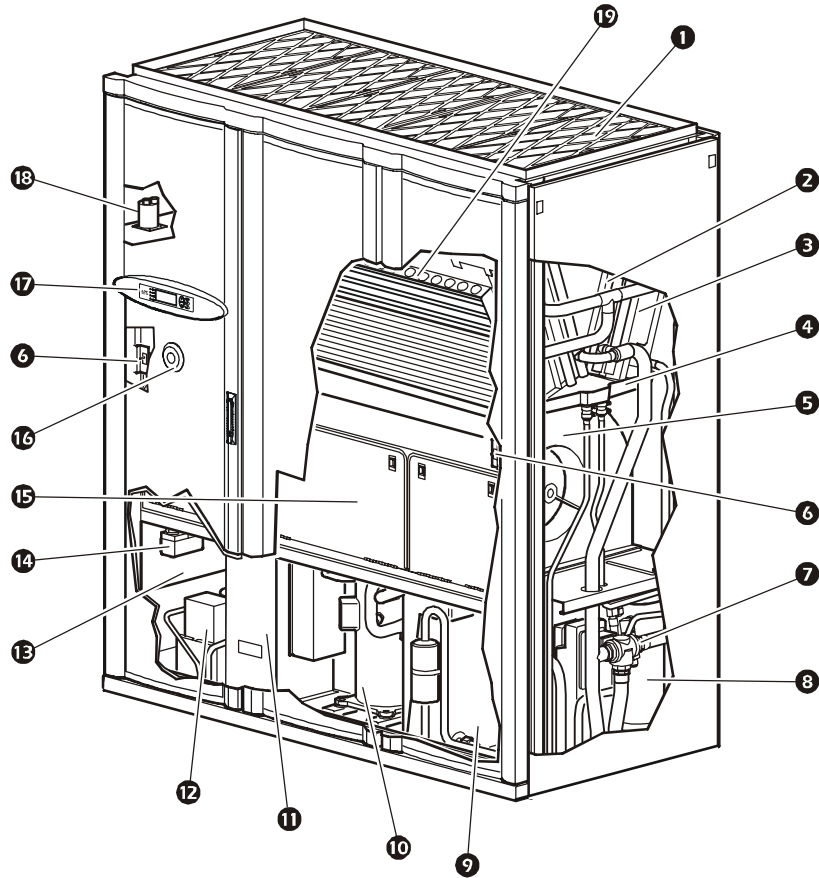


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|----------------------------------------------------|-----------------------------------|
| ① Motor and fan assembly | ⑫ Electrical junction box |
| ② Steam head | ⑬ User interface box |
| ③ DX-coil | ⑭ Firestat (optional) |
| ④ Economizer coil (optional) | ⑮ Air filters |
| ⑤ Condensate pan | ⑯ Fan interlock switch |
| ⑥ Liquid refrigerant receiver | ⑰ Main power interrupt switch |
| ⑦ 3-way ball valve | ⑱ Display interface |
| ⑧ Brazed plate condenser (water and glycol models) | ⑲ Electrical panel |
| ⑨ Condensate pump (optional) | ⑳ Duct flange (optional) |
| ⑩ Tandem compressors | ㉑ Electric reheat coil (optional) |
| ⑪ Humidifier (optional) | |

Downflow models

FM 35-50

Downflow components



- | | |
|----------------------------------------------------|------------------------------------|
| ❶ Air filters | ❶❶ Humidifier (optional) |
| ❷ Economizer coil (optional) | ❶❷ Condensate pump (optional) |
| ❸ DX-coil | ❶❸ User interface box |
| ❹ Condensate pan | ❶❹ Firestat (optional) |
| ❺ Motor and fan assembly | ❶❺ Electrical panel |
| ❻ Fan interlock switch | ❶❻ Main power interrupt switch |
| ❼ 3-way ball valve | ❶❼ Display interface |
| ❽ Liquid refrigerant receiver | ❶❽ Steam head |
| ❾ Brazed plate condenser (water and glycol models) | ❶❾ Electric reheat coil (optional) |
| ❿ Tandem compressors | |

Performance Specifications—Air Cooled

NET COOLING MODE CAPACITY - BTU/HR	FM 35	FM 40	FM 50
80F DB, 67F WB (26.7C DB, 19.4C WB) 50% RH			
Total	125,000 (36.6)	151,000 (44.3)	195,000 (57.0)
Sensible	110,000 (32.3)	132,000 (38.6)	163,000 (47.9)
75F DB, 62.5F WB (23.9C DB, 16.9C WB) 50% RH			
Total	114,000 (33.3)	139,000 (40.6)	178,000 (52.0)
Sensible	110,000 (32.3)	130,000 (38.0)	160,000 (46.6)
75F DB, 61F WB (23.9C DB, 16.1C WB) 45% RH			
Total	114,000 (33.3)	139,000 (40.6)	176,000 (51.3)
Sensible	114,000 (33.3)	139,000 (40.6)	173,000 (50.6)
72F DB, 60F WB (22.2C DB, 15.5C WB) 50% RH			
Total	109,000 (31.9)	131,000 (38.3)	169,000 (49.3)
Sensible	105,000 (30.9)	124,000 (36.3)	155,000 (45.3)
72F DB, 58.6 WB (22.2D DB, 14.8C WB) 45% RH			
Total	109,000 (31.9)	133,000 (38.9)	171,000 (50.0)
Sensible	109,000 (31.9)	133,000 (38.9)	171,000 (50.0)
70F DB, 58.5F WB (21.1C DB, 14.8C WB) 50% RH			
Total	106,000 (30.9)	128,000 (37.6)	163,000 (47.9)
Sensible	102,000 (30.0)	122,000 (35.9)	150,000 (44.0)
70F DB, 57.2F WB (21.1C DB, 14.0C WB) 45% RH			
Total	106,000 (30.9)	129,000 (37.6)	165,000 (48.3)
Sensible	106,000 (30.9)	129,000 (37.6)	165,000 (48.3)
NET DEHUMIDIFICATION MODE CAPACITY - BTU/HR (kW)			
72F DB, 62.7F WB (22.2C DB, 17.1C WB) 60% RH			
Total - 1 Compressor	55,000 (16.0)	66,000 (19.3)	87,000 (25.6)
Sensible - 1 Compressor	50,000 (14.6)	59,000 (17.3)	75,000 (21.9)
Total - 2 Compressors	104,000 (30.3)	126,000 (36.9)	157,000 (46.0)
Sensible - 2 Compressors	73,000 (21.3)	87,000 (25.6)	105,000 (30.6)
72F DB, 61.4F WB (22.2C DB, 16.3C WB) 55% RH			
Total - 1 Compressor	54,000 (15.6)	66,000 (19.3)	86,000 (25.3)
Sensible - 1 Compressor	54,000 (15.6)	66,000 (19.3)	84,000 (24.9)
Total - 2 Compressors	102,000 (29.9)	123,000 (36.0)	153,000 (44.9)
Sensible - 2 Compressors	80,000 (23.3)	94,000 (27.6)	113,000 (33.0)
70F DB, 59.7F WB (21.1C DB, 15.4C WB) 55% RH			
Total - 1 Compressor	53,000 (15.3)	63,000 (18.6)	84,000 (24.9)
Sensible - 1 Compressor	53,000 (15.3)	63,000 (18.6)	84,000 (24.9)
Total - 2 Compressors	99,000 (29.0)	120,000 (35.0)	150,000 (44.0)
Sensible - 2 Compressors	79,000 (23.0)	94,000 (27.6)	114,000 (33.3)
MULTICOOL -- NET COOLING CAPACITY DATA -- BTU/HR (kW) - 45F (7.2C) EWT			
80F DB, 67F WB (26.7C DB, 19.4C WB) 50% RH			
Total	183,000 (53.6)	211,000 (61.6)	254,000 (74.3)
Sensible	140,000 (41.3)	163,000 (47.6)	196,000 (57.3)
75F DB, 62.5F WB (23.9C DB, 16.9C WB) 50% RH			
Total	147,000 (43.3)	169,000 (49.6)	205,000 (60.0)
Sensible	129,000 (37.9)	149,000 (43.6)	181,000 (52.9)
75F DB, 61F WB (23.9C DB, 16.1C WB) 45% RH			
Total	144,000 (42.0)	164,000 (48.0)	200,000 (58.3)
Sensible	137,000 (40.0)	157,000 (46.0)	191,000 (55.9)
72F DB, 60F WB (22.2C DB, 15.5C WB) 50% RH			
Total	126,000 (36.9)	147,000 (43.0)	179,000 (52.6)
Sensible	120,000 (35.0)	138,000 (40.3)	167,000 (48.9)
72F DB, 58.6 WB (22.2D DB, 14.8C WB) 45% RH			
Total	120,000 (35.0)	138,000 (40.3)	168,000 (49.3)
Sensible	120,000 (35.0)	138,000 (40.3)	168,000 (49.3)
70F DB, 58.5F WB (21.1C DB, 14.8C WB) 50% RH			
Total	117,000 (34.3)	133,000 (38.9)	162,000 (47.6)
Sensible	112,000 (32.9)	128,000 (37.6)	156,000 (45.6)
70F DB, 57.2F WB (21.1C DB, 14.0C WB) 45% RH			
Total	110,000 (32.3)	126,000 (37.0)	154,000 (45.3)
Sensible	110,000 (32.3)	126,000 (37.0)	154,000 (45.3)
MULTICOOL REQUIREMENTS - CHILLED WATER, 45F (7.2C) EWT			
Water In -- GPM (L/s)	28.0 (1.8)	33.0 (2.1)	44.0 (2.8)
Pressure Drop -- PSI (kPa)	6.6 (45.5)	10.1 (69.6)	15.2 (104.8)

Performance Specifications - Air Cooled

FM-DX	FM 35	FM 40	FM 50
AIR SYSTEM -- DIRECT DRIVE CENTRIFUGAL			
Air Volume -- CFM (L/s)	6,000 (2,830)	7,200 (3,400)	9,000 (4,245)
Blower Motor -- HP (kW)	4 (3)	4 (3)	4 (3)
External Static Pressure -- inches of water (Pa)	0.5 (125)	0.5 (125)	0.5 (125)
Number of Blowers	2	2	2
COMPRESSOR -- TANDEM SCROLL			
EER	15.8	14.9	14.2
Quantity	2 (tandem)	2 (tandem)	2 (tandem)
Nominal HP (kW)	9.0 (6.71)	11.3 (8.43)	15.6 (11.64)
EVAPORATOR COIL -- V FRAME, COPPER TUBE/ALUMINUM FIN			
Face Area -- ft ² (m ²)	21 (1.95)	21 (1.95)	21 (1.95)
Rows Deep	3	3	3
Face Velocity -- FPM (m/s)	286 (1.45)	343 (1.74)	428 (2.17)
HUMIDIFICATION --- SOLID STATE ELECTRODE CANISTER			
Flush Cycle	automatic	automatic	automatic
Capacity -- Lbs/hr (Kg/hr)	10 (4.53)	10 (4.53)	10 (4.53)
kW	3.2	3.2	3.2
FILTERS			
Quantity	5	5	5
Size -- Inches (mm)	12.8×29.0 (325×737)	12.8×29.0 (325×737)	12.8×29.0 (325 ×737)
Depth -- Inches (mm)	4 (100.8)	4 (100.8)	4 (100.8)
REHEAT			
Electric -- Equally Loaded Three (3) Phase, Finned Tubular, Low-Watt Density - SCR Controlled			
Capacity -- BTU/HR (kW) Includes Motor Heat*	40,000 (11.6)	42,000 (12.2)	47,000 (13.8)
Stages	1	1	1
Hot Water -- 180F (82.2C) EWT, 140F (60.0C) LWT			
Capacity -- BTU/HR (kW) Includes Motor Heat	178,000 (22.9)	88,000 (25.7)	104,000 (30.4)
GPM (L/s)	3.6 (0.227)	4.0 (0.252)	4.5 (0.284)
Pressure Drop -- PSI (kPa)	3.7 (25.7)	4.5 (31.1)	5.2 (35.9)
Steam -- 15 PSI (103.3 kPa)			
Capacity -- BTU/HR (kW) Includes Motor Heat	139,000 (40.6)	149,000 (41.0)	157,000 (46.0)
Control Valve	Solenoid	Solenoid	Solenoid
PHYSICAL DATA			
Weight -- lbs (kg)**	1180 (535)	1180 (535)	1290 (585)
Height -- Inches (mm)	76.89 (1,953)	76.89 (1,953)	76.89 (1,953)
Length -- Inches (mm)	70.87 (1,800)	70.87 (1,800)	70.87 (1,800)
Depth -- Inches (mm)	35.00 (889)	35.00 (889)	35.00 (889)
CONNECTION SIZES***			
Air			
Liquid Line -- inches (od)	7/8	7/8	7/8
Discharge Line -- inches (od)	1-1/8	1-1/8	1-1/8
Hot Water			
Supply Line -- inches	1/2	1/2	1/2
Return Line -- inches	1/2	1/2	1/2
Steam			
Supply Line -- inches	1/2	1/2	1/2
Humidifier			
Supply Line -- inches	1/4	1/4	1/4
Condensate Drain			
Drain Line -- inches	1/2	1/2	1/2
MultiCool			
Supply Line -- inches	1-1/2	1-1/2	1-1/2
Return Line -- inches	1-1/2	1-1/2	1-1/2

*With equal loading on each phase, rated at 240V / 3-phase, 480V / 3-phase and 575V / 3-phase

**Add 150lbs (68kW) when Economizer or MultiCool option is selected

***Connections sizes, not recommended piping sizes

Performance Specifications—Water Cooled

NET COOLING CAPACITY - BTU/HR	FM 35	FM 40	FM 50
80F DB, 67F WB (26.7C DB, 19.4C WB) 50% RH			
Total	134,000 (39.3)	162,000 (47.3)	210,000 (61.3)
Sensible	115,000 (33.6)	137,000 (40.0)	171,000 (50.3)
75F DB, 62.5F WB (23.9C DB, 16.9C WB) 50% RH			
Total	123,000 (36.0)	149,000 (43.6)	192,000 (56.0)
Sensible	112,000 (32.9)	134,000 (39.3)	167,000 (48.9)
75F DB, 61F WB (23.9C DB, 16.1C WB) 45% RH			
Total	122,000 (35.9)	147,000 (43.0)	189,000 (55.3)
Sensible	122,000 (35.9)	145,000 (42.3)	182,000 (53.3)
72F DB, 60F WB (22.2C DB, 15.5C WB) 50% RH			
Total	117,000 (34.3)	142,000 (41.6)	182,000 (53.3)
Sensible	109,000 (32.0)	131,000 (38.3)	162,000 (47.3)
72F DB, 58.6 WB (22.2D DB, 14.8C WB) 45% RH			
Total	117,000 (34.3)	142,000 (41.6)	180,000 (52.6)
Sensible	117,000 (34.3)	142,000 (41.6)	175,000 (51.3)
70F DB, 58.5F WB (21.1C DB, 14.8C WB) 50% RH			
Total	114,000 (33.3)	138,000 (40.3)	176,000 (51.6)
Sensible	106,000 (31.0)	127,000 (37.3)	157,000 (46.0)
70F DB, 57.2F WB (21.1C DB, 14.0C WB) 45% RH			
Total	114,000 (33.3)	138,000 (40.3)	175,000 (51.3)
Sensible	114,000 (33.3)	138,000 (40.3)	170,000 (49.9)
NET DEHUMIDIFICATION MODE CAPACITY - BTU/HR (kW)			
72F DB, 62.7F WB (22.2C DB, 17.1C WB) 60% RH			
Total - 1 Compressor	60,000 (17.6)	72,000 (21.0)	95,000 (27.9)
Sensible - 1 Compressor	53,000 (15.6)	63,000 (18.3)	79,000 (23.0)
Total - 2 Compressors	113,000 (33.0)	135,000 (39.6)	169,000 (49.6)
Sensible - 2 Compressors	77,000 (22.6)	91,000 (26.6)	110,000 (32.0)
72F DB, 61.4F WB (22.2C DB, 16.3C WB) 55% RH			
Total - 1 Compressor	60,000 (17.6)	72,000 (21.0)	94,000 (27.6)
Sensible - 1 Compressor	60,000 (17.6)	72,000 (21.0)	89,000 (26.0)
Total - 2 Compressors	110,000 (32.0)	132,000 (38.6)	165,000 (48.3)
Sensible - 2 Compressors	83,000 (24.3)	98,000 (28.6)	118,000 (34.6)
70F DB, 59.7F WB (21.1C DB, 15.4C WB) 55% RH			
Total - 1 Compressor	57,000 (16.6)	69,000 (20.3)	91,000 (26.6)
Sensible - 1 Compressor	57,000 (16.6)	69,000 (20.3)	87,000 (25.3)
Total - 2 Compressors	107,000 (31.3)	129,000 (37.9)	162,000 (47.6)
Sensible - 2 Compressors	83,000 (24.6)	99,000 (29.0)	120,000 (35.3)
MULTICOOL – NET COOLING CAPACITY DATA – BTU/HR (kW) - 45 F (7.2 C) EWT			
80F DB, 67F WB (26.7C DB, 19.4C WB) 50% RH			
Total	183,000 (53.6)	211,000 (61.6)	254,000 (74.3)
Sensible	140,000 (41.3)	163,000 (47.6)	196,000 (57.3)
75F DB, 62.5F WB (23.9C DB, 16.9C WB) 50% RH			
Total	147,000 (43.3)	169,000 (49.6)	205,000 (60.0)
Sensible	129,000 (37.9)	149,000 (43.6)	181,000 (52.9)
75F DB, 61F WB (23.9C DB, 16.1C WB) 45% RH			
Total	144,000 (42.0)	164,000 (48.0)	200,000 (58.3)
Sensible	137,000 (40.0)	157,000 (46.0)	191,000 (55.9)
72F DB, 60F WB (22.2C DB, 15.5C WB) 50% RH			
Total	126,000 (36.9)	147,000 (43.0)	179,000 (52.6)
Sensible	120,000 (35.0)	138,000 (40.3)	167,000 (48.9)
72F DB, 58.6 WB (22.2C DB, 14.8C WB) 45% RH			
Total	120,000 (35.0)	138,000 (40.3)	168,000 (49.3)
Sensible	120,000 (35.0)	138,000 (40.3)	168,000 (49.3)
70F DB, 58.5F WB (21.1C DB, 14.8C WB) 50% RH			
Total	117,000 (34.3)	133,000 (38.9)	162,000 (47.6)
Sensible	112,000 (32.9)	128,000 (37.6)	156,000 (45.6)
70F DB, 57.2F WB (21.1C DB, 14.0C WB) 45% RH			
Total	110,000 (32.3)	126,000 (37.0)	154,000 (45.3)
Sensible	110,000 (32.3)	126,000 (37.0)	154,000 (45.3)
MULTICOOL REQUIREMENTS - CHILLED WATER, 45F (7.2C) EWT			
Water In – GPM (L/s)	28.0 (1.8)	33.0 (2.1)	44.0 (2.8)
Pressure Drop – PSI (kPa)	6.6 (45.5)	10.1 (69.6)	15.2 (104.8)

Performance Specifications—Water Cooled

FM-DX	FM 35	FM 40	FM 50
ECONOMIZER – NET COOLING CAPACITY DATA – BTU/HR (kW) @ 45F (7.2C) EWT			
80F DB, 67F WB (26.7C DB, 19.4C WB) 50% RH			
Total	185,000 (54.3)	218,000 (64.0)	264,000 (77.3)
Sensible	141,000 (41.3)	166,000 (48.6)	201,000 (58.9)
75F DB, 62.5F WB (23.9C DB, 16.9C WB) 50% RH			
Total	149,000 (43.9)	176,000 (51.6)	211,000 (62.0)
Sensible	129,000 (37.9)	152,000 (44.6)	184,000 (53.9)
75F DB, 61F WB (23.9C DB, 16.1C WB) 45% RH			
Total	146,000 (42.6)	171,000 (50.0)	205,000 (60.0)
Sensible	137,000 (40.3)	162,000 (47.6)	195,000 (57.3)
72F DB, 60F WB (22.2C DB, 15.5C WB) 50% RH			
Total	131,000 (38.3)	153,000 (44.9)	183,000 (53.6)
Sensible	120,000 (35.3)	142,000 (41.6)	170,000 (49.9)
72F DB, 58.6 WB (22.2D DB, 14.8C WB) 45% RH			
Total	121,000 (35.6)	143,000 (41.9)	172,000 (50.6)
Sensible	121,000 (35.6)	143,000 (41.9)	172,000 (50.6)
70F DB, 58.5F WB (21.1C DB, 14.8C WB) 50% RH			
Total	119,000 (34.6)	139,000 (40.6)	165,000 (48.6)
Sensible	113,000 (33.0)	132,000 (38.9)	159,000 (46.6)
70F DB, 57.2F WB (21.1C DB, 14.0C WB) 45% RH			
Total	111,000 (32.6)	131,000 (38.3)	158,000 (46.3)
Sensible	111,000 (32.6)	131,000 (38.3)	158,000 (46.3)
COOLANT REQUIREMENTS			
THR – MBH (kW)	162,000 (47.6)	199,000 (58.3)	263,000 (77.0)
85 F (29.4 C) Water In – GPM (L/s)	29.5 (1.9)	36.2 (2.3)	47.9 (3.0)
Pressure Drop – PSI (kPa)	5.4 (37.2)	6.3 (43.4)	8.4 (57.9)
Pressure Drop w/Econ Coil – PSI (kPa)	8.8 (60.7)	11.4 (78.6)	17.1 (117.9)
WATER REGULATING VALVES			
Size – 2 Way Ball Valve – Inches, NPT (Cv)*	1-1/2 (35)	1-1/2 (35)	1-1/2 (35)
Size – 3 Way Ball Valve – Inches, NPT (Cv)**	1-1/2 (35)	1-1/2 (35)	1-1/2 (35)
AIR SYSTEM – DIRECT DRIVE CENTRIFUGAL			
Air Volume – CFM (L/s)	6,000 (2,830)	7,200 (3,400)	9,000 (4,245)
Blower Motor – HP (kW)	4 (3)	4 (3)	4 (3)
External Static Pressure – inches of water (Pa)	0.5 (125)	0.5 (125)	0.5 (125)
Number of Blowers	2	2	2
COMPRESSOR – TANDEM SCROLLS			
EER	20.1	18.6	17.8
Quantity	2 (tandem)	2 (tandem)	2 (tandem)
Nominal HP (kW)	9.0 (6.71)	11.3 (8.43)	15.6 (11.64)
EVAPORATOR COIL – V FRAME, COPPER TUBE/ALUMINUM FIN			
Face Area – ft ² (m ²)	21 (1.95)	21 (1.95)	21 (1.95)
Rows Deep	3	3	3
Face Velocity – FPM (m/s)	286 (1.45)	343 (1.74)	428 (2.17)
HUMIDIFICATION – SOLID STATE ELECTRODE CANISTER			
Flush Cycle	automatic	automatic	automatic
Capacity – Lbs/hr (Kg/hr)	10 (4.53)	10 (4.53)	10 (4.53)
kW	3.2	3.2	3.2
FILTERS			
Quantity	5	5	5
Size – Inches (mm)	12.8×29.0 (325×737)	12.8×29.0 (325×737)	12.8×29.0 (325×737)
Depth – Inches (mm)	4 (100.8)	4 (100.8)	4 (100.8)
REHEAT			
Electric – Equally Loaded Three (3) Phase, Finned Tubular, Low-Watt Density			
Capacity – BTU/HR (kW) Includes Motor Heat***	40,000 (11.6)	42,000 (12.2)	47,000 (13.8)
Stages	1	1	1
Hot Water – 180F (82.2C) EWT, 140F (63.9C) LWT			
Capacity - BTU/HR (kW) Includes Motor Heat	178,000 (22.9)	88,000 (25.7)	104,000 (30.4)
GPM (L/s)	3.6 (0.227)	4.0 (0.252)	4.5 (0.284)
Pressure Drop – PSI (kPa)	3.7 (25.7)	4.5 (31.1)	5.2 (35.9)
Hot Gas Reheat			
Capacity – BTU/HR (kW) Includes Motor Heat	46,000 (13.5)	53,000 (15.7)	60,000 (17.7)
Steam – 15 PSI (103.3 kPa)			
Capacity – BTU/HR (kW) Includes Motor Heat	139,000 (40.6)	149,000 (41.0)	157,000 (46.0)
Control Valve	Solenoid	Solenoid	Solenoid

Performance Specifications—Water Cooled

FM-DX	FM 35	FM 40	FM 50
PHYSICAL DATA			
Weight -- lbs (kg)****	1220 (553)	1230 (558)	1350 (612)
Height -- Inches (mm)	76.89 (1,953)	76.89 (1,953)	76.89 (1,953)
Length -- Inches (mm)	70.87 (1,800)	70.87 (1,800)	70.87 (1,800)
Depth -- Inches (mm)	35.00 (889)	35.00 (889)	35.00 (889)
CONNECTION SIZES*****			
Water In/Out -- Inches	1-1/2	1-1/2	1-1/2
Hot Water			
Supply Line -- Inches	1/2	1/2	1/2
Return Line -- Inches	1/2	1/2	1/2
Steam			
Supply Line -- Inches	1/2	1/2	1/2
Humidifier			
Supply Line -- Inches	1/4	1/4	1/4
Condensate Drain			
Drain Line -- Inches	1/2	1/2	1/2
MultiCool			
Supply Line -- Inches	1-1/2	1-1/2	1-1/2
Return Line -- Inches	1-1/2	1-1/2	1-1/2

*2-Way Single Seated, 400 PSI W.W.P. max

**3-Way Single Seated, 400 PSI W.W.P. max

***With equal loading on each phase, rated at 240V / 3-phase, 480V / 3-phase and 575V / 3-phase

****Add 150lbs (68kW) when Economizer or MultiCool option is selected

*****Connections sizes, not recommended piping sizes. All water/steam piping is nominal.

Performance Specifications—Glycol Cooled

NET COOLING CAPACITY - BTU/HR	FM 35	FM 40	FM 50
80F DB, 67F WB (26.7C DB, 19.4C WB) 50% RH			
Total	121,000 (35.6)	148,000 (43.3)	190,000 (55.6)
Sensible	109,000 (31.9)	130,000 (38.0)	161,000 (47.3)
75F DB, 62.5F WB (23.9C DB, 16.9C WB) 50% RH			
Total	112,000 (32.6)	135,000 (39.6)	173,000 (50.9)
Sensible	108,000 (31.6)	127,000 (37.3)	157,000 (46.0)
75F DB, 61F WB (23.9C DB, 16.1C WB) 45% RH			
Total	111,000 (32.6)	136,000 (39.9)	175,000 (51.3)
Sensible	111,000 (32.6)	136,000 (39.9)	175,000 (51.3)
72F DB, 60F WB (22.2C DB, 15.5C WB) 50% RH			
Total	106,000 (31.0)	129,000 (37.9)	164,000 (48.0)
Sensible	104,000 (30.6)	124,000 (36.3)	152,000 (44.3)
72F DB, 58.6 WB (22.2D DB, 14.8C WB) 45% RH			
Total	107,000 (31.3)	130,000 (38.0)	167,000 (48.9)
Sensible	107,000 (31.3)	130,000 (38.0)	167,000 (48.9)
70F DB, 58.5F WB (21.1C DB, 14.8C WB) 50% RH			
Total	103,000 (30.0)	125,000 (36.6)	159,000 (46.6)
Sensible	100,000 (29.3)	120,000 (35.3)	148,000 (43.3)
70F DB, 57.2F WB (21.1C DB, 14.0C WB) 45% RH			
Total	103,000 (30.0)	126,000 (36.9)	161,000 (47.3)
Sensible	103,000 (30.0)	126,000 (36.9)	161,000 (47.3)
NET DEHUMIDIFICATION MODE CAPACITY - BTU/HR (kW)			
72F DB, 62.7F WB (22.2C DB, 17.1C WB) 60% RH			
Total - 1 Compressor	53,000 (15.6)	64,000 (18.9)	84,000 (24.6)
Sensible - 1 Compressor	49,000 (14.3)	57,000 (16.6)	73,000 (21.3)
Total - 2 Compressors	102,000 (29.9)	123,000 (36.0)	153,000 (44.6)
Sensible - 2 Compressors	72,000 (21.0)	86,000 (25.3)	103,000 (30.0)
72F DB, 61.4F WB (22.2C DB, 16.3C WB) 55% RH			
Total - 1 Compressor	52,000 (15.3)	64,000 (18.9)	85,000 (24.9)
Sensible - 1 Compressor	52,000 (15.3)	64,000 (18.9)	85,000 (24.9)
Total - 2 Compressors	99,000 (29.0)	120,000 (35.3)	149,000 (43.6)
Sensible - 2 Compressors	78,000 (22.9)	93,000 (27.3)	112,000 (32.9)
70F DB, 59.7F WB (21.1C DB, 15.4C WB) 55% RH			
Total - 1 Compressor	51,000 (14.9)	62,000 (18.3)	82,000 (23.9)
Sensible - 1 Compressor	51,000 (14.9)	62,000 (18.3)	82,000 (23.9)
Total - 2 Compressors	96,000 (28.0)	117,000 (34.3)	146,000 (42.6)
Sensible - 2 Compressors	78,000 (22.9)	93,000 (27.3)	112,000 (32.9)
MULTICOOL -- NET COOLING CAPACITY DATA -- BTU/HR (kW) - 45F (7.2C) EWT			
80F DB, 67F WB (26.7C DB, 19.4C WB) 50% RH			
Total	183,000 (53.6)	211,000 (61.6)	254,000 (74.3)
Sensible	140,000 (41.3)	163,000 (47.6)	196,000 (57.3)
75F DB, 62.5F WB (23.9C DB, 16.9C WB) 50% RH			
Total	147,000 (43.3)	169,000 (49.6)	205,000 (60.0)
Sensible	129,000 (37.9)	149,000 (43.6)	181,000 (52.9)
75F DB, 61F WB (23.9C DB, 16.1C WB) 45% RH			
Total	144,000 (42.0)	164,000 (48.0)	200,000 (58.3)
Sensible	137,000 (40.0)	157,000 (46.0)	191,000 (55.9)
72F DB, 60F WB (22.2C DB, 15.5C WB) 50% RH			
Total	126,000 (36.9)	147,000 (43.0)	179,000 (52.6)
Sensible	120,000 (35.0)	138,000 (40.3)	167,000 (48.9)
72F DB, 58.6 WB (22.2D DB, 14.8C WB) 45% RH			
Total	120,000 (35.3)	138,000 (40.3)	168,000 (49.3)
Sensible	120,000 (35.3)	138,000 (40.3)	168,000 (49.3)
70F DB, 58.5F WB (21.1C DB, 14.8C WB) 50% RH			
Total	117,000 (34.3)	133,000 (38.9)	162,000 (47.6)
Sensible	112,000 (32.9)	128,000 (37.6)	156,000 (45.6)
70F DB, 57.2F WB (21.1C DB, 14.0C WB) 45% RH			
Total	110,000 (32.3)	126,000 (37.0)	154,000 (45.3)
Sensible	110,000 (32.3)	126,000 (37.0)	154,000 (45.3)
MULTICOOL REQUIREMENTS - CHILLED WATER, 45F (7.2C) EWT			
Water In -- GPM (L/s)	28.0 (1.8)	33.0 (2.1)	44.0 (2.8)
Pressure Drop -- PSI (kPa)	6.6 (45.5)	10.1 (69.6)	15.2 (104.8)

Performance Specifications—Glycol Cooled

FM-DX	FM 35	FM 40	FM 50
ECONOMIZER – NET COOLING CAPACITY DATA – BTU/HR (kW) @ 45F (7.2C) EWT			
80F DB, 67F WB (26.7C DB, 19.4C WB) 50% RH			
Total	102,000 (29.9)	128,000 (37.6)	169,000 (49.6)
Sensible	102,000 (29.9)	126,000 (36.9)	160,000 (46.9)
75F DB, 62.5F WB (23.9C DB, 16.9C WB) 50% RH			
Total	87,000 (25.6)	106,000 (31.3)	137,000 (40.0)
Sensible	87,000 (25.6)	106,000 (31.3)	137,000 (40.0)
75F DB, 61F WB (23.9C DB, 16.1C WB) 45% RH			
Total	87,000 (25.6)	106,000 (31.3)	137,000 (40.0)
Sensible	87,000 (25.6)	106,000 (31.3)	137,000 (40.0)
72F DB, 60F WB (22.2C DB, 15.5C WB) 50% RH			
Total	77,000 (22.3)	93,000 (27.3)	120,000 (35.0)
Sensible	77,000 (22.3)	93,000 (27.3)	120,000 (35.0)
72F DB, 58.6 WB (22.2D DB, 14.8C WB) 45% RH			
Total	77,000 (22.3)	93,000 (27.3)	120,000 (35.0)
Sensible	77,000 (22.3)	93,000 (27.3)	120,000 (35.0)
70F DB, 58.5F WB (21.1C DB, 14.8C WB) 50% RH			
Total	70,000 (20.3)	85,000 (24.9)	109,000 (31.9)
Sensible	70,000 (20.3)	85,000 (24.9)	109,000 (31.9)
70F DB, 57.2F WB (21.1C DB, 14.0C WB) 45% RH			
Total	70,000 (20.3)	85,000 (24.9)	109,000 (31.9)
Sensible	70,000 (20.3)	85,000 (24.9)	109,000 (31.9)
COOLANT REQUIREMENTS			
THR – MBH (kW)	166,000 (48.6)	206,000 (60.3)	271,000 (79.6)
105 F (40.6 C) Glycol In – GPM (L/s)	24.5 (1.5)	30.5 (1.9)	40.1 (2.5)
Pressure Drop w/HX – PSI (kPa)	2.2 (15.2)	2.7 (18.6)	4.3 (29.6)
Pressure Drop w/HX, Econ Coil – PSI (kPa)	4.5 (31.0)	6.6 (45.5)	11.4 (78.6)
WATER REGULATING VALVES			
Size – 2 Way Ball Valve – Inches, NPT (Cv)*	1-1/2 (35)	1-1/2 (35)	1-1/2 (35)
Size – 3 Way Ball Valve – Inches, NPT (Cv)**	1-1/2 (35)	1-1/2 (35)	1-1/2 (35)
AIR SYSTEM – DIRECT DRIVE CENTRIFUGAL			
Air Volume – CFM (L/s)	6,000 (2,830)	7,200 (3,400)	9,000 (4,245)
Blower Motor – HP (kW)	4 (3)	4 (3)	4 (3)
External Static Pressure – inches of water (Pa)	0.5 (125)	0.5 (125)	0.5 (125)
Number of Blowers	2	2	2
COMPRESSOR – TANDEM SCROLL			
EER	14.5	13.8	13.2
Quantity	2 (tandem)	2 (tandem)	2 (tandem)
Nominal HP (kW)	9.0 (6.71)	11.3 (8.43)	15.6 (11.64)
EVAPORATOR COIL – V FRAME, COPPER TUBE/ALUMINUM FIN			
Face Area – ft ² (m ²)	21 (1.95)	21 (1.95)	21 (1.95)
Rows Deep	3	3	3
Face Velocity – FPM (m/s)	286 (1.45)	343 (1.74)	428 (2.17)
HUMIDIFICATION – SOLID STATE ELECTRODE CANISTER			
Flush Cycle	automatic	automatic	automatic
Capacity – Lbs/hr (Kg/hr)	10 (4.53)	10 (4.53)	10 (4.53)
kW	3.2	3.2	3.2
FILTERS			
Quantity	5	5	5
Size – Inches (mm)	12.8×29.0 (325×737)	12.8×29.0 (325×737)	12.8×29.0 (325×737)
Depth – Inches (mm)	4 (100.8)	4 (100.8)	4 (100.8)
REHEAT			
Electric – Equally Loaded Three (3) Phase, Finned Tubular, Low-Watt Density			
Capacity – BTU/HR (kW) Includes Motor Heat***	40,000 (11.6)	42,000 (12.2)	47,000 (13.8)
Stages	1	1	1
Hot Water – 180F (82.2C) EWT, 140F (63.9C) LWT			
Capacity - BTU/HR (kW) Includes Motor Heat	178,000 (22.9)	88,000 (25.7)	104,000 (30.4)
GPM (L/s)	3.6 (0.227)	4.0 (0.252)	4.5 (0.284)
Pressure Drop – PSI (kPa)	3.7 (25.7)	4.5 (31.1)	5.2 (35.9)
Hot Gas Reheat			
Capacity – BTU/HR (kW) Includes Motor Heat	60,000 (17.5)	69,000 (20.1)	81,000 (23.7)
Steam – 15 PSI (103.3 kPa)			
Capacity – BTU/HR (kW) Includes Motor Heat	139,000 (40.6)	149,000 (41.0)	157,000 (46.0)
Control Valve	Solenoid	Solenoid	Solenoid
PHYSICAL DATA			
Weight – lbs (kg)****	1220 (553)	1230 (558)	1350 (612)
Height – Inches (mm)	76.89 (1,953)	76.89 (1,953)	76.89 (1,953)
Length – Inches (mm)	70.87 (1,800)	70.87 (1,800)	70.87 (1,800)
Depth – Inches (mm)	35.00 (889)	35.00 (889)	35.00 (889)

Performance Specifications—Glycol Cooled

CONNECTION SIZES*****			
Glycol In/Out -- Inches	1-1/2	1-1/2	1-1/2
Hot Water			
Supply Line -- Inches	1/2	1/2	1/2
Return Line -- Inches	1/2	1/2	1/2
Steam			
Supply Line -- Inches	1/2	1/2	1/2
Humidifier			
Supply Line -- Inches	1/4	1/4	1/4
Condensate Drain			
Drain Line -- Inches	1/2	1/2	1/2
MultiCool			
Supply Line -- Inches	1-1/2	1-1/2	1-1/2
Return Line -- Inches	1-1/2	1-1/2	1-1/2

*2-Way Single Seated, 400 PSI W.W.P. max

**3-Way Single Seated, 400 PSI W.W.P. max

***With equal loading on each phase, rated at 240V / 3-phase, 480V / 3-phase and 575V / 3-phase

****Add 150lbs (68kW) when Economizer or MultiCool option is selected

*****Connections sizes, not recommended piping sizes. All water/steam piping is nominal

Electrical Data

AIR COOLED																
REHEAT	Electric				Steam, Hot Water or None				Electric				Steam, Hot Water or None			
HUMIDIFIER	Electrode Canister - Steam				Electrode Canister - Steam				Steam or None				Steam or None			
VOLTAGE	208	230	480	575	208	230	480	575	208	230	480	575	208	230	480	575
FM 35																
OLA-w/DX	59.7	58.4	27.8	23.0	47.3	42.8	21.0	16.8	59.7	58.4	27.8	23.0	38.1	34.5	16.8	13.5
OLA-w/DX&MultiCool	61.1	59.6	28.4	23.5	48.7	44.0	21.6	17.3	61.1	59.6	28.4	23.5	39.5	35.7	17.5	14.0
WSA	92.0	92.0	40.6	33.9	73.8	73.8	31.5	25.6	92.0	92.0	40.6	33.9	62.3	62.3	26.3	21.5
MOP	100.0	100.0	50.0	35.0	90.0	90.0	35.0	30.0	100.0	100.0	50.0	35.0	80.0	80.0	30.0	25.0
FM 40																
OLA-w/DX	71.2	68.7	33.4	27.5	58.8	53.1	26.6	21.3	71.2	68.7	33.4	27.5	49.6	44.8	22.4	17.8
OLA-w/DX&MultiCool	73.2	70.6	34.3	28.2	60.8	55.0	27.5	22.0	73.2	70.6	34.3	28.2	51.6	46.7	23.3	19.7
WSA	95.1	95.1	46.2	37.9	76.9	76.9	37.1	29.7	95.1	95.1	46.2	37.9	65.5	65.5	31.9	25.5
MOP	100.0	100.0	50.0	40.0	90.0	90.0	40.0	35.0	100.0	100.0	50.0	40.0	80.0	80.0	40.0	30.0
FM 50																
OLA-w/DX	96.1	91.3	45.5	36.5	83.7	75.7	38.6	30.3	96.1	91.3	45.4	36.5	74.5	67.4	34.4	27.0
OLA-w/DX&MultiCool	99.7	94.5	47.0	37.8	87.3	79.0	40.2	31.6	99.7	94.5	47.0	37.8	78.1	70.7	36.0	28.3
WSA	132.2	132.2	66.4	49.7	114.0	114.0	57.3	41.4	132.2	132.2	66.4	49.7	102.5	102.5	52.1	37.3
MOP	150.0	150.0	70.0	50.0	125.0	125.0	70.0	50.0	150.0	150.0	70.0	50.0	125.0	125.0	60.0	40.0
WATER COOLED																
REHEAT	Electric				Steam, Hot Water or None				Electric				Steam, Hot Water or None			
HUMIDIFIER	Electrode Canister - Steam				Electrode Canister - Steam				Steam or None				Steam or None			
VOLTAGE	208	230	480	575	208	230	480	575	208	230	480	575	208	230	480	575
FM 35																
OLA-w/DX	56.6	55.6	26.0	21.6	44.2	40.0	19.2	15.4	56.6	55.6	26.0	21.6	35.0	31.7	15.0	12.0
OLA-w/DX&MultiCool	58.0	56.8	26.6	22.1	45.6	41.2	19.8	15.9	58.0	56.8	26.6	22.1	36.4	32.9	15.7	12.5
WSA	92.0	92.0	46.0	33.9	73.8	73.8	31.5	25.6	92.0	92.0	46.0	33.9	62.3	62.3	26.3	21.5
MOP	100.0	100.0	50.0	35.0	90.0	90.0	35.0	30.0	100.0	100.0	50.0	35.0	80.0	80.0	30.0	25.0
FM 40																
OLA-w/DX	67.4	65.3	31.7	26.1	55.0	49.7	24.9	19.9	67.4	65.3	31.7	26.1	45.8	41.4	20.7	16.6
OLA-w/DX&MultiCool	69.5	67.2	32.6	26.9	57.0	51.6	25.8	20.6	69.5	67.2	32.6	26.9	47.9	43.3	21.6	18.3
WSA	95.1	95.1	46.2	37.9	76.9	76.9	37.1	29.7	95.1	95.1	46.2	37.9	65.5	65.5	31.9	25.5
MOP	100.0	100.0	50.0	40.0	90.0	90.0	40.0	35.0	100.0	100.0	50.0	40.0	80.0	80.0	40.0	30.0
FM 50																
OLA-w/DX	90.6	86.3	43.2	34.5	78.2	70.7	36.4	28.3	90.6	86.3	43.2	34.5	69.0	62.4	32.2	25.0
OLA-w/DX&MultiCool	94.2	89.5	44.8	35.8	81.8	74.0	38.0	29.6	94.2	89.5	44.8	35.8	72.6	65.7	33.8	26.3
WSA	132.2	132.2	66.4	49.7	114.0	114.0	57.3	41.4	132.2	132.2	66.4	49.7	102.5	102.5	52.1	37.3
MOP	150.0	150.0	70.0	50.0	125.0	125.0	70.0	50.0	150.0	150.0	70.0	50.0	125.0	125.0	60.0	40.0
GLYCOL COOLED																
REHEAT	Electric				Steam, Hot Water or None				Electric				Steam, Hot Water or None			
HUMIDIFIER	Electrode Canister - Steam				Electrode Canister - Steam				Steam or None				Steam or None			
VOLTAGE	208	230	480	575	208	230	480	575	208	230	480	575	208	230	480	575
FM 35																
OLA-w/DX	61.1	59.6	28.6	23.7	48.6	44.0	21.8	17.4	61.1	59.6	28.6	23.7	39.5	35.7	17.6	14.1
OLA-w/DX&MultiCool	62.4	60.8	29.2	24.2	50.0	45.2	22.4	17.9	62.4	60.8	29.2	24.2	40.8	36.9	18.3	14.6
WSA	92.0	92.0	40.6	33.9	73.8	73.8	31.5	25.6	92.0	92.0	40.6	33.9	62.3	62.3	26.3	21.5
MOP	100.0	100.0	50.0	35.0	90.0	90.0	35.0	30.0	100.0	100.0	50.0	35.0	80.0	80.0	30.0	25.0
FM 40																
OLA-w/DX	72.7	70.1	34.1	28.0	60.3	54.5	27.3	21.8	72.7	70.1	34.1	28.0	51.1	46.2	23.1	18.5
OLA-w/DX&MultiCool	74.8	72.0	35.0	28.8	62.3	56.4	28.2	22.6	74.8	72.0	35.0	28.8	53.2	48.1	24.0	20.2
WSA	95.1	95.1	46.2	37.9	76.9	76.9	37.1	29.7	95.1	95.1	46.2	37.9	65.5	65.5	31.9	25.5
MOP	100.0	100.0	50.0	40.0	90.0	90.0	40.0	35.0	100.0	100.0	50.0	40.0	80.0	80.0	40.0	30.0
FM 50																
OLA-w/DX	98.3	93.3	46.2	37.3	85.9	77.7	39.4	31.1	98.3	93.3	46.2	37.3	76.7	69.4	35.2	27.8
OLA-w/DX&MultiCool	101.9	96.5	47.8	38.6	89.5	81.0	41.0	32.4	101.9	96.5	47.8	38.6	80.3	72.7	36.8	29.1
WSA	132.2	132.2	66.4	49.7	114.0	114.0	57.3	41.4	132.2	132.2	66.4	49.7	102.5	102.5	52.1	37.3
MOP	150.0	150.0	70.0	50.0	125.0	125.0	70.0	50.0	150.0	150.0	70.0	50.0	125.0	125.0	60.0	40.0

OLA = Operating Load Amps, WSA = Wire Size Amps, MOP = Maximum Overcurrent Protection

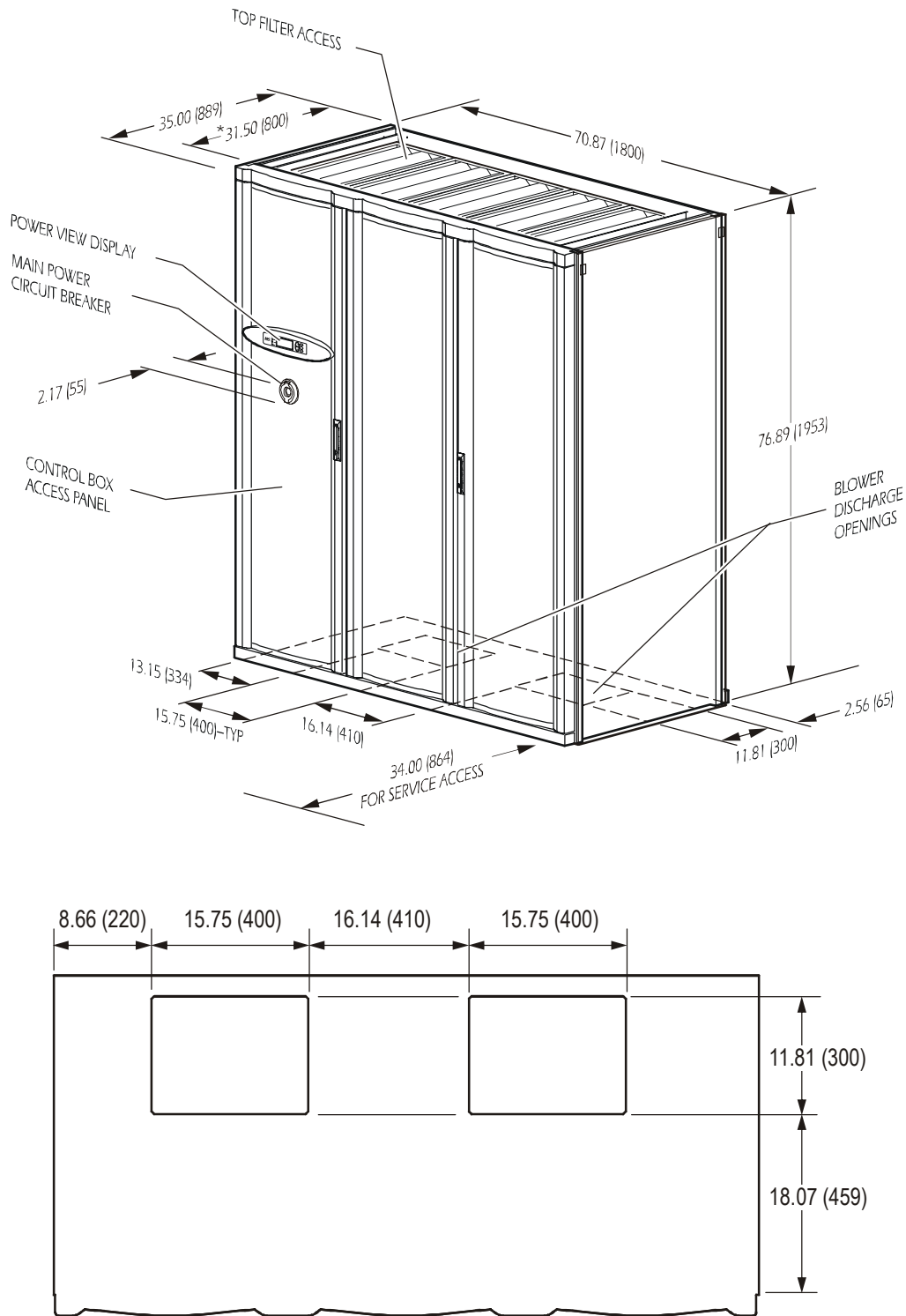
Locked Rotor Amps (LRA)

VOLTAGE	FM 35	FM 40	FM 50
208-230/3/60	123.0	156.0	195.0
480/3/60	49.5	75.0	95.0
575/3/60	40.0	54.0	80.0

* LRA data based on tandem compressors

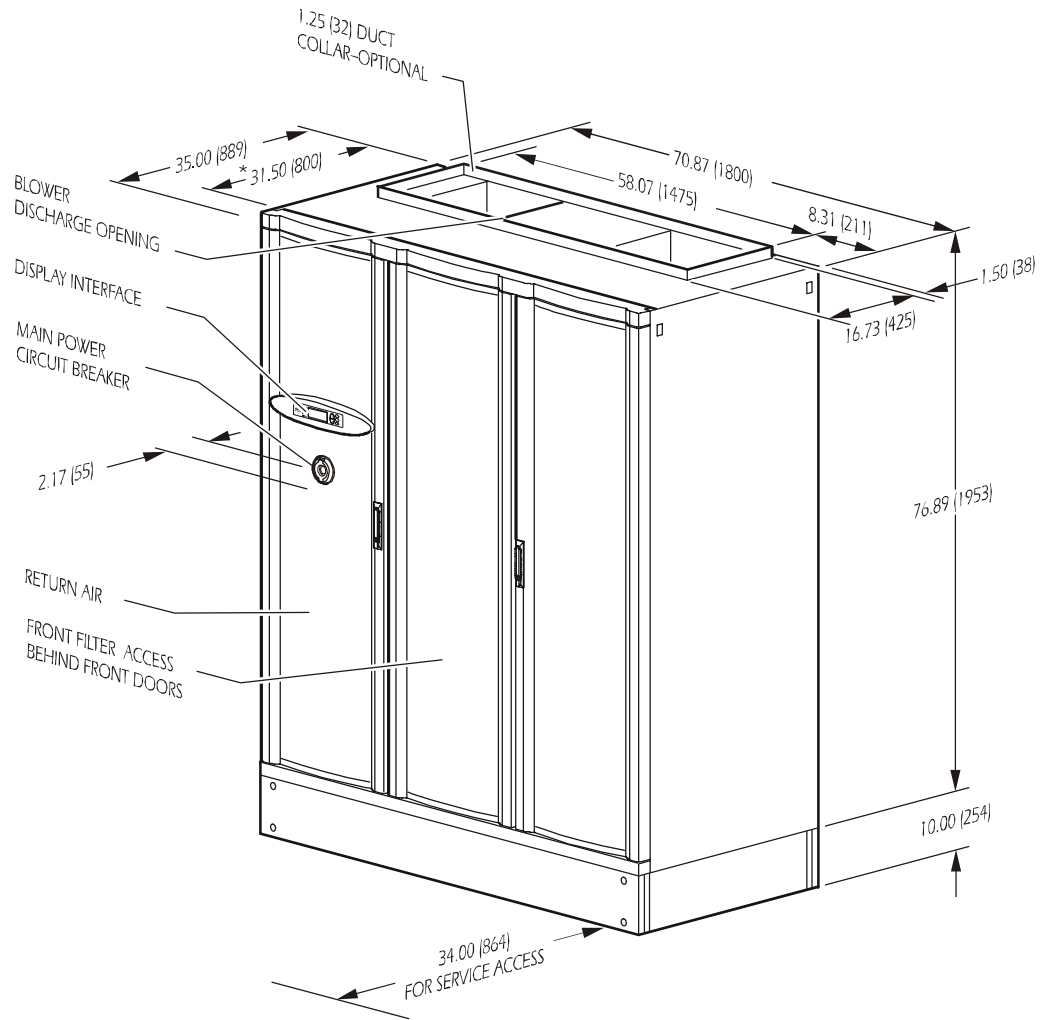
Dimensional Data

FM 35-50 downflow



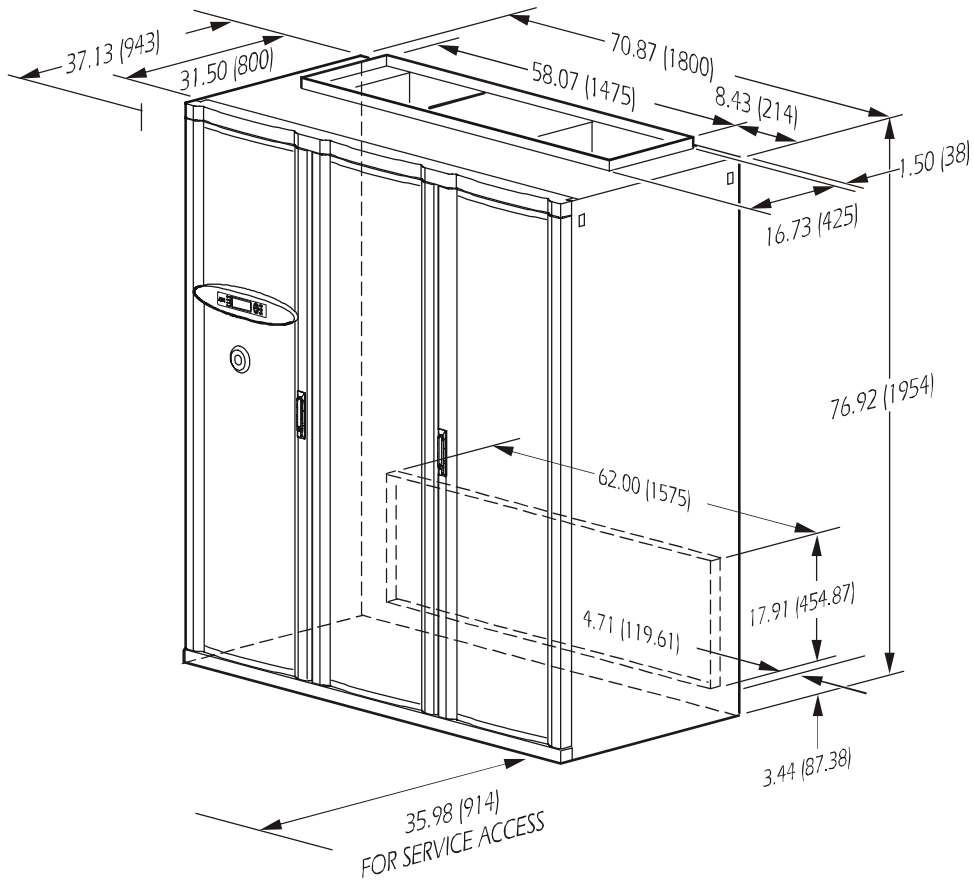
* All dimensions are in inches (mm).

FM 35-50 upflow



* All dimensions are in inches (mm).

FM 35-50 upflow, rear-return

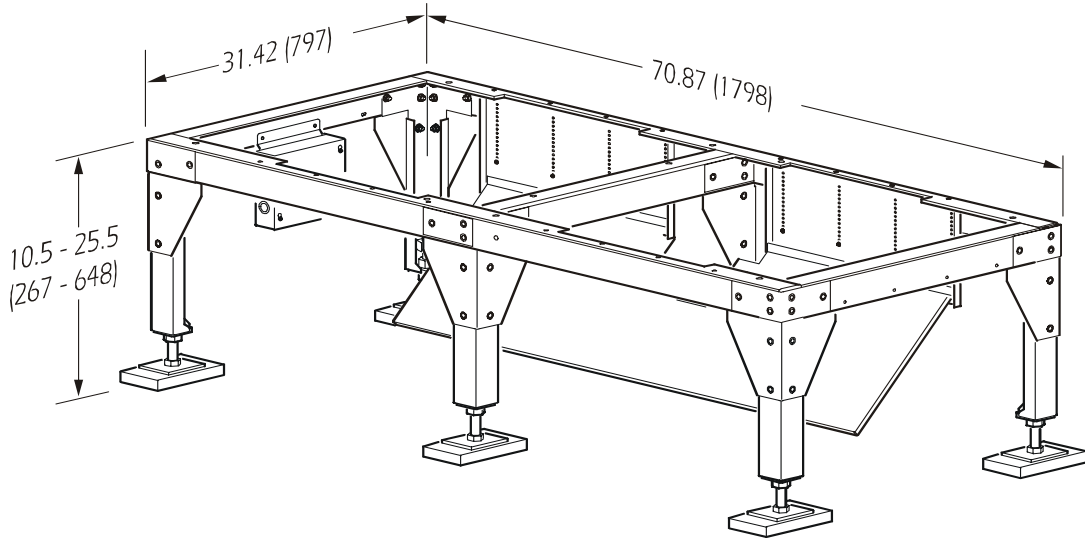


* All dimensions are in inches (mm).

System Configurations

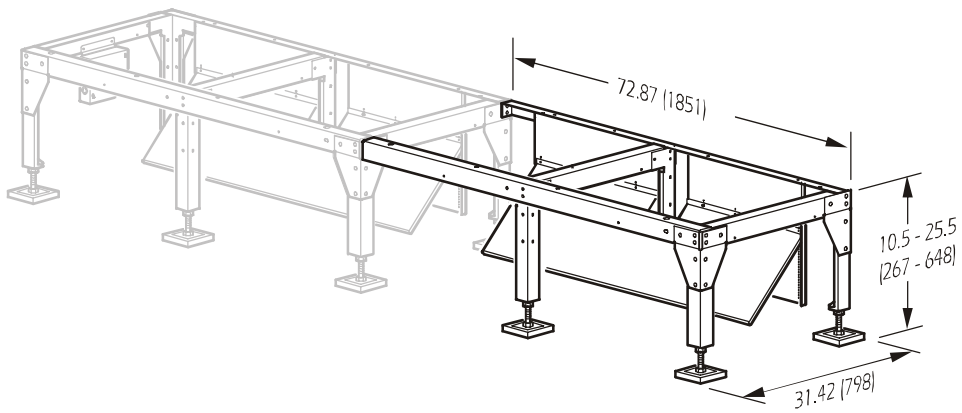
The NetworkAIR Floor Mounted units are modular, allowing up to three units to be bayed together, (one main module and two expansion modules) providing cooling capacity from 35kW to 150kW (10-45 tons).

FM 35-50 Floorstand

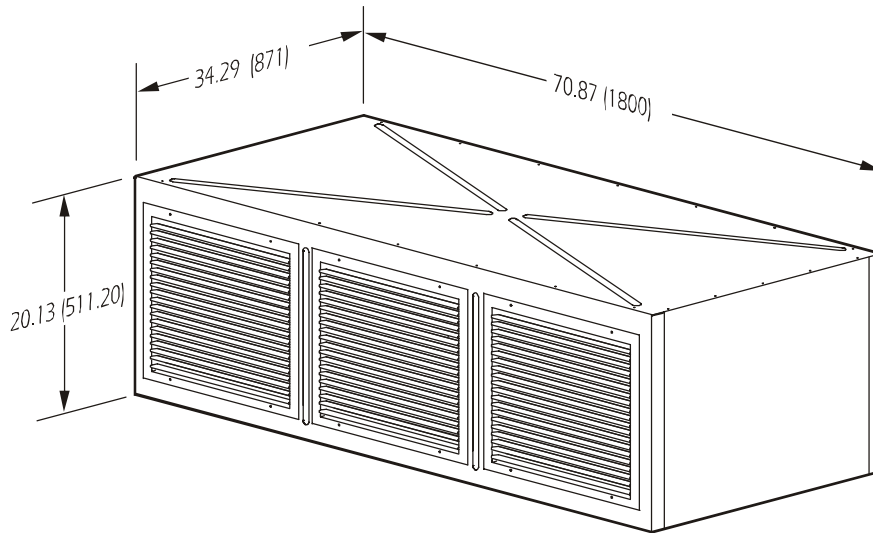


Orderable Floorstand Height	Range
12"	Adjustable 10.5"-13.5"
15"	Adjustable 13.5"-16.5"
18"	Adjustable 16.5"-19.5"
21"	Adjustable 19.5"-22.5"
24"	Adjustable 22.5"-25.5"

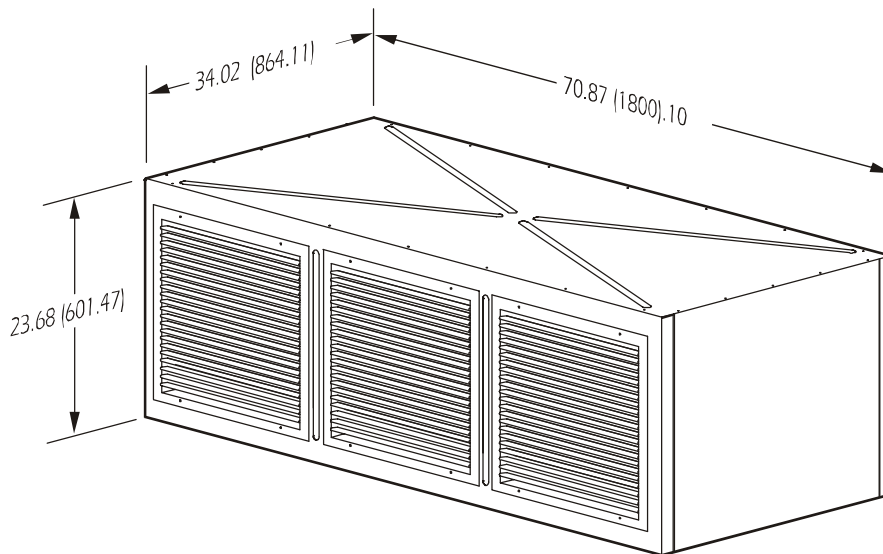
FM 35-50 Expansion Floorstand



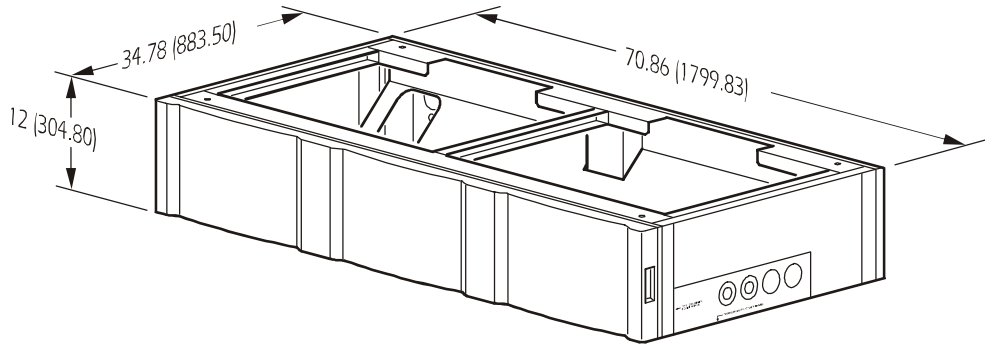
FM 35-50 20" Plenum



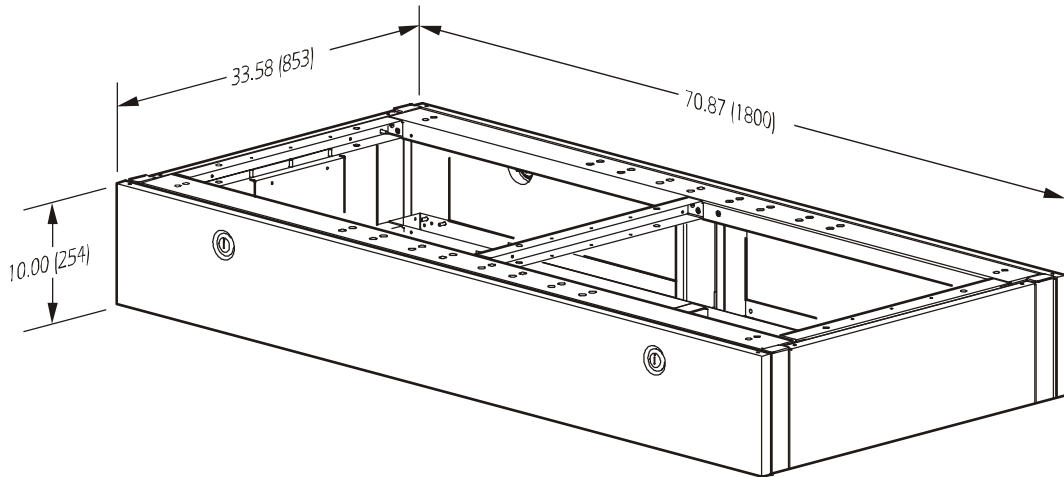
FM 35-50 24" Plenum



FM 35-50 Downflow Plenum



FM 35-50 Sub-Base



Air-Cooled Condensers

Air-cooled condenser—performance/electrical data

OHE SKU	Voltage	Air Quantity		Fan/Motor			Connection		Weight		Electrical Data		
		CFM	L/s	Qty.	HP	RPM	Hot Gas	Liquid	Lbs	Kg	FLA	MCA	MOP
ACCD75028	208-230/1/60	13,700	6,466	2	1/2	1075	1-1/8	7/8	510	231	8.7	15.0	15.0
ACCD75029	208-230/3/60	13,700	6,466	2	1/3	1140	1-1/8	7/8	510	231	7.4	15.0	15.0
ACCD75030	480/3/60	13,700	6,466	2	1/3	1140	1-1/8	7/8	510	231	3.7	15.0	15.0
ACCD75031	575/3/60	13,700	6,466	2	1/3	1140	1-1/8	7/8	510	231	2.7	15.0	15.0
ACCD75032	208-230/1/60	12,900	6,088	2	1/2	1075	1-3/8	1-1/8	530	240	12.6	15.6	20.0
ACCD75033	208-230/3/60	12,900	6,088	2	1/3	1140	1-3/8	1-1/8	530	240	10.0	15.6	20.0
ACCD75034	480/3/60	12,900	6,088	2	1/3	1140	1-3/8	1-1/8	530	240	5.0	15.0	15.0
ACCD75035	575/3/60	12,900	6,088	2	1/3	1140	1-3/8	1-1/8	530	240	3.7	15.0	15.0
ACCD75036	208-230/1/60	20,500	9,675	3	1/2	1075	1-5/8	1-1/8	550	249	8.7	15.0	15.0
ACCD75037	208-230/3/60	20,500	9,675	3	1/3	1140	1-5/8	1-1/8	550	249	7.4	15.0	15.0
ACCD75038	480/3/60	20,500	9,675	3	1/3	1140	1-5/8	1-1/8	550	249	3.7	15.0	15.0
ACCD75039	575/3/60	20,500	9,675	3	1/3	1140	1-5/8	1-1/8	550	249	2.7	15.0	15.0
ACCD75040	208-230/3/60	20,700	9,769	2	1-1/2	1140	1-5/8	1-5/8	880	399	11.8	15.8	35.0
ACCD75041	480/3/60	20,700	9,769	2	1-1/2	1140	1-5/8	1-5/8	880	399	5.9	15.0	15.0
ACCD75042	575/3/60	20,700	9,769	2	1-1/2	1140	1-5/8	1-5/8	880	399	4.5	15.0	15.0
ACCD75049	208-230/3/60	23,000	10,855	2	1-1/2	1140	1-3/8	1-3/8	730	331	11.8	15.8	35.0
ACCD75050	480/3/60	23,000	10,855	2	1-1/2	1140	1-3/8	1-3/8	730	331	5.9	15.0	15.0
ACCD75051	575/3/60	23,000	10,855	2	1-1/2	1140	1-3/8	1-3/8	730	331	4.5	15.0	15.0
ACCD75043	208-230/3/60	23,200	10,949	2	1-1/2	1140	1-5/8	1-5/8	770	349	11.8	15.8	35.0
ACCD75044	480/3/60	23,200	10,949	2	1-1/2	1140	1-5/8	1-5/8	770	349	5.9	15.0	15.0
ACCD75045	575/3/60	23,200	10,949	2	1-1/2	1140	1-5/8	1-5/8	770	349	4.5	15.0	15.0
ACCD75046	208-230/3/60	32,900	15,527	3	1-1/2	1140	2-1/8	2-1/8	1210	549	18.8	22.8	40.0
ACCD75047	480/3/60	32,900	15,527	3	1-1/2	1140	2-1/8	2-1/8	1210	549	9.4	15.0	20.0
ACCD75048	575/3/60	32,900	15,527	3	1-1/2	1140	2-1/8	2-1/8	1210	549	7.3	15.0	15.0
ACCD75052	208-230/3/60	46,400	21,898	4	1-1/2	1140	2-1/8	2-1/8	1,580	715	25.8	29.8	45.0
ACCD75053	480/3/60	46,400	21,898	4	1-1/2	1140	2-1/8	2-1/8	1,580	715	12.9	15.0	20.0
ACCD75054	575/3/60	46,400	21,898	4	1-1/2	1140	2-1/8	2-1/8	1,580	715	10.1	15.0	15.0

FLA = Full Load Amps

MCA = Minimum Circuit Amperes

MOP = Maximum Overcurrent Protection

Low noise air-cooled condenser—performance/electrical data

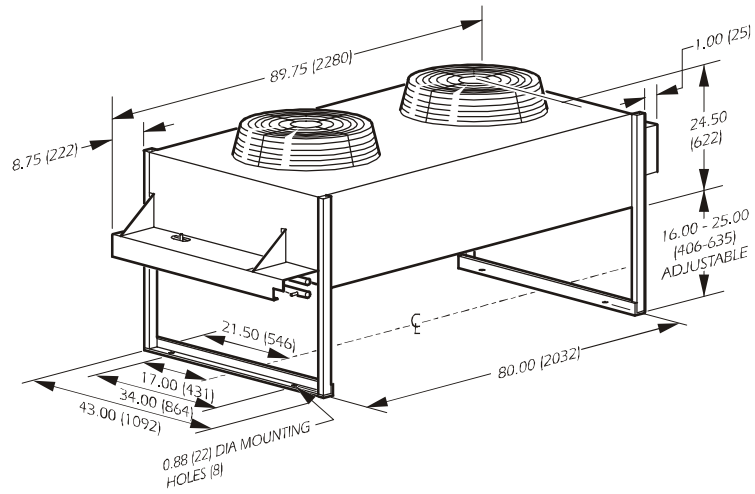
OHE SKU	Voltage	Air Quantity		Fan/Motor			Connection		Weight		Electrical Data		
		CFM	L/s	Qty.	HP	RPM	Hot Gas	Liquid	Lbs	Kg	FLA	MCA	MOP
ACCD75055	208-230/3/60	11,700	5,522	2	1/2	540	1-5/8	1-5/8	800	363	8.3	15.0	20.0
ACCD75056	480/3/60	11,700	5,522	2	1/2	540	1-5/8	1-5/8	800	363	4.2	15.0	15.0
ACCD75064	208-230/3/60	12,100	5,711	2	1/2	540	1-3/8	1-3/8	770	350	8.3	15.0	20.0
ACCD75065	480/3/60	12,100	5,711	2	1/2	540	1-3/8	1-3/8	770	350	4.2	15.0	15.0
ACCD75058	208-230/3/60	17,100	8,070	3	1/2	540	1-5/8	1-5/8	1240	562	11.8	15.6	25.0
ACCD75059	480/3/60	17,100	8,070	3	1/2	540	1-5/8	1-5/8	1240	562	5.9	15.0	15.0
ACCD75061	208-230/3/60	18,500	8,731	3	1/2	540	1-5/8	1-5/8	1180	535	11.8	15.6	25.0
ACCD75062	480/3/60	18,500	8,731	3	1/2	540	1-5/8	1-5/8	1180	535	5.9	15.0	15.0
ACCD75067	208-230/3/60	23,400	11,043	4	1/2	540	2-1/8	2-1/8	1600	725	15.3	20.4	30.0
ACCD75068	480/3/60	23,400	11,043	4	1/2	540	2-1/8	2-1/8	1600	725	7.7	15.0	15.0
ACCD75070	208-230/3/60	24,600	11,610	4	1/2	540	2-1/8	2-1/8	1580	717	15.3	20.4	30.0
ACCD75071	480/3/60	24,600	11,610	4	1/2	540	2-1/8	2-1/8	1580	717	7.7	15.0	15.0
ACCD75073	208-230/3/60	29,300	13,828	5	1/2	540	2-1/8	2-1/8	2000	907	18.8	25.2	35.0
ACCD75074	480/3/60	29,300	13,828	5	1/2	540	2-1/8	2-1/8	2000	907	9.4	15.0	15.0

FLA = Full Load Amps

MCA = Minimum Circuit Amperes

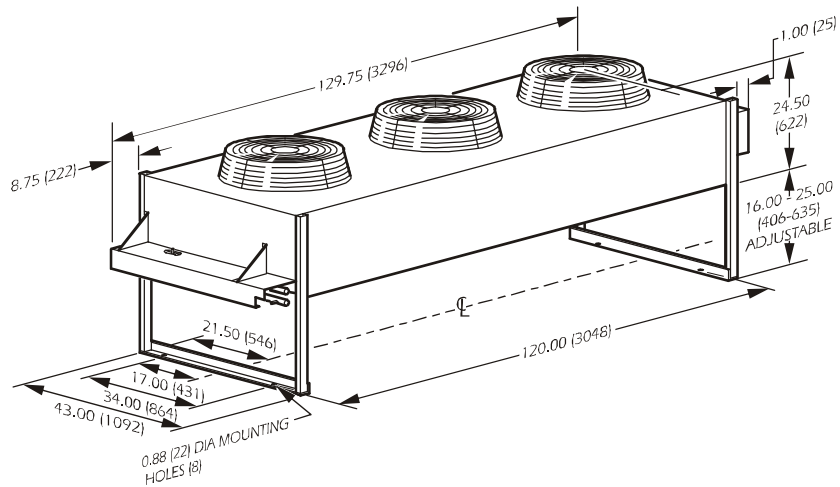
MOP = Maximum Overcurrent Protection

2-fan air-cooled condenser



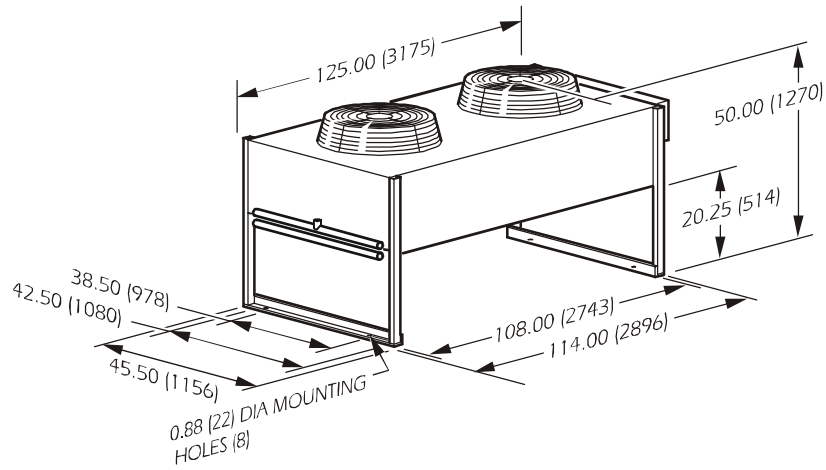
APC PART	CIRCUIT	VOLTAGE
ACCD75028	single	208-230/1/60
ACCD75029	single	208-230/3/60
ACCD75030	single	480/3/60
ACCD75031	single	575/3/60
ACCD75032	single	208-230/1/60
ACCD75033	single	208-230/3/60
ACCD75034	single	480/3/60
ACCD75035	single	575/3/60

3-fan air-cooled condenser



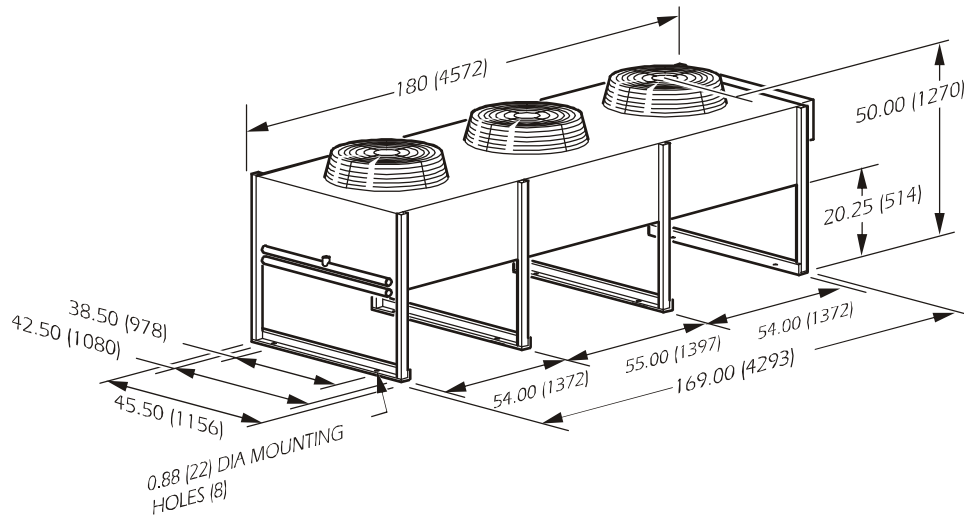
APC PART	CIRCUIT	VOLTAGE
ACCD75036	single	208-230/1/60
ACCD75037	single	208-230/3/60
ACCD75038	single	480/3/60
ACCD75039	single	575/3/60

2-fan air-cooled condenser



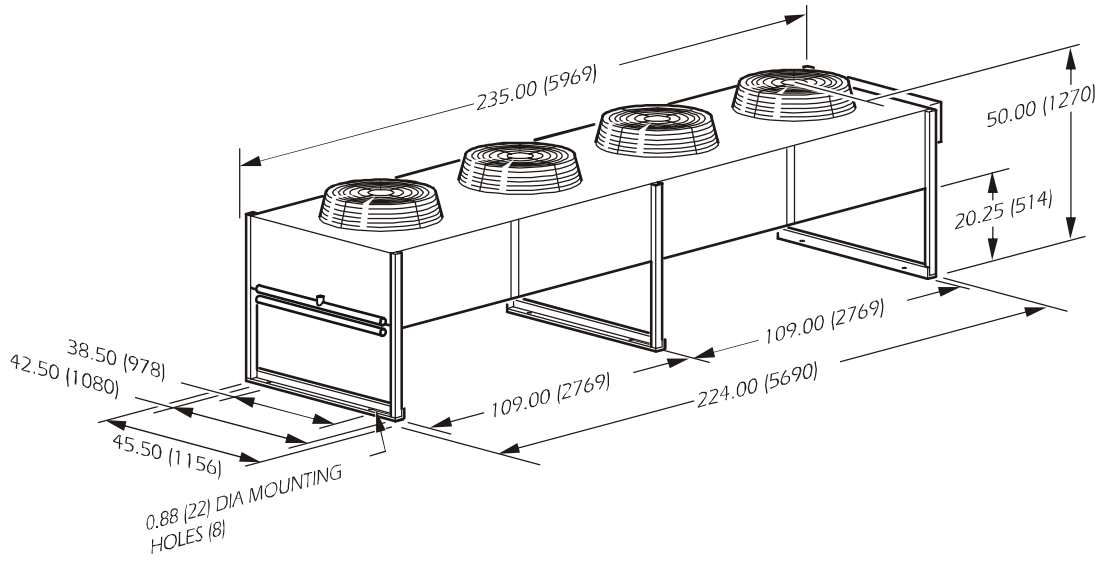
APC PART	CIRCUIT	VOLTAGE
ACCD75040	single	208-230/3/60
ACCD75041	single	480/3/60
ACCD75042	single	575/3/60
ACCD75049	single	208-230/3/60
ACCD75050	single	480/3/60
ACCD75051	single	575/3/60
ACCD75043	single	208-230/3/60
ACCD75044	single	480/3/60
ACCD75045	single	575/3/60

3-fan air-cooled condenser



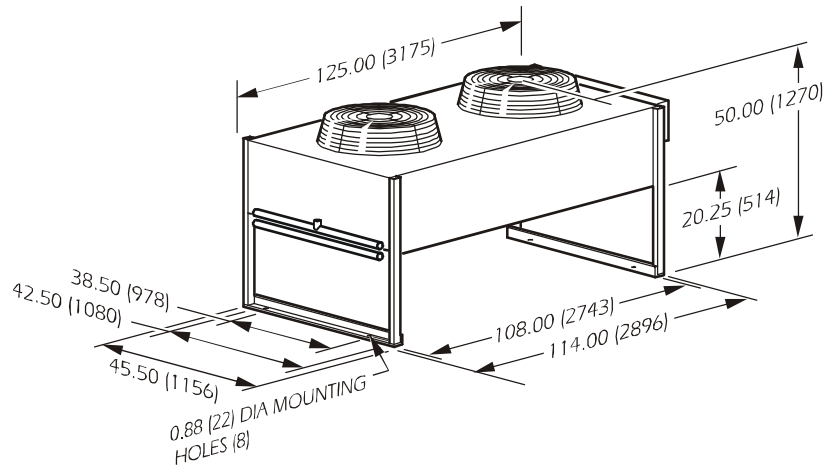
APC PART	CIRCUIT	VOLTAGE
ACCD75046	single	208-230/3/60
ACCD75047	single	480/3/60
ACCD75048	single	575/3/60

4-fan air-cooled condenser



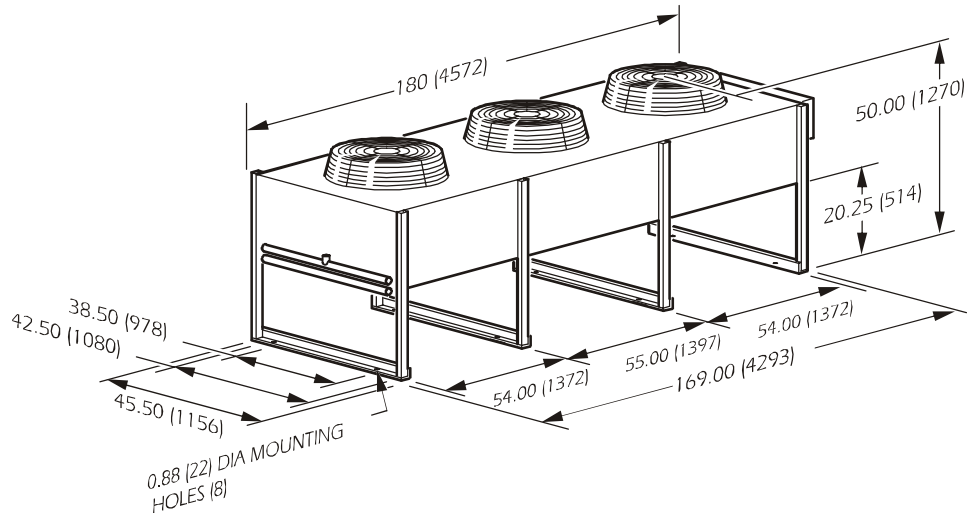
APC PART	CIRCUIT	VOLTAGE
ACCD75052	single	208-230/3/60
ACCD75053	single	480/3/60
ACCD75054	single	575/3/60

2-fan low-noise condenser



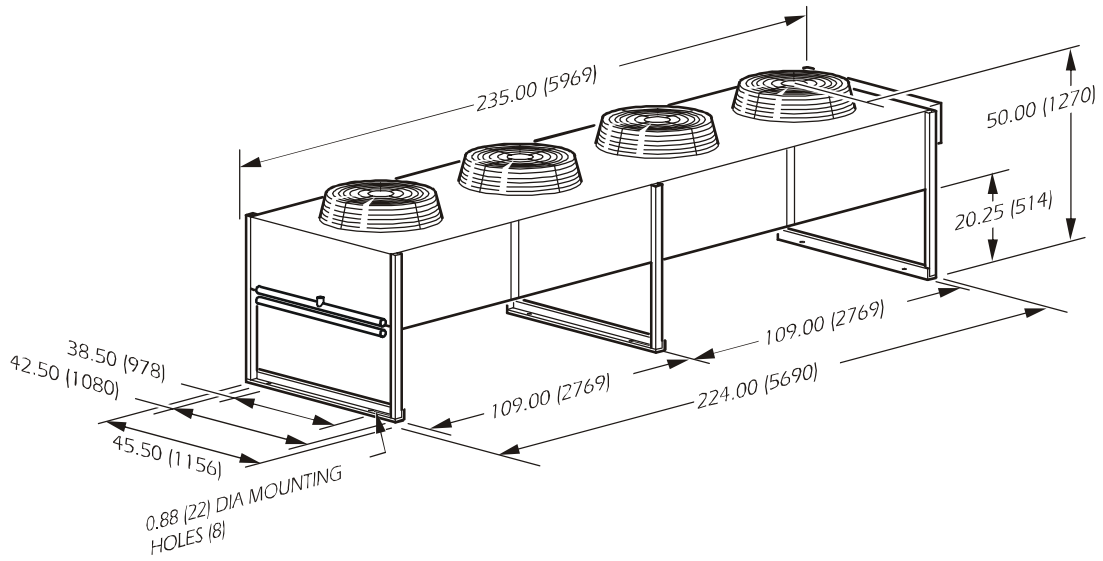
APC PART	CIRCUIT	VOLTAGE
ACCD75055	single	208-230/3/60
ACCD75056	single	480/3/60
ACCD75064	single	208-230/3/60
ACCD75065	single	480/3/60

3-fan low-noise condenser



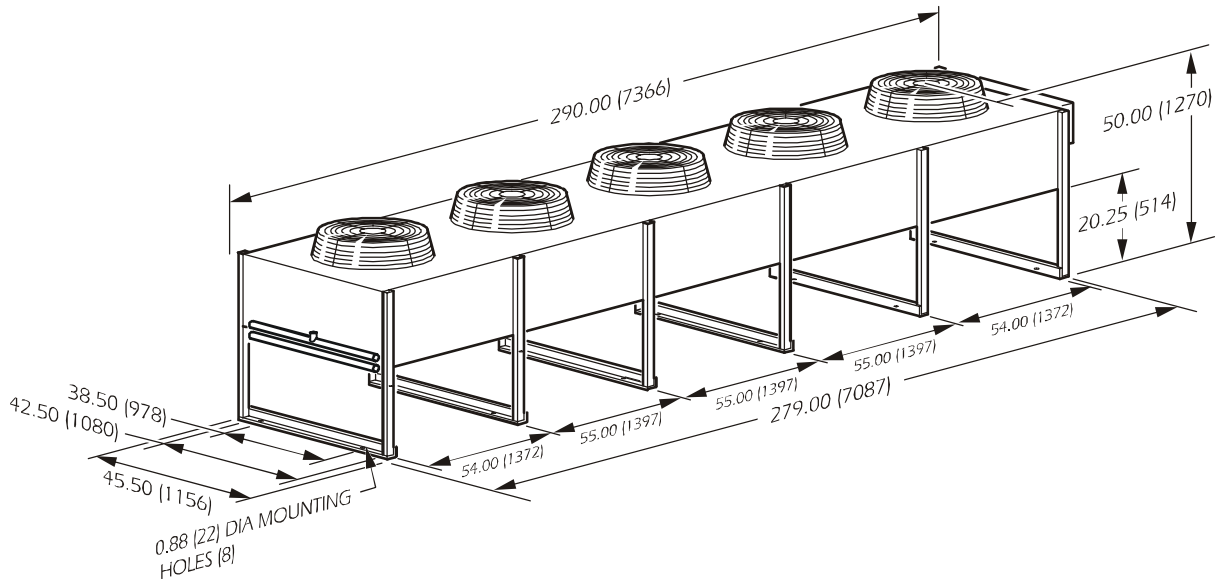
APC PART	CIRCUIT	VOLTAGE
ACCD75058	single	208-230/3/60
ACCD75059	single	480/3/60
ACCD75061	single	208-230/3/60
ACCD75062	single	480/3/60

4-fan low-noise condenser



APC PART	CIRCUIT	VOLTAGE
ACCD75067	single	208-230/3/60
ACCD75068	single	480/3/60
ACCD75070	single	208-230/3/60
ACCD75071	single	480/3/60

5-fan low-noise condenser



APC PART	CIRCUIT	VOLTAGE
ACCD75073	single	208-230/3/60
ACCD75074	single	480/3/60

Fluid Coolers

Glycol-cooled fluid cooler—performance/electrical data

OHE SKU	Voltage	Air Quantity		Fan/Motor			Connect -ions	Weight		Glycol Volume		Electrical Data		
		CFM	L/s	Qty	HP	RPM		Lbs	Kg	Gal	L	FLA	MCA	MOP
ACFC75122	208-230/1/60	12,900	6,088	2	1/2	1075	(2) 1-5/8	530	240	9.1	33.7	7.8	8.8	15.0
ACFC75196	208-230/3/60	12,900	6,088	2	1/3	1140	(2) 1-5/8	530	240	9.1	33.7	5.2	5.9	15.0
ACFC75197	480/3/60	12,900	6,088	2	1/3	1140	(2) 1-5/8	530	240	9.1	33.7	2.6	2.9	15.0
ACFC75125	575/3/60	12,900	6,088	2	1/3	1140	(2) 1-5/8	530	240	9.1	33.7	2.1	2.4	15.0
ACFC75132	208-230/3/60	21,900	10,336	2	1-1/2	1140	(2) 2-1/8	790	359	9.2	34.8	14.0	15.8	20.0
ACFC75133	480/3/60	21,900	10,336	2	1-1/2	1140	(2) 2-1/8	790	359	9.2	34.8	7.0	7.9	15.0
ACFC75134	575/3/60	21,900	10,336	2	1-1/2	1140	(2) 2-1/8	790	359	9.2	34.8	5.6	6.3	15.0
ACFC75126	208-230/1/60	20,500	9,675	3	1/2	1075	(2) 2-1/8	550	250	10.2	37.7	11.7	12.7	15.0
ACFC75198	208-230/3/60	20,500	9,675	3	1/2	1140	(2) 2-1/8	550	250	10.2	37.7	7.8	8.5	15.0
ACFC75199	480/3/60	20,500	9,675	3	1/2	1140	(2) 2-1/8	550	250	10.2	37.7	3.9	4.2	15.0
ACFC75129	575/3/60	20,500	9,675	3	1/2	1140	(2) 2-1/8	550	250	10.2	37.7	3.1	3.4	15.0
ACFC75202	208-230/3/60	34,800	16,424	3	1-1/2	1140	(2) 2-5/8	1190	540	13.0	49.1	21.0	22.8	25.0
ACFC75203	480/3/60	34,800	16,424	3	1-1/2	1140	(2) 2-5/8	1190	540	13.0	49.1	10.5	11.4	15.0
ACFC75143	575/3/60	34,800	16,424	3	1-1/2	1140	(2) 2-5/8	1190	540	13.0	49.1	8.4	9.1	15.0
ACFC75200	208-230/3/60	21,900	10,336	2	1-1/2	1140	(2) 2-1/8	790	359	9.2	34.8	14.0	15.8	20.0
ACFC75201	480/3/60	21,900	10,336	2	1-1/2	1140	(2) 2-1/8	790	359	9.2	34.8	7.0	7.9	15.0
ACFC75191	575/3/60	21,900	10,336	2	1-1/2	1140	(2) 2-1/8	790	359	9.2	34.8	5.6	6.3	15.0
ACFC75146	208-230/3/60	46,000	21,709	4	1-1/2	1140	(2) 2-1/8	1540	700	13.5	51.0	28.0	29.8	35.0
ACFC75147	480/3/60	46,000	21,709	4	1-1/2	1140	(2) 2-1/8	1540	700	13.5	51.0	14.0	14.9	15.0
ACFC75191	575/3/60	46,000	21,709	4	1-1/2	1140	(2) 2-1/8	1540	700	13.5	51.0	11.2	11.9	15.0

FLA = Full Load Amps

MCA = Minimum Circuit Amperes

MOP = Maximum Overcurrent Protection

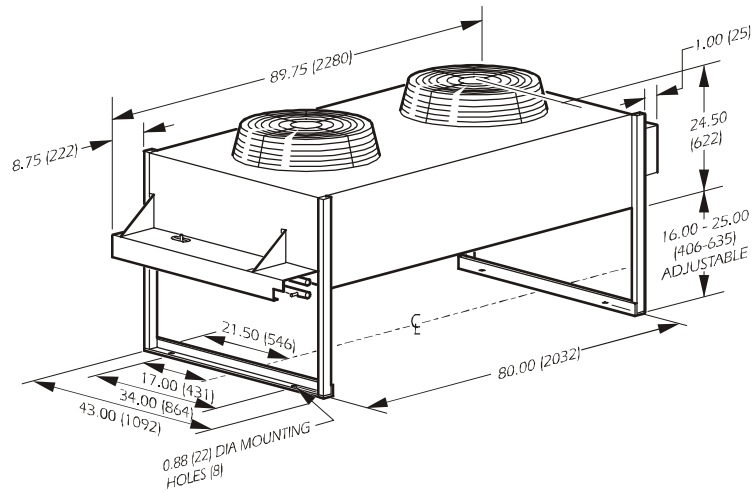
Glycol-cooled fluid cooler—performance/electrical data

OHE SKU	Voltage	Air Quantity		Fan/Motor			Connect -ions	Weight		Glycol Volume		Electrical Data		
		CFM	L/s	Qty	HP	RPM		Lbs	Kg	Gal	L	FLA	MCA	MOP
ACFC75158	208-230/3/60	17,500	8,259	3	1/2	540	2-5/8	1210	550	13.0	49.1	10.5	11.4	15.0
ACFC75159	480/3/60	17,500	8,259	3	1/2	540	2-5/8	1210	550	13.0	49.1	5.3	5.7	15.0
ACFC75155	208-230/3/60	18,500	8,731	3	1/2	540	2-5/8	1190	540	13.0	49.1	10.5	11.4	15.0
ACFC75156	480/3/60	18,500	8,731	3	1/2	540	2-5/8	1190	540	13.0	49.1	5.3	5.7	15.0
ACFC75161	208-230/3/60	24,600	11,610	4	1/2	540	2-5/8	2480	1125	16.7	63.1	14.0	14.9	15.0
ACFC75162	480/3/60	24,600	11,610	4	1/2	540	2-5/8	2480	1125	16.7	63.1	7.0	7.4	15.0
ACFC75164	208-230/3/60	23,400	11,043	4	1/2	540	2-5/8	3150	1430	16.7	63.1	14.0	14.9	15.0
ACFC75165	480/3/60	23,400	11,043	4	1/2	540	2-5/8	3150	1430	16.7	63.1	7.0	7.4	15.0

FLA = Full Load Amps
MCA = Minimum Circuit Amperes
MOP = Maximum Overcurrent Protection

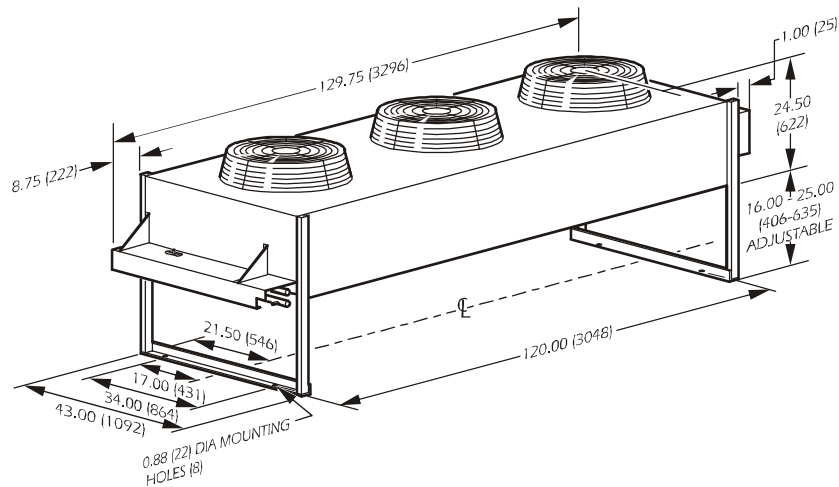
*Fluid coolers can be selected for multiple indoor air conditioning units from the factory. Consult factory for help configuring many-to-one or one-to-many glycol loops.

2-fan fluid cooler



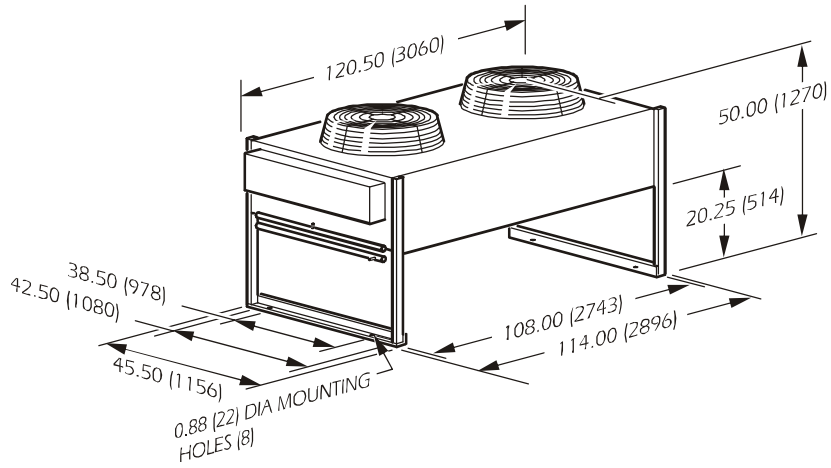
APC PART	VOLTAGE
ACFC75122	208-230/1/60
ACFC75196	208-230/3/60
ACFC75197	480/3/60
ACFC75125	575/3/60

3-fan fluid cooler



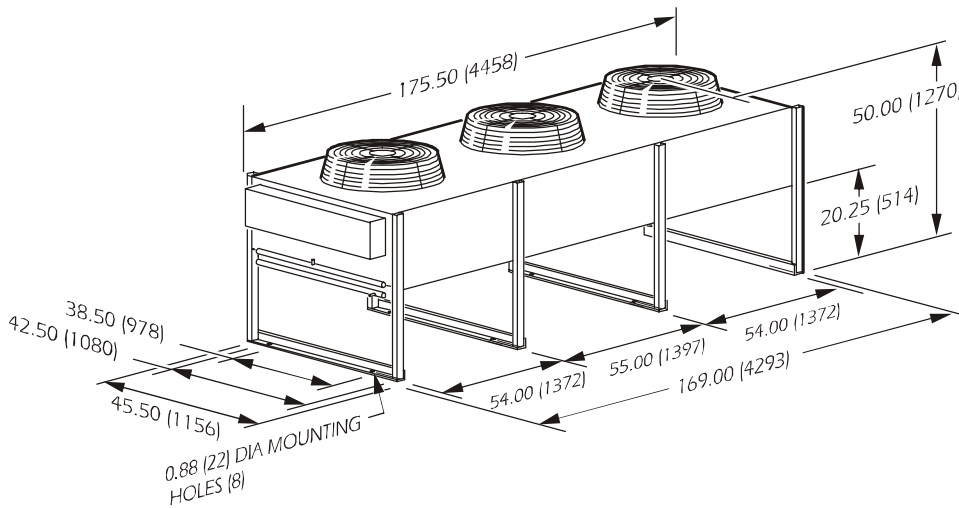
APC PART	VOLTAGE
ACFC75126	208-230/1/60
ACFC75198	208-230/3/60
ACFC75199	480/3/60
ACFC75129	575/3/60

2-fan fluid cooler



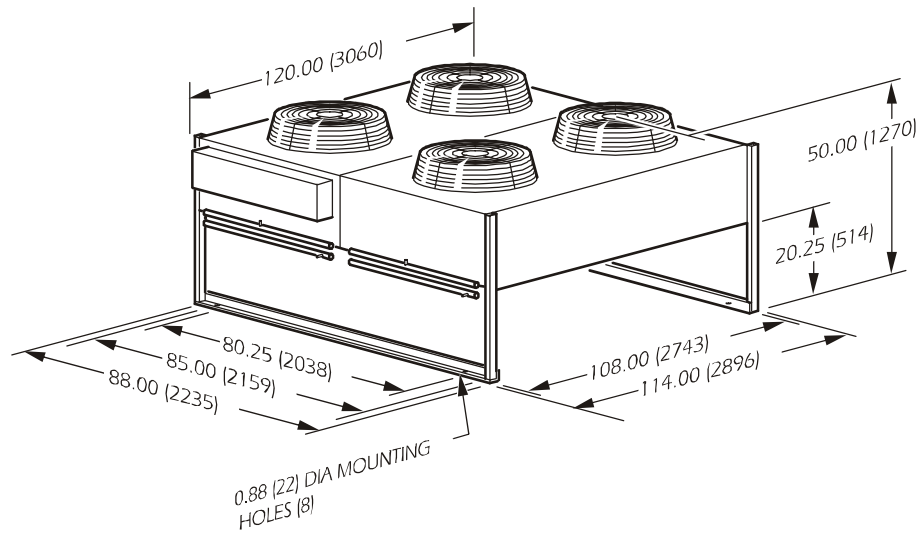
APC PART	VOLTAGE
ACFC75132	208-230/3/60
ACFC75133	480/3/60
ACFC75134	575/3/60
ACFC75200	208-230/3/60
ACFC75201	480/3/60
ACFC75191	575/3/60

3-fan fluid cooler



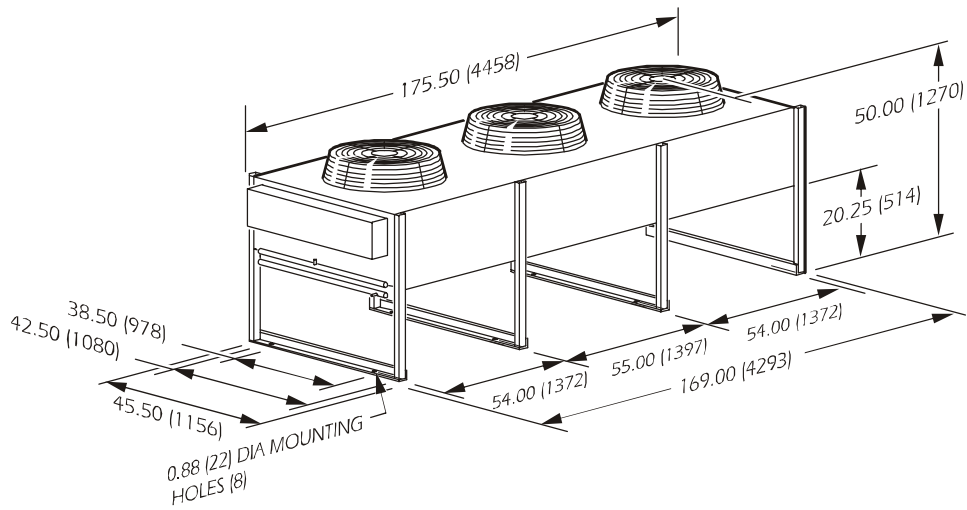
APC PART	VOLTAGE
ACFC75202	208-230/3/60
ACFC75203	480/3/60
ACFC75143	575/3/60

4-fan fluid cooler



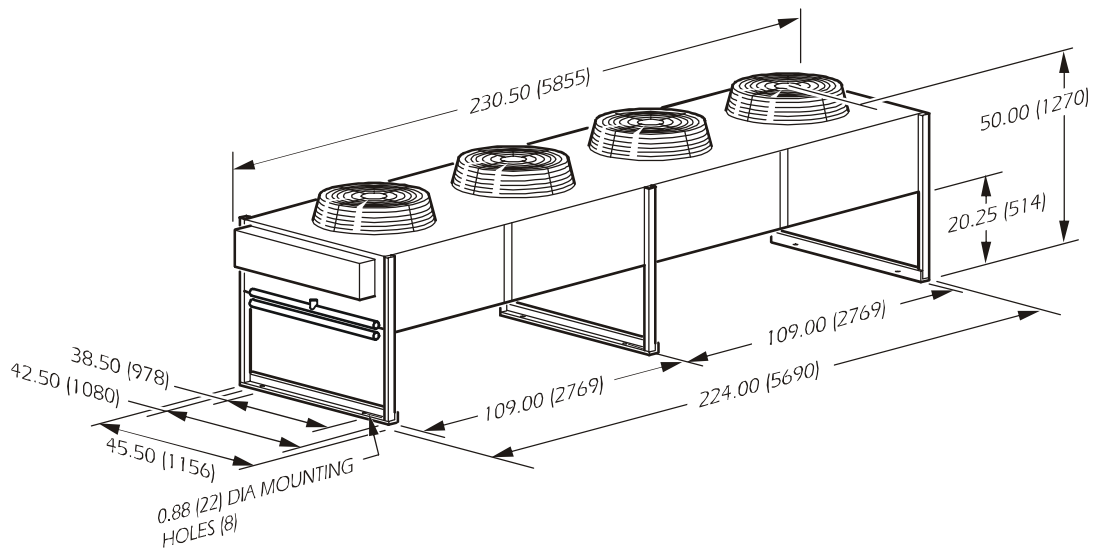
APC PART	VOLTAGE
ACFC75146	208-230/3/60
ACFC75147	480/3/60
ACFC75192	575/3/60

3-fan low-noise fluid cooler



APC PART	VOLTAGE
ACFC75158	208-230/3/60
ACFC75159	480/3/60
ACFC75155	208-230/3/60
ACFC75156	480/3/60

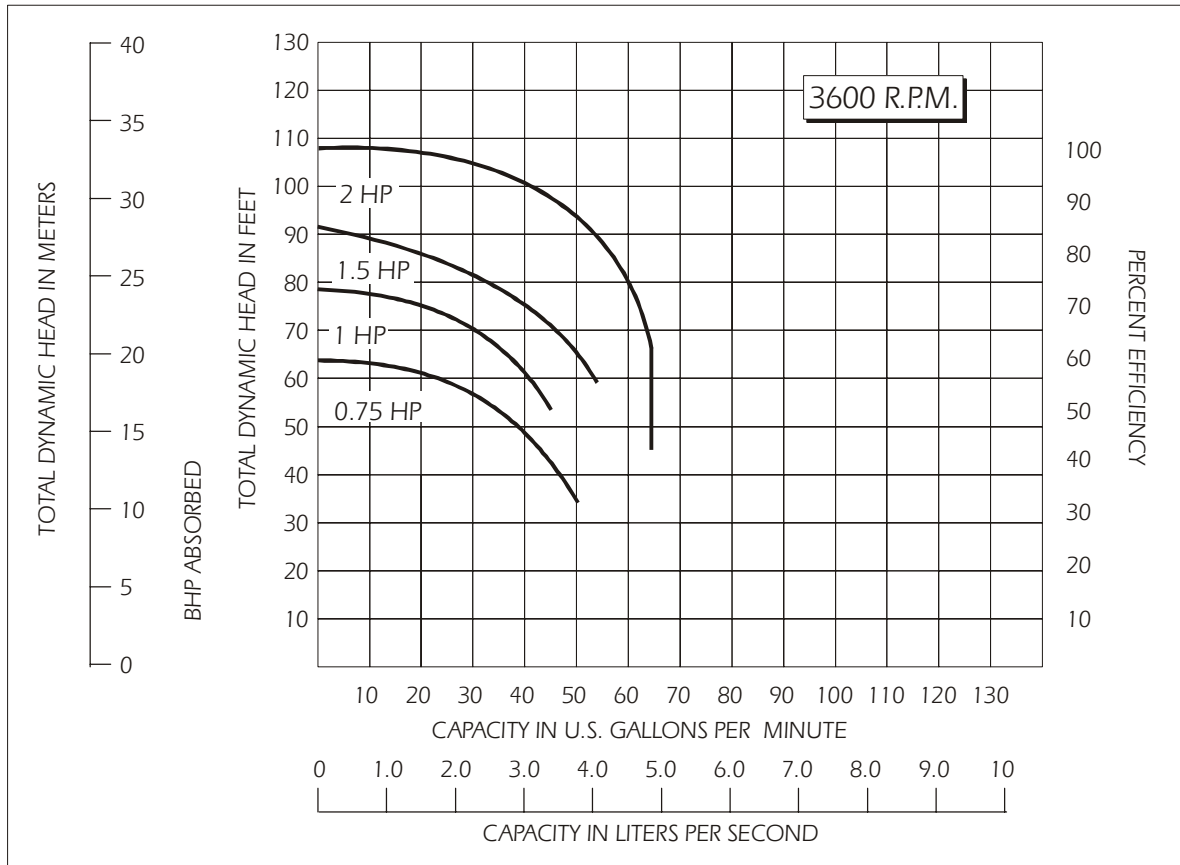
4-fan low-noise fluid cooler



APC PART	VOLTAGE
ACFC75164	208-230/3/60
ACFC75165	480/3/60
ACFC75161	208-230/3/60
ACFC75162	480/3/60

Pump Specifications

Pump performance



Pump connection sizes

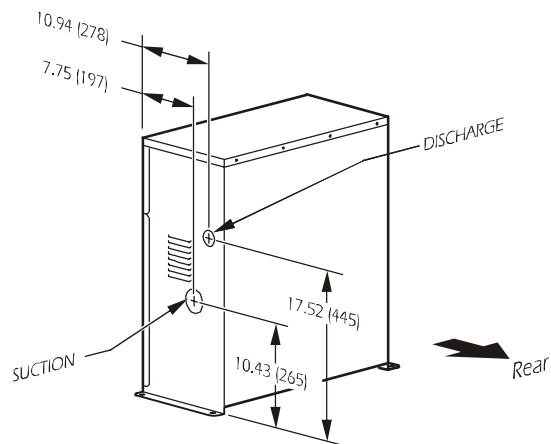
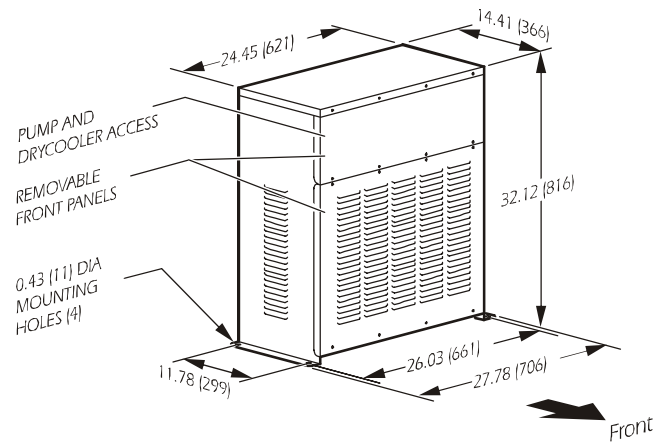
HP (kW)	3/4 (.56)		1 (.75)		1.5 (1.1)		2 (1.5)	
LINE	Suction	Discharge	Suction	Discharge	Suction	Discharge	Suction	Discharge
Size (inches)	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/2	1-1/4

Pump electrical data

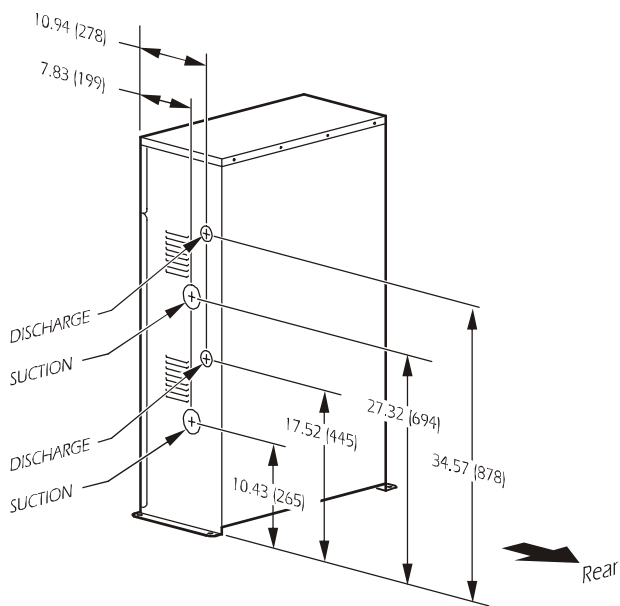
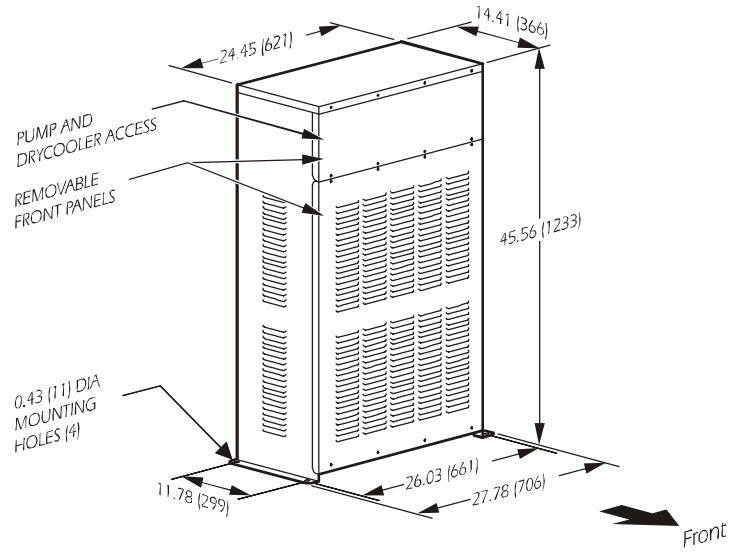
HP (kW)	3/4 (.56)		1 (.75)		1.5 (1.1)		2 (1.5)	
VOLTAGE	FLA	MCA	FLA	MCA	FLA	MCA	FLA	MCA
208/3/60	3.0	3.2	3.7	4.6	4.9	6.1	6.4	8.0
230/3/60	3.2	4.0	3.7	4.6	5.0	6.3	6.2	7.8
480/3/60	1.6	2.0	1.9	2.4	2.5	3.1	3.1	3.9
575/3/60	1.3	1.6	1.5	1.9	2.0	2.5	2.5	3.1

*Values are calculated based on 3-phase power.
 FLA = Full Load Amperes
 MCA = Minimum Circuit Amperes

FM 35-50 Single Pump Package

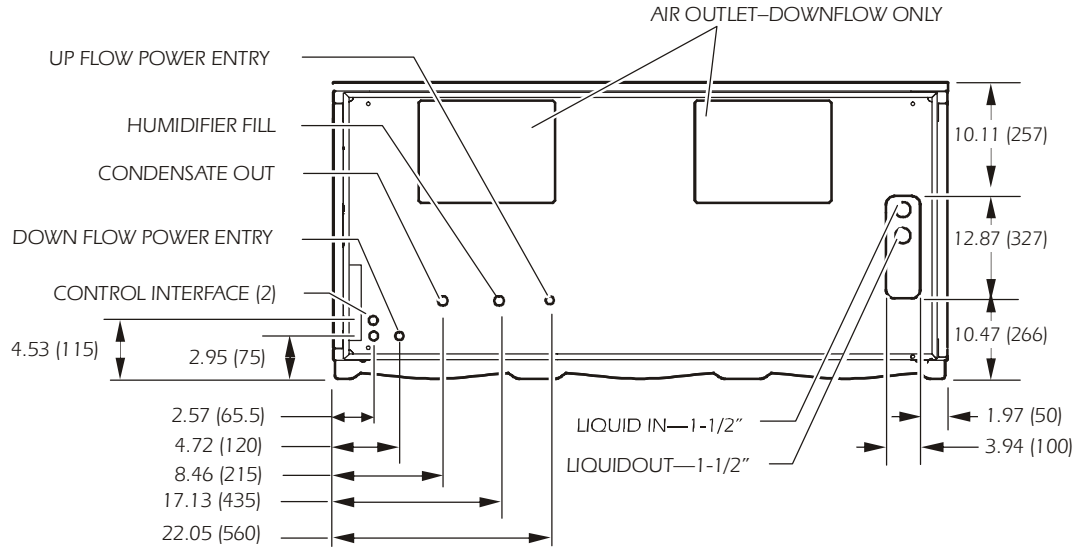


FM 35-50 Dual Pump Package



Piping Connections

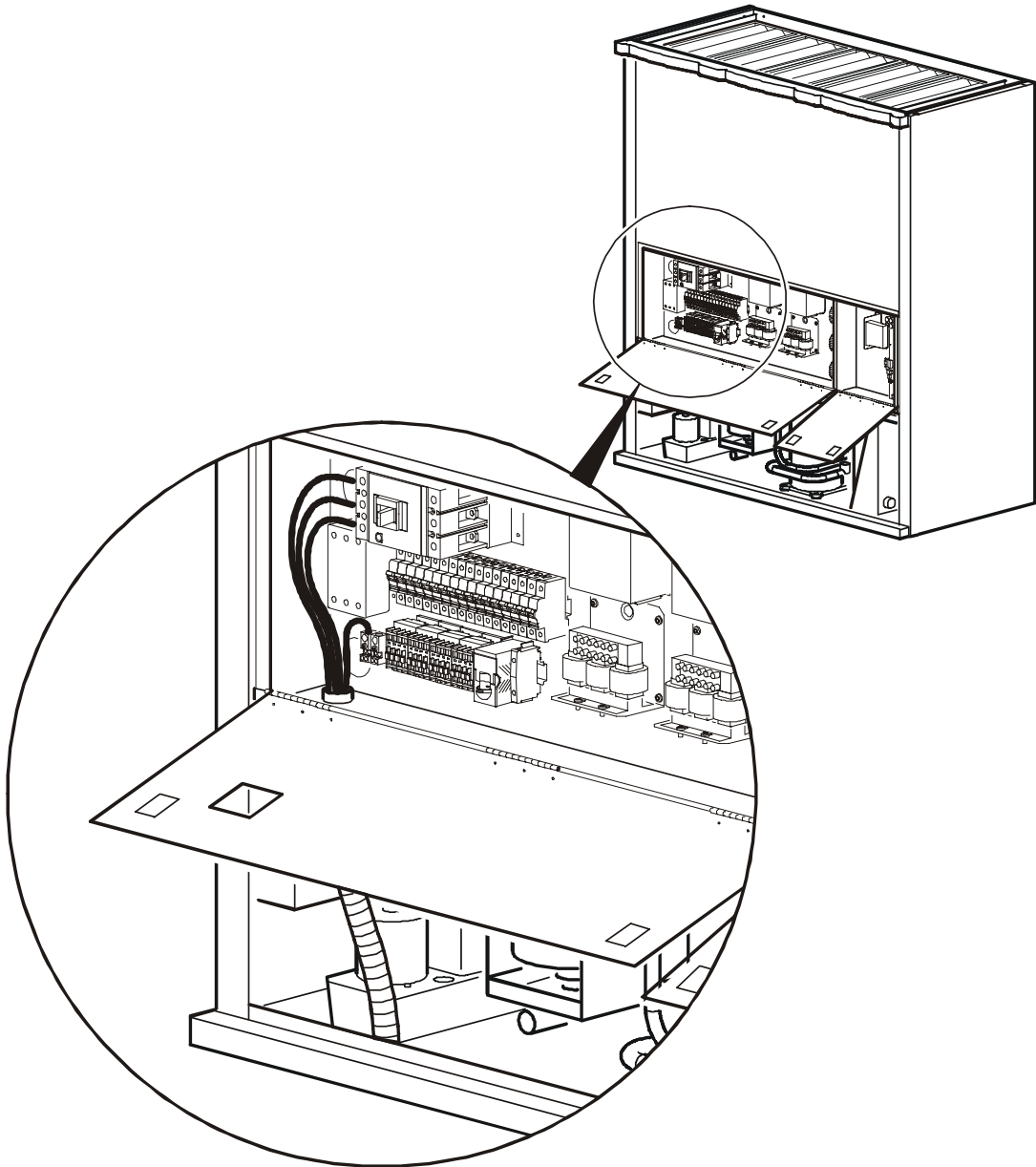
FM 35-50



* All dimensions are in inches (mm).

Electrical Connections

FM 35-50



Guide Specifications

PART 1 — PART 1 GENERAL

1.01 SUMMARY

- A. 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 floor mounted and configured for ____ (up/down/up rr) discharge of conditioned airflow, with draw-through air pattern, to provide uniform air distribution over the entire face of the coil.

1.02 DESIGN REQUIREMENTS

- A. The system shall be as described in the following specification as manufactured by APC.

1. Model: _____.
2. Total cooling capacity: _____ MBH (kW).
3. Sensible cooling capacity: _____ MBH (kW).
4. Return air temperature: _____ ° F (° C) DB.
5. Return air temperature: _____ ° F (° C) WB.
6. Humidity: _____ % RH.
7. Air quantity: _____ CFM (L/s).
8. External Static Pressure _____ inches (Pa).
9. Humidifier capacity: _____ lbs/hr (kg/hr).
10. Electrical supply: _____ V, _____ ph, 60 Hz.

1.03 SUBMITTALS

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

1.04 QUALITY ASSURANCE

- A. The system shall be completely factory-tested prior to shipment. Testing shall include, but not be limited to: complete pressure and leak testing to ensure system 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 ETL/CETL, NTRL listed, MCA, and electrical system shall be UL Listed to UL 1995 and CSA 22.2 No. 236.

1.05 WARRANTY

- A. System parts shall be warranted for a period of 12months from date of shipment from factory.

PART 2 — PART 2 PRODUCT

2.01 STANDARD COMPONENTS

A. CABINET CONSTRUCTION

1. Double Skin Panels: Modules shall be capable of latching using a cam-lock mechanical latching mechanism (optional kit). Exterior panels shall be double-wall 24 gauge metal with 24 gauge interior wall and insulated with 1.5 lb (0.68kg) density fiber insulation. Insulation shall be completely protected from the air stream by the panel wall or air blocks. Front exterior panel crown shall be 16 gauge. Front panels shall be powder coated and removable hinged with a locking handle. Exterior frame and panel color shall have color values: L = 74.50, a = -.53, b = +8.20. Main module bezel color shall have color values: L = 13.44, a = .43, b = -2.63.
2. Frame: The frame shall be constructed of 12 gauge bolt-together formed steel for maximum strength. All units shall have full service access from the front allowing systems to be placed side by side.

B. DIRECT DRIVE MOTOR/BLOWER ASSEMBLY

1. Blower: The unit shall be configured for draw-through air pattern, to provide uniform air flow over the entire face of the coil. Each cabinet shall include, double-inlet, double-width centrifugal blower(s) assemblies with forward-curving blades, dynamically and statically balanced as a completed assembly to a maximum vibration level of two mils on all planes. Blowers shall be mounted based on mass and frequency to minimize vibration and noise.
2. Frequency Controlled Motor: A direct drive motor and frequency controller shall be used with each blower in the system to enhance user functionality. The frequency controller shall communicate with the master controller via RS485 MODBUS communication link. The 10-15 ton (35-50kW) modules shall be equipped with two blowers with a direct drive motor and a frequency controller for each motor.

C. 30% ASHRAE 52.1 FILTERS

1. 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 front of the unit.

D. MASTER CONTROLLER

1. Monitoring and Configuration: The master display shall allow monitoring and configuration of the precision air conditioning unit through a menu-based control. Functions include status reporting, setup, and temp/humidity set points. Four LED report the operational status of the connected Precision air conditioning unit.
2. Controls: The microprocessor shall come equipped with control keys allowing the user to navigate between menus, to select menu items, and to input alphanumeric information.

3. Alarms: The microprocessor controller shall activate a visible and audible alarm in the occurrence of any of the following events:
 - a. High control temperature
 - b. Low control temperature
 - c. High control humidity
 - d. Low control humidity
 - e. High filter differential pressure
 - f. Return sensor failure
 - g. High supply temperature
 - h. Low supply temperature
 - i. Loss or low airflow
 - j. Supply sensor failure
 - k. Water regulator actuator failure (model specific)
 - l. PC/Multicool Actuator failure (model specific)
 - m. High head pressure
 - n. Low suction pressure
 - o. Humidifier failure (model specific)
 - p. Replace canister (model specific)
 - q. Frequency Controller1 failure
 - r. Frequency Controller2 failure (model specific)
 - s. Air block interlock open
 - t. Water detected (optional)
 - u. Fire (thermal sensor trip--optional)
 - v. Smoke detected (model specific)
 - w. Condensate pump failure
4. Logging: The microprocessor controller shall log and display the 30 most recent alarms. Each alarm log shall contain time/date stamp as well as operating conditions at the time of occurrence. Controller shall display the run time hours for major components (compressors, heaters, humidifier, blower motors).

E. ELECTRICAL PANEL

1. The electrical system shall conform to National Electrical Code (NEC) requirements. The control voltage shall be 24 VAC, class 2 circuit. The electrical panel shall contain contactors, starters, overload protection devices, and input power disconnects. The panel shall be hinged and removable in the unit for available access to blower motor assemblies.

F. TANDEM SCROLL COMPRESSORS

1. Refrigeration system: The system shall operate under the coordination of the main controller. Suction and discharge pressures shall be monitored and electronically controllable. Each refrigeration system shall consist of a fully protected scroll or tandem scroll compressor, evaporator coil mounted over an anti-fungal, 94VO thermal formed plastic 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.
2. Tandem Scroll Compressors: The unit shall contain scroll compressors for optimized performance, efficiency and reliability. The heavy-duty scroll compressors shall be designed for year-round usage. Modules shall utilize tandem scroll compressors for staged capacity control.

G. EVAPORATOR COIL/94VO THERMAL CONDENSATE PAN

1. The evaporator coil shall use aluminum fins and rifle-bored copper tubes. Coil end-supports shall be galvanized steel. To enhance dehumidification, the modular system shall utilize dual distributors on one circuit of the refrigeration system. Condensate pan shall be 94VO Thermal formed, anti-fungal, non-ferrous material for higher indoor air quality.
2. The condensate pan shall have a UL required overflow protection pipe. The overflow piping shall extend from the condensate pan to the base pan of the unit and allow for optional field piping as a gravity drain.

H. BRAZED PLATE CONDENSER

1. Water and glycol cooled systems shall employ a brazed plate heat exchanger. The condenser shall be equipped with clean-out plugs. Standard pressure rating shall be 450 psig (3102 kPa).

I. WATER REGULATING VALVES

1. Water and glycol cooled systems shall utilize two-way or three-way valves to regulate the amount of water or glycol supplied to the condenser in response to refrigerant discharge pressure. The standard valve pressure rating shall be 400 psig (2758 kPa).

J. PROGRAMMABLE INPUT/OUTPUT INTERFACE MODULE

1. The main module shall provide field connection through a system programmable input/output module. Each interface module shall be programmable with outputs that can map from any system alarm through the microprocessor controller. Inputs shall be capable of mapping to outputs as a system alarm or custom alarm.

K. REFRIGERATION SYSTEM MONITORING

1. The system shall report real time monitoring of both suction and discharge pressures to the controller. Pressures shall be logged and displayed at the proper menu selection on the controls.

2.02 OPTIONAL COMPONENTS

A. STEAM GENERATING HUMIDIFIER

1. Humidifier shall be able to modulate capacity. The humidifier shall be self-contained, steam-generating type, factory piped and wired, with disposable cylinder and automatic solid-state control circuit. The humidifier shall require little or no scheduled maintenance. Humidifier canisters shall be replaceable and/or cleanable or disposable. The humidifier controller shall communicate directly to the microprocessor controller and provide complete status and control at the operator interface.

B. SCR ELECTRIC REHEAT

1. Reheat elements shall be low watt density, wired for three-phase, loaded equally on all three phases and shall be electrically and thermally protected by both automatic and manual reset thermal cutouts. Reheat capacity shall be _____ MBH, _____ kW, SCR controlled. Reheat coils shall be stainless steel, fin tubular construction.

C. FLOORSTAND

1. The heavy gauge floorstand shall raise the unit above the subfloor to match the height of the raised floor. Floorstands shall be equipped with air deflectors and turning vanes for optimal air distribution. Heights shall be available from 12" (305mm) to 24" (610mm) for downflow units in 3" (76mm) increments and shall be adjustable +/- 1.5". Threaded pedestals shall provide adjustment. Vibration absorbing pads shall be included. The floorstand, pedestal and pads ship loose.

D. SUB-BASE

1. A sub-base shall raise the height of upflow units for electrical wiring and piping access. The height shall be 10" (254mm). Access panels shall be provided in the front and rear of the sub-base with 1/4 turn latches for removal.

E. PLENUMS

1. A discharge plenum shall mount on top of an upflow unit to direct and distribute conditioned air. The plenum shall be manually adjustable with double deflecting grilles provided on 2, 3 or 4 sides.

F. DUCT FLANGE

1. A 1" (25 mm) duct flange shall be provided for field installation on a unit to provide convenient connection to external ductwork.

G. HIGH LIFT, DUAL FLOAT CONDENSATE PUMP

1. Factory installed and wired condensate pump shall pump 60gal/h (0.06 L/s) at 60ft (18.3 m) head.

H. ADDITIONAL PROGRAMMABLE INPUT/OUTPUT INTERFACE MODULES

1. Each system shall be equipped with up to 3 additional discrete input/output modules for a total of 16 inputs/outputs. Each interface module shall be programmable with outputs that can map from any system alarm through the microprocessor controller. Inputs shall be capable of mapping to outputs as a system alarm or custom alarm.

I. FIRESTAT

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

J. SMOKE DETECTOR

1. A smoke detector shall be factory-installed in the return air to sense concentrations of smoke and send a signal to the main controller shutting down the unit and activating a visual and audible alarm.

K. SPOT WATER DETECTOR(S)

1. A water detector shall be factory-wired and shipped in the bottom of the unit to sense water and send a signal to the master control giving the operator possible alarm indications options for shutdown. The water detector shall be provided with 15 ft (5 m) of wire.

L. CABLE LEAK DETECTOR

1. A leak detection sensing cable shall be shipped loose with the unit. If water or other conductive liquids contact the cable anywhere along its length, the main controller visually and audibly annunciates the leak.
2. The detector shall be provided with 35ft (10.6 m) of cable. Cable may be cascaded up to 1000ft (305 m).

M. HOT WATER REHEAT

1. The unit shall be supplied with factory-installed copper tube, aluminum fin, and 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 valve.

N. STEAM REHEAT

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

O. HOT GAS REHEAT

1. The water- or glycol-cooled unit shall be supplied with a factory-installed copper tube and aluminum fin hot gas reheat coil. The coil shall be controlled by the main controller through a factory piped and wired three-way heat reclaim regulator and check valve.

P. 85% HIGH EFFICIENCY FILTERS

1. Filters shall be 85% efficient per ASHRAE Standard 52.1-92, UL Class 2. The full 4" (102 mm) deep, pleated filters shall be replaceable from the front or top of the unit.

Q. FLOW SWITCH

1. Single pole, double throw shall moderate fluid flow when it exceeds or drops below the set flow rate. Flowswitch shall ship loose for field installation

R. EXTERNAL CHILLED WATER SUPPLY SYSTEM (MultiCool)

1. The unit shall contain a primary chilled water coil and secondary coil within the same cabinet. These systems shall provide cooling using either building chilled water or the standard refrigeration system. The chilled water mode shall be configured as the primary or secondary cooling source and shall switch to the secondary upon loss of the primary.

PART 3 — PART 3 INDIVIDUAL SYSTEMS

3.01 AIR-COOLED

- A. The indoor unit shall consist of an evaporator section including evaporator coil, blower package, controls, electrical section, and compressor.
- B. CONDENSER
 - 1. Outdoor Propeller Fan Condenser: The outdoor condenser casing shall be made 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 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 weatherproof 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. A ship loose pressure relief valve shall ship with the condenser.
 - 2. Flooded Controls: Flooded controls shall maintain head pressure to -30° F (-34.4°C) by regulating the effective condensing area within the condenser coil. Controls shall ship loose and be mounted to the side of the condenser. A ship loose pressure relief valve shall ship with the condenser.

3.02 WATER-COOLED

- A. The water-cooled system shall consist of an evaporator section including evaporator coil, blower package, controls, electrical section, compressor, and water-cooled condenser. The condenser shall be stainless steel brazed plate design and shall be controlled by 2-way (3-way optional) head pressure-regulated valve. Maximum water pressure shall be 450 psig (3102 kPa).

3.03 GLYCOL-COOLED

- A. The glycol-cooled system shall consist of an evaporator section including evaporator coil, blower package, controls, electrical section, compressor, and glycol-cooled condenser. The condenser shall be stainless steel brazed plate design and shall be controlled by 2-way (3-way optional) head pressure-regulated valve. Maximum water pressure shall be 400 psig (2758 kPa).

B. FLUID COOLER

1. Outdoor Fluid Cooler: The fluid cooler casing shall be of aluminum, and all structural supports, coil frame, motor-drive supports, and mounting legs shall be made of galvanized steel. The fluid cooler 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 fluid cooler motors shall have permanently lubricated, sealed, ball bearings, and internal overload protection. Motors shall be mounted inside the fluid cooler casing for weather protection and wired to a terminal strip in a weatherproof panel on the unit. The direct-drive, aluminum fin 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 fluid cooler shall be sized for 95° F (35° C) ambient, and operate on _____ V, _____ ph, 60 Hz power.

C. PUMP PACKAGE

1. Single Pump Package: The pump package shall be comprised of a centrifugal pump in a vented enclosure with pump starter, separate fluid cooler fan and pump circuit breakers, Aquastat, and fan cycling contractors to control the fluid temperature. The controls shall be mounted on the fluid cooler. 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.
2. Dual Pump Package: 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 fluid cooler fan and pump circuit breakers, Aquastat, and fan cycling contractor to control the fluid temperature shall be mounted on the fluid cooler. 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.

3.04 ECONOMIZER

- A. Glycol systems shall have the option of an economizer coil that is designed to reduce operating costs during mid to low ambient temperatures. Economizer cooling coil shall be copper tube, aluminum fin coil located in the return air before the V-Frame evaporator coil. The economizer coil shall be rated at ____ BTU/HR (kW) sensible cooling capacity with a 45 F (7.2 C) entering glycol solution temperature. The economizer coil shall require ____ GPM (l/s) and the total unit pressure drop shall not exceed ____ feet of water (kPa), when in the economizer mode of operation.

3.05 MULTICOOL

- A. Air, Water and Glycol systems shall have the option of a chilled water coil that is designed to be the primary cooling source to the backup direct expansion coil. The MultiCool (chilled water) coil shall be constructed with copper tubes and aluminum fins. It shall be located in the return air, before the V-Frame evaporator coil. The MultiCool coil shall be rated at ____ BTU/HR (kW) sensible cooling capacity with 45 F (7.2 C) entering water temperature. The MultiCool coil shall require ____ GPM(l/s) of chilled water and the pressure drop shall not exceed ____ psig (kPa).

Guidelines for Installation

The NetworkAIR FM 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 NetworkAIR FM system will provide years of trouble-free service, when 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.

Minimum clear space of 18" (460 mm) is to be provided for units over 15 tons (53 kW).

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.

- Service access** At least 24" (610 mm) of clear space must be left in front of the unit for routine service (filters, humidifier). We strongly recommend approximately 32" (813 mm) clearance in front of the unit.
- Receiving the unit** Your NetworkAIR FM 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 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 NetworkAIR FM unit uses 3-phase power for operation. Power connections are landed to a receptacle on either floorstand or sub base. 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 point is provided with the equipment. A 1/4" (6.4mm) compression connection is supplied with the unit.
- Condensate drain** Condensate from the evaporator pan is collected and discharged by the condensate pump to a 5/8"od (15.9mm) fitting for field connection.

Water supply to humidifier

1. The humidifier fill valve orifice is sized for supply water pressure from 15 PSI (103.4 kPa) to 150 PSI (1034 kPa).
2. For cases above 150 PSI (1034 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 unit's 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 800 mW) must be preconditioned for proper operation and longevity of the humidifier.
8. Water supplies with low conductivity (less than 125 mW) may require a low conductivity cylinder (contact the APC configuration team). When the cylinder is first installed, a teaspoon of salt or an Alka-Seltzer tablet may be required to start humidification. If conductivity is less than 75 mW, water treatment may be necessary.

Water supply

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

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., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
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Asia Pacific	(61) 2 9955 9366 (Australia)

- 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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